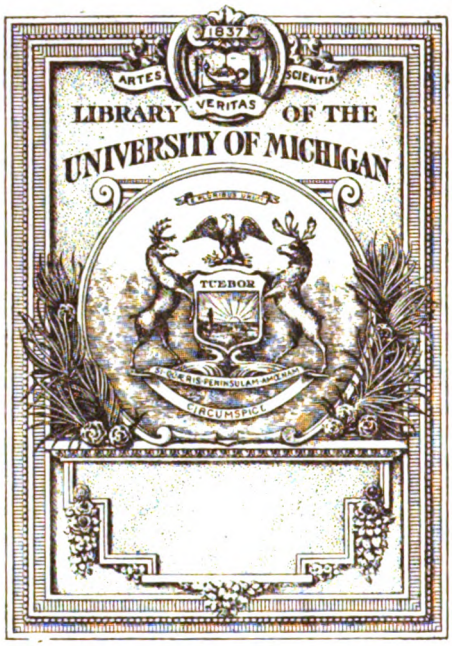
Popular photography



POPULAR PHOTOGRAPHY

VOLUME III

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POPULAR PHOTOGRAPHY

Volume III OCTOBER, 1914 Number 1

ETHEL A. S. CURRIER

Prize Picture—August Competition (*See page* 11)

HOME PORTRAIT H. SLOAN

A HOME PORTRAIT

Few of our readers have made a more consistent improvement in their work than Mr. Sloan, who seems not only to have mastered his technique but also to have grasped artistic principles well. There are several minor faults in this print, but the effect as a whole is very good. One of the defects is not allowing space enough above the lady's head for her to straighten up (in the observer's imagination) without interference from the margin. The spacing in other respects is excellent. Even the lines of the wall-paper are subdued sufficiently to be negligible at a little distance. Data: 3A Kodak fitted with a Wollensak Vinco anastigmat lens of 6½ inches' focus; 1-5 second at *f*:6.8 in March at 12.30 p.m. in very dull light on a Seed 30 plate; duratol-hydro developer; 8 x 10 enlargement on Soft Studio Cyko from part of the postcard negative.

THE USE OF FERROUS OXALATE AS A DEVELOPER

The present scarcity of all modern developing agents forces everyone of necessity to turn to the old developer, ferrous oxalate, the ingredients for which can still be obtained without difficulty. Those unaccustomed to its use need not fear that it is in any way inferior to the other developers; indeed, it is some ways superior, being a delightfully clear developer and giving excellent results with either plates or papers. The reasons why its use has been so generally abandoned are simple. It is more expensive than other developers in normal circumstances, though at present far the cheapest, and also more trouble is involved in keeping up a supply of solution, one solution, the iron one, not keeping well. The formula is simple:

A

Neutral potassium oxalate.. 5 oz.
Hot water.....20 oz.

B

Ferrous sulphate..... 5 oz.
Sulphuric acid.....30 mms.
Warm water.....20 gr.

If made with tap water, solution *A* will require filtering, or else it must be allowed to stand until the deposit settles and the upper part becomes clear. On the whole, it is worth while using distilled water.

In making *B* the acid must be added to the water first and then the iron salt is added. The dry iron crystals should be spread out on a sheet of paper and all brown or red crystals should be picked out and thrown away, leaving clear green ones only. Also there should be no dust or crushed crystals used. If the iron-salt is the last of a stock it may require sifting to get rid of the dust. When the iron is dissolved, put a few ordinary iron nails

MARY'S LITTLE PLAYMATE
ELIZABETH B. WOTKYNS
(See page 28

HAVE A DRINK, LILY? LEON LAKE

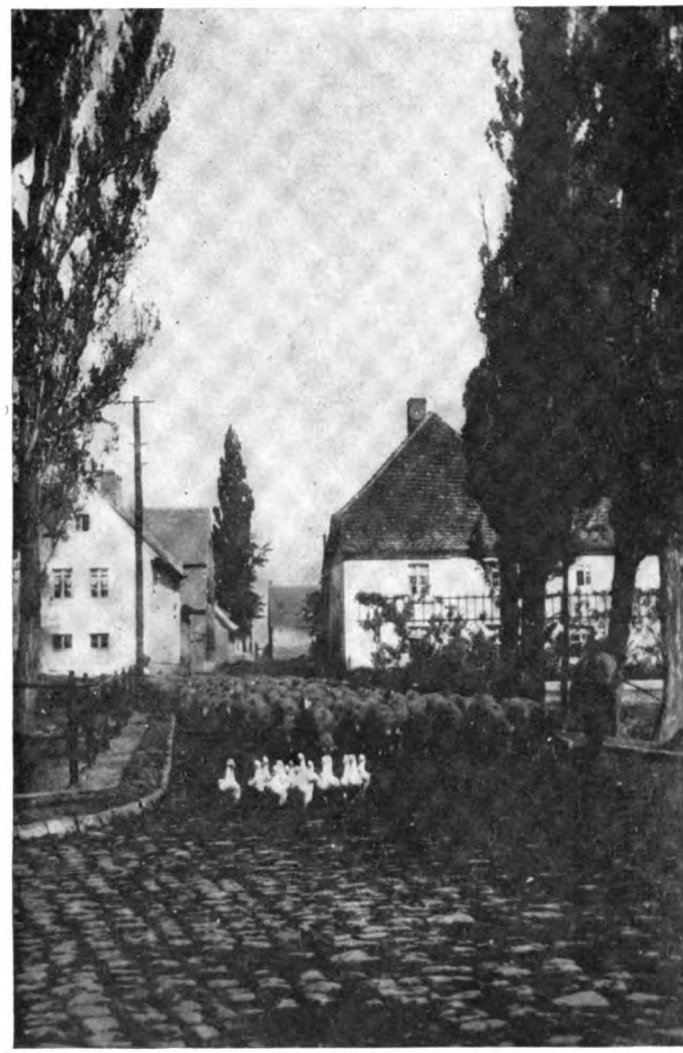
in the bottle and leave them there permanently. They will very materially hinder any depreciation of the solution.

The developer for use is made by mixing 1 ounce of *B* with about 4 ounces of *A*, pouring *B* into *A*, never vice versa. The exact amount of *A* does not greatly matter, it being usual to take anything between three and six parts of *A* to one of *B*. For plates we should take four parts of *A*, and for bromide papers five or six parts *A*. Potassium bromide can be added as necessary from a ten percent solution, allowing say, about half a grain of bromide per ounce of developer as an average.

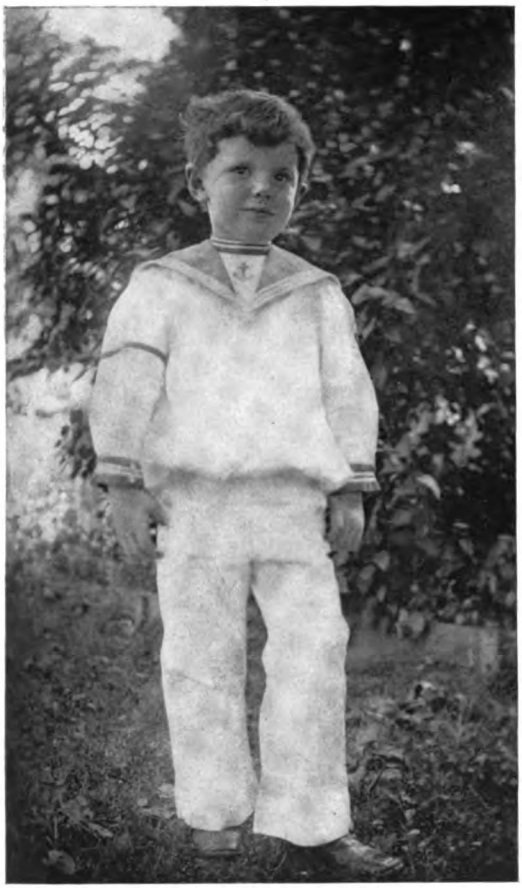
It will be found that the ferrous oxalate developer gives beautifully clear negatives with a quite neutral tint. Stain is only produced if a stale developer is used and even then stain is not inevitable. Indeed, when ferrous oxalate was a popular developer, it was the custom to keep some stale developer for the purpose of dealing with overexposure. A slight opalescence will sometimes appear owing to the action of the oxalate in tap water, but this deposit is of little consequence in negatives and will quite disappear upon varnishing, or it can be removed by a bath of oxalic acid. In the case of bromide prints a little care is necessary if sulphide toning is intended. If any iron is left in the paper blue stains will appear. To avoid these stains, a weak bath of sulphuric acid of about two percent strength should be applied after fixing and washing two or three rinses in successive fresh baths should be enough, and then after a final wash, the print can be dried and put through the further process.

HAVE A DRINK, LILY?

Mr. Lake has pointed out every defect in his own picture in his answers to the eight questions of our coupon. We wish that more of our readers would follow his example, for it is only by profiting by our mistakes that we gain the power to do better work by avoiding the same errors in future. Most of the trouble with the picture is due to lack of care in arranging the accessories. We cannot always expect perfect results from an artistic point of view, particularly in genre studies, and too much time spent in arranging and posing often takes all the life out of the picture. On the whole, we consider this a good effort. The technical work is satisfactory. Data: 4 x 5 Premo B camera with 6¼-inch rapid rectilinear lens; bulb exposure at *f*:8 in cloudy-bright light on filmpack; Ideal M.-Q. developer; print on Normal Studio Cyko.



ON A THURINGIAN FARM
JENNIE J. PFEIFFER
Fifth Prize. Country Life Permanent Exposition



THE YOUNG SAILOR THOMAS HUGHES

THE YOUNG SAILOR

Many amateurs subject their victims to an ordeal which leads to caricature instead of likeness by placing them in the open sunlight. How much better it is to do as Mr. Hughes has done and pose them in bright, diffused light in the shade of a tree. Note the brilliant yet soft lighting of the face and the absence of squint or "sun-grin." The background is a trifle distracting and the Normal paper has apparently failed to render all the gradation in the sailor suit, but the result as a whole is worthy of praise. Data: 4 x 5 Korona with 12-inch Rectigraphic lens; 1 second at *f*:32 in bright light in July at 4 p.m.; Seed 26X plate; Mitchell's Celeritas developer; print on a Normal Cyko Matte postcard.

FRIENDS

If any exception can be made to the rule that the subject must not be allowed to look at the camera, it would seem to be in this case, as the youngster appears to have been caught looking for appreciation of her fun with wooly favorites. The enlargement shows considerable thought, the entire background having been carefully blocked cut. The spacing of the figures is good. Data: 4 x 5 Conley camera with Rapid Orthographic lens; 1-5 second at *f*:8 in bright light; M.-Q.; enlargement on 8 x 10 Brome Black, Velours surface.

ECONOMY IN AMATEUR PHOTOGRAPHY

JAMES LOUIS SMALL

"Taking pictures," we are constantly assured by those who would like to own a camera, but feel they cannot afford one, or even by those who have recently made the purchase, "is a lot of fun, but it is an expensive form of amusement."

It is quite true that amateur photography may be costly; the point to be observed is, that it does not need to be so. The taking of pictures, like any other form of diversion, is, in the matter of expense, just what we choose to make it. The sport of photography, however, has some practical sides that should be more fully understood by the amateur if he expects to reduce expense to a minimum. I trust I may be pardoned if I cite my own case in this connection, but I have gone into the game more or less extensively, although never as a professional, and my experience may possibly be of value to others.

Suppose we go about amateur photography as we go about, or ought to go about, any other form of legitimate enjoyment. That is, we shall say to ourselves, "I have so much money to spend, so I will try and use it to the best possible advantage."

As to the camera itself: A common mistake for the beginner is the purchase of too complicated a machine. I am convinced that it is far better for the average novice to start with an exceedingly simple camera and to become thoroughly familiar with it, before proceeding to use one with a more elaborate mechanism. To the photographic enthusiast his camera bears the same intimate and friendly relation that a gun does to a hunter or a favorite rod and line to a fisherman, and he must have a thorough acquaintance with all its possibilities. I have in mind several cases where an expensive and highly mechanized camera bewildered the beginner and discouraged him from further effort.

FRIENDS MRS. CORA RUDRUD

Having used judgment in the selection of a camera, we shall find ourselves exercising care in the taking of pictures. We may even plan ahead for a good many of them. It is my custom to keep my eyes constantly open for scenes here and there which I wish to take. In this way an entire roll of films is sometimes planned for before it is purchased. Of course, this is not an iron clad rule, but it is a practice that has assisted greatly in reducing waste of films and that has given some mighty solid enjoyment, in the long run, to both myself and my friends. It is worth while to note that, generally speaking, only those pictures that are taken deliberately have permanent value. While many may disagree with me, I think they will be brought, upon reflection, to my point of view. In looking over our films, for instance, which do we prize most, and from which have we made the greatest number of prints—those fantastic and absurd ones, taken on the spur of the moment, or those of persons, scenes or buildings, which were taken carefully and have close associations of sentiment for us? Occasionally we may be fortunate enough to take a picture "off-hand" that gives us lasting pleasure, but this is apt to be rather the exception than the rule. Ordinarily, the "freak" pictures for which some people seem to have an extraordinary propensity serve no purpose beyond the moment and are soon discarded and forgotten, with nothing to stand as an equivalent for the cost of the films.

Again, the heedlessness of a great many people in the use of the camera results in expense that cannot justly be charged to the pursuit of photography as a pastime. This heedlessness is inexcusable, for the several companies manufacturing the machines issue accompanying booklets of very explicit directions. I know from personal experience that if these are faithfully followed the waste in films is almost negligible. I ordered my first camera, a Brownie 2A, by mail, when I was spending the winter in a frontier town. The one photographer that the village boasted was away on a hunting trip and my only guide was the small pamphlet that came packed with the camera. I read the directions from beginning to end and then acted upon them, following each step closely, and my first half dozen pictures were among the best I have ever taken.

Similarly, in finishing. If this process is financially burdensome it is usually because of waste in material. It goes without saying that no enterprising amateur will wish to remain long in ignorance of the principles of developing and printing. All he need do is to read the directions and

THE BARBER'S MODEL JOS. KOSSE

follow them as carefully as possible. There will be some loss at the outset, but after that the waste should be comparatively slight.

In talking with amateurs one is surprised to learn how careless they can be regarding details, and, at the same time, how disappointed if results are not of the best. Yet without proper attention to detail it is, surely, unreasonable to expect results that are even remotely satisfactory. I recall one lad who complained constantly that films were always foggy and lacking in contrasts. In answer to my questions as to his methods of development everything seemed to be "according to Hoyle," but when I examined his darkroom I found it had a skylight which, even at night, neutralized the rays of his ruby lamp to such an extent as to render perfection of detail impossible. Others, I find, are careless concerning the temperature of the developer; and still others fail to keep a watch close at hand for the correct measurement of time, either in developing films or in exposing negatives for printing.

Many, I think I may say most people, find it difficult to do their best work when any number of persons are standing around looking on. In my own case, in order to save time, labor and material, I have made a rule never to allow more than one spectator at a time in darkroom or by my printing table.

Some of my readers will say, no doubt, that the exercise of care in all these particulars interferes with the amount of pleasure to be derived by the amateur from his camera; that the pursuit of photography becomes, under these circumstances, more a labor than a pastime. On the contrary, this care will in the end contribute quite materially to the pleasure, for it will mean money saved and opportunity, consequently, for the taking of more pictures. Then, too, it will mean better work and better work will mean added enjoyment for all concerned. The principles of common sense carefulness in amateur photography are the same as those which govern all pastimes. The people who most enjoy canoeing are not those who are so silly as to "rock the boat;" and an angler who has any respect for his sport will use ordinary precautions in looking after his poles and lines and in his selection of a fishing place.

We may observe, in passing, that when holiday time comes around the camera of the amateur lends itself to all sorts of delightful possibilities in the way of gifts, an important fact from the viewpoint of economy alone. A picture of one of the members of the household, taken on the lawn, or of the entire family on a midsummer picnic, nicely finished and neatly framed, will have a value in the eyes of the recipient vastly out-weighing that of a gift which may have cost many times as much in mere dollars and cents.

To summarize, then, the few simple suggestions I have made, looking towards the practice of economy in amateur photography:

Use judgment in taking pictures. Don't snap everything.

In taking pictures follow carefully directions as to focus, light, length of exposure, position of subject, etc.

In developing and printing, observe with as great care as possible the rules given in the book accompanying the camera, especially those concerning the arrangement of the darkroom and printing table, temperature of developer, and the time to be given in making exposures.

THE BARBER'S MODEL

Mr. Kosse states that this print is one of a series of monthly records of the growth of his little girl, so we perceive that he is using his camera to the best advantage.

The arrangement of the figure in the space is very good. Possibly more reflected light on the shadow side would have given greater roundness; but a more serious defect is the light on the white of the right eye near the nose. Careful spotting would improve the expression of the face. Data: 4 x 5 Century camera with rapid rectilinear lens; 2 seconds at *f*:11 in May at 11.00 a.m.; faint shadows cast by sun; Seed 30 plate; print on Azo E. The exposure was calculated as follows: subject, 9; stop, 6; light, 1; hour, 0; plate, ½; sum, 16½, indicating 1½ seconds.

A YOUNG PERFORMER

This is one of those subjects in which it is not objectionable to have a soft effect in the face, as the smile is a hard thing to suggest, and diffusion keeps it from appearing frozen. In spite of the charm of the head and shoulders, the rest of the figure is very poor. Part of the trouble lay in the pose, which allowed the legs to become distorted by projecting so far in advance of the rest of the body. The blur of the right hand is bad. It would have been better to take this subject against a very light gray background in a very strong light diffused through cheesecloth and with the camera farther away. By such means, an exposure of 1-5 would have proved to be sufficient, and the fleeting expression could have been caught without blur. The ideal combination for child portraiture indoors is, of course, a reflecting camera capable of exposures of 1-10 and 1-20, with an *f*:4.5 lens, though a good modern shutter, such as the Compound, the Optimo, or the Ilex Acme, is almost as satisfactory. We recently tested an *f*:6.5 lens set in a Multispeed shutter against an *f*:5.6 lens fitted to an old reflex camera, exposing simultaneously on plates from the same box and developing in the same tray, and the slower lens gave much fuller exposure on 1-10 second. Mr. Lenk's data are: 3¼ x 4¼ Butcher Klimax camera with *f*:6 Busch lens of 5½ inches' focus; ½ second at 11.00 a.m. in July on filmpack; pyro; Aristo Self Toning. The factors used for calculating the exposure were: subject, 8; stop, 5; light, ½; hour, 0; plate, 1½; sum, 15, indicating ½ second.

USING A PRINT TRIMMER

A guillotine print trimmer is a very convenient tool; but the cheap models, which are now so very plentiful, must be handled carefully if they are to be kept in working order. One should try to avoid pulling over the blade so as to keep it close to the lower blade when making the cut; as if this is done, the pivot on which the blade works will soon give, and the trimmer will become useless. A slight pressure in the direction named is sometimes necessary, though it would not be with a high-class, properly constructed cutter; but on no account should more pressure be used than the occasion requires. To test the truth of the angle gauge on a trimmer, we may take a thin card and, using great care to keep it flat and to push it up to the guide bar, cut all four of its sides in succession, and then take a narrow cut of the first side once more. One can see at a glance, with such a narrow cut, whether the piece cut off is of exactly the same width at both ends. If it is, we may be quite sure that the gauge of the trimmer is true.

A YOUNG PERFORMER L. W. LEUK

WIPING THE NEGATIVE

Before standing it up to dry, the glass side of a developed and washed plate should always be wiped dry and clean. A film should have a smooth-edged flat squeegee drawn over both sides to remove

THE BROOK

LAWRENCE MACK

all the surplus water. A clean folded handkerchief is also admirable for this purpose. This wiping, however it is done, removes most of the danger of getting drying spots on the finished film. A drop of water on an unwiped negative may cause a spot which will remain wet long after the rest of the negative is dry, and if the conditions change before the drying is completed a permanent spot will remain on the negative, which can hardly be retouched or spotted out, especially if it occurs in a flat tone.

PRESERVING A DEVELOPER

A one-solution developer, that is, one containing all the chemicals in a single bottle of stock solution, does not keep very well unless air is carefully excluded. Fill the bottles to the neck, fit them with sound, tight corks, and dip the bottles well over the lip in melted paraffine wax. The solutions thus sealed will keep in good condition for a year or more.

REAL SHUTTER SPEEDS WANTED

The manufacturers of cheaper forms of cameras would do well to reform their shutter markings. The usual low-priced shutter is marked 1-25, 1-50, and 1-100. If these speeds were accurate, their use by the beginner would lead to continual underexposure, a fault to which he is always addicted. How much better if the shutters were marked and actually worked at, say 1-10, 1-20, and 1-30. We would then see many more full-timed snapshots, and the finishers would have less of their time taken up by explaining the cause of failures.

THE BROOK

This picture has an interesting leading line and is well exposed. The treetrunks are dark without being full black, and the values in the snow are reasonably true, though more brilliancy and texture could have been secured by using a ray-filter and a medium stop. The hole dug out of the film should have been filled with opaque on the film side of the negative and the resulting white spot on the print carefully worked up with black spotting color. Data: 4 x 5 Seneca camera with 6¾-inch rapid rectilinear lens; snapshot at 3.00 p.m. in February in bright light; Orthonon plate; pyro; print on Special Portrait Velox.

LIGHT-FOG

Modern plates are so sensitive to colored light that they should be exposed to even a "safe" darkroom light as little as possible. Develop one plate in full ruby light and another in a covered tray and note how much clearer and crisper the protected plate is. Most complaints of chemical fog can be traced to an unsafe light.

HOME, SWEET HOME A. LLOYD SHULTZ

HOME, SWEET HOME

This print has many things to commend it and only two defects. Both of these are of minor importance, and one of them could not have been avoided. The first is that the horizon line is too near the middle. The second is the absence of a strong line in the foreground to lead the eye into the picture towards the center of interest—the house. In spite of the lack of this desirable line, there is nothing to block the entrance, so the eye has little difficulty in crossing the open field, where it is held within an oval space bounded by the house, the road, the distant buildings, and the lake—an excellent example of oval or circular observation as described in Poore's "Composition." The technical work is perfect. We wonder how any amateur can justify himself in using plain plates when the superiority of the color-sensitive sort with a screen is presented as clearly as it is in this beautiful picture. Data: 5 x 7 Empire State camera with Planatograph lens of 8½ inches' focus; three-times ray-filter; 1 second at *f*:16 at 11.00 a.m. in August in bright light; Hammer Ortho Extra Fast plate; M.-Q.; print on a Kodak Velvet Green postcard.

ETHEL

Mr. Currier has produced an excellent record portrait. The figure is well placed and handled. The chief criticism we would make is that the horizontal band of light on the water makes too prominent a cross-shaped pattern with the vertical line of the figure. This criticism, however, is a minor one and is mentioned simply to call attention to the fact that the photographer must always be on the lookout for the patterns formed by spots of light and dark not only in the subject proper but also in the background. The technical work is very good; but the unity of the print would be better if some of the scattered highlights were reduced by careful spotting. The worst one is the light stick which is present near the left margin; but some of the others in the right foreground corner are almost equally strong in their attraction for the eye. It is always a good plan to keep the corners as free as possible from objects which catch the light and thus draw the eye away from the center of interest. The data sent by Mr. Currier are: Taken with a 5 x 7 Seneca No. 8 camera, with Triple Cono lens of fourteen inches focal length. The exposure was one-fifth second at 1.00 p.m. in August, with hazy light. The Standard Imperial Portrait film was developed with pyro and printed on professional Cyko. (See page 1.)

AN OUTDOOR PORTRAIT O. FORTENBACH

AN OUTDOOR PORTRAIT

An interesting bit of history comes with this portrait. Some time ago its maker asked whether we should advise his fitting an 8½-inch lens to a postcard camera in order to get better perspective, and we answered in the affirmative. His better half then made him a present of the 8½-inch lens plus a Premo No. 9, so he naturally returned the compliment by exposing the first plate on her. To make assurance doubly sure, he employed only half of the lens, thus securing a focal length of 17 inches, which accounts for the excellent drawing of all parts of the figure. Mr. Fortenbach says, "You can see what your magazine does. My wife has a picture which pleases her; one of your advertisers makes a sale, and yours truly has a new camera; everybody is satisfied; and I take this opportunity to thank you once more for all the benefits I have derived from POPULAR PHOTOGRAPHY." The negative could be improved by retouching out the fallen branch and the large tree behind the figure and rubbing down the hands with alcohol. Data: 5 x 7 Premo No. 9 with 8½-inch Planatograph lens; rear half used alone at marked *f*:16, actually *f*:32; 1 second at 3 p.m. in May; sun behind white clouds; Seed L Ortho plate; M.-Q.; print on Normal Studio Cyko.

TINTED BORDERS ON POSTCARDS

T. E. OAKES

It will be generally admitted that photographic postcards, particularly if they are from small negatives, printed on to standard size cards, look much better with tinted borders; but it is by no means easy to get these with any degree of certainty by the methods usually employed, and to attempt it generally results in many wasted prints through the masks being out of register.

A short time ago, wishing to make some postcards from quarter-plate negatives and parts of others, I thought of the following way, which has the advantage of being applicable to any process, either printing-out or developing, and for any reasonable number or disposition of borders; also, if the masks are cut correctly, it is impossible to get the prints out of register, except by actual carelessness.

However, to proceed. First, mark out the size of postcard, generally 5⅜ x 3½ inches, on a piece of paper, and inside this, in the position required, the size of picture it is proposed to print, and then the borders, as Fig. 1. This is best done by means of T square and set square, with the paper pinned down to a drawing-board; but in any case it must be done accurately. Mark the top and right-hand corner.

From this drawing make two tracings on ordinary tracing paper, taking care not to cross the lines at the corners, and not forgetting to mark the same corners.

Now get a clean half-plate glass, and stick one of the tracings down on to it with small dots of dry mounting tissue or other strong adhesive, taking care that none of the dots come under the shaded part, which, when printed, forms one border. Fig. 2. When dry, carefully cut out the part marked clear glass with a sharp knife and flat ruler; then cover the center part (line for mask) with a piece of black paper, cut exactly to size. This now forms the negative for printing the borders. It will be noticed that the black paper center is slightly larger all round than the size of picture, as it forms the narrow white border, in addition to masking the picture part while the tinted borders are printing.

Now take the remaining tracing, and

stick it down to a piece of black paper with dry mounting tissue as before (paste causes the paper to expand), and cut out the small opening by line for picture, Fig. 1, and also round the outside line of card. This forms the mask for border part while the picture is printing, and may, of course, be put over any part of the negative. The latter is conveniently held in position by a piece of cardboard, 5 x 7 inch size, in which an opening has been cut for it, and the mask may be attached to the card with stamp edging. If the negative is a film, the mask would be stuck on to it direct.

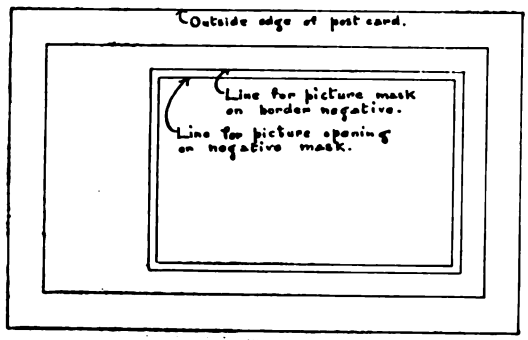


Fig. 1.

To print, use two 5 x 7 frames, one containing a clean glass, on which you place the negative with the cardboard and black paper mask attached, and the other containing the border negative. First fit one side and one corner of the card to be printed, *exactly* to the long side and marked corner of the black mask, and then print the picture. Now take the card out of that frame, and fit the *same* side and corner to the marked sides of the border negative, and print that also. Then develop, and if the masks have been carefully cut, the two will register exactly.

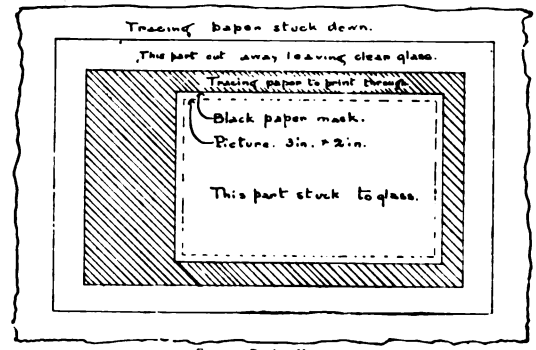


Fig 2.—Border Negative.

A very short exposure only is required for the borders, roughly from 3 to 15 second, at 7 inches from gas burner, for "gaslight papers," according to the depth of tint required and variety of paper.

The title of picture may be printed on the under side of the tracing paper border with Indian ink. This, of course, would print white; but generally it is more satisfactory to put the titles on the prints themselves, as the same masks can then be used for any other negative that they happen to suit.

BLUE MONDAY

This snapshot illustrates several common faults constantly besetting beginners. In the first place, although the focus was set at 50 feet—25 would have been better—the maker was unable to avoid cutting off

BLUE MONDAY E. L. BULLOCK

THE DERELICT

the feet of his foreground gazers; in the second, the exposure was far too quick, resulting in serious undertiming; and, finally, there are so many scattered highlights that the result is an offense to the eye. It takes considerable care and long experience to use a camera finder successfully; and even more to learn how to avoid scattered highlights. Data: 3A Kodak, 1-75 second at *f*:11; bright light in August at 10 a.m.; M.-Q.; Normal Studio Cyko.

THE DERELICT

The negative from which this enlargement was made was copied from a postcard sent to Mr. Hogan by a friend, whose name, unfortunately, he forgot to mention, so that we are unable to give proper credit. The copy was made on an enlarged scale, using a Standard Extra plate, and the print is on Platora Linen Buff, (Grade G). This is a most interesting picture, with the figure well placed in the picture space and even the accessories helping instead of harming the effect. The original was made with a No. 3 Kodak on Eastman film, but other data are wanting.

WHEN IS A FIXING-BATH EXHAUSTED?

A correspondent asks whether a fixing bath is still good when its hydrometer test has dropped from 70 to 60. This opens up an interesting question.

The hydrometer is an instrument which gives the density of a liquid, and its first use in photography was to test the silver bath used with the old wet-plate process. It was supposed to read grains of silver to the fluidounce of bath. Photographers got into the habit of using it to mix up solutions of sulphite, carbonate, etc., so that one often sees the *B* and *C* solutions of a pyro formula given by hydrometer test. Hydrometer readings are unreliable unless always taken at the same temperature, as the amount of solid which can be dissolved in water varies with the temperature.

The density of a fixing bath, as shown by a hydrometer, has absolutely nothing to do with its working. A good practical rule is to allow 1 quart of bath for 4 dozen 4 x 5 or 2 dozen 5 x 7 plates and to throw it away and mix fresh after that number has been put through. For paper, at least four times as many dozen can be used in the same amount of bath. One sign of exhaustion of a fixer is when it grows frothy or throws down a whitish sediment. Another good test is the speed with which the bath clears all the yellow from a plate. If it takes more than twice as long as it required when freshly mixed, it is best to discard the bath. Never "strengthen" an acid fixer by adding more hypo, but simply dump it out and mix fresh solution. Economy of plates and papers can be attained only by employing strong, fresh fixer.

RENDERING OF GREENS

The ultra-rapid plates classed in our tables as ½ are so sensitive to red light that they render greens about as light as they are reproduced by iso and ortho plates. The reason for this is that green light affects such a plate strongly, and any tinge of yellowness in the green is recorded because yellow light is composed of red and green.

DOVE ON NEST JAMES M. BELWOOD

DOVE ON NEST

Scattered highlights are the bane of natural-history photography from an artistic standpoint, hence we note with gratification that Mr. Belwood took pains to soften them down in this print by means of a leadpencil. Another print without this retouching is less satisfactory. The camera was placed within 3 feet of the nest, showing the confiding nature of the mourning dove and her devotion to the important business of hatching her eggs. The bird itself is well brought out and the result as a whole must be regarded as highly successful. Data: 3¼ x 4¼ Seneca camera No. 32, with Seneca Anastigmat lens of 5 inches' focus; ¼ second at *f*:8 in May at 8.30 a.m.; bright sunlight; Vulcan plate; pyro tank development; enlargement on Artura Carbon Black from part of negative.

PAINTING PORTRAITS ON GLASS

Materials Required.—One small artist's brush; tubes of oil paints; 3 chemical compounds; adhesive paper for binding; 2 glasses for each picture. Of the latter the convex cabinet size is the best for beginners, but flat glass of the required size will do almost as well.

Compound No. 1.—Mix thoroughly 3 ounces castor oil and 1 ounce alcohol.

Compound No. 2.—One package Nelson's gelatine (2 ounces) and 2 ounces acetic acid; boil in 1 quart of clear water until dissolved.

Compound No. 3.—Mix thoroughly 4 ounces olive oil, 1 ounce turpentine, and 1 ounce balsam of fir.

Instructions for Painting.—Take an unmounted photograph and apply Compound No. 1 on both sides, being careful to cover every part of it. Let it remain in this way until perfectly transparent (about 12 hours —a number of pictures may be treated in this manner at the same time), then wipe with a dry cloth.

Now mount the picture on one of the glasses with Compound No. 2, being careful to rub out all the wrinkles and air between the picture and glass. Always place the face or bright side of picture next to the glass.

After it is nicely on the glass let it dry a few minutes, then clean all the compound from back of picture with a damp cloth. Let it dry, then apply a little more of Compound No. 1. Let this remain until the picture is perfectly clear and transparent, then wipe off with a dry cloth, and the picture is ready to receive a few drops of Compound No. 3. Let this remain 5 minutes, then wipe off carefully and the picture is ready to paint.

Paint the eyes, all light colors, jewelry etc., on the back of the picture, then lay the other glass on top of this, and fasten the edges together in several places with stripes of the adhesive paper. On the back

PLEASE PLAY BALL MARGARET HITCHCOCK

of this second glass paint the hair, flesh, clothes, background, etc. Next cut a piece of white bristol cardboard the size of the glass, and fasten to the back of picture with strips of adhesive paper, and the picture is finished.

For photos that have been mounted, soak in lukewarm water until the print can easily be removed from the card, and with the finger wash the gum from the back. Let it dry and proceed as above.

Mixing Paints.—For dark hair, use Vandyke brown; for brown hair, use Vandyke brown and yellow; for light hair use yellow and white; for green color, use blue and yellow; for purple, use blue and red; for orange, use yellow and red. To lighten any color mix with white.—*The Agents' and Mail Dealers' Magazine.*

PLEASE PLAY BALL

This genre study is admirably conceived and executed. The placing of both figures is excellent; the framing of the view by the piazza posts is good in spite of their sloping—due to not having the camera level—and the exposure, though perhaps technically under, being good enough to give the general impression in values of dark objects seen against the light. A swingback is invaluable in cases of this sort, because it allows one to point the camera down and keep the verticals straight by using the swing. A further advantage of the swing is that it allows sharper focusing with a large stop. Data: 4 x 5 Seneca 6B camera with rapid rectilinear lens; ½ second at 5.00 p.m. in April; faint sunlight on opposite side of the house; Standard Orthonon plate; pyro tank development; print on Instanto No. 16.

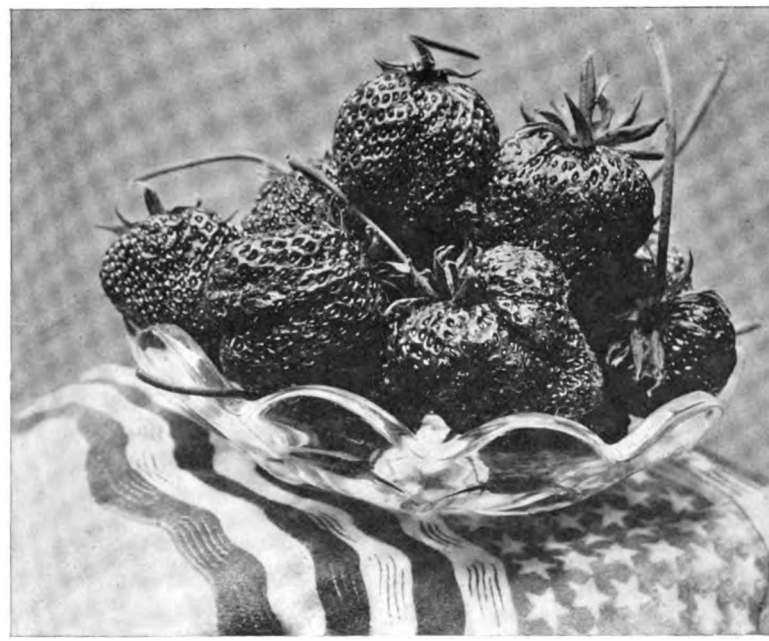
A CAUSE OF DISTORTION

An unsymmetrical lens of short focus compared with the size of the plate, and raised considerably above the center of the camera, cannot be expected to be quite free from distortion at the edges of the plate. A symmetrical lens would give an image free from distortion.

DASH

Portraits of animals are not always easy to make, so a good result like this is worth reproducing and commending in spite of one or two obvious defects. The background does not contrast sufficiently with the dog himself, and the two patches of strong light come in unfortunate places and detract from the figure. Data: Ensign camera with rapid rectilinear lens; 1-25 second at 4 p.m. in June in bright light; portrait attachment used; Eastman film; print on Regular Matte Velox.

DASH W. G. WHALE



STRAWBERRIES A. R. BROWN

STRAWBERRIES

It is of little use to attempt rendering red objects on a plate totally insensitive to red, for they are reproduced too dark. A panchromatic plate with a 5-times filter made from Filter Yellow K would have given a true rendering throughout. The accessories in this picture are distracting. The berries, too, are not well arranged, the long stems being particularly objectionable because of their light tone and their apparently helter-skelter arrangement. Panchromatic plates are just as easy to use as any if development is performed in total darkness (tray covered) by the Thermo system. Data: 4 x 5 Century Grand camera with 6-inch rapid rectilinear lens; 1 minute at *f*:22 under north window in attic; Wellington Anti-Screen plate; rodinal; Professional Cyko Glossy.

POINTERS ON PORTRAITURE

One of our readers recently brought up a number of interesting points on portraiture which occur so commonly in amateur practice that we thought them worth a note. He begins by stating that he has recently resumed photographic work after several years' disuse of the camera, and has purchased a 5 x 7 reflecting camera with *f*:4.5 lens. In accordance with our advice, he has determined to use double-coated iso plates for all his work, though he hesitates for fear there may be some disadvantage as compared with the plain plates he was formerly accustomed to work. Another difficulty he fears is that because of the cramped quarters in his home "studio" he will be unable to work without getting his background almost as sharp as his sitter. The question of emphasizing any particular plane puzzles him, as he does not know whether to attempt it in development or in printing.

There should be no difficulty in throwing the background out of focus with an *f*:4.5 lens in 5 x 7 size. In focusing, the lens should be racked out until the catch-lights in the eyes begin to soften, when the background should be out of focus unless it is within a few inches of the sitter. Emphasis in portrait work is largely a matter of lighting. If the background is turned so that it receives much less illumination than that which falls on the subject, the latter will be brought out strongly, and vice versa. A good lighting, correctly exposed, will need no manipulation in development, for a non-halation color-sensitive plate will need little correction by any means, and any slight changes can be easily made by retouching and other forms of hand work on the negative.

Perhaps the best method for the beginner

THE WOODLAND PATH C. D. CALKINS

in portrait work is to expose by Watkins Bee meter. The sensitive paper in the meter is held in the place where the sitter's head is to come and facing the light. It takes only a few seconds for the paper to discolor visibly, and the number of seconds required for it to do so is multiplied by 16 and used in calculating the exposure. For instance, we have before us a portrait negative made at home without accessories of any kind in the late afternoon with yellow sunlight falling on the muslin curtains of the window, but not on the subject. Such a light is extremely difficult to judge by the eye, but the meter called for 3 seconds which were given, and the plate was developed by the Thermo system and yielded a perfectly-balanced negative. If blinds and reflectors are used, the light should, naturally, be tested only after the arrangements are completed.

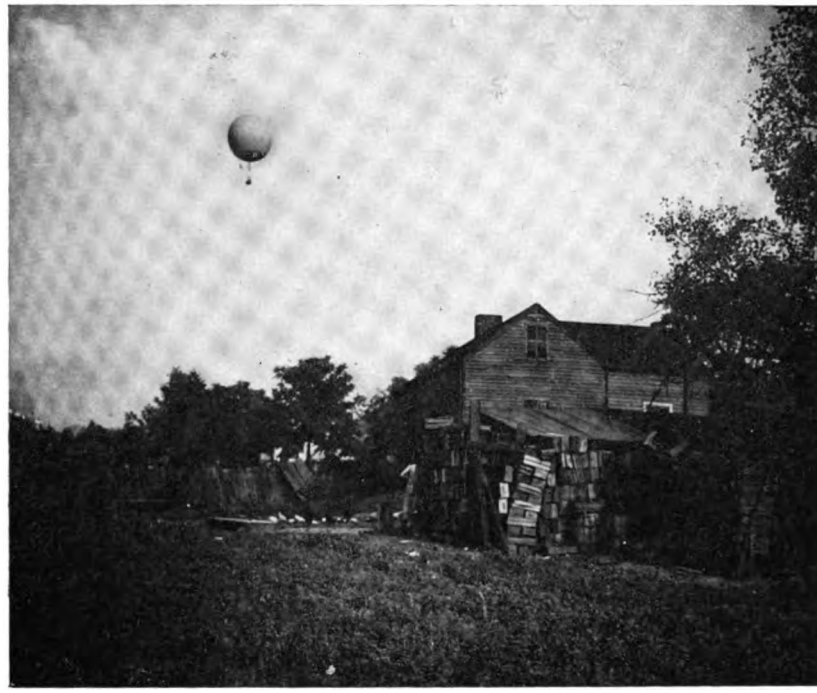
A plate timed by meter can be developed without inspection—particularly if it is double-coated and hence almost impossible to judge by transparency—if the Thermo system described in the June, 1914, issue is adopted. One or two trials will settle the right classification of the plate for portrait work on the particular paper in use, and results thereafter will be uniform. In fact, we can get better negatives in this way on double-coated plates than we ever obtained with a very weak developer with no guide but our own judgment based on experiments or factorial calculations. The only reason for recommending abnormally weak developers for double-coated plates seems to have been that users were likely to overdevelop if they used a normal solution, simply because they could not see through the plate by ruby light and had no guide.

THE WOODLAND PATH

This picture is a good example of the composition of strong vertical lines, with a few horizontals to balance them. It might perhaps have been better to include more of the top of the large trunk with a few branches, as the bare stem of the tree is not much more artistic than a post. The concentration of interest, however, is well managed, for the light is strongest inside the tree and over the path. The sapling in the middle distance is well placed and would effectively balance the large trunk if the latter were not so much exaggerated by being rather near to the short-focus lens used. Data: Postcard Premo with 6½-inch Planatograph lens; 1 minute at 6.45 p.m. at *f*:11; faint shadow cast by sun; Premo filmpack; edinol-hydrochinon; print on Normal Studio Cyko, redeveloped with "Tabloid" Sepia Toner.

O'ER VILLAGE AND TOWN

Although we have in the past printed several balloon pictures, this is the first which has reached us showing one in its journey over the open country. The picture is beautifully composed, the spotting, or arrangement of areas of light and dark, being such as to give a pleasing balance, and the principal object, the balloon itself, being placed exactly right. The technique is perfect. Data: 4 x 5 Seneca No. 8, fitted with Ilex anastigmat lens of 6 inches' focus; 3-times ray-filter; 1-10 second at *f*:6.3 in July at 5.30 p.m.; fair light; Ham-



O'ER VILLAGE AND TOWN ALVIN W. PRASSE

mer Ortho plate; ortol; print on Soft Argo Buff, developed with ortol-hydrochinon.

THE USE OF BOLTING SILK

HERBERT MILLS

At this time of the year possibly many amateurs are getting ready to make enlargements from the negatives obtained during the holidays—some, maybe, wondering how not to produce that unpleasing harshness so often seen in bromide enlargements.

The negative is, of course, at fault for this particular purpose, for, as a rule, it is developed to a density suitable for contact printing in platinotype, carbon, or P.O.P., often without a thought as to subsequent enlarging.

Reducing with ammonium persulphate would obviate the difficulty, but then the negative is spoiled for contact printing. There is a method, however, by which the same negative may be used for both enlarging and contact printing, and this is by the use of bolting silk—a most helpful tool in the hands of even the least artistic of photographers.

By its aid, crisp, "biting-sharp" negatives are made to yield the beautifully soft effects so often associated with platinotype, whilst contrasty ones are shorn of their propensity for producing soot and whitewash atrocities, which so often (practically every time) result from negatives too strong in contrast.

But, to my thinking, the greatest benefit which bolting silk confers upon the photographer is when it is used in enlarging portraits.

Photographers are often deterred from taking up this branch of photography owing to the frequent necessity for retouching, resulting from a too inquisitive lens, which with unblushing effrontery seizes upon every freckle and wrinkle, and passes them on to the all-sensitive plate.

The material—it may be mentioned—is a white, rather stiff, square-meshed fabric, manufactured primarily for "bolting" or sifting flour, etc., and can be obtained from any of the large dealers in photographic materials. A piece about 14 x 11 inches costs about fifty cents.

When purchased, the silk should be mounted on a light frame—a piece of stiff cardboard, having a rectangular piece cut out about three-eighths of an inch less all round than the silk. The edges are then pasted, and the silk laid down carefully on it.

TRANQUILITY J. M. CURRIE

As the paste will come through the material, it is as well to lay narrow strip of black or other paper along the edges; the whole can then be placed under pressure without sticking.

The method of using the silk is very simple. The negative to be enlarged is placed in the lantern, and focused sharply on the screen. The bromide paper is now pinned up ready for the exposure. The position of the silk during exposure may be anywhere between the bromide paper and the negative.

The broadest effects are obtained when the silk is about half-way between the lens and paper. If nearer to the lens, a double image results.

For a general softening of detail, the best place is just in front of the bromide, but not in contact with it, in which case the screen of silk may be held in the hand during exposure, if not unduly prolonged.

If the silk be pinned up with the paper, and in contact with it (a sheet of glass will be required to ensure perfect contact all over), the picture will be broken up into a fine grain, corresponding with the mesh of the silk.

When placed in contact with the negative, a coarse-grained canvas effect is produced, suitable perhaps to a very few subjects. If used in this position it is not recommended to enlarge more than two or three diameters.

The exposure, it should be mentioned, is in the ratio of five with to three without silk. That is, if the exposure without the silk be thirty seconds, it will be fifty seconds using the silk.

TRANQUILITY

There are several excellent points about this picture, but it has one serious defect, namely, the lack of a leading line in the foreground. The eye has to jump from the base to the figure of the goat lying down near the left margin; but from there it follows diagonally up the slope, observing one after another of the goats. The tendency, however, is for it to go out at the right margin, for the distance is almost equally attractive at all points and does not pull the eye to a good exit. In spite of these criticisms, we consider the picture very interesting and admire particularly the soft yet brilliant values and atmosphere. Data: Postcard Premo with 6½-inch Planatograph lens; 1-25 second at *f*:8 in July at 9.30 a.m.; intense sunlight; "Tabloid" Rytol; print on Soft Studio Cyko.

DISSOLVING METOL

Metol is somewhat slowly soluble in cold water, so it is usual to warm the water before dissolving it. Take care that it is completely taken up by the water before adding sodium sulphite, for if any remains undissolved, a precipitate may form, and no effort will cause this to redissolve.

A QUIET RETREAT J. F. WEBSTER

A QUIET RETREAT

Fuzziness is not always objectionable, and in this case the blurring of the trees has the merit of suggesting that the day was windy, as Mr. Webster states in his data was the case. We feel, however, that a better result could have been obtained with a large stop and shorter exposure if the vertical swingback had been brought into play to equalize the focus of foreground and middle distance. Our own landscape photography is all done with a 4 x 5 camera having a swing—in fact, we should be at a loss to compose and focus a view without this movement. The data are not very clearly stated, but we understand that the exposure was 7 seconds at *f*:22, therefore about 1 second at *f*:8 would have given equivalent results, and probably by watching for a lull in the wind the operator could have secured a much less fuzzy effect with this time. The generally dark effect is due to taking the picture with the sun ahead. We should like to see this same scene made over. Data: 5 x 7 Ray camera with rapid rectilinear lens; Ingento Series A filter; 7 seconds at *f*:22 in July at 3.00 p.m.; bright sun to right and ahead of lens; Cramer Medium Iso plate, developed 2½ minutes at 74 degrees in Modified Thermo D.-Q.; print on Azo D Soft, with sky held back.

MAKING UP A DEVELOPER

The amateur who compounds his own solutions saves a great deal of money at the expense of a little time. The work is not difficult. A good pair of scales is the first requirement, preferably a balance with open pans mounted on a wooden base. A good one costing between two and three dollars is on the market and is furnished with apothecaries' weights up to 3 drams (180 grains) and with avoirdupois half-ounce, ounce, and 2-ounce weights. The actual weights and their equivalents in grains are:

1 one-grain	1 gr.
2 two-grain	2 gr.
1 five-grain	5 gr.
1 half-scruple	10 gr.
1 scruple	20 gr.
1 dram	60 gr.
1 two-dram	120 gr.
1 three-dram	180 gr.
1 half-ounce (roughly)	220 gr.
1 ounce (roughly)	440 gr.
1 two-ounce (roughly)	880 gr.

Assuming that one is about to mix a typical metol-hydrochinon formula, place the formula on the table and lay out all the ingredients called for. As each is weighed, check it off on the formula and set it aside on a piece of paper. When all have been carefully weighed out, check them again, to make sure that nothing has been omitted. Next measure out a little less than the required quantity of water and dissolve the metol thoroughly, secondly, the hydrochinon, thirdly, the sulphite, fourthly, the carbonate, and, lastly, the bromide. Now add water to make the total volume called for by the formula and filter through absorbent cotton.

THE OLD BRIDGE ALBERT STRIEGEL

THE OLD BRIDGE

The value of full exposure is seldom better shown than in this case, for the natural contrasts of the subject were so great that the least undertime would have rendered the shadows dense and empty of detail, and the lights chalky. Mr. Striegel says that as he had left his exposure-tables at home, he was obliged to guess; but his estimate proved excellent. We hope that some of our readers who are in the habit of reproducing their shadows too dark will study this picture carefully and then compare its values with those in a similar scene in nature. The composition is good, though the maker says that he thinks he could have improved it by standing farther to the right and including a large clay-bank with strong highlights. Data: 3A Kodak with rapid rectilinear lens; ½ second at 4 p.m. in June in bright sunlight; Eastman film; M.-Q.; print on Azo E Hard.

IN THE MOONLIGHT

Real moonlight effects can be made, though it is customary to underexpose against the setting sun, as in this picture. The only criticism we wish to offer is on the use of a rounded-corner mask. The plain rectangle is always to be preferred. Readers who would like to make genuine moonlight pictures will find an article on the subject from the pen of William Steeple Davis in the November, 1913, issue of POPULAR PHOTOGRAPHY. Data: 4 x 5 Pony Premo No. 5 camera with rapid rectilinear lens; 1-100 second at *f*:16 in June at 6.30 p.m.; Standard Orthonon plate; edinol-quinol developer; print on a Paget Prize Self-toning Smooth Matte postcard.

PICTURE-MAKING IN HILLY COUNTRY

A reader says, "I have a 3A camera of the twenty-five-dollar sort and would like to have some information about securing good distant views of the hills surrounding Peekskill and Croton, on the Hudson. I have a tripod, Ingento A filter, and a Watkins Bee meter; but so far have not secured a satisfactory picture. Do you think my camera, with its short focal-length, is capable of making good panoramic views?"

Our familiarity with this region is slight, being confined to a trip by boat, but as we remember the region, it is one of great distances which might well need a telephoto lens. In the circumstances, good panoramas can probably be secured only by matching prints and having enlarged prints made from a copy negative of the first result. The method of taking the negatives is to level the camera perfectly and make two or more exposures without disturbing it except to swing it on its screw. The negatives should overlap about an inch. Place marks on the finder corresponding to this distance on the film and bring a certain object on these lines before exposing. Thus, if the first negative were the middle one of a three-plate panorama, suppose a tree were located on the left line and a steeple on the right line. In making the end pictures, the camera would simply be swung until the line formerly on the steeple coincided with the tree for one end

IN THE MOONLIGHT — OSCAR G. WHITING

picture, and similarly the former tree line would fall on the steeple.

This applies to distant landscapes, in which there is no real foreground, that is, nothing nearer the lens than a hundred feet. In hilly country, however, many very satisfactory views can be made through the doublet lens, as one wishes to include all of a hill across a valley, etc. A long-focus lens is useful for only a small proportion of views which are capable of making a satisfactory photograph. Really distant landscapes do not photograph well, for with color missing and no foreground they look most uninteresting on a small scale in black and white. Our advice would be to confine the actual exposures to subjects which pretty well fill the finder. More could be learned in a short time by securing a plate attachment and studying different views on the ground glass than by a whole summer's use of the finder alone.

Regarding exposure, the meter instructions say to halve the indicated exposure in the case of a distant landscape. Our method is to use the published P number on the speed card and take half the exposure for all average landscapes, so the actual time needed would be only a fourth the full meter time. Assuming that the filter requires an increase of four times, this would make the full time correct with the ray-screen in place. Test the best light.

To use a filter successfully with a film camera, it is generally necessary to find by experiment the correction of focus needed and to mark this on the focusing scale. A filter usually throws the distance out of sharp focus, hence it must be tested by means of a ground glass laid on the film rollers, ground side towards the lens, and the necessary alteration of focus marked on the scale. The only filter we have seen which does not alter the focus is the imported graduated filter sold by Burke & James under the name of "Reform." This filter requires no increase of exposure if used on a plate prepared with a filter dye in the emulsion and sold under such names as Anti-Screen, Non-Filter, Self-Screen, etc.

INACCURATE GRADUATES

Money spent for high-quality graduates with engraved lines running all the way around is not wasted, as the following incident will demonstrate. Recently we had occasion to dissolve a sparingly-soluble chemical in twenty ounces of water, and, as a friend had borrowed (and broken) the only engraved pint graduate in our darkroom, had to use a moulded-glass quart graduate. The chemical refused to dissolve properly, so we suspected that the graduate might be inaccurate on the short side. On testing it with an accurate 4-ounce measure, we found that it was nearly 3 ounces short of the right amount when filled to the 20-ounce mark. Such a difference, in some cases, might be enough to account for bad results.

A DARING LEAP W. H. KELLER

A DARING LEAP

High diving is one of those perilous feats which attracts by reason of its danger those who would never in their own well-ordered lives attempt anything out of the ordinary, so we doubt not that many readers will be intensely interested in this record photograph of what seems a foolhardy undertaking. The picture is excellent, considering the limitations of the apparatus used. Data: 4 x 5 Eastman magazine plate camera; Hammer Postal plate; pyro tank development, print on Normal Cyko Glossy.

SULPHITE SOLUTIONS

Although anhydrous sodium sulphite suffers little deterioration as long as it remains in the solid form, air begins to attack it and alter it to a deleterious substance, sodium sulphate, as soon as it is dissolved. The change takes place more rapidly in dilute than in strong solutions and in partly-filled bottles with loose corks more rapidly than in bottles filled to the neck and tightly corked. It is not economical of chemicals to risk wasting good paper or plates by making up more developer than one expects to use within a month or two. Never keep on hand a stock solution of sulphite for amidol developer, as within a day or two it will oxidize sufficiently to spoil the results.

SUBSTITUTE FOR GROUND GLASS

For preparing a plate with a matt surface to replace a broken ground glass, the following varnish can be used.

Sandarac	90 gr.
Mastic	20 gr.
Ether	2 oz.

Dissolve and add

Benzol	¼ to 1½ oz.

The proportion of benzol governs the fineness of the grain. The varnish is flowed over a sheet of perfectly clean glass and dries almost instantly. It can be tinted with a yellow aniline dye and flowed over the glass side of a negative for local intensification of the shadows, the parts over the lights being scraped off.

PHOTOGRAPHING NIAGARA

A correspondent asks what outfit we would advise for use in a trip to Niagara Falls. His present outfit consists of a 5 x 7 camera with 24-inch bellows, convertible anastigmat *f*:6.8, and Multispeed shutter, and he is thinking of adding a wide-angle lens if we consider it necessary. Another problem which bothers him is about plates and exposures.

The best pictures of Niagara which we have ever seen were made by William H. Kunz with an 18-inch anastigmat on 8 x 10 plates, so we should think that you would

THE BOAT O. W. HILL

use mostly the rear combination of your lens, with the complete doublet held in reserve for the few close views. As the full aperture of the single combination is about *f*:13.6, shutter speeds not exceeding 1-100 will probably prove right, with 1-50 and 1-25 more useful for getting out the detail in the rocks. We should advise a fast double-coated color-sensitive plate and tank development for slightly less than the normal time, in order to avoid piling up too much contrast. The great problem at Niagara is to get detail in the rocks, so a ray-filter could hardly be used for many of the views.

SILVERING MIRRORS

A

Silver nitrate	175 gr.
Distilled water	10 oz.

B

Ammonium nitrate	262 gr.
Distilled water	10 oz.

C

Caustic potash, C.P.	1 oz.
Distilled water	10 oz.

D

Rock candy	½ oz.
Distilled water	5 oz.

Dissolve and add

Tartaric acid	50 gr.

Boil in a flask for 10 minutes and when cool add

Alcohol	1 oz.
Distilled water to make	10 oz.

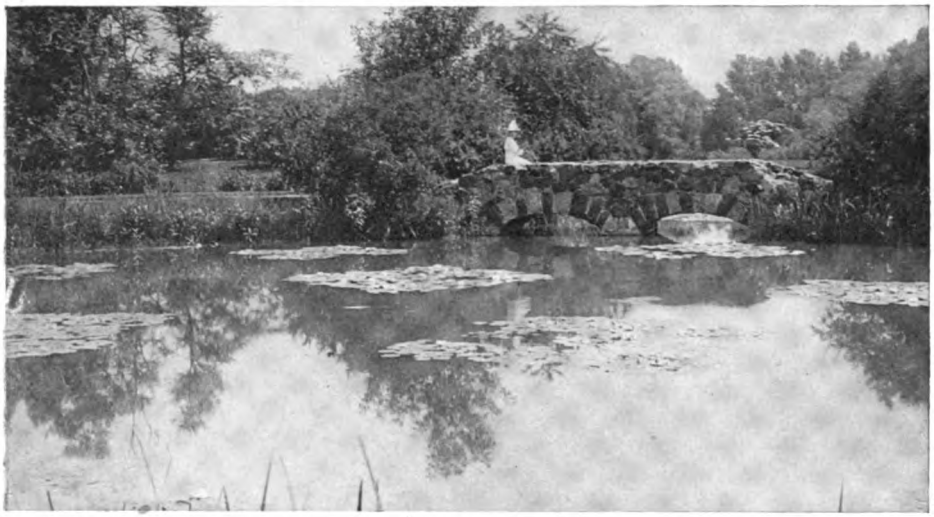
For use, take equal parts of *A* and *B*. Mix also equal parts of *C* and *D* in a separate measure. Mix both in the silvering vessel and suspend the glass face down in the solution. The glass must be absolutely clean. Wash it with warm soap and water, polish with a clean cloth, and rinse several times with distilled water, or use strong nitric acid and rinse well as before.

THE BOAT

This is a satisfactory vacation snapshot of the type which is so often spoiled by amateurs who have not learned that dark objects near the camera require full exposure to secure shadow detail. The print is a trifle too black. More water in the developer would have given a more harmonious result. Note the false foreshortening of the oar which projects towards the lens. This is the result of using a short-focus lens too near the subject. Data:. Postcard Ansco camera with rapid rectilinear lens; 1-25 second at *f*:16 in June at 2.00 p.m.; good light; Ansco film; M.-Q.; print on Normal Studio Cyko.

REFRIGERATION BY HYPO

In extremely hot weather, it is sometimes necessary to find a substitute for ice, and hypo, owing to its property of abstracting heat from the water in which it is dissolving, may save the day. A little hypo and water in a large tray will keep the developer from growing too warm; but care must of course be taken that none gets into the solutions.



THE PARK BEAUTIFUL J. H. BECKER

THE PARK BEAUTIFUL

Water foregrounds, even when broken by lilypads and reflections, are difficult to compose satisfactorily, but this example is better than most because the principal object, the bridge, is not centered and the eye has little difficulty in following the lighter portion of the water until it comes to the center of interest. The technical work has been well carried out and has given a soft, atmospheric effect which suggests nature much more forcibly than a chalky print can ever succeed in doing, for it is soft yet brilliant. Data: Postcard Premo Special with IIb Tessar lens; 1-5 second at *f*:32 in July at 11.30 a.m.; bright sunlight; Defender Non-halation Ortho plate; tank pyro development; print on Paget Prize Cream Rough Self-toning paper.

WOOD ANEMONIES

Flower studies, perhaps more than any other class of subject, admit and demand artificial arrangement. These anemonies were taken just as they grew. The result, though true to nature, is not a completely finished study, for the more distant blossoms, lacking sharp definition, are a distraction. In fact, the arrangement of spots is not well thought out. The data, however, are unusually interesting, showing the careful calculation of the exposure. Subject, 8, stop, 7; light, ½; light across subject, 1; month and hour, ½; plate, 1½; sum, 18½, indicating 5½ seconds. Although a ray-filter was used, no allowance seems to have been made for its factor of 3, probably because the shortening of the focus of the lens by the use of an Ideal Enlarging Lens was thought sufficient to counteract the exposure-increase normally required by the filter. The remaining data are: 3A Kodak with rapid rectilinear lens; Eastman film; tank pyro development; print on Hard Instanto Semi-Matte.

ACETONE AND ACETONESULPHITE

A correspondent asks for formulas for the use of acetone and acetonesulphite in developers. Acetone is a liquid chemical with an aromatic odor and has been recommended particularly as an accelerator with pyro in place of the usual alkaline carbonate, as it has no softening effect on the gelatine and can be used at high temperatures. Acetonesulphite is a dry crystalline powder soluble in an equal weight of water and used chiefly as a substitute for sodium sulphite, potassium metabisulphite, etc. It is acid in reaction and acts also as a clearing and hardening agent in the fixing bath, as well as being a very powerful restrainer with such rapid developers as edinol.

The Cramer formula for pyro-acetone is:

A

Water	16 oz.
Oxalic acid	12 gr.
Pyro	1 oz.

B

Water	20 oz.
Sodium sulphite, Cramer's dry	2 oz.
Acetone, Cramer's	4 oz.

C

Water.....30 oz.
Potassium iodide.....30 gr.

Use as follows:

For Tray

Solution *A*..... 1 oz.
Solution *B*..... 2 oz.
Water.....12 oz.
Factor.....12

For Tank, 30 minutes at 70 degrees

Solution *A*..... 1 oz.
Solution *B*..... 3 oz.
Water.....58 oz.
Solution *C*..... 2 oz.

The iodide allows development at 70 to 75 without stain or veiling.

Acetonesulphite is always used with a carbonate and is probably broken up into acetone and a sulphite. It can be used in almost any formula by taking one fourth as much as the formula specifies for anhydrous sodium sulphite. To replace potassium metabisulphite, half as much again of acetonesulphite should be used, say 15 grains instead of 10 of metabisulphite. Another way of calculating how much to use is to double the weight of developers used. For instance, if a formula called for 10 grains of metol and 30 grains of hydrochinon, 80 grains of acetonesulphite would be appropriate. A slight addition might have to be made to the carbonate in order to neutralize the acidity of the acetonesulphite. We recently had occasion to determine the alkalinity of Cramer's anhydrous sulphite and found that one ounce was neutralized by 36 grains of a good fresh specimen of metabisulphite crystals, so inasmuch as potassium metabisulphite neutralizes an equal weight of dry granulated sodium carbonate (containing one molecule of water), we conclude that only 14 grains of carbonate would take care of the quarter ounce of crystal acetonesulphite needed to replace an ounce of sulphite—truly a negligible quantity.

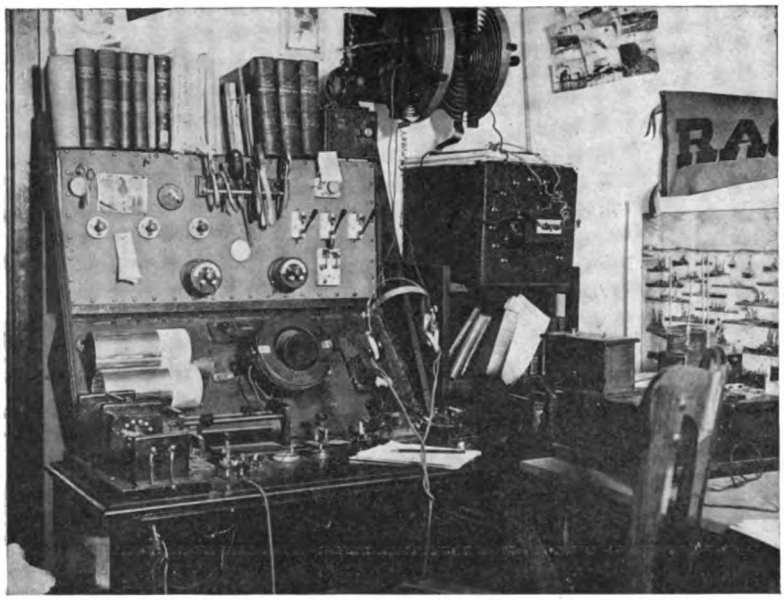
The restraining effect of acetonesulphite in excess is so marked that it has been found possible to develop a normal negative from overexposures several thousand times too great by adding large quantities of a 50 per cent. solution of acetonesulphite to the developer. In fact, we think that even in small amounts it lowers the speed of the plate and is therefore not suitable for snapshot work except when plates are stale and inclined to fog. It is useful for tank development. Dissolve an ounce in 7 ounces of water and use ½ ounce to each pint of water used in making up the tank solution.

WOOD ANEMONIES B. E. SHAW

As an acid clearing and hardening agent, acetonesulphite should be added to a plain hypo in the proportion of 50 grains to each pint.

