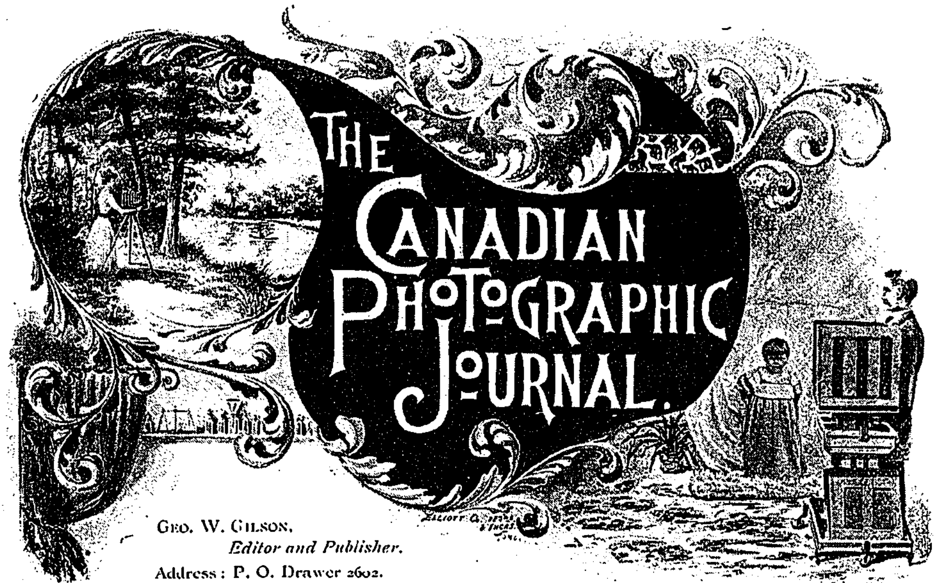
Ilford Plates. *American "Aristo" Paper.*

EVERY-DAY WORK

BY

GEO. B. SPROULE, PETERBOROUGH



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Our Illustrations.

OUR esteemed friend, Mr. G. B. Sproule, of Peterboro', has furnished us this month with some charming specimens of the every-day work of his well-known gallery. Mr. Sproule's studio is very complete with all the newest and best of instruments and accessories. This fact, coupled with the more important one of a thorough and practical understanding of photography in all its branches, and an experience dating back into the wet-plate days, when, as the saying goes, "a photographer was a photographer," accounts for the popularity of Mr. Sproule and the uniform good quality of his work. Mr. Sproule is a firm believer in Ilford plates and American Aristo paper, and the results here shown certainly bear witness to the good qualities of both of these popular brands.

Clouds in Landscapes.

BY JOHN CLARKE.

LOVERS of the beautiful in natural scenery know how to appreciate the glories of cloudland, and landscape painters rely, perhaps, more on cloud effects than on anything else to give charm and beauty to their work; while the poor photographer, more in need of something to supplement the monotony of his monochrome, is content, in all except occasional marine pictures, to neglect the opportunities and furnish only dull grey skies having neither character of themselves nor influence, except, perhaps, for evil, on the landscape over which they preside, and on which they should confer additional beauty.

Why this should be so is a puzzling question, as cloud negatives are easily made, or, failing that, may be bought at reasonable rates, and printed in without difficulty; and my object in this article is to urge photographers to commence the work of the season with a determination to do their best to remove the reproach.

The first step, is, of course, for each to supply himself with a stock of suitable cloud negatives; and, as it is better and more pleasure-giving to employ one's own handiwork, he should photograph them for himself. As suitable arrangements of clouds, in some parts of the world at least, are neither regular nor frequent visitors, he should be always lying on his arms—always ready to take advantage of an opportunity when it occurs.

For this purpose a slow plate is to be preferred—one that gives considerable latitude in development, as, although a cloud negative should not be dense, it should be brilliant and without a trace of fog. The too common practice of tilting the camera upwards towards the zenith cannot be too strongly condemned, as the printing-in of clouds so photographed is an outrage on nature. A little consideration will show that, as the clouds are to be seen with a horizon on a level with the eye, they should be photographed from as nearly as possible that position; that is to say that the camera should be as nearly level as possible, and that the lower part of the negative should include the landscape to the extent of nearly one-third from the bottom.

The printer-in of clouds is often, and not without cause, found fault with for placing clouds and landscapes together lighted from different directions; and, while such incongruity may not be noticed save but by a trained observer, it should, of course, never be perpetrated, especially as, even without any careful examination, it is easily avoided.

Cloud studies *per se* are very beautiful, and it has been my habit for years to photograph them whenever I had a chance. To render the negatives available for printing in without a careful examination, and with the certainty of being correctly lighted, every negative, as soon as taken from the dark slide, is marked on the back with a writing diamond, say, as follows: "May 1, 1893, 10.20, S.W.," and my landscape negatives are all marked in the same way. They may be matched without the slightest trouble.

Fault is also sometimes found with clouds as not altogether suited to the landscape in consequence of the accidental distribution of the lights and darks on the latter, but this is a degree of hypercriticism that may be safely disregarded, the fault generally being such as not to be noticed by one in a thousand.

There are many methods of printing-in clouds, each preferred by its advocate, and probably each better for those who practise it than would be either of the others, while all appear to give equally good results. The following method is as simple as any, and has been employed by me for many years with uniform satisfaction.

The negative is placed upright against a window pane and covered with a piece of paper sufficiently translucent to show the detail, and a pencil line roughly drawn of the junction between sky and landscape. This is pasted on a piece of opaque stout paper the full size of the printing frame, and, when dry,

LAKE SCENE NEAR LINDSAY.

divided along the line, forming two masks, one for the sky, the other for the landscape.

For printing, the sensitive paper and landscape negative are placed in the frame in the ordinary way, and the sky mask placed over the sky on the outside of the frame, the edges being further softened by cotton wool loosely pushed between mask and glass. When the landscape is sufficiently printed, the negative is removed and the sky one put in its place. The landscape mask replaces the sky mask, only covering the portion already printed, and the whole again exposed. Just how deep to print the clouds must be a matter of experience, but it may be taken for granted that they should never be prominent enough to concentrate attention on themselves. But this is a question in which no hard-and-fast line can be drawn, much depending both on the nature of the subject and on the clouds themselves. In some cases, a printing just deep enough to leave, after toning and fixing, a faint indication of cloudland, while in others they may be printed to full ordinary depth.

Simple as is the description of this method, it is really much simpler than it seems, and I have never known one who did not succeed to his satisfaction after one or two trials. There is, therefore, no reason why anyone should continue to send out landscapes with bare white or dull greyish skies, and I am quite certain that he who will give this method a fair trial will always thereafter beautify his pictures with the charm-giving clouds.

Date of the Convention.

To the Editor of THE JOURNAL:

DEAR SIR,—Will you allow me to ask, through you columns, why the meeting of the Association of Canadian Photographers was put off until the cold, rainy, muddy, and otherwise disagreeable days of November?

Is it possible that the Executive Committee were aware that the best of foreign photographers will be in this country in July? If so, would it not have been in the interests of the association to have at least made an effort to arrange our meeting at such time as would allow these gentlemen to have visited us if so inclined, and to encourage their inclination by a hearty invitation to be present as honorary members of the P. A. C. for 1893? Again, presuming that the Executive Committee are all going to meet these gentlemen in Chicago, and expect "us all" to do the same; then why not have taken the date of last year's convention again? A great many photographers arrange each year to attend the Toronto Fair, and a number of these, among them being myself, will hardly be able to go to Toronto again in November.

Everything considered, I, for one, think the meeting should be held during the Fair. What do others think?

A. MEMBER.

Books and Pictures Received.

PHILADELPHIA'S SHARE IN THE DEVELOPMENT OF PHOTOGRAPHY. By Julius F. Sachse, Philadelphia.

Originally a lecture delivered by the author before the Franklin Institute, and now published in pamphlet form. It comprises a very able resumé of the great share Philadelphia has had in the development of photography, and has a number of interesting illustrations.

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THE HOME OF THE KODAK.

A further instance of the fact that whatever the Eastman Kodak Company do is done in "proper shape," is shown in the artistic leaflet descriptive of the home of the kodak, which comes to us to-day and tells us, in an entertaining way and with many beautifully executed illustrations, of the immense plant which is necessary for the production of the enormous quantity of goods required to meet the demand for the popular productions of this firm.

• • •

Bing, French & Co., of Boston, who are sole agents in the United States for the Voigtlander and Darlot lenses, have just issued a very complete condensed price list of photo stock carried by them.

• • •

From Geo. Gillespie, of Shelburne, we have received some excellent samples of work, the lighting being exceptionally good. One of a pretty child shows Mr. Gillespie to be an artist.

• • •

From J. T. Aitken, of Sudbury (lately of Galt), comes a very well-posed picture of a lady. It is sharp and clear, and well finished.

WE have received a great many complimentary letters since beginning our second year, which are encouraging as showing appreciation of our efforts to make THE JOURNAL successful and a credit to the profession in Canada.

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YARMOUTH, N. S.,
April 22, 1893.

Mr. Geo. W. Gilson,
Publisher C. P. J.

DEAR SIR,—I enclose subscription to THE CANADIAN PHOTOGRAPHIC JOURNAL. Those sample copies received persuaded me that your journal, for a yearling, is showing strong points, and must surely win its way to the front. I hope you will receive encouragement and the subscription from every photographer in the Dominion.

Yours truly,

GEO. F. PARKER.

World's Columbian Exposition.

CHICAGO, March 30, 1893.

To the Public:—Because of many misrepresentations and misstatements relative to Exposition management and affairs being in circulation through the press and otherwise, both in this country and abroad, and in reply to many letters of inquiry or complaint touching the same matters, it seems advisable that some official statement regarding them should be made to the public. Therefore I respectfully ask that the widest publicity be given to the following facts:

1. The Exposition will be opened in readiness for visitors May 1.

2. An abundance of drinking water, the best supplied to any great city in the world, will be provided free to all. The report that a charge would be made for drinking water probably arose from the fact that hygeia water can also be had by those who may desire it at one cent a glass.

3. Ample provisions for seating will be made without charge.

4. About 1,500 toilet rooms and closets will be located at convenient points in the buildings and about the grounds, and they will be absolutely free to the public. This is as large a number in proportion to the estimated attendance as has ever been provided in any exposition. In addition to these there will also be nearly an equal number of lavatories and toilet rooms of a costly and handsome character as exhibits, for the use of which a charge of five cents will be made.

5. The admission fee of 50 cents will entitle the visitor to see and enter all the Exposition buildings, inspect the exhibits, and, in short, to see everything within the Exposition grounds, except the Esquimau Village and the reproduction of the Colorado cliff dwellings. For these as well as for the special attractions on Midway Plaisance a small fee will be charged.

6. Imposition or extortion of any kind will not be tolerated.

7. Free medical and emergency hospital service is provided on the grounds by the Exposition managment.

8. The Bureau of Public Comfort will provide commodious free waiting-rooms, including spacious ladies' parlor and toilet rooms in various parts of the grounds.

H. N. HIGINBOTHAM,
President.

Answers to Correspondents.