FORMALINE

Formaline is a solution of the gas formaldehyde in water. As sold, it contains 40 per cent. of the gas, though it loses a portion by evaporation as soon as uncorked. For photographic purposes, this loss seldom matters. It is employed generally in the proportion of 1 ounce of formaline in 20 ounces of water as a hardener. Since the introduction of the Autochrome plate, which is much more likely than ordinary plates to frill, formaline has come into more extended use. Autochromists, if obliged to develop at temperatures over 60,



A HOME WIRELESS STATION S. BRUGGER

usually treat the plate with diluted formaline for a minute or two before the first development to harden the film sufficiently to stand the various baths without injury. The same procedure is recommended when ordinary plates show signs of frilling. Formaline can also be used after fixing and will prevent the growth of moulds in the film, with resulting transparent or semi-transparent spots from liquefaction of the gelatine. Negatives thoroughly hardened in formaline will stand hot water.

A HOME WIRELESS STATION

This flashlight is well taken and shows the apparatus clearly; but the room was so small that the operator could not get far enough away to focus both apparatus and chair at once. The latter should have been removed and the rising front should have been utilized to include a little more at the top. Data: 5 x 7 Korona V fitted with Goerz Dagor lens of 7 inches' focus; *f*:16; flashsheet; Hammer Extra Fast plate; pyro; print on Contrast Studio Cyko.

A BIRD OF PASSAGE

Aeroplanes are seldom pictured to more advantage than in this print by Mr. Weatherall, for sometimes even press photographers fail to select the best point of view in their eagerness to bring out the aviator on a large scale. It would be almost impossible to suggest any way in which this picture could be improved. Data: 3A Ansco camera with rapid rectilinear lens; 1-25 second at 4 p.m. in October in hazy sunlight; *f*:11; Eastman film; tank development; print on a Contrast Studio Cyko postcard.

MARY'S LITTLE PLAYMATE

This charming study has only one serious fault, defective spacing. The child is too nearly centered. If the reader will cover up the right of the picture almost to the figures, he will note a great improvement. Data: No. 3 Kodak with rapid rectilinear lens; 1-25 second at *f*:11 in May at 3.30 p.m.; intense sunlight; Eastman Speed film; 5 x 7 enlargement on a rough, buff-toned bromide paper. (See page 3.)

DISSOLVING A DEVELOPER

Beginners sometimes have trouble in dissolving powder or tube developers, because it takes time to acquire the knack. The right way is to measure out the required quantity of water and put in the developing agents. In most cases, the metol and hydrochinon (or other developing substance proper) is the first to be reached on opening the tube. When all is in the graduate, stir well with a glass rod until the salts are completely dissolved. Hydrochinon is rather slow to dissolve, and often a few crystals remain visible after vigorous

A BIRD OF PASSAGE STARK WEATHERALL

stirring for a minute or more. However, when the solution appears clear, no matter what time it takes, the sodas, or second part of the tube, should be added *while the solution is briskly stirred.* If the sodas are allowed to fall to the bottom, they will cake and require crushing and prolonged agitation to get them into solution, but by the plan advised, they dissolve almost at once. When the solution clears, filter it through a tuft of clean absorbent cotton to remove any minute undissolved particles.

POTASSIUM METABISULPHITE

One of the most useful substances in the photographic field is potassium metabisulphite. It comes in large, irregular crystals with a slight white powdery deposit and smells strongly of burning sulphur. It is not only the best preservative for pyro and other developing agents which require an acid substance to keep them from going bad when in solution, but is also one of the best clearers and hardeners for use in the fixing bath. Used in the proportion of 120 grains to the ounce of pyro, it will keep this agent in perfect condition for at least a year and a half. Used in the fixer in the proportion of 2 ounces to each pound of hypo, it clears the film, hardens it, and prevents frilling. Metabisulphite should never be dissolved in water having a temperature much over 80 degrees or it will be decomposed and deposit sulphur, thus losing its usefulness.

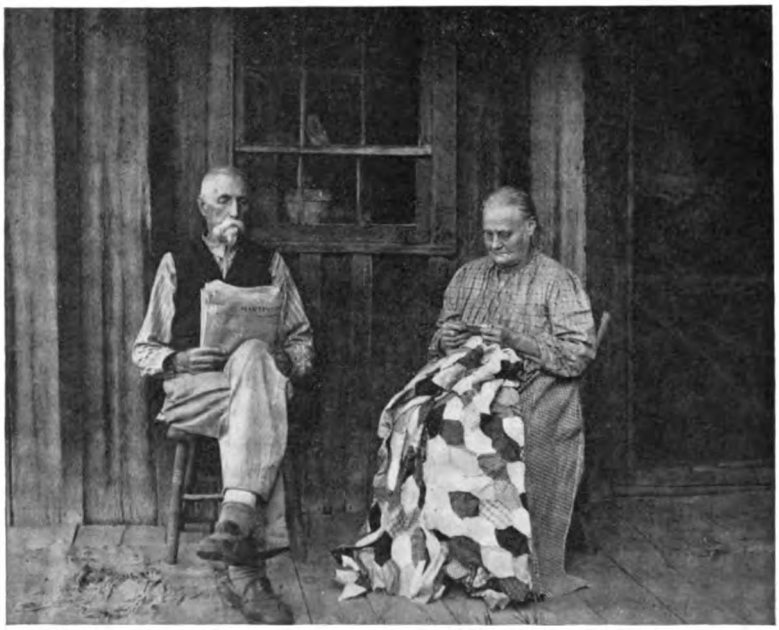
Index for Volume II will be found in this issue.

DISADVANTAGES OF CRYSTAL SULPHITE

Sodium sulphite in crystals is acted on by air and rapidly deteriorates, the surface of the crystals becoming covered with a white powder, which is sodium sulphate and very injurious to a developer. In warm weather, the prevailing humidity causes the crystals to melt down into a sticky mass of uncertain composition. If one is unfortunately obliged to accept a sample of sulphite crystals and they are not perfectly dry and clear, on no account use them until they have been rinsed with pure water and surface-dried on a clean towel or on a piece of pure photographic blotting-paper before weighing out. Pure anhydrous sulphite, as supplied by photographic stock houses, is over 90 per cent. pure and never contains injurious amounts of carbonate and sulphate as impurities.

WEIGHING SMALL QUANTITIES

Photographic scales for amateur use are seldom called on for differences of less than a grain, but when such a small quantity as, say, 7 grains is to be weighed, extra care should be taken to see that they balance accurately without a load on either pan. A common mistake is to try to bring the scales to rest. This should not be attempted, as friction in a dusty or rusted bearing may cause the scales to stick with a much greater load on one pan than apparently balances it on the other. The right way is to see that the indicator swings evenly to both sides of the middle mark of the scale.



DIVERSION C. W. DELANEY

DIVERSION

A soft, diffused light and full exposure have made this picture very clear and crisp without being harsh. The posing of both figures is good, as in each instance the position is such as might naturally be held by the subject even if he or she were unconscious of the camera. There is little to criticize, as the background, though full of interest, is entirely appropriate. Data: 5 x 7 Seneca No. 9 with triple convertible lens of 8 inches' focus; 2 seconds at *f*:11 in July at 3 p.m.; very dull light; Hammer Ortho Extra Fast; pyro tank development; Professional Cyko Plat. The exposure calculation was: subject, 7; stop, 6; light, 2; hour, ½; plate, ½; sum, 17, indicating 2 seconds.

THE BEST ALL-AROUND PLATE

For practically all amateur purpose, the best general-purpose plate is the rapid double-coated color-sensitive variety, class 1½. It is fast enough for everything except difficult speed work and snapshots in poor light; and early or late in the day, when the light is yellow, it becomes faster than plain (non-orthochromatic) plates of the same listed speed. It can be used with or without a filter. It is almost perfectly non-halation. It can be developed in tray or tank by the Thermo system with splendid results. Comparative tests show that it is not necessary to follow the usual advice to use the developer two or three times diluted, as the classification of the plates by development-speed takes care of the development automatically. We make no difference in handling single- and double-coated plates of the same emulsion when working by the Thermo system, and the results are fully as good as or better than are obtained by developing by factor in a very weak solution.

STRENGTH OF SODAS

A good quality of anhydrous sodium sulphite is almost exactly twice as strong as the crystals and should always be used in place of them. Sodium carbonate is sold in three forms, the crystals, the pure anhydrous, and the granular. Of these, the second is more than twice as strong as the crystals, and the granular is exactly twice as strong. The anhydrous carbonate, if exposed to damp air, takes up water until it becomes the same strength as the granular. Our own preference is for the "pure photographic granular" or "monohydrated," as its strength never varies. It is also somewhat cheaper than the anhydrous, especially if packed in tin cans instead of glass.

CORRECT EXPOSURE

The most important step in taking a photograph is getting the exposure exactly right. Use our tables.

ILLUSTRATING INDUSTRIES

A. F. BENSON

e is a tradition that the human body letely rebuilt and renewed every ars but retains identity throughout tne nge. Looking back over thirty years with the camera it seems that photography has not only been rebuilt, but has had several new and complete additions in that time and that the specific addition designated by the title of this article has itself been rebuilt.

The growth has been so rapid, the demand so extensive and the public so discriminating that to successfully illustrate industries is an art and a science by itself.

I have not mastered this branch of the noble art, I do not know any one who has, but from many blunders I have learned some of the difficulties of illustrating and many things that must be avoided. While every industry from the billion dollar steel mill to the acre truck patch wants illustrating, every picture is made for one of two things: to be used in advertising or for information. An obvious corollary is that those for information should be strictly true to life, while those for advertising can let the imagination run the full length of the tether of professional ethics.

The immense popularity of the "movies" shows that people wish to know how things are done and gives a big hint on successful illustrating; make your photo suggest action and action in some vital stage of the industry.

A picture of a band mill, the individual teeth of the saw and the spokes of the pulleys appearing as a blur, sawyer and block setters with eyes riveted on the cut, is a more perfect illustration than one showing the machinery in repose, employees self-consciously posing to get their pictures in the paper, for it suggests action, suggests it so forcibly that one can almost see it.

"The Tiller of the Soil," by Albert Snyder in October, 1913, *American Photography* is a perfect illustration and very justly took the first prize in the August competition.

PREPARING A BLAST — A. F. BENSON

One can almost see the mellow soil roll from the mold board of the plow, and while it is a picture of farming, it is not the picture of a farmer. It is compelling and centers interest on the action.

In marked contrast with this is one that I rode miles to get for a land outfit that wanted a picture of "Seeding in January" for a prospectus. They had ideas of their own, brought out a four-horse team and posed the driver. As a picture of a plow team, it was good, but gave no suggestion of sowing.

A perfect illustration compels one to see what is being done.

Preparing a blast is a good illustration: the operation was "flashed" and caught the

workmen in the act. Another flashlight "In a Coal Mine" is very poor, as it simply shows a group of men who if coal miners are not working at it.

Illustrating industries requires no specific nor expensive equipment.

I have illustrated the complicated processes of a great saw factory with no more expensive equipment than a good symmetrical lens and fast plate. While I was silly enough to carry a thirty-pound 8 x 10 inch, I would not advise others to imitate my folly.

IN A COAL MINE A. F. BENSON

Get the best you can afford; a 5 x 7 inch with long bellows and a three focus lens, six plate holders, three with 4 x 5 inch kits and a daylight enlarger constitute an outfit sufficient for ninety-nine percent of the work you will have to do. As for plates, the most rapid orthochromatic, non-halation, whatever the price, will be found the cheapest in the end. The illustrator of industries must take pictures when he is where they are to be taken, and cannot afford to have a negative spoiled by diffusion of the highlight for the difference in price between a case of plain and double-coated plates.

For paper, two grades, normal and contrasty, will give all possible results from negatives.

Photography is an art and a profession and as such has a code of ethics. When the illustrator has portrayed some step in a given industry in the most favorable light, made a picture that forces the attention, ethics allows a little exaggeration. Not long since a firm that had put out a device for pulling stumps engaged me to "write around" the photos. The illustrator had pictured the machine "broadside on," the main thing, the stump coming up, was in the extreme left, while the lineman and the engineer were near the center. The artist was indignant at criticism and claimed that all that belonged in the photo was there; true, but things were not where they belonged. The main thing was that the machine pulled stumps; the stump with its roots laden with earth, the yawning chasm from which it had just been wrenched should have been near the center of the picture. It would have appeared larger than it really was, but would have made the machine appear in the best possible light and been as legitimate illustrating as is madam's portrait with the signs of advancing years "retouched" out. Again, I must give *the* rule: show some important portion of the industry and get it in the center of the picture.

Usually the customer will say: "I think a general view and one picture from about here and one from over there is all I want." Then the photographer must become a missionary of art, "carrying light into dark places," and with samples of work done at other plants show how it should be done.

The East St. Louis Walnut Co. had decided on three views, but when I showed the photos illustrating the Curtis Co.'s plant the manager readily ordered seven. The money side of the question, next to faithful portrayal, is the leading one. There is good advertising and often extra money in "side issue" pictures. When I illustrated the cooperage industry, as a side issue, I went to a suburb and got a photo of a swill barrel at a farmer's back door. That one photo brought me more money than all the others. Besides being used to show the end of the career of cooper's handiwork it "adorned" a tale in a great Sunday paper and an article in "Barrel and Box."

The "old scaler" reading his favorite journal is a "side issue" that paid well,

while "Slightly Disfigured but still in the Ring," a side issue in illustrating the stave industry, has been seen by five million pairs of eyes.

The market for these "by products" is never satisfied. There is an amateur view man in St. Louis who receives a good income above what he is paid for illustrating the manufacturer's by furnishing the writers with illustrations for special articles.

Such "side issues" add much to the story. There is no royal road by which one may get into the game. Trade is solicited in this as in all other branches of the art, and as an Irish prospector once said: "The man who comes out with a poke of gold dust, is the man who has stayed in till he got it."

A great help in getting business is to have some samples of half tones and the photos from which they were made. These interest a prospective customer, and rousing his interest is half the battle. In portrait, group, and view work the customer usually restricts the circulation of pictures to personal friends. For the photographer to dispose of any is the limit in unprofessional conduct; in illustrating industries the more of them you can scatter the better he is pleased.

In illustrating the cotton industry "From Seed to the Bale," I sold four sets of the illustrations: one set to the customer for half tones to advertise the land, one to the railroad that served that region, one to an agricultural implement company, and one to a firm of cotton brokers. Later, I sold six to a "special writer," who used them in featuring his article, "A Bale of Cotton."

OLD SCALER A. F. BENSON

DISFIGURED BUT STILL IN THE RING A. F. BENSON

TIME DEVELOPMENT WITH PYRO

M. D. MILLER

Recently Professor E. J. Wall of the Photographic Department of Syracuse University published a very scientific article on time development with pyro. In brief, his instructions are summed up as follows:

"To obtain the best results when developing, there are two simple rules that should be most rigidly observed:

"1. Use a developer of a given strength at a given and constantly maintained temperature for a definite length of time.

"2. Never examine a plate during development."

The stock solutions recommended are:

Solution *A*

Water	28 oz.
Pyro	1 oz.
Sulphuric acid	20 drops

Solution *B*

Water	28 oz.
Sodium sulphite, anhydrous	3 oz.
Sodium carbonate, anhydrous	2 oz.

For tray development, use

Water	8 oz.
Solution *A*	1 oz.
Solution *B*	1 oz.

and develop exactly 6 minutes; temperature 65 degrees Fahrenheit. For tank development, use

Water	16 oz.
Solution *A*	1 oz.
Solution *B*	1 oz.

and develop exactly 20 minutes; temperature 65 degrees Fahrenheit.

This plan is beautifully simple in theory but almost impossible for the average amateur to carry out in practice under the conditions surrounding him. If one has a darkroom provided with artificial heat for winter and capable of being kept cool in hot weather, it is possible, with great care, to bring solutions to 65 degrees and keep them there for a short time, provided a large volume of water at the same temperature surrounds the tray; but if the room is much cooler than 60 or warmer than 70, the trouble required to keep the temperature constant, in tray development, at any rate, is too great. Time and again have I seen earnest workers attempt to follow the plan of keeping solutions at 65 degrees and reject it as impracticable. In fact, I do not believe that one out of a hundred readers who tries Professor Wall's plan will stick to it—judging from my own and others' experience; while I do most emphatically believe that by adopting the Watkins idea of developing at the natural temperature of the room instead of attempting the impossible "constantly maintained temperature" these readers will find all their difficulties vanquished.

Professor Wall's plan omits two practical variations of the utmost importance, viz., the variation for different temperatures and the variation for different brands of plates and films. The Watkins Thermo system goes further and provides a table of times of development covering all variations in temperature and also the differences in development speed for emulsions of diverse character. My suggestions are that the worker apply the correction for temperature instead of attempting to maintain the solutions at 65 degrees and also vary the strength of the developer when using different plates so that the same amount of contrast be reached in the same time, regardless of the development speed of the plate.

Having mixed the stock pyro solutions given above, I exposed two plates from the same box on an average landscape, giving 1-100 second at *f*:6.5, or half the full Watkins meter time. One was developed at the natural temperature of my cellar darkroom, 56 degrees, with every precaution to have the plate and all utensils at the same temperature. The image appeared in 35 seconds. The second plate was *started* at 74 degrees, but though development lasted only 4½ minutes, the temperature fell two degrees in that time, in spite of using a large water-bath in which tray, plate, graduate with developer, and thermometer were set for several minutes before beginning work. The time of appearance of the image in the second case was 14 seconds. Referring to "The Watkins Manual," 1911 edition, page 90, it will be seen that these values indicate a temperature coefficient for the developer of 2.6. From this datum, it is possible to construct a table, taking Professor Wall's prescription of 6 minutes at 65 degrees as a basis, as follows:

Table of Times for Wall's Pyro

Degrees Fahr.	Tray Minutes	Tank Minutes
70	4½	15
68	5¼	17
66	5¾	19
65	6	20
64	6¼	21
62	7	23
60	7¾	26
58	8¾	29
56	9¾	32
54	10¾	35½
52	11¾	39
50	13¼	44

These times were tested by exposing two more plates for equal times and developing one at 57 degrees for 9¼ minutes and the other at 67 degrees for 5½ minutes. In the first case, the temperature was that of the room and did not change in the time of development; in the second, it was necessary to provide a water-bath of about three quarts to get a body of liquid large enough to hold its temperature for the required time. The practical advantage of developing at room-temperature is well illustrated by this observation. The two negatives are practically identical, printing to the same depth in 7 and 8 seconds respectively.

The second variable factor, the development speed of the plate, did not enter into the experiments already detailed, because one plate, of medium development speed, was used throughout. But suppose that one uses an ultra-rapid plate for speed work, a double-coated ortho for general work, and a slow or process plate for copying, etc., how is one to follow Professor Wall's system? The times required for these plates to reach the same degree of contrast are, respectively, 9, 4, and 2¼ minutes in Watkins Time developer.

The standard Watkins Thermo system equalizes the time of development for all plates and films by dividing them up into nine classes, from VVQ (very very quick) to VVS (very very slow) and providing a different dilution (or concentration) for each class. To adapt the system to the formula as given by Professor Wall requires some experiment on the part of each user of any plate not belonging to the M class. The simplest method is to increase or diminish the water used for dilution. If 1 ounce of each stock plus 8 ounces of water does not give the exact contrast required in the standard time suggested in the table already given, the development speed of the plate must be found by reference to a Watkins Speed Card.

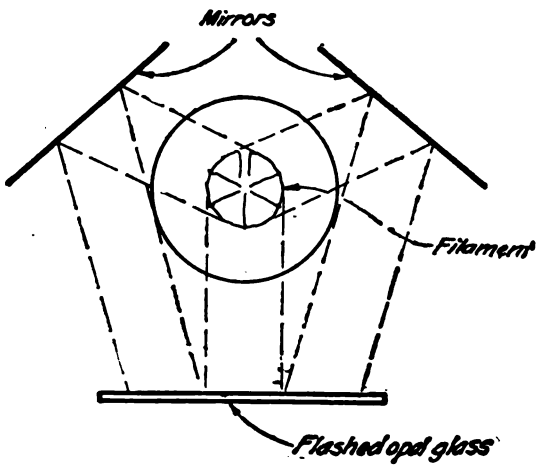
Since 8 ounces of water gives exactly the right quality with an M plate, I recommend 7 ounces for MS and 6 ounces for S emulsions for tray, and 14 and 12 for tank, these proportions being similar to the concentrations found correct for Watkins Thermo pyro-soda, though in that system the stock is more concentrated and the small amounts taken are made up always to 3 or to 10 ounces for tray and tank respectively. Time does not permit my working out Professor Wall's formula fully, but I know that readers cannot go far astray by trying slight variations of the water. In every case, it is better to vary the developer than to attempt to depart from the table of times. If the Wall formula is not considered a *sine qua non*, the Watkins formulas and full directions will be found in "The Watkins Manual." The value of the Thermo system lies in its completeness, the varying of concentration adapting it to all emulsions without change of the time, and the table for temperatures giving the user the power of obtaining a standard contrast winter or summer without trying to secure a "constantly maintained temperature."

The simple form of time and temperature development which I advocate requires the reader to copy out the tables and stick them up in his darkroom; then to purchase a thermometer, and, finally, to provide a supply of water *at the temperature of the room*. It is far easier to procure a large bottle or a jug and to fill it every time one finishes work and leave it to come to the temperature of the room than it is to procure hot water or ice to temper the supply to 65 degrees. Then whenever one wishes to work, the developer is mixed from the stock bottles and can be used directly, with a momentary look at thermometer and tables and one's watch to tell when development was started and when it will be done. So simple is the plan and so perfect the results at all temperatures from 52 to 72—the extreme range of my cellar darkroom—that I no longer bother with a red light. I handle the plate in darkness, cover the tray, turn on the white light, and when the time is up darken the room while the plate is going into the fixing box, which also has a cover. It is not necessary to rock the tray constantly. An occasional tilt will prevent mottled

skies, and this can be given without turning out the white light if both trays are grasped at once and held firmly together. My results by this system are better and more uniform than I have been able to produce by tentative development after fifteen years' constant practice as an amateur, so I think others will find it reliable. Expose by Bee meter and develop by the Thermo system if you want perfect results every time.

ILLUMINATION FOR ENLARGING

Having noticed lately in *American Photography* several requests for information on a satisfactory method of illumination for enlarging, I am offering a scheme that I have found to give perfect satisfaction. The real difficulty is to secure uniform illumination without expensive equipment such as condensers and reflectors. I use an ordinary tungsten 250-watt lamp which gives slightly over 200 candle power. Secure a box and suspend the lamp in a fixed



position in the center (of course having the open end to face the rear of the camera). Now secure two mirrors large enough to reflect the full image of the lamp filament. Place one of these on each side of lamp at such an angle that the direct light from the filament and the reflections on each side from the mirrors are adjacent. This is illustrated in the accompanying diagram which shows a plan of the arrangement. This arrangement gives a source of light equal to three times the width of the area enclosed by the filament. Flashed opal glass is used for diffusing the light. By photometric test this is found to be practically a perfect diffusing medium and the absorption comparatively low. The exact angle and position of the mirrors are easily found by trial, holding a piece of ruby or smoked glass just where the flashed opal glass will be fitted in. Line the box with white blotting paper; this is the most efficient diffusing reflector. Do not forget to provide ventilation for the box. With such an arrangement, including an 8 x 10 inch piece of flashed opal glass, the illumination is exceedingly uniform; in fact, first-class results can be secured without the mirrors, although the mirrors greatly increase the efficiency of the outfit. This principle of course can be used with any sized lamp or gas. It matters little how close the opal glass is to the lamp. Decide on the position of the opal glass before placing the mirrors. The rest of the outfit is a frame to receive the rear end of the camera. The illuminator just described is assembled as a unit and is hooked into place so that the glass is close to the negative when the camera is in place. Do not use ordinary opal glass, as its diffusion is poor and its absorption is high. Flashed opal is a clear plate of glass with a thin layer of opal on one side. It can easily be recognized by looking at the edge and is supplied by the Eastman Kodak Company.

I shall be glad to make any point clear that may not seem so at present.—*George G. Cousins.*

ENLARGING BY GASLIGHT

A correspondent asks how he can adapt his long-focus view-camera with anastigmat lens so as to use gas as the only available illuminant.

Gas is not very satisfactory unless condensing lenses are used. These lenses can be bought unmounted at a reasonable price and mounted in a box without much carpentry work. Two are needed; and they must be placed with the convex sides together and nearly touching.

Above on this page, there is shown a device for enlarging with a single Mazda bulb which ought to give equally good results with the vertical type of Welsbach mantel. It consists of a box containing the light in the middle, two mirrors to reflect towards the front, and a sheet of flashed opal glass in the front to act as a light-source behind the negative. It is practical as described by the author.

LENS GUMPTION

B. H. WIKE

That the science of optics has made wonderful progress can not be denied, and of course this affects very favorably the advance of photography, since lenses are a necessity in this work. We might say, without fear of contradiction, that the lens is the most important part of a camera. This much every worker has found out, that the quality of the picture, everything else being favorable, is decided by the style and grade of the lens.

The selection of a lens is no inconsiderable matter. It must be remembered that even with lenses the market is flooded, many kinds of which have been put up for the sake of selling, without a thought for real quality. There are, however, many capable and reliable makers of lenses and their goods should always receive first consideration. To get the right kind of lens for the right kind of work is a problem, and for this reason it will pay the ambitious worker to own at least three kinds. One of these should be a wide angle for interiors and architectural work, one for portraits and copying, and a group or view lens. The advanced amateur may feel that he can dispense with the portrait lens and get along with only the other two. Lenses that are used for groups and views often go by the name of "universal" lenses, and on the average they cover the field of work very well. There are times when confined situations will be met, like tall buildings, interiors of small rooms, and the like, where a wide angle lens will be absolutely necessary. For long distance photography the telephoto lens will be required. This need is met by using the back combination of a double lens; which makes it imperative that the double lens be of a high grade in order that each combination may have the requisite power when used singly.

It is foolish to expect the best results from a poor lens. For light amateur work the cheap lens will do very well, but when the desire comes for careful work, for fine definition, then it takes the best lenses. Nature studies, like wild life, require a fast shutter, and if a fast shutter then also a rapid lens. To have an extremely fast shutter behind a cheap and slow lens will not be satisfactory. The rapid lens, the rapid shutter, and the rapid plate are companions. A fast plate will seize an impression in any fraction of a second, no matter whether that image or impression be well defined or not; so it all depends upon the lens to define this image. To reproduce still life photographically and with fidelity will require a powerful lens.

It may not be generally known that stopping down a lens improves its covering and defining power. Too large stops, in some cases, tends to give a flat, blurry effect, because the stop in the diaphragm had not been of the right size to shut out the excess of light rays and allow the detail a chance to be well defined.

Lenses should be handled carefully. If dirty, they ought to be cleaned by an experienced person. A soft cloth dampened with alcohol is excellent for wiping off the surfaces of the lens. They should not be subjected to sudden temperatures, and when not in the camera the place for them is in dustproof cases with soft linings. A good lens should last as long as anybody ever desires one, and in this possibility they are like everything else a person uses. When they are kept clean and polished they are usually always ready for use, and in that condition will give just returns for all they are able to do.

When you buy lenses get the best, and study your wants carefully before you add them to your equipment.

LANTERNSLIDE POINTERS

CHARLES I. REID

When making slides by contact from film negatives it is not necessary to use a mask when binding the slide. Trim the film negative to the size of picture required, and center carefully on the lanternslide plate, making the exposure in the usual manner. The margin around the film will develop opaque and give a very nice mask. This is especially useful when making a number of slides from one film negative.

Slides can be toned to a sepia color in the re-developing solutions used for gaslight papers, the immersion in the solutions being about three times as long as for paper prints.

Announcement slides can be made with a typewriter, using onion skin paper with a sheet of carbon paper at the back. This leaves an impression on both sides, making it very opaque. The slide is then made by contact, from the onion skin negative.

EDITORIAL

THE EFFECT OF THE WAR ON PHOTOGRAPHY

It is inevitable that the present European conflict shall cause effects of far-reaching importance to American photographers. While American manufacturers produce a very large proportion of the photographic goods used in the United States, the volume of imports from Europe of raw materials and finished products is enormous. It unfortunately happens that the largest source of supply is Germany, and at the present time imports from that country are entirely cut off and may be for an indefinite period. From Germany we obtain the bulk of the raw paper used for coating, practically all photographic chemicals, most of our optical glass, almost all of the popular miniature cameras, and miscellaneous photographic articles of all kinds. It fortunately happens that the importing firms in the United States are, in most instances, fairly well stocked, and it is probable that in many lines, before present supplies are exhausted, new sources of supply, either at home or in countries whose commerce still is able to use the ocean, will be found. There is, however, no reason for photographers to feel unduly alarmed as to their ability to obtain whatever is necessary to practice their profession. Certain brands in any given line may temporarily be off the market, but we will doubtless have plenty of plates, cameras, developers and printing papers, no matter how long the war may last. It is certain, however, that prices in many lines will be materially higher, and in fact the increase has already taken place. Where lines are short, it is but prudent that both wholesaler and retailer protect themselves against the certainty of higher prices on their next supply, and ward off the tendency on the part of certain overprudent individuals to accumulate unnecessary stock in reserve. To guard against the latter tendency, we find that most dealers are absolutely refusing to sell more than a small quantity at a single purchase, in order to give everybody a chance at the supply as long as it lasts.

The final result is very sure to be advantageous to the American manufacturers. It will be many years, if ever, before the factories of Germany are able to work again on their previous scale of low wages for efficient labor, if the war is at all prolonged, and we may therefore hope to see the American manufacture of heavy chemicals, developers, optical glass, dyes, photographic paper, etc., developed to a degree sufficient to supply the normal needs of American consumers.

OUR COMPETITION

We take pleasure in listing below the names of the pictures which received Honorable Mention in our August Competition. "A Dear Little Dutch Boy," by Elizabeth B. Wotkyns; "At My Desk," by Burdette Harrison; "Smiling," by R. E. Chase; "Wild West," by C. Mullen; "Window Portrait," by L. J. Mathewson; "The Dutch Mill," by B. J. Hurcher; "Off for First," by Francis Parrish; "By the River," by Edward W. Cochems; "Breakfast Time," by William B. Merriman, Jr.; "Around the Bend," by Garnet E. Jacques; "Ducks Feeding," by E. A. Roberts; "The Picnickers," by H. P. Turrell; "Smiles," by A. W. Church; "Arcade—Brooklyn, N.Y.," by C. Schneider; "Rushing Waters," by A. R. Brown; "Before and After," by Arthur T. Bourne; "Our Pet," by James Smith; "Major," by Alice Flory; "The Kodak Girl," by Charles D. Meservey; "The Village Harnessmaker," by Kenneth Bolles; "The Morning Bath," by C. H. Newman; "Peaches and Cream," by Herbert Jackson; "Cuddling Time," by J. J. Siddell; "Edith," by H. C. Stewart; "Waiting for a Bite," by Mrs. F. R. Wiley; "Willow Road," by Eliot C. French; "A Summer Day," by R. D. Sage; "The Lonely Road," by Ernest G. Cook; "Bird's-eye View of Philadelphia," by J. P. Jones; "The Quiet Stream," by R. W. Tyler; "The Mineral Spring," by Mrs. E. R. Thordenberg; "Crickets," by R. A. Taylor; "The Track Walker," by Stark Weatherall; "The Lagoon," L. L. Mathewson; "The Relay Race," by Garnet E. Jacques; "In the Park," by A. E. Puls; "A Nice Street to Live on,"

by L. E. Phillips; "The Bridge," by F. Tarri; "In the Conservatory," by N. D. Wilson; "The Old Pond's Church," by Raymond H. Ash; "The Farm House," by L. C. Hogan; "The Beauty of Nature," by S. Brugger; "Bridge Construction," by Herbert Jackson; "Still Water," by L. R. White; "The Old Farm Well in Summer," by J. W. Garwick; "The River Bed," by Stanley Tappen; "Full Speed Ahead," by Cornelius Korb; "Gilford Brook," by Vernon W. Hutchins; "The Century Plant," by Jas. W. Wigginton; "Sunrise," by Lee K. Coffin; "Madam Butterfly," by H. R. Vant; "Below the Mill Pond," by R. H. Osborne; "The Foaming Sea," by H. S. Maddix; "At the Barn at Sunset," by Mrs. T. R. Wright; "Negro Again," by J. E. Conner; "Along the Pequea," by William R. Brackbill; "Noontide," by Martha Hume; "Aground," by Mrs. L. A. Hirschy; "After the Blizzard," by Ivan Knoer; "Ansable Chasm," by Edward N. Donn; "Edith," by John H. Markley; "Fresh Caught," by T. W. Lindsell; "The City Boy's Favorite Place," by Walter N. Bossler.

In this issue we are publishing the index to Volume II. It is bound in the center of an advertising form between pages VI and VII and upon folding open the pages, it will be seen that the four pages comprising this index can be detached by loosening the wire stitching which binds the magazine. Many of our readers wish to bind the twelve numbers of Volume II and of course will need a separate index.

The Country Life Exposition contest was held in New York City and was open to all amateurs. The first prize $50.00 in cash was won by Alve W. Ward, for a print entitled, "Hadrian's Villa." The second prize of $35.00 in cash was won by Lewis Simpson for an attractive print bearing the title, "Ancient Gateway on the Danube." A third prize of $15.00 was awarded Jennie J. Pfeiffer for print, "Near Fiesole." A fourth prize, "A Child's Dream" was awarded Haswell C. Jeffery and will probably be reproduced in our forthcoming November issue. The fifth prize, "On a Thuringian Farm" won by Jennie Pfeiffer is reproduced in this issue. Miss Pfeiffer also won the sixth prize for, "A Close at Edinburg." The competition lasted two months. The judges were Alfred Steiglitz, Paul P. Haviland and G. Chamberlain.

Many excellent prints come to us toned green or blue green. If it is possible we would like to have you send at the same time another print on glossy paper, as the green and blue tones are more difficult to reproduce. The delicately toned prints are very attractive and we prefer them for exhibition purposes, but the values are lost in reproducing from these toned prints. Brown or yellow-brown prints are not so, for you can readily understand that the warmer tones reproduce better than the cold ones when photographed again for the half-tone process.

Some times our prize pictures may not present half the snappy values and good contrasts which the original print shows; much of the beautiful texture is bound to be lost in the process of not only reproducing for the half tone plate, but also in the next process of printing on the pages of our magazine. We endeavor to keep all the values just as true as possible and render the print as near the original as can be by mechanical process.

We have recently had a number of inquiries as to whether we have received certain prints or not. It is not our custom to acknowledge prints, as we receive a very large number each month. As the magazine is prepared considerably in advance, it is usually at least a month before we are in a position to judge these prints. Therefore, we ask you to give us a little more time before writing us.

Readers' Forum

Popular Photography
Dear Sir:

Being in the electrical business—specializing on incandescent lamps—and having been interested in photography for about fifteen years, and having conducted a few experiments with Mazda lamps in photographic work are statements made here simply to qualify me to answer the question in the last paragraph of Mr. E. B. Collins' letter appearing in the Readers' Forum of the September, 1914, issue of *Popular Photography*.

The ordinary type of Mazda lamp will not give the best results in enlarging apparatus when condensors are used, but the manufacturers of Mazda lamps have on the market concentrated filament lamps which are designed for projection work. These lamps are obtainable in the following sizes, 100 watt, 250 watt, 350 watt, 500 watt and 1,000 watt. These lamps are rated at about one watt per candle, and for all practical purposes this is near enough, although the large sizes will show a much better efficiency—and the small sizes will be a shade less efficient.

If Mr. Collins will have the Mazda agent in his home town (and nearly all electrical contractors and dealers are agents for one brand or another of the Mazda lamp) procure for him a concentrated filament stereopticon clear bulb Mazda lamp of a voltage suitable for use on the circuits in the house where he lives, he will have a source of light far more suitable and satisfactory than an incandescent gas lamp.

I feel confident that the 100 watt size will more than effectually replace a single incandescent gas burner, but I would suggest that he purchase one of the larger sizes—preferably the 500 watt—which will permit the use of gaslight papers instead of bromides. In the machine which is in use in my own workroom I am using the 350 watt size, which, in connection with 6½ inch condensors—a fast portrait lens (Dallmeyr Series C, working at about *f*:3) and Azo paper—but without a diffusing screen, enables me to make two to three times enlargements in from five to thirty seconds.

With my present understanding of the optics of enlarging, I can see no advantage in placing frosted celluloid between condensors and negative. It seems to me the best method is to take advantage of the maximum covering power of the condensors by placing the negative as near thereto as is possible; and I do not believe there is any real objection in placing the negative in actual contact with condensor. Regardless of this, most writers advise placing a diffusing screen between the condensors, which in a great measure eliminates the necessity of focusing the light. When using the lamp suggested, the focusing is such a simple matter that I rarely use a diffusing screen, except when the character of negative makes it advisable.

M. B. DOUGHTEN.

Trade Notes

The new catalog of Photographic Lenses and Shutters, published by the Bausch & Lomb Optical Co., has just come to our desk and is one of the most attractive publications ever issued by that company. Besides detailed descriptions and price lists of the high grade Tessar and Protar lenses, shutters and other accessories of Bausch & Lomb manufacture, it contains a wealth of scientific material of importance to photo enthusiasts and specific suggestions on the selection of a lens. The seventy-one excellent reproductions of Tessar and Protar work are presented to splendid advantage on an ivory-tinted paper. A copy of this interesting publication may be obtained by writing to the Bausch & Lomb Optical Co., 629 St. Paul St., Rochester, N.Y.

We were recently called upon to act as judge in a Contest among users of Instanto, the popular amateur gaslight paper made by the Photo Products Company, Chicago. Only regular users of Instanto were permitted to enter. Six prizes of paper to the amount of $5.00 were given for the best letters on "How I Became an Instanto Booster." A large number took part in the contest and it was rather a difficult matter to select six from so many excellent letters. Quite a number of splendid ones could not be considered on account of their exceeding the one-hundred-word limit which was placed on their length. So many of our readers were entered that the results of this contest will prove of general interest. Here are the names of the winners:

G. A. Righter, 110 N. 18th St., Richmond, Ind.
H. W. Funk, 2739 Wells St., Milwaukee, Wis.
Frederick S. Anderson, 68 S. Clinton St., E. Orange, N.J.
F. M. Fernald, Principal of Haverling High School, Bath, N.Y.
L. C. McDonald, 495 Huntington Terrace, Pasadena, Cal.
C. D. Calkins, 248 W. Ferry St., Buffalo, N.Y.

The letters of R. B. Olsaver, New Brunswick, N.J., Marcus P. Stark, 440 McKnight Bldg., Minneapolis, Minn., and Alice F. Foster, 36 Mills Avenue, Wyoming, Ohio, are worthy of honorable mention and the Photo Products Company will present each of these contestants one gross of Platora Linen surface postal cards.

Such contests promote a closer feeling between the manufacturer and consumer. It is an especially excellent idea in this case as the Photo Products Company deal only with the *users direct*.

Notes from the Illinois College of Photography.—The class in Motion Picture Photography spent a day at the County Fair at Altamont last month and took a number of scenes of horse races, balloon ascensions, and various other performances. The films will be run at the local movie theatres.

The students' Camera Club held its regular quarterly election last week and Mr. C. R. Dyer, Mr. Vance Langley and Mr. Talmage Morrison were elected secretary, president, and treasurer respectively.

Mr. M. C. Eignus of 1913 has returned to the college to finish his course in photography. We also received visits last month from Mr. T. V. Hannaford of 1910 and Mr. Walter R. Lodders of 1913.

Mr. C. R. Dyer has established himself as one of our most versatile and efficient pupils. He has just executed a very unique order for several dozen enlargements in color photography. The "color" effect consisted of the various tints and shades of the subjects—a company of "colored" minstrels who performed in this city.

Ansco Company's $5,000 Loveliest Women Contest closes December 1st. This means that you have just one more full month in which to gather together the loveliest women prospects in your town and vicinity, photograph them and enter their portraits in the big contest.

Most of these prospects have returned from their vacations by this time, so that now you are in an excellent position to reach them through the columns of your local newspapers.

By all means, you should make use of the newspaper electro service that Ansco Company has had prepared for professional photographers. If you haven't yet picked out the electros that most appeal to you, order them now.

Full-size reproductions of these electros, you remember, have been shown in consecutive issues of *Popular Photography*. If you will just refer to these back numbers, you will have no difficulty in making your selection.

Let's take this last month and cram into it all the concentrated enthusiasm of the months that have preceded it. Let's determine that November and the remaining weeks of October shall be the most prolific of any time and efforts that we shall have expended on the contest.

Surely you know of several women in your home town, or within a reasonable radius, who would stand an excellent chance of winning fame in this big competition. Why not make a special effort to induce them to let *you* photograph them and enter their portraits.

If they are just a little bit shy themselves, you can prevail upon them through the medium of their enthusiastic friends. There are any number of ways in which you can arouse their interest.

A personally dictated letter setting forth the merits of the contest to these women should be effective. Point out the fact that the fifty winning photographs will be enlarged to life-size and exhibited at the Panama-Pacific Exposition in 1915 to the gaze of the whole world. Also mention the fact that leading magazines have requested the privilege of reproducing the photographs of the winning contestants, thereby adding to the international fame and glory already achieved. By advertising your studio as contest headquarters, both in newspapers and by circular letters, folders and other supplemental means of publicity, you will not only attract prospective contestants to your place of business, but will also add many new names to your list of customers.

Ansco Company is willing and anxious to assist you in every possible way to make this contest a source of everlasting benefit.

If you are looking for something different in the line of view cameras, a style not possessed by everybody, yet equally suitable for groups and artistic landscape work, we would advise you to write the Gundlach Manhattan Optical Company, South Clinton Avenue, Rochester, N.Y., for descriptions of their new panoramic view cameras. These are made in three sizes, 5 x 12, 7 x 17, and 8 x 20. They do away with the necessity of carrying a bulky and heavy camera around, by including only those portions of the picture which you would use and omitting the parts which would eventually be trimmed away—the extreme portions of the sky and foreground. These outfits, together with the new Pixie roll film cameras and the famous Turner-Reich lens, are all described in the new Korona Catalog, which will be gladly sent on request. A postal card will bring it to you today. Mail one now before you forget it.

A new bargain list supplement from Willoughby of New York has just reached us and we notice that he is making a specialty of many cameras and other novelties which we are sure will interest our readers. We do not see any reference to chemicals on this list, at which we are not surprised. The market has been in such an unsettled condition for a time that it is almost impossible to issue a list that can convey in any degree of accuracy the prevailing market prices. Hydrochinon is being offered at a reduction by Willoughby, who desires to give his customers the benefit of his many years' experience in buying large quantities at reduced prices, and we feel sure that if you write him he will be only too pleased to give you any information at hand in reference to the chemical market which at present is abnormal on account of the European war. Metol and hyrochinon have advanced to unheard-of prices; the former to $15.00 per pound, the latter to $4.00 and $5.00 per pound. Mr. Willoughby informs us that he has made arrangements to take care of his customers, and will sell hydrochinon at the lowest possible prices.

Those interested in motion picture work should write Bausch & Lomb Optical Co., 629 St. Paul St., Rochester, N.Y., for a copy of their new circular on the Bausch & Lomb-Zeiss Tessar for motion picture work.

The circular describes the regular barrel mountings with iris diaphragm adjustment; the spiral focusing mount with distance and diaphragm adjustments and scales; and a newer form where the lenses are mounted in tube with diaphragm adjustments so that two or more lenses of different focal length may be readily interchanged in the same jacket.

The motion picture photographer sometimes wishes to make larger size images, and information covering this point is also given. Those who are interested in motion picture taking cameras or in projection lenses for motion picture work should write for a copy of these circulars.

We are advised by the W. J. Lafbury Company that they have at present a very good stock of lenses on hand, and for the time being are well prepared to fill orders. Nevertheless, if the war is protracted, it will be very difficult to replenish lens stocks, and those interested are advised to make inquiries at once.

Rochester Photo Works Inc. of Rochester, N.Y., have a trial package of Velour Black, and Brome Black postcards. It might be well worth your while to try a dozen if you are not already supplied.

EXPOSURE-TABLES *for* OCTOBER

DIRECTIONS: Find in the tables printed below the NUMBERS for SUBJECT, STOP, LIGHT, HOUR, and PLATE. Add them, find the sum in the last table, and give the exposure indicated. When the exposure fails to correspond with the speed-marking on shutter, use the nearest shutter-speed, preferably the lower. If sunlight falls over one shoulder, add **0**; if straight across subject, add **1**; if sun is ahead, add **2**. When using back combination only of lens, add **2**.

EXAMPLE

Average landscape	3	July, 11 A. M.	0
Stop U. S. No. 8	6	N-C film	1½
Intense light	0		

Adding these numbers, we get **10½**, and on referring to the last table, under **10½**, we find **1-40** second, which is the exposure to give. In this case you would use the speed marked **1-50** and open the lens a little, if possible; say, half-way to U. S. No. 4.

SUBJECT

Sea (only) and clouds	½	Street scenes, buildings, groups	5
Sea-views, snow-scenes, distant landscape	1	Portraits in shade	7
Open landscape, without foreground	2	Indoor portraits	8 to 10
Average landscape, with foreground	3	Interiors	16

STOP:—

f:2	*f*:2.3	*f*:2.8	*f*:3.3	*f*:4	*f*:4.7	*f*:5.6	*f*:6.7	*f*:8	*f*:11.3	*f*:16	*f*:22	*f*:32	*f*:45	*f*:64
				U.S. 1	U.S. 1.4	U.S. 2	U.S. 2.8	U.S. 4	U.S. 8	U. S. 16	U. S. 32	U. S. 64	U.S.128	U.S.256
1	1½	2	2½	3	3½	4	4½	5	6	7	8	9	10	11

LIGHT: Intense sunlight (inky-black shadows), **0**; Bright sunlight (strong shadows), ⅓; Faint shadow cast by sun, **1**; Dull (no shadows), 1⅓; Very Dull (whole sky very dark), **2**.

HOUR: 11 a.m. to 1 p.m., ⅓; 10 a.m. and 2 p.m., **1**; 9 a.m. and 3 p.m., **1**; 8 a.m. and 4 p.m., **2**; 7 a.m. and 7 p.m., **5**.

PLATE: AMERICAN, 1⅓. ANSCO FILM, 1⅓. BARNET — Film, 1⅓; Superspeed Ortho., **1**; Ortho. Ex. Rap., **2**; Red Seal, **1**; Red Diamond, 1⅓; Self-screen Ortho., **2**. CENTRAL — Special XX and Sp. Home Portrait, ⅔; Special, **1**; Comet, Colornon, and Pan-Ortho., 1⅓. CRAMER — Crown, **1**; Anchor, **2**; Banner, 1⅓; Inst. Iso., 1½; Med. Iso., **2**; Commercial Isonon, 2⅔; Portrait Isonon, 1⅓; Trichromatic, **3**; Slow Iso., **5**; Contrast, **9**. DEFENDER — Vulcan, **1**; Vulcan film, 1⅓; Ortho., **2**; Non-hal. Ortho., **2**; Slow, **9**; Process, **9**. DUFAY DIOPTICHROME, **7**. EASTMAN — Portrait Film, **1**. ENSIGN FILM, 1⅓. FORBES — Challenge, 1⅓. HAMMER — Sp. Ex. Fast, **1**; Ex. Fast, **1**; Aurora Ex. Fast, 1⅓; Ortho. Ex. Fast, 1⅓; Ortho. Non-hal., **2**; Fast, **2**; Ortho. Slow, 2⅔; Slow, 2⅔. ILFORD — Monarch, **1**; Zenith, 1⅓; Sp. Rap., **2**; Chromatic, 2⅔; Ord., **3**; Process, **9**. IMPERIAL—Flash-light, **1**; Spec. Sensitive, **1**; Orthochrome S. S., **1**; Spec. Rap. 225, 1⅓; Spec. Rapid 200, **2**; Non-filter, **2**; Process, **9**. JOUGLA—Violet Label, 1⅓; Green Label, **2**; Omnicolore, **7**. KODAK—Speed Film, **1**; N. C. Film, 1⅓. KODOID PLATES, 1⅓. LUMIERE—Sigma, ⅔; Blue Label, 1⅓; Film, 1⅓; Ortho. A, **2**; Ortho. B, **2**; Panchro. C, **2**; Autochrome (outdoors), **8**, (indoors) **9**; Process, **9**. MARION — Record, ⅔; P.S., **1**. PAGET—XXX, 2⅔; XXXXX, **2**; Swift, **1**; Ex. Spec. Rapid, **1**; Ortho. Ex. Spec. Rapid, 1½; Panchro. Ord., **2**; Panchro. Colour (no screen), 2½; Spec. Rapid, 1⅓; Hydra Panchro., 3⅓; Hydra Rapid, 3⅓. PREMO FILM PACK, 1⅓. ROEBUCK — Blue Label, **1**; D. C. Ortho., **2**; Ortho., **2**. SEED — Gilt-edge 30, ⅓; Color Value. **1**; Gilt-edge 27, 1⅓; L. Ortho., 1⅓; 26X, **2**; Non-hal., **2**; Non-hal. L. Ortho., **2**; Tropical, **2**; C. Ortho., 2½; Panchromatic, 2½; 23, **3**; Process, **9**. STANDARD—Extra, 1⅓; Imperial Portrait, 1½; Orthonon, 1½; Polychrome, 1½; Thermic, 1⅓. STANLEY — 50, 1⅓; Commercial, **4**. THORNWARD — Regular, **1**; Orthochromatic, **2**; Orthochromatic N. H., **2**. WELLINGTON — Extreme, ⅓; 'Xtra Speedy, **1**; Film, 1½; Iso. Speedy, 1½; Portrait Speedy, 1⅓; Anti-screen, 1⅓; Speedy Spec. Rap., **2**; Ortho. Process, **9**. WRATTEN & WAINWRIGHT — Panchromatic, 1⅓; Process Panchromatic, **3**.

3½ S 1/500	4 S 1/1000	4½ S 1/1500	5 S 1/2000	5½ S 1/1250	6 S 1/1000	6½ S 1/700	7 S 1/500
7½ S 1/350	8 S 1/250	8½ S 1/150	9 S 1/100	9½ S 1/75	10 S 1/50	10½ S 1/40	11 S 1/25
11½ S 1/20	12 S 1/15	12½ S 1/10	13 S 1/8	13½ S 1/5	14 S 1/4	14½ S 2/5	15 S 1/2
15½ S 2/3	16 S 1	16½ S 1½	17 S 2	17½ S 3	18 S 4	18½ S 5½	19 S 7½
19½ S 11	20 S 15	20½ S 23	21 S 30	21½ S 45	22 M 1	22½ M 1½	23 M 2
23½ M 3	24 M 4	24½ M 6	25 M 8	25½ M 12	26 M 15	26½ M 24	27 M 30
27½ M 45	28 H 1	28½ H 1½	29 H 2	29½ H 3	30 H 4	30½ H 6	31 H 8

These tables are based on the 1914 edition of the "American Photography Exposure-Tables," a new and revised form of the "Photo Beacon Exposure Card." Owing to the great increase in the speed of lenses and plates since the original compilation of these tables, it has been necessary to completely change the system of numbers corresponding to stops, plates and exposures, so that exposure numbers from this table are 5 units higher than in the old tables. The complete tables, in pocket form, 3 x 5 inches, containing full directions for obtaining correct exposure under all conditions, may be obtained from our publishers at the price of 25 cents postpaid.

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POPULAR PHOTOGRAPHY

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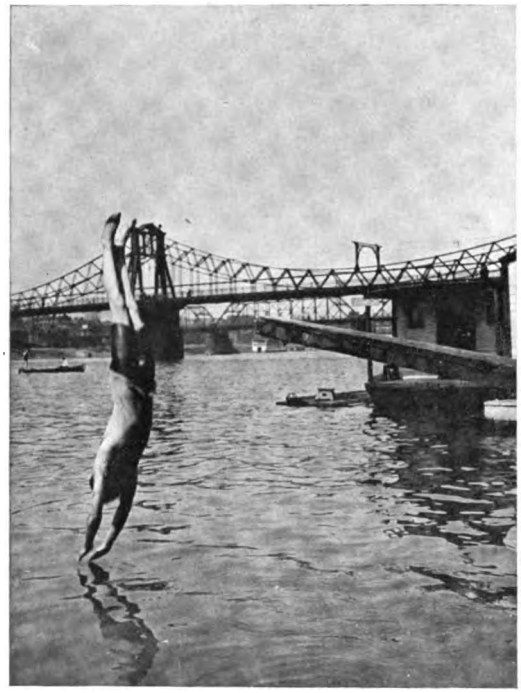
UP A DARK STAIR — GEO. W. BETZ

Prize Picture—September Competition *(See page 72)*



THE DIVER E. A. ZINSMEISTER

THE DIVER

The technique of this picture is fairly good, though a slight amount of blur is visible in the extremities. The composition, however, is poor, the figure being too near the margin and too much mixed up with the bridge in the distance. The springboard also comes across the view unpleasantly and seems too near the diver to be quite natural. Data: No. 3 Special Kodak with Zeiss-Kodak lens of 5 inches' focus; 1-250 second at *f*:8 at 3.00 p.m. in July; bright sunlight; Eastman film; pyro tank development; print on Regular Velvet Velox.

WHEN THE PHOTOGRAPHER COMES TO CALIFORNIA

TWIFORD C. WILSON

California, with two World Expositions within her borders, and every city, town, burg, and hamlet in full gala attire, will attract a great army of camera workers to the Pacific Coast in 1915. To the greater part of these, California will be a new and virgin country. Undoubtedly, there will be a goodly sprinkling of old "vets," true dyed-in-wool California fiends, whose proud boast is that they "have been there before." It is for the eye of the unwary tenderfoot, however, that this article is intended. The hardened tourist needs no advice, or if he does he is hopeless, and advice on him is wasted.

First, as to equipment. Any sort of camera which has given satisfaction in any other part of the world will answer. Do not forget the tripod,—it will prove indispensable. And as for the color-screen and exposure meter—if you have never used them before, you will surely need them in California. But more of this later. If you possess one of the miniature "vest pocket" plate cameras, it is well to lay in your stock of plates before starting on your tour. It has been my experience that plates smaller than 3¼ x 4¼ are extremely difficult to obtain on the Pacific Coast, even in the largest stock houses. Aside from this, all supplies are readily obtainable. Any well known make of plates, and the Eastman, Vulcan, Ansco, and Ensign films are to be had.

Opinions are greatly varied as to the most pleasant time of year to visit California. There is so little variation in climatic conditions that the question is not one of great importance. All seasons are good. But the interior valleys should be visited in winter, when the country is green and beautiful, the mountain peaks snow-capped, and the atmosphere cool and snappy.

No doubt every one has his own ideas about California, and knows exactly the places he desires to visit. In the last he is not far wrong, for it is difficult to find a spot in the Golden State devoid of interest. But the average Easterner entertains very vague and strange ideas concerning California. These ideas seem to be about equally divided into two classes—the garden spot variety, and the Wild West type. Both are erroneous. The garden spot notion is mostly confined to women. They see California as a vast garden filled with flowers and climate—a land of perpetual sunshine and sweet-scented breezes. The second class, by some wild feat of imagination, sees California as a chaotic jumble of towering mountain peaks piled up about death-haunted deserts; of yawning chasms and bottomless lakes; of cities springing up over night; of Chinese gambling dens, real estate agents, and Indians. In short, it is a continual procession of the weird, fantastic, and bizarre, arranged on the plan of a three-ringed circus. Any one

BOY WITH RABBIT
E. B. WOTKYNS
(See page 61)

A GO OD CATCH LILLIAN H. VARNUM

holding such ideas is bound to be disappointed. But there is much that is wonderful, beautiful, and unique in California. The man with a camera need not fear for lack of adequate subjects. Only he must not expect to find seventy-five different kinds of scenery and climate all within an hour's walk. He must remember that California, with her thousand miles of coast line, is a large State, and that her wonders are not piled up in a small space for the benefit of the tourist.

It is obvious that all places of interest cannot be visited, and that a careful selection must be made. The two Expositions—at San Francisco and San Diego—will be the centers of interest to many. There is much to be seen in the immediate vicinity of both cities. In and about San Francisco, Golden Gate Park, the Cliff House, and Sutro Heights afford excellent material for the camerаist. North of San Francisco, in Mill Valley, is a magnificent grove of redwoods. Across the bay are Oakland, Berkeley, and Alameda. The University of California at Berkeley, and especially the Greek Theatre is worth traveling many a mile to see.

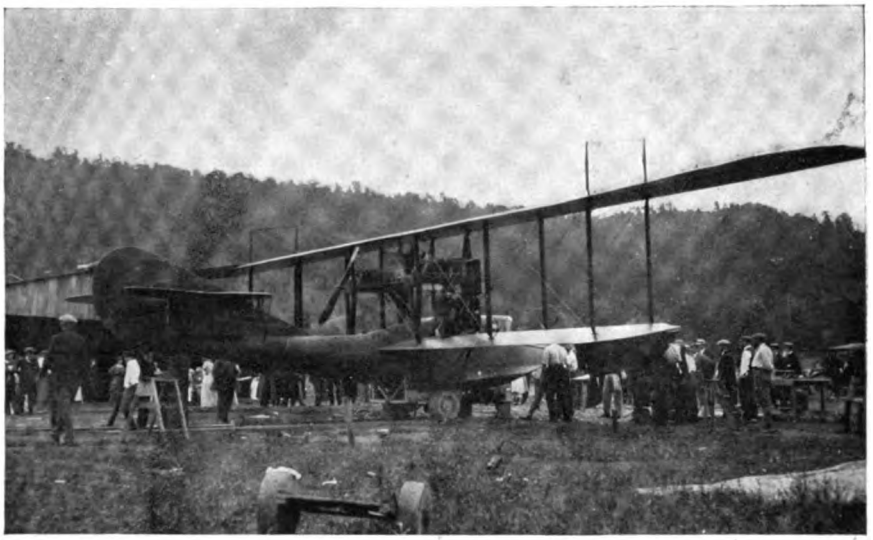
All true lovers of Nature will delight in the country around Mt. Shasta. Here are thrilling scenes of wild grandeur calculated to make the photographer wish to remain forever.

The fame of that wonderland,—the Yosemite Valley,—has spread over the entire world, and here are inexhaustible pleasures for the man with the camera. Rivaling in beauty the Yosemite, are the superb King's River and Merced River Canons. And in the Sierras are many other canons, mountain peaks, and crystal lakes of marvelous beauty. Speaking of lakes, one of the most striking of California's beauty spots is that enchanted region called Lake Tahoe.

The entire coast, from Del Norte and Humboldt, with their lumber camps and forests of noble redwoods, to San Diego and its Spanish Missions, might be visited with profit. Monterey, Santa Barbara, the island of Santa Catalina, Coronado, La Jolla, Point Loma,—these are but a few points worthy of attention. Quite different from the northern section of the State, is Southern California. This is the romantic land of the Spanish Missions. Here flourish the orange and olive groves and the date palms. Here are beautiful cities and fine homes. There are innumerable places of interest,—Los Angeles, Pasadena, Long Beach, Santa Monica, Riverside, Pomona, Redlands, Coronado, San Diego, and a veritable host of others.

In summer, the light in Southern California is very intense, and the photographer used to Eastern light, unless he uses an exposure meter, will have difficulty in timing his negatives. For weeks at a time not a cloud will be seen in the sky. The so-called bald headed landscapes are in order here.

California scenery is totally different from the eastern type. Instead of charming brooks and their quiet pools and clear,



PREPARING THE "AMERICA" FOR A TRIAL G. E. JACQUES

mirror-like reflections, are deep, swift-running torrents. Instead of peaceful valleys are huge, deep gorges strewn with massive boulders and overgrown with gigantic trees. Eastern mountains are covered with trees, while the mountains of Southern California are brown, steep, rugged, and bare, save for scattered clumps of scrub-oak, sage-brush, and manzanita. Everything in California is big and rugged, and one is apt to miss its beauty, when used to scenes of a smaller and quieter order, and see only vast stretches of waste and desolation.

To the photographer interested in trees —and few are not—Southern California will prove a boon. Here are hundreds of varieties of trees seldom or never seen in the east. The country roads are lined with eucalyptus and umbrella trees. The exquisite camphor and pepper trees are seen on lawns and road-sides. There are several hundred varieties of the acacia tree alone. And palms of all sizes, shapes, and descriptions abound every where.

An excellent railroad system covers the entire state, but to my mind the best way to see the country is to "hike." Traveling along the coast is delightful. The days are cool, while the nights are not chilly. Two blankets are sufficient bed-clothing for "roughing it." And there are none of the usual pests which make life miserable, such as gnats, flies, mosquitoes, etc. From May to October, one can travel under cloudless skies.

A GOOD CATCH

As a record photograph, there is nothing to criticize in this print, which shows perfect focusing, exposure, developing, and printing. The happy fisherman doubtless desired a portrait of himself with his catch and must be well satisfied. A good opportunity was lost here to make an interesting genre picture. With the material at hand, the man might have been shown lifting the big fellow from the boat and would have composed better even if the face did not show fully. Data: 5 x 7 Seroco camera with rapid rectilinear lens; 1-25 second at *f*:16 in May at 10.00 a.m.; bright sunlight; Stanley 50 plate; M.-Q.; print on Instanto No. 6.

PREPARING THE "AMERICA" FOR A TRIAL

Before the outbreak of the European War, the public was intensely interested in the reports of the trials of the flying-boat "America," in which it was proposed to attempt the flight across the Atlantic. The dirigible balloon of the same name some years ago met a disastrous end. Mr. Jacques has made an excellent record photograph under somewhat trying conditions, as shown by the following data: 3A Kodak with rapid rectilinear lens; 1–50 second at *f*:16 in June at 2.00 p.m.; cloudy; Eastman Speed film; M.-Q.; Azo Glossy F Hard X postcard.

OUTDOOR PORTRAIT R. B. WILLIAMSON

AN OUTDOOR PORTRAIT

The author of this print writes that he feels the head is perhaps somewhat crowded in the picture space, and we are inclined to agree with him. A position just a little farther away would have given better proportions and perspective drawing. The technique otherwise is, however, admirable. The effect of sunlight is particularly good, the flesh tones being almost warm in the print and the shadows rich and transparent. The picture has just about the right amount of sharpness to represent skin texture without exaggeration, due doubtless to the use of an *f*:4.5 lens wide open. Data: 3A Graflex camera with Ic Tessar of 7⅛ inches' focus; 1-75 second at *f*:4.5 in January at 1.00 p.m.; bright sunlight; Eastman film; metol; Azo A Hard.

INTRODUCING VIRGINIA

Although the technique of this picture is fairly good, there are several rather obvious defects which prevent it from being satisfactory. The place was poorly chosen, for the background, with its "busy" pattern in the wallpaper and the table with its obtrusive objects, detracts greatly from the figure. The lighting is good, having been managed by using the light from another room to soften the shadow side of the face. The close position of the lens has resulted in distortion, or false foreshortening, as shown by the poor drawing of hands and lower limbs as they project towards the camera. Data: 4 x 5 Conley camera with 6¼-inch rapid rectilinear lens; 1 second at *f*:8 in March at 2.00 p.m.; bright sun outside on snow; Hammer Ortho plate; M.-Q.; Normal Studio Cyko.

SIMPLIFYING SIMPLE PHOTOGRAPHY

HYPERFOCUS

Photography of today compared with photography of even twenty years ago shows marvelous advances, but it is interesting to apply to its further developments the inflexible and inexorable laws of logic. A little thought in this direction leads one to some very interesting conclusions.

Some years ago the wet plate was the standard sensitive material for the photographer. In those days the photographer was obliged to go around with a clumsy dark tent of opaque material, i.e., if he wished to make his pictures at any distance from his headquarters. The photographer could be easily identified by the vile condition of his hands from the silver stains which promptly turned to indelible ink in the light. In comment on those old days, however, it must be stated, that the photographer had to know the chemistry of his process, as he was his own plate maker, and if anything went wrong, he could not call for help in the form of a plate demonstrator.

The next step was the abolition of the wet plate, which was prompted by its logical advantage to the photographer, and from this step sprung up the great dry-plate industry of today. Obviously, it was better to take along a box of plates which would keep for some time and load them in the holders and make your pictures at your convenience. The explorer and the traveller, who was not a photographer and could hardly be expected to be an expert in these lines, could now use photography to record his results. Of course, the keeping qualities were not what they are today, nor would the plates record color-value, but along these lines the reader's mind will be carried rapidly to the dry-plates of today, which leaves us right on the threshold of color photography.

A similar revolution took place in the rise of the paper industry just as in the

case of the plates. Our old time photographer took his blank paper, coated it with albumin, sometimes not of the most pleasant odor, and was his own paper factory. After a while, ready sensitized papers took their proper place alongside the dry plate and today we have papers with remarkable keeping qualities.

There have been a tremendous number of processes, and we can make prints in any conceivable color with the carbon process and can change the color of bromide papers and tone various other papers to a great variety of effects.

As we have said before, our old time photographer carried his laboratory with him in the form of a darkroom tent when he went away from home. He had to stick his head into the dark and opaque and absolutely unventilated chamber while he made the plates and put them in the plate holder. With the dry-plate, the darkroom tent went into the limbo of the forgotten things, but he still had to go into the darkroom to put the plates into the plate holder.

In the case of films, a most happy idea was evolved. The cartridge system made daylight loading possible, and in one stroke gave the start to amateur photography, which has swept throughout the whole world. Not only could the sensitive material be put into the camera in the light, but it could be taken out as well and repeated loads and unloads made indefinitely. But the darkroom was still necessary for the development of the film and again inventive genius came to the rescue. A device was produced by which the sensitive film could be separated from the protecting black paper, and with a very small apparatus the films could then be developed completely in daylight.

With dry plates this similar step has not been attained practically, and a natural development of photographic devices would be a scheme to do away with this disadvantage.

It would obviously be better if we could load and unload the plates in the light as well. To do this it will evidently occur to some of the readers that some kind of a machine like a film tank would be the next step, but even the tank for films is not the simplest method. To go on in our imaginative processes, these deductions must not be taken too lightly, for the dreams of today are the actual realities of tomorrow; and

INTRODUCING VIRGINIA A. W. CRAWFORD

in the world in which we live, an idea born today sometimes grows up to manhood in months instead of years.

The logical development of simplicity of camera manipulation would be to use a material which in its commercial form, as sold in the stores, would not be sensitive to light at all, in other words, the dry plates (or film) would be put in the holder in the light. We would put these plate holders in the camera and by suitable manipulation of the plate after the holder was put in the camera, we would then protect the plate from the light. By another simple process in the camera, we would then treat the plate, so that it would become light sensitive. After the image is impressed, we should then have to desensitize the plate, after which it could be developed in the light.