J. C. writes: I have just purchased a lens the diaphragms of which are marked differently from my old one, viz., plain numbers, instead of *f*/4, *f*/8, etc. Can you tell me why this difference? Ans.—Your lens is marked by the U.S., or "uniforma system," as arranged by the Photographic Society of Great Britain. The following will show you the corresponding values:

U. S.		*Ratio of Focus.*	*U. S.*		*Ratio of Focus.*
No. 1	=	F-4	No. 32	=	F-22.6
No. 2	=	F-5.657	No. 64	=	F-32
No. 4	=	F-8	No. 128	=	F-45.2
No. 8	=	F-11.3	No. 256	=	F-64
No. 16	=	F-16			

• • •

"JUSTO."—The pyro-ammonia developer is used extensively in England, but is not recommended by American plate makers. If you wish to try it, the following formula gives excellent results:

I.

Pyrogallic acid	1	oz.
Citric acid	60	grs.
Sodic sulphite	2½	oz.
Water, to make	20	"

II.

Liquor ammonia (.880)	1	oz.
Potassium, bromide	½	"
Water, to make	20	"

For studio work use one part each Nos. 1 and 2 to ten parts water. For outdoor work double the quantity of bromide of potassium and begin with smaller portion of No. 2.

Amidol.

(Concluded from the April number.)

EXPERIMENT No. 4.

Another sheet of bromide paper was exposed as before and divided into two parts. A solution of amidol in water was rendered alkaline with sodium carbonate and poured on one portion of the paper. In thirty seconds the image began to appear. The developer was now poured off, acetic acid was added to it, drop by drop, until the solution tested acid, and this solution poured over the second portion of the paper. No image appeared, even after five minutes, showing that the acid had completely checked the development. Carbonate sodium was again added to the developer, and as soon as it reacted alkaline it was poured back on the paper, when in forty-five seconds the image made its appearance.

EXPERIMENT No. 5.

Supplementary to this a final experiment was made on another exposed sheet of bromide paper, and this divided into two parts:

Part No. 1 received the half of a solution of amidol 10 grains, sodium sulphite 25 grains, water 4 ounces. Development began in thirty seconds.

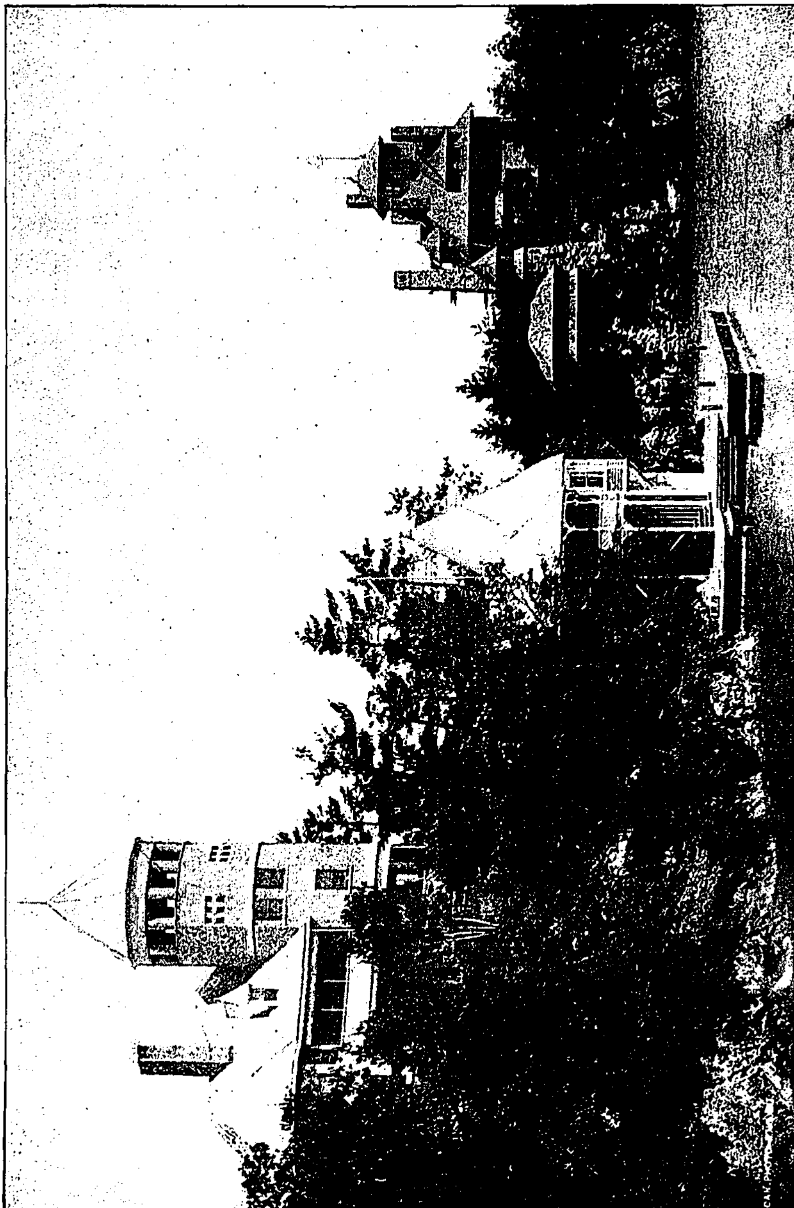
Part No. 2 received the other half of the above solution to which had been added one drachm of a five per cent. solution of sodium carbonate. The image made its appearance in fifteen seconds, *one-half* the time.

EXPERIMENT No. 6.

An experiment was lastly made to determine, if possible, what acid was in combination with the organic base. To a solution of amidol in water was added the usual reagent test solution of silver nitrate. A copious white flocculent precipitate separated, which in a few minutes began to change to a violet shade. This when filtered off and well washed responded to all the tests for silver chloride. The amidol of Hauff is, therefore, the hydrochlorate of amidophenol, and from the quantity of silver chloride separated the salt is evidently a highly acid one.

The amidol of Andresen was next examined. Physically it was a crystalline powder of a lighter shade than that of Hauff - in fact almost white. It was much more soluble in water than the Hauff amidol, the solution did not decompose as rapidly, and its reaction was not as strongly acid. Used as a developer, *per se*, in aqueous solution, it was found after a few minutes a faint image appeared, but this gained nothing in either detail or density, even after the developer had remained on the exposed film for twenty minutes. The addition, however, of a drachm of either of the solutions of sodium carbonate or sodium sulphite previously used, immediately started development, and it then progressed steadily and rapidly to good density. Its action with the phospate, acetate and biborate of sodium was similar to the preparation of Hauff, although the liquids changed to a greenish-black color instead of a reddish-brown. The two articles are not therefore identical in every respect. To determine the acid forming the Andresen amidol a simple solution of the latter in water was tested with barium chloride. A white precipitate was formed which responded to all the tests for barium sulphate, showing that the combination is probably a sulphate. The Hauff amidol gave no reaction with barium chloride.

The result of these experiments would lead to the conclusion that amidol is not, in any sense of the word, an *acid* developer. On the contrary, when *by itsel*



AMONG THE THOUSAND ISLANDS—HOPEWELL HALL AND CASTLE REST.

in solution *it fails to act*, and its acid reaction is simply a result of the method in which the diamidophenol is combined in order to insure stability. When an alkaline salt is added to partial neutralization, development commences. It increases rapidly in proportion to the quantity of the salt employed, and seems to proceed equally well with other salts than sodium sulphite. Development also occurs with the use of alkaline carbonates, and probably also with caustic alkalies, and the development is restrained by the addition of acids and accelerated by alkalies or their salts in the same manner as with the other organic alkaline developers. When sodium sulphite is employed it acts as an accelerator simply because the salt is an alkaline one. It is quickened when more sulphite is added, because the amount of alkali is increased, and this same quickening can be produced by another alkaline salt instead of the sodium sulphite. When a neutral salt is employed, as, for instance, potassium ferrocyanide, no action occurs until an alkaline salt is added. The only point in which, probably, amidol differs from either pyrogallol, eikonogen, hydrokinon, or paramidophenol is in the fact that it is influenced by much weaker alkaline salts. There is nothing remarkable in this, for it is well known the other agents in the series vary as regards their susceptibility to alkalies, pyro, always fogging with caustic alkalies, while hydrokinon always requires them in order to obtain the best result. Sodium sulphite acts also as an accelerator with eikonogen, and it is well known that the ordinary stock solution of eikonogen and sodium sulphite will render visible the latent image. Diamidophenol is of itself an organic compound of probably extremely unstable character. To enable it to be used it must be in more permanent form, and for this reason it is placed on the market in the form of a combined salt. When exposed in solution to the action of light and air, oxygen is absorbed, the solution changes color, and the salt is decomposed. This same change takes place very rapidly, in fact immediately, with the alkalies and their weaker salts. The diamidophenol is probably also decomposed and the solution soon loses its virtue. In the case of sodium sulphite, and the reason why this salt is preferred, is because while it is alkaline enough to cause development, its oxygen-absorbing properties prevent decomposition of the amidophenol, and thus keep the solution clear and render it moderately permanent.

Before leaving the subject finally, let us look for a moment to see whether there is the least evidence of a documentary character to support the claim that amidol is acid. First, listen to what the manufacturers of amidol have to say. Hauff states in the sheet of directions which accompanies his amidol : "No separate alkali is needed, as amidol is such an energetic reagent that the amount of *alkali* which is present in the sodium sulphite is amply sufficient to complete the reaction." And Andresen states in his directions : "Solution of *potash* (1.5) added by drops quickens development." And yet amidol is an *acid* (?) developer. Finally, the patent specifications of Julius Hauff, of Feurbach, Germany, after reciting briefly the nature and chemical constitution of the members of the "glycine" group sought to be covered by the patent, say : "These compounds are used in solution with sulphites and *carbonates* of the *alkalies*, for the purpose of developing photographic images or views." If potassium carbonate or sodium carbonate are not alkalies in the general photographic acceptation of the term, then what are they?

It remains to add a few words concerning the practical employment of amidol. The fact that the alkaline character of sodium sulphite promoted development would also lead to the supposition that it also produced a certain amount of decomposition of the amidol, and that a stock solution, made with sulphite according to the instructions of the manufacturers, would not be altogether a permanent one. That this conjecture is a true one has already been confirmed by several observers. Mr. F. C. Beach, in the January number of the *American Amateur Photographer*, states that a stock solution of amidol after standing several weeks lost two-thirds of its strength. The writer would therefore suggest that amidol be used dry and fresh in connection with a strong solution of sodium sulphite, or it be dissolved in weak sulphurous acid, either pure, or as made by the regulation formula of Cramer (Sodium sulphite, 1 dram; sulphuric acid, 15 minims; water, 6 ounces). A solution of amidol made according to the latter formula is, at this date of writing, nearly four weeks old, and yet seems as active as when first made. As a developer, the writer has not found amidol to be any faster than the other new organic developers, and thinks all such statements are largely relative, owing to the varying quantities of accelerators and restrainers employed by different experiments. It requires the addition of a small proportion of bromide to obtain contrast, and then, although the image appears rapidly, it lacks density, and this follows quite as slowly as when eikonogen or hydrokinon are used. There seems to be, however, almost a total absence of fog, and the image when complete has good color and full detail.

There is no doubt that the capacity of amidol as a developer, and the proper method of its use, are not as yet at all fully understood. It is undoubtedly a most potent reducing agent, and is influenced by much weaker alkaline agencies than any other organic developer yet known. With our present knowledge it therefore might well be placed at one end of the series of organic developers, as highest in sensitiveness to alkaline influences, while hydrokinon would probably stand at the other end of the list.

EXTRACT from a letter from Mr. B. W. Kilburn, who has the exclusive privilege of making stereoscopic views at the World's Columbian Exposition:

LITTLETON, N.H.,
April 7th, 1893.

G. Cramer Dry Plate Works,
St. Louis, Mo.

GENTLEMEN,—I had fine success using your plates, and it is solid comfort to have a stock of such plates on hand. It gives courage, and you know to a nicety what is possible.

I did not lose *one* plate in *two hundred and ninety-two* exposures — all Cramers—from *any fault in the plate* while in Chicago the last time.

Yours very truly,
B. W. KILBURN.

"I've just started in as a photographer, and I wish I had that man's reputation."

"Who is he?"

"A professional magician, and noted for his fine *cabinet work.*"—*Photo. Times.*

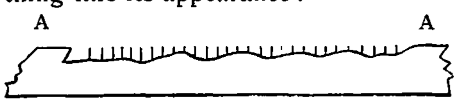
Photogravure, or Photographic Etching on Copper.

BY HERBERT DENISON.

(Continued from the April Number.)

AS the depth of the etching is proportionate to the length of time the mordant is allowed to act, it will be understood that the plate will be most deeply bitten where the etching first began (that is in the shadows), while in the highest lights which the mordant attacked last the polish will scarcely have been removed from the copper.

On cleaning off the "resist" (as the negative film upon the copper is called) we shall see that throughout the etched portions of the plate little bright points, which have been protected by the bitumen dust, stand up to the original surface level, and if we magnified a section of the plate this would be something like its appearance :—



Take our first diagram ; the wavy line represents the etching portion of the plate with its gentle gradation from shadow to half tone and half tone to high light; this wavy line is still there, but it is interrupted by the grain (which we have called the file teeth) which goes to form, as it were, little compartments of varying depth. In wiping the plate for printing, the ink in these compartments will be undisturbed, and so the true gradation in the print will be preserved.

So far I have referred only to photogravure plates in half tone. In line subjects, theoretically, no grain should be necessary, but in practice it is found advisable to have a certain amount, very fine in quality, but less in quantity than for half tone work I have a few examples to show you both of my own work and of that of the New York Photogravure Company, some of these latter being, I consider, amongst the finest yet produced.

I think we have now got hold of the principles of the process sufficiently to understand the details, to which we will now pass on.

First of all, I will give you a list of the materials and appliances which will be required :—

A printing frame.

Autotype special transparency tissue for the reversed transparency, and a tin box with a weighted lid to keep the tissue in.

An actinometer (Sawyer's) as a guide to the exposure of the tissue.

A porcelain dish and a three per cent. solution of bichromate of potash, for sensitizing the tissue, and some ferrotype plates to dry it on.

Then we shall want two developing trays made of tin, a squeegeeing board covered with zinc, and a small gas stove.

A bottle of a 5 per cent. solution of alum, and another of methyl. spirit, and some glass plates coated with bichromatized gelatine will complete the list so far as the transparency and reversed negative go.

The articles connected with the copper plate are :—

The plates themselves, which may be obtained to order in any size, from Messrs. Hughes & Kimber, or from Mr. A. Nicholls, of Cyrus Street, London, E. C., England.

Some pure cotton wool (to be obtained at the chemist's) and washed whiting, for cleaning and polishing the plates.

A dusting box about 12 inches square at the base and 18 inches high, arranged to revolve upon pivots placed in the middle of each side. There is a door at the front through which a plate may be passed, after shaking up the dust by causing the box to revolve.

About a pint of powdered bitumen or asphaltum to place in the box.

A sheet of iron about a quarter of an inch thick, somewhat larger than the size of plate intended to be worked. This is to place over the gas stove, and is used for fixing the bitumen dust to the copper by heat.

We shall further want a flat ruler, a draughtsman's pen, a camel's-hair brush for varnish, five solutions of perchloride of iron of different strengths, and five dishes for using these solutions in.

I have no doubt you are all familiar with the mode of production of a photographic negative, and if not, it is much too big a subject to enter upon at this time, so I will merely point out the class of negative best suited to the process.

It should be fairly strong, but without being hard, with detail fully out in the shadows, and free from fog. In short, the negative should be of the class to give a good print on platinotype or on plain silver paper.

It is important that the negative should be free from defects and should require as little retouching as possible, and what retouching *is* done should be done in a skilful and careful manner. There is, however, an opportunity of remedying any over-retouching by working in the transparency.

Although to some of you it may appear to be a waste of time to go through all the details of the carbon process, I believe that, its antiquity notwithstanding, a want of the knowledge of that process is far more common than would have been expected. Moreover, so much in the photogravure process depends upon the reversed carbon transparency and the reversed negative or "resist" printed from it, that I feel obliged to treat of it somewhat minutely.

The Autotype Co. prepare a special transparency tissue for reproducing negatives, the film of which contains a larger proportion of pigment than the ordinary tissue; the pigment is also in a finer state of division. This is the material we will use; it can be obtained either sensitized or insensitive. I buy most of mine sensitized in order to save trouble, but the sensitizing is quite simple.

We will assume that the tissue is insensitive and proceed to sensitize it.

Pour your solution of bichromate of potash into a dish somewhat larger than the tissue to be sensitized and deep enough to allow of the solution being an inch deep.

I have previously mentioned the strength of the solution (three per cent.); it should be made by suspending the bichromate in a jar containing the required quantity of water.

When sensitizing, the solution should be about 60° F.

The tissue is dusted with a camel's hair brush and then taken in the right hand, pigment side downwards, the left hand edge is put into the solution near the right edge of the dish and then the tissue is pushed along with the right hand, while with a brush held in the left the tissue is pushed under the surface.

All air bubbles are carefully removed from the back and the tissue is turned over, any air bubbles there being removed. At first, on immersion, the tissue will be inclined to curl with the pigmented side inwards, but after a while the curl will be reversed and it is then time to remove the tissue from the sensitizing bath. This is a better guide than to state a definite time for the immersion to continue, because the temperature and dryness or dampness of the atmosphere materially affect the time of sensitizing. The tissue will usually be ready to remove in from two to four minutes.

Have ready a clean Ferrotype plate on the squeegee board, take up the tissue by one corner and allow a drop or two to fall from the tissue on to the plate, then place the tissue face downwards upon the plate and apply the squeegee; blot off any superfluous moisture from the paper and set aside to dry. The temperature while drying should not be above 65° and the drying should take place in the dark. When perfectly dry, the tissue can be stripped from the plate with a very fine bright surface.

In carbon printing it is necessary to have a margin of tissue unacted upon by the light surrounding the print, in order to prevent the film washing up on development.

This is obtained by masking the negative with opaque paper all around the edge for an eighth of an inch, or more according to the portion of the negative it is desired to reproduce.

Unless the edge of the negative is a sufficient guide for placing the tissue in position, it is as well to draw the pencil lines along the top and one side parallel with, and ⅛-inch away from the opening in the mask.

Now cut the sensitized tissue accurately a quarter of an inch larger each way than the mask opening, place the negative in a printing frame and the tissue behind it with the edges just touching the pencil marks on the mask.

Expose to daylight, at the same time and in the same light exposing the actinometer, in which a piece of sensitive silver paper has been placed.

The duration of the exposure depends of course upon the density of the negative, but with an average negative it will be necessary to print through the whole of the nine tints registered by the actinometer and to the 3rd or 4th tint after drawing forward a fresh piece of the silver paper.

A little experience will soon teach you what exposure is required. And it must be remembered that the action of the light upon the tissue continues after its removal from the light, so that the length of time between exposure and development is an important factor.

The transparency must be developed upon glass and it is necessary to prepare the glass by flowing over one side a hot solution of gelatine to which has been added sufficient bichromate of potash to give it a lemon-yellow color. These plates are dryed in daylight which renders the bichromatized gelatine insoluble and this film forms the substratum which is to hold the transparency during development.

After exposure immerse one of the bichromatized plates in a deep dish of clean cold water, take the exposed tissue and immerse that *face up* in the same dish. It is usual to recommend the tissue to be placed in the water *face downwards*, but my experience is that fewer air bubbles result from immersing face up.

If any air bubbles should be seen either on front or back of the tissue remove them with a camel's-hair brush. The tissue will first curl with the pigmented side inwards, and as soon as it begins to uncurl, arrange it in position under water on the glass plate, lift out both together and apply the squeegee (a flat one) to the paper backing of the tissue, beginning a little past the middle, and then, taking the squeegee in the other hand, repeat the process on the other half of the tissue. This is to remove from between the tissue and the plate any water or air, and so ensure contact.

Place the plate, the tissue downwards on blotting paper for five minutes, and it is then ready for development.

Take a tray of water at 95° Fahr., immerse the plate with the printed tissue uppermost, and leave for a few minutes until you see the pigment oozing out round the edges; you will then be able to insert a finger nail under the corner of the paper backing, removing the latter gently (under water of course), leaving the pigmented gelatine on the glass. Now dash the warm water over the plate with the hand, and continue until all the soluble gelatine has been washed away; the temperature of the water should be increased from time to time as may be found necessary, and if the development is slow the water may be heated to 120°, and the plate allowed to soak in it.

After development the transparency is rinsed in cold water, soaked in a 5 per cent. solution of alum for a few minutes, rinsed again, flooded with spirit, and placed on one side to dry.

And now to judge whether or not the transparency, being finished, is suitable for our purpose.

As it is to be used to print from, we must judge it from the same standpoint as we would a negative; it must be vigorous with full details in the high lights, showing very little clear glass when placed on white paper. When looked at against white paper on which a strong light is thrown, it should appear very much like what we desire in the finished photogravure print.

If the transparency is lacking in density or vigor, it will be much improved by staining the film with permanganate of potash. Flow a solution of permanganate (strength immaterial) over the plate and rinse until the redness disappears.

The transparency must now be masked in the same way as we masked the negative, only the opening in the mask must be a quarter of an inch larger each way than was that of the negative mask. The result will be that there is a margin of clear glass ⅛ inch wide all round the picture, and so we shall get a very dense line all round the negative print we are going to take from it. This is not absolutely necessary, but it affords an additional protection to the margin of the copper when we come to the etching, and that is an advantage.

The pencil lines are again drawn on the mask as guides for placing the tissue in position. A piece of Autotype standard brown tissue, sensitized as before, accurately cut a quarter inch larger each way than the opening in the mask, is placed behind the transparency and the exposure is made.

The exposure again depends on the density of the transparency we are printing from, but it is not merely so long as in making a transparency. From three to six tints will be found the average required, but it is best to make a *trial* exposure and develop it on an opal plate. If you find clear glass only in the deepest shadows, the exposure is right.

We have now arrived at the preparation of the copper plate to receive the carbon resist, and I think this is the most convenient place to divide my subject. In my next lecture I propose to explain and demonstrate the preparation of the copper plate, laying the ground, transferring the carbon resist to the copper, protecting the margins of the plate, preparing the etching solutions, and etching the plate. We will then pull a proof and consider how we may improve the plate by hand or other work. The steel facing I will explain to you, but it is not a process which I can well demonstrate here.

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LECTURE II.