The most satisfactory form of sensitive material would be one where the image would show direct upon the plate just where the light had acted, and where the light had not acted we would expect no blackening at all.

To divert from this subject for an instant, we are nowadays satisfied to take the plate or film and wet it up in the developer. Then after developing and rinsing operations

RUSHING WATERS A. R. BROWN

we treat it with hypo and then have the task of washing the film from the hypo, and drying it as well. As hypo is one of the worst enemies of the photographer, it would seem as though it would be better to dispense with hypo and get a better fixing agent; one which did not contain a sulphur constituent, as sulphur is the cause of most of the trouble.

It takes a lot of time to develop a plate or film, and fill it full of water and other chemicals and then carefully dry out the water, in an after process. Why wet the plate at all? A process along these lines would certainly represent a simplification in the art.

Now, let us carry the process a step farther. If we have a developer to bring out an image and a fixer to take away the sensitive material we do not use, it would obviously be simple if we could get rid of the trouble of developing and fixing at all; or in other words, a still more logical process would be one in which the image was formed directly on the surface of the plate by the action of the light.

Similar reasoning could be applied to photographic papers. We should not have to bother with printing from a negative by light, but all that would have to be done would be to lay the sensitive paper in contact with the negative, very much similar to the interesting photographic processes which have been evolved under the name of "Catatypy."

The above thought may sound like the ravings of a disordered brain, but at the same time there is a vein of seriousness beneath the proposition, and it may be very interesting to see how far towards this Utopian dream the inventors of the photographic processes may go in time.

RUSHING WATERS

The halftone has taken off the edge of excessive contrast and makes the reproduction better than the original print, which is too black in the lowest tones to be true to nature. The picture is a very good piece of work in focus, composition, exposure, and development. The effect as a whole is probably the best which could have been secured at the spot. Data: 4 x 5 Century Grand camera with 6-inch Centar lens at *f*:16; ½ second; May 30, 1.00 p.m.; bright light; dense foliage over brook; Tabloid rytol; Contrast Glossy Cyko.

HOW TO PHOTOGRAPH A WINDOW DISPLAY

Many window trimmers do not know how to overcome the reflections on the window glass when taking photographs of their displays, and we give below suggestions.

THE PICNICKERS H. P. TURRELL

If there is a broad street before your window, it will be almost impossible to take a picture by day; it is always darker in your window than it is outside, and the opposite condition should prevail. But you can get it at night. See that your electric lights, while flooding the window, are themselves hidden from the street. If you have a good lens, from ten to thirty minutes' exposure will be enough. People can walk between the camera and the window without injuring the picture—provided they don't stop.

A good time to photograph a window is just before sunrise. The light is strong and penetrating, and a good picture will usually result. If your window is darker than the street the glass acts as a mirror, reflecting everything on the opposite side of the street. If the sun shines on your window and the opposite side of the street is dark, there will be no reflection of foreign objects in your picture.

A method often adopted with good success is as follows: Make a cloth screen of black cambric, sufficiently large to shut off all reflections when raised before the window. Fasten the two upper corners to poles, and when about to take the picture have two men or boys back of the camera. All reflections will be avoided, and a clear picture will be the result.—*Judicious Advertising*.

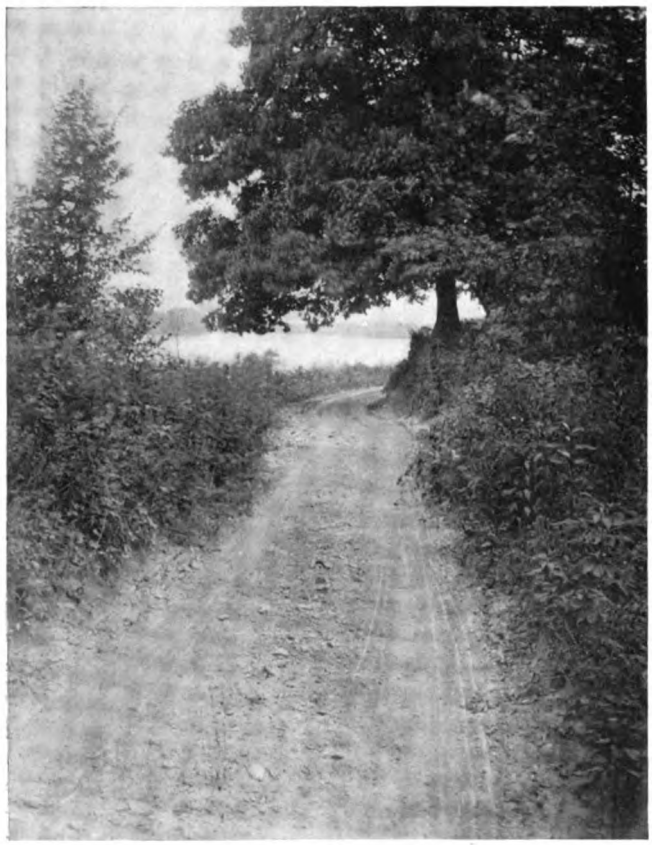
THE PICNICKERS

This is one of those pictures which allowed time for consideration of ways and means yet not enough to study out the best possible arrangement. The title indicates that the maker thought the picnic was the principal object, yet he took it from so great a distance that it has shrunk into insignificance. Boldly carrying the camera forward until the figures were of good size would have made this an excellent record, if not a picture. Data: 5 x 7 homemade camera, fitted with 8½-inch Planatograph lens; 1 second at *f*:16 in July at 5.00 p.m.; bright light, Hammer Extra Fast (Blue Label) plate; pyro tray development; print on Noko Medium A. The exposure factors were: subject, 5; stop, 7; light, ½; sun ahead, 2; plate, 1; hour, 1; sum 16½, indicating 1½ seconds. The automatic "1 second" of the shutter was given in preference to trying for 1½ seconds on a bulb exposure.

TO DRAW AN OVAL TO EXACT SIZE AND SHAPE

C. O. CHAPMAN

In January, 1914, number of POPULAR PHOTOGRAPHY, Mr. Jno. W. Moore gives instructions for drawing an oval, (properly called an ellipse). As it is rather difficult to determine by experiment the length of



MIDSUMMER R. E. WILSON

the string to use and the distance between the nails when an ellipse of certain dimensions is desired, allow me to give the following rule for determining the same:

First, ascertain the longest and the shortest diameters of the ellipse you wish to draw; from the square of the longest subtract the square of the shortest and extract the square root of the difference. This gives the distance between the foci of the ellipse, or distance between the nails. (I prefer pins, a fine thread and a fine pointed hard pencil for greater accuracy.)

The length of the loop of thread used can be ascertained by adding to the distance between the pins, one half the difference of that distance and the longest diameter.

It may be necessary to make several attempts at tying the thread before the exact length is obtained, but having once located the pins, the rest is no difficult matter.

MIDSUMMER

The first thing which strikes the observer when his eye falls upon this print is the empty white-paper sky corner. This is so bright that it almost comes out and hits one in the face. A very little time spent in rubbing down the sky with a piece of chamois leather moistened with alcohol would introduce a tint of light gray and instantly pull the composition together. The highest light would then be the sunlight on the open meadow, and it would have an ideal position, namely, close to the darkest dark in the picture as well as at the vanishing point of all the perspective lines. The reader can demonstrate the advantage of eliminating the highlight in the wrong place, namely, near the edge, by simply covering the white sky with the fingers and noting how the interest at once becomes concentrated. A further improvement can be effected by trimming the foreground liberally, the almost square

shape of the resulting picture being far from unpleasing. A worker equipped with a long-bellows camera and using the rear combination of the lens from twice as far away could have composed this portion of the picture to better advantage. Lenses of ordinary focus as furnished with cameras, for example, 6 to 6½ inches for 4 x 5, must always be used with caution on the lines of a road, as the tendency is to take the camera too close to the principal object and thus to include too much foreground. For landscape photography pure and simple, the single combinations of a rapid rectilinear will be found superior in most instances, simply because they give a large image from a distant viewpoint and in that manner do away with the temptation to approach too near to the subject. Data: 4 x 5 Cyclone magazine camera; short time exposure—evidently with small stop—in summer about noon; Stanley plate; print on Azo Semi-matt.

FIGURING A FOCUSING SCALE

A correspondent asks how it is possible to calculate a focusing scale without resort to ground glass focusing at measured distances.

The secret is found in a table of conjugate foci, such as is to be consulted in optical textbooks and photographic annuals. For example, we have before us such a table published some years ago by the American agents for Cooke lenses. Suppose we have a lens of 5 inches' focus and wish to find how much movement must be allowed to focus from infinity to 5 feet, or 60 inches. Reference to the tables show that a 5-inch lens must be moved about 0.46 inch, as the nearest pairs of conjugate foci are 55.00 and 5.50 and 65.00 and 5.41, the smaller figure of each pair representing the distance of the optical center of the lens from the plate when the object is placed at the greater distance.

This method, while theoretically accurate, needs to be checked by actual trial in order to get the final adjustments sufficiently accurate to be dependable with a fine lens.

WITCHERY

This picture has an unfinished effect, owing to the patches of strong light showing through the trees and catching the girl's nose and hand. A little local work with pencil or spotting brush would bring the whole into more harmonious balance. The idea of the picture is excellent, the title

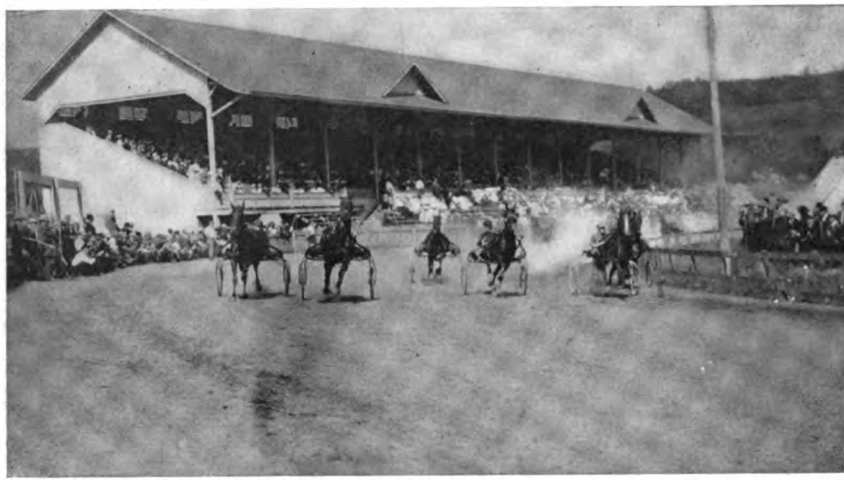
WITCHERY C. D. MESERVEY

appropriate, and the handling of a portion of the plate in enlarging has kept the interest concentrated. Data: 4 x 5 Cycle Poco with rapid rectilinear lens; 1-5 second at *f*:11 in August at 11.00 a.m.; bright sunlight; Standard Polychrome plate; D.-Q. developer; enlargement from portion of negative in Brownie enlarger on Azo E Hard.

MARKING TRAYS

A correspondent asks for the best method of marking glass, composition, or enameled trays so as to distinguish them in the darkroom. He desires something which will be wet-proof and which will not rub off.

We cannot vouch for the fact that it is the best thing, but we have had good success with ordinary flake white oil paint from our sketching kit. About 15 years ago we had occasion to fit up a darkroom



ROUND THE BEND GARNET E. JACQUES

for a club and lent some of our own apparatus. A composition fixing box for 4 x 5 plates had the word "hypo" painted on it in large letters which have resisted time and wear up to the present, the tank now being used by a neighbor. The white paint, to be sure, has turned somewhat yellow, but the letters have not rubbed or chipped at all.

Aside from marking utensils, a simple plan is to use trays of different sizes for different purposes, so that after a short time the mere feel and heft of a tray will tell the user, even in the dark, which it is.

Trays can be cleaned and used for other purposes by means of a strong solution of potassium bichromate acidified with sulphuric acid.

ROUND THE BEND

This otherwise excellent picture is marred by a dark streak which the maker thinks is due to fog from an unsafe ruby light, but which looks to us like the marking which results from letting the film curl up above the surface of the acid hypo, where it is light-struck. Our experience with films is that too much care cannot be taken in rinsing out the developer and keeping them submerged and on the move in the acid hypo for some minutes before admitting any white light to the workroom. An English investigator recently pointed out the necessity of such precautions by proving that fixing baths do not prevent light-action from fogging films during the early stages of the fixing process. Unless all traces of developer are removed from the film before fixing (and that means prolonged washing, not simply one or two changes), no actinic light should be allowed to reach the film until it is quite fixed. We have repeatedly had streaks which could not be fixed out completely where a small portion of the film had remained above the surface of the acid hypo until white light was turned on; but not when taking care to keep the strip moving in the fixer until cleared of all yellowish appearance. Data: 3A Special Kodak with Zeiss-Kodak anastigmat lens; 1-200 second at *f*:6.3 in bright light in September at 2.45 p.m.; Eastman Speed film; Cyko hydro-metol developer; printed on a Normal Glossy Cyko postcard.

STREAKS ON FILMS

A correspondent who uses a film tank to develop his own exposures writes that he has been troubled with dark streaks crossing the pictures from side to side, never lengthways.

This trouble is one which is due entirely to faulty manipulation, not to defects in the film itself. We have never seen it in films developed in the strip in a tray, so it is evidently due to careless handling of the film tank. It seems to be entirely due to two causes: (1) uneven wetting of the film and (2) temporary exhaustion of developer, with no replacement by fresh solution. The remedies are twofold. The first is to soak the film in clear water before development. The second is to take extraordinary pains to agitate the tank at regular

intervals—short ones, say three minutes—during the entire time of development. The tank should not only be turned end for end, but also given a distinct corkscrew motion to insure quick, complete circulation of developer.

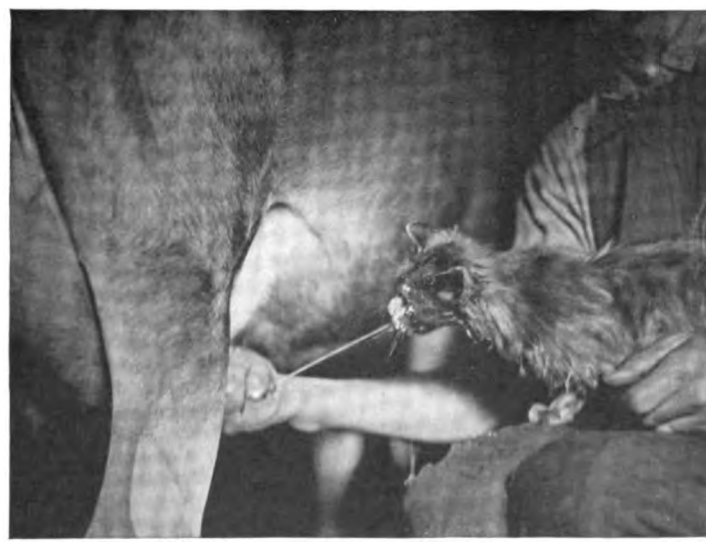
A FLOWER STUDY

This flower study falls short of perfection because, although the film used is somewhat orthochromatic, it needed a properly adjusted ray-filter to bring out the true values in the greens, which in the print are somewhat too dark. The arrangement is fairly satisfactory, as regards the placing of the bouquet in the picture space, but the background is distracting on account of the shadow behind the vase. Data: 3A Kodak with rapid rectilinear lens; 15 seconds at *f*:32 in June at 11.30 a.m.; dull light; Eastman film; M.-Q.; Special Velvet Velox.

A FLOWER STUDY F. D. BROWN

A MORNING MEAL

This picture makes no pretense of being anything but an accurate record, and as such it is highly successful. The cat is shown in a clear, convincing manner, in the enjoyment of its novel method of getting a meal, the focus being admirably placed to bring out the details, and the exposure having been short enough to give a clear image of the stream of milk. This picture is somewhat reminiscent of our subscriber, Mr. Nick Bruehl's, well-known "Free Lunch on the Farm," which is doubtless familiar to many readers in the form of an enlargement used to advertise the product of a noted Rochester lens-maker. Data: 3¼ x 4¼ Reversible Back Graflex fitted with a Series II Cooke lens of 8 inches' focus; 1-35 second at *f*:4.5 in June at 7.00 a.m.; bright sun outside; Standard Orthonon plate; pyro tank development; print on Noko. The only light available was a 3 x 3 window in the barn.



THE MORNING MEAL GEO. A. MORRIS

SMILING R. E. CHASE

SMILING

At last we have found a picture properly spaced! It is refreshing to the critic to come across a portrait not centered. Mr. Chase has managed very well and produced an interesting record, though a little more exposure would not have hurt, the dark masses being now too heavy and empty, in spite of the soft-working printing paper used. The meter was used to calculate exposure, but there must have been some mistake. Our method is to take the sixteenth tint with the meter held in the place where the sitter's head is to come, multiply the time by 16, and use that actinometer value in calculating the exposure. Data: 3¼ x 4¼ Rietzschel Reform-Clack camera with 135 mm. Rietzschel Sextar anastigmat lens; ½ second at *f*:6.8 in August at noon in diffused light from east window; Hammer Extra Fast plate; pyro; print on soft matt Darko paper.

TANK M.-Q. FORMULAS

Although we published in the June issue, in Dr. Miller's article, "Scientific Development," a suitable formula for tank work with M.-Q., a number of readers seem to have overlooked it and are asking for special formulas to suit their own size of tank. We recommend all readers to turn to the June, 1914, issue and try either of the Modified Thermo formulas there published.

The Agfa formula is:

Hot water	12 oz.
Metol	7½ gr.
Sodium sulphite, anhydrous	274 gr.
Hydrochinon	30 gr.
Sodium carbonate, anhydrous	150 gr.
Potassium bromide	2 gr.

For use, take 1 ounce to each 4 ounces of water at 65 degrees and develop 12 minutes. The exact time for each different brand of plate would have to be found by experiment. The Thermo method is preferable, because it allows accurately for different plates and all temperatures.

CUDDLING TIME JOS. J. SIDDALL

CUDDLING TIME

It is cheering to receive a picture showing so much evidence of care in arrangement as Mr. Siddall has put into this. The reason for taking it is given as an attempt to study out the principles of posing and spacing. The faults seen by the maker are chiefly such as could have been remedied by taking a little more time in arranging the accessories before setting off the flash. The picture near the man's head is one thing which should have been removed. The whole group should then have been shifted a little more to the right, or in other words the camera should have been swung to the left, as the chair is now too near the margin and the group, as Mr. Siddall says, needs something to balance it, some object of interest on the right. Probably the removal of the two photographs on the mantel will suggest itself. Data: 3¼ x 4¼ Graflex with Cooke lens of 5½ inches' focus; flashlight with Agfa powder; *f*:6.3; Premo Speed Filmpack; rodinal; Normal Glossy Cyko, developed with M.-Q.

GRADES AND SURFACES OF D.O.P.

Greatly distressed, a reader asks us please to explain to him when to use a hard or a soft paper, and when to use glossy, semi-matte, matte, etc. He states that no article he has ever read has cleared up these points so that he could understand them.

The hardness or softness of a paper is generally called its grade. For instance, the original gaslight paper, Velox, was put out at first only in one grade and one surface, called Carbon Velox. As the demand grew, several other surfaces were brought out, and finally a softer grade, called Special, was introduced. To this day there are only two grades of Velox, Regular and Special, though each is furnished in a number of surfaces. The Regular is hard and the Special, soft in its working quality.

Hard-working papers are furnished for use with all negatives which lack contrast, as they tend to increase the differences between the tones of the negative and make brilliant prints with pure whites and dark, rich shadows. They are not suited to well-exposed and properly developed negatives, but only to thin, poor negatives which give dull, flat prints on other papers.

Special or Normal grades are right for all average negatives which have been properly (fully) exposed and well developed. They give the tones of the negative about as they are.

Soft grades tend to decrease the contrast between shadows and highlights, bringing out all the halftone details in dense parts and softening the blackness of the shadows. They are best suited to negatives which have been developed too far, whether the exposure was a little under or just right.

Generally speaking, Hard papers are to be chosen not because negatives are thin, but because there is not enough difference—

GOOD LICKINS' THE HOWES

contrast—between the shadows and the highlights. Soft papers are meant for negatives of too much contrast, whether thin or opaque.

The surface of a paper is chosen according to the amount of detail one wishes to show. The Glossy grades are best for reproduction, as they carry every minute detail without loss. The Semi-Matte or Velvet grades are almost as good for rendering details but not so likely to bother the observer with reflections. The Matte or perfectly smooth but lustreless surfaces, have a tendency to obscure the very finest details, and the Rough go further still and get rid of a great deal. The choice of a surface, then, is chiefly a matter of preserving or suppressing detail. The most useful all-around surface for small or medium prints (under 8 x 10) is the Velvet, and this should be bought in two or three grades so that negatives of any degree of contrast may be made to yield good prints.

WYNNE METERS AND FOCAL-PLANE SHUTTERS

A correspondent is greatly disturbed because his Wynne meter is marked only with exposures from ¾ to 1-128, and he finds that his reflecting camera with focal-plane shutter gives him exposures from three to six times too great. In other words, if the meter calls for 1-21 second and he gives the exposure marked 1-20 on his focal-plane shutter, he gets considerably too long a time.

The original Wynne meter was designed many years ago, when plates were slow and possessed great latitude and shutters giving an actual 1-100 were rare. In those days, exact calculations were not necessary. There is a new form of the Wynne meter now available for focal-plane work, and this will be found to indicate accurately for the fastest lenses and the highest speeds. There is, however, no reason why the user of the old type cannot find by a few trial exposures just what factor to apply to correct his readings. As a general thing, a reflecting camera will give good results with 1-5 the meter exposure, hence the calculated 1-21 can be converted into 1-100 and so on throughout.

It is important to remember that fast shutters of ten give remarkably full exposures when the conditions seem to call for much more time than one can allow without showing motion in the subject. In speed work, the only important consideration is to stop the motion, even at the expense of undertiming.

GOOD LICKIN'S

The flashlight opens up many delightful possibilities to the amateur, not the least of which is the ease with which genres like this can be secured indoors. The exposure problem is reduced to its simplest elements and the amount and direction of the light are quite under the control of the operator. The technical part of the work is satisfactory. We wish we could say as much of the composition; but will confine our criticism to the fact that the youngster was allowed to stare at the camera, even though his expression is not spoiled thereby. The print is too black. Such a brilliant negative would have made a more harmonious positive on the Soft grade. Data: 4 x 5 Cycle Poco No. 3 with rapid rectilinear lens; *f*:11; one level coffeespoonful of Victor flashpowder; Central Comet plate; tank pyro-metol; Normal Studio Cyko.

HIS FIRST TROUSERS

This picture has many good points, but the obtrusiveness of the surroundings, with the many scattered highlights which fleck the foliage and draw the eye away from the boy's figure, makes it less successful than it

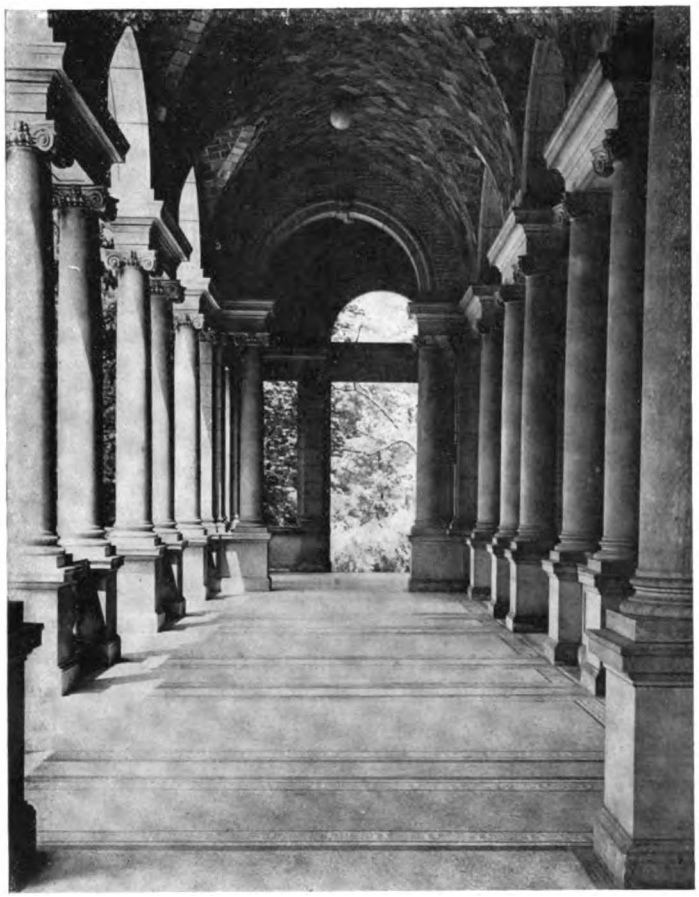
HIS FIRST TROUSERS HARRIET E. WILLIAMS

might have been with a more suitable background. The remedy here is trimming. Practically all of the superfluous margins can be trimmed away, leaving the figure with only a little of the darker foliage and a few spots of light which could easily be taken out by spotting. The gain in unity can be seen by covering the reproduction with two L-shaped pieces of card, moving them around until a long panel is obtained. We wish that every reader would study his prints by means of this simple device before submitting them. Data: 4 x 5 Korona camera fitted with a Euryplan lens of 6¼ inches' focus; 1-20 second at *f*:8 in August at 10.00 a.m.; bright light; Wellington plate; pyro tank development; enlargement by Ralph Harris & Company on Wellington bromide paper.

UTILIZING STALE FILMS

A correspondent writes that he has on hand a dozen rolls of films which because of age give fog, and he is in search of some method of manipulation which will allow him to get clean, fog-free negatives with good printing contrast.

There is only one way in which spoiled films can be easily handled, and that is by the use of acetonesulphite as a restrainer. The exposures must be full, at least as much as called for by our monthly tables, and the restrainer should be added as a 50 per cent. solution. About 15 minims to each fluidounce of strong tray developer should be sufficient for the average case. If too much is added, the effect will be not only to hold back the fog, but also to prevent the appearance of the shadow details as



THE ARCADE, TENNIS SHELTER, PROSPECT PARK C. SCHNEIDER

well. Bromide has been said to possess a similar action, but it is true only when development is brought to an end early, for if it is long continued, fog inevitably comes out again.

ARCADE, TENNIS SHELTER, PROSPECT PARK

Although this subject is very formal in its treatment, the effect is unusually good, owing to almost perfect technique. There is a very slight lack of detail in the highest lights on the stonework, though so slight as to be negligible, the other values being excellent. Intense sunlight, of course, does partly blot out detail, but not to the extent of making it disappear entirely. Data: 4 x 5 Conley camera with Wollensak Vinco anastigmat of 6 inches' focus; five-times filter; *f*:32; 5 seconds; Cramer Instantaneous Iso plate; pyro; print on Solio.

THERMO FILM DEVELOPMENT

A correspondent asks whether the Thermo system is applicable to films when they are developed in the strip in a tray, or whether the fact that they are not continuously immersed will upset the results. There is no reason why the time of development should not be found by the Thermo tables in the usual way. The strength of developer most suitable for films is MS or S, and our observation has been, in several instances, that the table time for the temperature has been correct. The most important point in strip development is to keep the film moving all the time, as this insures even action, and the film soaks up fresh solution each time a given section passes through. This motion, it will be noted, corresponds to constant rocking of a tray, hence it may give too much density and contrast with the S dilution, though that is a matter for individual decision.

LIGHT AND SHADOWS J. S. CHANDLER

LIGHT AND SHADOWS

The author of this picture is greatly troubled because he gave it 1-25 second and thinks 1-50 would have been better. Assuming that his shutter actually gives exposure as marked (which few of the less expensive types do), the only effect of shortening the time to 1-50 would have been to suppress detail somewhat in the darker tones and bring the lights to such a density that instead of gradation in the snow there would have been nothing but white paper. We consider the picture perfectly timed. The composition has some good points, particularly the placing of the house to the left of the middle; the shadows across the foreground, however, act as bars to hinder the observer from entering. Data: 3A Senco with rapid rectilinear lens of 7 inches' focus; 1-25 second at *f*:16 in March at 3.30 p.m.; intense sunlight; Vulcan film; developed and printed by a professional.

BOY WITH RABBIT

When readers send in two prints with two data slips in all respects precisely alike save the titles, and no marks whatsoever on the backs of the prints, it is rather difficult to know which is which. The proper procedure is to write on the back of each print or mount the title of the picture and the maker's name and address, with the words, "POPULAR PHOTOGRAPHY Competition." This is the amount of writing allowed by the Postoffice Department on third-class mail, and anything more subjects the material to first-class postage. Anything less makes it difficult and in some cases impossible to care properly for the pictures.

In the present case, two pictures of the same subject, differing chiefly in the size of the figure, having been sent, we have chosen the better and entitled it as above. The subject matter here is essentially picturesque, for foreign costumes in our eyes gain interest from their novelty. The sitter, too, is truly what the photographer calls him on one data slip, "A dear little Dutch boy." Photographically, the record could have been made into a more telling picture by not spacing the figure almost exactly in the middle. Otherwise the result is good. Data: No. 3 Kodak with 5-inch rapid rectilinear lens; 1-25 second at *f*:8 in July at 4.30 p.m.; bright sunlight; Eastman Speed film; 4 x 6 sepia enlargement. (See page 45.)

VARIATIONS OF TEMPERATURE

One of the commonest mistakes of the beginner is to take his negative out of a warm developer and plunge it into an ice-cold hypo bath. This invariably causes frilling of the gelatine, often complete separation. Never use a freshly-dissolved fixing bath, but wait until it has come to the temperature of the room. Users of self-toning paper should keep a stock solution of hypo and make sure that it comes within the temperatures advised by the paper manufacturer before using it. It is better to have all baths too warm than one warm and another cold. *Use your thermometer!*

FAIRVIEW BRIDGE G. A. TUTTLE

FAIRVIEW BRIDGE

This picture is well composed and exposed, but the print lacks gradation in the lightest tones, probably because it was not carried quite far enough in printing and consequently bleached out too much in the fixing process. P.O.P. always loses at both ends of the scale, as compared to the untoned print. The composition might have been bettered by changing the station-point of the lens sufficiently to move the large tree about half an inch nearer the middle, though perhaps that would have brought in something objectionable. Data: Postcard Korona Petit with rapid rectilinear lens; 4 seconds at *f*:22 in August at 10.00 a.m.; dull light; Cramer Instantaneous Iso plate; print on Paget Cream Crayon Self-toning paper.

THE LONELY ROAD

We have here an ordinary subject treated with such care that it has become attractive in black and white. The point of view seems to have been about right, as it has allowed excellent spacing and good leading lines. Note the manner in which the rail fence assists the lines of the road in carrying the eye past the masses of unimportant foliage on the right and towards the exit in the distance. Note, too, the good effect of atmosphere, due to full exposure, which gives separation of the planes. Of more than passing interest is the use of ferrous oxalate as the developer for the plate. We recently published an article on the use of the iron developer for the benefit of those who cannot obtain the organic developers since the outbreak of the European war. This picture shows that the negative yielded by the iron developer is all right for gaslight printing. Data: 5 x 7 Century Grand Senior camera with 8½-inch Goerz lens; 1½ second at *f*:16 in failing light at 6.00 p.m. in May; Hammer Extra Fast plate; ferrous oxalate developer; Normal Studio Cyko, developed with E.-Q.

ON THE FADING OF SILVER PRINTS

Is there any real reason why a silver print on P.O.P. should change in color, or become spotty, or the image partially disappear within a short space of time? Are these changes inherent in the process, or are they the result of carelessness on the part of the photographer?

Old silver prints which have not faded are frequently shown at society meetings, or occasionally met in amateur's collections. This fact indicates that silver prints can be produced which retain their force and beauty for a considerable time. In contrast to this, a silver print hung at a recent prominent exhibition faded and discolored badly during the time that the exhibition was open, and the print had only been produced a few days before the opening of the exhibition.

WHY SHOULD SOME PRINTS RETAIN THEIR BEAUTY

unimpaired for so many years, while others lose all their quality so quickly? It is self-evident that the cause must be found in the working of the process and not in the process itself. Otherwise, all prints would deteriorate or fade, none would stand. The fact that many prints do not fade or become discolored is the best indication that the photographer is at fault rather than the process.

It is unquestionable that a silver print has not the same basis of stability that platinotype and carbon possess. The image

THE LONELY ROAD ERNEST G. COOK

is one that is much more easily affected by adverse conditions. Many impurities, or dampness in the air, or unsuitable substances in the mounts, will cause silver prints to deteriorate while carbon or platinum prints would have remained uninjured.

The liability of a silver print to change should make a photographer more careful to avoid all those conditions or methods which tend to make a print less stable. He should endeavor to make his prints possess the greatest degree of stability or permanence in themselves. They are then in the state most conducive to resisting the effect of adverse conditions.

IGNORANCE RATHER THAN CARELESSNESS

is the cause of many photographs being produced in such a condition that fading results. Silver printing is the amateur's first process. He makes silver prints before he has learned that care and systematic work are essential conditions for success in photography. And as silver prints of fairly good quality can be produced without the thoughtful care that should characterize all photographic work, it results, unfortunately, that very many workers never adopt system and care when printing in silver. Carelessness or absence of all method is the most noticeable feature of their work.

The weak point in the production of a silver print is that there is nothing in the appearance of the print to indicate whether it has been properly produced and finished or not. Unless a photographer really knows the conditions to be observed, and works very carefully so as to conform to the requirements, he cannot produce prints with any degree of certainty that will be reasonably permanent. He may or he may not—most probably the latter. The absence of any visible change when finishing the print beyond the changes produced by toning prevents him from gauging the correctness of his work by examination of the print only. Hence the necessity for system and care.

VERY THOROUGH WASHING AFTER FIXING

is most frequently given as the most important precaution against fading. Thorough washing is important, but it is not the *most* important point. Very careful and thorough fixation is the most important factor in securing stable prints. It may be safely asserted that almost all fading of silver prints may be traced either to insufficient fixing or fixing in an impure bath. Fading arises more from partially changed or decomposed silver salts remaining in the print than from any other cause. These semi-decomposed salts are more easily

HELPING MOTHER S. W. LINDSELL

affected by unfavorable conditions than the more stable image. And they assist also in attacking the image.

WITHOUT THOROUGH FIXING, WASHING IS VALUELESS

The fixing bath should never be weaker than two and a half ounces of hypo to each pint of water—a one-in-eight solution. Prints should remain in a bath of this strength for fifteen minutes. During the operation of fixing, the prints should receive the same care and attention as in toning. They should be turned over and well separated from time to time. The lowest print should be moved to the top, the dish well rocked, and the operation constantly repeated. By this means the solution has free access to the surface of all prints, and thorough fixation is assured.

The fixing bath should never be acid. It must be neutral or slightly alkaline. The latter is preferable. In order to ensure that the fixing bath is in good condition, a little liquid ammonia should be added. Twenty minims of the strongest ammonia will be sufficient for twenty ounces of fixing bath.

Prints carefully fixed in such a bath and moderately well washed will last for many years without the slightest loss of quality.

ARE SILVER PRINTS WORTH SO MUCH TROUBLE AND CARE?

This is a question that is very frequently asked, especially by those who decry silver printing. If silver prints are worth making they should be made carefully. And there are still many purposes for which a silver print is pre-eminently suitable. Many amateurs prefer silver prints, and never master any other process. The fine rendering of detail attracts those who work only small sizes. In addition, there are now several silver papers on the market that have matt or semi-matt surfaces, and give very fine results. The same principles that apply to ordinary P.O.P. apply equally to these varied papers. And all who use them naturally desire results as permanent as possible.

There is an additional reason. Those who commence with silver printing and secure passable results with careless work and absence of method will be careless in all their later work. They will not realize the value of system and care. Those who realize that care and systematic work are necessary in their earliest and most simple work will instinctively adopt the same careful methods in more difficult and advanced photography. This alone is sufficient to justify all the care necessary for a beginner to obtain stable silver prints.

HELPING MOTHER

The author of this picture writes apologetically that "this subject was not posed, and the old man was in the act of peeling potatoes. My space was limited, and as I did not wish him to know I was about to make an exposure, I was unable to arrange

A CLOSE AT EDINBURGH JENNIE J. PFEIFFER
Sixth Prize—Country Life Permanent Exposition

for better lighting." No apologies are needed. This is an almost perfect piece of work and is an excellent example of the sort of interior snapshot work which is difficult to accomplish with any but a reflecting camera. The composition is very well managed, the figure of the old man being placed just in the spot where it was needed. We do not see how this picture could be improved, except by removing the chair in the foreground. Data: 1A Graflex camera with Series II Cooke lens of 5 inches' focus; 1-35 second at 12.30 p.m. in May; good light; Eastman Speed film; pyro tank development; Professional Studio Cyko.

TO CLEAN GLASS

Every photographer has occasion at times to clean glass, either for framing pictures or for squeegeeing prints, or some other photographic purpose. The following will be found useful:

Water	5 oz.
Denatured alcohol	1 oz.
Ammonia	½ oz.
Tripoli powder	¼ oz.

Shake together the water and alcohol, then add the ammonia, and finally the Tripoli. The mixture may be bottled and kept for use as required. For use, rub a little over the glass, allow to dry, and polish off with a clean dry cloth.

THE QUIET STREAM R. W. TYLER

THE QUIET STREAM

The chief defect of this picture is too marked a softness in the foreground as compared to the distance. The maker states that the lens was set at the 100-foot mark. Our experience of many years with a 4 x 5 film camera having a 6½-inch rapid rectilinear lens confirmed us in thinking the 25-foot most generally useful in landscape work. Even at *f*:8, this setting would preserve a moderate amount of definition in the far distance, while increasing the foreground sharpness greatly, as compared to that obtained with the 100—or even the 50-foot setting. Given a little more clearness of the detail in the reflection and in the tree itself, the interest of the picture would be better concentrated. Perhaps the best general statement regarding focus is a twofold one: first, the principal object should always be the most clearly defined; secondly, the foreground should always be sharper than the distance. Data: 3A Folding Brownie with rapid rectilinear lens; 1-25 second at *f*:8 in hazy sunlight in August at 4.30 p.m.; Eastman Speed Film; M.-Q.; print on Instanto Hard Dead Matt.

DUCKS FEEDING

"They seemed so happy and glad they were alive." Such was Mr. Roberts' reason for taking this picture, and surely he has justified it by retaining more than a suggestion of the effect which appealed to him. The subject is very well handled

THE ANGLER'S RETREAT R. W. DE LA MATER

to convey the desired impression, with everything subordinated to the ducks themselves by the expedient of pointing the camera downwards and thus cutting off the sky. Data: 5 x 7 Seneca No. 9 with 8-inch Convertible lens; 1-25 second at 10.00 a.m. in June in bright light on a Cramer Instantaneous Iso plate; *f*:8; pyro, diluted; print on Noko Slow Soft A, hypo-alum toned.

THE ANGLER'S RETREAT

Although the halftone reproduction of this print is softer than the original, we cannot help calling attention to the extreme density of the shadows as contrasted with the almost pure white of the pebbles. Mr. De La Mater states that the values seem to him very true, but we should prefer a less black effect. An orthochromatic plate would have given lighter greens. Very often

DUCKS FEEDING E. A. ROBERTS

BREAKFAST-TIME W. B. MERRIMAN

a snappy negative gives an intense deposit in the shadows even on a soft-working paper, in which case dilution of the developer will be found to yield a more transparent effect by lightening the deposit. Data: 5 x 7 Seneca camera with Wollensak Velostigmat lens of 7 inches' focus; 1-25 second at *f*:6.3 in July at 2.30 p.m.; intense sunlight; Central Comet plate; pyro-metol; print on a Glossy Kruxo postcard, developed with edinol-hydrochinon.

BREAKFAST-TIME

Record photographs of the pets must be taken regardless of suitable backgrounds and other desirable factors, as Mr. Merriman truly points out in his self-criticism. One has to take the picture quickly to avoid a posey look. The enlarging process, however, gives opportunity to correct some of the defects. The spacing of the dog's figure is excellent. The effect as a whole is good, with a pleasing softness of focus which suggests the extreme roughness of a Welshman's coat better than a sharp and biting deliniation of separate hairs would do. The print, though, seems slightly muddy, so we would suggest shorter exposure and a little more bromide in the developer. Data: 1¾ x 2⅜ Ica Atom camera Model 51, with 3½-inch Hekla anastigmat lens; 1-50 second at *f*:6.8 in February at 8.30 a.m.; poor light; Premo filmpack; tank pyro development; enlargement on Paget Smooth bromide with Radion enlarger, developed with rodinal.

ON MAKING UP SOLUTIONS

H. W. RICHARDSON

What is easier than to say "and dissolve in water to make 10 ounces," or 20 or 40, as the case may be? Yet in making up most of the solutions that we use in photography it is not sufficient guide to anyone who is unfamiliar with the particular substances employed, and it is with that in view that I have thought a few words on the subject of making up solutions may be of value to the readers of POPULAR PHOTOGRAPHY.

THE QUANTITY OF WATER

One of the first phrases that needs explanation is "Water to." In some formulas the quantity of water to be taken is stated thus, "Water, 10 ounces." In others, the expression "Water to 10 ounces" is employed. The two do not mean the same thing, although I do not think that in a single instance in photographic procedure it matters whether the water is the measured amount stated or whether the solution is made up to the total bulk given. For this latter is the meaning of "water to." We are apt to overlook the fact that when solids are dissolved in water, while they do not, as a rule, increase the bulk of the water to the extent of their own bulk, they do increase it considerably. The expression "water to" any amount means, then, that dissolving the solids in a quantity of water a little less than the amount

stated we add more water after they are dissolved to bring the total bulk of liquid to the amount given.

FORMULAS IN PARTS

How many readers get puzzled over the formulas in which "parts" figure. How much is a "part?" I have been asked, and how can we make up such a formula as—

Hypo	5 parts
Alum	3 parts
Water	40 parts

It is easily answered. Parts, unless otherwise stated, are parts by weight. As an ounce weight of water is a fluid ounce, or at least is near enough to a fluid ounce for the two to be used indiscriminately, it is only necessary in making up a formula such as this to weigh out the hypo and alum in ounces and to measure the water. If we do not want 40 ounces we can use less by taking a half or a quarter of the total quantity, thus—

Hypo	5 oz.
Alum	3 oz.
Water	40 oz.

or—

Hypo	2½ oz.
Alum	1½ oz.
Water	20 oz.

or—

Hypo	1¼ oz.
Alum	¾ oz.
Water	10 oz.

The ounces referred to should be avoirdupois ounces of 437½ grains; these are the ounces indicated by the weights sold with scales for photographer's use. The difference between the two kinds of ounces, although too large to be altogether ignored, is not, as a rule, important in formulas that are given in ounces at all, except to this extent, that any one user of the formula should always use the same ounce in making it up, otherwise his solutions at one time may appear to work much more quickly than at another. The difference between the two, in any of the baths in ordinary photography, is not going to make a success into a failure, but needless laxity should be avoided.

DISSOLVING HYPO

One of the first solutions the photographer has to make up is a hypo bath. Now hypo is a very easy salt to dissolve, especially in hot water, and we can weigh out the quantity necessary, put it in a jug, and pour boiling water on it, stirring it up with a stick until it is dissolved. The jug should be kept for this purpose, as when once hypo solution has been made in it, it is practically impossible ever to get every trace of hypo out again, simple as it seems to wash it out, and even a trace of hypo is very harmful at times. When a solution is made thus with boiling water and wanted quickly, the cold water necessary to bring it up to bulk should not be added at once. The hot solution should first be quickly cooled as much as possible, and then cold water added. This will bring it down to a workable temperature much faster than by diluting and then cooling. It is quickest cooled by pouring it out into a flat dish (not a vulcanite or pulp one, which would be spoilt by the heat), and filling the jug up with cold water. In a minute or two the jug is emptied and the hypo put back into it, while the dish is cooled with the water in the same way. Two or three changes will very quickly effect what is wanted.

COLD WATER FOR HYPO

When the hypo is not wanted very quickly it may be dissolved in cold water, but as it is not so soluble in cold as in hot, and as the act of dissolving cools the liquid very much, this may take a long time. A pound of hypo may be placed in a Winchester quart (80 ounce) bottle of water, and at the end of a week all may not be dissolved. Had a wide mouth bottle been used, and the hypo hung at the top of the liquid in a muslin bag, instead of lying at the bottom, the hypo would have dissolved in a few hours instead of several days.

MAKING UP DEVELOPERS

In making up developing solutions, particularly in the case of a pyro solution, the action of ordinary water on pyro is very rapid, and the solution discolors almost the moment it is made. To prevent this, it is the practice first to dissolve the preservative, sodium sulphite or potassium metabisulphite, usually the latter, and then to add the pyro. Sulphite may be dissolved in hot water, the crystals, if the water is very hot, suddenly become an opaque instead of a clear white, but no harm is done. The pyro must not be added till the solution is cold. If sulphite is used, it is usual to add a trace of acid, citric acid will do, which liberates a little sulphurous acid, as can be detected by the smell, and helps to preserve the pyro. Hot water

must not be used to dissolve metabisulphite, as this drives off some of its sulphurous acid, and so weakens its power as a preservative. The best plan is to hang the metabisulphite just below the surface of some cold water which has been boiled briskly, and allowed to cool quietly without shaking. The metabisulphite will dissolve without any agitation in an hour or two, and then the pyro or other developer may be added.

THE ORDER OF THE ADDITIONS

The order in which the different ingredients are dissolved is often important; and when no information on the subject is volunteered, the order in which they are given in the formula should be followed, except that the water, which is generally put last, must first be taken. If metol, for example, is dissolved in water and then sulphite is added in any great quantity, the metol may all be driven out of solution again. A ferrous oxalate developer is made by mixing a saturated solution of ferrous sulphate with one of potassium oxalate. If the oxalate is added to the sulphate, a thick muddy fluid quite unsuitable for use is formed, whereas if the sulphate is added to the oxalate we get a clear red liquid, which is what we want. In making up toning baths, the gold solution should always be diluted freely with part of the water and then added to the sulphocyanide, or whatever other substance is used, and not *vice versa*.

BOILING LIQUIDS

When a solution has to be boiled, as in the case of sodium sulphide for sulphur toning, it will not do to use a saucepan or other kitchen utensil, but a thin glass boiling flask must be got from the chemist. This may be supported on a piece of iron wire gauze over a spirit lamp or gas stove, and the liquid boiled in it without the slightest fear of the glass breaking, and without any risk of contamination, as would be likely to follow the use of an enameled iron or similar vessel. Those who have done any chemistry understand the use of a glass flask for this purpose, but to those who have not, it seems strange that it should be possible to boil liquid in a glass vessel without risk of breakage, but it is quite easy.

SOLUTIONS OF GELATINE

Gelatine and glue, which is only impure gelatine, are curious substances to dissolve. They need hot water, yet if placed direct in hot water they may take an interminable time to dissolve. They should always be allowed to soak in cold water until quite soft, and then when placed in hot water, or heated, they will liquefy completely almost directly. When chrome alum has to be mixed with gelatine, as when preparing paper for single transfer carbon, the chrome alum must not be added suddenly, or the gelatine will just separate out in an insoluble form. The quantity of water should be divided, the gelatine dissolved in one part and the chrome alum in the other, both should be made hot, and then the alum solution should be added to the other a little at a time, with stirring. No precipitation of the gelatine will then take place if the chrome alum is not present to excess.

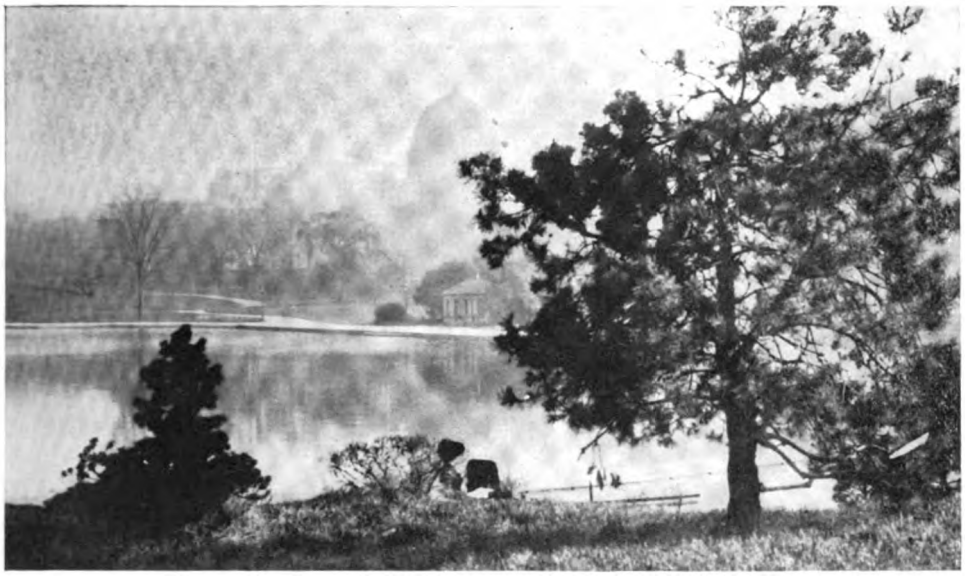
From what has already been said it will be seen that almost every solution has its peculiarities, and that these should be understood if it is to be made up easily and correctly.

MEASURING HOT SOLUTIONS

The meaning of the phrase "water to" such and such an amount has been explained, and one method of making up such solutions was noted. They cannot be made by taking so much of the substance and so much water unless the increased bulk of the liquid caused by adding the water to it is known; and in nearly every case this is not known. But the substance may be put into a measure and water added till it stands at the right mark. If we wish to use hot water for the solution, and this is often very convenient, it is very likely that we shall not care to pour hot water into a measuring glass, at least not after we have done it once. Ordinary white earthenware jugs are useful in such a case, a mark of some kind being made on the jug to indicate the height. Brunswick black is often suggested, but unfortunately Brunswick black will not stay on the glazed surface when hot liquids are poured into the jug.

A HANDY DEVICE

The following plan has been worked out to meet the necessities of one who often wants to do such measuring. Three or four jugs, all of a size and shape, have their places on the darkroom shelves. Ten, fifteen, twenty and twenty-five ounces of water have been put into them at different times, and the height of the top of the jug above the surface of the liquid noted. Quite full, the jugs hold thirty ounces. A



A CHILD'S DREAM HASWELL C. JEFFERY

Fourth Prize—Country Life Permanent Exposition

number of thin cardboard T's are cut with the top bar long enough to go across the top of the jug, and the long leg is cut off to such a length as to touch, but only to touch, the surface of the liquid in the jug when that has a bulk that is marked on the T in question. These are hung on a nail close to the jugs, and a year's supply can be cut in a few minutes. When, say, fifteen ounces of liquid are wanted the T marked fifteen ounces is placed across the top of the jug with its leg hanging down, and liquid added until it just touches the leg of the T. There is no need to test each T, if one is marked by trial, the rest of its size may be made from that as a pattern. A number are wanted because, of course, any T that has once been used must be thrown away, unless it is cut shorter to measure a large quantity; if not, there will be a risk of introducing impurities into the liquids.

WHEN WARM WATER MAY BE USED

Many photographic chemicals dissolve faster in hot water than in cold, and are not any the worse for the heat. The principal substances in this class are hypo, alum, potassium ferricyanide, borax, sodium sulphite, sodium carbonate, potassium bichromate, and potassium oxalate. Bromide and sulphocyanide dissolve almost as quickly in cold as in hot water, common salt dissolves equally well in both, alum and borax almost compel the use of hot water. Pyro, metol, and developing agents generally, must only be dissolved in cold water, as also should potassium metabisulphite. Caustic soda, caustic potash, and ammonium persulphate, also should be dissolved in cold water. In most cases, solution takes place more quickly if the substance is first crushed. This is best done either in a mortar, or by wrapping it up in two or three thicknesses of clean paper and hitting it with a hammer.

WHAT IS A SATURATED SOLUTION?

There seems to be a good deal of doubt in some minds as to the meaning of the term "saturated solution" which is often used in photography. As far as most substances which are soluble are concerned, there is for each a definite proportion which a given quantity of water at a given temperature will dissolve, and no more. Thus at ordinary temperatures a pint of water will dissolve eight ounces of copper sulphate, but only two ounces of potassium bichromate. If more in either case are added, it will remain undissolved in the water, unless this is warmed; and even then as the liquid cools it may pass out of solution again. A solution which has dissolved all it can is called a saturated solution, and it is often a very convenient method of making up a solution of known strength. If, for example, we have dis-

OFF FOR THE FISHING GROUNDS S. J. HENDERSON

solved in cold water as much as it will take up of potassium bichromate, we can quite confidently take such a solution as a ten per cent. one, as ten per cent. is known to be the strength of a saturated solution of potassium bichromate at ordinary temperature.

HOW TO MAKE SATURATED SOLUTIONS

The accuracy of the method, however, depends on the care taken to get as much of the salt dissolved as will dissolve. One way of doing this is to make as strong a solution as we can by means of warm water, and to let that cool. This is not always strictly accurate, but as a rule is near enough. Or we may tie the salt in a little muslin bag and hang it just below the surface of the liquid for a few hours, as already described. If there is then some of it left in the bag we may be fairly confident that the solution is a saturated one. The reason for using the bag is that the solution is heavier than water, and as the salt dissolves the heavy solution sinks and fresh water takes its place to dissolve more in its turn, this action going on as long as there is some of the substance left, or until the liquid is saturated. If the salt is merely placed at the bottom of the bottle and left there, it will soon be surrounded by a heavy saturated solution in which it cannot dissolve, although there may be comparatively pure water above. This can easily be seen if some hypo is put into a clear glass bottle of water, as hypo solution is much denser than water, and the heavy solution can be perceived at the bottom, and only mingling with the rest when the bottle is shaken. Potassium bichromate (ten per cent.), potassium oxalate (about thirty per cent.), ordinary alum (about twelve per cent.), and mercuric chloride (about five per cent.), are examples of salts which are conveniently kept in the form of saturated solutions.

OFF FOR THE FISHING GROUNDS

Boston Harbor is a splendid place for the camera worker in search of watercraft of all kinds, from the sailing dory to the square-rigger. Mr. Henderson has secured a good record photograph of one of the famous fishing fleet which upholds the fame of Boston as the greatest fresh-fish port in the world. The picture is somewhat lacking in atmosphere, in spite of the clouds, a result which is doubtless due to the use of *f*:16, or smaller, though the data omitted to state the stop used. The print also needs spotting and cleaning with alcohol to remove friction marks. Data: Postcard Conley Jr. with rapid rectilinear lens; snapshot; filmpack; tank development; print on a glossy Instanto postcard.

UP A DARK STAIR

Our prize picture this month is full of lessons for every aspiring amateur who cares to picture children engaged in their characteristic occupations. Genre photographs like this, when as well conceived and carried out as this one is, possess more than a passing attractiveness. They are pictures in the truest sense, for they tell their story with lasting interest to every observer. Most pictures of children, when the face is visible, are of importance chiefly to the relatives: a good genre, on the contrary, has appeal in proportion to the skill with which the maker has applied his knowledge of photographic technique and artistic principles. We find almost nothing to criticize here. Data: 5 x 7 Premo camera with Crown anastigmat lens of 12 inches' focus; flashlight at *f*:8 at 7.00 p.m.; Seed 30 plate; pyro; print on Artura Iris A.

HOW TO PREVENT HALATION

M. D. MILLER

Halation, or the spreading of light-effect in the sensitive film by reflection from the glass side of the plate so that windows are blurred, is one of the commonest reasons for failure in taking interior views. With hardly an exception, camera manuals lay down the rule that windows should not be included in interiors unless the shades are drawn. The advice is sound: yet it is possible to secure perfect results on even single-coated plates if the conditions governing halation are well understood.

Without going too deeply into reasons, let us briefly review the factors which minimize halation.

The first of these is opacity, or light-stopping power, of the emulsion. A cheap, plain plate generally has a thin coating poor in silver and therefore is quickly penetrated by rays from light objects. Such plates often develop very quickly through to the back and are incapable of giving much contrast with any development. They also show excessive halation. A double-coated plate, on the contrary, has an undercoating of slow emulsion of great opacity and except in cases of extreme contrast does not allow rays to penetrate to and reflect from the glass.

The second factor is the thickness of the support. Plates coated on thick glass are more subject to halation than those on thinner and therefore more expensive glass. The size of the stop, in the third place, greatly influences the amount of halation. The smaller the stop, the narrower the cones of light having the diaphragm as their base and the plate as their apices; hence the smaller the angle at which reflection occurs and the less the spreading of light objects into their surroundings.

For the fourth factor there is another, intimately connected with the third, namely, that halation increases more rapidly away from the middle of the plate, because the oblique rays are reflected at a more obtuse angle and consequently spread out over a larger portion of the emulsion.

The fifth factor, not very important, depends on the phenomenon known as irradiation, or spreading of light-action from grain to grain within the emulsion, so that particles which receive less light are notwithstanding acted upon by neighboring particles more strongly exposed. It is probable that irradiation varies directly with the coarseness of grain of the emulsion and is increased by using the developer at too high a temperature.

The sixth factor is concentration of the developer. A strong solution invariably piles up the surface density of the highlights and thus renders unprintable the delicate halftones which show plainly to the eye when the plate is held up to a strong light. Weaker baths, on the contrary, yield softer gradation.

Exposure, perhaps the most important factor of all, is intimately bound up, in interior photography, with the question of color-sensitiveness, so these two considerations may be treated together as the seventh factor. A plain plate can never

BACKED HYDRA PLATE

be exposed on an interior containing inactinic colors, such as greens, reds, or browns, sufficiently long to record detail in the deeper shadows without tremendously overtiming the lights. Orthochromatic or isochromatic plates, chiefly sensitive to yellow-green, are a great improvement, and, if a window is included, can be made to yield beautiful results by using a three- or four-times filter. A simpler means of attaining the same end is to use one of the plates containing a filter dye in the emulsion. A panchromatic plate, naturally, particularly if exposed through a light screen, will give the best results, for it alone is capable of registering all the colors with normal exposure. And this brings us to the question, what is normal exposure for an interior?

Perhaps the best definition of normal exposure in this particular case is that exposure which gives the greatest amount

of shadow detail which the emulsion in use is capable of rendering without reversal of the highlights. I have found by experiment that the Watkins meter accurately indicates the normal exposure. Furthermore, I have proved that as much as quadruple the meter time gives no improvement with non-color-sensitive plates. The only rational course, then, is to use color-sensitive plates whenever possible. The easiest method for determining the exposure is as follows. Look up the Watkins speed of the plate and apply the following table.

Watkins P Number	Whole Tint	Quarter Tint	Sixteenth Tint
65	*f*:64	*f*:32	*f*:16
90		*f*:40	*f*:20
130		*f*:45	*f*:22
180		*f*:56	*f*:28
250		*f*:64	*f*:32

Example. With a plate listed as 180, use *f*:28 (halfway between *f*:22 and *f*:32) and the sixteenth tint. Expose the meter

BACKED PANCHROMATIC PLATE

facing the light in a position which fairly represents the *average* lighting of the shadows. Start the camera exposure at the same time. As soon as the meter paper shows a visible discoloration (the sixteenth tint), cap the lens. Remember that deficient shadow detail may be due, not to underexposure, but to insensitiveness of the plate to colors; though possibly it may be due to placing the meter in a light too strong to represent the average illumination.

So much for theory. Let us now see precisely how results can be controlled.

Figure 1 is from a negative made on a Paget Hydra Rapid plate. It was exposed for the quarter tint with stop *f*:16; in other words, it was given four times' normal exposure. Development was performed by inspection with the Paget formula pyro-soda, with bromide. Halation is present in spite of the backing. This may be attributed to the excessive exposure of the lights, which with the hydrazine emulsion cannot reverse, but continue to accumulate density as long as the plate is left in the developer. It will be noticed, too, that there is insufficient detail in the woodwork and that the yellow centers of the daisies are black. Shorter exposure would not have given any details in the warm brown colors of wallpaper and woodwork, though a normal exposure and greatly diluted developer might have retained the gradation and detail in the curtains at the expense of the shadows.

Figure 2 is from a negative on an unbacked Wellington Anti-Screen plate. It received normal exposure, that is, the sixteenth tint with *f*:28, and was developed with Modified Thermo Duratol, Q dilution, or two classes more dilute than usual. Halation is practically absent, but the exposure was not sufficient for the red-browns, this plate being totally insensitive to red. The opaque, dyed emulsion, thin glass support, and small stop, account for the suppression of halation. In passing, I may say that this subject is the only one I have been able to discover which did not give a perfect negative with the M dilution. All other outdoor and indoor subjects, when timed by meter, have fallen strictly within the latitude of the plate with normal development. What influence the developer itself had in minimizing halation is problematical. My friend, Mr. Frank W. Palmer, is convinced that duratol is the only developer which allows him to get rid of the last trace of halation on double-coated iso plates, and it was this property which led him to adopt duratol for all of his commercial work, especially on such subjects as factory interiors.

Figure 3 is from a negative made on a backed Wratten Process Panchromatic plate. As its speed is 90 on the Watkins list, the sixteenth tint was used with stop *f*:20. The influence of the larger stop can be seen in the greater diffusion in the outside view. Its red-sensitiveness has enabled it to bring out the browns in a higher tone and with more detail. In spite of the backing, however, the curtains are not so

clear as in Fig. 2, from which it seems evident that a small stop is more efficient than backing.

Figure 4 was made with the same panchromatic plate, only using a Burke & James Ingento Series A filter and stop *f*:14 with the sixteenth tint. This was to allow a multiplying factor of 2 for the filter with this plate. It is normally a three- or four-times screen with an iso plate. The greatest improvement is to be noticed in the light tone of the walls, with almost full rendering of the grain of the wood. As in Fig. 3, the larger stop has increased the halation. Both of the panchromatic plates were developed in VVQ dilution, as they normally belong in the Q class. The prints are all on Instanto No. 17, and were developed in used M dilution saved after developing one 4 x 5 Anti-Screen plate in each 3 ounces and kept in a partly-filled bottle three weeks.

BACKED PANCHROMATIC PLATE WITH FILTER

I think these results effectively supplement my article on "Scientific Development" in the June, 1914, issue and also prove that Mr. Charles F. Rice was right to a limited extent in his criticism published in the July number. I contend, however, that it is only in cases of contrasts in the subject altogether outside of the range ordinarily considered as photographable that any change from the normal dilution is necessary. As previously stated, this particular subject is the only one I have yet been able to discover which required a departure from the M dilution for the Anti-Screen plate, and I have made metered exposures on subjects far more difficult than Mr. Rice originally suggested. As a result of seeing prints from the negatives,

UNBACKED WELLINGTON ANTI-SCREEN PLATE

my former critic has tried the Modified Thermo Duratol carefully and has just informed me that he is about to develop all his vacation exposures with it. The most important thing, though, is to secure correct exposures. My personal preference is for the Watkins meter, but the means employed does not matter so long as the exposure falls within the latitude of the plate and the *print* correctly represents the contrasts present in the subject.

In this connection it may not be amiss to quote from a letter I have just received from an old-time photographer who has recently acquired a meter by my advice and adopted the Thermo system in its entirety. He writes, "I took a view from our piazza with grass and dark trees in the foreground and the harbor in the distance. The foreground and distance are beautifully graded, the foreground being strong and vigorous and the distant harbor showing atmosphere and distance and yet distinct enough to show the boats at anchor and yet every line softened, which gave the effect of distance.

"I suppose I have made at least twenty exposures of the same view under my old method of guessing at the exposure and developing by inspection and never got an even decent result.

"They say it is difficult to teach an old dog new tricks, but I think I have done fairly well in following up a new system at which I was a little inclined to scoff at first."

Summary

To prevent halation, then, one should select a fine-grained plate of medium speed and good opacity, coated with an emulsion rich in silver and on moderately thin glass.

Exposure should be by meter with a small stop. Development should be performed by the Thermo system with the developer two classes more dilute than usual for the plate. The same method works just as well on double-coated plates and is the only plan known to me for handling them so as to obtain uniform contrast without danger of light-fog. Just try this system as described and note the results.

HOME SENSITIZED PAPERS AND FABRICS

All workers from time to time would like to have an expert at hand to whom a question arising out of the work could be put and by whom it could there and then be answered definitely. Here is the result of such a cross-examination of a well-known authority.

What are the advantages of sensitizing papers for one's self?

The operator has the choice of a much larger variety of paper than when he is dependent upon commercial productions; he can vary the printing properties of the emulsion, or coating solution, to suit any type of negative, within wide limits; he can be certain of the paper being freshly prepared, and, as he need not in most processes prepare more than he requires at the time, there need be but little waste from keeping. The paper will probably cost more to prepare than the price of a commercial article of the same class, but, on the other hand, a knowledge of photographic procedure will be gained which cannot well be obtained in any other way, and there is always a pleasure in widening the scope of one's hobby.

Which process should the beginner first take up?

The blue printing processes are the best with which to make a start, not because the chemical salts used are less complex in their action than in other processes, nor because the operations are less difficult, but because the materials required are inexpensive and the experience acquired in mixing the solutions and in coating the paper will be of great value when more costly materials are to be used.

Are the blue printing processes of much practical value?

The papers are used largely in making copies of drawings for engineers' and architects' use. They may be used in place of more expensive papers in proving negatives when masking and combination printing have to be carried out, and the saving so effected may be of importance when the prints are of large size. They may be occasionally employed in pictorial work—although only suitable for a very few subjects—and a blue print is frequently the base in three-color work.

Which is the simplest of these processes to begin with?

The simplest is that prepared by the formula given by Sir W. Abney in his "Instructions in Photography." A smooth-surfaced, hard, well-sized paper is coated with a mixture in equal parts of the two following solutions:

A

Potassium ferricyanide.... 2½ oz.
Water..... 10 oz.

B

Ammonio-citrate of iron (brown).....2½ oz.
Water..... 10 oz.

The mixture of the two solutions should be kept in the dark, and if not absolutely clean should be filtered before use. The solution should be coated upon the paper with a brush or a sponge. If a brush is used, there must be no metal in the mount, and it must be kept thoroughly clean. A piece of fine-grained sponge is quite as effective, is less expensive, and is at least as readily cleansed as the brush. A wad of absorbent cotton is cheapest of all and may be thrown away after using. The solution is to be brushed lightly over the paper, first in the direction of the length, and then across to ensure the coating being even. No more of the solution should be laid on than is sufficient to tint the paper, and every care must be taken not to wash up the fibre. As in all processes in which salts of iron are employed it is desirable to dry the sensitized paper as quickly as possible, which may be done by holding it in front of a fire. The brown ammonio-citrate of iron referred to in the formula may be obtained from most druggists, but a more recently introduced variety, the green salt, is better for most purposes.