CONTINUING from the point we reached last week; having, by means of the trial resist, ascertained what is the corect exposure and made a second exposure with a piece of standard brown tissue behind the transparency or positive, taking care that the tissue has been cut accurately, with right-angled corners, a quarter of an inch larger each way than the transparency mask-opening, and has been placed on the transparency so that the print will be made exactly in the middle of the piece of tissue, the next step is to prepare a copperplate for its reception.

The plates when received should have a perfect surface and be quite free from scratches or other blemishes, and if they are in any way imperfect they should be returned to the makers, as it is a matter of great difficulty without special appliances and considerable experience, to remove blemishes and obtain again a proper surface upon a copperplate.

It is as well to state, when ordering, that the plates are required for photogravure and that the plates must be perfect in polish. It is well also to order the plates to be sent with bevelled edges, as, although it adds a trifle to the cost (which is lost in the case of a spoilt plate) still it avoids the risk of a good plate being scratched in bevelling the edges afterwards.

The plate, then, being free from defects, all that is necessary is to clean it, freeing it from grease or anything else which might cause the etching to proceed irregularly.

To do this, lay a piece of clean paper, larger than the copperplate, upon the table, lay the plate on it face upwards and rub the surface with a plug of cotton wool moistened with a solution of American potash (the strength is immaterial but it should not be strong enough to tarnish the plate). When all signs of greasiness have disappeared rinse off the potash under the tap and rub with another plug of cotton wool moistened with weak nitric acid (about one part acid to 3 parts water), rinse again and with a third plug of wool go over the surface with washed whiting moistened with a 5 per cent. solution of ammonia.

Washed whiting can be purchased ready for use or can be easily prepared by mixing ordinary household whiting with water, allowing the coarser particles to settle for a few minutes and then decanting the water off into another vessel and allowing the finer particles held in suspension in the water to settle; the water can then be poured off and the whiting dried and stored.

A small shallow pot, such as one buys tooth powder in, is useful for keeping a small quantity of the whiting in, ready mixed with the ammonia.

After the final treatment with whiting the plate should be rinsed and dried, and if the plate is perfectly clean the water should run off it quite regularly. It is as well to give the final rinse in hot water as the warmth facilitates the drying of the plate. The cloth used for drying must be perfectly clean.

We are now ready for laying the bitumen ground. This is done in a box which I will describe to you. (You will see it on the table and so be able to follow my description.)

The size of the box depends upon the size of the plate to be dusted ; the one before you measures 12 inches square at the base and 18 inches in height ; this is large enough for any plate up to 10 inches square. Through the bottom of the box wire nails are driven from the outside so that the points stick up inside the box to a uniform height of one inch : the nails are an inch apart and cover a space about six inches square and they serve the purpose of a rest for the plate out of the way of the bitumen dust which will lie at the bottom of the box. A piece of wire netting fixed at the same height from the bottom will answer the same purpose. Another very good plan, adopted by my friend (and to-night my assistant) Mr. Wilmer is to make a little stand of two pieces of wood in the form of a cross which can be put into the box with the plate upon it.

The inside of the box should be lined with glazed paper, as there is then less danger of coarse particles of dust clinging to the top and sides and falling down upon the plate at inconvenient times. There is a door at the bottom of the front which allows of the insertion of a plate, and the box is suspended on pivots so that it can be readily revolved.

In this box about half a pint of finely powdered bitumen is placed and the box is revolved some twenty times or until a dust is raised inside, and then brought to a stand with the door at the bottom. There is a little peg at the side to keep the box steady. The door is opened and the plate is laid upon the nails face upwards ; the door is closed and after a lapse of from three to ten minutes the plate is taken out. It will be found to be covered with a layer of bitumen in very small particles.

The degree of fineness of the grain is governed by the class of picture to be reproduced, the more delicate the subject the finer the grain. A dark subject requires not only a large quantity of grain, but requires that grain to be somewhat coarse in character. It will be readily understood that one has considerble control over the quality of the grain. It can be varied either by allowing the dust in the box to settle for a longer or shorter time before insertion of the plate or by leaving the plate in the box for a longer time, or by inserting the plate a second time after again revolving the box. In the first case if the dust is allowed to settle for a considerable perid—say two minutes—all the coarser particles will have subsided, and only the very finest will be still held in suspension, and if on examination of the plate the quantity of dust is found to be insufficient, the box can be revolved once more, and the plate inserted after a rest of two minutes, when a further quantity of the same class of dust will be found deposited on the plate. For ordinary subjects with a normal amount of light and shade I have found the most suitable grain is obtained by allowing the dust to settle for from half to one minute and then leaving in the plate for ten minutes. In this way one gets a deposit of rather coarse dust during the first minute or two after insertion, and this is followed by a deposit of finer throughout the rest of the time. This mixture of coarse and fine dust I have found to answer very well. No doubt many ways of modifying the character of the grain will suggest themselves to you from these remarks.

"Takem made a hit with his photograph of the Bigwig Club."

"Oh, a club is an easy thing to make a hit with."—*Photo. Times.*

[*From Anthony's Bulletin.*]

Les Petits Metiers and Photography*

BY P. C. DUCHOCHOIS.

THERE is in the French capital a class of artisans inventing, making and decorating at home various objects, many of them showing real artistic taste; all great ingenuity. They are *les ouvriers en chambre.*† Their shop is their parlor, and sometimes also the kitchen and the dining-room. From their hands come those *articles de Paris*, those charming little *riens* which we admire when, in our hours of leisure, we slowly walk in the streets of New York, observing the passers-by, stopping here and there, looking at every show-window, making our profit from everything we see. Nothing so useful, so instructive, as to do nothing intelligently. A paradox? Not at all. There are people who do nothing, do not see, do not think; but there are others who do nothing, see and do think—and so much the better. We love to loiter in the rich, in the poor, and in the bad, wards of this immense city, inhabited by people of all nations, and, verily, dear reader, if you do not, we pity you. There are many amusing and philosophical observations to make on our singular human nature; many beautiful things to see in the fashionable business streets which cultivate or develop one's artistic taste, and this is not to be disdained even by a photographer. Besides, seeing suggests new ideas which never come when confined in our business place or at home. If it happens that you are in a working mood, take your climax detective with you, but by all means do not forget your notebook. Ideas are sometimes so fugitive that they must be caught on the fly, or they disappeaar, never to come again.

Well! the Parisian artisan often loiters in daytime or at night in search of new ideas. In the afternoon he will go in the Louvre to see, among others, the peerless Sauvageot's collection of objects of vertu from the antique, the renaissance, the time of Louis XIV, of Louis XV, etc.; then he will stop at the Hotel Cluny, where all the marvels of the Middle Age are accumulated, and in the Museum of the Decorative Arts at the Carnavalet Hotel he also will find much to learn. And when the evening comes—Paris is in full blaze, then—he will stop at the show windows of the Rue de la Paix, the Avenue de l'Opera, the Boulevards, the Palais Royal. He wants to know what is done by others, for it is a *sine qua non* in his trade to devise new, original models, and the means to make them at little cost as rapidly as possible, to avoid imitation and competition, for the profits are already small. It is a struggle for a living, but he is satisfied with his lot, takes life for what it is worth, and sings in working.

Of course our artist-workman was not long to see what help photography could be to his industry, and he became a photographer. Indeed, reader, if we could bring you in his workroom, you would be astonished at the various ingenious applications he has made of our art. We know many of them; not all. We do not know everything, and, besides, some are trade secrets, and rightly, because they could not be patented; moreover, often it would be useless. Some articles are good for a season or two and then go out of fashion. We will describe everything which came to our knowledge; or, at least, everything we are at liberty to divulge. Some of these applications

*The small trades and photography.

†Workingmen working in their room, at home.

have been published, but, perhaps in photo-journals you do not read, or in photo-books you do not buy, if you ever buy any.

Of course, the first process, applied in *les petits metiers*, was the ordinary printing-out process for the decoration of boxes, small objects with colored pictures. An albumen print, toned, fixed and dried, is placed against the glass of a window, face downwards; the image is thus seen as a transparency. Then, with a lead-pencil, a rough, light sketch of the outlines of the image is traced, to mark the places where the colors should be applied. This done, the proof is laid face downwards on blotting-paper and colored from the bath with water or oil colors in flat tints, without taking notice of the half tones; for, when the paper is rendered transparent by being imbued with castor oil and wax, dissolved in turpentine, the colors thus applied on the back are softened by the thickness of the paper and the photo-image, which, together, do not permit one to see the strokes of the brush or the imperfections of the coloring. It now remains to paste the picture on the material selected—wood, boxes, etc.—by means of glue, with which is mixed white lead or white zinc, to which is sometimes added a colored substance, to form a white or tinted ground, and, finally, to varnish it with copal varnish.

This, and similar processes were soon discarded, the pictures turning yellow, partly from the drying of the oil, partly and principally from the fading of the photographs; and, also, because, though the pictures were more artistic, the effect was not so pleasing as that of the common chromo-lithographs, employed for the same purpose in decalcomania.

The carbon process, which yields inalterable images, was next employed, and its applications are indeed quite numerous.

A carbon print, on its removal from the sensitizing bichromate solution, is spread on a sheet of transparent celluloid, then squeezed into contact and allowed to dry. It is then exposed through the celluloid film, and developed in the usual manner, alumed and set aside to dry spontaneously. The *modus operandi* is so well known that we need not describe it.

The carbon image is colored with oil or water colors, the latter preferably. Those which resist the action of light with certainty are, according to Rood, a great authority in these matters, cobalt, French blue, smalt, new blue, cadmium yellow, yellow ochre, Roman ochre, terre verte, Mars yellow, light red, Indian red, raw umber and burnt sienna. These colors, as well as every other employed for the purpose in question, should be ground with the following albumen mixture:

Clear albumen	100 grams.
Sal ammoniac	5 "
Glycerine	5 "
Ammonia	4 drops.
Water	25 c. c.

Sometimes the image is ornamented by a border, *a la grecque*, foliages, Arabian ornaments, etc., which are colored as above and in places gilt with a pigment made by triturating gold leaves with albumen and a little glycerine, or silvered by a pigment made in the same manner with silver foil.

The object of preparing the colors with albumen is to prevent them from being dissolved and running off when an alcoholic varnish is applied, the alcohol coagulating the albumen, which entangles and retains the coloring matters.

As to the backing, white or slightly colored, it is applied on the object upon which the picture is to be pasted. If it is desirable that the ground be in gold, a sizing is applied all over the picture, and upon it German gold in fine powder is dusted. We have seen pictures in the Byzantine style made in that way, which, indeed, were very fine.

Pseudo-stained glasses are made in the same manner; the carbon print is developed as in the ordinary well-known process on a glass plate, finely ground by hydrofluoric acid and then colored with transparent colors. These colors are all the aniline colors prepared with albumen, or, in lieu, such vegetable colors as madder, alizarine, cochineal, ammoniacal carmine, indigo, indigotine, pastel quercitron, fustac, sumac, etc.

Pseudo-ceramic pictures are made by developing, or usually transferring, a carbon print on faience or porcelain (cups or dishes), coloring the images, then varnishing by two or three coatings of copal varnish, which is dried in an oven heated to a temperature of about 58 degrees C.

These images are colored by girls, and sometimes by the wives of the workingmen, all working at home. They color every kind of prints, lithographs or photographs. The latter are also pasted on panels, gelatinized, the edges rubbed clear to the wood with sand paper for a space of about one-quarter of an inch, then colored, partly with water-colors, partly with oil-colors, and when finished, varnished as oil paintings. You have seen many of these pictures in the show windows of Broadway and other streets. They are sometimes sold as original oil paintings by unscrupulous persons. The colorists earn from 5 to 6 francs per day; sometimes more, according to their ability and their taste in harmonizing the colors. This they learn by an apprenticeship. All the workingmen in France likewise learn their trade by an apprenticeship, for which their parents pay from a few hundred francs to as much as three hundred dollars, besides giving their time for two to three years; but after the first year they commence to earn something, and their wages increase gradually as they become more useful.

It is that system of paying apprentices which makes the French workingman so often superior to others in the making of objects requiring taste, and an artistic education which Paris offers to every one by its numerous evening schools and the collections accumulated in its museums open on Sundays, as well as on every weekday, of a variety of objects, jewelry, cameos, mosaics, ceramics, cabinets, all the masterpieces of decoration, from the Greeks, the Romans, the Arabs, the artisans of the Middle Ages, of the Renaissance and of modern times.

The applications of the carbon process above described are not the only ones. There are many others, among which the following are quite ingenious.

The objects to be decorated are painted with patches of blue, red, yellow, green, etc., and the selected colors are blended by lightly passing over the whole with a camel's-hair brush; or the objects are coated with a little litho varnish or gilder's sizing, then dusted in places with different metallic powders, silver and German gold, and bronzes of various colors. Upon the surface of each object thus prepared is applied a carbon print, not too intense, from an appropriate design, such as marble, tortoise-shell, etc.

For this kind of decoration one also employs an impression from watered silk, made in the following manner:

A zinc plate is inked; then, having placed upon it a piece of moiré with proper care, the whole is subjected to a heavy pressure under the typographic press (a letter press will do). The zinc plate, being thus covered with an exact image of the moiré, is etched with nitric acid, to obtain a relief sufficient for printing, and the print pulled off, giving a negative. Laces, etc., can be reproduced in the same manner.

Designs, strange, fantastical, inimitable, called marbrotypes, or selenotypes, are much employed for this kind of ornamentation. These are obtained by various processes. The most simple consists in rolling upon a zinc plate, previously inked, a coarse, stiff sponge, one having holes more or less numerous and big; or, better, a similar sponge may be impregnated with printing ink, and, by lightly rubbing and dabbing, similar designs, never the same, are produced. A proof of these designs can be immediately pulled off or, if it is desirable to preserve it, the plate is etched as usual by nitric acid, and from it proofs are pulled off for many purposes.

All the processes above described serve for the decoration of buttons for sleeves, ladies' drèsses and of other articles.

Here is a process by which ornaments are obtained in a mechanical manner, without the aid of photography. Masks, made on thin paper, representing any design of the same size as the object to be decorated, let us say a white or lightly colored button; designs cut off from perforated, stamped papers, such as those placed in boxes of candies; embroideries, tulle, cheap laces, anything from which can be cut a design, is applied to the button by wetting it slightly; then, holding the button from the back by means of a thin piece of wood passed through one of the holes, it is held over an oil lamp or a candle to blacken it on the parts not protected by the mask. This done, the latter is removed and the button just dipped in a copal or shellac varnish, then at once dried over an alcohol lamp. The whole operation is very rapidly made indeed. We have seen it done in Paris by *un ouvrier en chambre* who, although only a few cents were paid per dozen, managed to make a good day's work. Instead of using masks, he and his daughter simply blackened the whole surface of the object, and with a sharp pointed stick of hard wood, which from time to time they slightly wetted, they drew arabesques upon the lampblack.

The following is a photo process of great simplicity employed for the decoration of window glasses or of transparencies, usually used to make ornamented colored borders appropriate to the image which forms the principal subject: Dissolve 5 grams of gum arabic (best quality) in 100 parts of distilled or rain water, then add 30 c.c. of clear albumen, free from fibrine, which is eliminated by beating the white of eggs to a very thick froth and decanting the clear liquid after ten or twelve hours. To this is added a solution consisting of 4 grams of ammonia bichromate, 1 (one) c.c. of aqueous ammonia, and 150 c.c. of distilled water. This compound keeps well for three or four days. It should be filtered before use.

The glass plate, cleaned by immersion in a lye of carbonate of potash, then rinsed under the tap, is coated when well drained but still damp, and, this done, the desiccation should be hastened by gently and uniformly heating the plate and fanning, care being taken not to heat the plate above 60 degrees C., for at 65 degrees the albumen commences to coagulate and becomes opalescent.

The plate should be exposed in the shade, not to the sun. The time of exposure in clear weather is about five minutes, but no certain rules can be given. When the image is visible, which is ascertained by opening one of the sides of the lid of the printing frame, the exposure time is very likely correct.

On its removal from the printing frame the plate is immersed in a tray containing filtered water, which dissolves the albumen compound not acted on by light, leaving the image fixed on the plate. Generally from three to four minutes of immersion suffice for the entire development. It may, however, be ascertained by viewing the plate, while it is immersed in water, at a certain angle, when the whole image will be seen on the surface of the plate.

After developing, and while the plate is still wet, but drained for a few seconds, the image may be colored. All the colors soluble in alcohol can be employed: aniline, blue, red, yellow, black, etc. The transparent vegetable colors, quercitron, indigo, sumac, carmine, cochineal, etc.,* can also be used.

The object of using strong alcohol as a solvent is to increase the insolubility of the albumen, which then retains the coloring matters in its pores without the possibility of its being removed by subsequent washings with water. Necessarily the colors are retained in proportion to the various thicknesses of the insoluble albumen forming the image; hence the process.

To color the whole image, the plate is flowed with a concentrated alcoholic solution of the coloring matter, and when the alcohol is evaporated and the color dry, the plate is washed under the tap until the color not fixed by the albumen is dissolved, and the image stands out clear. It remains now to let the plate dry spontaneously, and to varnish it, not with an alcoholic varnish, which would dissolve the color, but with a copal varnish thinned with turpentine.

By coloring the image in the way above described a monochrome is obtained, but it is obviously possible to apply different colors by juxtaposition. For example: the red is first applied on a certain part of the design to be colored with that tint; then, after the alcohol is evaporated and the aniline dry, the plate is washed and the yellow color and afterwards another color are applied in the same manner on the other parts; the yellow will not take on the red, nor another color on the yellow and red, for the albumen coagulated by alcohol will prevent it; moreover, colors dissolved in water will not take on any part of the design.

Two causes of failure may occur in this process, viz., under and overexposure. In the first case there is no remedy; the half-tints will be washed off during the development; in the second, a veil is formed, which very often can be removed by passing a soft brush on the plate under a jet of water.

(To be continued.)

*The vegetable colors are faster than most of the aniline colors, but not as brilliant.

N.Y. Mounting Paste.

THE New York Aristo Company have recently put on the market a very superior article of mounting paste, which has been thoroughly tested in their own factory for the past six months. It is chemically pure, and will not sour or become hard, qualities which will at once recommend it to every photographer. It is put up in wide-topped 16-ounce jars with screw top at 50 cents per jar, and should be given a trial. We have been using some of it, and find it exceedingly *good*.

Theories of Development.

(Photographic Society of Philadelphia.)

I LISTENED with much pleasure and great interest to the lecture of Dr. Mitchell, delivered at the last meeting of this Society, and was especially gratified to find that some opinions of mine, held for some time, regarding development were supported by such an able and eloquent advocate. I refer principally to the building down or etching of the film of the dry plate in contradistinction to the building up in the wet plate by the application of the alkaline developer, which, to my mind, accounts partly for some of the mishaps that frequently occur to all of us. But I think it hardly fair that the Doctor should so summarily have dismissed the photo-physical part of development, especially so in view of the lately very striking discoveries made in regard to light. I refer to its production of sound. It was found, so the report states, that when a beam of sunlight was thrown through a lens on a glass vessel containing lampblack, colored silks, worsteds, and other substances, this beam of light being cut up by a revolving disc, so arranged with slits as to make alternate flashes of light and shadow, sound was heard, the ear being placed close to the glass vessel, as long as the flashing beam was falling on the vessel. By continued experiments a more wonderful result was obtained. A prism being interposed between the disc and the lens, it was found that sounds were given with different intensity by different parts of the spectrum, and at times no sound was heard in other parts of the same. The report goes on to say that when red played on the green, or green upon the red, the sounds were the most intense of all, but when blue was used there was little or no sound given off. The published account of these experiments in the *Art Journal* are not as full or well arranged as one would wish, and we will anxiously await further developments. But from these experiments, if correct, it will be necessary to give to light other powers than have been conceded to it, and will considerably modify, if not change entirely, the theories of the formation of the latent image as now held.

It is well known that, in regard to the formation of the latent image and its subsequent development, there have been three classes of investigators and defenders, two of these classes holding very widely different views on the subject:—the photo-physical, who claim that the action of light by its dynamic force so arranges or disarranges, as the case may be, and so makes less the molecules of silver held in the gelatine film as to enable the developer to bring forth and render visible the image unseen until action has taken place.

The photo-chemical, who claim that it is a tolerably certain fact that under the action of light the haloid of silver, the bromides, chlorides and iodides have a tendency more or less powerful to return to the metallic state, which tendency is promoted and made permanent by the action of developers which are always reducing agents; that is, they are substances which are able to reduce the soluble salts of silver to the metal state. But will either of these two theories account satisfactorily for all the changes that take place from the time of exposure to the fully developed plate?

The third class are in favor of a combination of the two classes, or claim a mechanical and chemical combination, and set forth thus: The dynamic action of the wave of light setting free the invisible particles of silver in the granules which form the emulsion on the plate, and these nuclei of metal acting as centres upon which the chemical action may take effect and proceed to the end. We know that some agents have the power of starting an action, and that others, though not able to start the act, have the power of continuing it and completing it. Another theory is, that the development of a negative may be effected in one or two ways. First, the new compound may possess an attractive force. The action of light on sensitive compounds of silver tends to cause the formation of a substance capable of attracting the metal of which it is a salt when slowly deposited from a solution. This first deposit is capable of attracting more of the metal, and in this way an image is gradually built up. This is the theory of the physical development of the wet-collodion plate. If the theory of the dynamic power of light can be used, it can also be used as a theory for the development of the dry plate. Secondly, the image may be the result of the reduction, more or less complete, to a more elementary state of the altered compound when treated with certain solutions, in which state it may have the same attractive power as before. This is the *rationale* of all alkaline development.

But to return to the discoveries previously mentioned, and subsequent ones following rapidly, as they will. If correct, they will of necessity, displace to a great extent, if not entirely, the vagueness that now surrounds the words "actinic force," "dynamical," and "mechanical" powers of light—words that are too frequently used to conceal our ignorance or to impress upon the minds of others an erroneous estimate of our own wonderful knowledge. If a wave of light is capable of producing sound, it must have ponderance, a power to disturb an equilibrium, to disrupt and to separate, in fact, a dynamic power in many ways. By dynamic power we mean the power inherent in light to strike, to move, arrange, separate, congregate, disrupt, build up, or destroy any of the elementary substances, and in many cases their compounds upon which it acts.