Where may the green salt be obtained and how is it used?

It may be obtained from most druggists or photographic dealers by ordering in advance if it is not kept in stock. The salt is free from the impurities found in the brown variety, and is more reliable in use, though a trifle more expensive. A suitable formula is:

A

Potassium ferricyanide..... 1 oz.
Water..... 10 oz.

B

Ammonio-citrate of iron (green).....2½ oz.
Water..... 10 oz.

Equal parts of the two solutions are mixed and applied to the paper as with the previous formula, and the mixed solution should also be stored in the dark. Whilst the coating should be as even as possible, a slight streakiness cannot always be avoided, and will not show in the print.

What paper is suitable for coating?

Any good drawing paper, cartridge paper, or writing paper may be used. A thin cartridge paper will serve well for early experiments. If the paper is soft and absorbent, it may be improved by a coating of size. Twenty grains of arrowroot made into a cream with two ounces of water, and then brought to the boiling point makes a good size. It is applied with a sponge or cotton in the same way as the sensitizing solution previously described, but the paper must be quite dry before it is used. If the bulk of the water used is increased four or five times and boiled as before, the paper may then be sized by immersion, and the difficulties met with in coating are avoided.

What precautions are necessary in sensitizing the paper?

Every precaution must be taken to prevent the paper from being contaminated with chemical or organic impurities. The table on which the work is done should be covered with one or two thicknesses of paper free from folds or creases. The paper to be sensitized will, in most cases, be found to have one surface that is better than the other, and this should receive the solution. Care should be taken not to let any of the sensitizing mixture reach the back of the paper, and finger marks must be avoided.

What class of negative is suited for paper made to the formulas given?

The negative should be of the type suitable for use in carbon printing, that is, it should be correctly exposed as for use with any other printing process, but development should be carried much further than when gelatino-chloride paper is to be employed.

Can the process be varied to suit other types of negatives?

The following formula, though requiring a little more skill in mixing and in coating the paper, may be used with negatives having gradations less steep in character than those previously described. A negative that will give a brilliant print on gelatino-chloride paper may be employed. Three solutions must be made up as follows:

A

Tartaric acid.....1 oz.
Water.....2 oz.

B

Ferric chloride.....1 oz.
Water.....3 oz.

C

Potassium ferricyanide.....1 oz.
Water.....8 oz.

Two drams of *A* are taken, and strong ammonia is added drop by drop till the precipitate which forms is redissolved. Three drams of *B* are taken and added slowly to the first solution, stirring the while with a glass rod, and then eight drams of *C* are added in the same way. Care is required in the last operation to prevent the formation of a precipitate, which would spoil the solution. The paper is to be coated in the same way as before, but as the sensitizing compound is very unstable, the mixing of the solution, the coating of the paper, and the drying of it should all be done inside twenty minutes. If the operations are properly conducted the coated paper will be a bright yellow, and will remain so for a day or two if preserved from light and moisture. It will also print more rapidly than paper sensitized with the formulas previously given.

How is printing carried out with these papers?

In printing from a negative the paper is placed with it in the printing frame in the ordinary way. If a drawing or tracing is to be copied it is placed in the printing frame supported on a sheet of clear glass, and to avoid reversal of the subject as from right to left, the back of the drawing must be in contact with the face of the sensitized paper. Ordinary precautions should be exercised to keep the sensitized paper dry, and the exposure should be made in bright daylight—direct sunlight, if possible. The image will appear first of a blue color, and will gradually change to a bronzed gray. A little experience is required in judging the depth to which printing should be carried, particularly if the paper has itself turned to a blue shade, as is commonly the case by the time commercial paper reached the hands of the

worker, and not infrequently in the case of home made paper.

How are the prints finished?

If the paper is in good condition, the negative of the required quality, and if the exposure has been correct, simple washing in cold water is all that is necessary. This must be continued till the last washing water shows no signs of yellow coloration and until the highlights are quite pure. As ordinary tap water contains carbonates which slowly discharge the blue color, it is desirable to acidulate the washing water with a little citric acid. Should the print be slightly overexposed the whites may be cleared by using an exceedingly dilute solution of sodium carbonate in place of the acidulated water for one of the washings. As, however, this will lower the tone of the whole print, it is but a poor remedy for incorrect exposure.

How is the process worked by which positive copies can be obtained from drawings?

The cyanotype process giving positive blue prints from positives is worked as follows. Three solutions are to be made:

A

Gum arabic.....1 oz.
Water.....5 oz.

B

Ammonio-citrate of iron.....1 oz.
Water.....2 oz.

C

Ferric chloride.....1 oz.
Water.....2 oz.

Thirty parts of *A* are mixed with eight parts of *B*, and then five parts of *C* are added. The mixture should be made immediately before use, as it quickly deteriorates, and the paper should be coated and dried in the same manner as in the processes previously described. The paper is printed by daylight, and is developed in a solution of:

Potassium ferrocyanide.....50 gr.
Water..... 1 oz.

It should be noted that ferrocyanide, a yellow salt, and not ferricyanide, the red salt, is required in this process. Development is carried out with a brush, and as soon as all details have appeared the print is quickly rinsed and transferred to a bath of:

Hydrochloric acid..... 1 oz.
Water.....10 oz.

In this the image brightens up and the whites are cleared. A final washing completes the process.

What is the method by which lantern slides and other transparencies are made by these processes?

Clear flawless glass of the required size is first to be coated with a solution of gelatine, say 20 grains to the ounce of water. The gelatine solution should be filtered whilst warm, and the coated plate must be placed on a level slab to set. When quite dry, it is immersed in any of the solutions given till the gelatine has absorbed the sensitizing liquid, and then may be surface rinsed to remove the surplus solution, or it may be mopped off with fluffless blotting paper and the plate again dried, this time in the dark. Printing is carried out by daylight, and development is conducted as with paper prints.

May ordinary lantern or negative plates be used for sensitizing with the blue printing solutions?

Light struck plates which have not been developed require only to be fixed in hypo, washed and dried. If they have been developed the image may be cleared away by immersion in a two per cent. solution of ammonium persulphate very slightly acidulated with sulphuric acid; one or two drops to the ounce of solution will be quite sufficient. As soon as the image has disappeared the plate must be transferred without intermediate washing to a five per cent. solution of sodium sulphite, in which it should remain for five minutes. It must then be thoroughly washed, fixed in hypo as a precautionary measure lest any silver salts should have been left in the film, washed again, and dried. If stale but undeveloped plates are used the iridescent markings which are frequently found round the edges will not be removed in the hypo bath, but will disappear in the persulphate bath. As the acid in the persulphate solution will decompose hypo and lead to yellow stains, the plate must be thoroughly washed between the two baths.

How may the image be examined during printing?

A slight modification in the printing frame will enable this to be done, or it may be done in an ordinary printing frame if a little care is exercised. In the latter case the negative must be wedged tightly against one side and end of the printing frame. If the transparency is the same size as the negative, it may be wedged up in the same way, and can be taken out and replaced without doubling the image. When the

transparency is smaller than the negative an L-shaped piece of card, thin wood, or metal of a suitable size, and not thicker than the transparency glass, will hold it in position. A more convenient apparatus is made by having the back of the frame in one piece. It should be hinged by one end to the end of the frame, and must be arranged so as to lie flat on the transparency plate when the frame is closed for printing. The sensitive plate is placed in position on the negative, one or two small pieces of adhesive wax are placed on top, and the back is closed down. The wax binds the plate to the back of the frame, which may be opened as often as required to examine the image, the plate falling back into position each time.

Can silk, linen, and other fabrics be sensitized in the same manner as paper?

If the fabric is well sized and firm in texture it may be stretched on a frame and the solution sponged over the surface as in the case of paper. If, on the contrary, it is lightly sized and is open in texture, it is better to add a little of the arrowroot sizing solution to the sensitizing solution, and to immerse the fabric. The surplus liquid must be squeezed out, the fabric stretched over a frame, and the surface lightly sponged to remove streaks and irregular patches of sensitizing compound. As open texture fabric is very liable to shift in the printing frame, it should be attached by the edges to a sheet of stout paper, and the exposure is better made by the aid of an actinometer.

What are the principal features of the kallitype process?

It resembles to some extent the platinotype process in so far that paper is coated with a sensitive iron salt, but silver is substituted for platinum. When the print is placed in the developer the iron is dissolved out, and the silver salt in the case of kallitype is converted into the metallic form, just as platinum is precipitated in platinotype.

What kind of paper is most suitable for the process?

Any good photographic or drawing paper may be employed, but different brands of paper, chiefly, no doubt by reason of the varying nature of the size in them, give different tones. One paper may give a pure black while another will give nothing but brown. It is necessary that the paper should be well sized, or the iron salts will be absorbed, leading to sunken-in images, and possibly at a later stage to yellow stain. An arrowroot size should be made up according to previously given instructions, and the strength may be two grains to the ounce of water, and in this the paper should be soaked and afterwards dried. There is less risk of roughening the grain of the paper when working in this way than by coating a thicker solution on the surface with a brush or a sponge.

What is the sensitizing solution?

Dr. Nicol, who invented the process, at first coated the paper with the iron salts only, as was at first done in the platinotype process, but later on the silver was added to the sensitizer. Many formulas have been published, but that devised by the late W. K. Burton has the merit of simplicity and has been found to work well. The formula is:

Ferric oxalate	75 gr.
Silver nitrate	30 gr.
Distilled water	1 oz.

As ferric oxalate is liable to contain a proportion of ferrous oxalate, due either to faulty preparation or to exposure to light, it should be obtained direct from a wholesale druggist. The ferric oxalate is dissolved first, and should be filtered till quite clear, when the silver nitrate is added. It is advisable not to make up more than is required for the work in hand. The solution should be coated lightly and evenly over the paper, and dried quickly. If the ordinary precautions are taken the paper will keep for a day or two, but if it is to be kept longer, it must be stored in a calcium tube. In a general way it is desirable to take all the precautions against moisture which are employed in the use of platinum papers.

How is printing carried out, and what is the appearance of the image?

The sensitive paper resembles platinotype paper in appearance, and should be printed in precisely the same way, but not quite so far. In a general way, it will be sufficient if the half-tones are faintly visible. If the paper is allowed to become damp the image will not be so clearly seen as when dry.

What is the developer and how is it employed?

A number of developers have been devised, each of which gives a different

color, but as the color depends to some extent upon the quality of the paper used, the description attached to each developer can only be taken as a general guide. As a very small proportion of potassium bichromate is required in most of the solutions to keep the whites clear, a one per cent. solution should be made up. The developing solutions are: For

Black Tones

Borax	44 gr.
Rochelle salt	33 gr.
Potassium bichromate solution (1%)	50 minims

Purple Tones

Borax	12 gr.
Rochelle salt	44 gr.
Potassium bichromate solution (1%)	50 minims

Sepia Tones

Rochelle salt	22 gr.
Potassium bichromate solution (1%)	25 minims
Water	1 oz.

Maroon Tones

Rochelle salt	44 gr.
Sodium tungstate	22 gr.
Water	1 oz.

ON STOPS

W. LAKE

There are three distinct uses to which stops may be put, and unless the photographer realizes this, and forms some idea of the way in which each purpose is achieved by the use of the stop or diaphragm, he will be working in the dark, with results which may easily be foreseen. The fault of most writers on this subject seems to me to be a failure to recognize that the amateur photographer approaches the subject from a standpoint quite different from that of the optician, and the use of stops is lost sight of amid a great deal of very valuable and interesting optical information, which, with all its value, is beside the mark. I trust that in attempting to deal with this subject in a different way, my hope that it will be intelligible and useful to many to whom the other is merely deterrent will not be considered a presumptuous one.

AND FIRST AS TO THOSE THREE USES OF STOPS

The division is quite clear, yet how many could answer at once such a question as "What are the three distinct purposes of stops?" They are (first) to do away with or to conceal the optical defects of the lens, (second) to bring objects at different distances from the camera into sharp focus at the same time, and (third) to lengthen the exposure in order to make it manageable, or for other reasons. The user of a lens ought, I think, at least to know to what extent he uses his stops in each capacity, and I hope to be able to explain the first of these purposes sufficiently for practical workers without going into details of astigmatism, spherical aberration, and all the other dreadfully named complaints that lenses are heirs to. It will be most convenient to treat these three uses in order named.

THE OPTICAL DEFECTS OF THE LENS

Nearly all of these manifest themselves in the same way, and have the same result, namely, to make the image unsharp; and the user of a lens and focusing camera can hardly spend a little time more profitably than in finding out to what extent they prevail. To do this, we must have a definite standard subject, and one of the best and readiest things for the purpose is a flat wall with a fairly striking wallpaper. We may set the camera up as far from this as we can, provided that the wallpaper pattern covers the whole of the focusing screen. It is most important in any test on a flat subject that the focusing screen and the subject shall be perfectly parallel; if not, the test is valueless. It is not at all as easy a task as it may seem at first sight to fix up a camera so that its focusing screen shall be perfectly parallel with the wall.

HERE IS A HITHERTO UNPUBLISHED DODGE which is useful in such a case; it is one that I have never seen described, but is certainly the best method I know. We want most particularly to get two opposite corners of the plate equidistant from the wall. Let us first plumb the wall to make quite sure that it is vertical. This may seem an absurd precaution, but it is quite surprising how many walls are not vertical in modern as well as in old houses. Setting up the camera in position, let it be turned bodily halfway on to its side, so that the bottom edge of the ground glass is no longer level, but at an angle of 45 degrees, or even

more, until, in fact, the two opposite corners of the plate are in the same vertical line. Then, if one of these corners is exactly above the other, and we carefully plumb the ground glass with a thread and weight, we may be fairly confident that those two corners at least are equi-distant from the wall. We must not rely upon the other two corners, as they, of course, may be anything but equidistant, though the camera must be put to face the wall as squarely as we can.

MAKING A TRIAL

Having done this, and focused with the full opening of the lens as carefully as possible on a spot midway between the center of the plate and one of the corners, we may expose a plate. If a plate on such a subject is exposed with each of the stops in succession, the set of negatives will give us a very useful little record of the capacity of the lens for dealing with a flat subject. A certain stop will be found with which the image of the wallpaper at the top and bottom corners and everywhere in a straight line between them is fairly or reasonably sharp. When that is so, unless the lens is a very extraordinary one indeed, we may feel sure that were the whole plate parallel with the wall the whole image would be sharp; and the larges stop with which this is obtained is a measure of the quality of the lens. Subject to certain qualifications,

THE LARGER THIS STOP THE BETTER THE LENS

It would be quite a mistake to suppose that with any lens by a good maker such a subject could be got quite sharp with the biggest stop; it depends not only on the workmanship, but also on the design. A simple form of single lens might have to be stopped down to *f*:22 to obtain a result as good as could be got with a rapid rectilinear at *f*:16 or one of the finest modern anastigmats at *f*:6 or *f*:8. The biggest stop in a rectilinear is provided for use when definition all over the plate is not so important as rapidity, or when the subject is one which favors the lens. Into the reason for these differences it is not my intention to go, as it would take too long, and has been treated by more skilful pens than mine. I pass to the second purpose of the stop, namely,

TO BRING OBJECTS AT DIFFERENT DISTANCES SHARP AT THE SAME TIME

However perfect the lens may be—the costliest and most skilfully designed and made anastigmat, as well as the commonest uncorrected single lens—it is not capable with a large stop of bringing objects close to it and far away from it sharp at the same time; and the bigger the lens the more marked is its failing in this respect. It is also undoubtedly the case that the better the lens the more is this noticed, because its definition in parts is so good that where the image is out of focus this blurring is made all the more conspicuous by contrast. It is this failing which makes hand camera work increase in difficulty the larger the size of plate used. Two photographers may stand side by side, each with a camera with an equally good lens, each using the same stop, and each photographing the same object. The one using a quarter-plate camera and a 5-inch lens may get every detail near and distant as sharp as could be wished; the other, with a larger camera with a 7-inch or 8-inch lens, will be quite unable to get foreground and distance sharp at the same time, and must stop down to do so. This is quite distinct, as is evident, from any stopping down done to remedy defects of the lens.

A TRIAL MAY BE QUITE VALUELESS

Two things should now be very clear. One is that unless the photographer knows how much he has to stop down on account of difference of distances in his subject, and how much to hide the optical defects of the lens, he is not in a position to say definitely whether his lens is a good one or not. From this it follows that to try a lens on an ordinary outdoor subject, as so many workers do, where there may be objects at all sorts of distances from the camera, can be little or no use as a test of the lens. In practice, of course, when we stop down on account of deficiencies in the lens, we also at the same time render it better able to deal with different distances in the subject.

STOPPING DOWN TO PROLONG EXPOSURES

The third reason for stopping down is a comparatively trivial one. If we are out photographing in summer time, and have not got a shutter, or, what is much worse, if we have got one of those shutters the only thing about which that is at all definite is that it does not give the speed marked, it is often absolutely essential that we should use a small stop, in order to bring the exposures to such a length that they can be given by hand. It is much better in most cases to use *f*:32 and give an exposure of two seconds with the cap than

to use *f*:8, even if the lens will work with a sharp picture at that opening, and give a nominal one-eighth of a second with a shutter, which may be anything from a quarter to a twentieth.

LARGE OPENINGS AND EXPOSURES

The way in which exposure is altered by using different stops is too well known to need more than a passing word. As the different stops, or graduations on the iris diaphragms, are now generally made, each one as we go in succession from the largest to the smallest requires twice as much exposure as the preceding one. This rule is practically universal from *f*:8 downwards, but above *f*:8 it does not usually hold good, for a very sufficient reason. A very rapid lens indeed may work at *f*:4; the next size stop smaller than this, and requiring double the exposure, would be *f*:5.6; and the next doubling again is *f*:8. Now, as there is a good deal of competition to make lenses as rapid as possible, there are forms which can be made faster than *f*:8, but not so fast as *f*:5.6. Such openings as *f*:6.3 and *f*:7 are quite common. If we started with *f*:7, for example, and the stops required double the exposure with every decrease in their size, we should get a series like this—*f*:7, *f*:10, *f*:14, etc., none of the stops in which were of the same denomination as in the *f*:8, *f*:11.3, *f*:16, etc., series. To avoid this, the custom generally is to make the first stop the largest which the lens will stand, *f*:6, *f*:7, etc., and the second *f*:8, and the others in such a series from *f*:8 that each one requires double the exposure required by the preceding.

HOW TO FIND THE RELATIVE EXPOSURE

We ought, therefore, to know the difference in exposure between *f*:8 and the biggest opening if we have a lens with a bigger opening than *f*:8, and this is quite easy to work out. We only multiply the *f*: number by itself in each case. Thus if we have *f*:7 and *f*:8, we multiply 7 by 7 = 49, and 8 by 8 = 64, and know that if *f*:7 requires 49 seconds, *f*:8 needs 64, or, roughly, *f*:7 requires three-fourths the exposure with *f*:8.

"WHAT STOP SHALL I USE?"

Before leaving this subject altogether, I feel I ought to say something on the size of stop required for different classes of work. Few questions are more often put to a photographer by beginners than the simple one, "What stop ought I to use?" The mere putting of such a question is evidence that the enquirer has not any clear idea of what it is the stop is supposed to do. He thinks, no doubt, that if he uses the wrong size of stop his picture will be wrong, though in what way it will be wrong he does not know. It is like a friend of my own, who abstained from attempting anything but portrait work for a long time because he only had a portrait lens. Afterwards he found that it was one which would take excellent landscape and general photography when used with a fairly small stop, and that its principal drawback for such work was its size. I shall not forget his astonishment when I first showed him that this was the case. There is, of course, no definite rule laying down the stop to use for different classes of subjects. For portraits, the full opening is used as much as possible, because we want to cut exposure as short as ever we can, and portraits are generally not very well lighted.

CANDLE-POWER

The way to figure candle-power, which sometimes comes up in photography, is to procure a candle as near as possible to the British standard, namely a sperm candle about seven-eighth of an inch in diameter, and which burns at the rate of 120 grains per hour. After it has been burning for ten minutes place it, say, four feet from a white screen; pretty close to the latter, place an upright rod of wood or metal about an inch in diameter. Then see that the lamp is burning at its best, and arrange it so that it will cast a shadow of the rod within an inch or so of that cast by the candle. Now move the lamp gradually away from the screen, keeping the shadow of the rod in the same place, until the two shadows are as near as may be identical in depth, and then measure the distance between the candle and screen, and divide the square of the lamp by the square of the candle, the result will be the candle-power of the lamp. Thus, suppose the candle has been placed four feet from the screen, and the lamp is found to be twenty feet:

$$\frac{\text{Lamp} - 20 \times 20 = 400}{\text{Candle} - 4 \times 4 = 16} = 25 \text{ candle-power}$$

EDITORIAL

OUR COMPETITION

In the interesting collection of photographs sent in to our September competition the prize was awarded to Mr. Geo. M. Betz for his print entitled "Up a Dark Stair." The criticism of this will be found on page 72. Honorable Mention was awarded to the following pictures:—"His First Pants," by Burton Ames; "Self Portrait," by R. W. De La Mater; "The Feather," by R. W. Tyler; "On the Bridge," by J. H. Becker; "Motion Picture Actors," by T. T. Sturgeon; "What Will Daddie Say?" by Alec Blackie; "Two Strange Things," by Juventino Ocampo; "Eleanor," by Charles D. Meservey; "Summer," by Margaret Hitchcock; "Vacation Snapshot," by Mrs. E. M. Fraser; "Recreation," by Don P. Cowles; "Summer Logging in Idaho," by Paul M. Elder; "The Sentinels," by Kenneth M. Oyster; "Spring Woodland," by J. H. King; "A Mountain Road," by George F. Mims; "Roses and Gentians," by H. D. Wilson; "Josephine," by Stanley von Arnstein; "Run Along, I'm Coming," by Charles D. Meservey; "A Short Cut," by Wm. Ludlum, Jr.; "That's my Papa," by B. F. Anderson; "The Belle," by C. W. Becker; "Chums," by S. F. Purllant; "Outdoor Portrait," by J. H. Becker; "The Cottage at the Corner," by R. W. De La Mater; "Caught Napping," by N. E. Johnson; "The Cast," by Edwin A. Roberts; "A Country Church," by Michael Brazil; "Landscape," by Alvin W. Prasse; "Indoor Portrait," by Leo Lee; "Copy," by B. C. Betancourt; "Lady Bumps," by Stark Weatherall; "The Bend in the Road," by Wilford E. Jost; "Trespassers," by E. W. Shoemaker; "Railroad Wreck," by Wm. Walsh; "The Hermit," by F. C. Schornburg; "A Fair Enthusiast," by J. A. Mountain; "Sheep Shearers," by Paul H. Hartwig; "Hill Crest in Winter," by Dora W. De La Mater; "On Possadaiga Lake," by E. A. Zinmeister; "Outdoor Portrait," by G. E. Stringfellow; "The Fast Express," by C. F. Marvin; "At Port," by Ralph W. Higgins; "Sunrise on Salmon River," by Florence R. Waugh; "Ever Bearing Strawberries," by L. J. Mathewson; "On the Mississippi," by Raymond Kegley; "The Serve," by W. J. Willis; "Sunset," by Edward N. Donn; "The Lonesome Elm," by G. E. Peaslee; "In the Fenway," by A. L. Pashek; "All Within Reach," by Floyd Kimren; "The Ship," by Albert Sauerbier; "September," by H. B. Rudolph; "Dahlias and Daisies," by B. C. Eddy; "The Oil Fire," by Roy W. Burns; "Loading," by James V. Cooper; "The Maid was in the Orchard," by Clyde Merritt; "Outdoor Portrait," by Charles Graybill; "Lincoln College," by McKinley Crowder; "Sunset on the Lake," by G. Arthur Tuttle; "Outdoor Portrait," by Glenn A. Curtis.

A STANDARD OF PRACTICE

At the Convention of the Associated Advertising Clubs of the World held in Toronto in June, 1914, a Standard of Practice for business papers was adopted. At a meeting of the full membership of the Photographic Publishers' Association of America, held in New York, October 16, 1914, the same Standard of Practice was unanimously adopted, and will be adhered to by the following publications: *Abel's Photographic Weekly*, *Amateur Photographers Weekly*, *American Photography*, *Bulletin of Photography*, *Camera*, *Photo-Era*, *Photographic News*, *Photo-Miniature*, POPULAR PHOTOGRAPHY and *Wilson's Photographic Magazine*. The standard is as follows:

1. To consider first the interest of the subscriber.
2. To subscribe to and work for truth and honesty in all departments.
3. To eliminate, in so far as possible, his personal opinions from his news columns, but to be a leader of thought in his editorial columns, and to make his criticisms constructive.
4. To refuse to publish "puffs," free reading notices, or paid "write-ups;" to keep his reading columns independent of advertising considerations, and to measure all news by this standard, "Is it real news?"
5. To decline any advertisement which has a tendency to mislead or which does not conform to business integrity.

6. To solicit subscriptions and advertising solely upon the merits of the publications.
7. To supply advertisers with full information regarding character and extent of circulation, including detailed circulation statements subject to proper and authentic verification.
8. To co-operate with all orgainzations and individuals engaged in creative advertising work.
9. To avoid unfair competition.
10. To determine what is the highest and largest function of the field which he serves, and then to strive in every legitimate way to promote that function.

Readers' Forum

HOW WAS IT MADE? WINFIELD H. STANNARD

HOW WAS IT MADE?

In looking at the picture reproduced herewith, one wonders what may be the remarkable objects in the foreground, but upon careful inspection it appears that they are the finder, focusing scale and track of the camera bed. As these objects are only two or three inches from the lens, while the rocky landscape is a great distance away, many camera enthusiasts will be puzzled to know just how this remarkable feat of focusing was accomplished. We are interested to see how many of our readers can answer the question. If you know, write and tell us about it. There is no fake about it, it is a straight print from a straight negative and only one camera was used.

Trade Notes

Among the recent introductions of the enterprising firm of G. Gennert, 24 East 13th Street, New York, is the Ensign-Popular Reflex Camera, which is claimed to be the lightest, smallest and simplest reflex camera made. This is entirely of English construction, and in the quarter plate size, 3¼ x 4¼, fitted with a Zeiss *f*:4.5 anastigmat, costs but $68.00. It may be had with other anastigmat lenses at both higher and lower prices. It is impossible for us, in the limited space at our disposal, to give a full description of the very attractive features of this camera, but a full descriptive circular may be had on application, from the manufacturers.

There is a new film on the market. Its name is ATLAS, and it is marketed by Burke and James of Chicago. The prices are the same as other standard

films, and like the very best makes on the market it is non-curling, rapid, orthochromatic and non-halation. Having had the privilege of personally trying this film, the editors can recommend it as being of the highest grade, which, of course, is insured by the reputation of the manufacturers, for it is made by the Eastman Kodak Company, the largest manufacturers of film in the world.

December 1st marks the close of Ansco Company's $5,000 Loveliest Women Contest. This leaves you but a few weeks in which to make your final entries.

Why not make special effort to round up as many prospects these few remaining weeks as you have in all the months preceding?

Take a look through your old negatives; pick out those that impressed you several months or a year ago as having prize-winning possibilities. Make some new prints of them; give them the very best work of which you are capable—then send them into the contest while there is yet time.

Fifty camera users are going to get cash prizes of $50 to $500 each. YOU have just as much chance of walking off with one of these real, spendable prizes as the other fellow.

Are you going to stand aside and assume a what's-the-use air or are you going to take advantage of every minute that is left to turn this contest to your advantage?

Remember, besides the chance to win $50 to $500, the winning photographs, enlarged to life size and the names of their producers will be exhibited to the gaze of the entire world in 1915 at the big Panama-Pacific Exposition.

Besides this, leading magazines have requested permission to reproduce the winning photographs as soon as the contest is over and the judges have made the awards. Think of the international fame attached to such an exhibit, both for the lovely women and the photographer.

Let's go to it with renewed vigor and a determination to make Ansco Company's $5,000 Loveliest Women Contest one that will live in photographic history for years to come.

Notes from the Illinois College of Photography. Mr. Kigaro Kurosawa, one of our Japanese students, has just finished the photographic course and will locate on the Pacific Coast. He expects to send his nephew to the college for the course in photography on his arrival home.

The College Camera Club gave an old fashioned Hallowe'en Party at their rooms on Hallowe'en and entertained the students and faculty and other guests.

Mr. Edgar A. Brown has returned to finish his course in photography after an absence of several months.

Prof. Latshaw is building a handsome new bungalow next to Prof. Killen's home, and expects to occupy the same in about a month. Prof. Fisher is also building a very cozy and pretty bungalow on the lot adjoining his home, which will be occupied by Prof. Dishinger.

The college received pleasant calls from Mr. Kelsey Gardner of 1913, and Mr. Geo. Blakesly of 1898, last month. Mr. Gardner is employed as photographer at the University of Illinois, and Mr. Blakesly is working at photography in connection with the Y.M.C.A. Chautauquas throughout the country.

Mr. Chas. F. Ladd of 1899, sends us an announcement of his marriage to Miss Harriett Mae Johnson of Millville, N.J., last month.

Mr. C. C. McCorkill, formerly instructor in the printing department, writes that he expects to enlist with the Canadian forces to join the war in Europe.

The Motion Picture Class took a number of scenes at the local Old Settler's Day Celebration last month.

The Rochester Photo Works, Inc., announces the results of the first R.P.W. Enlarging Contest. Prizes have been awarded by the jury as follows: First prize, A. C. Sheldon, Charlotte, N.C., "Sunbeams;" second prize, Wm. S. Davis, Orient, N.Y., "Ice Crowned;" third prize, Herbert Wheaton Congdon, New York, "Emerald Lake—Dawn." The high quality of the entries has been so gratifying that it has been decided to add to the list two more special prizes of $5.00 each awarded to those entries upon which the majority of the judges have bestowed honorable mention, and these are: Fourth prize, Miss D. E. Wallace, St. Louis, Mo., "Daughter of Mojave;" fifth prize, J. A. Murdock, Atlanta, Ga., "Park Scene." The following other entries have received honorable mention, some of them with strong recommendation for second choice for third prize, sixth prize, Miss Rae Davis, Glendale, Cal., "Portrait of Child;" seventh prize, J. B. Strachota, Detroit, Mich., "Polar Bear;" eighth prize, E. J. Brown, Newark, N.J., "Large Head of Child;" ninth prize, Wm. S. Davis, Orient, N.Y., "Summer Foliage;" tenth prize, John Bray, Brooklyn, N.Y., "Public Library, New York City;" eleventh prize, Richard Pertuch, Philadelphia, Pa., "Winter Scene;" twelfth prize, Miss D. E. Wallace, St. Louis, Mo., "Nocturne;" thirteenth prize, Richard Pertuch, Philadelphia, Pa., "A Marine." The firm is naturally proud that, while some very excellent entries have been made on other enlarging papers than theirs, and while some of these have received honorable mention, all of the first prizes have been won on Velour Black paper. The impartiality of the judges of this contest being beyond question, it feels that these results speak highly for Rochester Photo Works enlarging papers. The results of this contest have been encouraging to such a degree that the firm will be glad to continue at regular two-monthly intervals contests along the same line as this first one.

There is a new film on the market. Its name is Atlas, and it is marketed by Burke & James of Chicago. The prices are the same as for other standard films, and, like the very best makes on the market, it is non-curling, rapid, orthochromatic and non-halation. Having had the privilege of personally trying the film, the editors can recommend it as being of the highest grade, which of course is insured by the reputation of the manufacturers, for it is made by the Eastman Kodak Company, the largest manufacturers of films in the world.

Exposure-Tables for November, December and January

DIRECTIONS: Find in the tables printed below the NUMBERS for SUBJECT, STOP, LIGHT, HOUR, and PLATE. Add them, find the sum in the last table, and give the exposure indicated. When the exposure fails to correspond with the speed-marking on shutter, use the nearest shutter-speed, preferably the lower. If sunlight falls over one shoulder, add **0**; if straight across subject, add **1**; if sun is ahead, add **2**. When using back combination only of lens, add **2**.

EXAMPLE

Average landscape	3	July, 11 A. M.	0
Stop U. S. No. 8	6	N-C film	1½
Intense light	0		

Adding these numbers, we get **10½**, and on referring to the last table, under **10½**, we find **1-40** second, which is the exposure to give. In this case you would use the speed marked **1-50** and open the lens a little, if possible; say, half-way to U. S. No. 4.

SUBJECT

Sea (only) and clouds	½	Street scenes, buildings, groups	5
Sea-views, snow-scenes, distant landscape	1	Portraits in shade	7
Open landscape, without foreground	2	Indoor portraits	8 to 10
Average landscape, with foreground	3	Interiors	16

STOP: —

f:2	*f*:2.3	*f*:2.8	*f*:3.3	*f*:4	*f*:4.7	*f*:5.6	*f*:6.7	*f*:8	*f*:11.3	*f*:16	*f*:22	*f*:32	*f*:45	*f*:64
				U.S. 1	U.S. 1.4	U.S. 2	U.S. 2.8	U.S. 4	U.S. 8	U.S. 16	U.S. 32	U.S. 64	U.S.128	U.S.256
1	1½	2	2½	3	3½	4	4½	5	6	7	8	9	10	11

LIGHT: Intense sunlight (inky-black shadows), **0**; Bright sunlight (strong shadows), ½; Faint shadow cast by sun, **1**; Dull (no shadows), 1½; Very Dull (whole sky very dark), **2**.

HOUR: 11 a.m. to 1 p.m., **1**; 10 a.m. and 2 p.m., 1½; 9 a.m. and 3 p.m., **2**; 8 a.m. and 4 p.m., **3**; 7 a.m. and 7 p.m., **5**.

PLATE: AMERICAN, 1½. ANSCO FILM, 1½. BARNET — Film, 1½; Superspeed Ortho., **1**; Ortho. EX. Rap., **2**; Red Seal, **1**; Red Diamond, 1½; Self-screen Ortho., **2**. CENTRAL — Special XX and Sp. Home Portrait, ½; Special, **1**; Comet, Colornon, and Pan-Ortho., 1½. CRAMER — Crown, **1**; Anchor, **2**; Banner, 1½; Inst. Iso., 1½; Med. Iso., **2**; Commercial Isonon, 2½; Portrait Isonon, 1½; Trichromatic, **3**; Slow Iso., **5**; Contrast, **9**. DEFENDER — Vulcan, **1**; Vulcan film, 1½; Ortho., **2**; Non-hal. Ortho., **2**; Slow, **9**; Process, **9**. DUFAY DIOPTICHROME, **7**. EASTMAN — Motion Picture Film, **1**; Portrait Film, **1**. ENSIGN FILM, 1½. FORBES—Challenge, 1½. HAMMER—Sp. Ex. Fast, **1**; Ex. Fast, **1**; Aurora Ex. Fast, 1½; Ortho. Ex. Fast, 1½; Ortho. Non-hal. **2**; Fast, **2**; Ortho. Slow, 2½; Slow, 2½. ILFORD—Monarch, **1**; Zenith, 1½; Sp. Rap,. **2**; Chromatic, 2½; Ord., **3**; Process, **9**. IMPERIAL—Flash-light, **1**; Spec. Sensitive, **1**; Orthochrome S. S., **1**; Spec. Rap. 225, 1½; Spec. Rapid 200, **2**; Non-filter, **2**; Process, **9**. JOUGLA — Violet Label, 1½; Green Label, **2**; Omnicolore, **7**. KODAK—Speed Film, **1**; N. C. Film, 1½. KODOID PLATES, 1½. LUMIERE—Sigma, ½; Blue Label, 1½; Film, 1½; Ortho. A, **2**; Ortho. B, **2**; Panchro. C, **2**; Autochrome (outdoors), **8**, (indoors) **9**; Process **9**., MARION — Record, ½; P.S.,**1**. PAGET—XXX, 2½; XXXXX, **2**; Swift, **1**; Ex. Spec. Rapid, **1**; Ortho. EX. Spec. Rapid, 1½; Panchro. Ord., **2**; Panchro. Colour (no screen), 2½; Spec. Rapid, 1½; Hydra Panchro., 3½; Hydra Rapid, 3½. PREMO FILM PACK, 1½. ROEBUCK—Blue Label, **1**; D. C. Ortho., **2**; Ortho., **2**. SEED — Gilt-edge 30, ½; Color Value, **1**; Gilt-edge 27, 1½; L. Ortho., 1½; 26X, **2**; Non-hal., **2**; Non-hal. L. Ortho., **2**; Tropical, **2**; C. Ortho., 2½; Panchromatic, 2½; 23, **3**; Process, **9**. STANDARD — Extra, 1½; Imperial Portrait, 1½; Orthonon, 1½; Polychrome, 1½; Thermic, 1½. STANLEY — 50, 1½; Commercial, **4**. THORNWARD — Regular, **1**; Orthochromatic, **2**; Orthochromatic N. H., **2**. WELLINGTON — Extreme, ½; 'Xtra Speedy, **1**; Film, 1½; Iso. Speedy, 1½; Portrait Speedy, 1½; Anti-screen, 1½; Speedy Spec. Rap., **2**; Ortho. Process, **9**. WRATTEN & WAINWRIGHT — Panchromatic, 1½; Process Panchromatic, **3**.

3½ S 1/500	4 S 1/1000	4½ S 1/2500	5 S 1/2000	5½ S 1/1250	6 S 1/1000	6½ S 1/750	7 S 1/500
7½ S 1/350	8 S 1/250	8½ S 1/150	9 S 1/100	9½ S 1/75	10 S 1/50	10½ S 1/40	11 S 1/25
11½ S 1/20	12 S 1/12	12½ S 1/10	13 S 1/8	13½ S 1/5	14 S 1/4	14½ S 2/5	15 S ½
15½ S ⅔	16 S 1	16½ S 1½	17 S 2	17½ S 3	18 S 4	18½ S 5½	19 S 7½
19½ S 11	20 S 15	20½ S 23	21 S 30	21½ S 45	22 M 1	22½ M 1½	23 M 2
23½ M 3	24 M 4	24½ M 6	25 M 8	25½ M 12	26 M 15	26½ M 24	27 M 30
27½ M 45	28 H 1	28½ H 1½	29 H 2	29½ H 3	30 H 4	30½ H 6	31 H 8

These tables are based on the 1914 edition of the "American Photography Exposure-Tables," a new and revised form of the "Photo Beacon Exposure Card." Owing to the great increase in the speed of lenses and plates since the original compilation of these tables, it has been necessary to completely change the system of numbers corresponding to stops, plates and exposures, so that exposure numbers from this table are 5 units higher than in the old tables. The complete tables, in pocket form, 3 x 5 inches, containing full directions for obtaining correct exposure under all conditions, may be obtained from our publishers at the price of 25 cents postpaid.

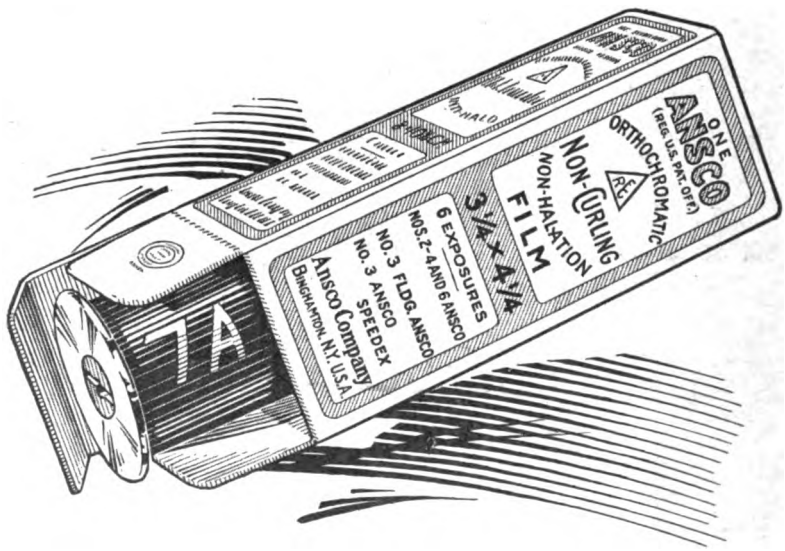
DECEMBER, 1914 TEN CENTS

Popular Photography

Published Monthly
Boston, Mass.

Ansco Film

The article and invention for which many millions were paid as a result of the decision handed down by Judge Hazel, in the United States District Court of Buffalo, which decision was affirmed by the United States Circuit Court of Appeals.



The Ansco non-curling color value film costs no more than ordinary film.

Be sure to load your camera with the original, genuine and perfect film.

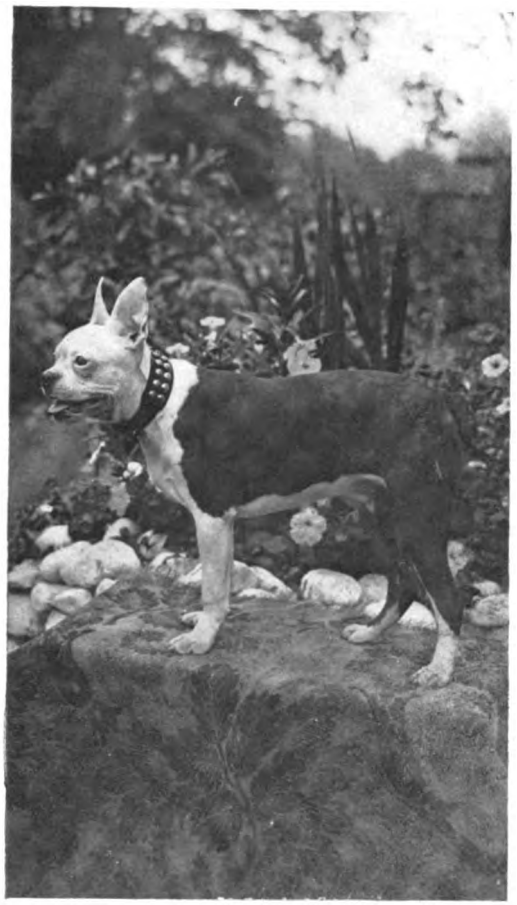
Ansco Company
Binghamton, N. Y.

POPULAR PHOTOGRAPHY

Volume III | Boston, Mass., December, 1914 | Number 3

ALONG THE SHORE — G. E. PEASLEE

Prize Picture — October Competition (*See page 112*)



ACCESSORIES AND DOG JAMES SMITH

ACCESSORIES AND DOG

The title which we have given to this untitled print seems to us simply a fair statement of the impression it made on us at first glance. Closer examination reveals the fact that the dog is well posed, in a light which gives perfect modeling and detail, the image exquisitely defined, as only a good anastigmat lens can define — but the accessories overwhelm the dog and attract far more attention. The maker has simply fallen into the common mistake of crowding his picture with things which have nothing to do with its idea. Data: No. 10 Ansco Special with Wollensak Velostigmat lens; 1-50 second at *f*: 11; bright light; July, 3.00 p.m.; Seed 26X plate; pyro tank development; Azo C Hard card.

LOCAL REDUCTION OF NEGATIVES

PRACTICUS

It is frequently necessary to reduce the intensity of portions of a photographic image without in any way altering the remainder, less frequently perhaps since the introductions of persulphate, but still an almost everyday operation where the best class of print has to be obtained.

There are two principal methods of effecting the desired end — chemical and mechanical, the one being the local application of the well-known reducing solutions, while the other depends upon abrading or scraping away a portion of deposited silver. The chemical method is perhaps the favorite, as many photographers are still nervous where the use of the knife is suggested, and they know of no other way. The ferricyanide and hypo solution introduced by Mr. Howard Farmer is the one most generally used, and if applied with some small degree of dexterity gives most excellent results. For local use it should be fairly strong, as it is then quicker in action and less liable to wander onto parts of the negative which do not require its ministrations. I have found a 10 per cent hypo solution, rendered a bright yellow color with a strong solution of potassium ferricyanide, to work well and quickly. Care must be taken not to use too much ferricyanide solution, or it will work too quickly, and show streaks where the brush or pad has been used. It is desirable to use perfectly fresh ferricyanide solution; dissolve a few crystals in a small graduate, throwing away any that may be left.

Some sort of a desk is absolutely necessary, especially with large negatives; the easiest way to arrange one is to rest a sheet of stout glass on two blocks of wood, or even small boxes on the bench or in the sink, one end being slightly raised, so that the direction of the flow of any surplus solution can be predetermined; beneath the glass a piece of opal glass serves as a reflector, so that the reduction may be watched without lifting the negative.

The best condition for the film is when it has been drained long enough for all loose moisture to have disappeared. If too wet it will be difficult to keep the reducer from spreading, and if too dry there is danger of showing a sharp outline to the work. A camel's-hair brush in quill or a small pad of cotton is used to apply the solution, which must be applied sparingly and distributed over the area to be reduced, fresh solution being applied from time to time as may be required. A pad of damp cotton wool is convenient for quickly removing the reducer when it has done its work, and after this the negative should be put under a spray to wash as after fixing. Some workers prefer to follow the reduction by immersion in a clean fixing bath but I have not found this

GOOD FRIENDS
E. B. WOTKYNS
(See page 108)

STEER RIDING · C. MULLEN

necessary when using the solution at the strength already mentioned.

Besides the "Farmer" reducer, there are many others suitable for local application, notably the iodine and cyanide solution as used by bromide workers. This must, of course, be used in a more concentrated form for negative work, as the deposit of silver is much heavier. It must be remembered that cyanide fumes are extremely poisonous, so that it is not desirable to get the mouth and nose too near the negative while the solution is upon it. Apart from this the solution is an excellent one, and does not alter the color of the portion treated with it.

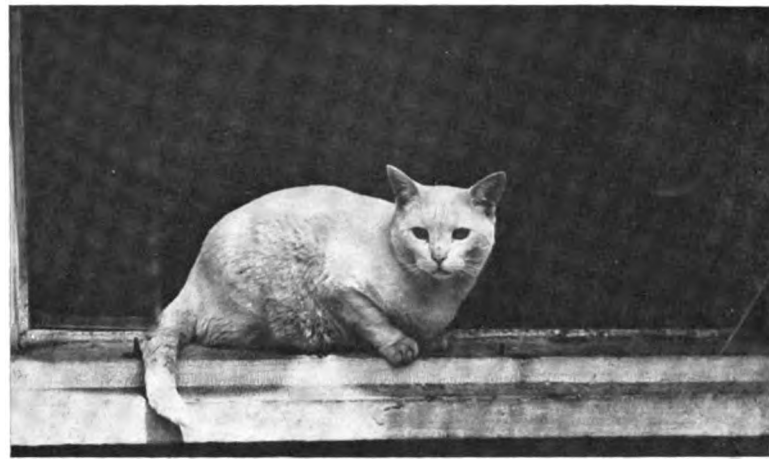
There is one method of reduction which stands midway between the chemical and the mechanical, and that is the use of "ozone bleach," which in action seems to be very similiar to "eau de javelle." If a negative is immersed in a solution of this, the gelatine becomes softened and the image is removed bodily. For local reduction the negative is entirely immersed, and when the surface is softened a soft camel's-hair mop is used to remove any desired portion. The objection to this process is that it is difficult to avoid removing more of the film than is necessary.

Turning to purely mechanical methods of reduction, the most simple is friction with a piece of fine chamois leather, moistened with methylated spirit. This is frequently used for the reduction of overexposed and halated windows in interiors, and for this purpose it answers very well, as the patch to be reduced has no decided outline, and consequently the rubbed portion, which softens off gradually, is not at all in evidence. In cases where the patch to be reduced has a sharp outline it is difficult to keep clear of the surrounding parts, and consequently the patch is surrounded by a dark halo. Another attrition process is known as Baskett's. Here, instead of methylated spirit, a sort of pomatum is used, the formula being:

Salad oil ..... 1 oz.
Terebene ..... ½ oz.
Globe Polish ..... 1d. tin

This is rubbed on with a soft leather or rag, and the reduction goes on fairly rapidly; it is easier to keep to an outline than with the spirit as a lubricant. A very elegant method of mechanical reduction is furnished by the "Negafake" pencils and lubricant. These work on the same principle, but permit of the finest details being dealt with. They consist of the fine crayons or leads made of a composition which, when used for retouching, removed a portion of the image instead of adding to it. Effects equal and in some cases superior to fine knife work can be obtained without the exercise of any great skill. Dry powders, such as pumice and cuttle-fish, have been recommended for local reduction, but they are very prone to give "scratchy" or granular results, and are not to be recommended.

The retouching knife is often the best local reducer, especially for fine detail which cannot be treated with a liquid reducer or by rubbing. As its use pertains more particularly to retouching, I will not deal with it at length, but will merely give one or two hints. One is that the gelatine film must be absolutely dry. Another is that the knife must have a fine and keen edge and must be held nearly at right angles to the film; and a third is that the



MIKADO MARGARET HITCHCOCK

lightest possible shaving should be taken off at a time. The knife must be firm enough not to "chatter" or jump when scraping, or a succession of lines across the line of scraping will appear. A really good penknife or a surgeon's scalpel are very suitable, and the special knives as designed by Mr. Bruce are still better.—*British Journal of Photography.*

STEER RIDING

Action pictures like this demonstrate the superiority of a reflecting instrument, as can be seen by the sharp focus the operator is able to secure on his principal object, though at the expense of definition elsewhere. The data are: 5 x 7 Hall Mirror camera, fitted with a Tessar IIb; 1-500 second in bright sunlight; Seed 30 plate; pyro tank development; Normal Glossy Cyko postcard, developed with duratol.

CLASSIFYING A PLATE

A reader who formerly thought the Thermo system of development a delusion writes: "D.-Q. is my standard developer now, thanks to you — for plates, films, paper — everything, and I believe it is the best developer I ever used. Oh, by the way, you might add Wratten and Wainwright Panchromatics to your Thermo list as VVQ development speed. I got some negatives on those plates at Q dilution which were too strong for even Professional Cyko. At VVQ they gave negatives about right for average P.O.P."

We have recently tested both Wratten Panchromatic and Process Panchromatic. The former is listed in the September 15, 1914, issue (English) of the Watkins speed card as 250 M.-Q., which corresponds exactly to the rating we determined by actual exposures outdoors. The Process Panchromatic is not listed by Watkins, but we would place it as 90XQ. Our reader may, of course, require a different type of negative, but we believe that if he has to use the weakest developer he is exposing altogether too long. Normal exposures, that is, half Bee meter time with P number 250, gave us perfect negatives at M.-Q. dilution.

MIKADO

As is so often the case with halftone reproductions, this one fails to do justice to the original. The finer tones which give roundness and almost make one feel the fur texture in the print have been mostly lost in the cut, which has brought out many of the faintest grays almost white. The technique of the print is very fine. The arrangement is good, particularly the spacing, with the major part of the cat's body to one side of the middle line. Data: 4 x 5 Seneca No. 6B camera with 9¼-inch R. R. lens; portrait attachment used; 1-25 second at *f*: 11 in May at 10 a.m.; bright sunlight; Defender Ortho plate; Eastman tank pyro powders; print on Instanto Hard Semimatte.

STANDARDIZING EXPOSURE AND DEVELOPMENT

Although a goodly number of readers of POPULAR PHOTOGRAPHY have written that they have tried the Thermo system and are getting better results than they ever had before, a few hesitate to adopt it for various reasons. One of these subscribers writes as follows: "I have read several articles on the Thermo System. I have an Ansco No. 10 Special postcard camera for films and plates.

MAJOR ALICE FLORY

I have the same difficulty as all amateurs. I either overdevelop or underdevelop. It is only luck when I get them right. I have fitted up a studio in the rear of my house, with a south door and window for light. I find I need about 5 seconds at *f*: 6.3, which is all right for adults; but young children move and spoil the picture. I have been using plates classed as 2 in your tables. Can you recommend a faster plate? Will you also please let me know the cost of the Thermo system?"

All that is needed in a case like this is to reduce all possible factors to a uniform standard. If daylight is used, the easiest way to regulate exposures so that they will be uniform is to use an exposure meter. The tinting meters, Watkins and Wynne, are good; or one can use the Heyde, which, though more costly, can be operated quicker in indoor light. For the children, it might be advisable to adopt a flashlight system, all exposures being made alike by using the same weight of powder for each flash. Still, by adopting any of the plates listed in our Class ½, the daylight exposure can be reduced to about one fourth what is needed for a Class 2 plate. All of the plates rated ½ are good.

The extra cost of using the Thermo system is hard to determine, for practically the only thing which may have to be purchased is a thermometer. The regular trays, etc., are used, though perhaps one might invest a little money in extra trays to use as covers. The developer, to be sure, is used for only one plate; but this is really economical, for it may be saved for paper, and it is cheaper not to run the risk of spoiling negatives by using a solution a second time. Anyone doing a great deal of work should use a plate tank, of which there are several good patterns on the market.

A complete outfit for Thermo development would include an expenditure of $3.50 or $4.00 for an Improved Interval Timer; but this outlay is soon saved in comfort alone, to say nothing of the benefit of being able to do some other work while plates are developing, secure in the knowledge that they cannot remain in too long, as the alarm bell calls one at the right time to take them out.

When exposures are brought within a narrow range and well within the latitude of the plate, and when the control of contrast is regulated by the Thermo system of developing, technically perfect work can be turned out day after day without the slightest trouble. Any apparent extra cost of the Thermo system for developer is saved in the plates, for one need never lose a plate if ordinary care is exercised to avoid scratching them.

MAJOR

Poor drawing is sure to be the result of using a short-focus lens close to the subject in order to get a large image. The false foreshortening in this picture is marked, for a lens of only 8 inches' focus is a short focus lens when it comes to working for large images. Half of the lens used at twice the distance would have been about right. In fact, there are both theoretical and practical grounds for considering a 16-inch lens almost ideal. One reason is that 16 inches is about the best reading distance

A MOUNTAIN ROAD GEO. F. MIMS

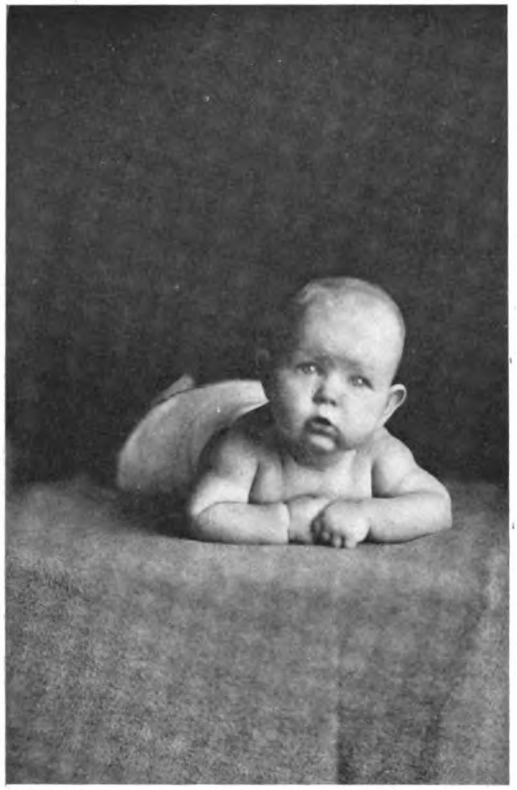
for normal eyes, and any picture looks best when viewed from a distance equal to the focus of the lens which took it. Thus, if the observer can focus this picture at eight inches from his eyes, the distortion will not be evident at all. The point is, notwithstanding, that even in cases where it would be perfectly easy to employ the long-focus single combination, camera workers seem to think they must use the doublet. Aside from this one mistake, there is nothing to criticize in this picture, which has good technical work in all respects. Data: 5 x 7 Century camera with 8-inch rapid rectilinear lens; *f*: 11; 30 grains of flashpowder; Standard Polychrome plate; pyro; print on Noko Medium B.

A MOUNTAIN ROAD

Halation, slight in amount, is the only thing which mars the perfection of this print, technically considered, though the composition, as the maker admits, would be better if there were a larger mass on the left. What is of more importance, however, is the fact that although the detail is brilliant, the exposure correct, and the rendering of values very fine, the print remains a record for lack of some theme in the author's mind. He seems to have had no thought to express except that the road offered good photographic material. He succeeded in recording that fact, but did not thereby make a picture. Data: 4 x 5 Korona IV with 6½-inch R. R. lens; 1 second at *f*: 16 in November at 4 p.m.; bright light; Hammer Red Label plate; hydro-metol tank; print on Normal Glossy Cyko.

TAKING THE CHRISTMAS TREE

Although it can hardly be considered a pictorial subject, the family Christmas tree will be taken by hundreds of our readers. Don't forget that flashlight is the best and simplest source of light, and don't be afraid to use plenty of powder, even with an orthochromatic plate,



EDITH JOHN H. MARKLEY

because the blue-green of the tree is sure to photograph black unless very fully exposed.

EDITH

Portraits of the four-months stage of babyhood are, fortunately, not quite so hard to secure as those of a later period of development, when the infant's only idea seems to be keeping perpetually in motion. Still, the problems of securing a good lighting, proper surroundings and the best possible moment for making the exposure are not of the easiest. The handling in this case is worth study. Observe the simple, dark background, the blanket-covered table, and the interesting pose, with the emphasis of sharp focus on the head, yet showing enough of the body to prevent stiffness. The facilities of a studio, of course, make the problem of lighting less difficult than it is in average home surroundings, yet by choosing the brightest possible illumination, the amateur can often get a lighting which both looks and photographs well. Data: 5 x 7 portrait camera with *f*: 4 Harrison portrait lens of 12 inches' focus; quick bulb exposure at full opening; December; faint sunlight outside; Standard Thermic plate; M.-Q.; Normal Studio Cyko.

A USE FOR SPOILED PRINTS

Don't throw away the spoiled prints, but keep them together, and when you have a few minutes' spare time put a good number of them in a dish or washer, practically under the same conditions that they would be when dealing with a batch of prints. Before doing this, give all the prints a soaking for a minute or two in a bath of dye. Ordinary red ink will serve for this, or any of the packet dyes which wash freely out of gelatine. By then going through the washing process as you would in the ordinary way, you can obtain some idea of how efficient it is. The gradual removing of the dye is seen and you may take it that the washing that removed such dye from the prints is about on a par as regards effectiveness when washing out hypo. In the same way a little of the dye dropped into an automatic washer so as to color the water in it strongly will provide a test for showing how long the washer takes to provide a completely fresh change of water. Four or five such changes will remove all hypo that can be removed from negatives.—KUAN-AHAN.

A SELECTIVE REDUCER

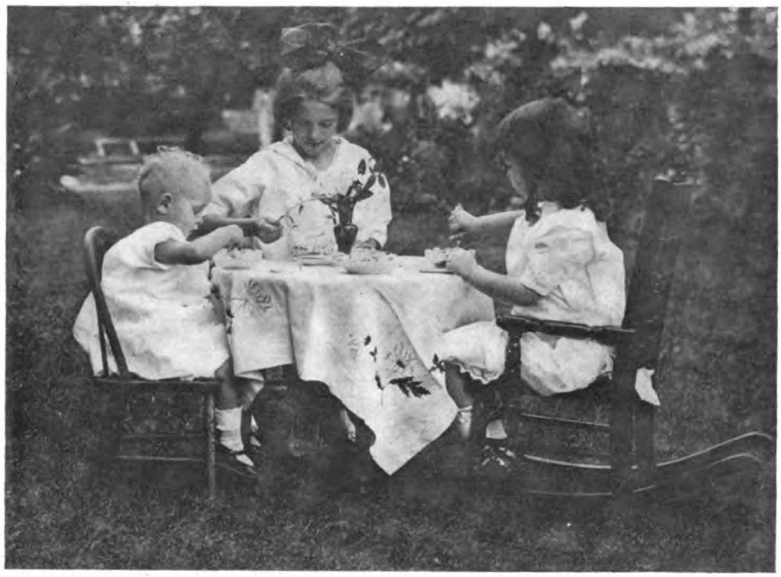
Thousands of amateur negatives are so dense in the highlights from undertiming and forced development that no paper can ever record anything save the shadows and the middle tones until the density is reduced. What is wanted is a selective reducer, one which will thin the highlight without attacking the shadow details. Ammonium persulphate is one, but it is notoriously unreliable, some specimens absolutely refusing to work at all, doubtless because they had decomposed, as the salt is very unstable. A far more reliable reducer is acid permanganate. A stock solution of 1 grain of potassium permanganate in a pint of distilled water may be kept at hand, and when reduction is to be carried out, the dry negative should be immersed in a portion acidified with a drop or two of concentrated sulphuric acid just before use. The action is rapid and should be closely watched. As soon as reduction is sufficient, immerse the plate in a weak solution of sodium bisulphite or potassium metabisulphite until the brown stain is bleached out, and finally wash well.

Failure of the reducer to act is due to the plate having been tanned too hard during fixing. The gelatine in such a case must be softened by prolonged soaking in warm or hot water, sometimes with the addition of a little hydrochloric or nitric acid.

THE YOUNG FISHERMAN W. F. BAKER

THE YOUNG FISHERMAN

This charming little study in home portraiture would perhaps be improved if it were not quite so crowded in the space. A little more room could advantageously be given on all sides but the top, an indication that the camera was brought too near the subject, which is also carried out by the rather soft focus of the print, though the enlargement has a share in this. The pose could hardly be more natural or graceful because of its thorough unconsciousness. The exposure was made with a 3A special kodak, fitted with Zeiss lens of 7 inches' focal length. The exposure was 1-10 second at *f*: 6.3 at 10 a. m. on a bright day in May. The N. C. film was developed with pyro and the enlargement was made on royal bromide.



PEACHES AND CREAM HERBERT JACKSON

PEACHES AND CREAM

The author of this picture makes the following note, "The negative is underexposed. A short exposure was necessary, as the children were constantly moving." Making all the allowance which is needed, on account of the statement just quoted, we still cannot refrain from pointing out the possibility of using a set or automatic exposure of 1-5 or the quickest possible bulb exposure, generally amounting to about 1-5 second. There are, in all moving objects, certain phases when the movement is very slight or even stopped momentarily. By watching patiently for the right instant, the painstaking operator can often make the longer exposure without showing any blur at all. An undertimed negative must always fail to give a thoroughly satisfactory print, no matter how skilfully one works it up and favors its weaknesses. Mr. Jackson has done wonders here, but the effect is poor in spite of all his care. The subject is otherwise extremely worth while and makes us regret the technical lapse which has prevented it from showing to the best advantage. Data: 4 x 5 camera with Wollensak Vinco lens of 6¾ inches' focus; 1-25 second at *f*:8 at 3.30 p.m. in August; figures in shade of house, but bright sunlight elsewhere; Eastman film; tank pyro; part of negative enlarged on Normal Studio Cyko.

FIRELIGHT TONES

Bright golden-red tones ranging to crimson are a variation from the customary style which few photographers seem to take up, probably because they have not come across a reliable method of getting such tones on bromide prints. A formula which was published some years ago in a foreign paper and which has been used with success is applied after first toning in the hypo-alum bath. The toning solution is made as follows:

Gold chloride	1 gr.
Water	2 oz.
Ammonium sulphocyanide	10 gr.
Hydrochloric acid	10 minims.
Sodium chloride (common salt)	10 gr.

The chemicals are mixed in the above order. The toned prints are thoroughly washed and the toning solution applied. The process is not rapid, the first distinct warm stage of tone being reached in about ten minutes. The tone passes toward pink and red, finally becoming a rich crimson. For firelight portraits this method is a useful variation from the plan of staining the whole print. So far as we know, the red tones are permanent.— G. F. SAUNDERS.

A HINT FOR SNOW PICTURES

Inasmuch as a great part of the effect of a snow scene depends on the crystalline texture of the snow, it is not advisable to use a large stop if such an opening loses to any degree the granularity of the snow. A good average aperture for snow work is *f*: 16; but a smaller stop will seldom do harm, while it is sure to prevent the fogging of the plate by the strong light which floods the camera interior through a large stop. It is also particularly important to use a good lens hood which will cut off all

side light, whether from the sky or from the snow, if crisp, truthful results are desired.

ELEANOR

As a record portrait, the present example has an interest even for those who do not know the child, because the arch, mischievous expression is so charming. Mr. Meservey says that he does not see how the developing and printing could be improved; but we do not agree with him, for the print seems too dark and flat, even after making allowance for the short range of tones presented by the subject. We should try brightening up the negative by very brief treatment with ferricyanide-hypo, possibly followed, after thorough washing, by slight intensification with mercuric iodide, unless a more brilliant print could be had on the same paper by shortening the exposure and strengthening the developer. Data: 4x 5 Cycle Poco camera with 6½-inch R. R. lens; 1-5 second at *f*: 11 in August at 2 p.m.; bright sunlight, but sitter in shade of trees; Standard Polychrome plate; duratol-hydro developer; enlargement with Brownie enlarger on Azo E Hard, developed with duratol.

ELEANOR C. D. MESERVEY

MOTION-PICTURE ACTORS

This interesting picture was not submitted for publication, but we deemed it of sufficient novelty to merit obtaining Mr. Sturgeon's permission to reproduce it. He writes that the chimpanzee shown is one of the menagerie maintained by the Jungle Film Company, a well-known producer of the film drama. The anthropoid is evidently a young specimen, as may be seen not only by his size but also by his fondness for the keeper's child. It is said that chimpanzees are the most intelligent of all the great apes, and they certainly approach the human type more closely than do the other anthropoid apes. Data: 4 x 5 Premo D camera with 6⅝-inch single lens; 1-25 second at *f*: 22 in August in bright sunlight; Vulcan Ortho plate; metol-hydro-pyro; print on a Normal Studio Cyko postcard.

MOTION-PICTURE ACTORS F. T. STURGEON

PARADISE ROAD A. S. CURRIER

PARADISE ROAD

The illustration presented herewith is one of the many recently received, doubtless showing summer work. In the collection just looked over we were much pleased to see the amount of outdoor work, and such a large number of excellent landscapes showing not only good technic but a fine appreciation of composition as well. We hope either in this issue or the one following we will be able to show a large portion of miscellaneous work, with the idea that the data which apply to landscape and portrait work may be useful to others. Similar bits of scenery can be found in nearly all parts of our country, and interesting poses of people and characteristic attitudes of young children may be copied. Sometimes a suggestion shown by the work of others will bring forth equally as good, if not better rendering from the hand of another. The data of the print entitled Paradise Road are as follows: Made with an American camera, fitted with triple convertible lens of 8 inches' focal length. The exposure was 1-5 of a second at stop 16, at 12.30 on October 18, in bright sunlight in southwest New Hampshire. The plate was developed with pyro and printed on Noko paper.

We are reproducing two cuts of this picture, the former as it was received by us and the latter trimmed as we believe it should be. Taking an inch from the left side, and a quarter inch from the right side helps materially to simplify the composition, and to concentrate the interest on the two beautiful lines of trees on either side of the road, allowing the eye to enter the picture from the lower right-hand corner and follow along past the two darker masses or spots, as pictorialists call them, on to a vista beyond. The imagination can here have some play and we may wonder whether

this road leads to an attractive pond or an artistic home in the depth of the country.

Let us suggest that you try to make your landscapes as simple as possible. For record work it is advisable many times to show all that can be rendered with a strong lens, but for a pleasing photograph that may be called a picture, and one which we would like to look at again and again, let us repeat that the simpler you can make it the very much stronger it becomes. Simplicity is one of the hardest things to master, and many of the famous paintings which have stood the test of years have done so largely on account of their simplicity.

METOL DEVELOPER

Fifteen years ago we used to pay 75 cents an ounce for metol and 25 cents an ounce for hydrochinon. During the last week in July we bought 4 ounces of hydro. for a quarter, but now metol is back to the old price and hydro. is quoted at $5.50 a pound. While the war lasts, or until the American chemical firms get to making photographic developers in sufficient quantities, it will be cheaper to use a straight metol developer. One which we can confidently recommend is:

A

Metol	150 gr.
Sodium sulphite, anhydrous	550 gr.
Water to make	20 oz.

B

Sodium carbonate, anhydrous,	770 gr.
Potassium bromide	16 gr.
Water to make	20 oz.

For use, take equal parts for strong negatives and equal parts with one or more parts of water for soft negatives. Watkins factor 30.

RED IN NATURE

During the fall, which this year has been an unusually dry one, we have been making a study of the colors to be seen in the landscape. Even as late as the middle of November considerable vivid green could be found in the fields where moisture lingered and frost had not penetrated. Elsewhere, in dead leaves and in weeds, red-brown seemed to be the predominating color. Actual photographic work proved that even a yellow-green-sensitive emulsion (the ordinary ortho or iso plate) could not secure these reddish tones in their true value unless exposures were greatly increased. A spectrum plate, on the other hand, even without a filter, gave proper rendering with normal exposure and needed a filter only to reduce the overtiming of the sky. A Reform filter proved excellent for this purpose, as it did not require any larger multiplying factor than 2 to render both sky and foreground harmoniously.

PARADISE ROAD A. S. CURRIER

There are two objections to the use of red-sensitive plates: the first, that they do not keep well; the second, that they must be developed in total darkness or a safe green light. The first objection may be got around by ordering in small quantities, dating the box, and using them within three months in summer or six months in fall and winter. The second is not serious, as Lumière's Virida papers form a cheap and perfectly safe light, and as a matter of fact, handling the plates in total darkness is easy if the Thermo system of development is employed.

THE DUTCH MILL B. J. HURCKER

THE DUTCH MILL

Mr. Hurcker says in answering the question, "Could you improve on it if you tried again, and how?" that he believes a color-sensitive plate with a filter would have saved the clouds, which now are too dense to print out. Putting aside for the moment the obvious advice to use nothing but color-sensitive plates for general work, let us see how overdense clouds can be saved. This negative has so many lines against the sky background that it would probably be impossible to shade it out in printing without causing very perceptible lines of demarcation between shaded and unshaded portions, so the only thing to do is to work on the negative. The problem is to introduce a little contrast between the blue of sky and the white of clouds, hence a reducer which will cut out the silver deposit more rapidly from the thinner than from the denser parts is what is required. Farmer's reducer, ferricyanide-hypo, is the thing in this case. Soak the negative for half an hour (or more, if it has been hardened in any of the usual acid fixers) and swab the sky with a tuft of cotton wet with a weak reducer, say 1 ounce of hypo dissolved in 8 ounces of water and enough ferricyanide solution added to make it a light straw color. Watch the action carefully, rinsing frequently under the faucet, and when there is sufficient contrast between blue and white, wash well. This reducer will, of course, tend to eat out all traces of shadow detail in the wings of the mill, but if the work is carefully done it will not be too noticeable. In case a negative is valuable, a better course is to make a contact positive on a fast plate, so that a negative can be printed from it, the second negative often showing values impossible to secure on paper except by passing through the medium of a transparency.

The spacing of this picture is poor, the mill being too near the middle. Half an inch taken from the left and added to the right in arranging the view on the ground glass would have seemed more satisfactory. A little more rise of the front, aided, in the last extremity, by the vertical swing, would have allowed the whole of the wing to show. Data: 5 x 7 Seneca camera with Wollensak Velostigmat lens of 7 inches' focus; rear combination used alone; ½ second at 3.30 p.m. in May; bright sunlight; Cramer Crown plate; M.-Q.; Normal Cyko Semi-Matte. The exposure was calculated by our tables, as follows: Subject, 3; stop, 7; light, ½; hour, 1.00; plate, 1; rear combination, 2; sum 14½, or 2-5 second exposure.

WHITE GROUNDS

There is one error which is very easy to fall into when starting to make photographs with white backgrounds, and that is giving too short an exposure. Of course if the lighting is purposely flattened and no heavy shadows are present, it is possible to work more quickly, but in the majority of cases only the background is altered, and the lighting of the figure is the same as for a medium or dark background. It should stand to reason that even if the same quality of negative be required the exposure must be the same, while if, as is more usual, a softer effect is desired a slightly longer exposure should be given. A plate of good quality will stand a very full exposure before it becomes flat, and if this is followed by full development, an image is obtained that will give pearly lights and soft shadows. Even in ordinary portraiture there is a tendency to underexpose, and then to blame the studio lighting. This is especially the case with artificial light. A more diffused light and a longer exposure will go a long way toward making electric-light pictures comparable with daylight ones.

WINTER EXPOSURES

Winter is full of picture-making opportunities. Buy a tripod and expose by our Monthly Tables and you will be successful.

SUMMER H. B. RUDOLPH

SUMMER

One of the principal beauties of this interesting landscape is the pleasing rendition of clouds in the original, though we regret to say that the halftone reproduction does not adequately reproduce them. In order to get the clouds, however, the maker has given too little exposure for his landscape and made the shadows of the trees far darker than they appear in nature. The arrangement is so pleasing, however, and the quality of the sky and water so well rendered, that one is inclined to overlook this and regard it as a fairly truthful representation of the scene. The Century 5 x 7 camera was fitted with a Euryplan lens of 7 inches' focal length and a Burke and James 8 times ray filter. The exposure was one second with *f*: 16 in bright light at 4 p. m. in August. The Standard Orthonon plate was developed with pyro in a tray and the print was made on Azo E soft.

THE RAPID PRODUCTION OF PHOTOS

There are numerous occasions on which the photographic worker wishes to get through the operations as rapidly as may be, and to have a finished print in the shortest possible space of time after making the exposure. When, for example, some interesting subject has been photographed, and it is thought that some of the illustrated papers might use the picture, it is essential to submit a number of prints with the minimum of delay, for not only is promptness necessary, but a few minutes may mean the difference between one's own prints being accepted and the other man's. Quite apart, however, from such press work, one often wishes to get out some copies of groups taken, perhaps, on a holiday, and the whole of the work has to be run through very rapidly, though not at such high pressure as when working for the daily illustrated papers.

In the manipulation of the camera there is little need for anything but ordinary attention, for if a hand camera is used the exposing of the plates or films will not occupy more than the ordinary time. If a stand camera is employed some little care must be taken in its manipulation, for its movements may be bungled when one is endeavoring to work rapidly and gets flurried. It is also possible to kick over the camera, or to fall over it one's self, if one catches a foot in the tripod leg. Hence the best advice we can give is to keep cool when exposing.

Special care should be taken to ensure the exposure being correct, for this contributes enormously to the obtaining of a good negative. When work is wanted in the minimum of time such processes as intensifying or reducing are at a discount. Besides, development may have

to be carried on in other surroundings than those of the ordinary darkroom, and so development may need to be by time rather than by observation. Under these conditions the best results will always be obtained with normally exposed plates. When development is being watched the little more or little less demanded on occasion may be given by the experienced worker. In those cases where a good darkroom is available, some time may be saved by the use of a concentrated developer. The saving of time will be most in the case of films, for a spool of say half a dozen exposures may be developed in less than a minute from removing the film from its paper roll to placing it in the fixing bath. When several plates have been exposed they will be developed in a batch in a large dish, or in a grooved tank, but the developer should be fairly strong, in order to shorten time of development. Nothing much is to be gained by cutting this down below three or four minutes, however, when a batch of six to a dozen plates is being handled.

The fixing is an operation where some time may be saved by the use of a fairly strong hypo solution. It does not follow, however, that the stronger the hypo the more rapid its action. It is generally recognized that 40 per cent is the greatest strength which may conveniently be used, and we have always found that 25 per cent fixes with great rapidity. An unused solution of this strength should fix any plate or film in five minutes, if its temperature is in the neighborhood of 60 deg. Fahr. The addition of ammonium chloride to the bath has been recommended as promoting rapid fixation, but it is somewhat doubtful if the minute or two saved is worth while, except in extraordinary cases. It should be noted, however, that if the fixing bath is cold, fixation is very slow. For this reason the hypo should never be freshly mixed, as on solution the temperature will drop many degrees. If hot water is used, on the other hand, it may be found that the temperature of the bath will be too high. The best way is to have a solution of hypo of the proper strength at hand, and it will then be of approximately the temperature of the room in which it is kept.

Where one or two plates only are required hurriedly, possibly the selected exposures of the batch, they may be washed by placing them horizontally under the tap, and allowing the stream of water to fall gently on the center of the surface of the film. The plate will then have to be washed in five minutes. Where a greater number have to be washed the process may be accelerated by filling the washing tank, leaving it for a minute or two and then emptying the whole of the water away, leaving it for a few seconds to drain from the plates and again filling up. If this is repeated a dozen times there will be little or no hypo left in the plates. Films are not so easily washed as plates, unless constant attention is given or unless a large vessel is available. The danger, of course, is that one part of the film rests on another, and perfect circulation of water over the gelatine surfaces is not obtained. The best and simplest plan we know is to cut up the film and place it in a marmalade jar. Then let a soft rubber pipe from the tap hang down into the center of the rolled-up film, and as the water impinges on the bottom of the jar it is thrown upward again, and passes through the rolled-up coils of films. For hand washing the film may be rolled up and unrolled or seesawed, as in development, constantly changing the water. If a large tank or a domestic bath is available, the ends of the film may be pinned to corks of good size, and the film left floating, the bath tap being left slowly running, and the bath, of course, draining away at the overflow. With cut films each one must be attached separately to a cork, and washing will then be almost automatic.

The drying of the plates is the next step. We do not recommend the use of alcohol, because it is apt to cause a milkiness in the film which will affect printing. If a whirler is at hand the plates may be soaked for five minutes in a 5 per cent solution of formalin, blotted dry with a clean linen cloth, and then whirled in front of a fire or gas stove until dry. But it is possible to print from the wet plates by carefully cleaning and drying the glass sides, and then, after soaking the sheet of gaslight paper, laying it against the film side of the negative, lightly squeegeeing it into contact, and exposing to the light as usual, but without using a printing frame. The edge of a plate box carefully broken off makes an excellent squeegee for this purpose, if one is working away from one's ordinary workroom, and naturally in all this work one must accustom oneself to making shift with what is at hand, what is more, making shift without allowing the quality of the work to suffer. Where there is any selection, and if the negatives are of small size, it will be better to use a glossy paper, as the prints can then be examined under a glass, and will show detail better than the smoothest of matte-paper surfaces. The prints may be dried rapidly by placing them in alcohol for five minutes and then hanging them up in the air, either in the open or near a stove. Naturally

LANDSCAPE ALVIN W. PRASSE

they will be blotted as they come from the washing water, and before placing them in the alcohol, and again when they are taken out of the alcohol.

To recapitulate, the work must be done with promptness and precision; there must be no misfires, and nothing at all ambiguous due to lack of technical perfection. The washing of plates or prints in the ordinary way would appear to be unnecessary, if results are wanted rapidly and need not be permanent. This is the case where prints are merely required as quick proofs to show to friends, or where their purpose has been served if cuts have been made from them. Of course it will be understood that the hypo must be washed out of the negative to avoid staining the printing paper if printing is done while the negative is wet, though this might be avoided if a sheet of thin celluloid is placed in contact with the wet film so as to insulate the printing paper.

It is a mistake to mount prints which are to be submitted to the illustrated dailies and weeklies. The cut makers can work quite well from unmounted prints, and the time occupied in mounting is more or less wasted. But if prints, even turned out in a hurry for one's friends, are wanted to have a nice appearance, mounting is a great advantage. Where a dry mounting method is available it gives the neatest as well as the quickest means. Probably for small prints many of the methods advertised for dry mounting without a machine would prove not only neat and effective but rapid. In the absence of such means this simple attachment of the print by its two corners may be resorted to. A tiny dab of nearly dry paste just inside the corner is sufficient, and if the print is then laid down on the mount in the proper position, and a heavy book laid on top, it will be found that a few moments only are needed to secure firm attachment.

LANDSCAPE

This print has some very good qualities, though in our opinion they would show to more advantage on a smoother paper. The spacing, too, is not the best, for the horizon line is too low. It is seldom advisable to depart from the rule that the horizon should fall at the line separating the middle third from either the upper or the lower third of the picture space;

THE BELL(E) C. W. BECKER

and here the distances are about one eighth and seven eighths. In the case of a salt marsh, such proportions may be justified, as the effect of great distance is enhanced by sacrificing the foreground; but with trees disposed as they are here, the normal proportions would have been safer. The enlargement shows a good feeling for the pictorial in that the details have been massed by throwing the trees slightly out of focus and not timing enough to bring out all the tones in the greens. The sky gains in importance by being rather full of detail, as compared to the trees. Data: 4 x 5 Seneca No. 8 with 6-inch Ilex anastigmat lens; three-times filter; 1-5 second at *f*: 11 in July at 10 a.m.; good light; Hammer Ortho plate; ortol developer, half strength; enlargement on Velours Black, Silk Surface.

THE BELL(E)

We have all heard of people ugly enough to "stop a clock," but here is a belle pretty enough to stop a bell (cloche, in French) even though in this instance she has to sit in it to prevent it from ringing. The hammer suspended on the right-hand post shows that this bell is really a gong. The picture, taken as a whole, is a rather remarkable bit of decoration, the framing effect of the big ring and its supporting framework being rather pleasing. The background, however, is too important, owing to the use of so small a stop that it has quite as sharp detail as the foreground. Data: 3A Kodak Special; 1-3 second at *f*: 22 in August in bright sunlight; Eastman film; pyro tank development; print on Normal Cyko Glossy.

CHUMS

The spacing of this group is worth the careful study of all readers, for the three figures are not evenly spaced, but arranged in an unsymmetrical manner which gives them each a proper relation to the other. The mare, being largest, is farthest from the middle, with the girl, very important on account of her costume, almost in the middle, but really forming with the mare part of a group of two. The colt acts as a balance for this larger group because he is on the other side of the fulcrum of the lever. The connection is well shown by the arms of the girl, which bind the two smaller masses into one large group. The area of medium-dark gradations to the right of the colt acts as a dark object to add weight to the mass of the colt, hence trimming would destroy the balance. We might wish for a better background, with no empty sky corner; but Mr. Purllant has felt the bad effect of a highlight at this point and has printed out the sky to a decided tone which helps prevent it from being too important. On the whole, this is a highly successful piece of work, the more so as the maker has not sent in pictures before but has relied chiefly on study of those reproduced in our pages and in the "Portfolio" published each month in *American Photography*. Data: 4 x 5 Seneca No. 32 camera with Ilex anastigmat lens of 6 inches' focus; 1-10 second at *f*: 8 in bright light in July at 4 p.m.; Standard Chromic plate; M.-Q.; enlargement on Brome Black Semi-Matte.

TEMPERATURE-COEFFICIENTS EXPLAINED

A reader has asked Dr. Miller to explain a little more fully about temperature-coefficients. He has two main perplexities. The first is, whether a table of times applying to one developer, for example, Modified Thermo M.-Q., will also apply to all other developers having the same temperature-coefficient, in

CHUMS S. F. PURLLANT

this case 1.9. The second is that Modified Thermo D.-Q., as published in the June, 1914, issue, has a T. C. of 2.6, and Wall's pyro, as given in the October, 1914, issue, has also a T. C. of 2.6, *yet the tables of times are different.* Why is this? he asks.

A temperature-coefficient is simply a ratio. It represents the relation between the times (18 degrees Fahrenheit apart) to obtain the same contrast. Thus, if the developer reached or produced a certain contrast in 1 minute at 60 degrees, but took 2.6 minutes to produce the same contrast at 42 degrees, the ratio is as 1 to 2.6, or in other words, the T. C. is 2.6. Now, the coefficient having been found, it is necessary to do two things: first, decide on the standard strength of developer for the particular plate in use; secondly, find *by actual trial* at a given temperature the exact time of development. With this time as a starting point, a table is drawn up by means of the diagrams published in "The Watkins Manual."

Duratol has a T. C. of 2.6, and the table was drawn up on a basis of 6½ minutes at 54 degrees, which Dr. Miller found by repeated trials was the proper duration of development. Mr. Watkins gives 6½ minutes as the proper 60-degree time for Thermo M.-Q., so that value was retained for the Modified Thermo M.-Q., as it proved by trial to give exactly similar results to those yielded by the unmodified formula. It should, however, be noted that Mr. Watkins's times are apparently based on making a rather dense negative suitable for P.O.P. and contact bromide, whereas Dr. Miller's aim was an average negative for Normal grades of gaslight papers, hence the different standard times.

SMILES A. W. CHURCH

Turning to Wall's pyro, no attempt was made to depart from the standard laid down by Professor Wall, namely 6 minutes at 65 degrees, and this was accordingly used in determining the times for the other temperatures. It will be noted that the table is confined to temperatures from 50 to 70 degrees, pyro not being suitable for a higher or a lower range, as duratol has proved itself to be.

The flexibility of the Thermo system is very great on account of the fact that one can change the classification of a plate by using a stronger or weaker developer at will. Thus it will be found by reference to a "Watkins Manual" that all the 1.9 developers have been worked out so that all can be used with the same tables of times if only the proper strength is employed. Once the most suitable strength has been decided on, all negatives will tend to become far more uniform than under the old plan of development by inspection.

SMILES

This print is covered with a uniform gray fog and has a few friction or abrasion marks as well, showing that more bromide was needed in the developer. The lighting of the two faces, with plenty of modeling, is noteworthy. Mr. Church states that the subjects were posed in the shade of the house but exposed to the full light of the sky. This arrangement gave a soft, yet brilliant light which allowed a snapshot and still did not cause squinting. The result is worth study by all of our readers who have during the last summer caused their friends to pose for snaps in direct sunlight. A portrait attachment was used to allow making a large image. Data: 3A Kodak with rapid rectilinear lens; 1-25 second at *f*: 11; Eastman film; Seed's developer (M.-Q.?); print on Contrast Semi-matte Cyko.

A FAIR ENTHUSIAST

Mr. Mountain neglected to send data with his prints, but the one we reproduce teaches several things which can be pointed out without the aid of data. Unlike so many of our illustrations, this one shows good placing of the figure, with much more space in front of than behind the girl. There was evidently considerable wind blowing, as the skirt is blurred, and the maker seems to have exposed generously and developed too far, thus getting a dense, flat negative which makes a weak print. Reduction with ferricyanide-hypo would probably convert this negative into one capable of yielding a much better print, though by choosing the right grade of paper, namely the most contrasty, and printing deeply, even a flat negative can be made to print remarkably well without any reduction.

A FAIR ENTHUSIAST J. A. MOUNTAIN

JOSEPHINE — STANLEY VON ARNSTEIN

A SAFE ELECTRIC LIGHT

A reader desires to know how an electric bulb may be turned into a safe darkroom light. The luminosity of the bulb is such that merely coating it with colored material would hardly be sufficient, and the most approved method is to surround the bulb with a thick liquid layer. There are on the market pear-shaped containers for such liquids or an ordinary glass fruit jar or other sufficiently large vessel may be used. This is to be filled with a saturated solution of potassium bichromate, to which is added rhodamin or rose bengal to give the solution a deep orange red color. At least an inch of solution should be between the bulb and the outer container. In immersing the bulb one must be careful not to get the socket under the solution, which would result in a dangerous short circuit and probably a fire. A little simpler method would be to soak a sheet of white blotting paper in a deep solution composed of tartrazine and rose bengal, and wrap one or two thicknesses of this loosely around an ordinary bulb. It will be necessary to test this light in the usual way and see if it is safe for the plates employed. For ordinary plates one or two thicknesses of orange post-office paper and one of cherry fabric or paper, all of which may be obtained from the photographic supply houses, may be used to surround the bulb.

JOSEPHINE

This portrait belongs in the class of snapshots, as far as arrangement is concerned, for it was taken on the spur of the moment without stopping to change the pose or arrange the accessories. There are, naturally, a number of minor defects which the maker appreciates, though he has not mentioned what to us seems the greatest of them — the sad, strained expression due to trying to hold the pose for a time exposure of nearly three seconds. Children, in particular, never look quite as natural

WINDOW PORTRAIT L. J. MATHEWSON

in timed work as they look in real snapshots such as can be secured indoors in white surroundings with a reflecting camera fitted with an *f*: 4.5 lens. Data: 4 x 5 Premo with R. R. lens; 2½ seconds at *f*: 11 in September at 3.30 p.m.; east window lighting; Standard plate; hydrochinon; print on Platora E.

A WINDOW PORTRAIT

Perfect technique has produced in this print an effect far more true to nature than one usually sees in a window photograph. The only fault is that the print was made from the middle of the negative, bringing the figure right on center. As the negative is a 5 x 7, there is plenty of room to slide the card farther to the left, or in other words, to trim behind the girl so as to bring her nearer the right margin. Data: 5 x 7 Conley camera with *f*: 6.8 double anastigmat lens; ½ second at *f*: 8 on Hammer Special (Red Label) plate; pyro; Normal Studio Cyko card.

GOOD FRIENDS

Here we have an excellent example of home portraiture, and the posing, whether intentionally or not, is so arranged as to make a pleasing triangular composition. The picture could be improved a little if the young lady's head had been tilted a little more to the right, thereby more satisfactorily completing the triangle, and we would also prefer to see the dog's legs a little nearer together. We would suggest a slight trimming from the top in order to minimize the amount of empty space. The picture was taken with a No. 3 folding pocket kodak, fitted with R. R. lens of 5 inches' focal length. The exposure was 1-25 second in bright light in August at 3.30 p. m., using the largest stop, U. S. 4. It is not stated whether the exposure was indoors or outdoors. The negative was made on an Eastman Speed film and the print is a 4 x 6 Sepia toned bromide enlargement.

REMOVING DUST FROM A CAMERA BELLOWS

No matter how careful a photographer is, dust will always be found in a camera bellows or inside of a box camera, and if it remains there in any quantity it will both cause pinholes on the film or plate and introduce general fog by settling on the back surface of the lens. If an effort is made to get rid of it by blowing it out, as is often done, it is simply stirred up and settles back in a new place. A new scheme for removing this dust depends on the use of a vacuum cleaner, which is so common nowadays. If a bellows camera, it is to be opened up to its greatest extension, and then the tube of the cleaner is to be placed inside the camera and gradually withdrawn while the pump is working. The strong suction will easily take the dust out of the smallest crevice and permanently remove it.

VIEW POSTAL CARDS

We have had an inquiry in regard to making postcards from photographs of local views. We would say that the postcards which are sold in local stores at one cent each are undoubtedly printed from halftone blocks. A halftone block to cover a postcard measures about 17 or 18 square inches and costs about fifteen cents a square inch when made of fair quality. Any local printer can print postcards from such blocks at the rate of from three to five dollars per thousand, according to the stock. It is not profitable to print in quantities smaller than one thousand of a view, and the

AFTER ARTHUR T. BROWNE

expense can be materially reduced by making four or eight at a time.

AFTER

The younger generation seems to have learned well the lesson that caring for such intricate machines as automobiles involves discomforts which cannot be minimized and must be bravely faced. The adult automobilist might emulate this young mechanician to advantage at times. The picture is of a sort which is sure to be valued in the future far more than any of the more formal poses which might be taken. It is frankly a record, and therefore satisfactory because of its clearness. Data: 1A Kodak with 5-inch rapid rectilinear lens; 1-50 second at *f*: 16 in July at 10.00 a.m.; bright sunlight; Eastman film; tank development; print on Special Velvet Velox.

THE MORNING BATH

This picture is well spaced, though the screen in the background is rather too prominent and makes one wish that a neutral-toned and patternless fabric had been draped over it as a background. The wall and the mopboard alone might have been less "busy" than the screen. There seems to have been too little difference between the colors of tub and carpet to bring the former out clearly; more exposure, if it had been feasible to give it, would have helped the shadows without injury to the lights, which now seem to have been carried to the stage of maximum density, not allowing full halftones to print through before the deepest shadows are slightly filled up. Data: 5 x 7 Scovil camera with Eurygraph lens; ½ second at *f*: 6 in June at 11.00 a.m.; Standard Extra plate; M.-Q.; Disco gloss.

THE MORNING BATH C. H. NEWMAN

HIS FIRST TROUSERS BURTON AMES

HIS FIRST TROUSERS

The negative from which this picture was printed would seem to have been lightstruck at the bottom, perhaps by leakage of light through a defective shutter in the holder, for all four prints on different papers sent in show the same light streak above the head. The posing having been done outdoors in the shade, there seems to be no other possible explanation of this defect. It should be possible to reduce the dense portion successfully by rubbing down with alcohol on a bit of chamois leather. Outside of this technical defect, the picture is very good. Data: 5 x 7 Conley camera fitted with a Euryplan anastigmat lens of 8 inches' focus; 1-25 second at *f*: 6.8 at 3.30 p.m. in June; bright light, but subject posed in shade; Vulcan plate; duratol-hydro.; print on Noko Hard.

AXEL

This is another charmingly rendered picture of child life and while the youngster is a little too interested in some object outside the picture space, the maker has nevertheless caught a characteristic and therefore satisfactory pose. The arrangement in the space is excellent, the figure being just enough to one side to break up too obvious a symmetry. The 3A Graflex was fitted with a Goerz Celor lens of 7 inches' focal length. The exposure was 1-35 second with stop *f*: 4.8 at one o'clock in August. The light was bright though the figure was posed in the shade of a house. The Eastman Speed film was developed with M.-Q. and the Sepia enlargement was made on Wellington cream crayon paper, only a portion of the negative being used.

OVEREXPOSURE — LITERARY, NOT PHOTOGRAPHIC

J. E. KING

"Oh, wad some Power the giftie gie us
To see oursels as ithers see us!"

After I had finished writing an article which I intended to send "fully prepaid," with "stamps for the return of the MS. in case it is not available," to the editor of this magazine for "examination with a view to publication," I read it to my wife — I always try my literary "stuff" on her first because she always tries her gastronomic "stuff" on me first — and when I had finished reading it, there was a dead silence, as there often is on such occasions.

I knew that something was coming, but whether it was good or bad I could not guess from the cast of her countenance. So after counting ten seconds by the old photographic method, "one thousand and one, one thousand and two, etc.," I said, "Well, what do you think of it?" And this is what she said: "I see what you are driving at, but I would not call that an *article*. I would call it an editorial."

More dead silence. Then I straightway tossed the manuscript into the fireplace; and went to my "studio," which is also the laundry, and made some bromide enlargements to assuage my wounded feelings. It made me feel "canny" to be told in effect that I was trespassing on the sacred precincts of the sanctum sanctorum, and I then and there resolved on a package of bromide paper that I would write no more on photographic matters, since apparently I could not, in my ignorance, distinguish between an article and an editorial, thereby running the risk of bringing down on my six-and-three-quarter-sized head the wrath of the gods, which would result in my being shut off forever and a day from having any more of my literary efforts accepted by editors of photographic magazines.

AXEL EDWIN VIGGERS

However, after I had finished the enlargements, which looked pretty good to me, and which made me feel better, I put away my "truck," and went back to the living-room, whence I came, and lo! my wife had retired, evidently in disgust, and I was left to myself to think over the situation.

While doing so, my eye caught the sheets of yellow paper containing the article in the fireplace — I always use yellow paper for writing, because it is cheap and matches my complexion. I fished the sheets out of the fireplace, and again read what was written on them. Then the awful truth was borne in on me — I had actually written an editorial, when I supposed I had simply written an article for the edification of my fellow amateur photographers.

Now, most men and perhaps a few women would have felt quite puffed up under the circumstances, but I could not feel that way, even after having again read an unfavorable criticism on one of my pictures in one magazine, and some very favorable comments on another one of my photographic efforts in another magazine, and had also again read a letter from the editor of this magazine, wherein he informed me that he emphatically dissented from the views which I had expressed in an article (please note article) which I had

CAUGHT NAPPING N. E. JOHNSON

recently submitted to him for publication, but which he also stated he had accepted.

No, I was not puffed up, neither was I squelched. I reached for the pad of yellow paper, stopped the clock, and went at the job again. When I had finished it, I threw the original sheets back into the fireplace, put out the candle — I always write by candle light because candles now come in glass bottles and do not heat the room as much as gas does — and, taking off my shoes, stole quietly upstairs and reached my room without waking my spouse.

Nothing has since been said by either of us about the editorial, and the first knowledge of the article (or is it still an editorial?) which the "missus" will have will be when she sees it or reads it (if published) in this magazine, as I do not let anyone, excepting my stenographer and the editors, see my revised efforts; and if or when, they are printed, I can't help what happens because it is then too late to further "doctor the negative." However, "Isch ka bibble." I had a lot of fun making the "exposures."

CAUGHT NAPPING

Flashlight pictures of the little ones are often very much more satisfactory than the best daylight poses, because they are in effect snapshots indoors and have all the advantages of allowing the worker to control his lighting. Here the effect is good, in the main, though it is unfortunate that the reflector shows along the left margin, and the shadows have been printed too deep in securing all the halftones in the flesh and cloth values. The lace curtains, too, are rather too patterny. A medium gray background behind the chair would have concealed the curtains and at the same time thrown the chair up in relief. Data: 5 x 7 Premo camera with 8½-inch Planatograph lens; flashlight at 8.30 p.m.; *f*: 8; Plastic plate; pyro; print on Azo K. Medium.

ALONG THE SHORE

(*See page 87*)

This pleasing landscape of Mr. Peaslee's owes much of its interest to the fact that he has taken care not to have a large amount of white sky. The day being bright, a cloudless sky would have been a hard task to manage, but the present treatment is all that could be desired. The picture is possibly a little faulty in composition in that the interest is divided by the outlets for the eye on each side of the principal group of trees, but the values are well held and it is a very pleasing specimen of landscape photography. The 3¼ x 4¼ Goerz Tenax camera was fitted with a Dagor lens of 4¼ inches' focal length. The exposure was 1-5 second at *f*: 8 in good light at 4 p. m. in September. The Isochromatic plate was developed with M.-Q. and the enlargement was made on matte bromide paper with a Brownie enlarger.

THE TIME THERMOMETER

An ingenious invention of Mr. Alfred Watkins's makes it possible for amateurs to develop by temperature without any calculations whatever. The Time Thermometer is provided with scales of times to develop for both tray and tank strengths of developer, and one simply dips it into the solution and reads against the top of the mercury column the correct time in minutes. One kind is correct for pyro-soda with bromide, M.-Q., and rodinal (azol and citol are the same), and special types are obtainable for rodinal, Tabloid rytol, and autochromes.

FLASHLIGHT LIGHTINGS

In using a flash for portrait or group work, remember that most failures are caused by having the light too low. The illumination must fall on the face at an angle of 45 degrees to produce the best effect.

THAT'S MY PAPA B. F. ANDERSON

THAT'S MY PAPA

Seldom is the use of flashlight to supplement an impossible natural lighting more effectively shown than in this picture. The amount of flashpowder used, 5 grains, seems to have been just sufficient to light up the interior and bring out, in the photograph, the values which the eye sees in such a subject but which the plate, ordinarily, cannot handle. Most pictures against the light render tones untruly in one end of the scale. This print has all the tones about right. The composition, of course, is too crowded; but as a record it is a noteworthy achievement and one of which the maker may well be proud. Data: 6½ x 8½ Century camera fitted with a Goerz Dagor lens of 8¾ inches' focus; *f*: 8; flashlight and daylight at 1 p.m.; Standard Extra plate; pyro; print on Azo C. Hard.

CONDITIONS OF THE COMPETITIONS

The subjects may be of any nature whatsoever: landscapes, marines, portraits, interiors, genre, street scenes, etc. The only requirement is that the person entering the picture shall have made the exposure himself. The rest of the work may be done by the dealer or by a friend. The prints should be unmounted and should be plainly marked on the back with the title, the name of the sender, and the words "POPULAR PHOTOGRAPHY, Dec. Competition." This requirement cannot be too strongly stated.

AT MY DESK — B. HARRISON

AT MY DESK

This is quite an interesting study, but Mr. Harrison, like almost every other amateur, has not yet learned the principle of composition that the center of the picture space is the weakest point of the whole composition, so he had painstakingly arranged the camera to bring the head exactly in the middle. The camera should have been used with the plate in the vertical instead of the horizontal position, the left margin of the picture coming about half an inch behind the sitter's back, and the arrangement would have been far more pleasing, with a better concentration of interest. Data: 5 x 7 Conley camera; 4 seconds at *f*: 8 in August at 2.00 p.m.; bright light; Standard Orthonon plate; pyro; print on double-weight Matte Argo, grade not stated.

OFF FOR FIRST

Unlike a great many action pictures, which only too often perpetuate phases of action which our eyes never see, the effect being grotesque and not suggestive of motion so much as of Goldberg's statuary, this example by Mr. Parrish is highly successful. He caught his runner in a position which looks right. The speed of 1-250 second (actual) possessed by the shutter was high enough to give a sharp image on the small scale necessitated by the short-focus lens of his camera. The too rapid running off of the perspective, shown by the difference in the foreground figures and the distance, is another effect of the short focus. Data: 3¼ x 4¼ Ica camera with Hekla anastigmat lens; 1-250 second at *f*: 6.8 in July at 4.00 p.m.; Hammer Red Label plate; pyro; print on Normal Studio Cyko.

OFF FOR FIRST — FRANCIS PARRISH

RUN ALONG, I'M COMING

There are several rather important lessons in this picture. Let us consider first the matter of the pose. There is a considerable amount of skill shown in the placing of the figure, both with regard to the spacing just to one side of the middle line and also with regard to the dark shadow in the hedge. This brings the highest light, the white-gowned figure in sunlight, beside the darkest dark, the shadow in the foliage, thus causing each to gain in importance and effect by contrast. The vertical spacing, however, is not satisfactory, the almost horizontal line just above the head and the empty sky together being too abrupt a transition from the interesting foreground masses. The picture is, in fact, all in one plane, with no real middle-distance and only the sky for a distance. Liberal trimming of the sky improves the effect slightly. The second lesson is the increased exposure needed by a figure near the camera. Many readers would doubtless consider this subject so well lighted that it could be taken in a twenty-fifth; but a glance at the contrast between the sunlighted white and the deep green of the shadow should cause one to time rather more generously. Mr. Meservey did so, with the result that he preserved the effect of sunlight and true values by securing a transparent shadow. Data: 4 x 5 Cycle Poco with 3½-inch R. R. lens; 1-5 second at *f*: 16 in bright sunlight at 3 p.m. in August; Standard Polychrome plate; duratol-hydro. developer; print on an Azo E Hard postcard.

RUN ALONG, I'M COMING C. D. MESERVEY

EMANATION IMAGES

A reader who was unfortunate enough to wrap some especially precious plates in a newspaper after they had been exposed, was very much annoyed to find the printing on the newspaper impressed upon the plates when developed. As he got not only images of the printing on the side of the paper next to the plates but also a faint image from the other side, he asks for information on the subject. Images caused on photographic plates by emanation have been the subject of considerable literature in photographic periodicals in the past, and it is well known that many substances emit fumes or rays which will fog a photographic plate in the dark. Among these are turpentine and resins, and this causes the action of printer's ink. Therefore printed paper should never be used for wrapping plates. Contact between the plates and the paper is not essential, for the action may take place if the paper is a sixteenth or even an eighth of an inch away from the sensitive surface. A similar effect is produced by a piece of zinc whose surface has been freshly scratched.

IRON DEVELOPER FOR TANK USE

A correspondent brings up an interesting question by asking for a formula for a twenty-minute tank solution of ferrous oxalate, as published in the October issue.

We regret that we cannot supply a formula from our own experience or from any test-book, for the iron developer was almost forgotten before the tank came into use. The only way to find the right time would be by experiment. The proper way to go about it would be as follows: First make two identical exposures on plates from the same box. Then develop one in full strength iron developer, taking care to carry the image on until it seems pretty dense, and fix in an acid hypo. Now mix a second portion of developer and dilute it with, say, three times its volume of water. Develop the second plate in this until it looks as dense as the first one seemed, noting the total time and the temperature. This gives the right tank time for that temperature,

THE VILLAGE HARNESSMAKER KENNETH BOLLES

and from these data it should be easy to determine what changes to make to bring the development time to exactly 20 minutes at 65 degrees. Should the user desire to construct a table applying to all temperatures, it could readily be accomplished by following the directions in "The Watkins Manual" for finding the temperature-coefficient of this developer.

HOW TO PUT A PHOTOGRAPH ON A WATCH CASE

Make a contact print of the desired portrait on a dry plate. Develop, fix, wash and dry. Strip the film from the plate by any of the well-known methods, the simplest being an immersion of five minutes in hydrofluoric acid. (Don't inhalf fumes.) Dry the film and cut out with a pair of scissors the desired portion of the picture. This may then by affixed to the watch case by dropping in the desired spot one or two drops of thick rubber cement, and allowing it to evaporate until it is tacky. The film may then be brought in contact with it, taking care to avoid air bubbles.

THE VILLAGE HARNESSMAKER

Appreciation of the strength of indoor light — or perhaps we should have said, its lack of strength — led Mr. Bolles to time his film very well indeed. The only improvements which one could desire are a simpler background and more foreground. The former is too much cluttered up with objects. The latter is trimmed in such a way as to make it hard to tell what portion of the harness the old man is working on, and, furthermore, the hands, catching the strong light, have become important from their light tone. If there were more margin, they would not have so much influence in leading the eye away from the face. Data: Vest Pocket Kodak with meniscus lens; 8 seconds at *f*: 16 at 3.00 p.m., Eastman film; M.-Q.; postcard enlargement on P.M.C. bromide paper, slightly trimmed.

PRINTS FROM A BROKEN NEGATIVE

One of our amateur friends dropped an irreplaceable negative, and on picking it up found it to be badly cracked, though the gelatine film was not broken. When he tried to print it he found that the cracks in the glass all appeared on the print. Successful prints were made by tying four strings about three feet long to nails in the corner of a board about 1 foot square, and suspending the board by these four strings which were knotted together as far from the board as possible. The printing frame was laid on this board, which was suspended in a suitable place and rotated vigorously to twist the strings. When allowed to untwist, it would continue rotating for a number of minutes, and by repeating this process until the print was finished absolutely no trace of cracks appeared.

ASTRONOMICAL CYCLE WHEEL

USED TO PHOTOGRAPH FLYING METEORS BY SCIENTIST

An interesting use has been found in astronomy for the bicycle wheel. By fitting such a wheel with a series of opaque screens placed at regular intervals and then rotating it with the aid of a small motor at the rate of from 30 to 50 turns in a minute before the cameras used to photograph meteors, one investigator has succeeded in measuring the velocity of the meteor's flight. The principle depends upon the interruptions produced by the screens in the trails of light made upon the photographic plates by the flying meteor. The velocity of the wheel is known at every instant by means of a chronographic record, and the length of the interruptions indicates the speed of the meteor.

SUPPLEMENTAL LENSES

G. B. BUCHANAN

I cannot personally vouch for the assertion made by some dealers that "as good a camera can bought to-day for $2.00 as cost $25.00 twenty-five years ago," because twenty-five years ago I hadn't much interest in cameras. In fact, I lacked a temporal interest in anything, for I hadn't been born. But I do know that I have examined some of the antiques made then, and have used a number of the more modern tools. The modern ones are mighty fine articles — but even so they are still far from perfect in that they cannot do more than one kind of work with the regular lens equipment. The perfect camera would have a universal lens. And this is what the more far-sighted experimenters in photographic materials are striving for. The universal lens may be an impossibility—time alone can tell. Until it does come, however, the amateur can obtain what amounts to universal service from his regular lens by providing himself with a set of the ingenious little "supplemental lenses" which are on the market to-day.

Strictly speaking, the term "supplemental lens" may mean anything from a fifty-cent portrait attachment to a three-hundred-dollar photo-engraver's equipment. The man who bought the latter, however, would not be a beginner—though he might be an amateur—and for that reason we will confine this article to the more moderate priced auxiliaries—comrades of the fifty-cent portrait attachment, though good ones of some of the supplementaries cost several dollars. Such for instance as two wide-angle cells, if one wants a cell supplemental. A good cell telephoto supplemental might cost anywhere from $10.00 up, according to size and power. The variable power telephoto lenses are really wonderful articles. I have seen series of photos made with them of a clock on a city hall tower, every exposure being taken in one setting of the camera. The size of the clock shown in the pictures ranged from a size covering about three-fourths of the plate, to a print showing the *entire building*. Remember, the camera was not moved for any exposure, only the enlarging power of the telephoto lens was varied. Such a lens for a 4 x 5 camera would cost around $25.00.

The telephoto attachment which will probably interest amateurs most, however, is a much less complicated article. It is simply a piece of glass ground to magnify, set in a small circle of metal which has a flange around the rim so the flange can be set over the projection of the lens barrel of the small hand camera. The flange is slightly adjustable so it will fit several models and makes of lens barrels. This contrivance costs from 50 cents to $1.00 and is a similar article to the portrait attachment. Telephoto photography means the making of pictures showing objects at a distance as if they were close by — reducing to photography the process of using a telescope for making objects at a distance look larger to the eye. The first-class telephoto lens is really a small telescope, somewhat more delicately adjusted for refraction than the ordinary eye telescope, and fitted so it may be screwed into the regular lens barrel whenever needed.

The smaller supplemental telephoto lens is of course only a poor relation of the better class lenses. Nevertheless it does very commendable work within its natural limitations. While the sellers do not mention this, my experience has been that the focus of these lenses has been not far from 1,000 feet. That is, the picture would show a sharp image at this distance where it would be a little indistinct at other distances. Not enough to mar the picture entirely, but it shows "out of focus." It should be stated in this connection that bad focusing on a telephoto picture has the same effect as bad focusing on a close exposure made with the ordinary lens. While the distance view made with the regular lens can stand considerable indistinctness of detail if the "atmosphere" or effect is good, the telephoto picture must be sharp and distinct, for it is nothing else than a distant object reduced to a close one.

The principal uses up to now for telephoto lenses have been the photographing of sports, game birds and animals, and aeroplanes. They help out materially when taking racing yachts at different stages of the race. Also baseball, football, horse racing, etc., where it is necessary to get a picture of fair size of contestants but impossible to locate the camera in the proximity of the actual playing. Game animals and birds often cannot be approached close enough to let the regular lens make good pictures, and of course an aeroplane several thousand feet in the air is not a suitable subject for an ordinary lens on the ground. The exposures for telephoto pictures must, naturally, be somewhat lengthened, for each cell in a lens lengthens the time rays of light require to pass through. With the larger telephoto lenses this additional exposure may amount to as much as a rather dense rayfilter — in the small lens described above from once and a half to twice the normal exposure will be about right.

Other supplemental lenses made in different styles and prices are "copying," "rayfilters," "wide angle" and an amusing device known as a "duplicator." This has the faculty of making a double image and is quite popular with the younger photographers. It puts it all over Burbank in the creation of queer hybrids. It makes two-headed dogs, eight-legged cats, four-armed men, etc. It usually costs about 25 cents. It is amusing but hasn't much practical value.

Wide-angle lenses (lenses which, as their name indicates, take a wider angle of view than regular lenses, the angle of vision of the regular lens being not more than 60 degrees, while the wide angle may take as much as 90 degrees to 130 degrees) come in styles of different prices. Of course a set of two wide-angle cells which can be inserted in the regular lens barrel do the best work. These come at about $4.00 to $6.00 a set. The regular rapid rectilinear lens barrel must be refitted to accommodate the wide-angle cells, however, for to be a wide-angle lens the cells must be placed closer together. Wide-angle lenses are used in photographing interiors principally, though they also help considerably in taking extensive views in cramped positions. A church spire could not well be taken from the other side of the street in front of the church with a regular lens, but the wide-angle lens would in all probability be able to get it. For the tourist a wide-angle supplemental is an excellent auxiliary. Church spires, high mountains, abrupt cliffs, noted interiors — many views present themselves where there is a lack of room in front to accommodate the narrow angle of vision of the regular lens.

Nevertheless the wide-angle lens should not be allowed to replace the regular lens except where absolutely necessary. The fact that it gets so much wider an angle into the picture also tends to crowd it. The field being very much flatter also ruins the perspective, and everything in the picture looks more or less distorted. It is an aid in its own field, however. Besides the supplemental cells, there is also a small wide-angle lens attachment similar to the portrait attachments, which sells for 50 cents. This slips on over the regular lens barrel and does away with having to remove the regular lens and put in the wide-angle cells every time a wide-angle exposure must be taken. This device does not have so wide a range as the regular wide-angle lens — not much over 80 to 90 degrees. It is not necessary when using this to remove the regular front board and use the special wide-angle board, which the better grade of hand cameras provide for wide-angle work. This angle of vision is not great enough to photograph the front board with horizontal pictures. It may sometimes get a slice of the front board in vertical pictures when using a long plate like a 2¼ x 4¼ or postcard size. However, if the camera has a rising and falling front the front can be slid up a little and usually miss the front board in that position.

Photographing the front board is due to the considerable shortening of the distance between lens and plate when using a wide-angle lens, to correspond with the lessened distance between cells in the wide-angle lens. Exposure should be lengthened slightly when using a supplemental wide-angle lens of the flange type, though the regular cell wide-angle lens exposes in nearly the usual time. And it goes without saying that when photographing interiors non-halation plates or film should be used. Much more care is needed in developing this kind of plate than ordinary single coated plates. If there is too wide a variation between the temperatures of the different baths the double coating will peel off and otherwise good negatives and hard work will be spoiled. This never happens with a single coated plate although if such a plate is allowed to freeze after washing and before drying it will "frill" badly — the negative will have the appearance of a frosted window and the positive will print this frosting.

Wide-angle lenses are often used in connection with rayfilters. For such work the cell lenses are best, for the rayfilter is always furnished in a flange type and if there is already a flange wide-angle lens on the camera there is no room for another, unless it is put on behind. In emergencies this has some value — if the lens board is mounted in such a way that another flange can be set over the rear end of the lens barrel. Not all lenses are so mounted, especially the single cell type.

Portrait attachments I believe have already been treated in these columns; if not sufficiently, the reader can get a helpful and instructive booklet entitled "Home Portraiture" from many dealers in photographic goods free of charge. This booklet explains how to use attachments, all about lighting, posing, exposure, etc. We will therefore proceed without devoting space to it.

"Copying" attachments for hand cameras are furnished in similar styles to the portrait attachment and wide-angle lens described. They are, in fact, a more highly magnifying edition of the supplemental telephoto device.

With this lens and a "process" plate one can copy, and if need be, enlarge small articles like postage stamps, coins, jewels, buttons,— in short the lens, within certain limitations, is an excellent, efficient substitute for the expensive copying and enlarging camera.

The process plate referred to is an especially slow one, about sixteen times as slow as, say, a Seed's Gilt Edge 30. The slower the plate the more detail it gets. Nevertheless, there is some drawback to amateur use of the ultra slow plate. Hand cameras mounted on light tripods are subject to trembling, by wind, jars, footsteps on the floor in the vicinity. As a rule many amateurs also fail to mount their subject for copying or enlarging solidly, and this too is likely to wiggle like the camera. So sometimes a faster plate turns out a better reproduction. If one uses a very slow plate and the camera or subject trembles, the resulting blur will be worse than the slight loss of detail in the faster plate. An Iso, or Slow Iso, or Seed's 23, or plates of this speed will usually be found quite satisfactory. These plates are all about six times as fast as Seed's 30, which is acknowledged one of the fastest plates made. I consider it the very fastest.

Very often a subject for copying must be "pointed up" a little before doing the copying. This is because the surface of a photograph, postage stamp, or any plane object presents but one face to the camera. There is no light and shadow — without light and shadow photographs have a decided tendency to be "flat." This is doubly so in copying. So if the subject lacks strong contrast and snap it is advisable to deepen some of the shadows by a judicious use of pencil, crayon or brush. Of course this work is not manual labor — go at it gently and carefully.

Sometimes in copying beautiful paintings and other colored subjects a rayfilter aids in securing a more realistic copy of the original. If the flange type of copying attachment is used the rayfilter must be mounted behind. This is for amateur purposes. Of course in the printing business where they photograph paintings for reproduction in colors they use copying cameras and photograph through a series of different colored filters, each of which is sensitive to one color or group of colors.

Little definite can be said of the actual exposure for copying work, because conditions differ so widely. Often such exposures may extend into hours. Conditions of light, color of original, speed of plate, individual camera and a dozen or so other factors make different exposures imperative at different times, even for the same camera and subject. But in general a subject factor for copying work about two and one-half times as great as the factor given in the exposure table for "portraits in the shade" will be found quite as likely to make a good copy print of engraved subjects as any exposure one can use. To illustrate: Assume an engraved postage stamp, bank check, map — anything engraved — is placed securely before camera, same well-focused and copying attachment on. Assume the light enters the room from a north window, no sunbeams on subject, and the light falls evenly upon the subject from behind the camera. It is a clear sky outside, midday and a Seed's 23 plate is in the holder. Now you consult the exposure table, calculate the exposure for work under such conditions but leaving out the factor coming under the head "subject." You add the factors for light, time, season, stop and plate. Then you go back to the subject heading, find the factor for "portraits in the shade," multiply it by 5-2 and add to the former addition. Reduce this sum to an exposure time according to the rules of the table being used and this will be as near a correct exposure as can be calculated — for an engraved subject or its class, which will include good snappy photographs. But lithographed postage stamps, bank checks, or litho. matter of any kind, are not good subjects for re-photographing. Snappy contrasty oil paintings in black and white expose quicker than engraved stuff — probably 3-2 of portraits in the shade factor will be about right to add for subject. Oil paintings in colors are a troublesome class and only a few trials on the particular painting will produce a good reproduction at the hands of the inexperienced. This is because the color values in such a picture will not be clearly understood by those who do not make an especial study of that kind of work. Different colors affect photographic plates variously. Charcoal, pen and ink, or pencil drawings usually photograph pretty well, but require slightly more time than the oil painting in black and white class.

Copying is a process upon which one can study for years and not know half of it in the end. It should prove interesting as well as being the most highly paid branch of photography we know of. Good photo-engravers are not a drug on the market as so many professional people are nowadays. And the first stage of becoming a good photo-engraver is to learn to copy with a camera.

We have one more type of supplemental lens to consider. It is put last because, to my

thinking, it is unquestionably the most important, in a general way, with amateurs—rayfilters. The albums of photographers would be sadly lacking in beauty were it not for the rayfilter. Without it there could be no cloud pictures — aside from beautiful women perhaps the most eloquent appeals to the artistic eye the photographer is called upon to depict. Without it a noted photograph entitled "The Silver Lining," showing the sunbeams shining from behind a heavy cloud upon the edge of another cloud with a celestially radiant effect, could never have been taken. Photography would thus have been without this great picture which I am told did much to present to artists the artistic possibilities in the camera. Artists often, and not without reason, denounce the camera as too mechanical, its work as soulless. They glimpsed in "The Silver Lining" a presage of modern photography's promise. Without rayfilters many yachts would go down into history as absolutely sailless, many white-roofed houses would be bereft of their roofs in photographic records thereof made for posterity; many snowclad mountains would melt inanely into an all-embracing sky; the girl on the beach in a white gown would many times reveal herself as a head and pair of feet at the extremities of a white blank.

As stated above in printing work a number of different colored filters are used. But in ordinary photography the color used is amber. The amber glass checks the more powerful rays of light — the ultra-violet rays — and so give the slower rays a chance to get through and expose. This amber is furnished in different densities, and the degrees of density are referred to as requiring so many times the exposure with the regular lens. A "three-times" filter means the regular exposure must be trebled when a three-time filter is placed in front of the regular lens. From three-time filters the densities range up to fifteen-time filters. The latter are for very fine landscape work; also white, glistening statuary, beautiful white gowns in modistes' shops, etc. The three-time filters naturally do not turn out so effective work as the higher densities, but it has the advantage of being suitable for snap-shots. Another filter is made clear over a portion of the lens, and the other portion ruled with amber lines. This is used extensively in marines — the ruled half gets the sea and clouds while the plain half the shore. Rayfilters sell for 50 cents up. Be sure to find out the degree of density when buying, and never forget to increase the exposure accordingly. It is also imperative to use orthochromatic plates or films with rayfilters. Altogether, the writer is of the opinion that a camera without at least a few supplemental lenses and attachments is as incomplete as a kitchen without a stove. Their use, however, must be studied well.

PINHOLE PHOTOGRAPHY

W. H. STANNARD

In the November issue of POPULAR PHOTOGRAPHY there appeared a photograph which no doubt excited the curiosity of many readers. This photograph showed a landscape in the back- and middle-ground, while the bed of the camera itself formed the foreground. The writer, who is also the author of this photograph, wishes to state that no auxiliary apparatus whatever was used in taking it, and, moreover, it was a perfectly "straight" photograph. The question that many ask is, "How did you focus your lens on the distant landscape and the camera bed at the same time?" and the answer is, "I used no lens." The writer has some portraits and landscapes which are admired by his friends, but when he casually remarks that, "Those were all taken without a lens," admiration gives way to curiosity.

Few people realize that a lens is not an essential part of a camera. However, a little study will show anyone familiar with the theory of a lens that a pinhole works similarly to a lens, but in a much simpler manner. A lens passes axial rays (passing in a straight line) and marginal rays (bent by the lens) from every point of an object and then has to bring these axial and marginal rays together again to form an image of that point. This bringing to a common point in the image of all the rays from a given point in the object constitutes focusing. A pinhole may be considered to be a lens whose diameter is zero or nearly zero. Hence, it passes axial rays only, and there is no occasion for focusing. It follows that every part of the view is always in focus no matter how near or how distant that part is from the camera. Furthermore, the angle of view and the size of the image can be adjusted at will by changing the focal distance. The degree of sharpness or softness of the image can be varied by using pinholes of different diameters. The one great objection to the pinhole is that, since its diameter and hence its relative aperture are necessarily very small, the exposure must be proportion-

ately long. This renders the pinhole entirely impractical for the photographing of moving objects.

Anyone who has a camera with focusing-screen and removable lens-board can adapt it to pinhole photography in a few minutes. First remove the lens-board from the camera, and unscrew the lens. Cut a piece of opaque paper the size and shape of the lens-board. Then place the lens-board with the opaque paper behind it back in the camera. This should exclude all light from the camera. Now pierce the paper with a common pin, and the outfit is ready for use. The image on the focusing screen will be difficult to see because of its dimness. However, it is not necessary to see it very distinctly, as it is necessarily in perfect focus. All that is necessary is to notice what is included in the field of view; and to see that the composition of the picture is satisfactory. Right here appears one great advantage of the pinhole over the lens. The pinhole is equivalent to a whole battery of lenses of different focal lengths. If the angle of view is too great or too small, it is only necessary to rack the front of the camera out or in until the desired angle is obtained. Changing the angle of view changes the size of the image in inverse proportion. If the focal distance is changed, the size of every portion of the image is changed in the same proportion, while, if the camera is moved backward or forward, the images of the near objects only are changed in size. By shifting both the focal distance and the position of the camera, the operator can adjust the scale of the picture as a whole and also the relative scale of the near and far portions. The last feature is especially valuable when a landscape is used as a background for a portrait, or when a near object is included in a landscape. A simple improvement on the above arrangement can be made by using two layers of opaque paper instead of one. Make a hole about one-eighth inch in diameter in the rear layer, and arrange the front layer in the form of a flap which covers the hole. Make a pinhole in the flap where it comes over the large hole. With the flap up, the image on the ground glass is brilliant enough to see easily. When ready to expose a plate, lower the flap, and the image on the plate will be the same as that on the ground glass except that it will be sharper and less brilliant.

If one intends to use a pinhole much, it will pay to make a more elaborate piece of apparatus than that described above. First write to the camera manufacturers for an extra lens-board. Then turn out a cylinder of close-grained wood the same diameter as the outside of the lens and from one-quarter to one-half inch long. In the center turn a conical hole, which is about three-sixteenths of an inch in diameter at one end and perhaps an inch at the other. Cut a shallow groove about one-half inch wide across the center of one face of the cylinder so that it intersects the hole at the little end. When the extra lens-board arrives, glue this cylinder on the center of the front of the board with the groove and the little end of the hole inward. In the lens-board make a conical hole similar to that in the cylinder and co-axial with it with the little end inward. Now cut a strip of sheet brass of the right width to fit the groove. This strip should slide freely through the groove, and yet have enough friction to hold itself wherever it is placed. Now all that remains is to drill a series of holes of varying diameters in the brass strip. It will be well to make the largest hole one-eighth of an inch in diameter and the others gradually smaller until the last is as small as can be made. The reason for making the cylinder the same diameter as the lens is to enable one to use his rayfilter in the usual way. The series of holes gives opportunity for making pictures of any degree of sharpness. It will be advisable to use the largest hole while composing the picture on the ground glass, and then to slide the strip along until a hole is reached which gives the right amount of sharpness. The degree of diffusion varies directly with the diameter of the hole, while the exposure varies inversely as the square of the diameter.

A pinhole photograph necessarily requires a long exposure. The exact exposure necessary must be found by trial, but, as a first approximation, it may be said that as many minutes will be required with a pinhole as seconds would be required with a lens. The same rules of exposure that govern a lens also govern a pinhole. However, with a lens the focal distance is commonly assumed to remain fixed so that the relative aperture changes only with the lens opening. With a pinhole, this assumption does not hold, because the focal distance at one time may easily be five or ten times as great as at another time. Hence the relative aperture at one time may be five or ten times as small as at another, even though the same hole is used. It is neither convenient nor necessary to compute the actual relative aperture. All that needs to be remembered is that the correct exposure varies directly as the square of the focal distance and inversely as the square of the diameter of the hole. That is:

$$\text{Exposure} = \text{constant}\frac{(\text{focal distance})^2}{(\text{dia. of hole})^2}$$

$$= \text{constant}\frac{(\text{focal distance})^2}{(\text{dia. of hole})}.$$

A few trial exposures will determine the proper constant for use under any given circumstances. It should be noticed that the user of a large camera is at a marked disadvantage in the matter of exposure. For instance, compare a 4 x 5 with an 8 x 10 camera. To get the same definition with each camera, it is necessary to use a hole of the same actual (not relative) size in each. To get the same perspective, each camera must have the same angle of view. This means that the focal distance of the 8 x 10 must be twice that of the 4 x 5, and hence the exposure will be four times as long as the 4 x 5 requires.

One fascinating branch of pinhole photography is portraiture. The pinhole can do what is impossible with a lens; that is, make a protrait with a distant background such as a landscape in which the whole picture has any desired amount of diffusion, and yet everything is equally well defined or diffused. To get pleasing portraits it is advisable or even necessary to so arrange things as to use a short exposure. To accomplish this the work should be done out of doors, and also the focal distance should be made as short as is consistent with good composition and good perspective. The author has made a satisfactory pinhole portrait in twenty seconds, and probably that is about the minimum that could be given in any practical circumstances. The subject was in bright sunlight on the Maine coast in July. The focal distance was about three and one-half inches, and the plate was a 4 x 5 Lumière Sigma.

In conclusion, the advantages and disadvantages of a pinhole over a lens may be summed up as follows: With a pinhole every part of a view is always in focus; one pinhole is the equivalent of a battery of lenses of different focal lengths varying from the extreme wide angle to the telephoto; a series of holes, which may be conveniently arranged in a single strip of brass, is the equivalent of a battery of lenses of different degrees of softness varying from the sharpest anastigmat to the softest pictorial or portrait lens; a pinhole never gives flare or color fringe; its sole disadvantages are the length of exposure necessary and the difficulty of seeing the image on the focusing screen.

THERMO DEVELOPMENT

CHARLES W. FRICKE

When the amateur photographer has passed the "let George do it" stage and decides to do his own finishing, the developing of his plates and films is his greatest difficulty. Tray development may be fascinating, but, for the beginner, it is mostly a story of fog and failures; experience alone tells when to stop development and few amateurs and not over many professionals have the necessary experience, and this lack of experience applies particularly when a new brand of plates is developed.

Tank development substitutes time, temperature, and strength of developer for experience and personal judgment and yields better negatives. I know that there will be some who will contradict this; I was once a skeptic on the tank development question myself and I know the symptoms, but after giving the tank a fair trial I have no desire to go back to the stuffy darkroom days. I will even concede that there are some (and I know of at least one professional photographer who has had this experience) who followed the instructions accompanying the tank but did not get first-class results. The general instructions accompanying the newly purchased developing tank may be all right for certain plates or films, but when one considers that some brands of plates and films develop faster than others (some developing in as little as one-tenth the time required for other brands) it must be appreciated that "develop twenty minutes at 65 degrees Fahrenheit" will yield first-class negatives only on some plates; other plates might be materially over- or under-developed. For example: — Kodak N. C. Film developed in the Eastman Film Tank as directed in the instruction book accompanying the tank will give good results, but if Ansco or Ensign film were developed according to the same instructions the negatives would be overdeveloped and the highlights blocked up.

The following plan is based almost entirely upon information gained from the Watkins Manual supplemented by personal experiment and method. The developer used can be made up in three stock solutions, A, B, and C, as follows:

Stock Solution A

Pyro ½ oz., Potassium metabisulphite, 60 grains, dissolved in 12 ounces of water. (If crystal pyro is used the oxalic acid may be omitted.)

Stock Solution B

Sodium sulphite (anhydrous), 1 oz. dissolved in 8 ounces of water.

Stock Solution C

Sodium carbonate (anhydrous), 1 oz. dissolved in 12 ounces of water.

To develop take 1 oz. of A, 1 oz. of B, and 1 oz. of C and dilute with water to make 30 ounces. The amount of the pyro stock (*A*) must not be varied, but the amounts of sulphite and carbonate may be slightly varied without interfering with the time of development. Thus: 1½ ounces of sulphite stock (*B*) may be used instead of one ounce; this will reduce the slight stain which is typical of pyro-developed negatives. The amount of carbonate stock (*C*) may be reduced when developing those plates for which the manufacturers recommend a smaller amount of carbonate than is ordinarily used. Instead of the stock solutions the developer may be compounded by dissolving 18 grains of pyro, ⅛ ounce anhydrous sodium sulphite and 40 grains of anhydrous sodium carbonate in 30 ounces of water.

To insure the developer remaining at the same temperature during development, it is advisable to keep the stock solutions, and a jug of water sufficient for diluting the developer, in the room used for developing.

Having prepared the developer, pour it into the tank and insert a thermometer to ascertain the temperature. In this connection it should be noted that it takes several minutes for a thermometer to register the temperature of any solution.

The next step, if you have not already done so, is to ascertain the development speed of the plate or film to be developed. The development speed of the various plates and films is given in the Watkins speed card and has also been published in the June, 1914, number of POPULAR PHOTOGRAPHY in a valuable article by Malcom Dean Miller on "Thermo Development by the Dilution System."

Having obtained the development speed of the plate or film and the temperature of the developer, a reference to the following table will give the proper time of development in minutes and seconds:

For example: If we have a Cramer Iso Instantaneous plate to develop (which has a development speed of MQ) and our developer has a temperature of 68 degrees Fahrenheit, we look opposite the development speed MQ in the table and under the column headed 68° we find the figures 8′51″ indicating that development should continue for eight minutes and fifty-one seconds. Development for a slightly shorter time will give a softer effect; to accomplish this, develop for the time given for the next highest temperature opposite the given development speed. If the thermometer registers a temperature between those given in the table, use the next highest temperature to ascertain time of development; for example, if the thermometer registers 65 degrees, use the time give under 66 degrees. Greater contrast may be obtained by developing for the time given under the next lowest temperature for the same development speed. Ordinarily, however, the time of development should be determined by using the actual temperature of the developer. There are a few plates which have a development speed of VVQ; the time of development of all plates so classed is just one-third of the time of development of plates classed as M.

The addition of bromide to the developer does not alter the time of development if added to the developer herein recommended. Bromide should be used only for known over-exposure or to keep back fog, for which purposes from 20 minims to 3 drams of a 10 per cent solution of bromide of potassium may be

PLATE	78°	76°	74°	72°	70°	68°	66°	64°	62°	60°	58°	56°	54°	52°	50°	48°	46°
VQ	3′27″	340	4′	4′18	4′36	5′	5′19″	5′51	6′18	6′45	7′21″	7′51″	8′24	9′09	9′54	10′48	11′33
Q	4′30	448	5′15″	5′42″	6′9″	6′32	7′3″	7′39″	8′15″	9′	9′36	10′21″	11′6″	12′9″	13′12	14′15″	15′18″
MQ	6′9″	6′27	7′3	7′39	8′6	8′51″	9′27″	10′12″	11′6	12′	12′54	13′51	15′	16′12″	17′24″	18′54″	20′6″
M	8′6″	8′33	9′18	9′54	10′39	11′33	12′27	13′30	14′33	15′45	17′6″	18′18″	19′30	21′18	23′6″	24′27	27′
MS	10′48″	11′24″	12′36	13′30	14′24″	15′36″	17′6″	18′	19′12″	21′	22′48″	24′36″	26′24″	28′30″	31′12″	33′36″	36′
S	13′48″	14′42″	15′54″	17′24″	18′18″	19′48″	21′18″	23′6″	24′54″	27′	29′24″	30′18″	33′54″	36′18″	39′54″	42′12″	45′18″
VS	17′42″	18′36″	20′6″	21′36″	23′24″	25′12″	27′18″	29′42″	32′6″	34′30″	36′54″	40′12″	43′12″	46′30″	51′	54′54″	58′30″

added, depending upon the fog or overexposure to be counteracted. The practical effect of adding bromide is to lower the speed of the plate, thus compensating overexposure, and to hold back the lowest tones and fog.