The very disturbances which these waves of light are subject to in passing from and through different media must of necessity cause the generation of an immense amount of energy, and when we call to mind the immense velocity of these waves of light, and uncountable number, we cannot yet estimate the force contained in a single ray, or the power it exercises upon any sensitive substance it impinges on. It has been repeatedly denied that light produces any separation of the elements in the formation of the invisible image, such as occurs when a visible image is formed by its action. But where is the proof for this assertion? I have as yet been unable to find it, though I have sought for it diligently, and am forced to believe it to be the *dictum* of one, repeated by others as true. The fact is, that, surrounded by light, we have all the time been wandering in darkness. Cannot the occurrence of halation or solarization be explained if we give due credit to the dynamic power of light, as defined? By halation we mean not only the havoc it plays on a window in an interior, but also with a landscape, the foliage becoming blurred, losing its true tone value, and thus becoming both inartistic and unscientific. We have been taught that the reflection of light from the outside or back of the glass or transparent support is the cause, and to prevent it we must back the plate with some opaque substance in optical contact. This explanation and teaching is true, as far as it goes, with our rapid plates and films. But why do these returning rays exercise this power and produce this effect, if they have not hammering force, so to speak, upon the already disturbed molecules of silver in the film?

A plate has recently been introduced in England, called the Sandell plate, that is said to be entirely free from a chance of this mishap. It is coated by two or three emulsions of different sensitiveness, and to my mind, this tells the story. The first coat is decidedly less sensitive than the others; in other words, the light power is used up by the time it reaches the glass, and there is no reflection.

The objections raised against those plates, in the main, consisted of the extreme length of exposure said to be necessary; but even here "the doctors disagreed." Wuestner, of Jersey City, has very much improved the Sandell plate. His first substratum was a slow orthochromatic, and upon that spread one or two emulsions of high and highest sensitiveness, working upon the premises that halation occurred less with dyed than plain plates. Since then he has also prepared another brand, simply with plain bromide of silver emulsions of different degrees of sensitiveness. It is said that either of these plates works rapidly, and can be safely used for instantaneous exposures, and the halation has been reduced to *nil*. The reversal of the image is evidently caused by the same action of light as in halation, but that action has ceased before halation is produced.

The veiling and the ultimate production of fog can be accounted for if we agree that the dynamic action of light causes the molecules of silver to be so arranged and freed from their environment in the gelatine film, so that the latent image is formed, and, by development, made visible. All goes well if there are plenty of molecules of silver for the developer to act on. But let the film be weak in especially the iodide of silver, we find at a certain point the developer stops its work. An additional quantity of the alkali is added, the work begins again, then stops. More alkali is added to force the developer. Suddenly a veil appears, followed quickly by a fog that destroys our work. You may ask me for my explanation of this destruction. The plates most subject to fog are those known as "rapid." The film is thin and very delicate. Bromide of silver is in excess, the iodide much less than normal. Whilst the light was so arranging the molecules of silver to form the latent image, it doubtless disarranged and partly separated some adjacent molecules, not needed for the image, from their weak support. The development ceased because all the silver of the image was used up, or nearly so. More alkali, the accelerator, caused the using up of the remaining molecules. An additional dose of the alkali started the pyro or reducing agent in search of more material to work upon against the adjacent only partly protected molecules, and then—well—you all know what happens when a lighted match touches a pile of gun cotton.

JOHN H. JANEWAY, M.D.,
U. S. Army.

"Thieves will steal things without any reference to their number."

"What of it?"

"I only wanted to say that it is strange, though, that photographs are nearly always taken by the dozen."—*Photo. Times.*

[*The Photographic Times.*]

A Practical Note on Bromide Printing.

BY F. C. LAMBERT.

THE following hint is addressed to those inexperienced in the use of bromide paper. In few branches of our art and its practice do we find the need and value of actual experience so valuable as in the timing, etc., of exposures for bromide papers. The hint represents the evolved experience of the writer, who had no "friend in need" to suggest or guide, and such may be, presumably, the position of other amateurs. It is to amateurs that the suggestion is tendered, and for the following reasons: The professional worker is in constant practice, soon acquires a stock of experience sufficient for the purpose, and often requires to take a dozen or more prints from one and the same negative. Should the first or second be slightly at fault, the third ought to be correctly timed, and the loss of one or two pieces of paper per dozen is no serious matter. The amateur, on the other hand, usually uses the bromide papers at irregular intervals, and, still more to our present purpose, and seldom needs to make more than one or two (or possibly three) prints from any one negative. To spoil, say, two pieces of paper in order to get one satisfactory print soon makes the process a costly one. Furthermore, having hit upon a correct exposure for negative A, this is little help towards that best adapted for negative B.

The first step is to fix upon some light which shall be (as near as may be) constant. I find a No. 5 Bray's (gas) burner *practically* constant. It is, however, advisable, I think, to *very loosely* pack the inside of the burner with a small ball of cotton wall. This seems to tend towards equalizing the slight variations of gas pressure in the supply pipes. Next a small (half-plate is convenient size) negative is selected as a "*standard negative.*" This should show a good long range of densities from clear glass to moderate opacity. An ordinary landscape with some foreground object, cottage, distance, and if possible a slight indication of clouds, or such a negative as may usually be found among shipping and sea-side studies.

We now take a piece of stout string, and mark it with a knot at intervals of 6 inches, *i.e.*, half feet, beginning from 1 ft., 1½ ft., 2 ft., 2½ ft., and so on up to 6 ft. at least. It is a safe precaution to make a double knot for the whole feet and a single one for the half feet. It now only remains to discover the exposure of our standard negative. In order to do this I strongly recommend the employment of a fairly thin sheet of white pot opal glass, large enough to cover the face of the printing frame. Its use is twofold. Firstly, it helps greatly to diffuse and equalize the gas light. The second one I will point out below.

We now take our standard negative, place it in contact with the opal glass through which we are presently to print. Holding the two together *at arm's length* (if your sight is fairly good, but in any case endeavor always to maintain the same distance from eye to negative), now look all over (*i.e.*, through) your negative. Try the effect of approaching only to and receding from the illuminant. Trial will presently show you that distance at which you seem to get the best value out of the negative—the point where the delicacy and detail of shadow is shewn—while the light is not too strong to prevent the highest light remaining bright and pure. Your string scale has already been fastened by one end to the gas pipe a few inches below the burner. You now have a ready means of measuring the distance at which you found a satisfactory illumination. Let us for example say, this is 3 feet. This is about right for a slightly over-dense negative ; we now turn down the gas to the "blue."

Put negative and paper in printing frame. (N. B.—The paper curls with the coated side inwards). The opal glass is laid over the face of the printing frame. With one hand the string at the sixth knot (3 feet) is held, and also the printing frame with the opal glass as a diffusing screen. With the other hand the gas is turned "full on" for say 10 seconds, and then again turned down to the "blue." Now cover up half the face of the trial negative with something opaque (*e.g.*, a piece of cardboard), replace opal glass, and give a second exposure to say 10 seconds. We have now a piece of paper one-half of which has had 10 seconds exposure, the other 10 + 10, *i. e.*, 20 seconds exposure. Proceed to develop this. The result will show the direction in which the second experiment must be made. Let us suppose that 10 seconds is undoubtedly too short, and you are somewhat doubtful about the part which received 20 seconds.

Repeat your experiment, giving 15 seconds first, and then say 10 as a supplementary time, so that the first half is exposed 15 and the second 15 + 10, *i.e.*, 25 seconds. Development will now probably show you that 20 seconds is the best result of all trials. In this way it should not be difficult to discover quite the best length of time for the standard negative with a given developer. Let us for sake of example say 20 seconds at 3 feet is our standard time for standard negative at standard distance.

Now comes the crux of the whole question. How is this to help one with *other* negatives. The solution of the difficulty is simple enough, provided one or two points are kept clear in mind. Two factors to be kept in mind are : Firstly, with any given light the time should theoretically vary as the square of the distance from the light. That is to say, if 20 seconds at 3 feet gives a certain result, a quarter of the time (viz., 5 seconds) at half the distance (*i. e.*, 1½ feet) should give the same result, or four times the time (80 seconds) at double the distance (6 feet). In order to have this matter conveniently at hand, the accompanying table may be conveniently copied on a card and hung on the wall near the gas for ready reference.

The first column gives the actual distance from the gas ; the second is the *relative* time of exposure. These numbers, it will be observed, are the squares of the numbers of knots. Thus, the 3-feet knot is No. 6 from burner, and that at 4 feet is No. 8 from burner, so that the relative times at these points corresponding to equal exposures are six times six (36) and eight times eight (64). The remaining columns speak for themselves, being the times corresponding to the standard medium negatives, and other negatives weak (thin) and strong (dense).

Secondly, while *theory* says that an exposure of 9 seconds at, say, 2 feet ought to give exactly the same result as four times that exposure (36 seconds) at double the distance (4 feet), yet experience tends to show that some negatives yield the best result with a brief exposure near a strong light, while others call for a prolonged exposure in a weaker light, *i.e.*, at a greater distance away from the same illuminant. And herein lies much of the success of bromide printing, *i.e.*, not only to know *how long* to expose, but also to know *how strong* light to use. It is for this purpose that we shall again need our foot opal glass. The two uses may thus be described: Firstly, the new negative to be printed must be compared with the standard negative (in each case behind the opal glass, of course), so that it may be classified as a weak, medium or strong negative, as the case may be. This enables us to determine which column, A, B, C, D or E, is to be used. To this end it will be as well to compare each new negative with the standard negative at the latter's best point (viz., 3 feet), as has been described above. Secondly, it remains to examine each negative at varying distances (using the knotted string as a measuring guide), so as to ascertain at what point the strength of light yields the most harmonious illumination. It will quickly be found that weak, thin negatives (poor in contrast) yield the best results in a weak light, *i.e.*, at some distance away. To these the lower part of the cols. A and B will be found applicable; while on the contrary dense, hard, strong negatives require a strong light, otherwise only the thinner parts of the negative permit any light to reach the sensitive surface and chalkiness must perforce result. To these cols. D and E apply.

It is obvious that, after all, exposure is only half the battle, and complete victory must be sought for by a judiciously combined developer prescribed to meet the symptoms of each patient—at the same time it is equally obvious that correct exposure is a very liberal half of the way to success.

It is beyond the intent of this note to enter into the question of development beyond saying that each exposure must be, as it were, especially calculated on the assumption that an appropriate developer will be applied to build up the image of which the exposure has laid the invisible foundation.

In exposure keep the two points clear and separate in mind, viz.: 1st, What *strength* of *light* will yield the most harmonious result; and 2nd, What length of exposure will sufficiently penetrate the high light without once exposing the shadow detail?

Distance from Light.	Relative Time of Exposure.	Very Weak Negative.	Weak Negative.	Standard Negative.	Strong Negative.	Very Strong Negative.
		A	B	C	D	E
1 ft.	4					5
1½ "	9			5	7	10
2 "	16			9	13	18
2½ "	25	7	10	14	21	28
3 "	36	10	15	20	30	40
3½ "	49	13	20	27	40	54
4 "	64	18	27	36	54	72
4½ "	81	22	33	45	67	90
5 "	100	28	42	56	84	132
5½ "	121	34	50			
6 "	144	40	60			

A Sensible Decision.