This system of development is of great advantage to the amateur in determining whether his exposures have been correct. Underexposure will be evidenced by a negative too thin throughout, with no detail in the shadows, while the overexposures will be very dense and will show want of detail in the upper tones and highlights which will all have about the same tone.

Another advantage is that the user of this system will not overdevelop his underexposures or underdevelop his overexposures. Any exposure within the latitude of the plate used will give a negative of fair printing quality; the nearer correct the exposure has been, the better the negative will be.

Plates of different development speeds may be developed in the same tank at the same time, each plate being removed as its time of development expires.

No special thermometer is required nor is any calculation necessary, as the developing time is read direct from the table given.

Freshly drawn tap water may cause air bells to form on the plates during development, resulting in pinholes in the negatives. If a supply of water for dilution purposes is kept continuously in the room used for developing there will be no trouble of this sort.

An additional preventive of pinholes in tank development is to reverse the tank as soon after commencing development as possible. Thereafter the tank should be reversed every three or five minutes.

By using the developer at twice the strength given the time of development is reduced one half; by using the developer three times as strong the time of development is one-third of that given by the table. This course is not recommended except where it is of very great importance to save time. Negatives will be of a better quality if the developer is used at the normal dilution first given.

After development rinse the plates or films well and fix for at least fifteen minutes in an acid fixing bath. It is advisable that no white light should strike the negatives until after they have been fixed.

Developing tanks should be well rinsed after being used. Success in photography depends largely upon absolute chemical cleanliness.

While it has taken some space to describe this method of development, it is in fact the simplest method which can be devised and, if directions are carefully followed the first time this system is used, its simplicity and the excellent results obtained will commend its continued use.

THE VIEW-FINDER AND ITS USE

Though a view-finder of some kind or other seems to be considered indispensable with any kind of a hand camera, yet it can hardly be contended that all the numerous types in existence are equally satisfactory. Some work excellently if we look upon them as required only to do the work of rifle sights and to enable us to get a bee-line upon the object that it is desired should appear in the center of the plate, but many of these types fail to show satisfactorily how much of the view is included on the plate. Such finders may very well be replaced by a much cheaper device copied from rifle sights, and, in fact, a couple of small pins put in suitable positions will often serve equally well.

Other finders are eminently well suited to show what is included on the plate, though they may not include any special device that secures accurate aiming on a given spot. Others are adapted to fulfill both purposes perfectly, sometimes together with that of leveling the camera, but these are usually complex fittings which are readily damaged. Also, it generally takes some little time to get things properly arranged with these more elaborate appliances, and time is often a valuable consideration in snapshot work. We are strongly of the opinion that the designers of view-finders very often fail to realize the true requirements of the photographer, and therefore some consideration of what is really wanted may be of value.

Four things are essential to the production of a successful snapshot. The act of exposure must be performed or the critical moment will be lost. The photographer must aim straight or he will miss the main subject, and he must not be too near the subject or else he will not get all of it on the plate. Also the camera must be held level to avoid distorted effects.

With some of the more elaborate forms of finder the first of these requirements cannot be fulfilled. It is impossible to work quickly and utilize the finder at the same time, for its use involves the simultaneous observation of greatly differing things. There is a device for aiming, one for framing the view, and another for leveling the camera, all of which have to be noticed and considered together.

Straight aiming can be accomplished fairly easily with very simple devices or without any devices at all. For our own part we find no difficulty in aiming sufficiently straight to get the object fairly near the center of the plate without using any form of finder. Such aiming is only a matter of practice, but it is far more difficult to insure that all the subject is included on the plate, especially when dealing with objects moving toward the camera. There is a moment when the subject just fills the plate nicely, but a second later it is too near, and part of it is cut off. On other occasions anxiety to secure all the subject leads us to expose a little too soon, and then the result is on a much smaller scale than it should be. On these grounds we have come to the conclusion that the more important function of the finder is its masking effect of the view, and that the most useful finder is the one that shows with approximate accuracy the manner and extent to which the object fills the plate.

The oldest type of finder was a small reflecting camera made like a miniature reflex with a little ground glass hooded screen upon which the view was visible. This type had the disadvantage of giving an image that was hardly visible in a poor light, though quite clear in bright weather. To some extent the varying degrees of brightness of the finder image were useful, inasmuch as they offered a guide to exposure, but this slight advantage, which was only useful to experienced workers, was counterbalanced by the invisibility of the image in very poor light. This type of finder was replaced by the "brilliant" finder, in which no ground glass is used, and a bright clear image is obtained in almost all conditions. This is of no use as a guide to exposure, for the brightness of the image is so great that it is very likely to deceive one into thinking that the light is far better than it really is; but, considered as a finder only, we think that the brilliant finder is very hard to beat. Its chief defect is that the camera must be held low down to enable us to see the finder image. A modified form, giving similar results at eye level, would, however, be preferable for many purposes, and we see no reason why such a device should not be tried. So far few serious attempts seem to have been made to secure such a finder, excepting in the form of the direct vision finder, next dealt with. The most popular of the small finders is one devised for direct vision only, and it usually consists of a rectangular concave lens with a small peephole or sight behind it. With such a finder aiming straight and with accuracy is quite simple, but the masking of the view is by no means accurate unless the eye is at exactly the right point, and it very often happens that the construction of the camera absolutely prevents the eye from getting anywhere near the right place. We have also seen some finders of this type which were obviously designed by someone quite unacquainted with the peculiarities of vision and ignored the fact that objects quite close to the eye cannot be seen with any accuracy. There should be as much space as possible between the sight and the lens, and then such a finder, if designed by a good optician, is very useful and quite practical, provided only that it is so fixed that the eye can be placed near enough to the sight hole. The better forms of direct vision finders are, perhaps, the large ones consisting of a small sight on the back part of the camera and a masking open frame on the front part as far away from the sight as possible. The chief defect of these is that they are not always ready for use and are also somewhat frail and easily bent and damaged.

The fourth condition for successful snapshot work is keeping the camera level, and nothing is so useful for this purpose as a spirit level. Sometimes a shot or a mercury globule on a slightly concaved surface is used as a substitute, and such an arrangement has the advantage that it can well be incorporated with a brilliant finder, so that level and finder can be observed together. The leveling trouble is not so easily got over with a direct vision finder, though various ingenious and more or less satisfactory attempts have been made to surmount the difficulty.

It stands to reason that no type of small finder can be so perfectly efficient as the full-size finder of the reflex or twin-lens camera. Even with a reflex it is not easy to catch our subject exactly at the critical moment, and the difficulty is much greater with a small finder. In practice we find it better to ignore the finder altogether at the moment of exposure and fix our attention on the subject itself. The finder and the level device should be brought into play before if possible, just as is the focusing scale. Get the camera level and determine in the finder where the moving object should be at the moment of exposure, then, keeping the camera steadily in its predetermined position, wait for the object to reach the right place. For ourselves, we look first to the leveling, being of the opinion that good leveling is of more importance than the scale or exact position of the subject on the plate. Second, to the view included, to see that we are neither too near nor too far from the object, while for

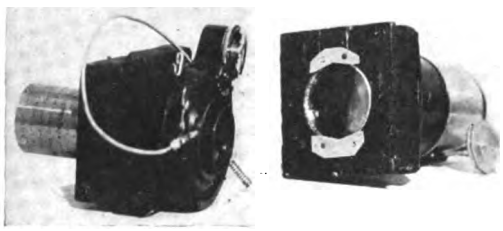
aiming we trust to instinct. If the camera is held square with the body and we turn so as to face the object squarely, not much can be wrong in the aiming. It is far easier to aim with a camera and get what we want than it is to do the same thing with a gun or a pistol, and yet with a little practice very fairly accurate shooting can be performed with the latter without any use of the sights at all and without even raising the weapon to eye-level.

SOME HOME-MADE TELEPHOTO LENSES

LEONARD W. WESTPHALEN

Of late, photographers have been enthusing over long-focus lenses and particularly fixed focus telephoto lenses.

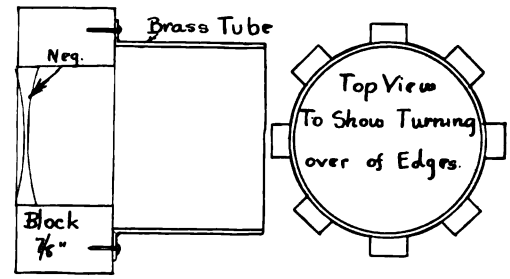
There are a number of such telephoto lenses on the market working at from *f*: 15 to *f*: 5.4 and costing from $15 to $150. Telephoto attachments cost $25 up. Wishing one for myself to use on a 4 x 5 reflecting camera and not having the money to buy what I wanted made me think, and I finally made one which at *f*: 9.3 and 8-inch extension covers



a 4 x 5 plate to the corners (see photo) and gives 14 inches' focus. The definition is more even than a 5 x 7 Bis Telar of practically the same back focus working at *f*: 7.7 and listing at $49.

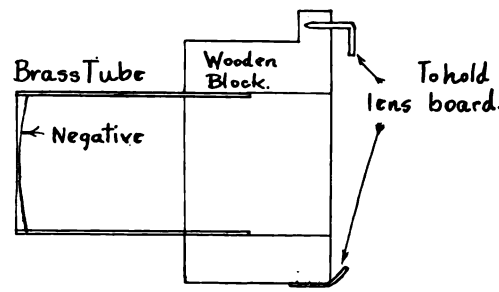
The positive is a 6-inch projection lens working at *f*: 4 costing in rack and pinion mount $4.50. The negative is a simple double concave of 6-inch focus and is not an achromatic, cost 20 cents. Diameter 1¾ inches. The positive is screwed into a section of brass tube 1-32 inch thick and 2 3-16 inches inside diameter. To make a tight fit a piece of cloth is glued to inside of tube and the barrel of positive lens screwed in tight. This may seem crude, but it has worked very well on mine. The tube is mounted on a 7-8 inch block of wood, size of same to fit camera front, by splitting the end of tube, turning edges over and nailing to wooden block. It is hardly necessary to state that the tube must be put on at right angles to the block that serves as lens board. The negative is sunk in the other side of the block. See drawing and photo.

You can, if you wish, use a 3-inch negative and get 24 inches at 9-inch extension and *f*: 16 and so on, but the combination covers 4 x 5



best at 8 inches extension or more. At 6 inches extension it shows a very round field, while at 8 inches the field is practically flat.

If you have no reflex and wish a long focus lens on your folding camera, No. 2 may interest you. Details: 7 inches *f*: 6.3 anastigmat in Multispeed Jr., mounted as shown in drawing and photo and used on 4 x 5 folding camera with 8½-inch bellows. The tube is partly inside camera, for the reason that having it outside would make the outfit look too odd, and



it could not be put inside on account of bellows not being long enough. Negative 10 inches' focus, 1 3-16-inch diameter, gives 11 inches of focus at *f*: 10 on 6-inch extension from rear of tube; just barely covers 4 x 5.

It should be stated in closing that you can combine positives and negatives of almost any focus in much the same manner.

UNMARKED STOPS

Low-priced cameras often do not have their stops marked. If the catalog description says that the lens is a single meniscus achromatic, the largest stop is almost invariably *f*: 16, and others, if provided, are *f*: 22 and *f*: 32.

EDITORIAL

OUR COMPETITION

We received a large number of very pleasing pictures for our October competition, and the prize was awarded to "Along the Shore," by G. E. Peaslee. The criticism of this photograph appears on page 112. The following pictures received honorable mention: "Stone Bridge," by A. A. Furman; "Horticultural Building, New York," by W. J. Gerhardt; "Down the Ladder," by Charles Chamberlain; "Kate," by L. C. Hogan; "Pelham Bay," by X. J. Barile; "Outdoor Portrait," by George P. Shaw; "Wildcat Canyon," by F. M. Wilkins; "We Three," by G. Anderson; "The Picture," by Louis Rommel; "The Trouble Hunter," by Ralph F. Rhodes; "A Quiet Brook," by Jessie C. Van Wye; "Big Creek," by J. L. Moore; "The Faithful Little Mother," by C. A. Guimont; "Innocence," by S. R. Kitchin; "The Peace Disturber," by Joseph Bath; "Grazing," by T. W. Lindsell; "Outdoor Portrait," by H. H. Harloff; "Harbor Scene," by H. L. Maddix; "The Old Tower Church," by Juventino Ocampo; "The Storm's Victim," by Stark Weatherall; "Down by the Spring," by G. L. Cheney; "Flowers," by H. M. Stone; "The Viaduct," by W. H. Frasse; "On the Housatonic," by B. B. Snowden; "Making up Time," by L. L. Emmons; "The Homestead," by W. K. Johnson; "Mirror Lake," by James Gallimore; "Moving Day," by John K. Kruger; "Our Boy," by Oscar G. Whiting; "The Brook," by J. D. Ficklen; "Edna," by Nathaniel Mortonson; "Portrait Group," by A. L. Mason; "Portrait," by Carl Struck; "Good Friends," by Elizabeth B. Wotkyns; "The Young Fisherman," by W. F. Baker; "Summer," by H. B. Rudolph; "Axel," by Edwin Viggers; "Autumn Time," by Wm. McGrath; "An Old Swimmin' Hole," by Mason E. Hufford; "Heart of the Glen," by John Bischoff; "A Quiet Retreat," by J. F. Webster; "Warwick Avenue," by Leo Lee; "The Pond," by Walter A. Karow; "A Summer's Day," by C. K. Baker; "October," by W. Gilbert; "Minnie Ha-Ha Creek," by A. D. Tinklepaugh; "A Sylvan Path," by W. A. Van Rensselaer; "The Drive Through the Dell," by R. W. Tyler; "Paradise Road," by A. S. Currie; "Republic Steel Works," by Edward L. Dickinson; "Lumbering," by E. S. Bechtold; "An Early Morning Bather," by W. B. Merriman, Jr.; "Fox Squirrel," by R. H. Fellers; "Initials," by Willis E. Mason; "Feeding Her Pet," by Matti Antila; "Mother and Twins," by Charles Leising; "A Modern Nimrod," by George L. Speer; "The Old Creamery," by W. H. Pennoyer; "A Picnic Party," by Wm. W. Soper; "Interior," by R. W. Tyler; "Little Tots," by Grace Carlson; "In Peacedale Valley," by Ernest G. Cook; "Sand Dune," by Virginia A. Mears; "On the Job," by S. S. Chojnacki; "Fast on the Sand Bar," by Burdette Harrison; "The Woodland Pool," by Garnet E. Jacques; "Attention," by Wm. D. Wilder; "Nobody's Dog," by S. H. Gottscho; "Native Alaskans," by Oriel Shade; "Mt. Lassen in Eruption," by C. Mullen; "The Old Farmhouse," by H. Sloan; "Parting Day," by R. Railton; "The Elopement," by Mrs. W. Durrant; "Recreation," by C. D. Meservey; "At the Beach," by Martha Hume.

HOW IT WAS MADE

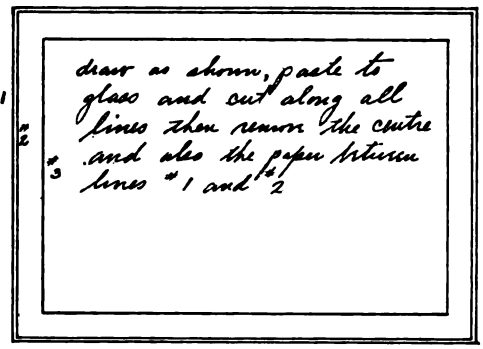
The picture published on page 84 of our November issue was apparently of considerable interest to our readers and brought forth a number of interesting letters. The majority of the writers were not sufficiently acquainted with photographic optics to deduce the correct answer theoretically and had not made the acquaintance of that cheapest of all optical instruments, the pinhole, with which the picture was taken, as described by the author, W. H. Stannard, on page 120 of this issue. The majority of our correspondents believed that the picture was taken with a wide-angle lens, much stopped down, but to get distant mountains and an object three or four inches away in focus at the same time is beyond the capacity of any lens of long enough focus to be used on a hand camera and cover a 4 x 5 plate. Those who answered correctly were: C. O. Chapman, Willis E. Mason, George F. Mims, Alvin W. Prasse, Burt Stone, Stark Weatherall, B. J. Weeber.

We trust many of our readers will experiment with pinholes, and will be pleased to publish results if they are up to our standard of interest in subject and execution.

Readers' Forum

EDITOR POPULAR PHOTOGRAPHY
DEAR SIR:

I have just finished reading the article on "Tinted Borders on Postcards" in your October number and with all due respect to Mr. Oakes I think I have him beaten. My method prints a black border at the same



time as the picture is printing, eliminating the possibility and in a good many cases the probability of non-register, and also making the printing a joy instead of a cause for strong language.

First secure a piece of black paper (I use the black papers that come around my printing paper), tack this to a drawing board and lay out your actual print size in the center being sure that the lay-out is square. I make this lay-out $\frac{3}{16}$ of an inch smaller both ways than the actual size of the film negative. Now lay off another line $\frac{3}{16}$ of an inch all around from the one first drawn; this makes the inner edge of your black border; then lay off around that still another line at a distance from the second outline that you wish to have your border. This distance I find most effective at 1-20 of an inch. Your black paper is now ready for mounting. Take a glass the size of your printing frame, lay your black paper, drawn as above, on a flat surface and lay your glass over it; you will then see your outline through the glass. Now take any good paste and cover the glass thoroughly at all parts where you want the mask to stick; if you get a little over the edges it doesn't matter, the idea being that the less unnecessary paste you use the less paper you will have to scrape from the glass when it is dry. Now lay your black paper quickly on the paste-covered glass with the drawn side uppermost and smooth down quickly with a handkerchief or print roller and you will find that it will lay perfectly flat and not wrinkle if done quickly; let it dry for half an hour and then with a sharp knife and a straight edge cut out the center and the narrow border strip, using the point of the knife to scrape close up to the line after cutting. With a little care in cutting and scraping you now have a permanent mask for printing. It is sometimes necessary to trim your films so that the edges do not project ontothe border space.—C. J. KELLAM.

EDITOR POPULAR PHOTOGRAPHY
DEAR SIR:

The information contained in Mr. Daughten's letter which appeared in the Readers' Forum of the October number of POPULAR PHOTOGRAPHY has no doubt saved me considerable time and expense which would otherwise have been wasted in trying to adapt the ordinary Mazda lamp to use with condensing lenses for enlarging.

Permit me to express my sincere thanks both to the publishers and to Mr. Daughten.

Teamwork of this sort gives isolated workers all the privileges of membership in a large and flourishing camera club.— E. B. COLLINS.

EDITOR POPULAR PHOTOGRAPHY

DEAR SIR: I have every issue of POPULAR PHOTOGRAPHY that has been published to date, and hope to continue reading it provided it continues to keep up the standard it has maintained so far. A magazine of this character is what the average and advanced amateur requires to keep him progressing in the field of photography, as it supplies the needs and information so necessary to a thorough understanding of his work. I am a regular subscriber to every American photo magazine and find POPULAR PHOTOGRAPHY to contain features not included in the others. You ask from time to time for suggestions that would help to improve the make-up of the magazine, so allow me to offer my mite in the hope that it may find response in the future. 1. Keep on publishing the practical articles, which are very illuminating and thorough. They are one of the main things that have appealed to me in *American Photography* and POPULAR PHOTOGRAPHY. 2. The idea of up-to-date advertisements is to our mutual advantage, as it keeps the amateur informed of new apparatus that will improve and simplify his work. 3. Interpolate plenty of articles on exposure and development, as these two things are the bugbears of the average amateur and subjects upon which he can never know too much. Modern developers and developing methods are always welcome, even to the man who is somewhat advanced, as it keeps his interest from lagging and incidentally adds to his experience. With best wishes for the success of the periodical.—GEORGE C. CONGDON.

Trade Notes

A 4 x 5 lens makes 11 x 14 negatives. The Turner-Reich convertible anastigmat lens, *f*: 6.8, claimed by its makers to be the most versatile anastigmat on the market, possesses some wonderful capabilities which will astonish those who are as yet unfamiliar with it. It is the only American convertible anastigmat on the market to-day, its single combination of unequal focal length being perfectly corrected for use separately. The Series II, No. 1 (listed for 4 x 5 plates) covers a 5 x 7 plate perfectly at the open aperture *f*: 6.5. In this capacity it can very well be used as a wide-angle lens for 5 x 7 cameras, its focal length being but 6¼ inches. The back combination alone, working at aperture of *f*: 12, and of a focal length of 11 inches, covers a 6 x 10 plate perfectly at the open stop and an 11 x 14 at *f*: 16. The possibility of using singly the separate combination of a high-class anastigmat lens thus saves the necessity of purchasing several lenses of various focal lengths, and also of unsatisfactory wide-angle lenses. Try this test with the anastigmat that you

are now using and see how its capabilities compare with these. Then write to the Gundlach-Manhattan Optical Company of Rochester, N. Y., for their complete catalog of lenses and cameras, and for full particulars of the wonderful capabilities of the Turner-Reich anastigmat. Also ask them for their free handbook on Telephotography — another interesting branch.

The question of Christmas gifts is well settled with the Ensignette, Jr., 2¼ B camera. All the simplicity of this camera immediately appeals to the amateur, be he a beginner or advanced in his work. The camera is very small, fitting comfortably a sack-coat pocket and yet will make pictures 2¼ x 3¼. The camera is focused and is as simple in operation as the ordinary box-form models offered to-day, yet has the advantage of compactness. The finish of the camera is excellent throughout, as the rest of the Ensign line. If you have not seen this little camera, send for the Ensign catalog. There are also other cameras in this catalog that might be of interest to you. All readers of this magazine will be sent a catalog prepaid on application to the firm mentioned here. G. Gennert, 24–26 East 13th Street, New York; 320 South Wabash Avenue, Chicago; 628 Mission Street, San Francisco.

Those Famous Trial Offers. Interest in the trial offers of the Photo Products Co. of Chicago never seems to lessen. Those who have taken advantage of them pass the word along to their friends. The "direct-to-you" policy of this company is making many friends for them among amateurs who appreciate quality combined with lower prices. The Photo Products Co. informs us that they have a good supply of imported stock on hand, and don't anticipate any shortage, regardless of the duration of the war. Unlike most paper manufacturers, they have a completely equipped bartya coating plant which places them in a little more independent position. If you have not taken advantage of their trial offers on Instanto and Platora, refer to the advertising pages for details regarding them. Hundreds of our readers have sent for a copy of Dr. Malcolm Dean Miller's booklet, "The Magic Quarter." If you have not read it, we advise you to write at once. It's free.

By an unfortunate error the trial offer of Graffo Paper announced by the Rochester Photo Works in our November issue stated that the price for three dozen sheets of Graffo, 4 x 5 or smaller, would be 25 cents, whereas, as a matter of fact, it should be 50 cents. We trust that our readers will take due note of this correction, and assure them that even at the higher price the trial offer is well worthy of acceptance.

We are also advised by the Rochester Photo Works that they have decided that the closing of their next enlarging contest on December 31 would be inadvisable, on account of the holiday season, and that therefore prints in this contest will be accepted until January 31.

Purchases "Pyro" Process. Dispatches from Hartford, Conn., announce that the Eastman Kodak Company has purchased the plant of the Eastern Chemical Company at Elmwood, Conn., and will thus acquire the process for the manufacture of pyrogallic acid, a valuable compound employed in the making of photographic supplies, which heretofore the company has purchased in Germany. Fred W. Lovejoy of the Eastman Company, who conducted the negotiations, said that the purchase was simply of the Connecticut company's process, and the plant wherein this particular acid has been made. Ultimately, he said, the plant will be removed to Rochester, N. Y.

The New York Camera Exchange, 109 Fulton Street, New York, has just issued its Photographic Bargain List No. 19, which contains nearly 1,000 items of new and second-hand cameras and lenses at bargain prices. This firm has been in existence for twenty-five years, and guarantees to refund the purchase price of any unsatisfactory item returned, carriage paid, within one week of receipt. A novelty in this list is that any purchase of a new equipment valued at $15.00 or more will be given free of charge a year's subscription to POPULAR PHOTOGRAPHY or any other photographic magazine published in the United States.

The Autographic Kodak is still the sensation of the photographic world. The ability to date and title negatives at the time they are made greatly increases the value of the picture to the kodaker. Interesting data surrounds the making of every picture, and it is a fact to be deplored that formerly much of this data was forgotten. The Autographic Kodak ends all this, because the record on the negative furnishes permanent and positive identification as to when, where, and under what conditions each picture was taken. The Eastman Kodak Company say that the Autographic Kodak is the biggest photographic advance in twenty years — a claim that can hardly be denied. Stroll down to your dealer's to-day and have him explain the simple workings of the Autographic Kodak to you.

The Ansco Loveliest Women contest closes December 1, and while there will probably be little time left to make pictures for this contest, this final notice may serve to recall to some of our readers the necessity of getting their pictures in for this competition.

A Christmas combination that should be universally popular is the Velox Transparent Water-Color Stamps and the Yuletide Calendar. Any of your prints will show up nicely on this handsome calendar mount, and if they are colored, a more attractive holiday remembrance could hardly be imagined. The Yuletide Calendar is supplied for both black and white and sepia toned prints, and for horizontal and vertical prints in all of the standard amateur sizes. Your kodak dealer carries a complete line.

The Bausch & Lomb Optical Co., Rochester, N. Y., call attention to their line of Balopticons as especially suitable for Christmas gifts. Lanternslide projection is a most interesting amusement for winter evenings, and there is no photographer who would not appreciate the ownership of a modern projection lantern. Descriptive catalogs will be sent on request.

"How to Make Lanternslides" is the name of a simple but comprehensive little book fully describing the contact method of slide making. You can get it from our publishers for ten cents postpaid.

Exposure-Tables for November, December and January

DIRECTIONS: Find in the tables printed below the NUMBERS for SUBJECT, STOP, LIGHT, HOUR, and PLATE. Add them, find the sum in the last table, and give the exposure indicated. When the exposure fails to correspond with the speed-marking on shutter, use the nearest shutter-speed, preferably the lower. If sunlight falls over one shoulder, add **0**; if straight across subject, add **1**; if sun is ahead, add **2**. When using back combination only of lens, add **2**.

EXAMPLE

Average landscape	3	July, 11 A.M.	0
Stop U. S. No. 8	6	N-C film	1½
Intense light	0		

Adding these numbers, we get **10½**, and on referring to the last table, under **10½**, we find **1-40** second, which is the exposure to give. In this case you would use the speed marked **1-50** and open the lens a little, if possible; say, half-way to U. S. No. 4.

SUBJECT

Sea (only) and clouds	½	Street scenes, buildings, groups	5
Sea-views, snow-scenes, distant landscape	1	Portraits in shade	7
Open landscape, without foreground	2	Indoor portraits	8 to 10
Average landscape, with foreground	3	Interiors	16

STOP:—

f:2	*f*:2.3	*f*:2.8	*f*:3.3	*f*:4	*f*:4.7	*f*:5.6	*f*:6.7	*f*:8	*f*:11.3	*f*:16	*f*:22	*f*:32	*f*:45	*f*:64
				U.S. 1	U.S. 1.4	U.S. 2	U.S. 2.8	U.S. 4	U.S. 8	U.S. 16	U.S. 32	U.S. 64	U.S.128	U.S.256
1	1½	2	2½	3	3½	4	4½	5	6	7	8	9	10	11

LIGHT: Intense sunlight (inky-black shadows), **0**; Bright sunlight (strong shadows), ½; Faint shadow cast by sun, **1**; Dull (no shadows), 1½; Very Dull (whole sky very dark), **2**.

HOUR: 11 a.m. to 1 p.m., **1**; 10 a.m. and 2 p.m., 1½; 9 a.m. and 3 p.m., **2**; 8 a.m. and 4 p.m., **3**; 7 a.m. and 7 p.m., **5**.

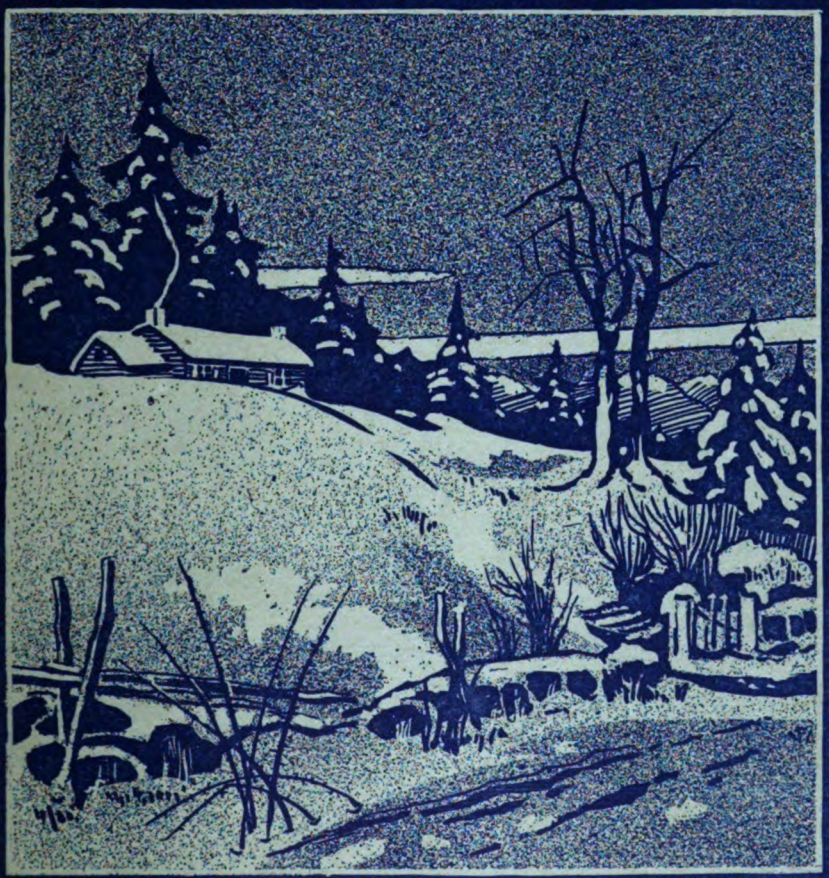
PLATE: AMERICAN, 1½. ANSCO FILM, 1½. BARNET — Film, 1½; Superspeed Ortho., **1**; Ortho. Ex. Rap., **2**; Red Seal, **1**; Red Diamond, 1½; Self-screen Ortho., **2**. CENTRAL — Special XX and Sp. Home Portrait, ½; Special, **1**; Comet, Colornon, and Pan-Ortho., 1½. CRAMER — Crown, **1**; Anchor, **2**; Banner, 1½; Inst. Iso., 1½; Med. Iso., **2**; Commercial Isonon, 2½; Portrait Isonon, 1½; Trichromatic, **3**; Slow Iso., **5**; Contrast, **9**. DEFENDER — Vulcan, **1**; Vulcan film, 1½; Ortho., **2**; Non-hal. Ortho., **2**; Slow, **9**; Process, **9**. DUFAY DIOPTICHROME, **7**. EASTMAN — Motion Picture Film, **1**; Portrait Film, **1**. ENSIGN FILM, 1½. FORBES—Challenge, 1½. HAMMER—Sp. Ex. Fast, **1**; Ex. Fast, **1**; Aurora Ex. Fast, 1½; Ortho. Ex. Fast, 1½; Ortho. Non-hal. **2**; Fast, **2**; Ortho. Slow, 2½; Slow, 2½. ILFORD—Monarch, **1**; Zenith, 1½; Sp. Rap,. **2**; Chromatic, 2½; Ord., **3**; Process, **9**. IMPERIAL—Flash-light, **1**; Spec. Sensitive, **1**; Orthochrome S. S., **1**; Spec. Rap. 225, 1½; Spec. Rapid 200, **2**; Non-filter, **2**; Process, **9**. JOUGLA — Violet Label, 1½; Green Label, **2**; Omnicolore, **7**. KODAK—Speed Film, **1**; N. C. Film, 1½. KODOID PLATES, 1½. LUMIERE—Sigma, ½; Blue Label, 1½; Film, 1½; Ortho. A, **2**; Ortho. B, **2**; Panchro. C, **2**; Autochrome (outdoors), **8**, (indoors) **9**; Process **9**. MARION — Record, ½; P.S., **1**. PAGET—XXX, 2½; XXXXX, **2**; Swift, **1**; Ex. Spec. Rapid, **1**; Ortho. Ex. Spec. Rapid, 1½; Panchro. Ord., **2**; Panchro. Colour (no screen), 2½; Spec. Rapid, 1½; Hydra Panchro., 3½; Hydra Rapid, 3½. PREMO FILM PACK, 1½. ROEBUCK—Blue Label, **1**; D. C. Ortho., **2**; Ortho., **2**. SEED — Gilt-edge 30, ½; Color Value, **1**; Gilt-edge 27, 1½; L. Ortho., 1½; 26X, **2**; Non-hal., **2**; Non-hal. L. Ortho., **2**; Tropical, **2**; C. Ortho., 2½; Panchromatic, 2½; 23, **3**; Process, **9**. STANDARD — Extra, 1½; Imperial Portrait, 1½; Orthonon, 1½; Polychrome, 1½; Thermic, 1½. STANLEY — 50, 1½; Commercial, **4**. THORNWARD — Regular, **1**; Orthochromatic, **2**; Orthochromatic N. H., **2**. WELLINGTON — Extreme, ½; 'Xtra Speedy, **1**; Film, 1½; Iso. Speedy, 1½; Portrait Speedy, 1½; Anti-screen, 1½; Speedy Spec. Rap., **2**; Ortho. Process, **9**. WRATTEN & WAINWRIGHT — Panchromatic, 1½; Process Panchromatic, **3**.

3½ S 1/500	4 S 1/1000	4½ S 1/2500	5 S 1/2000	5½ S 1/1250	6 S 1/1000	6½ S 1/700	7 S 1/500
7½ S 1/350	8 S 1/250	8½ S 1/150	9 S 1/100	9½ S 1/75	10 S 1/50	10½ S 1/40	11 S 1/25
11½ S 1/20	12 S 1/12	12½ S 1/10	13 S 1/8	13½ S 1/5	14 S 1/4	14½ S 2/5	15 S 1/2
15½ S 2/3	16 S 1	16½ S 1½	17 S 2	17½ S 3	18 S 4	18½ S 5½	19 S 7½
19½ S 11	20 S 15	20½ S 23	21 S 30	21½ S 45	22 M 1	22½ M 1½	23 M 2
23½ M 3	24 M 4	24½ M 6	25 M 8	25½ M 12	26 M 15	26½ M 24	27 M 30
27½ M 45	28 H 1	28½ H 1½	29 H 2	29½ H 3	30 H 4	30½ H 6	31 H 8

These tables are based on the 1914 edition of the "American Photography Exposure-Tables," a new and revised form of the "Photo Beacon Exposure Card." Owing to the great increase in the speed of lenses and plates since the original compilation of these tables, it has been necessary to completely change the system of numbers corresponding to stops, plates and exposures, so that exposure numbers from this table are 5 units higher than in the old tables. The complete tables, in pocket form, 3 x 5 inches, containing full directions for obtaining correct exposure under all conditions, may be obtained from our publishers at the price of 25 cents postpaid.

JANUARY, 1913 TEN CENTS

POPULAR PHOTOGRAPHY



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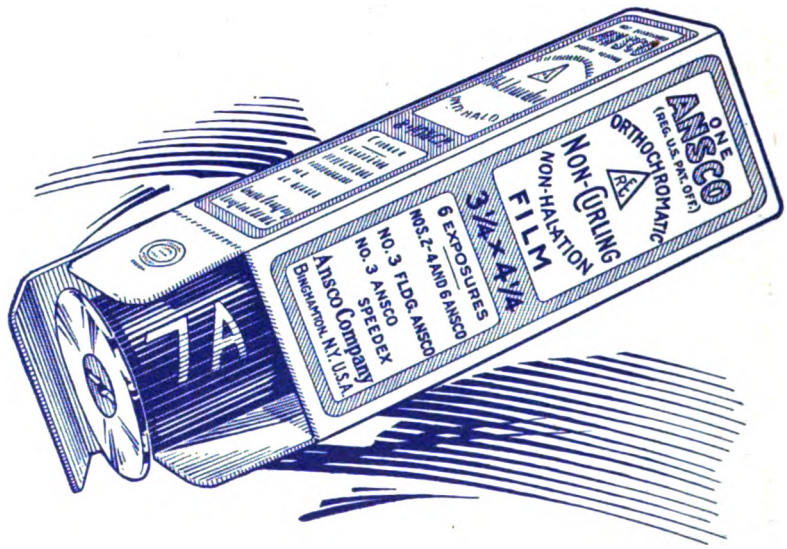

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POPULAR PHOTOGRAPHY

Volume III | BOSTON, MASS., JANUARY, 1915 | Number 4

A MODERN NIMROD — G. B. SPEER

(*See Page 155*)

SUMMER M. HITCHCOCK

SUMMER

Here we have a combination of good composition and excellent technical work which makes the picture unusually attractive. The attractiveness of any view in color cannot be wholly preserved on paper (though a color transparency is faithful and delightful) but a great part of its charm is retained when the color-values, or relative lightness and darkness of colors, are preserved through the use of a color-sensitive plate exposed through a rayfilter. The values are very good here, and the sky has considerable atmosphere, though pronounced cloud forms are lacking. Data: 4 x 5 Seneca 6B camera with 9¼-inch R. R. lens; 3-times filter; ½ second at *f*: 16 in August in bright sunlight at 11 a.m.; Defender Ortho plate; Eastman tank powders; print on Platora Medium Soft Matte.

A SHORT CUT

Mr. Ludlum has turned out a very creditable piece of work, with a composition which should teach all readers the value of proper spacing. This print is so well arranged that it looks well as an arrangement of spots when turned upside down or on one side and also when viewed through half-closed eyes so as to blur the fine details and see only the spots and the pattern formed by them. The placing of the little girl and of the doll as well could hardly be bettered. Even the hair-ribbon, usually the hardest possible thing to handle, has been kept subdued by good posing and lighting. For a posed genre, this is one of the best we have ever seen. Data: Seneca View camera; Wollensak Vesta portrait lens of 10 inches' focus; *f*: 6; 1-5 second at window with reflector used to lighten the shadows; Standard Polychrome plate; pyro; print on Professional Studio Cyko, developed with duratol.

TONING BROMIDE PRINTS IN COLOR

The desire for variety leads many workers to wish for other colors in the bromide enlargements than the conventional black and sepia. Luckily, the silver image in a bromide can readily be coverted into one in other colors though the permanency of the resulting tone is seldom all that could be desired. Gaslight papers, however, though in theory they should work with the same formulas, seldom yield as satisfactory colors, so what follows should be applied only to bromide prints.

The first essential for good work is a perfect print in black and white. This implies that the exposure must have been just right and that development shall have affected every

A SHORT CUT WM. LUDLUM

THE ELOPEMENT
MRS. W. DURRANT
(See page 160)

THE COTTAGE AT THE CORNER R. W. DE LA MATER

particle of silver which was exposed. A good standard is that the print shall stop developing at the end of two minutes, at normal temperatures. Fixing must have been complete and washing must have removed every trace of hypo. Such a print contains nothing but the paper support and pure metallic silver imbedded in gelatine.

WARM BLACK TO RED CHALK TONES

Copper toning is one of the cheapest and most satisfactory of all the processes applicable to bromide prints. It gives a good range of warm tones up to red and does not intensify the print. Two solutions are required:

A

Copper sulphate (blue vitriol).....60 gr.
Potassium citrate (neutral).....240 gr.
Water.....20 oz.

B

Potassium ferricyanide.....50 gr.
Potassium citrate (neutral).....240 gr.
Water.....20 oz.

These solutions are mixed in equal parts in quantity sufficient to cover the print, which must be immersed evenly and kept moving until the desired tone is reached, when it should be well washed. Increase the citrate if the highlights are pinkish.

Uranium toners have also been recommended for securing brown and red tones, but our experience with them has been highly unsatisfactory, so we omit formulas.

GREEN TONES

Vanadium is the basis of most of the commercial preparations for toning bromides green. Weigh out 20 grains of vanadium chloride and dissolve in a little hot hydrochloric acid and water. Now take 2½ ounces of a saturated solution of oxalic acid and add 10 ounces of water. In this dissolve 10 grains of ferric chloride and 10 grains of ferric oxalate. When these are dissolved, weigh out 20 grains of potassium ferricyanide, dissolve it in a little water, and add it to the oxalic solution, stirring well during the addition. Next add to this same portion the acid solution of vanadium chloride and make up the total volume to 20 ounces. This toning bath should be used without diluting. Tone the prints until they are blue and then wash them until they are green. If the whites show yellow stain, remove it by treating the print with a solution of ammonium sulphocyanide, 2 grains to the ounce.

BLUE TONES

Iron, as in the blueprint process, is the substance which gives the best blue color with the least trouble. The following formula intensifies the print.

10% sol. ferric ammonium citrate...2 oz.
10% sol. potassium ferricyanide....2 oz.
10% sol. acetic acid.....20 oz.

The prints are toned until the desired color is obtained and then washed until the highlights are clear.

Gold can be used to turn brownish prints a rich blue-black.

Ammonium sulphocyanide.....30 gr.
Gold chloride.....2 gr.
Boiling water.....4 oz.

THE SENTINELS KENNETH M. OYSTER

As soon as the solution has cooled to room temperature, apply it with a broad, flat camel's-hair brush to the surface of the wet print laid on a sheet of glass. If the toning is long continued, a decided blue is obtained. The print is well washed, as usual, and finally dried.

There have been many other toning solutions recommended, but those given are the pick of the lot and will be found most reliable.

The various toning tablets on the market, such as Schering's Varitone Tablets, the "Tabloid" brand toners, and Johnson & Son's Scales brand toning powders or tubes, will be found entirely satisfactory and in most instances far more economical than making one's own solutions, unless great quantities of prints are to be toned.

THE COTTAGE AT THE CORNER

This picture is a perfect piece of photographic technique as regards exposure and all subsequent processes. It also shows to great advantage the special qualities of an anastigmat lens, for the data state that the objective was used wide open, *f*: 6.3, and yet the plate is covered with extreme minuteness. The study of a picture like this should teach any reader why an anastigmat lens is worth all it costs, for a rectilinear lens could approach this brilliancy only when stopped down to *f*: 16 or smaller. In other words, the expensive lens covers perfectly at full opening and is therefore several times as fast as the cheaper one. The composition might possibly have been bettered, though Mr. De La Mater states that he took the picture from the only possible viewpoint and can see only one possibility of improving it, namely, to exclude the telegraph pole at the left. Data: 5 x 7 Seneca camera with Wollensak Velostigmat lens of 7 inches' focus; 1-50 second at *f*: 6.3 in bright sunlight at 2 p.m. in August; Cramer Iso plate; metol-hydro.; print on Disco Gloss P.O.P., toned in a plain gold bath.

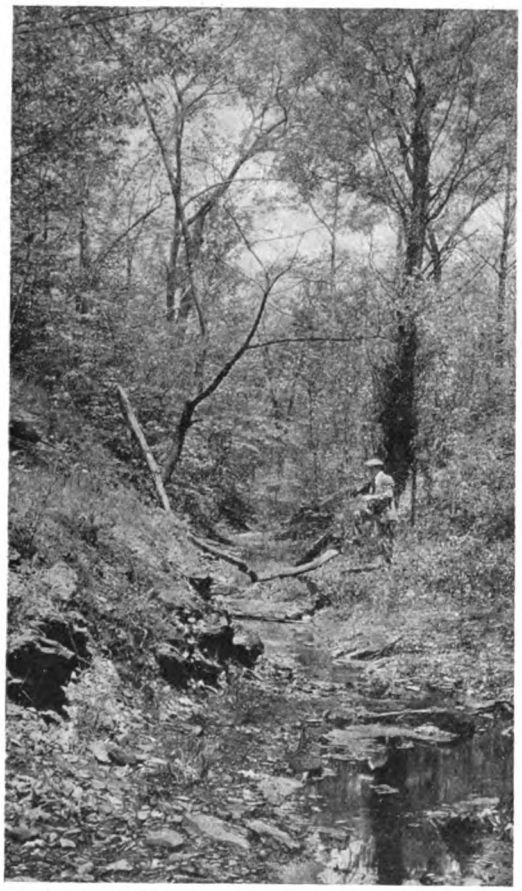
THE SENTINELS

This picture was taken as a record of a scene which is attractive to the maker. As such, there is little to criticize in the print, though if a position a little farther back could have been taken up, the lines of the road would have been in less violent perspective. The effect of atmosphere is largely due to taking the picture in dull light on a day marked by a typical fall haze. With a long-bellows plate camera and the rear combination alone, these two interesting trees could be composed to better advantage, as an image the same size at twice the distance would be in better perspective. Data: No. 9 Ansco with 6½-inch Wollensak R. R. lens; ½ second at *f*: 16 in October at 3 p.m.; dull light; Ansco film; print on Normal Glossy Cyko.

TABLE OF DILUTIONS

VVQ	VQ	Q	MQ	M	MS	S	VS	VVS
1½	2	2⅔	3½	4½	6	8	10	12

drams *A* and *C* to 3 ounces for tray or 10 ounces for tank development. Use *B* as follows: For tray, 2 drams; for tank, 5 drams. Mix developer by first mixing *B* and *C*, adding a little water, then the *A*, and, finally, water to make the number of ounces required. Further particulars will be found in the June, 1914, issue of POPULAR PHOTOGRAPHY.



SPRING WOODLAND J. H. KING

SPRING WOODLAND

An anastigmat lens, deep filter, medium stop, and color-sensitive plate are capable, in combination, of exaggerating a scene in springtime until it resembles the original only in its drawing. The peculiar yellow-green of unfolding leaves is the color to which orthochromatic plates and films are most sensitive, hence the leaves are likely to come out almost white paper in the print unless special precautions are taken to keep the negative extremely soft. Very generous exposure and short development are the only means to keep the negative on the soft side. The effect of this print is not so extreme as in many cases, for the weak tank developer has to some extent compensated for the harsh nature of the contrasts present, but the effect as a whole is quite lacking in artistic qualities. Data: 3A Special Kodak with IIb Tessar lens of 6⅞ inches' focus; Bausch & Lomb 5-times filter; ½ second at *f*: 16 in May at 11.00 a.m.; Eastman film; tank pyro; print in Solito.

WINDOW LIGHTINGS

A lady recently asked the writer to take a picture of herself and her little daughter seated in a window-seat with sunlight falling on the curtains. A test with the Bee meter showed that an exposure of 8 seconds at *f*: 11 would be sufficient for the portions of the figure which received the diffused light at a distance of two feet from the window. The negative, though spoiled by movement of the sitters, showed full detail and excellent modeling in the shadows. If a reflector had been used to lighten the shadows, the exposure could have been cut greatly, probably to 2 seconds.

A subsequent test of direct and reflected light at this point demonstrated that the strengths were as follows: direct diffused light 2 feet from window, 10 seconds for sixteenth tint; reflected light from room at same point, 120 seconds.

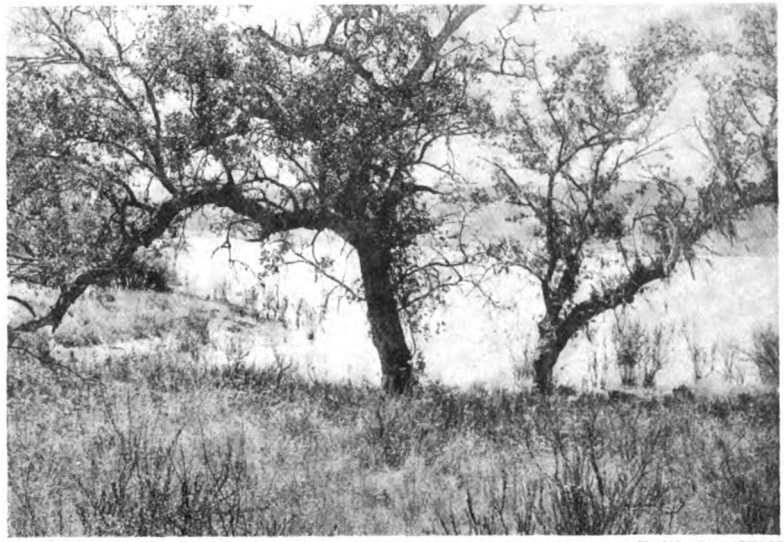
It goes without saying that the exterior view in such cases will be greatly overexposed and will require either a diluted developer or subsequent reduction. The main requirement, however, in all window lightings, is to employ plenty of reflected light from within the room to subdue the excessive contrasts and allow shorter exposures.

BY THE WATER'S EDGE

Mr. Cochems's data did not reach us, so we are obliged to criticize his print solely from the standpoint of arrangement, after stating that the technique is very good. The trouble with this subject is that it has no unity. The branches of the gnarled and twisted trees lead the eye away from the center of interest in so many directions that the final impression is simply one of a confused tangle of lines. It is doubtful whether any viewpoint could have been found which would have allowed the two separate masses to be pulled together into one main object and at the same time get rid of the centrifugal tendencies of the radiating lines of the branches. In other words, the subject was not capable of good interpretation, hence any picture of it must remain purely a record.

THE SPOUTING HORN

Some of the readers of POPULAR PHOTOGRAPHY may remember that in the first few numbers I took occasion several times to emphasize the fact that 1-25 second is the best average shutter-speed for use on waterfalls.



BY THE WATER'S EDGE E. W. COCHEMS

Last summer, while on a trip, I had an opportunity to photograph a natural phenomenon in the rocks at Newport called the spouting horn. A chasm in the rocks admits the wave, which is thrown violently out at the end of the passage. I took the picture at a speed (actual) of 1-50 second in order to demonstrate that it was too fast and would, as it were, freeze the spray. On the other hand, if I had used my marked twenty-fifth, which is actually 1-18, it might have proved a trifle slow, though a certain amount of blur would at least have suggested motion, which the present record decidedly fails to do. Data: 4 x 5 Korona III camera fitted with a 6.01-inch Series III F Cooke anastigmat lens mounted in a No. 1 Multispeed shutter; 1-50 second at *f*: 6.5 in August at 3 p.m.; hazy sunlight; Wellington Anti-Screen plate; tank development in Modified Thermo Duratol; print on Soft Instanto Semi-Matte, developed in used Thermo duratol. *M. D. Miller.*

THE SPOUTING HORN M. D. MILLER

SELF PORTRAIT R. W. DE LA MATER

WINTER LIGHT

Experience alone is hardly a sufficient guide to the actinic strength of the light in winter. An actinometer exposure-meter, such as the Watkins or the Wynne, is somewhat sensitive to yellow light and indicates exposures with great precision for orthochromatic plates. For example, a portrait group posed in a yellow room with yellow sunlight falling near the figures at 3.30 p. m. in November was timed by meter and given 1 second at *f*: 6.6 on an antiscreen plate, P number 180, equivalent to Class 1½. The negative, developed in tray M dilution Modified Thermo Duratol, proved very fully timed. Another plate, sensitive to blue-violet and slightly sensitive to red, with a P number of 500 in blue light, was given ½ second (accurate) on the same subject and proved to have only about half as much exposure as the color-sensitive plate. It was developed in S dilution. The plate was supposed to be three times as fast as the antiscreen, but as it is almost totally insensitive to yellow, the poor light slowed it down tremendously, while the yellow-sensitive antiscreen plate actually gained in speed in the yellow light and surroundings.

Another example is found in the case of certain brands of Cramer plates. The Crown, which is a plain plate, is to the Instantaneous Iso, in blue light, as 1 is to 1½. Late in the day, when the light is no longer blue, but decidedly yellow, the speeds are reversed. Except during the middle hours of the day, then, an Iso plate is actually faster than a plain plate of the same or even faster rated speed. Readers who have followed our advice to adopt a double-coated Iso plate as their standard can appreciate the advantage they gain during the hours most suitable for satisfactory picture-making when the sun is low and shadows are long. Winter light is yellow, so the advantage is particularly great at this season.

A SELF PORTRAIT

There are just two main criticisms to offer against this print: the first, that there is rather too much space above the head; the second, that the figure is too near the middle. Possibly, however, the original 4 x 5 negative would allow a better trimming than was adopted for the postcard print sent in. The technique otherwise is admirable, and we desire to call particular attention to the accuracy with which the Bee meter determined the exposure. The lighting is very soft and well managed, bringing out the bony and muscular structure of the head clearly yet without exaggeration. The exposure was made by pressing the bulb, attached to a long piece of tubing, by means of the foot. Data: 4 x 5 Seneca camera fitted with Wollensak Velostigmat lens of 7 inches' focus; ½ second at *f*: 6.3 at 2 p.m. in July; dull light; Cramer Iso plate; pyro; print on soft D.O.P.

AUTUMN TIME

If one sort of woodland scene is more difficult than another, the kind with white birches must be placed at the head of the list in difficulty. Not only is the usual need of proper exposure made evident; the technical difficulty of representing accurately the almost pure white of birch bark and at the same time bringing out full shadow detail leads one to despair — unless previous failures have pointed out the way to success. Too short an exposure will give harsh contrasts; too long a one will tend to gray down the bark and lose the clean, brilliant detail; overdevelopment will spoil the

AUTUMN TIME WM. McGRATH

rendering by making the lights too dense. The only way is to time generously and develop in a weak solution, such as is normally employed in a tank. Of course a color-sensitive plate should be used. Mr. McGrath chose one capable of giving a screened effect on account of the special yellow dye in the emulsion. Data: 3¼ x 4¼ Premo camera with Cooke anastigmat lens of *f*: 6.3 speed; 1-10 second at *f*: 11 in October at 11.15 a. m.; good light; Wellington Anti-Screen plate; M.-Q.; enlargement on Wellington Carbon Bromide.

METOL-HYDROCHINON WITHOUT CARBONATE

An expert on commercial photography recently came out with the advice to handle subjects of extreme contrast in development by cutting down or actually leaving out the carbonate from an M.-Q. developer. This amounts to using metol and sulphite alone, for hydrochinon has no developing power in the absence of an alkali. Many years ago we proved the value of metol in cases of extreme overexposure. Hauff's original two-solution formula was used, as follows:

A

Metol	150 gr.
Sodium sulphite, anhydrous	550 gr.
Water to	10 gr.

B

Sodium carbonate, anhydrous	770 gr.
Potassium bromide	16 gr.
Water to	10 oz.

The method of using for uncertain exposures, known overexposures, or subjects of excessive contrast, is to place the plate in a portion of

OUTDOOR PORTRAIT J. H. BECKER

A alone and add *B*, if necessary, a few drops at a time. If the image did not appear at all in a minute (at 65 degrees), underexposure was the trouble, in which case one-half to one part of *B* could be added, preferably with several parts of water, to keep the highlights thin while developing out the underexposed shadows.

Readers who like to putter with their developing and modify the solutions for different effects can mix a third solution containing hydrochinon, as follows:

C

Hydrochinon	48 gr.
Sodium sulphite, anhydrous	550 gr.
Water to	10 oz

This can be used with *A* and *B*, equal parts of each, with water as desired, to make a developer containing a compound of metol and hydrochinon without any excess of either, as the amounts are calculated in accordance with the chemical equivalents of the two substances so as to form this compound. With such a three-solution developer, one can omit carbonate entirely, if desired, or add it in minute quantities, thus securing all the advantages (?) of subduing excessive contrast. The same end, however, can be attained by simply diluting the regular developer and developing for the same time.

AN OUTDOOR PORTRAIT

It is not always an advantage to obtain a large image if at the same time one crowds the picture space unpleasantly, and we are rather inclined to think the disadvantages predominate in this case. At a distance of 8 feet, with the regular lens, the figure would have been large enough to stand considerable enlargement and at the same time there would have been sufficient margin to allow careful study of trimming for the best effect. The technical work seems fairly satisfactory with the exception of the triangular hole in the film near the ostrich plume. A little work with the spotting brush on negative and print would remove this defect. Data: 3A Premo with Tessar lens; portrait attachment used: *f*: 16; 1-5 second at 11.30 a.m. in June in cloudy-bright light; filmpack; M.-Q.; print on Professional Studio Cyko.

THE POND

Overdevelopment is the bane of most amateurs who do their own work. They are likely to get an idea that if they leave the print in a little longer they can get out more shadow detail. No more erroneous idea ever gained popularity in the field of photography. Any detail which is impressed on the plate during exposure will develop completely by the time the highlights have reached sufficient density. To develop further simply "plugs" the highlights by piling up silver on the surface and burying the delicate halftones. Sometimes

THE POND W. A. KAROW

THE CAST EDWIN A. ROBERTS

these bright, good-looking negatives can be printed on a very soft paper; but generally they are hopeless. It is far better to develop by the Thermo system and thus avoid the temptation to overdevelop. This picture, though grayed down by the halftone process, is a typical example of what overdevelopment can do. All the lighter tones are too bright, giving the foliage the appearance of being covered with hoar frost. Data: Seneca No. 8 camera; 2 seconds at *f*: 32; Hammer plate; Argo print.

NAUGHTY TOMMY

(*See page 155*)

Our prize picture this month is an extremely interesting piece of animal photography, and, while it is a trifle crowded in the space, the humor of the incident is so well portrayed that it amply deserves the award which we have made it. If, as is very likely, catching the cat in this position was a happy accident, one can well afford to overlook the fact that the cat's tail does not appear in the picture, but if the cat were known to be in the habit of performing such a trick, it would be comparatively easy to do the work over again setting the camera a little farther from the table, and thus produce a picture which would doubtless find a ready sale for calendar purposes. The data were as follows: Taken with a 3¼ x 4¼ Folding Pocket Kodak, fitted with rapid rectilinear lens of 5 inches' focal length. The exposure was 1-25 second at 11 a. m. in November at stop U. S. 4, in bright light. Eastman Speed film and the print was a 4 x 6 enlargement, sepia.

THE CAST

This enlargement reached us without data, so our remarks must be confined to what the print itself says to us and may therefore not seem quite right to the maker. To begin with the composition, the figure is excellently placed, what little foreground there is leading the eye up to him, and the thrust of the body, carried on through the line of the rod, brings the eye back into the picture quite satisfactorily. The diagonal line of the figure is pleasantly supported by the horizontal of the farther shore, or, looking at it in another way, the figure ties together the two planes of the shores. There is little room for improvement in the picture as it stands, though sky and water are perhaps a tone too similar to their grayness. In the absence of data we should assume that the enlargement was made from only a small portion of the original negative.

WINDOW PORTRAITURE

A good general method of making a plain lighting is to place the sitter opposite one casing of the window and as far from the wall as the width of the window, with the camera as close as possible to the wall, and having the sitter turn toward the window until the light crosses the bridge of the nose and falls upon the farther cheekbone. If the shadows are still rather heavy, lighten them by means of a white reflector.

A USEFUL HINT IN ENLARGING

HARRY SLOAN

Until a friend showed me his way of doing, I had been accustomed, in making enlargements, to pin the paper on the easel with push pins. This necessitated cutting down the print to do away with the marks of the pins, and, besides, it was difficult to have the paper for subsequent enlargements in exactly the same place. In the following method this is obviated.

In a piece of cardboard, cut an opening slightly smaller than the size of the enlargement intended; for an 8 x 10-inch, say, make the opening 7½ x 9½ inches. At each corner on the back paste narrow strips of heavy paper or cloth to hold the sensitive paper in place. (Fig. 1.) From another piece of cardboard, cut out a form in the shape of a carpenter's square. In making the enlargement, first insert a piece of plain white paper measuring 8 x 10 inches in the cardboard frame, then pin the frame on the easel. Now pin the cardboard square in the upper right-hand corner, so that it fits against the top and side of the frame. (Fig. II.) Focus and arrange

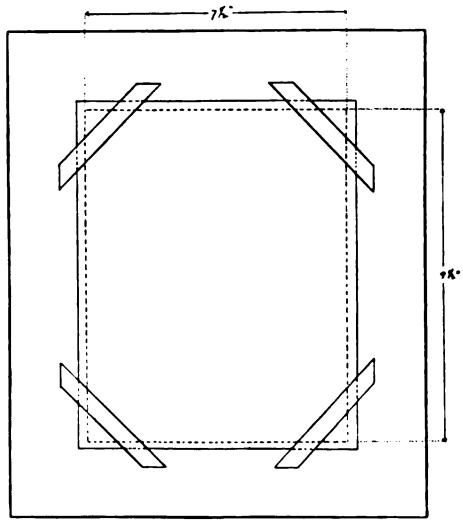


Fig. I.

the picture, remove the frame from the easel, take out the plain paper and put in the sensitive paper. Repin the frame on the easel, being sure that the top and side rest evenly against the square, which you have left on the easel, make your exposure, develop and fix. Then if more enlargements are required from the same negative, it is only necessary to leave the square on the easel and repeat the operation and all of the enlargements will be spaced just the same, with a neat quarter-inch margin.

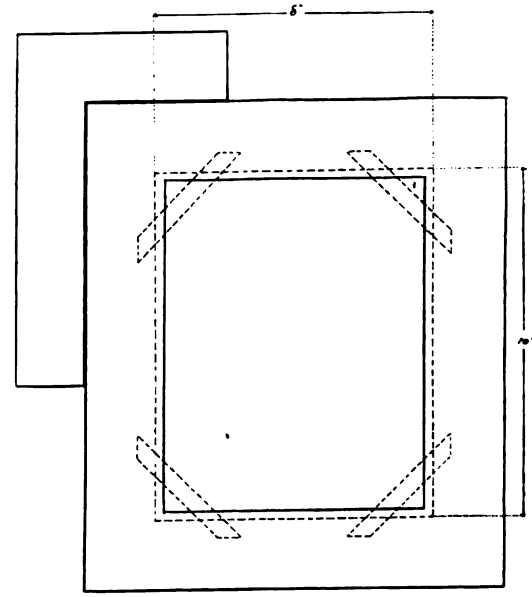


Fig. II.

While this may not be as convenient as using a printing-frame, the large-sized printing-frames are rather expensive, so it has the advantage of economy at any rate.

AN AID TO BRILLIANT NEGATIVES

A little dodge, which it is worth while to bear in mind, as it can often be of service, is the following: If you have a subject and the day is dull, or you happen to have overexposed, you can make quite a considerable improvement in the brilliancy of the negative by drying it quickly after the final washing. Mop off all superfluous water from both the film and glass sides. It is best to lay a piece of fluffless linen, such as an old linen handerchief, on the film side and steadily go over it with a roller squeegee. This will take out a large part of the water. Then hold the negative film side toward a clear fire, or film down over a ring gas burner. Take care, as the negative may suffer from the film melting, but with proper attention there is no danger of this happening. You can readily see from the negative beginning to come up in relief, the extent to which it is being subjected to the heat. Also test with the flat of the hand on the glass side of the negative; it should never be more than comfortably warm. By this means it is surprising what a degree of pluck and brightness can be obtained.

DEPARTING DAY

Mr. Railton attempted a very difficult subject and is to be congratulated on the success of his print, though he is dissatisfied with it. He says, "The sky, which was intended to be the principal object, is scarcely printable." To improve the results, he would shorten the exposure and increase the factor used in developing from 8 to 12, in order to get more contrast in the clouds. He considers the exposure of 10 seconds about 3 seconds too long. With some of these self-criticisms we are in sympathy; with others, not at all. What difference, for instance, would a variation of one-third make in the rendering when the exposure was so long? Hardly any. We should judge that this negative is simply in need of a little dodging. The effect is almost perfect; but if it is desired to bring out the sky more strongly, it could readily be accomplished by mixing a little ground-glass substitute tinted with aurantia, coating the back of the plate, and scraping the varnish off from the sky. Or a more contrasty positive could be made on a lantern plate and from that a more snappy negative printed. The sky could be reduced with ferricyanide-hypo and the whole negative subsequently be intensified.

DEPARTING DAY R. RAILTON

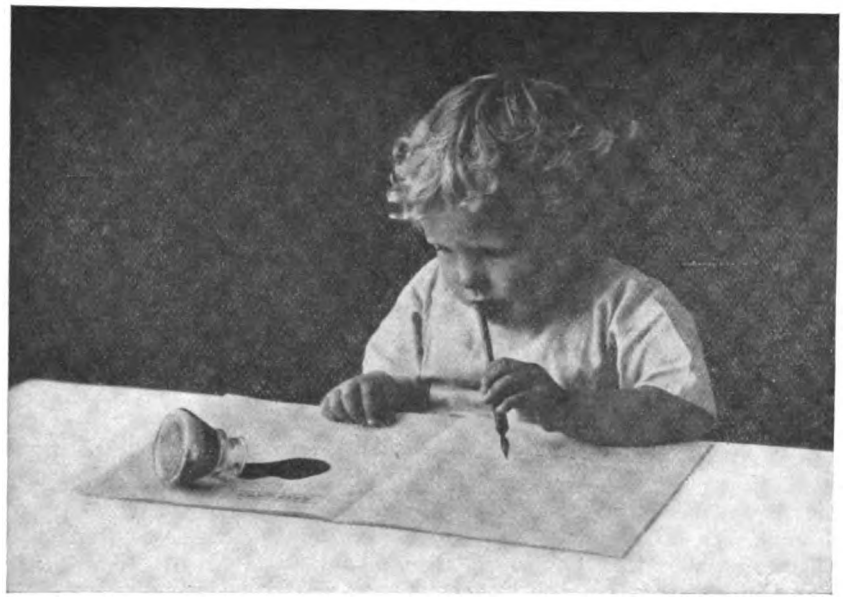
The most satisfactory method of making sunsets is timing by meter, using in the lens a stop of such a size that the meter exposure for the sixteenth tint will equal the camera exposure. The meter paper is exposed and the shutter is opened at the same moment. As soon as the first visible discoloration occurs, the shutter is closed. Using this method, we have made (with a graded or foreground filter) some very successful pictures, with plenty of contrast in the clouds and full detail in the foreground. The plate used was the Anti-Screen, which takes the sixteenth tint at *f*: 28.

Mr. Railton estimated his exposure by means of tables, his data being: 3¼ x 4¼ Seneca camera with R. R. lens; three-times filter used; 10 seconds at 5 p. m. in October; red, dull light; *f*: 16; Imperial S. S. Ortho plate; Tabloid Rytol developer, factor 8; print on Soft Cyko Buff.

RECREATION D. P. COWLES

RECREATION

When one is able to pose a picture so well that it suggests motion as strongly as this figure does, the result is worthy of praise. We thought, until we read the data, that this print was a snapshot with the man actually walking. The technique in all other respects is equally good, and the picture should have a market value if submitted to one of the sporting publications. Data: 3A Kodak with R. R. lens; 1-25 second at *f*: 11 in September at 11.30 a.m.; bright sunlight; Eastman film; M.-Q.; print on Normal Matte Cyko.



WHAT WILL DADDY SAY? ALEX BLACKIE

WHAT WILL DADDY SAY?

It took a great deal of patience, to say nothing of four plates, to get this result, Mr. Blackie informs us; but the result is certainly worth it. The only suggestion for improvement which we could offer is that a lighter background would have given a feeling of more atmosphere. The seriousness of the offense may be gathered when we state that it is a photographic magazine which has been so terribly inked. Data: 4¾ x 6½ camera with R. R. lens of 8 inches' focus; 1-5 second at 3 p. m. in September at *f*: 8; dull light; Imperial S. S. plate; M.-Q.; print on Normal Cyko Glossy.

BE PREPARED

Some morning before long you will wake up and find the air full of falling flakes and the earth covered with a white mantle. The first snowfall is certain to create many beautiful pictures out of what seemed during the fall only the ugliest material. Don't wait for the snow to come. Go now to your dealer and purchase a rayfilter adapted to the film you use or one recommended for the orthochromatic plates you can obtain, and see that the dealer has or will get promptly a supply of double-coated orthochromatic plates.

To use the filter with films, you may find it necessary to fit a ground glass temporarily to your camera and mark on the focusing scale the correction of focus made necessary by the thickness of the filter. The same would, of course, be true of a plate camera if focused by scale instead of on the ground glass.

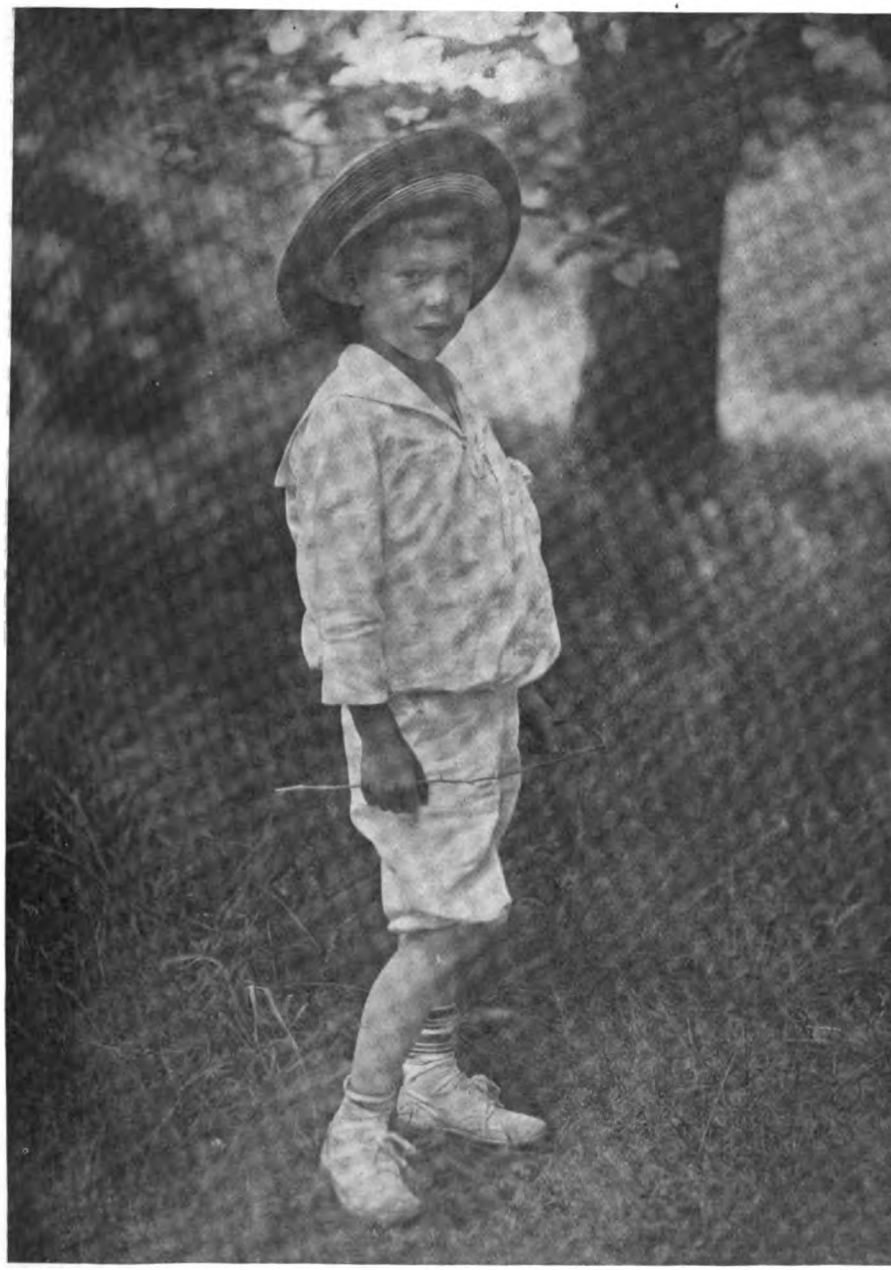
When you receive your plates, load some at once, for you won't have time to get the picture unless every item of your equipment is ready for instant use.

LOCAL REDUCTION WITH ALCOHOL

A friend complained that when he tried to rub down a dense highlight with alcohol he got hard lines. Investigation proved that he had been using a sharp stick covered with chamois skin. The right way to reduce with alcohol is to wrap the moistened leather around a large cork and use it as if it were a carpenter's plane, not confining the action to the light. Used in this manner, the alcohol will affect only the dense deposit which "plugs" the surface of the offending highlight.

FOCUSING A PORTRAIT

With the advent of winter days many readers are turning their cameras on their friends and relations, often with painful results to all concerned. Part of the blame may sometimes be laid on improper focusing. The focus should be sharpest on the catchlights in the eyes and the part of the face in front of that plane, with the back of the head somewhat softer. In focusing, rack the lens away from the plate until this effect is seen, never vice versa.



OUTDOOR PORTRAIT KATHARINE STANLEY

OUTDOOR PORTRAIT

Many of our readers have suggested that it would be a desirable addition to the educational side of POPULAR PHOTOGRAPHY if we could publish each month a picture by some photographer of recognized merit, telling what its good points and bad points were. There are some difficulties in doing this consistently, but we shall henceforth from time to time endeavor to publish occasionally pictures of high grade, with some analysis of their qualities. The picture which we have selected this month for this purpose is a charming outdoor portrait made by one who specializes in the portraiture of children. It will be obvious at a glance that the picture is both a truthful portrayal of char-

SUMMER LOGGING IN IDAHO PAUL M. ELDER

acter and an exceptionally fine piece of technical photography. The technical success is due to correct exposure, which has reproduced the values, especially in the whites, in a truthful and interesting manner. The handling of focusing is also very successful, the background planes are subordinated so that the attention of the beholder is centered on the figure, where it naturally belongs, and the unimportant objects in the background take their natural place. Some of our readers claim that every object in the picture should be of equal sharpness, on the ground that the eye can see in succession any portion of a scene which is studied, and that the one who looks at the picture ought to be able to decide for himself which part of the picture he will look at at any moment. This, however, is not logical, for the artist must express his intention, and must fix, once and for all, the importance of objects in his scheme. This is properly done in photography by a difference in the sharpness of rendering of various planes.

SUMMER LOGGING IN IDAHO

Mr. Elder, in answering the eight questions of our coupon, says that the negative is heavily fogged; furthermore, that he has not yet learned to manipulate filmpacks successfully. We submit that the print is perfect, so why should anyone worry about the appearance of the negative? A negative is merely a step in the photographic process, so if the final result is all that could be desired, why is not

FEEDING THE COLT E. M. FRASER

ATTENTION WILLIAM D. WILDER

that "togged" negative a good one? We can remember the worry we used to suffer when negatives did not come out with absolutely clear-glass shadows, as so forcibly described as the desideratum in certain old textbooks; but when we found that the veiling of the shadows often helped the printing quality we soon ceased to care about anything but the print. A negative is perfect, no matter how it *looks*, if it gives the kind of print which is wanted! We have nothing but praise, from all points of view, for Mr. Elder's *print*. Data: Premoette with R. R. lens 0; 1-25 second at *f*:11 in June at 2.30 p.m.; intense sunlight; filmpack; M.-Q.; print on Azo E Hard X.

FEEDING THE COLT

This is a good record snapshot of fair technical quality, though a little more transparency in the shadows, obtainable by giving fuller exposure and printing on a softer paper, would have made the values truer to nature. One does not see perfectly black shadows on surfaces of average color. The arrangement is also fairly satisfactory, though a position a few feet farther away would have allowed the inclusion of a little foreground beneath the feet of man and colt. It is always hard to judge how much will be included from a finder image alone, which is one of the greatest reasons for the popularity of reflecting cameras. Data: 3¼ x 4¼ Ansco film camera; 1-25 second at *f*: 8 in August at 11 a.m.; intense sunlight; glossy D.O.P. print.

ATTENTION

Most posed photographs of two or more dogs are simply a row of objects of equal importance, hence there is no composition. Here, however, there is a decided subordination of one figure to another in placement and in lighting. The arrangement is worthy of praise. Only those who have tried to portray animals can appreciate how successful this print is. Data: 4 x 5 Conley camera with anastigmat lens; ½ second at *f*: 6.8 under skylight and with side window as well; bright light outside, Hammer plate; pyro; print on Azo E Hard.

EIKONOGEN

A LITTLE-USED DEVELOPER WHICH WORKS WELL WITHOUT HYDROCHINON

With hydrochinon at $5.50 a pound and higher, many readers are at a loss for something to use for development of plates. We have in the past used a considerable quantity of eikonogen, which gives a clear, soft negative of a

A QUIET RETREAT, NO. 2 J. F. WEBSTER

quality particularly suited for gaslight papers. It used to be very cheap, and there must be a fair stock on hand in this country. A good all-around formula for plates is:

A

Water to make	32 oz.
Sodium sulphite, anhydrous	1½ oz.
Eikonogen	256 gr.
Potassium metabisulphite	60 gr.

B

Water to make	32 oz.
Sodium carbonate, anhydrous,	2 oz.

For use, mix equal parts Watkins factor 9.

Eikonogen is soluble with difficulty in cold water, so the best way to mix A is to dissolve the sulphite and the eikonogen in hot water, let cool to 80 degrees or lower, and then dissolve the metabisulphite. Fresh stock may need a few drops of 10 per cent bromide solution; but the usual way to employ this developer used to be to save the old developer from day to day and add fresh stock as needed. It may be used until it is blacker than strong coffee. We recently mixed this formula from old eikonogen which had been standing exposed to air for ten years, and although it was perfectly black, it developed clearly with only about as much stain as is always seen with tank pyro powders. Negatives should be thoroughly rinsed and fixed in an acid fixing bath.

A QUIET RETREAT NO. 2

On page 21 of the October issue, we reproduced a print of this spot and suggested that Mr. Webster make it over in accordance with our criticisms. The reproduction above is the result. If readers will compare the two reproductions and the accompanying data, we think they will be able to appreciate the points to follow. The changes made for No. 2 are: October at 3.30 p. m.; 2 seconds at *f*: 8; Seed Non-halation L Ortho; Watkins Thermo pyro-soda tank development; Normal Cyko Matte print. The exposure was calculated for a Watkins P number of 130, with actinometer test in shade 20 seconds. How Mr. Webster arrived at an exposure of 2 seconds, we cannot understand, even with a multiplication of 3 times for the filter. Our calculation would be, taking *half* the actinometer number, about 1-10 second without the filter, or 3-10, say 1-5 second, with the filter. Movement of the tops of the willows would not have been in evidence with that exposure. The falling off of definition in the taller trees is due to curvature of the field of the R. R. lens. The focus is sharp in the middle only. Such a lens should be focused at a point about midway between center and margins, in order to split the curvature; but a medium stop will need to be inserted if real sharpness is required all over. With a heavily clouded sky, in which we should judge there was little blue showing, the ray-filter might well have been omitted, in which

case the 1-5 second of the shutter could have been utilized with stop *f*: 11.

THE HEART OF THE GLEN

The tendency of tank pyro to develop highlights too far in case of subjects of abnormal contrast has been several times referred to in these columns. In the case of abnormal subjects, one has either to shorten the tank time, in which case the thinner negatives will print well on Normal or, in exceptional cases, on Hard grades of paper or else resort to selective reduction. Now, whatever the reason, largely because films are tanned so hard by the acid fixing bath needed for them, after-treatment is particularly hard to carry out successfully. The problem here is to reduce the white of the waterfall without affecting the shadow detail, none too abundant as it is. The film should be softened by prolonged soaking and then reduced with acid permanganate or else a print should be made by contact on a fast dryplate, exposing long enough to get full gradation in the white, and a new negative made by contact from this positive. Data: 3A Kodak with R. R. lens; 1-5 second at *f*: 8 in July at 2.15 p. m.; deep shade of trees; Eastman film; 20-minute tank pyro; print on Special Velvet Velox.

THE HEART OF THE GLEN JOHN BISCHOFF

AUTOCHROME PHOTOGRAPHY IN WINTER

A few of our readers are familiar with the beautiful color transparencies which can be produced on Lumière's Autochrome plates, but most of them are not aware how simple and easy the process is. We are informed that in spite of the war a good supply of these plates is obtainable, and we are sure that if a supply is obtained and even one wholly successful snow scene is secured, the maker will be amply rewarded for the expense, time, and trouble he has gone to.

The necessary equipment, beyond what every plate-camera user already has, consists only of a special rayfilter and the plates. The chemicals needed had better be bought in the form of Tabloid Rytol and Tabloid Reversing Compound, as they are quite reliable and avoid waste. The camera should have its ground glass reversed so that the ground side faces the rear, unless it is already arranged that way for normal work, in which case the lens must be moved back about 3-32 inch after focusing. The reason for this is that the Autochrome plate is put into the holder glass side toward the lens.

The exposure is easily figured by the *American Photography Exposure Tables*, the speed of the Autochrome plate being 8 for outdoor and 9 for indoor work. The only precaution to bear in mind is that overexposure is worse than underexposure, so, practically, one times for the lights rather than the shadows.

Development takes place by time in a covered tray. All solutions should be prepared in advance and brought to the same temperature by standing in a large pan of water. Great care must be taken to work only between 55 and 65 degrees or the plates will frill and spoil. The developer is Tabloid Rytol made up with one pair of tabloids to each ounce of water. The time is:

55° Fahrenheit	9½ minutes
60° Fahrenheit	8 minutes
65° Fahrenheit	6¾ minutes

When the time is up, pour the developer off and save for the second development, rinse the plate in the tray, pour on the Tabloid Reversing Compound, and turn on the white light. Reversal takes from 3 to 5 minutes,

THE DRIVE THROUGH THE DELL R. W. TYLER

according to the temperature. When it is complete, rinse again and pour on the used Rytol developer, holding the tray directly under the artificial light or in strong daylight. After about two minutes the plate will be completely blackened, when it should be rinsed a few times and set up to dry in a place where it will dry evenly and quickly in about 20 minutes. When dry, the positive is bound up with a mask and a cover-glass like a lantern-slide. The result, if the exposure has been correct, is a truthful record of the original subject in full color.

THE DRIVE THROUGH THE DELL

If it were not for the bands of halftone parallel to the base of the picture, this view would be nearly perfect. The bands act like bars to make inspection of the roadway difficult, the eye traveling from side to side as it reaches each one. The concentration of light in the distance, however, is exactly what one should work for, as it gives a fine effect to have the foreground shaded and then to pass suddenly out into a splash of sunlight. A worker who can see as well as this should be able to improve on this result next season. Data: 3A Kodak with R. R. lens; 1-5 second at *f*: 16 in September at 2 p. m.; bright sunlight; Eastman Speed film; M.-Q.; print on Instanto Soft Matte.

THE OLD FARMHOUSE

As an essay in composition, Mr. Sloan thought this subject filled several of the desirable requirements, such as decentering of the principal object, filling up of the corners, and a diagonal line in the foreground leading toward the subject. The first two are well carried out; but when we take up the last element, a little thought will convince the reader that the diagonal line is badly placed. It should run toward the house instead of by it. The tendency now is to follow the road with only a hasty glance at the house. The print is a little muddy from overtiming. It is very important in handling Instanto not to overtime, but to let the image build up until it stops, the process often taking 2 to 3 minutes in duratol. Data: 3A Kodak fitted with a Wollensak Vinco anastigmat lens of 6½ inches' focus; ½ second (timed by Wynne meter) at *f*: 16 in bright September sunlight at 10.30 a. m.; Cramer Medium Iso plate; development with Modified Thermo Duratol; print on Instanto No. 17.

ON THE BEACH

The spacing of the figures shows good judgment in arranging the view in the finder, an appreciation of values, and of the balancing of a spot of light tone near the center by a darker one toward the margin. This may be only a lucky snapshot, but some people make their luck by learning to use the kodak so

THE OLD FARMHOUSE H. SLOAN

ON THE BEACH MARTHA HUME

unconsciously that they can give all their attention to seizing precisely the right moment to expose. Data: 3A Kodak, Eastman film; 11 a. m. in February in bright sunlight; bromide enlargement.

WHEN A DEVELOPER POISONS

From a constant reader we have received the following: "Will you kindly suggest for my use a developer for gaslight papers which will give soft yet brilliant prints and which is not poisonous. I have been using a developer which poisons my fingers every time I use it, besides giving prints too contrasty to suit me. I have been using of late a concentrated single-solution developer, but, although with very vigorous negatives it gives me excellent prints, just about what I wish, I am troubled with yellow stains, and with negatives at all flat or of medium contrast, I cannot get prints with enough contrast or detail, even on contrast paper."

We wonder whether this reader remembers the editorial entitled "Water," which we printed about a year ago? When a developer gives too black a deposit, add water, and in mixing up the next batch cut down the hydrochinon and increase the soft-working ingredient, metol, duratol, or edinol. The latter, however, may not now be obtainable. It used to be on the market a few years ago, but it has not been advertised for some time and we are under the impression that it can no longer be obtained.

Practically all developers poison some people, yet very few are affected. Dr. Malcolm Dean Miller, who was formerly Associate Editor of this magazine, informs us that he has seen several cases of poisoning by duratol, including his own. He believes that the trouble is due to an acid state of the system, as proved by chemical tests in all the cases he has had under observation, and the correspondence of acidity with poisoning has apparently been proved in several cases in which the developer ceased to cause the slightest irritation as soon as the acidity was reduced to normal by appropriate treatment. In other words, the susceptibility to duratol poisoning can be entirely removed and the individual can thereafter use it with impunity. It is quite different with metol poisoning, which has a tendency to become chronic, the slightest contact with metol, even in dry powder, causing an acute outbreak. It is generally thought necessary to change at once to an entirely different developer when a given one causes irritation. A good developer which has almost never caused poisoning is ortol. A set of ortol tubes will make 40 ounces of stock solution, sufficient for a thorough trial on plates, films, and papers. It gives a fine pure-black deposit of soft quality,

MINNEHAHA CREEK A. D. TINKLEPAUGH

yet brilliant, and the contrast can be controlled by adding more or less water to the stock.

Another good developer, though it has the fault of staining the skin somewhat pinkish, is amidol. We published a number of selected and tested formulas on pages 345 and 346 of our June, 1914, issue. Strong solutions with the minimum amount of bromide which will keep the whites clear give rich, dark blue-black tones. By adding water in suitable amounts, the tones can be brought to pure black and delicate tints of pearly gray.

MINNEHAHA CREEK

Like so many other river pictures, this one lacks the cloud sky which is needed to pull the composition together. We have good picture elements here in the foreground lines bounding the creek, the main tree mass on the right bank and the balancing smaller dark mass on the left bank; but cohesion or unity is lacking. The upper right corner should be filled with a fairly dark cloud mass and the rest of the sky would then be properly treated by filling it up with lighter clouds, leaving the lightest portion over the highest light in the water. By searching among other negatives, a suitable sky might be obtained and printed in. Data: Postcard Seneca camera with 7-inch R. R. lens; snapshot at 10 a. m. in September in sunlight at *f*: 11; Standard plate; pyro; print on Normal Studio Cyko.

VIBRATION IN SLOW EXPOSURES

Not long ago we were approached by an amateur who had a fine 5 x 7 anastigmat lens on an old camera which had passed its days of usefulness. He had need of a good outfit for picturing the new arrival, so we advised him to advertise in POPULAR PHOTOGRAPHY for a second-hand reflecting camera, because with a wide slit and a low tension a focal-plane shutter is particularly effective in making portraits indoors. He has succeeded admirably in his object of securing a weekly record of the growth of the son and heir; but of late he has taken to making landscape studies as well, and here a puzzling thing occurred. Some of his pictures showed a distinct doubling of the image in the foreground. This phenomena seemed to be confined to the portion of the plate which comes uppermost in the camera and is therefore the first portion to be uncovered by the curtain in its descent. On investigating his instrument, we found that on low spring tensions it released with difficulty, so that the shock of pressing down the lever was communicated to the entire instrument and caused the image to double while the curtain was uncovering a portion about equal to the width of the slit. The vibration, however, seemed to pass off before the slow-moving curtain completed its travel, hence the lower (sky) portion was sharp.

The results in this case show why certain makers of reflecting cameras advise users not to make exposures slower than 1-75 second with the instrument held in the hand. It takes a great deal of practice to acquire sufficient steadiness to give exposures of, say, 1-20 second, which are about the slowest a focal-plane shutter is capable of in average hands. If vibration occurs, the only remedy is to use a faster exposure.

ROSES AND GENTIANS H. D. WILSON

ROSES AND GENTIANS

This flower study is fairly well done, though the number of blooms is too great and the lack of proper color-sensitiveness of the plate used has brought out the deep blue gentians altogether too light in tone. The prominence of the background is also distressing. Data: No. 3 Special Kodak; portrait attachment used over the Zeiss-Kodak lens; 5 seconds at *f*: 32 on Seed 30 plate near north window, at 2.30 p.m. in dull light.

MILDEW ON PHOTOGRAPHS AND PRINTS

As photographers we are very fond of talking of the permanence of prints, as though we had no other consideration to bear in mind than the constitution of the photographic image. The effect of time with the train of deleterious influences it brings is often lost sight of. We have, for example, the enemy mildew, which attacks not only photographs but perhaps to a greater extent engravings, water-colors and other art productions. We have seen old silver prints under cut mounts, the prints in a good state of preservation and the mounts speckled all over with spots of mildew. It is probable that the early photographic workers took especial care to employ pure mounting boards, paste treated with some antiseptic preservative, and, when framing their work, to paper the glass into the frame so as to exclude not only dust and moisture, but the spores or other means of propagation of the fungoid growths which we refer to as mildew. Nowadays the mounting boards commonly used are made of very poor stuff indeed, very largely of wood pulp or esparto grass, if we may judge from the rapid way in which they discolor when exposed to light. The board is surfaced with smooth paper, but we have no means of knowing what putrescence there was in the adhesive employed. It has often been remarked that any mounting board will do for carbon or platinum prints, as they are permanent, but the mildew possibility was overlooked when this remark was made. The dry-mounting method, with the waterproof shellac tissue, of course, insulates the print quite effectively, and would, we believe, be valuable in the case of water-colors. Another point not usually thought of is the cleaning of the glass of the frame. It is quite possible for the fungoid growths to be on the glass even after cleaning, unless precautions are taken to sterilize the glass in some way. Ordinary methylated spirit mixed with ammonia is a good cleaner, but a rub over with formalin would be an additional precaution, and might save much trouble at a later date. It is, however, only the conscientious worker who will go to this trouble to save trouble in years to come.

FOCUSING WITH THE SWINGBACK

A great many amateurs purchase cameras which are fitted with a vertical swingback, but never learn to use it to advantage in landscape work. The chief use of the swing is, of course, to allow one to tilt the camera upward and then by moving the book to get the plate quite vertical, so that perpendicular lines will be

A FOX SQUIRREL R. H. FELLERS

truly rendered. But there is another use which when one gets accustomed to will be relied on more and more frequently. We refer to the pointing of the lens downward and setting the swing at an angle.

When one attempts to focus objects very near and others farther away on a perpendicular screen, it is at once found that the only way it can be done is by the use of a very small stop; but in landscape work a small stop takes all the atmosphere out of the picture. If, now, one points the lens down so as to include more foreground, the trouble is increased *so long as the plate is left at right angles to the bed of the camera.* But if the swingback is now brought into operation and the upper portion of the ground glass screen is pulled backward while the lower portion is pushed forward, it will be found that the nearer and the more distant parts of the view come into focus at once. The plate, of course, is *not* perpendicular, but this is of no moment unless prominent perpendicular lines occur in the subject — seldom the case in landscape work. The reason for this effect is that the nearer an object is to the lens, the farther behind the lens lies the plans of sharp focus for that object; hence the rays from the foreground come to a focus at a greater distance behind the lens than do those from the middle distance, and a perpendicular ground-glass screen is in the worst possible position to receive them both. By using the swingback, workers will find it easy to focus *at full aperture* and thus retain atmosphere and separation of planes in their pictures.

A FOX SQUIRREL

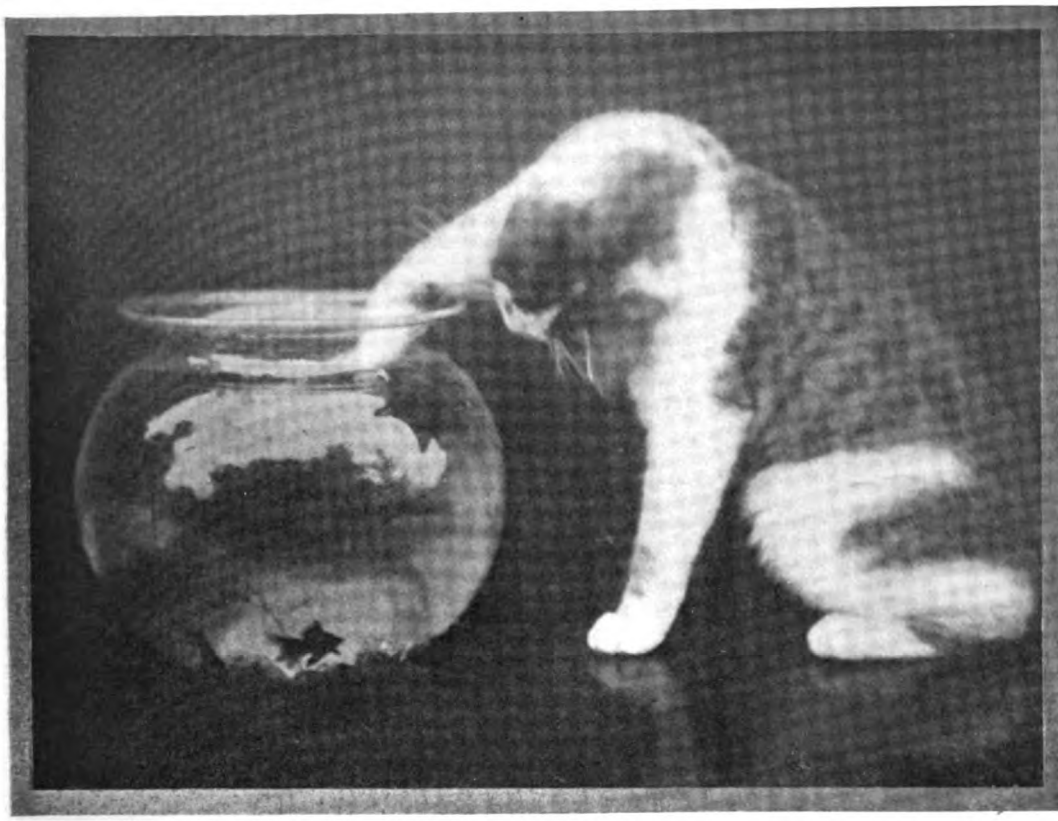
Waiting two hours for a squirrel to come down and have his picture taken is a feat which requires considerable patience. Mr. Fellers was rewarded, however, by securing a negative which, with a little retouching to remove the out-of-focus background, would make an excellent enlargement, if only a portion of the trunk of the tree were included. Data: 5 x 7 Conley Model XVIA camera with R. R. lens; 1-25 second at *f*: 8 in September at 12.30 p. m.; bright sunlight; subject in deep shade of woods; Hammer Blue Label plate; tray pyro; Normal Cyko Semi-Matte postcard.

FINDING SUBJECTS

It is a tendency of the human mind to long for what is out of reach and to believe that others have better opportunities than one's self. This is true even in photography. We were talking recently with a group of amateur workers from a mountainous region, and they expressed envy of our opportunities for picture making, while we responded in kind and said how much we would like to spend a week or two taking the views they thought so stale, flat, and unprofitable. The truth is, there are pictures everywhere, needing but the seeing eye to discern them and pick them out from their surroundings. One of the best ways to learn to see pictures in nature is to use a viewfinder. Suppose you are using a 4 x 5 camera with 6-inch symmetrical lens, the rear combination alone giving you a view lens of 12 inches' focus. Cut from a card mount an opening 4 x 5 and near one corner of the aperture insert a string. Make knots in the string at 6 and at 12 inches. By holding this frame in position, with the appropriate knot pressed to the outer bony margin of the orbit, and sighting with one eye closed, one can at a glance see just what would be included by a lens of that focus. It saves setting up the camera, and, as one can take it on all walks and study composition with a minimum of trouble, it soon teaches one what will and what will not be worth photographing.

A noted professional photographer once paid us a visit and in the course of a short walk through the neighborhood picked out no less than fifty pictures which he said were worth taking. His seeing eye is considerably better trained than ours, for we passed by most of his compositions without noticing them.

One reason why amateurs fail to make pictures out of good material is because they use short-focus lenses, which include too wide an



NAUGHTY TOMMY ELIZABETH B. WOTKYNS

Prize Picture — November Competition. *(See page 141)*

angle of view. If they habitually employed the rear combination instead of the complete lens, they would soon learn to select a principal object and to exclude everything which did not support and harmonize with it. A few minutes' experimenting with the view-finder described will demonstrate the truth of this statement.

A MODERN NIMROD

(See page 131)

We are sorry to observe that Mr. Speer's model this year has descended to the unsportsmanlike depth of shooting furred game with a scatter-gun. Last year's picture was better posed and exposed. Here the squirrel comes partly against the sky and therefore does not show quite clearly. A weaker pyro would have given more of a tone in the sky and thus introduced a little atmosphere. Data: 5 x 7 Century camera with Bausch & Lomb Plastigmat lens; 1-5 second at *f*: 22 in September at 11 a. m.; hazy light; Kodoid plate; pyro; Seltona print.

WHEN TO USE SMALL STOPS

During the winter, when snow scenes form so large a portion of the amateur's pictorial material, the advice to use a large stop no longer applies. Unless snow is rendered crisply it does not look like snow. Snow in sunlight takes one fourth the exposure which would be needed for the same light on bare ground, hence if one ordinarily used *f*: 8 for snapshots, *f*: 16 would now become the right stop. With a tripod, a shutter giving 1-5 second would allow one to stop down still more, and this fact should be taken advantage of when possible, as the greater crispness of detail in the snow conveys the impression of its crystalline structure to perfection.

SOME NOTES ON FIRELIGHT EFFECTS

F. J. MORTIMER, F.R.P.S.

It may as well be frankly stated that for all practical purposes photography by firelight alone is impossible.

The actinic quality of the light given by an ordinary coal fire burning in a modern grate is far too low for the satisfactory illumination of any subject for portrayal by the camera.

There is, nevertheless, a fascination about the quaint lighting effects given by firelight that any attempts to secure the same results by other methods of illumination cannot be regarded as illegitimate.

Often, during the winter evenings, when a group is assembled round the fire, or even when only one person is seated in the firelight, the almost theatrical intensity of the lighting and the beauty of the shadows force comment from the observer with pictorial instincts. If he is also a photographer, the thought uppermost will be how to reproduce the effect with the camera.

It is obvious that to secure the effect of the firelight a stronger light must take the place of the burning coals in the fireplace. Flashlight here comes to our assistance, and the intense actinic light given by burning magnesium will easily solve the difficulty.

A flash-lamp is, therefore, necessary, and one of the blow-through type will not only be found safest to use, but lends itself far more readily to the purpose in hand than a flash-mixture needing ignition.

It should be very carefully borne in mind, however, that nothing but plain magnesium powder should be burnt in a flash-lamp. *Never under any circumstances use a flash-powder or flash-mixture in such a lamp*, or an explosion will probably result. Plain magnesium powder will, under even extreme treatment, prove quite harmless and not liable to explode.

The flash-lamp will therefore take the place of the fire in the grate, which will need to be cleared, and suitable preparations made for actuating the flash from a distance.

This is most easily managed by means of a long rubber tube and ball attached to the lamp in place of the usual small length of tubing and small ball usually sold with the lamp.

The first attempts, however, are almost certain to be attended by failure unless suitable precautions are taken for trapping the smoke.

In most other forms of flashlight photography the model is some distance from the light, and usually below it. The light is also removed a certain distance from the field of view. With firelight effects the source of light is included in the composition, and although the actual flash itself is not photographed, the puff of smoke that arises instantaneously with the flash, and which is nearly as actinic as the flame itself, must be taken into account, and means adopted for diverting it out of the picture. This smoke usually takes the line of least resistance, which in this case is the open front of the fireplace and not up the chimney. It is necessary, therefore, to fix a screen of some sort inside the bars of the grate to allow the light to come out unobstructed, but fitting sufficiently well to keep the smoke in. The draft from the bottom of the grate will then carry the smoke up the flue without any further trouble.

If the opening of the fireplace is modern and fairly rectangular, a sheet of glass will be usually sufficient for the purpose; and even if the angle at which the photograph is taken is such that a part of the glass is included, it will be practically invisible. If the shape of the grate is such that difficulty is experienced in fitting a piece of glass inside, tissue paper, calico, or muslin can be stretched and wedged into the entire front, taking care to keep it well back out of view. Tissue paper or muslin will, of course, reduce the power of the light considerably, and a stronger flash will be necessary. The oiled paper used for wrapping P.O.P. or plates is better if obtainable in large enough sheets, and the calico can be made more translucent and less liable to catch fire if well wetted before use.

The effect of firelight can be heightened in the finished print by staining it with a suitable dye.

As in other forms of flashlight portraiture, the lights in the room can be kept going during the entire operation, provided none of them impinge on the field of view; but for estimating the final effect of the lighting, it is as well, when focusing, to turn these lights down and place a lighted lamp in the empty grate. The figure can then be posed in a more satisfactory manner in relation to the lighting than would be possible if the effect was seen only by the flashlight.

After posing the subject the camera is quite ready, the lamp is removed from the grate and replaced by the lighted flash-lamp, the glass or calico screen put into position (all this should have been rehearsed beforehand, so as to get it done expeditiously and not tire the model), and the exposure made. If the grate is big enough, it is always a good plan to leave the other light inside also. Then the sudden glare of the flashlight will not be so disconcerting to the sitter.

EFFICIENCY OF SHUTTERS

An amateur who had read somewhere that a focal-plane shutter is 100 per cent efficient

NOBODY'S DOG S. H. GOTTSCHO

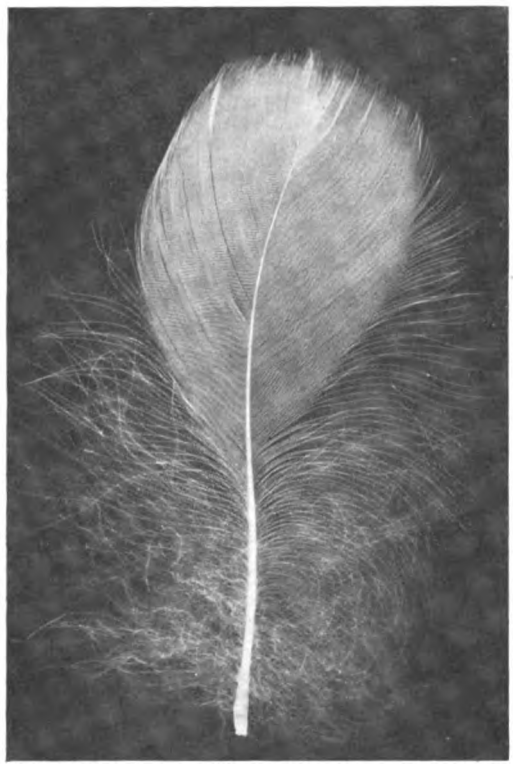
and believed it asked us one day to submit to a trial of the focal-plane against the between-lens shutter. His instrument was fitted with an 8½-inch *f*: 5.4 lens and the slowest speed of his shutter, as nearly as we could figure it (he had altered it to give a slit of 3 inches in place of the original maximum of 1½ inches), was 1-10 second. Our own outfit was a 6-inch *f*: 6.5 lens in Multispeed shutter, and we knew that the 1-10 second was accurate. The two cameras were set up side by side and exposed simultaneously on the same subject, using class ½ plates from the same box. The four plates were developed together in the tank, when, greatly to the surprise of our opponent, those exposed with the inter-lens shutter proved to have much more shadow detail than those exposed with the focal-plane shutter. We afterward calculated the efficiency of the latter shutter as only 45 per cent, as the curtain travels ½ inch in front of the plate. What the efficiency of the lens shutter is we have no means of determining; but this test confirmed what we had so often proved in a practical way, that it gives extraordinarily full exposures and doubtless has an average efficiency on all speeds fully equal to or greater than that of the focal-plane.

NOBODY'S DOG

One of the disadvantages of a small camera is shown by this print, and that is the impossibility of throwing the background out of focus, as can be done with a large-aperture, long-focus lens. The sharpness of the detail in the dog is desirable, but not so the equally sharp rendering of the boards. After all, one cannot do everything with one camera. Even the reflecting box is handicapped by the lack of a swingback, though a few ultra-expensive English designs offer a swingfront as a substitute. Mr. Gottscho has done the best he could with the material his negative offered him, by enlarging and securing in the enlarged print as good spacing as possible. Data: 4 x 6 Goerz Tenax camera with 6½-inch Dagor lens; 1-10 second at *f*: 11 in October at 11 a. m.; bright sunlight; filmpack; pyro tank development; enlargement on P.M.C. bromide No. 2.

HANDLING FILMS IN QUANTITIES

Evidently our readers are in many instances looking out for a chance to make money through their knowledge of photography, for we have received a number of inquiries of the following character. "Kindly tell me in your next issue



A GOOSE FEATHER R. W. TYLER

the best way to handle film in quantities. I have a goodly number of rolls of film to develop and experience some little trouble with them, especially in the fixing. I have always been an exclusive user of plates, but I am now doing finishing for amateurs and will appreciate any help you can give me as to the trays I should use, the sizes, how to build them (if that is necessary), and how to finish them to make them acid-proof."

The best way to handle roll films in quantities is by the tank system in both development and fixing. The principle is to hang the films, firmly held by clips, from wires strung above a deep vertical tank, using weights to keep them pulled out straight. Development is by time and temperature. The workroom, of course, is darkened and lighted with "safe" ruby light. Fixing takes place in the same manner; and, if running water is available, the washing also takes place in a similar vertical tank. When washing is complete, the films, clips and all, are hung up to dry. A complete outfit of tanks, with the necessary platform, etc., can be bought from the Eastman Kodak Company; Burke & James, Inc., also catalog a complete outfit at a moderate price. Unless there are special reasons for requiring flat trays, it would be the truest economy to purchase one of these outfits, as it would soon pay for itself by doing away with all the accidents which can happen to films when handled in flat trays.

A GOOSE FEATHER

No camera was used in making this picture. Mr. Tyler writes that the feather was simply placed on a sheet of clean glass in a printing-frame and printed direct on a sheet of Instanto Hard paper.

MORE ABOUT THERMO DEVELOPMENT

A reader asks for confirmation of the correct method of developing a Seed 26X plate by the Thermo system, using the Modified Thermo M.-Q. given in the June, 1914, issue.

The plate is listed as MS (medium slow). The MS dilution of the developer is 6 drams of each stock and water to make the total volume 3 ounces. Assuming that the temperature is 68, the correct time to develop is 5 minutes.

This same reader and a number of others have asked for the tables applying to Mr. Watkins's Thermo Pyro-Soda. This developer can be used with the M.-Q. Table of Temperatures printed on page 371 of the June, 1914, issue, but the Table of Dilutions is different, namely,

VVQ	VQ	Q	MQ	M	MS	S	VS
1	1⅓	1¾	2¼	3	4	5	6¾

drams each solution to be made up to 3 ounces for tray or to 10 ounces for tank. The Watkins formula is:

Thermo Pyro-Soda. No. 1

Pyro	160 gr.
Potassium metabisulphite	80 gr.
Sodium sulphite, anhydrous	1 oz.
Water to make	10 oz.

No. 2

Sodium carbonate, anhydrous	2 oz.
Potassium bromide	40 gr.
Water to make	10 oz.

N. B. The bromide is necessary to make the temperature coefficient 1.9 and allow the use of the tables for the M.-Q. developer.

MAKING AN ENLARGING EASEL

A reader asks for the *simplest* way to make an enlarging easel. This is rather a large order, for the simplest might not be the best. It all depends on the space available and the other purposes for which the workroom must be used.

One of the best forms of enlarging easel is a drawing board fixed at right angles to an

A SYLVAN PATH W. A. VAN RENSSELAER

overhead track and capable of being moved along by turning a crank operating a set of pulleys with cord for bringing the board nearer to or farther from the enlarging camera. Our own arrangement is simply a large wooden easel, of the kind which was fashionable in parlors two decades ago, the legs provided with blocks to make it stand vertical, and the rear support altered to correspond. A drawing-board stands on the original wooden pins which pass through holes in the front standards and is held firmly in place by cast-iron screw clamps. This answers admirably for bromide paper and can even be used for supporting a large plate when an enlarged negative is to be made, but it lacks a proper supporting shelf for a printing-frame. The use of the frame is to secure a clean and even white margin on enlargements. A set of masks is provided and the paper is loaded into the frame behind the masks after the size, etc., have been finally adjusted and a sharp focus obtained. There is, however, already on the market a suitable enlarging easel which is fitted for a frame. It is cataloged by Burke & James, Inc.

NEGATIVES GOOD IN PARTS

There are many negatives useless as a whole, which still contain the makings of a picture if the best portions be enlarged, and for this reason, among many others, it is recommended that every photographer keep an enlarging apparatus ready for use. As a case in point I remember taking a large number of negatives of a well-known clergyman. In one of these, a three-quarter length, he moved his hands badly and the plate was put aside. Sometime after, in looking over the "spoils" the expression struck me as a good one and I enlarged the head to twelve by ten. This was submitted, and resulted in orders many times the value of the first one from the "good" negatives.

A SYLVAN PATH

The composition of this print is probably as good as could have been secured at this point, for the principal tree is well placed. The print, however, is too contrasty. A print on the softest grade of D.O.P., or even bromide paper, would be considerable of an improvement. Subjects of this type are always difficult to render, as the scattered lights defy the principle of unity and the strong contrasts need prolonged exposure — far more than most workers are willing to give. A double-coated color-sensitive plate used with a filter, and the focus slightly diffused, would moderate the harshness of the scene; but a better way to take it would be with a diffused- or soft-focus lens, which gives the vibratory quality in sunlight, or else on a dull day. Data: 4 x 5 Century camera with 6-inch convertible lens; 8 seconds at *f*: 32 in July at 9.45 a. m.; intense sunlight; Stanley 50 plate; Seed's metol-hydro.; print on Regular Velvet Velox.

THE SAND DUNE V. A. SPEARS

THE SAND DUNE

As an example of perfect technique, this print is worth careful study by all readers desirous of photographing white sand or snow. The impression is not one of dazzling whiteness, but rather of a number of delicate tones of pearly gray, with the needed contrast furnished by the foliage farther down the slope. To accomplish such a result without a filter is a feat attainable only when an exposure correct within a small margin is given. If the exposure is too long, the differences in the lighter tones are not brought out, as all will tend to become of a uniform grayness. Too short an exposure, on the other hand, introduces an unnatural contrast. A small stop, with extreme sharpness in the immediate foreground, is necessary to bring out the sand texture. The lighting must be diagonal, so that shadows model the surface. To all these points the maker has paid careful attention; but there is room for improvement by trimming from the top enough to get rid of the patch of sky which fills the upper right corner. Data: 2A Kodak Special; 1-25 second at *f*: 16; June 2.30 p. m.; bright sunlight; Eastman film; pyro; print on an Azo E postcard.

THE ELOPEMENT

(*See page 133*)

Posed genre pictures are seldom entirely successful, but here is an example to which little objection can be made. The idea is well thought out and has been adequately handled from the photographic point of view. Data: 5 x 7 Poco camera with Goerz Dagor lens; 1-10 second at *f*: 8 at 4 p. m. in September; subjects in shade; Stanley 50 plate; Metol-hydro.; print on Kruxo Hard Carbon Matte.

CLEANING NEGATIVES

Few negatives are quite free from dirt when they come from the drying rack. Even if both sides are swabbed with a tuft of absorbent cotton before they are set up to dry on the rack, by the time they are dry, dust from the air has settled on them and made them perceptibly dirty. The film side, of course, cannot be touched, but the glass side can be well scrubbed. A good cleaning mixture is made as follows:

Alcohol, 95 per cent.....1 oz.
Stronger ammonia water.....1 oz.
Water.....2 oz.

This solution will clean and polish the glass and will thoroughly remove traces of emulsion which have got on the back of the plate in coating.

A CAUSE OF BLISTERS IN BROMIDES

Various things contribute to blisters in bromide papers, of which perhaps the chief is too strong a hypo fixing bath. One should never make up the hypo bath for prints haphazard, but make it a rule always to weigh out the hypo in the proportion of not more than 4 oz. hypo per 20 oz. water. But recently I had a case of bromides blistering despite every means taken to avoid the defect, such as hypo bath, temperature of developer, wash water, etc. Finally the trouble was traced to the water supply, which was of extra high pressure, with the result that it contained an excessive amount of air. At least, this is the only explanation that I can give in view of the fact that when we allowed the water to stand for an hour or so before using it for making up the hypo bath or for the first wash or two the print blisters were no longer produced.

A COUNTRY CHURCH MICHAEL BRAZIL

A COUNTRY CHURCH

This church interior is a very satisfactory piece of technique, showing the almost perfect recording of tones from very intense lights to shadows dark yet not empty. Part of the credit in this instance must be given to the plate, the famous Hydra, which cannot be overexposed. With this plate it is possible to expose for the shadows of any subject, no matter what its range of contrast, without thinning the lights. The development must of course be skillfully carried out to avoid making the lights too dense; but with care one can handle hitherto impossible subjects and get splendid results. Data: Postcard Conley camera with R. R. lens; 13 minutes at *f*: 22 about 2 p.m. in April; bright sun outside; heavy stained-glass windows; Hydra Rapid plate; tank pyro-metol; print on Soft Glossy Instanto.

NOTES ON WINTER LANDSCAPES

MARY C. COTTAM

"The woods decay, the woods decay and fall,
The vapours weep their burthen to the ground."

"Winter is not the time for landscape work. I never take my camera out; it's much too dull and cold," I think I hear many a photographer say, upon reading the above headline. And when we consider the conventional idea of this season we cannot be surprised. Days of drizzling rain, of boisterous gales and wild storm-clouds, of fog, of leaden skies, when earth looks unutterably mournful, desolation and dreariness are the predominant features.

These conditions I frankly admit frequently prevail, but winter has many moods, and weaves her pictures with such consummate and masterly skill that there can be no monotony or satiety.

THE BRIGHT SIDE OF WINTER

Each worker will see with strangely different eyes, for to each one nature sings a fresh song, which calls forth varied emotions in our hearts. Therefore our interpretations are diversified, for our visions cannot be the same. The gloomy and desolate will appeal to some, to others the stern and solemn, yet to another the fairylike and ephemeral. It is to the brighter and sunnier aspect of winter that I should like to draw the reader's attention. We have had so many somber and low-toned pictures representing this season, which have been extremely popular, and deservedly so; yet, if these were shown to someone who had never experienced an English winter, they would imagine the climatic conditions to be much worse than that which is actually the case. Personally, I think it a matter of regret to invariably reproduce the sadness of nature, for by dwelling upon this we stand in danger of eventually becoming pessimistic. In that case, we shall only find our pleasure in render-

ing gloom. And what, after all, is the message that the Spirit of Winter brings us? Can it be only one of desolation and death?

Is there not a more cheerful aspect? Her face, though very beautiful, is stern and sad; her eyes are often filled with tears; her voice is full of warning, yet has within its depths a sweetness untold. For she speaks of life and light to follow the darkness and decay; of budding leaves and bright spring flowers. She weaves, for those who care to listen, a dream and a prophecy of immortality. In her hands she holds a marvelous consolation for those who will accept it. It is left for us to choose. Shall we take the gift she offers us, or shall we turn away and refuse to be comforted by dwelling only on her superficial aspect? Therefore, I would urge upon the landscape worker to come out into the winter sunshine, for there is sunshine even in December and January. These two months are almost the very best for atmospheric effects. Subjects are on every hand. Very frequently we have days which are by no means too cold, and upon which work with the camera is most enjoyable and invigorating.

WINTER HAZE AND SUNSHINE

For instance, take the woodlands over which brood a deep and ineffable peace. The conditions are almost perfect, with the thin gray haze veiling the distance; the slanting rays of sunshine which are so beautiful and so transient; the fallen leaves; the delicate, dainty tracery of the leafless trees, those exquisite branch forms which remind one very forcibly of Japanese designs. If we love form, now is our opportunity to revel in it, for it lies on every side. We are no longer troubled with solid, impenetrable masses of foliage and deep, dark shadows, neither are we confronted with conflicting color problems. The earth is almost a monochrome of dull browns, cold purples, and silvery grays—a subtle harmony of a few quiet tints in which winter arrays herself.

There are endless themes for innumerable pictures lying around our towns, both vague, mysterious, and poetical; especially toward evening, when the towers and buildings stand silhouetted against the sky, the glow of the fast-sinking sun reflected on the wet road at our feet, with the hurrying figures of the wayfarers homeward bound. All these should appeal to our esthetic senses, for there is grandeur of both form and line and beauty of expression for those who possess the gift of observation. These are subjects which have by no means been worn threadbare.

FROST AND SNOW

Sometimes we have hoar-frost or snow, when a magic transformation takes place which in a few brief hours changes the entire aspect. Cameras should always be ready and slides filled. Almost any morning we may wake to find that winter has donned a robe which seems miraculous, for almost anything becomes beautiful when wrapped in snow. At these times we do not have far to wander, for subjects await us but a few steps from our own door, and we may find a picture at every bend of the road, so entirely are commonplace objects idealized and clothed with a veil of beauty. It is best to use an Isochromatic plate, and to be careful not to underexpose. The great thing to avoid is a "soot and whitewash" negative, which will be the inevitable result unless our exposure is ample.

PLATES

Backed plates should always be used. This applies to any subject. It is quite as necessary to have a backed plate for landscape as it is for architectural work. Some workers would as soon think of leaving their focusing cloth at home as they would of setting out with their plates unbacked. "Too expensive," says one photographer. "Too much trouble to back one's own," urges another. All that one can say in answer to such is that if one really loves the work and feels keen upon securing some fleeting effect no trouble should be thought too great to secure it. Labor and love go ever hand in hand. No half-hearted worker can hope to succeed, for he has not sufficient desire to base his efforts upon. "Nothing is denied to well-directed labor; nothing is to be obtained without it."

IMAGINATION

No doubt for all picture making a certain amount of imagination is necessary. We may have a mastery of technique, we may also be cognizant of the rules of art, which are useful up to a certain point; but unless we are dowered with that strange gift of the gods, an imaginative mind, our efforts will lack spontaneity and inspiration. It is but a faint line of demarcation that lies between the seen and the unseen. Happy those mortals who possess the power of discovering the ideal. In conclusion, I think the best advice that anyone can offer to the young worker is to specialize. Keep to landscape photography if that is the subject that most appeals to him. We cannot make much advance in drifting idly from land-

scape to architecture, from architecture to portraiture, and so on. Life is too short for the average worker to perfect himself in every subject.

INITIALS

This picture was taken to illustrate the fact that some people have the reprehensible habit of disfiguring nature, but in the case of the present offender one is inclined to plead the example set by others as extenuation of the offense. The maker of the picture thinks the idea original. At any rate, he has handled it well, and improvement could be secured only by handwork on the negative. In the first place, the gown is rather too staring a white, so it could with advantage be rubbed down with alcohol or even reduced with a chemical agent, such as acid permanganate. Secondly, the trunk behind the figure could be retouched until it became merged into the background. The defect in rendering the whites is due to too prolonged development. Data: 3A Kodak with R. R. lens; 1 second at 5 p. m. in July in bright light; Eastman's Vulcan film; hydrometol developer; print on a Soft Instanto Semi-Matte postcard.

MODIFIED THERMO DURATOL IN THREE SOLUTIONS

Chemical fog, caused by sulphite, is far commoner than ordinarily believed. It is most liable to occur in tank development, for careful tests on unexposed plates have proved that fog forms when the grains per ounce of sodium sulphite (anhydrous) fall to or below about 6 per ounce, i. e.; about 1 per cent. On the other hand, increasing the sulphite to approximately 8 grains per ounce is sufficient to prevent fog and give a "clear-glass" negative, without affecting the speed of the plate. A 25 per cent solution of sulphite keeps well and can be added in quantity sufficient to make the sulphite content of the completed developer in proportion to the number of ounces of water used.

A

Water to make.....20 oz.
Potassium metabisulphite.....60 gr.

Dissolve and add:

Duratol..... 30 gr.
Hydrochinon.....90 gr.

B

Sodium sulphite, anhydrous.....1200 gr.
Water to make.....10 oz.

(Or, if desired, 300 grains acetone sulphite may be substituted.)

INITIALS W. E. MASON

C

Sodium carbonate.....2 oz.
(Mallinckrodt's dry granular)
Water to make.....20 oz.

IN PLACE OF VARNISHING

A hardening treatment for negatives, which answers as well as a varnish for work such as view postcards where a large number of prints have to be taken off, is a minute or two's immersion in the following:

Alum..... 2 oz.
Tanic acid..... 60 gr.
Water.....16 oz.

The negatives should be immersed in this solution for not more than four minutes. If longer, the film is liable to become so hard that it shows a tendency to crack and split at the edges. The solution can be used repeatedly, and will be found to serve equally the purpose of varnish, the hardened film acquiring such a tough nature that water accidentally spilt on it can be wiped off without affecting the gelatine.

SOME RULES IN ART

MAX LÜTY

Although there is a tendency among some photographers to contend that there are no rules in Art, yet there are certain conventions, to borrow a phrase from a well-known art critic, into which pictures fall. The following

Fig. 1

Fig 2

Fig 3

Fig 4

Fig 5

instructive diagrams and explanatory notes are given in "Photographische Künst."

Although the photographer is denied the use of color, being bound to some extent by the limitations of his instrument, and has, therefore, to rely upon line, form, and the infinite gradations between white and black, it is possible for him to suggest color, as is done by every engraver and etcher. The misleading effect of color can always be obviated by the Claude Lorraine or black glass mirror, which may be obtained from every artist's colorman. The intelligent use of this will frequently prove that a scene which is otherwise satisfactory will, when translated into black and white, prove disappointing. The world which the artist reproduces is enclosed by the four sides of his frame; it must be a perfect whole in this, and, if it is to awaken a feeling of pleasure in the observer, it must be so arranged that a harmonious ratio exists between the whole and its parts.

THE SILHOUETTE

One of the most important features is the silhouette, for this is closely akin to a frame. It may be dark on a light ground as in Fig. 1, or light on a dark ground as in Fig. 2. In the latter the tree stems and boughs do not detract from the bright silhouette, which is quite distinct to every observer. Fig. 3 shows an extremely irritating silhouette. The reason why 1 and 2 are more interesting lies in the rhythm with which the silhouetting line moves with the frame — now short, now long, now rising and falling, at other times straight or jagged. The rhythmical enclosing line is similar to the time of a piece of music; a monotonous continuous tone is never pleasing. Such is Fig. 3.

MASSES

Now let us turn to masses. Masses of equal size weaken one another, and therefore care should be taken to avoid placing them in such a position as is shown in Fig. 4.

A principal mass only acquires its importance by contrast with a smaller one — Fig. 5.

If we divide the picture by a diagonal, we can obtain equal importance and contrast, and the due proportion of light and shade — Fig. 6.

If on one side of this line we place the whole of the dark masses, and on the other the lights, we obtain the broadest effect — Fig. 7. Yet if the whole of the composition lies to one or the other side of the diagonal the result is a want of harmony, and it is erroneous to suppose that a very small object on the other side restores the balance, as since it is separated from and in contrast to the more distant parts it gains ten times in importance — Fig. 8.

CORRECT POINT OF VIEW

The choice of the point of view is naturally of the first importance, and the use of the correct focus lens. Above all things the unity of the picture is of the greatest importance, and it should always be considered when the picture is in the frame; the effect of surfaces and of spots is then seen. Sometimes trimming will help wonderfully, but if the correct distribution of masses can be obtained without its aid the better the effect.

The old and modern masters are not afraid, as is well known, in order to obtain any particular massing, to divide a figure or object at any place. This cutting away or through ought not, however, as is too often seen, be done as a striving for effect or want of judgment, and just because one has done it, and therefore others must follow suit because it is "modern."

Very frequently landscapes will be seen with

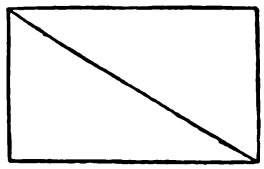


Fig. 6

Fig. 7

Fig. 8

on one side twigs or leaves, which are quite without motive, and take away entirely the sense of completeness or finish. If on one side there is required a balance to a mass on the other, a tree should be arranged as shown in Fig. 9. The cutting of this should be done so that by its mass it minimizes the larger mass, and also that its vertical line should form the frame and cause fancy to increase the space.

LIGHT AND SHADE

Besides the satisfactory arrangement of line and mass, there must also be an artistic arrangement of light and shade. These may be divided into five parts, light, half-light, middle tones, half-dark and dark. If a picture is composed of light and half-light, the shadows become stronger and more vigorous, and it will then have a dull appearance, which for certain low keys is exactly what is required. If, on the other hand, it is dark and half-dark, the lights will appear more brilliant, but will then frequently be spotty, as the half-lights which are essential to connect the two are absent. The whole will then have the appearance of gloom, and there is the danger of its looking heavy.

If the picture is composed chiefly of middle tints, the dark and light parts will have equal effect, and the total effect may be weak and insignificant.

SOME DEFINITIONS

Light and shade are the means of producing three things: relief, harmony, and breadth. The first gives precision of form and the corporeal appearance of nature; the second proceeds from the congruity and combination of one part with another; and finally the third, the all-pervading breadth, is the necessary accompaniment of the expansion and size. Too much relief produces hardness and frigidity; too great delicacy and blending of the individual parts cause weakness and want of expression, and in striving after breadth one may easily become flat.

Turning again to our diagonal line and placing on one side of it the greatest dark, and on the other the highest light, we obtain, as already said, the greatest breadth of effect. If, however, we want to obtain a balance or to combine the two, the only thing that we can do is to take a piece from one and replace it by a piece from the other. The harmony of the whole is increased by this process, and lights and shadows become through opposition more intense — Fig. 10.

Frequently the highest light lies in the middle of the picture and shades off to its

Fig. 9.

Fig. 10.

Fig. 11.

Fig. 12.

edges, being bounded by a framework of shadow, which unites the whole. The light then becomes extremely brilliant, especially if a small portion of the shadows is brought into conjunction with it — Fig. 11.

Finally, we may bring our deepest shadow into the middle of the picture and distribute the light around it. Then the dark, as it is isolated, gains in strength and importance — Fig. 12.

That the above brief laws are open to modification is self-evident, and must be left to the artistic taste and feeling of the landscape operator.

Eclectic art in the beginning of this century has cried down composition. It places the principal accent on the attainment of juxtaposition in the picture; the true artistic feeling as to how the whole fills the frame is lost.

TWO STRANGE THINGS JUVENTINO OCAMPO

TWO STRANGE THINGS

Mr. Ocampo's technique is very good in all the work he sends us, so that it is difficult to select the most interesting print for reproduction; but there are certain features about this animal study which lead us to prefer it to other subjects. The use of the portrait attachment made it possible to secure a large image without losing the advantage of an instantaneous exposure. The rendering of the texture of hair and feather is perfect. The bird, in particular, is very skilfully brought out against a background which tends to afford it concealment, owing to its protective coloration. Data: 3A Kodak with R. R. lens; portrait attachment used; 1-100 second at *f*: 8 in bright sunlight in September at 1 p. m.; Eastman film; M.-Q.; print on Professional Cyko Semi-Matte.

SMALL CAMERAS AND CITY PARKS

B. J. NASIEF

Beginners in photography, and also many advanced amateurs, often entertain the notion that in order to secure scenic pictures of anything worth while it is necessary to go on a long hike into the country. Landscape pictures of any artistic merit are in their minds usually associated with vast stretches of meadows, dense forests, browsing cattle and the like, and too often in searching for the unusual they overlook a wealth of material right at home.

Those of us who love to point our cameras at a bit of nature but are unable to take many trips into the country have in the city parks an abundance of material for the making of landscape pictures. Little corners here and there, a group of trees, some foliage and underbrush,— any of these will afford us the opportunity to exercise our artistic skill and when tastefully arranged and lighted yield pictures which we will always prize.

It is my object in this article to show what can be done right in the parks of a large city. The illustrations are not put forward as examples of any artistic merit, but rather as pretty little bits of city park landscape; such pictures as we love to place in our albums or to enlarge and frame. And the fact that they represent scenes of our own city, possibly only a few minutes' ride from our home gives them an interest that views of places many miles away cannot possess.

In this respect the advent of the small camera has done wonderfully, I believe, in increasing the amateur's attempts at pictorial photography. And because of the ease with which it can be carried it has also induced hundreds of prospective amateurs who would never think of lugging about a large camera to try their hand at picture taking. It is undoubtedly responsible for the rapid increase of late in the number of beginners taking up photography as a hobby. For just *induce a* person to try his hand at it once and allow the photo-germ to gain a footing, *when it is*

IN MAPLEWOOD PARK — B. J. NASIEF

really unbelievable how swiftly the disease grows. Just get a man interested in photography, start him in the right direction and show him that he too can make good pictures of places and objects he prizes, then leave him alone for a week or two. But drop in to see him unexpectedly sometime and if you don't find him tucked away in a darkened corner of the attic or the bathroom, the cellar or even the barn, amid dozens of bottles and trays and buckets,— and if he isn't too absorbed in his work to give you more than a little nod, you may be sure that as a teacher you stand a very poor chance indeed.

The time has not long since passed when small cameras were considered as being out of the question for serious work by advanced amateurs as well as professionals. The large view camera, clumsy tripod and heavy plate-holder case were all considered indispensable to the production of good pictures, especially if the finished prints were to be in any size larger than 4 x 5. Had you ventured the assertion but a few years ago to any camera enthusiast that in the near future he would be able to place the required apparatus for making 8 x 10 pictures, plates and all, in one pocket, carry enough material with him for the making of a hundred exposures and then develop and print the pictures without spending any length of time in a stuffy darkroom, I'm sure he would have replied that he agreed with you perfectly in every way, patted you timidly on the shoulder, and done everything in his power

JUST BEFORE SUNSET — B. J. NASIEF

to keep you quiet and prevent your getting violent while somebody ran for help.

The favor shown small cameras at present and the almost universal manner in which they are replacing larger apparatus among amateurs is not due to the greater portability alone; the wonderful improvement in modern lenses with their microscopic definition, making possible

IN SENECA PARK B. J. NASIEF

the enlarging of pictures without any loss in their sharpness, and the perfection of enlarging papers and methods have also played a great part in the change. The flat grayish tones which in the old enlarging papers were unavoidable have now been entirely done away with. Furthermore, many enlargements are actually better than the contact prints made from the same negative. They show a wealth of beauty and hidden detail which often remains unnoticed in the miniature prints. And owing to the ease and certainty with which they may be "faked" during the printing the results are usually more balanced.

My present equipment includes two folding film cameras in the 1A and 3A sizes, both of which are in constant use. The capacity of these little cameras in practical work is surprising, their lens equipment especially being splendidly adapted to quick work under varying conditions. The unusual depth of focus of these lenses is a very great factor when taking pictures without the aid of a ground-glass.

Negatives obtained in the field with a pocket camera are without doubt far more satisfactory than those secured with a large and clumsy outfit. With a pocket camera we are entirely free of the heavy load of the larger apparatus and can with ease walk about and select the positions and views that please us most. The cost of materials which to the user of a large camera is a big item, need trouble us but little. We can, at the cost of one 8 x 10 plate, make half a dozen 1A exposures, select the ones which suit us best and enlarge them to the required size.

We can also select just those parts of our negatives which please us most and enlarge them to the full size thus altering the composition of our view in any way to suit our taste. Many objects and conditions that remain unnoticed in the field become objectionably apparent when shown upon the negative. By omitting certain parts of our picture and enlarging the rest of the negative to the required size, these may be done away with altogether or their position in the picture so changed that the composition remains balanced. This, of course, the man with the large camera can do also, but he has neither the number nor the variety of negatives that we have to select from, and his expense for enlarging apparatus too will be very much greater than ours.

When once tried this plan of enlarging only selected portions of the film is one which will quickly grow into a habit. Just examine your last lot of landscape negatives and you will find that there are mighty few which cannot be improved by the omission of certain parts. And in selecting the preferred negatives of a lot made on an outing, choosing the best portions of these and enlarging them, you will find as interesting and instructive an evening's work as could be had in any of the many branches of photography.

CLOSING OF THE COMPETITIONS

Readers who hope to have prints selected for reproduction should get them mailed in time to reach our office before the twenty-fifth of each month, as the judges make the awards and select Honorable Mention pictures for reproduction on that date.