The other week a popular young man was brought before a justice in Natal, charged with the offence of kissing a young lady "by force and against her will." The young lady, who was very handsome, gave her testimony in an honest and straightforward manner, after which the judge gave the following decision:—"The court in this case sympathizes with the defendant, and will therefore discharge him without fine, imprisonment, or reprimand, because the court, whilst this case has been in progress, has been obliged to hold on to both arms of his chair in order to keep from kissing complainant himself."

[*From Amateur Photographer.*]

The Intensification, Reduction and Varnishing of the Negative.

JOHN A. HODGES.

THE beginner will find after he has exposed a few plates, that one of his greatest difficulties will be to produce with certainty just the requisite amount of density to give a good print. Some of his negatives will be much too dense, while others will be far too thin. At first he will probably not be able to determine, by a mere inspection of the negative after development, whether it is of a character to give a good print or not, but upon taking a trial print he will find that in some cases he can only succeed in getting a flat muddy-looking picture without contrast, or vigor, and that in others the negatives take an abnormally long time to print, and the results, when attained, are hard and crude. The first of these effects is due to over-exposure, the employment of too vigorous a developer, or one containing too little pyro; and the second to under-exposure, or too prolonged development, or to both combined. Of course, the *best* thing to do in such cases, when it is practicable, is to make a fresh negative by exposing another plate on the subject, modifying the exposure in the direction indicated by the result obtained in the first instance. But there are many occasions when it is impossible to do this, and when, at the same time, it is very desirable to get as good a result from the defective negative as it is possible to obtain. Now, fortunately for the photographer, there are two processes by which negatives possessing either of the above-named faults may be to some extent improved, and these are called "Intensification" and "Reduction." The meaning of the two terms is probably sufficiently obvious without further explanation. The first one with which I shall deal—namely, Intensification—is applied to a process by means of which the density or opacity of the negative is increased or strengthened, when from any cause it is too thin to give a good print. The second term, Reducing, is applied to the converse process, namely, that of reducing or lowering the density of a negative when it is excessive. It will be readily understood that these two processes, when intelligently employed, place a wonderful power in the hands of a photographer. But, notwithstanding, my earnest advice to the beginner is to aim at producing, by careful exposure and development alone, a perfect printing negative requiring no after treatment, and he should always try to avoid the necessity of resorting to either process. However, as I have said, it sometimes happens that partial failure will occur, and then it is that the process of intensification and reduction stand us in good stead.

There are many formulæ given in textbooks for compounding intensifiers, but I do not intend to discuss their relative merits here, nor do I wish to depart from the broad system which I have endeavoured to carry out in writing these articles, of presenting one practical and well-tried mode of working to the reader, rather than confuse him by describing alternative methods.

The particular intensifier which I shall advise the reader to adopt is that known as the Mercury Intensifier, and it has the advantage of being one of the oldest methods which have been applied to the intensification of gelatine plates. It is true that it has had one fault alleged against it, namely, that negatives which have been so treated have been found to be wanting in permanency, and have sometimes become discolored, but investigation has pretty conclusively proved that where this has occurred, the negatives have not been properly washed between the different operations. Undoubtedly, when such precautions are neglected fading will probably result. The process is an extremely simple one, and the necessary preparations very few. To begin with, the negative which is to be intensified must in the first place have been *thoroughly* washed, in order to remove the least trace of fixing solution which might otherwise remain in the film. About two hours' washing in running water in the washing tank which has been described, will probably be sufficient to effect this. If, as will probably be the case, the negative has been allowed to dry, it must first of all be soaked in clean water until the film has become thoroughly wet. It should then be placed in the dish which has been reserved for the special purpose of intensifying, and some of the intensifying solution, which has already been prepared, poured over it. It will be understood that the whole of these operations can be performed in actinic light, and, therefore, the change which the plate will now undergo will be clearly seen. It will very soon lose its dark appearance and gradually assume a white or pinkish color. This will be more easily observed if the dish in which the operation is performed be a black one. In from three to four minutes the action will probably have proceeded sufficiently far; the solution may, therefore, be carefully poured back into its bottle, as it will last a long time and may be used over and over again. The caution as to its poisonous nature, which has previously been given, should be remembered, and due care taken not to spill or drop any about the table or floor. The negative must then be most thoroughly washed, for upon the effectiveness of this operation the future permanency of the negative will in a great measure depend. It should have at least half an hour's washing in running water. At the end of that time it is to be replaced in the tray, and a weak solution of ammonia (made by adding 15 minims of a 10 per cent. solution of ammonia to 2 oz. of water) poured over the plate. Under its influence the white color will disappear, and the plate rapidly darken, ultimately becoming quite black. At this stage the action will probably have gone sufficiently far, and the plate may be removed from the solution and thoroughly washed under the tap. Upon examining it by transmitted light it will be found to have acquired a considerable accession of density, and will probably be capable of giving a good print. After a thorough washing the operation will be complete, and it may be placed in the rack to dry. The degree of density attained may, to some extent, be varied by the length of time the plate is allowed to remain in the mercury solution, and by altering the strength of the ammonia bath. If only a slight increase of density is desired, only a few drops of the ammonia solution need be used; if, on the other hand the negative is very thin and requires considerable stengthening, the proportion of ammonia may be very considerably increased. Various other solutions may be employed to effect the blackening of the image after bleaching, some photographers preferring to use a few drops of a saturated solution of sulphite of soda, and where only a little extra density is needed this is to be preferred. In the converse case of a negative requiring a considerable accession of density, equal portions of the two solutions used for compounding the hydroquinone developer may be mixed and applied to the plate.

We will now consider the treatment of a negative which is over-dense, and requires to be reduced. There are several methods by which the process known as reduction may be effected, but I shall only describe one. I may, however, mention that when only very slight reduction is necessary the negative may be sufficiently reduced by allowing it to remain for a short time in an ordinary clearing bath composed of a pint of saturated solution of alum to which half an ounce of hydrochloric acid has been added. When, however, the negative is very dense, more vigorous treatment will be necessary. Two ounces of water are poured into a clean measure, and about ten drops of solution of perchloride of iron (of the strength used in pharmacy) added. The negative, if dry, should have been allowed to soak in water, in the manner already described, and is then to be placed in a tray, and the solution poured over it, and allowed to remain for a few minutes. It is then removed but no visible change in its appearance will be detected at this stage. It should then be placed in a second tray containing three ounces of water, to which has been added about two drachms of the saturated solution of hypo. The reducing action will at once commence, and the plate must be carefully watched, as the action sometimes proceeds so quickly as to be almost beyond control, in which case over-reduction might ensue, and the negative be spoilt. If, on the other hand, the reducing action proceeds very slowly, a few drops more of the solution of perchloride of iron may be added to the first solution, and the negative re-immersed and, without washing, again re-transferred to the hypo solution, when probably the action will proceed. These solutions must be thrown away after use, and the dishes, of course, thoroughly washed. When the reduction has proceeded sufficiently far, the negative is to be removed from the solution and thoroughly washed.

The beginner should make it a rule to take a trial print from every negative with a view to ascertaining its printing qualities, and whether it requires to be either intensified or reduced; and if it does not, it should at once be varnished. If, however, either intensification or reduction be necessary, varnishing must be deferred until those operations have been carried out. The object of varnishing is to protect the film, which, though apparently tough, is very liable to become scratched or stained by contact with the silver paper used in printing. Stains so caused are extremely difficult to remove.

The operation of varnishing a negative is very often a difficult one to a beginner, and as it can only be learnt by practice, he will do well to make his first attempts on some spoilt negatives. The object is to cause the varnish to flow over the entire surface of the plate without forming markings or ridges which show in the print. Any good negative varnish may be employed. Personally, I prefer Hubbard's, and always use it. The negative to be varnished should first be lightly brushed with the camel-hair brush to remove any adherent dust, and then held over a gas flame until it is just as hot as the hand can bear. The plate should then be held between the thumb and finger of the left hand in as nearly a level position as possible, and a pool of varnish poured in the middle; the plate is then slightly inclined so as to cause the varnish to flow towards and fill up one corner of the plate, and, directly it does so, tilted so that it runs to the next corner, repeating the tilting with a slight rotatory movement until the varnish is made to cover the last corner, when the plate must be tilted vertically and the excess of varnish allowed to drain back into the bottle. The rotatory motion must be continued at this point in order to avoid the formation of ridges. The plate must then be held over the gas flame or in front of a fire until the varnish sets quite hard, which it will do in a few minutes. The operation, although a difficult one to describe, may easily be acquired with a little practice. Varnishes are now supplied which may be applied to the plate with a camel-hair brush, but such a mode of working is very clumsy, and one which I would not recommend the reader to adopt. The negative, after varnishing, will be ready to print from.

[*Pacific Coast Photographer.*]

Shutters Theoretically and Practically Considered.

BY SANFORD ROBINSON, Ph. B.

(Continued from the April Number.)

We can represent the quantity of illumination given to any portion of the lens by the product of the area of that portion into the time. For example, the diameter being one inch, let us take one-half of each strip contiguous to the middle line as having a length of one inch, which is nearly correct. We have then a strip 1/12 of an inch in width and one inch long of which the area is 1/12 of an inch. The shutter exposes every point of the lens in this strip for one second. The "area-time" or illumination is therefore 1 x 1/12 or .0833. Taking the remaining halves of these two strips and half of the next two contiguous strips on each side, we will have a width of 1/6 of an inch to be multiplied by the corresponding length. Tabulating, we have the following for all the strips shown in the diagram, the result being closely approximate.

STRIP.	AREA.	TIME.	AREA-TIME OR ILLUMINATION.
MIDDLE.	.0833	1.00	.0833
1	.1633	.98	.1600
2	.1558	.94	.1464
3	.1410	.86	.1221
4	.1200	.74	.0895
5	.0800	.55	.0440
6	.0420	.27	.0108
TOTALS.	.7854		.6561

The total area of the lens being .7854 square inches and the length of all the lines in the square orifice shown in Diagram 4, being one inch and the times of all the lines being one second, all the strips have an equal area and equal time. The total area-time or illumination of the lens will therefore be represented by the total area of the lens multiplied by the time or .7854 x 1 = .7854.

We have found the total illumination of the circular orifice to be .6561 or a percentage of 83.53 of the total illumination of the square orifice. As the proportions would be the same no matter what the diameter of the circle, it follows that a circular orifice in a drop shutter will give but about 83 ½ per cent as much illumination as a square orifice, having its sides equal to the diameter of the circular orifice, the time of the shutter being the same, or that the square orifice will give about one-fifth more illumination than the circular. Therefore, a nominal or apparent one-second exposure with a circular orifice is really but an exposure of .6561 seconds or a nominal 1/100 of a second is but 66/10,000, the equivalent time of a nominal 1/100 second with a square orifice being 78/10,000.

For shutters of the drop class it is therefore evident that the square opening is the best, although, if that form is departed from, the same result is obtained if the upper and lower edges or exposing and closing edges of the orifice are made parallel.

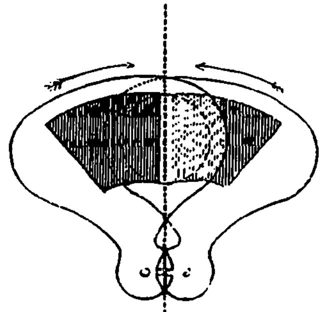
II.

The next class of shutter to be considered is that of which the best example is found in the well known and popular

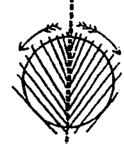
"PROSCH."

This shutter is very ingenious, strong and compact. It is placed between the lenses and has a simple method of increasing or diminishing speed for instantaneous work and for altering it to a time shutter. It is not an automatic time shutter like the Bausch and Lomb and some others, but this is probably no disadvantage. It has two blades working on independent centers, with orifices somewhat approaching in form and being the same in principle as that of the "radial" revolving shutter. The two blades move in opposite directions, the orifices crossing each other. They give, therefore, half the time of exposure that would be given by a single blade with the same orifice moving with the same velocity. (See Diagram No. 7).

The two blades open from each other at the middle vertical diameter of the lens, the opening connecting at the top. This opening spreads towards the sides in a "V" shape until the lens is fully opened, when the other edges of the orifices begin to close the lens from the sides towards the middle forming the same "V," the last point closed being the first one opened. (See Diagram No. 8). It is obvious that the top of the lens orifice has the longest duration of opening, the bottom less,



7



8

and that the duration regularly decreases towards the sides until at the extremities of the horizontal diameter of the lens the duration is zero.

Estimating the amount of illumination by calculating the areas of successive strips of the orifice in the manner adopted for the drop shutter, by computing the areas of successive segments and deducting each one from the next largest and then multiplying the area of each strip so found by its average time of exposure, we arrive very closely at the correct result. The "V" shaped strips may be resolved into vertical ones of uniform width and the areas will be the same as found in the case of the drop, the diameter of the lens being 1, and the nominal time 1, as before.

The total quantity of illumination is found to be .4506. We have previously found the quantity of illumination given by the square drop to be .7854 and by the circular drop .6513.

To compare shutters, we must, of course, take into consideration the total time that elapses between the first opening of the lens and its final closure, and so the shutter that gives the most illumination in that time is, for instantaneous work, the best. In other words, the shutter that with the same illumination can give the shortest exposure, is the most suitable for photographing moving objects. The drop shutter, while giving to each ray a certain time of effect on the plate, takes twice that time to fall; that is, in the case of the drop already considered, while each ray has a duration of effect on the plate of *one* second, this being the nominal time of the shutter, *two* seconds elapse between the first exposure of the *top* of the lens by the *bottom* edge of the shutter orifice and the final closing of the *bottom* of the lens by the *top* edge of the same.

(To be continued.)

What he Took.

Bobby (at the breakfast table)—Maud, did Mr. Jones take any of the umbrellas or hats from the hall last night?

Maud—Why, of course not! Why should he?

Bobby—That's just what I'd like to know. I thought he did, because I heard him say when he was going out, "I'm going to steal just one, and—" Why, what's the matter, Maud?

Emperor William has been presented by the Italian Government with a superb album containing photographs of every ship in the Italian navy.

Toronto Camera Club.

OFFICERS 1892-93.

E. Havelock Walsh,	President.
A. W. Croil,	1st Vice-President.
W. H. Moss,	2nd Vice-President.
Ernest M. Lake,	Secretary.
R. G. Muntz,	Treasurer.

Club Rooms and Studio:
Cor. Yonge and Gerrard Streets.

ON Monday evening, May 1st, the last public lantern exhibition of the present season was given in the club rooms. In spite of the unfavorable weather, there was a good attendance of the members and their friends. The lantern was very kindly supplied and operated by Mr. Hugh Neilson. Some very fine slides were shown, and were contributed by Hon. A. M. Ross, A. W. Croil, H. Neilson, W. H. Moss, Ernest M. Lake, Oscar L. Bickford, W. H. Sherman, Bert Smith, John J. Woolnough, Dr. Edmund E. King, Dr. T. Verner, A. R. Blackburn, F. Jeffrey, H. M. Glover and D. J. Howell.

Mr. Ross' slides were of the usual high quality and rich, velvety blacks so often attained by him.

Mr. Moss had a nice set of the new Parliament buildings, showing the exterior, the western porte cochére, the grand staircase, the mezzarine floor, and several bits of detail of the carvings. Mr. Lake showed a good slide of the Board of Trade buildings, and another of his, "Mouth of the Creek," near Oakville, was also admired. Mr. Bickford showed some interesting views in and about Rugby. Mr. Smith had some of his popular military slides. Mr. Woolnough showed some very fine slides of Raglan Castle, the Market-place, Monmouth, and several pretty bits of rural Wales. Dr. King is one of the latest accessions to the ranks of the club slide-makers, and in a short time has achieved remarkable results. Some of his Rosedale views and flower studies are as fine in quality as any slides shown in the rooms during the past winter. They were deservedly applauded as they were thrown on the screen.

SNAP SHOTS.

Mr. W. Braybrooke Bayley was an exhibitor at the exhibition just concluded in Philadelphia.

The lantern exhibition mentioned above is the last public exhibition which will be given until October next.

Mr. G. R. Baker has been making some fine enlargements lately, and has turned out some of the largest work ever done in the rooms.

The secretary has received from the Hamilton Association Camera Club a neatly gotten-up list of that club's outings for this season, and covering a period from May to October.

The sending out of the monthly notices to the members will be discontinued until October next. The rooms and studio, however, will be kept in order and open to members, as usual, at all times.

Mr. Geo. S. C. Bethune returned recently from a trip to Bermuda. He took a Lancaster instantograph with him. Mr. Bethune tells many interesting and amusing experiences of his trip. He says the island was fairly overrun with cameras of all sizes, shapes and makes. Another of our members, Mr. David Walker, is still in Bermuda.

Venus de Medicis a Poor Type.

If anything is safe in this iconoclastic age it might be supposed to be the reputation for beauty and grace of the Venus de Medicis, says the *London News*. More than two centuries have elapsed since this famous piece of sculpture was unearthed on the site of Hadrian's villa at Tivoli, and since then connoisseurs of all nations have joined in doing homage to the ancient sculptor's skill. How many visitors to the Uffizi gallery have stood, Murray or Appleton in hand, gazing at the undraped figure without a thought of questioning these learned persons! But of late years there have been skeptics daring enough to class this with the Apollo Belvedere as a sample of ancient art that has been "monstrously overrated," and now comes no less an authority than Holman Hunt to assure us that the Venus de Medicis, to use a popular phrase, "won't do." There is a little anecdote attaching to this expression of opinion.

Some years ago, at the house of Sir Richard Owen, the great naturalist, Mr. Hunt met that professor of sanitary science, the late Sir Edwin Chadwick, who began a conversation thus: "As a commissioner of health, I must confess myself altogether opposed to the artistic theory of beauty. There is the Venus de Medicis, which you artists regard as giving the perfect type of female form. I should require that a typical statue with such pretensions should bear evidence of perfect power of life, with steady prospect of health and signs of mental vigor, but she has neither. Her chest is narrow, indicating unrobust lungs; her limbs are without evidence of due training of muscles, her shoulders are not well braced up, and her cranium, and her face, too, are deficient in all traits of intellect. She would be a miserable mistress of a house and a contemptible mother." But the listener assured the sage critic that he had made a most artistic criticism of the statue, and that his auditor would join in every word as to his standard of requirements. Mr.

Hunt was aware, he said, that he was talking heresy to the mass of persons who accepted the traditional jargon of the *cognoscenti* on trust, but in his opinion "the work belongs to the decadence of Roman virtue and vitality, and its merit lies alone in the rendering of a voluptuous being without mind or soul." If no authorities of equal weight will stand forth in defence of this marble lady, it is to be feared that the famous Venus de Medicis will soon be ranked among impostors. The strange part of the matter is that it has taken 213 years to find her out

[*From the Photographic Times.*]

The World's Congress Auxiliary of the World's Columbian Exposition.

COMMITTEE OF THE WORLD'S CONGRESS AUXILIARY ON A CONGRESS OF PHOTOGRAPHERS.

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THE following persons have accepted the invitation of the Committee on a Congress of Photographers, to prepare papers upon subjects, as stated below, to be read at the congress, which commences at Chicago on the 31st of July and closes on the 5th day of August:

"Amateur Photography," Catherine Weed Barnes, New York.

"Astro-Photography," Prof. E. E. Barnard, of Lick Observatory, Mount Hamilton, Cal.

"Coarse-Grained Negatives and How to Prevent Them," M. A. Seed, St. Louis.

"Color Photography, Fred. E. Ives, Philadelphia, Pa.

"Electric Lighting in the Studio," Henry Vander Weyde, London, Eng.

"Fine-Line Screens and Their Use," M. Wolfe, Dayton, Ohio.

"Isochromatic Photography," G. Cramer, St. Louis, Mo.

"Landscape Photography," W. N. Jackson, Denver, Col.

"Marine Photography," Henry G. Peabody, Boston, Mass.

"Medical Photography," Ellerslie Wallace, M.D., Philadelphia, Pa.

Orthochromatic Photography and Its Practical Application," John Carbutt, Philadelphia, Pa.

"Orthochromatic Photography and the Artistic Tendency of 'Platindruck' in Photography," Charles Scolik, Vienna, Austria.

"Photographers' Efforts at Union," H. Snowden Ward, London, Eng.

"Photography in Natural Colors," Edward Bierstadt, New York.

"Photography Without Objective by Means of a Little Aperture," Captain R. Colsoy, Assistant Professor Polytechnique School, Paris, France.

"Photography in Anthropological Work," Prof. Frederick Starr, Chicago University, Chicago.

"Photography in Surgery," Mrs. G. F. Shears, M.D., Chicago, Ill.

"Photography Applied to Scientific Research," Romyn Hitchcock, Washington, D. C.

"Photographic Optics," Dr. Adolph Miethe, Rathenow, Germany.

"Photo-Micography," H. G. Piffard, M.D., New York.

"Photo-Mechanical Processes in England," W. T. Wilkinson, Manchester, Eng.

"Photogravure," Ernest Edwards, New York.

"Portraiture," Shapoor N. Bhedwar, Bombay, India.

"Posing and Illumination," E. Estabrooke, Elizabeth, N.J.

"Subject Relating to Photo-Mechanical Processes," Prof. Jacob Husnik, Prague, Austria.

"Shutter Photography," Prof. N. Gray Bartlett, Chicago.

"The American Bibliography of Photography," C. W. Canfield, New York.

"The Finer Division of the Silver Haloids for Scientific Work," Thomas W. Smillie, of the Smithsonian Institute, Washington, D.C.

"The Desirability of an International Bureau, Established (1) to Record, (2) to Exchange Photographic Negatives and Prints," W. Jerome Harrison, Manchester, Eng.

"The Present and Future Possibilities of Photography," Leon Vidal, Paris, France.

"The Sensitiveness of Photographic Plates," Prof. G. M. Hough, Northwestern University, Evanston.

"The Services of Photography to Medicine," Andrew Pringle, Cromwell House, Bexley Heath, Eng.

The following persons have signified their acceptance of the invitation to prepare papers, but the subjects of their papers have not been announced:

Edward Bausch, Rochester, N.Y.

Prof. W. K. Burton, Imperial University, Tokyo, Japan.

W. M. Giffard, Honolulu, H. I.

Dr. John Nicol, Tioga Centre, N.Y.

Communications relating to the Congress of Photographers, may be addressed to

JAMES B. BRADWELL,
Chairman.

1428 Michigan Avenue, Chicago.

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