LANTERNSLIDE MAKING FOR BEGINNERS

DR. JOHN NICOL

The first essential in the making of good lanternslides is, of course, a good and suitable negative; and that requires more consideration, as is too evident from many of our slide shows, than it usually gets. It should never be forgotten that the slide of about nine square inches is to be magnified to about one hundred square feet, and that a degree of definition sufficient or even desirable for printing or ordinary enlargement would be simply intolerable in the larger size. Nor should it be forgotten that a flaw or speck that in a print would be unnoticed will, when so magnified, utterly ruin a slide, nor that none, or hardly any, of the dodges admissible on prints would be tolerated on a slide.

CONTACT OR REDUCTION

The negative suitable for slide-making, therefore, should be rather on the thin than the dense side, should include the full range of gradation that is in the subject, without a trace of clear glass or an opaque part, unless it included objects perfectly black and perfectly white, neither of which are frequently found in nature; and at the same time must be free from fault or failure that cannot be so removed as not to be visible on the magnified image.

The next question is as to the method, whether by contact printing or copying in the camera. Much has been written as to the comparative merits of the methods, but we are safe in saying that to those properly acquainted with both, the one is as good as the other, and to them it is simply a question of the negatives. When the subject is within the three-inch space the contact method, while equally efficient, is vastly more convenient, but when it is larger and must be reduced, copying is a *sine quâ non*. With the more convenient method, especially as those who are likely to be slide-makers are just those who have been making small negatives either for the purpose or for enlarging, we shall deal in this article.

THE DEVELOPER

Plates and negatives having been provided, the next step is the consideration of the developer, which should be a good standard formula, never varied, but the exposure made to suit it. What that developer should be is of less importance than that it should be adhered to, although the slide-maker may have two developers, one weak, the other strong, the purpose being to vary the color of the resulting slides, strong developer and short exposure tending to black, and weak developer and long exposure giving warm colors.

While, as we have already said, almost any of the modern developers, including pyro, and almost any of the formulas given for their use, may answer well enough, the following has always given us all that we could desire:

Edinol	40 gr.
Hydrochinon	20 gr.
Sodium sulphite	240 gr.
Sodium carbonate	240 gr.
Potassium bromide	10 gr.
Water	20 oz.

This, with properly arranged exposure, will give on most slide plates fine velvety black tones, and if diluted with equal, two, or three parts of water, and exposures suited to the various dilutions, will give various shades of warm browns or reds.

In speaking of plates we had omitted to say that backing greatly improves the quality and brilliancy of the slides. What the backing shall be is of less importance — almost anything that will destroy the reflecting surface of the glass will do.

THE LIGHT FOR EXPOSURE

The next thing requiring consideration is the light. It is of little consequence what it is so long as it is steady and uniform; that is, that it shall be so far as practicable always the same, so that the exposure, once ascertained, shall be the exposure for all time. The printing frame should be a size larger than the slide plate, and larger than the negative if it should be small, the object being that the one may be moved upon the other so as to straighten bent lines or select only the portion of the negative to be included in the slide. And this brings us to the exposure and how to get at it. The first essential is a time meter and nothing is better than a pendulum, a stone at the end of a string 39.5 inches long and so swinging seconds. As to the light, in the absence of anything better, an ordinary kerosene lamp, with, say, an inch wick, in the ordinary darkroom lantern answers admirably. Thus provided, the next step should be to select an average negative and, placing it and one of the plates in the printing frame, put the latter on end at a given distance from the light and give exposures varying from, say, ten to forty seconds, in the well-known way by slipping a card across the front of the frame, thus giving a graduated exposure with a fixed time for each gradation. Perfection may not be reached

by the first or even the second experiment, but keeping in mind that perfection on the slide depends on perfection of the exposure, the expenditure of a number of plates brings with it its reward; nor is the reward confined to exposure, as the development of such varied exposures teaches much that is never forgotten.

EXPOSING

Just what the distance between the light and the printing frame should be is not so easily ascertained. It should vary with the density of the negative, nearer when it is dense and farther when thin. It is well to have a certain place for the lamp and a series of easily seen lines at equal distances from it drawn on the work table, say at 6, 12, 18, and 24 inches; and as light diminishes according to the square of the distance, it is easy, knowing the exposure, at once to find what it should be at all. It is true that in printing delicate films the distance rule does not hold quite accurately, but the error is so small as not to interfere in the printing of films so slow as are those of lanternslide plates, the irregularity being much less than the latitude.

Correct exposure having been ascertained, the best method is to print the evening's work, as many slides as we intend to make, one after the other, and then develop in the same way. Our lantern, or rather light-box, is homemade, with an 8 x 8 light of clear glass, over which there is a sliding screen of orange glass, dark enough to be perfectly safe and at the same time to give plenty of light for changing the plates. The lamp is an ordinary kerosene "kitchen" variety, with a reflector; and with a medium negative on an average lantern plate the exposure at eighteen inches from the light will be about twenty seconds.

DEVELOPING

The first thing, of course, before developing is to clean off the backing, and it is as well, as far as possible, to do so without letting the water touch the face of the plate, and if it does so, the whole plate should be moistened. The "first appearance" differs considerably from that on a negative, the whole image coming more together; and just when to stop development is one of the difficulties encountered by the slide-maker; but in this, as in exposure, it is better to over- than to under-do. Indeed, some of the best slide-makers overdevelop on purpose, believing that by reducing in daylight they can hit the desired density better than under the orange light. Slow as most lantern plates are, and safe as the orange light is, the less they are exposed to it the better, as a slide developed altogether uncovered is grayer than one that has been covered during most of the time of development. This brings us to the fact that in transparency as well as negative development the factorial method is available. Careful observation will in a short time enable any one to know just what the factor of his developer is, and he may then with perfect confidence watch for the first appearance and then cover the tray till within a few seconds of the factorial time, before he examines the positive by the transmitted light, and if all has gone well, the slide will have every degree of gradation that was in the negative without a trace either of clear glass or perfect opacity, unless there has been in the subject an object in the highest of highlight and something in the deepest of deep shadow.

From the developer, the slide, after a little washing, is transferred to the fixing solution, which should be of the "acid" variety, and left there for at least as long after the white film has disappeared as it took to remove it, underfixing being one of the dangers to which a slide is liable. Thorough washing and drying in a place free from dust completes the slide so far as photography is concerned.

THE SIXTEENTH TINT

A reader asks how to judge the sixteenth tint for interior work with a Watkins meter. All his results have been overtimed.

The sixteenth tint is the first visible graying or discoloration of the paper and can be seen only by turning the paper slightly so as to expose a minute strip of the unaltered paper for comparison. The untinted paper is rather bright yellow, so the sixteenth tint is readily appreciated as a faint gray coloration. Multiply by 16 for full exposures indoors.

AN ADVANTAGE OF THE TANK

It is comparatively easy to keep a large body of solution in a polished, nickel-plated tank from changing temperature rapidly. Users of tanks have found that if they *mix* their developer at 65 degrees and then immerse the tank in a pail of water at the same *temperature*, it will retain the desired degree during the 20 minutes required for *development*. This applies just as much in winter as on the hottest dog days.

EDITORIAL

OUR COMPETITION

The prize this month was awarded to Miss Elizabeth B. Wotkyns, for "Naughty Tommy." This is a very original photograph and the arrangement is particularly fortunate. Other examples of Miss Wotkyns's work have been presented in this magazine, but we believe this is the first time we have had the pleasure of awarding her a prize. We received a very large number of extremely pleasing photographs for the November Competition, and honorable mention was awarded to the following: "Mum Season," by F. L. Kimrey; "Unappreciated," by R. S. LaGrange; "An Outdoor Portrait," by H. D. Metcalf; "Eating Apples," by E. Herman; "Morning in Woodland," by Ken Muchima; "Willows by the Lake," by Edwin A. Roberts; "OO, Pictures," by Charles Brodsky; "Horseshoe Falls," by Wm. J. Morris; "Papa's Pet," by George A. Nelson; "You're It," by Geo. Verber; "Water Nymphs," by O. Holmes; "A Discord," by Nick Bruehl; "Interested," by John J. Neuer; "Still Life," by R. W. Tyler; "Kathryn," by E. B. Wotkyns; "Pals," by A. R. Brown; "A Group of Trees," by E. V. Bowers; "An October Sky," by O. Fortenbach; "Take Me to Your Arms," by W. G. Whale; "The Old Dam," by W. H. Bristol; "Late Summer Storm," by J. A. Seidl; "Getting Better," by C. D. Meservey; "In Madison Square Park," by B. J. Weeber; "Log Camp," by J. H. Hensel; "Sidetracked for a Picture," by Arthur A. Jellison; "Speeding," by Stark Weatherall; "Margaret," by Marl M. Moran; "Four-Mile Creek," by Carl Buckel; "The Spotless Kitchen," by S. E. Halla; "The Band Stand," by F. A. Dobberman; "Balanced Rock," by M. Brookhart; "In the Woods," by P. J. Smith; "A Portrait," by C. E. Hopsecker; "Blue Hills Observatory," by Ernest G. Cook; "At the Landing," by R. W. De La Mater; "Half Dome — Yosemite Valley," by C. F. Roberts; "Billie," by Gordon Kent; "Our Home," by T. J. Behr; "The Racer," by Peter Hine; "Road by the Lake," by H. D. Lafayette; "Van Cortlandt Mansion," by C. W. Becker; "The 2.30 Trot," by A. R. Brown; "Channel Light," by V. R. Thompson, "Outdoor Portrait," by H. C. Hurley; "My Pet Cat," by F. P. Linsley; "Discussing Photography on the Hill," by Leo Lee; "The Rocks," by A. J. Nesbit; "For Thanksgiving," by W. L. Newman; "When the Fodder is in the Shock," by W. W. Dennis; "Interested," by Wm. L. Bennett; "The River Road," by L. R. White; "Campus, Des Moines College," by D. R. Robinson; "Petrified Tree," by J. H. Cunningham; "Jack's Letter," by P. D. Booth; "Breaking Up," by Ernest G. Cook; "Portrait Study," by Alice Flory; "A Home Portrait," by D. K. Wilson; "The Cliffs," by Lawrence Mack; "The Brook in Winter," by Garnet E. Jacques; "Callas," by B. C. Eddy; "A Bad Disaster," by Ora M. Shigley; "Birch Woods," by Eugene Herman; "Portrait," by F. M. Marcille; "Brook Willows in November," by Margaret S. Hitchcock; "What Are the Wild Waves Saying?" by Wm. T. Morrison; "Young Coyotes," by Mrs. W. T. Ross; "Jenkins Lake," by G. H. Cantrell; "Innocence," by Annie W. Hickey; "Waterfall," by W. J. DeReamer; "Where the Minnows Play," by Marion P. Smith; "The Game Is On," by J. Robert Clair; "Home in Early Morning," by Reginald Falk; "Jennette Falls," by C. K. Baker; "Lace," by Stark Weatherall; "Vase," by C. H. Lee; and "The Grotto," by F. B. Hammond.

PRIZE ANNOUNCEMENT

The continued interest in our competitions and the standard of merit which has been so well maintained in the pictures sent in to these competitions, have convinced us that our readers are extremely interested in this phase of the magazine work, and that the value of the competition as a stimulus to good work is steadily increasing. We have therefore decided that we will increase the number of cash prizes to be awarded each month to three instead of one, and beginning with the competition which closes January 25th, we shall award a first prize of $5.00, a second prize of $3.00 and a third of $2.00. We shall thus be able to specially distinguish prints such as those in the past to which we have been able to give only an honorable mention, though they

approach in excellence the prize picture. We do not regard the money value of the prizes as of as much importance to our readers as the fact that they have been able to win an award against contributors from all over the United States, on the basis of an award made by absolutely impartial judges. The award of an honorable mention shows the successful competitor that his work is of at least more than average merit and will encourage him to do more work of the same class. We earnestly hope that every reader of the magazine during the next year will send in prints for one or more competitions, that he may assure himself just where his work stands in comparison with that of others.

READERS' FORUM

EDITOR POPULAR PHOTOGRAPHY:

Dear Sir: In your issue for November you give a method for figuring a focusing scale. However, as a small difference in the focal length of two lenses will cause a considerable difference in the movement of the front for focusing upon near objects, a scale so figured may be found to be valueless upon checking as recommended by you, because the focal length of the lens is not accurately known. As an example, my lens, an anastigmat made by a well-known firm, is marked 6.5 inches whereas it actually figures 6.61 inches by the method which I shall describe. Another lens is marked 12 inches, but, while I have not measured its exact focal length, I have found that this is not correct. Hence the first thing to do in order to figure a focusing scale is to figure the focal length of the lens. This requires the ground glass that your correspondent wished to avoid. In focusing for this purpose the full opening of the lens should be used in order to restrict the plane of definition within as narrow limits as possible, also a strong magnifying glass should be used to examine the image upon the ground glass, in order to detect the slightest blur.

Focus the camera carefully upon a distant object. For this purpose a light several blocks away is excellent. Now the lens is in the position of the infinity mark of the scale. Make a mark upon the fixed bed of the camera to correspond with a mark upon the movable front, corresponding with this position. Now focus upon a near object, say four or five feet from the camera. Estimate as near as you can where the optical center of the lens is, and measure the distance in inches from this assumed center to the object focused upon. Make a mark upon the fixed bed to correspond with that upon the movable front. Measure very accurately the distance between the two marks on the fixed bed expressing it in inches and hundredths of an inch.

Calling this distance C, and the distance in inches from the optical center to the near object D, the focal length is found by solving the following equation:

$$f=-\frac{C}{2}+\sqrt{CD+\left(\frac{C}{2}\right)^2}.$$

Now by setting the front in the infinity position and measuring from the ground glass our guess as to the position of the optical center may be checked, and if found to be badly off, a recalculation may be made, taking the center at the distance from the ground glass found by the first calculation.

Knowing accurately the focal length we are ready to figure a scale for all other distances. A method for doing this without reference to tables is as follows: Call any distance from the optical center for which it is desired to figure the position of the front D (measured in inches), the corresponding distance from the optical center to the ground glass d, and the focal length f, then

$$d=\frac{Df}{D-f}.$$

Then the movement of the front from the infinity mark corresponding to the distance D is d−f.

As an example let us suppose that having focused upon a distant object and upon an object four feet away from the optical center, it is found that the marks on the bed show that a movement of 1.05 inches was necessary. Then the focal length is

$$f=-\frac{1.05}{2}+\sqrt{1.05\times48+\left(\frac{1.05}{2}\right)^2}=6.6 \text{ inches.}$$

Now to find the position on the focusing scale for the 25-foot mark, we have, since 25 feet equals 300 inches,

$$d=\frac{300\times6.6}{300-6.6}=6.75 \text{ inches.}$$

The distance of the 25-foot mark on the scale from the infinity mark is 6.75−6.60=.15.— M. S. CRAYTON.

EDITOR POPULAR PHOTOGRAPHY:

The following are some hints which I found very satisfactory, so I hope they will help other amateur photographers.

A GOOD HYDROCHINON DEVELOPER.— When great contrast is desired, one which will work well with any brand of plates or films, is as follows:

A

Water	10 oz.
Hydrochinon	25 gr.
Sodium Sulphite	½ oz.

B

Water	10 oz.
Sodium carbonate	½ oz.

Use equal parts of *A* and *B*.

FOR COATING HOMEMADE TRAYS, SINKS, ETC.— Use common asphaltum, which can be obtained at any paint dealer's. Mix two parts asphaltum to one part of Japan dryer. Let dry thoroughly before using them. I have found this to be the best coating for trays, as they are acid- and alkali-proof.

FOR CLEANING ENAMELED TRAYS.— Use Sapolio, salt, and warm water. Scour well with a coarse cloth and note the result. This will remove anything that sodium carbonate will not remove.

A good way to use up old newspapers is to spread them over the work table. Then when you spill a little hypo or developer it soaks into the newspapers and does not run down on the floor to be walked through.

TO TITLE NEGATIVES.—Take some retouching varnish and rub over the light part of the negative wherever you want the title, then write *reversed* with a soft pencil. The title can be removed by rubbing more retouching varnish over the lettering. Remember to write *reversed* when titling negatives.— S. S. CHOJNACKI.

EDITOR POPULAR PHOTOGRAPHY:

Dear Sir: I would call your attention to a typographical error in my article, on page 122, December issue, first column, second line:

$$\text{exposure} = \text{constant} \frac{(\text{focal distance})^2}{(\text{dia. of hole})^2}$$

should read

$$\text{exposure} = \text{constant} \left(\frac{\text{focal distance}}{\text{dia. of hole}} \right)^2$$

WINFIELD H. STANNARD

NEWS AND NOTES

GUSTAV CRAMER MEMORIAL FUND

To honor and perpetuate the memory of a man who stood out before all others during his life as the friend of all men, whose charities were manifold and whose influence in our profession of photography was a big factor in its wonderful progress, it was suggested at the Ohio Michigan Convention of 1914 that a committee be appointed to establish a Memorial Fund to be used in some manner that would seem peculiarly appropriate to the character of this man, Gustav Cramer.

Mr. Pirie MacDonald, being interested in the matter, called a meeting of the gentlemen mentioned for the committee, for November 1, at the Phillips Studio in Philadelphia.

Present at the meeting were Messrs. MacDonald, Ryland Phillips, W. H. Towles, G. W. Harris, Dudley Hoyt, Frank Noble, Frank Scott Clark, L. B. Jones and J. C. Abel.

It was decided then to establish this Memorial and to proceed to collect funds, the purpose of the funds to be:

The establishment of an endowment of a room in a hospital, preferably in St. Louis, which would be called the Gustav Cramer Memorial.

Various plans for the collection of moneys were discussed and adopted by the committee which will be made very shortly through the medium of the photographic publications.

Mr. Ryland Phillips of Philadelphia was made the permanent chairman, with Mr. E. B. Core of New York permanent treasurer-secretary. Mr. MacDonald was appointed chairman of the Press or Publicity Committee.

The following gentlemen were appointed to the Executive Committee: Messrs. Phillips, Core, MacDonald, Harris, Noble, Clark, Strauss, Stein, Steckel, Walinger, Knaffl, Rinehart, Hammer and Topliff. The chairman will appoint a larger General Committee, whose members will cover the entire country. The affairs of the Memorial will be handled for the present by the Executive Committee. The full plans will be made public shortly. Meanwhile those desiring any information can address Mr. Ryland Phillips at 1507 Walnut Street, Philadelphia, Pa.

The prizes in the second Rochester Photo Works Enlarging Contest, the judges of which were Messrs. J. C. Abel, W. I. Lincoln Adams and F. R. Fraprie, were awarded as follows: 1st, "Cupid," Mrs. C. B. Fletcher; 2d, "Jolly Cobbler," Robert E. Stoll; 3d, "Old Lady Before Fire," Ethel Tomar; 4th, "Marine," Alexander Murray; 5th, "Lone Road," Lawrence Baker; 6th, G. M. Allen; 7th, Mrs. Alice Foster. Instead of the three prizes offered seven were awarded, the fourth and fifth being five dollars in cash, and the sixth and seventh three dollars' worth of paper. Six of the seven pictures were made on Velour or Brome Black Paper. The third contest will be conducted on similar lines and all pictures will receive careful consideration and will be criticized if desired. Full information regarding the entries can be had from the Rochester Photo Works, Inc., 65 Atlantic Avenue, Rochester, N. Y.

The Wellcome 1915 Diary. We have received a copy of the 1915 Photographic Exposure Record and Diary sold by Burroughs Wellcome & Company. It is, as in former years, an exceedingly handy and useful reference textbook of photography with Tabloid photographic chemicals. Two of the illustrations this year are by Dr. D. J. Ruzicka of New York. The section on developing gives fairly complete directions for Thermo development of plates and films with all the Tabloid developers. In the section on Exposure we note some extremely valuable new material on exposure by gaslight, electric light, and flashlight. There are many other valuable tables which are of interest even to photographers who use Tabloids only occasionally.

The Southern School of Photography, McMinnville, Tenn., has just issued a new catalog, describing the advantages of the school and giving some account of the natural scenic beauties by which the town is surrounded. It is perhaps the most attractive catalog in printing and binding which has come to our desk for some time and the landscape and portrait work which adorn it show every evidence of finished craftmanship and artistic training. The covers of the catalog are adorned with Artura prints, one showing the school building and the other a most attractive panorama of mountain, river and plain around McMinnville.

"Enlarging and Condensing" is the title of a new circular published for free distribution by the Bausch & Lomb Optical Company, 625 St. Paul Street, Rochester, N. Y. This shows the way enlarging apparatus should be set up and gives instructions as to the adjustment of light, the lens to use for enlarging, and information as to improved mountings for condensers.

The 14th Annual Exhibition of the Wilkes-Barre Camera Club will be held from February 22 to 25, 1915. Entries will close February 6. Full information may be obtained from Ben J. Boyd, Chairman of the Executive Committee, 141 South Main Street, Wilkes-Barre, Pa.

Exposure-Tables for November, December and January

DIRECTIONS: Find in the tables printed below the NUMBERS for SUBJECT, STOP, LIGHT, HOUR, and PLATE. Add them, find the sum in the last table, and give the exposure indicated. When the exposure fails to correspond with the speed-marking on shutter, use the nearest shutter-speed, preferably the lower. If sunlight falls over one shoulder, add **0**; if straight across subject, add **1**; if sun is ahead, add **2**. When using back combination only of lens, add **2**.

EXAMPLE

Average landscape	3	July, 11 A. M.	0
Stop U. S. No. 8	6	N-C film	1½
Intense light	0		

Adding these numbers, we get **10½**, and on referring to the last table, under **10½**, we find **1-40** second, which is the exposure to give. In this case you would use the speed marked **1-50** and open the lens a little, if possible; say, half-way to U. S. No. 4.

SUBJECT

Sea (only) and clouds	½	Street scenes, buildings, groups	5
Sea-views, snow-scenes, distant landscape	1	Portraits in shade	7
Open landscape, without foreground	2	Indoor portraits	8 to 10
Average landscape, with foreground	3	Interiors	13

STOP:—

f:2	*f*:2.3	*f*:2.8	*f*:3.3	*f*:4	*f*:4.7	*f*:5.6	*f*:6.7	*f*:8	*f*:11.3	*f*:16	*f*:22	*f*:32	*f*:45	*f*:64
				U.S. 1	U.S. 1.4	U.S. 2	U.S. 2.8	U.S. 4	U.S. 8	U.S. 16	U.S. 32	U.S. 64	U.S.128	U.S.256
1	1½	2	2½	3	3½	4	4½	5	6	7	8	9	10	11

LIGHT: Intense sunlight (inky-black shadows), **0**; Bright sunlight (strong shadows), ½; Faint shadow cast by sun, **1**; Dull (no shadows), 1½; Very Dull (whole sky very dark), **2**.

HOUR: 11 a.m. to 1 p.m., **1**; 10 a.m. and 2 p.m., 1½; 9 a.m. and 3 p.m., **2**; 8 a.m. and 4 p.m., **3**; 7 a.m. and 7 p.m., **5**.

PLATE: AMERICAN, 1½. ANSCO FILM, 1½. BARNET — Film, 1½; Superspeed Ortho., **1**; Ortho. Ex. Rap., **2**; Red Seal, **1**; Red Diamond, 1½; Self-screen Ortho., **2**. CENTRAL — Special XX and Sp. Home Portrait, ½; Special, **1**; Comet, Colornon, and Pan-Ortho., 1½. CRAMER — Crown, **1**; Anchor, **2**; Banner, 1½; Inst. Iso., 1½; Med. Iso., **2**; Commercial Isonon, 2½; Portrait Isonon, 1½; Trichromatic, **3**; Slow Iso., **5**; Contrast, **9**. DEFENDER — Vulcan, **1**; Vulcan film, 1½; Ortho., **2**; Non-hal. Ortho., **2**; Slow, **9**; Process, **9**. DUFAY DIOPTICHROME, **7**. EASTMAN — Motion Picture Film, **1**; Portrait Film, **1**. ENSIGN FILM, 1½. FORBES—Challenge, 1½. HAMMER—Sp. Ex. Fast, **1**; Ex. Fast, 1½; Ortho. Ex. Fast, 1½; Ortho. Non-hal. **2**; Fast, **2**; Ortho. Slow, 2½; Slow, 2½. ILFORD—Monarch, **1**; Zenith, 1½; Sp. Rap,. **2**; Chromatic, 2½; Ord., **3**; Process, **9**. IMPERIAL—Flash-light, **1**; Spec. Sensitive, **1**; Orthochrome S. S., **1**; Spec. Rap. 225, 1½; Spec. Rapid 200, **2**; Non-filter, **2**; Process, **9**. JOUGLA — Violet Label, 1½; Green Label, **2**; Omnicolore, **7**. KODAK—Speed Film, **1**; N. C. Film, 1½. KODOID PLATES, 1½. LUMIERE—Sigma, ½; Blue Label, 1½; Film, 1½; Ortho. A, **2**; Ortho. B, **2**; Panchro. C, **2**; Autochrome (outdoors), **8**, (indoors) **9**; Process **9**. MARION — Record, ½; P.S., **1**. PAGET—XXX, 2½; XXXXX, **2**; Swift, **1**; Ex. Spec. Rapid, **1**; Ortho. Ex. Spec. Rapid, 1½; Panchro. Ord., **2**; Panchro. Colour (no screen), 2½; Spec. Rapid, 1½; Hydra Panchro., 3½; Hydra Rapid, 3½. PREMO FILM PACK, 1½. ROEBUCK—Blue Label, **1**; D. C. Ortho., **2**; Ortho., **2**. SEED — Gilt-edge 30, ½; Color Value, **1**; Gilt-edge 27, 1½; L. Ortho., 1½; 26X, **2**; Non-hal., **2**; Non-hal. L. Ortho., **2**; Tropical, **2**; C. Ortho., 2½; Panchromatic, 2½; 23, **3**; Process, **9**. STANDARD — Extra, 1½; Imperial Portrait, 1½; Orthonon, 1½; Polychrome, 1½; Thermic, 1½. STANLEY — 50, 1½; Commercial, **4**. THORNWARD — Regular, **1**; Orthochromatic, **2**; Orthochromatic N. H., **2**. WELLINGTON — Extreme, ½; 'Xtra Speedy, **1**; Film, 1½; Iso. Speedy, 1½; Portrait Speedy, 1½; Anti-screen, 1½; Speedy Spec. Rap., **2**; Ortho. Process, **9**. WRATTEN & WAINWRIGHT — Panchromatic, 1½; Process Panchromatic, **3**.

3½ S 1/500	4 S 1/1000	4½ S 1/2000	5 S 1/2000	5½ S 1/1250	6 S 1/1000	6½ S 1/700	7 S 1/500
7½ S 1/350	8 S 1/250	8½ S 1/150	9 S 1/100	9½ S 1/75	10 S 1/50	10½ S 1/40	11 S 1/25
11½ S 1/20	12 S 1/12	12½ S 1/10	13 S 1/6	13½ S 1/5	14 S 1/4	14½ S 2/5	15 S 1/2
15½ S 2/3	16 S 1	16½ S 1½	17 S 2	17½ S 3	18 S 4	18½ S 5½	19 S 7½
19½ S 11	20 S 15	20½ S 23	21 S 30	21½ S 45	22 M 1	22½ M 1½	23 M 2
23½ M 3	24 M 4	24½ M 6	25 M 8	25½ M 12	26 M 15	26½ M 24	27 M 30
27½ M 45	28 H 1	28½ H 1½	29 H 2	29½ H 3	30 H 4	30½ H 6	31 H 8

These tables are based on the 1914 edition of the "American Photography Exposure-Tables," a new and revised form of the "Photo Beacon Exposure Card." Owing to the great increase in the speed of lenses and plates since the original compilation of these tables, it has been necessary to completely change the system of numbers corresponding to stops, plates and exposures, so that exposure numbers from this table are 5 units higher than in the old tables. The complete tables, in pocket form, 3 x 5 inches, containing full directions for obtaining correct exposure under all conditions, may be obtained from our publishers at the price of 25 cents postpaid.

POPULAR PHOTOGRAPHY

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POPULAR PHOTOGRAPHY

Volume III BOSTON, MASS., FEBRUARY, 1915 Number 5

AN OCTOBER SKY O. FORTENBACH

(See Page 195)

OCTOBER W. GILBERT

OCTOBER

Mr. Gilbert has succeeded admirably in turning out a picture which is not only technically perfect, but which has also an extremely well-balanced composition. The sky has, of course, a great deal to do with the success of such a view, for a blank sky would attract too much attention, and inappropriate clouds would be equally distracting. Here everything is in harmony, showing the skill of the photographer in selecting just the right conditions for the exposure. The placing of the figure is managed well, so that it comes just right to balance the mass of the tree. Data: 3A Ansco Speedex camera with Goerz Dagor lens of 6½ inches' focus; 1-5 second at 11 a. m. in October in cloudy bright light; *f*: 16; Eastman Speed film; development with Modified Thermo Duratol; print on Medium Soft Platora Grade F.

THE FOG QUESTION AGAIN

A reader says that he has had considerable trouble during the past fall with fog in pyro development, and as he saw in our columns that "pyro makes fog," he would like a remedy. He uses a 20-minute tank formula.

There seems to be some misconception here. We cannot find any reference to the fogging power of pyro, except a statement that at temperatures over 70 it causes a yellow veiling which can be prevented by the addition of a weak solution of potassium iodide to the developer. This is the plan advocated by the G. Cramer Dry Plate Company in the case of their pyro-acetone tank formula, for summer work.

When fog is not due to the presence of hypo or other chemical which should not be in the developer, it can sometimes be traced to insufficient sulphite, particularly if a pyro stock weak in sulphite is greatly diluted for tank use. The sulphite should always be in proportion to the total number of ounces of water, regardless of the strength of the other ingredients of the solution, and the proper amount to prevent fog and pyro stain is 10 grains of anhydrous sulphite to the fluid ounce.

If fog occurs at any time, add to the developer this amount of sulphite and you can be sure that no chemical fog can take place. A convenient method is to make up a 25 per cent solution, of which 1 dram should be added to every 1½ ounces of diluted developer. A 25 per cent solution contains 120 grains in each fluid ounce.

RUBY VARNISH

A suitable ruby varnish for manufacturing ruby glass for darkroom illumination, coating electric bulbs (only the tipless variety are safe, unless inclosed), and other photographic purposes, may be made as follows: Mix equal parts of white hard varnish and wood alcohol,

DOROTHY
WM. C. HERCHENHAHN
Prize Picture, December Competition *(See page 187)*

LITTLE TOTS GRACE CARLSON

and to each pint add ½ ounce each of chrysoidine and coralline rouge. Shake, let stand two days, and add more dye if all has dissolved, that is, make a saturated solution. Another formula is plain gelatine solution dyed with red stains to produce a safe light for color-sensitive plates. In 10 ounces of gelatine solution dissolve 75 grains of tartrazine, 75 grains of patent blue A, and 75 grains of naphthol green, with 30 minims of sulphuric acid. Flow the colored gelatine over glass rendered adhesive by a solution of bichromated albumen, dried in the light. Or use plain collodion with the same dyes.

LITTLE TOTS

If the squinting produced in one's subject when posed in full sunshine is objectionable, as the author of this picture admits it is, there is an easy way out. The solid shade cast by a tree, for example, if quite open to sky all around except on the side of the tree, will be found brilliant enough in illumination to allow a slow snapshot with the largest stop. At the same time, this bright diffused light will seldom cause squinting. The use of a large chair in an outdoor picture seems incongruous. Data: No. 3 Brownie camera with 5-inch meniscus lens; 1-50 second at *f*: 11 in June at 3 p. m.; bright sunlight; Eastman film; M.-Q.; print on Azo C Hard.

SILVERING MIRRORS

Take a piece of glass and clean it by treating it with soap and water, with repeated rinsings, until it is chemically clean. If the plate is not absolutely clean, failure will invariably occur. The solutions needed are:

A

Silver nitrate.....175 gr.
Distilled water..... 10 oz.

B

Ammonium nitrate.....262 gr.
Distilled water..... 10 oz.

C

Caustic potash, C. P. stick..... 1 oz.
Distilled water..... 10 oz.

D

Pure rock sugar candy.....219 gr.
Distilled water..... 5 oz.

Dissolve and add

Tartaric acid..... 50 gr.

Boil during 10 minutes in a flask, cool, and add

Alcohol..... 1 oz.
Distilled water to make..... 10 oz.

The silvering solution is made by mixing equal parts of *A* and *B*, then in another vessel mixing equal parts of *C* and *D*, and finally mixing together these two mixtures in the vessel in which the silvering is to be done. The glass to be silvered is then suspended face downward in the solution.

RELATIVE SPEEDS

How much faster is *f*: 6.8 than *f*: 8?

The rule is to compare the squares of the *f* numbers. The easy way to get the result is to look at the exposure tables in the magazine. There we see that *f*: 8 has a factor of 5 and *f*: 6.7 one of 4½. Each variation of ½ in the tables represents a 50 per cent variation in exposure, hence *f*: 6.7 is 50 per cent faster than *f*: 8, and *f*: 6.8 is so close to 6.7 that the difference may be disregarded. It is a foolish and useless refinement to attempt to calculate exposures closer than 50 per cent when plates from the same box sometimes vary as much as 200 per cent.

The stops from *f*: 8 and smaller are marked so that each size smaller requires double the exposure of that next larger.

FAKE MOONLIGHT PICTURES

We do not encourage the production of "fake moonlight" pictures, for the results are seldom deceptive. If photographers would entitle them "Late Afternoon" or something

RECREATION C. D. MESERVEY

similar, though, there would be no objection to them. A reader asks for directions for making them, so we give the following hints.

The effect is generally best seen over water, though it is possible to make it over land. The principle is to expose for the sky, so exposure can be calculated by the monthly exposure tables for a subject factor of either ½ or 1. Thus, if an ordinary snapshot at the same hour took 1-25 second at *f*: 8, the sky would require the same snap with *f*: 22 or 1-100 second on *f*: 16.

RECREATION

It is always a pleasure to reproduce Mr. Meservey's work, for he seldom fails to send in pictures which are not only technically good but also well thought out. In this instance, the theme, "Recreation," was selected and the figures were posed to carry out the idea. The use of a color-sensitive plate with full exposure has given a charming quality in all the colors. The print is soft, yet brilliant, as a scene in bright diffused outdoor light should be. The figures are very well handled. Perhaps the only fault in the picture is that pointed out by the maker, namely, the white sky corner; but this could easily be corrected by local reduction. Data: 4 x 5 Cycle Poco with 6½-inch R. R. lens; 1-5 second at *f*: 16 in August at 3 p. m.: bright light; Standard Polychrome plate; duratol; print on Azo C Hard postcard.

THE CAMERA AS A DETECTIVE

The camera has been frequently instrumental in the detection of criminals. In case of forgery photography is invaluable, for there is no forger in the world clever enough to baffle its detective skill. An interesting proof of this was provided a few years ago in the case of a forged will. An enlarged photograph revealed the penciled lines over which the signatures of the testator and witnesses had been written, although no trace of them was visible through the microscope.

This is one of the peculiarities of the camera, that it brings to light marks which are invisible through a microscope, just as it has been known to reveal the signs of measles and smallpox several days before they became visible to the naked eye.

Where a forged signature is suspected the method adopted is to take photographs of the genuine and supposed false signatures, magnify each a hundredfold or more, and compare the results. Under this careful test the slightest discrepancy becomes exaggerated out of close resemblance to the signature, and every sign of hesitancy — for few forgers can write a counterfeit signature with perfect ease and fluency — stands revealed.

A forged banknote, however minutely and faithfully the original may have been copied, cannot deceive the eye of the camera, which will show not only the slightest deviation from the genuine note, but also any difference in the

ON THE JOB S. S. CHOJNACKI

texture of the paper used. In a recent case, where a section of a check had been removed and another piece in the form of pulp substituted with infinite skill, the camera revealed the fraud at once, showing exactly where the new and old paper were joined.—*London Standard.*

ON THE JOB

The maker of this picture writes that only two months before he took it he was snapping with a cheap film camera, giving out his finishing, and getting only poor results, in spite of the fact that he was reading another photographic magazine. He then saw a copy of POPULAR PHOTOGRAPHY and was encouraged to invest in a plate camera. He now compounds his own solutions and does his own finishing, with results much more to his liking, and certainly of a high order of merit, as the reproduction shows. Not only is the technical work satisfactory, with very good values; but the arrangement is well managed, showing that our idea of hammering away in our criticisms on the decentering of the picture is beginning to impress even new readers. The figure of the man is well placed. We doubt whether it would be an improvement to include all of his figure, for in that case there would be a strip of light tone along the margin which would draw the eye to that side. For a similar reason, we should try the effect of trimming into the chimney. Data: 4 x 5 Conley camera with R. R. lens; 1-50 second at *f*: 11 in September at 3 p. m.; bright sunlight; Hammer plate; hydrochinon; print on Azo E Normal.

AN EARLY MORNING BATH

The reproduction fails to give the sense of warmth and sunshine which Mr. Merriman has suggested here in his warm sepia print. The delicacy of tone and the subtle gradations are lost in halftone reproduction, but the spacing, or perhaps we had better say, the arrangement of spots of dark on a light field, is very good. The idea might be considered more unified if the dog on the left, like his fellow on the right, were looking at the girl. Data: 3¼ x 4¼ Butcher's Popular Pressman Reflex camera with Aldis-Butcher Anastigmat lens *f*: 4.5 of 5¾ inches' focus; 1-150 second at *f*: 4.5 in August at 8 a. m.; bright sunlight; Lumière Sigma plate; 2-grain pyro-soda, used with a factor of 10 instead of 12, in order to get soft contrast; print on Seltona Linique.

USING THE REAR COMBINATION

Some time ago we published several notes on the use of the rear combination. Some subscribers, however, still seem to be puzzled about the change of *f* value of the same absolute opening.

Let us suppose we are using an R. R. lens of 8 inches' focus, the actual effective aperture of the stop being 1 inch. This is, of course, *f*: 8 for the doublet. We now unscrew the front lens and use the rear combination, which has a focus of 16 inches. The one-inch stop is now *f*: 16 and requires exactly the same exposure as *f*: 16 for the doublet. Now let us suppose that *f*: 16 does not give enough definition and we wish to stop down. We find, say, that

AN EARLY MORNING BATH WM. B. MERRIMAN

A PICNIC PARTY WM. H. SOPER

when the pointer comes to the mark *f*: 16 (for the doublet) the definition is satisfactory. This opening is not, however, *f*: 16 for the single combination, but *f*: 32. It requires four times the exposure needed for *f*: 16. Similar reasoning holds good for all the other markings. Simply double the *f* number and quadruple the exposure.

The same reader has somehow picked up the idea that the rear element can be used only for objects at least 100 feet away. A single trial with the camera will demonstrate that near objects can be focused if the bellows are long enough, which is the case with all double-extension cameras. The definition with the single combination is not quite so good as is yielded by the doublet, and *f*: 22 may have to be used if extreme sharpness is desired. For landscapes and portraits, though, too fine definition is often a mistake. The rear combination should be used about as much as the whole lens, instead of only once in a while, for even near subjects are generally better for being taken with a long-focus, narrow angle lens.

A CORRECTION

Owing to a printers' error, a portion of the article on "Modified Thermo Duratol in Three Solutions" on p. 163 of our January issue got astray and was inserted on p. 135 by mistake. The material on the latter page under the heading, "Table of Dilutions," should follow the formulas.

A PICNIC PARTY

Unconsciousness of the camera is perhaps the greatest merit of this group. The massing is also particularly good, the tent in the background completing a pyramid which without being too formal yet gives great solidity to the composition. The observation is circular, one's eye enters the light foreground and goes round and round the group without finding much else to attract it. The quality of definition in the print is peculiar, no detail anywhere being quite sharp. This would seem to be due to using a meniscus lens in enlarging the original anastigmatic image. Data: Premoette Junior Special with anastigmat lens; 1-50 second at *f*: 9 in August at 2 p. m.; hazy sunlight; filmpack; pyro; print made with Brownie enlarger on Blue Label Darko paper.

REMOVING HYPO

If a plate is supported a short distance under a faucet and washed for ten minutes with a gentle stream, all of the hypo will be eliminated. If it is put into a washing tank which does not drain from the bottom, at least half an hour is needed, with a good head of water. By punching holes along the bottom of such a tank, allowing the hypo-and-water from the plates to drain away as rapidly as possible, and running the stream with enough head to keep the plates covered, we found that we could reduce the washing time to 15 minutes and be sure that no trace of hypo remained in the plates.

FAST ON THE SANDBAR BURDETTE HARRISON

The test employed was a weak solution of potassium permanganate containing a little carbonate. If hypo was present in the drippings from a plate, the pink color was discharged.

When running water is not available, hypo can be completely removed by giving the plate a dozen five-minute changes; but the plate must be lifted out and drained and the tray rinsed at the expiration of each five-minute period.

Films can readily be freed of hypo by pinning them loosely to a board and floating them, face down, on a considerable body of water in the bathtub. After half an hour, remove, drain the tub, and give another half-hour soak in fresh water.

Prints cannot be freed of hypo unless at frequent intervals they are thoroughly separated from one another so that fresh water gets at all parts of them. Few mechanical washers can be trusted to do the work unless one stands over them and keeps the prints separated. A more reliable method is washing in two trays in 12 five-minute changes, each time draining and rinsing the tray and letting the prints drain while stacked on a sheet of glass. Too much pains cannot be taken in washing prints, as on the complete elimination of hypo depends their permanence.

FAST ON THE SANDBAR

As a record picture, this photograph shows good technique; but the strip of light water and foam in the foreground is too nearly parallel to the base of the print to impress the beholder favorably, from a pictorial point of view. If the camera had been taken to a part of the beach whence the stranded steamer was visible and the line of the shore could have been made to point toward it, the effect would have been far superior. Even a record photograph should always be made from the best available point of view and some effort to secure good composition should invariably be made. Data: 3A Hawk-Eye camera fitted with Zeiss Tessar IIb lens; 1-75 second at *f*: 16 in September in bright sunlight at 2.15 p. m.; Eastman film; pyro tank development; print on Instanto Soft Semi-Matte.

INTERESTED

Mr. Neuer is an enthusiastic advocate of the miniature camera and carries with him at all times a Watch-pocket Carbine, with which he secured the small negative from which this genre was enlarged. The story-telling quality is marked. Not only that, but the composition is excellent, "balance" being perfectly illustrated by the manner in which the large dark mass formed by the two interested lads is countered by the smaller mass of boy and boat *placed at a greater distance from the fulcrum of the steelyard.* We have often referred to this principle, which is fully explained in Poore's "Pictorial Composition"— a book every photographer should own. In this particular case, the balance is not directly across but into the depth of the picture. Mr. Neuer's camera has a Cooke anastigmat of 3 inches' focus and *f*: 5.6 aperture. He made the exposure of 1-25 with stop *f*: 8 at 5.30 p. m. in May in dull light on Eastman film. Development was with pyro. The 4¾ x 6⅝ enlargement from a portion of the negative is on Soft Studio Cyko.

INTERESTED JOHN J. NEUER

TRAY DEVELOPMENT OF FILMS

Several readers have asked whether the Thermo tables published in the June, 1914, issue apply to films when the tray strength of developer is used and the strip is developed by the seesaw method. They argue that if plates are not supposed to be rocked during the entire course of development, the constant motion of the film would make a difference in results.

Careful tests have shown that the tables apply accurately to film development as described. The movement of the film seems to be counterbalanced by the fact that the developer is not covering it all the time. We had occasion recently to demonstrate it to a friend from Buenos Aires, and proved to his satisfaction that the Thermo tables were more accurate at a temperature of 48 degrees than his judgment of when to stop. He wished to

AN OLD SWIMMING-HOLE M. E. HUFFORD

terminate development after 5 minutes, but we insisted that he had better follow the system and continue until 9½ minutes were up, and the results justified our confidence. The next day was still colder — in fact, a record low reading for that date — and the darkroom had fallen to 42 degrees; but the development time of 12¾ minutes proved accurate. The two rolls, developed on the two different days at temperatures 6 degrees apart, had exactly the same contrast.

Given a well-equipped darkroom and a really safe ruby light located some feet from the tray, and the strip method of development, from some points of view, is better than tank development. The Thermo system makes it possible to get just as good gradation as in the weaker tank solution by providing an automatic check on the time of development and thus preventing overdevelopment.

AN OLD SWIMMING-HOLE

This print is not a satisfactory record, for it does not show enough of the topography of the spot to be convincing. The leaning tree seems to be the principal object, yet the light tone of the foreground is so spread out that it does not form a leading line; furthermore, the entrance is blocked by the out-of-focus weeds. The radiating lines of the branches, backed by a pure-white-paper sky, scatter the attention. The worst of these lines is that formed by the dead branch nearest the roots, on account of its high tone. In every respect, this is one of those ordinary snapshots which are made by the million every year and which soon cease to be interesting even to their makers on account of their lack of composition. Data: 2A Kodak with 5-inch R. R. lens; 3 seconds at 10 a. m. in September with stop *f*: 32; Eastman Speed film; Cramer's lanternslide formula developer; print on Azo D.

THE REPUBLIC STEEL WORKS

Taken purely as a record, to preserve the smoky cloud which hangs over the plant and the city of Youngstown, Ohio, in the background, this print is very successful. The maker asks whether we consider it objectionable in a picture of this kind to have no place where the eye rests. We most assuredly do think it bad. Even a record picture, in many instances, can be taken from more than one station-point, and by moving the camera around from place to place it will often be found possible to secure a point of view which will give, if not good composition, at least unobjectionable arrangements. It would seem to us that a more unified result could have been secured from a position several feet to either right or left. Data: Postcard Ensign camera with Rectimat lens; 1-25 second at *f*: 11 in August at 2 p. m.; bright light; Eastman film; tank development; print on Special Velvet Velox.

TIME OF FIXING IN WINTER

In summer a fresh hypo will fix a plate in a few minutes, say 10 minutes at 65 degrees. In winter the same bath, when cooled down to about 50 degrees, may take half an hour or more. The only safe rule is to note how long it takes to remove the last trace of creamy-yellow silver bromide and let the plate remain in the tank as long again.

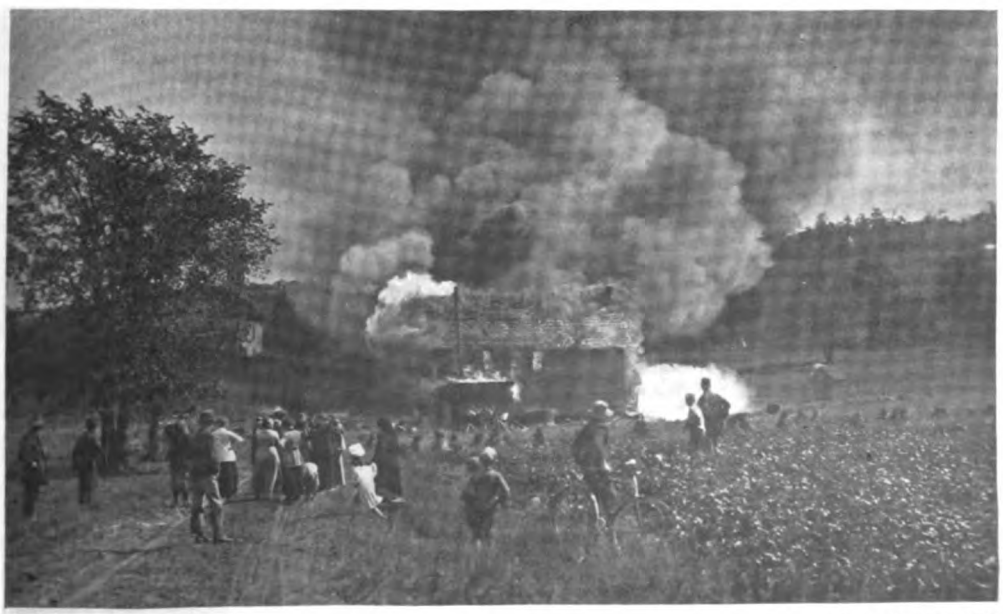
MOTTLING ON NEGATIVES

Pyro has a peculiarity which bothers those who do not take the precaution to rock the tray during development. It is that of causing a marbled or mottled appearance of the plate. The marking can be *prevented* by giving the tray an occasional tilt, but it cannot be remedied once it has occurred.

THE REPUBLIC STEEL WORKS E. L. DICKINSON

THE OLD CREAMERY FIRE

With one slight exception, this picture could hardly be improved as a record of an interesting though unfortunate event. The precise centering of the principal object in the picture space is something which few film-camera users seem to be able to get away from. In this case, by stepping to the left side of the road, the user could have secured a better view of the burning building, with the line of the road leading up to it, and at the same time he could have swung the camera enough to bring the old structure nearer the right margin. Apparently the maker set his focus at 100 feet, as he has entered that value in his data under "focal length." The 50-foot setting would have made the building practically as sharp and would have improved the definition of foreground objects. Data: 3A Kodak; snapshot (1-25 second) at *f*: 8, September, 10.30 a. m.; good light; M.-Q.; print on Azo A paper.



THE OLD CREAMERY FIRE W. H. PENNOYER

FEEDING HER PET MATTE ANTILA

FEEDING HER PET

Selection of a portion of the negative for enlarging is certainly one of the easiest as well as one of the most effective ways to secure a good composition. The maker of this 4 x 5 enlargement realized this fact and took good advantage of it to place the figures away from the middle of the picture space. The arrangement is satisfactory and the technical work is above the average. Data: 3A Kodak with R. R. lens; 1-50 second at *f*: 16 in bright sunlight in July at 2 p. m.; Eastman film; tank M.-Q.; bromide enlargement.

THAT CHRISTMAS CAMERA

Few more appropriate Christmas presents than a camera can be given, for nothing is capable of giving more enjoyment throughout the year. More cameras are sold at Christmas time than at any other season, and a great proportion of them go as presents to people who have never owned a camera and know nothing about picture taking. We wish that every one of them could read the advice we are about to give, for then they would be sure of reasonably good results from the first and their success would enlist them permanently in the army of enthusiastic amateurs. Otherwise, many of them are sure to experience failures and ultimately to give up picture-making in disgust, blaming the camera or the films, but never themselves.

It was only a few days after Christmas that we saw an instance of carelessness which suggested a word of warning to others. A lady had received a dainty little folding pocket film camera fitted with meniscus lens and shutter marked for time, bulb, and two speeds of snapshots. The subject of presents being the all-absorbing one at the time, the little camera was duly brought out and shown, when suddenly it occurred to the owner that it would be a good opportunity to secure a portrait of a lady who was calling. She opened her camera, advanced to within about four feet of the willing sitter, and was about to give a snapshot of 1-25 when we interposed. We pointed out to her that there was an instruction book in the box and that book said very clearly and emphatically that nothing nearer than 8 feet could be focused. We then took a tape measure and showed her exactly how far 8 feet from lens to sitter was. This point cleared up, she was about to snap, when we showed her another passage in the book. This one said that a snapshot could not be made except outdoors in sunlight between 9 a. m. and 3 p. m. She then set the shutter to T and would have attempted a time exposure of no one knows what length had we not read from the book, "When making time exposures it is absolutely necessary that the camera be placed upon a tripod, table, or firm support where there will be no danger of its being moved during the exposure."

This little scene took place with great rapidity and was over in short order, the lady closing the incident by saying that she thought herself too impetuous ever to learn to take pictures. She did not make an exposure of her friend, by the way.

It may seem trivial to dwell on such an incident, but it is really important. Time after time we have been asked questions which are fully and clearly explained in the book, and yet people will simply glance at the title of the instruction book, and either throw it away or lose it. Later, some difficulty arises and they say, "This camera is no good," or, "I don't think my lens is as good as so and so's," or, "The dealer spoiled my film," or some other unjust remark; but they seldom think themselves at fault for not reading the instructions. The lady in our story promised to read her instruction book thoroughly and to learn to work the empty camera before taking any pictures, so we have hopes that in time she will succeed in getting the really good pictures which her little camera is capable of making when given half a chance. The moral of all of which is, read the instruction book and you will be more likely to succeed.

WHAT IS HOME WITHOUT A DOG?

Although there are several faults in the print, the execution is in the main unusually satisfactory, chiefly because the exposure was ample and the print carries all the tones

WHAT IS HOME WITHOUT A DOG? P. C. GROSE

without excessive contrast. The thought underlying the picture, technically called its theme, is a good one, though perhaps a more appropriate title might have been found. The arrangement is good, the camera having been well placed, and the exposure was made at a moment when the expressions of both sitters were highly interesting. The story-telling quality is therefore far above that of many genre pictures. Data are lacking.

DOROTHY

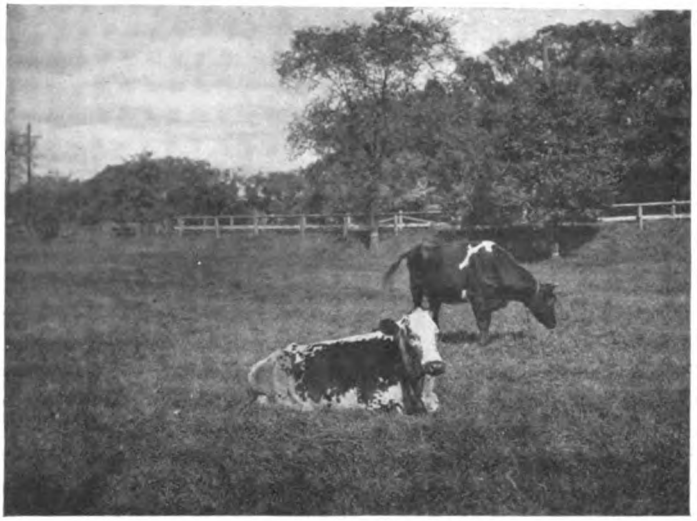
(*See page 177*)

This picture was awarded first prize in our monthly competition because it is a thoroughly satisfactory example of technical work and at the same time shows good composition, excellent perspective and a knowledge of how to make an outdoor portrait which will be pleasing not only to the sitter but to the casual onlooker. The principal fault that we have to find with the picture artistically is that the lower right-hand corner is somewhat too light, and if this were somewhat darker the general effect would be better. As it is now there are too many light spots below the face, carrying the attention into this corner instead of the lower left-hand corner where it should naturally go. If the lady's coat had been placed out of sight on the seat it would have materially improved the print. Mr. Herchenhahn writes that he used our exposure tables in taking the picture, the factors being as follows: Portraits in shade 7; *f*: 16.3; intense sunlight, O; Oct. 11 a. m., ½, Imperial Special Sensitive, O; total 10½, which equals 1 second exposure. He adds, "The negative is a dandy one, as is nearly every one which I get when I use your exposure tables." The picture was taken with a 4 x 5 Korona camera, series 5, fitted with a rapid rectilinear lens of 6 inches' focal length. The exposure was 1 second at 11 a. m. in October in intense sunlight at stop 16. The Imperial Special Sensitive plate was developed with M.-Q. and the print is on Montauk enlarging paper.

A DEVELOPING AND PRINTING OUTFIT

A lady reader who has been finding it inconvenient to send her films away for development and who is also tiring of the brown tones of self-toning paper, asks for a list of articles necessary for doing her own work.

In making out the following list, preference has been given to articles which would not be expensive and yet would not require weighing (which most ladies dislike). The quantities given are calculated for a year's supply. Film tank, 4 cartons Ingento M.-Q. tablets, thermometer and tablet crusher combined, 10 pounds pea crystal hypo, 2 pounds liquid bisulphite, ½ gross contrast semi-matte or studio D.O.P., 1 gross normal semi-matte



IN PEACEDALE VALLEY E. G. COOK

or studio D.O.P., ½ gross soft semi-matte or studio D.O.P., 1 insulate tray, 4 x 5, for paper development, 1 insulate tray, 4 x 5, for rinsing, 1 insulate tray, 8 x 10, for fixing films and prints.

The Ingento M.-Q. tablets are recommended because they are accompanied by a card giving the exact times of development at all temperatures for tank development and are also well adapted to the development of D.O.P. The thermometer is essential for accurate timing of development by means of the tables just mentioned. Ten pounds of hypo in one package can be bought for about 2-3 the cost of 10 one-pound cartons. The acid fixer for both films and paper is:

Hypo..... 1 lb.
Water.....4 pts.
Dissove and add, while stirring
Liquid bisulphite.....2 to 3 oz.
Water to make.....1 pt.

Should frilling occur, half an ounce of alum may be dissolved in the bisulphite solution before pouring it into the hypo. This fixer can be made up and stored in bottles or jugs, as it keeps well. It is much cheaper than the prepared packages of acid hypo.

There are many little conveniences, such as film clips, hypo dissolvers, graduates, etc., which might be added to this list, but films can be developed and prints made without any other bought materials, as the necessary weighing and measuring can readily be done with household utensils. The manufacturers' manuals on the film tank and on the handling of the paper will furnish all the necessary instructions for getting good results. The monthly exposure-tables printed in the magazine should of course be followed to insure the greatest percentage of good films.

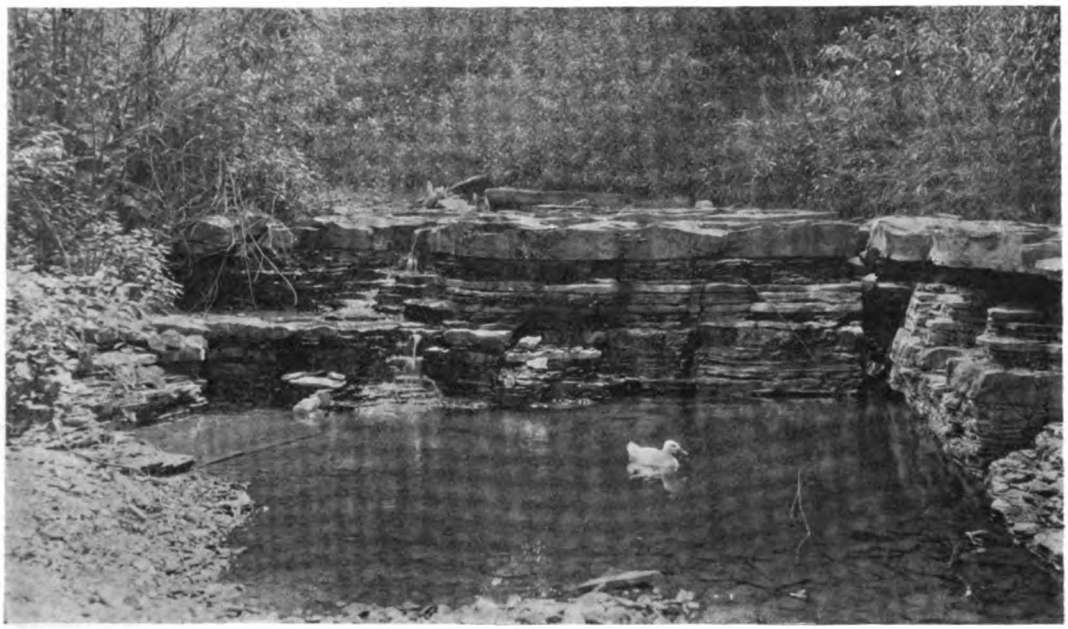
IN PEACEDALE VALLEY

Our first thought on looking at this print is that it is lopsided, for all the dark masses come near the right margin. The two cows themselves are well placed, but the background was not carefully considered with relation to them. There ought to be some decided block of foliage extending up along the left margin and tending to throw the eye back into the picture. As it is, the eye first rests on the white patches in the cows and then follows the line of the white fence toward the large light area of cloudy sky. The technical work is excellent. Data: 5 x 7 Century Grand Senior camera, fitted with a German-made Goerz lens of 8½ inches' focus; 1-25 second at *f*: 16 in September at 10 a. m.; good light; Lumière Sigma plate; ferrous oxalate developer; print on Normal Studio Cyko, developed with edinol-quinol.

WHITE BACKGROUNDS

A reader asks how to get enough density in a white background to make it print quite white.

The method generally recommended is to put the plate, after development is finished for the sitter, into a very strong developer to force the development of the ground. It must be remembered, however, that the whitest effect can only be obtained when the ground is placed so that it receives the full light from skylight or window.



A WOODLAND POOL GARNET E. JACQUES

A WOODLAND POOL

Here is a fine bit of technical work which lacks interest because the composition was not thought out with the same attention which was devoted to the problem of exposure. It is not at all improbable that the viewpoint seemed to the maker the only one available, yet it was not well adapted to bringing out the subject to the greatest advantage, for the main mass forms a strip parallel to the base. The bit of white shore along the very bottom of the card is also objectionable. In the same manner, the two edges of the print are occupied by light masses and the eye is drawn to them instead of to the darker value of the water. The exposure, development, and printing, however, seem to have been perfectly carried out, and the print is quite free from the harsh contrasts characteristic of most amateur work. Data: 3A Special Kodak with 6¾-inch Zeiss-Kodak anastigmat lens; 1-10 second at *f*: 11 in August in intense Sunlight at 2.45 p. m.; Eastman Speed film; pyro; print on Normal Glossy Cyko, developed with amidol.

FAST SHUTTER SPEEDS

A reader asks whether 1-250 second, as given by a Compound shutter fitted to an *f*: 6.8 lens, is not too fast, except with very bright light conditions.

Laboratory tests of a number of Compound shutters by a competent scientific man who used specially devised apparatus have shown that they are generally extremely accurate on their speeds, the highest invariably being almost what it is marked. The light-efficiency was not tested, but an English investigator at the National Physical Laboratories some time ago stated that modern sector shutters have an average efficiency of about 85 per cent on their entire range of speeds. Assuming that it is 75 per cent on the highest speed, the efficient exposure on the 1-250 setting is 1-333 second. Taking track sports as a basis for calculation, the ordinary *full* exposure indicated by our tables, subject factor 2 (or in some cases 1), would be for midsummer: subject, 2; stop, 4½; light, 0; hour, 0; plate (assuming Speed film is used) 1; sum 7½, indicating 1-350 second.

The question now becomes, how much less exposure can be given without showing underexposure by lack of detail in the shadows? Since film has considerable latitude, and since, too, the exposures indicated by the tables are always a trifle on the full side (in the opinion of many users), we could, to start with, when armed with a shutter like the Compound, give half the table times in any event. One quarter the times would probably be just on the lower margin of correct exposure, hence conditions adding up to 9½ instead of 7½ would be all right for the top speed.

What has been said applies to subjects of little contrast in full sunlight at a considerable

ON THE BRIDGE J. H. BECKER

distance from the lens. Reference to the tables will demonstrate that average landscapes and other subjects with dark masses near the lens which require good rendering of detail will add up to considerably more than 7½ in poor light; but by keeping in mind the principle of using not less than half the table time, one can always get passable negatives.

ON THE BRIDGE

The trouble with this picture — and it almost hits one in the face — is that the spot of light formed by the path is so bright that it overpowers the bridge and keeps pulling the eye away from it and from the small figures placed there. This is one of those cases where it is necessary deliberately to alter nature. The patch of highlight may be reduced and retouched until it becomes in effect an extension of the grass. Then there will be nothing to compete with the bridge and its occupants and the picture at once gains in unity. The effect can be seen by placing the finger over the path. Data: Postcard Premo Special with Tessar lens; 1-5 second at *f*: 4.5 with 10-times rayfilter; September, 10 a. m.; bright sunlight; Seed 30 plate; tank development; print on Kodak Velvet Green.

FROSTED LENSES

During the winter many times one will notice that on bringing a camera in from outdoors the lens instantly "steams" or becomes covered with a film of condensed water-vapor. It goes without saying that such a film prevents the use of the outfit. Simply standing the camera in a moderately warm place until it warms up is enough to dissipate the moisture.

AIR BUBBLES IN TANK DEVELOPMENT

A gentleman was showing us some negatives at a dealer's shop one day and complaining of the fact that he could not get them free from small round transparent spots. The examples he showed were due to air bubbles. It seemed that he was in the habit of dropping a rackful of plates into the tank of developer without any precautions. We pointed out the well-known fact that if water is drawn from the faucet and allowed to stand for a short time, a great many air bubbles will form on the sides of the container, so it would not be reasonable to expect a plate to be exempt. We recommended that he use a preliminary filling of plain water, moving the plates in this to break up air bubbles, and then throwing it out and replacing it with the developer, when we were sure he would have no more trouble. We had a similar experience once in each of three different types of tank, but have never seen a single bubble since adopting the preliminary wetting of the plates with water.

In this connection it might be mentioned that it is not advisable to wet plates before development in *tray* work.

GETTING BETTER CHARLES D. MESERVEY

GETTING BETTER

This picture is very well thought out and executed in the technically sound manner which Mr. Meservey's numerous other examples in our pages have shown. Especially noteworthy is the ample exposure, which has rendered full detail in the shadows without degrading the whites, which remain soft and beautifully graded without losing brilliancy. The exposure was only 1-5 second at *f*: 16, a fact which speaks volumes for the amount of reflected light and accounts for the fine rendering of the outside view. Mr. Meservey speaks of the patch of white sky in the upper right corner as a defect which might be improved by toning down, did he feel himself expert enough to undertake the job without spoiling the negative. We feel, however, that it could not be grayed down without putting the whole picture out of key, so it had better be left alone unless clouds are printed in. Data: 4 x 5 Cycle Poco with R. R. lens of 6½ inches' focus; 1-5 second at *f*: 16 in April at 11.30 a. m. in bright sunlight; Standard Polychrome plate; duratol; enlargement on Azo E Hard in Brownie enlarger.

THIN NEGATIVES IN WINTER

The coldest spells of the year generally come in January and early February, accompanied often by snows which bring a great deal of interesting pictorial material to the enthusiastic amateur photographer. If he survives the mishaps which may overtake him outdoors in the actual making of the picture, it is surely discouraging to lose the negatives because the cold prevents the normal process of development. We can well remember the difficulties we used to have, working in a portion of the attic, where, though running water was available, nothing short of heating the room during several hours by burning a gas stove in it could make it bearable. To counteract the frigidity of the water supply, it was necessary to fill the washbowl with hot water (brought from downstairs) and mix the developer with hot water to bring it to about 70 degrees before beginning work. The large body of hot water in the bowl would then keep the tray, set above it on a board, from falling below 60 during development. These precautions were absolutely necessary to insure sufficient density in the negatives, unless one had unusual patience, for the tendency is to take the plate out too

WARWICK AVENUE LEO LEE

soon when working in an uncomfortably cold room. Platemakers' manuals generally advise using more carbonate and less water in winter, in the attempt to compensate for the reduction in speed of the formula at a lower temperature. This is good advice, because the faster-working solution thus produced will develop out sufficient density in a reasonable time. However, if one has patience enough to wait for the necessary time, most formulas will eventually give the necessary density.

Hydrochinon alone — one of the developers which we do not recommend for general work — quite loses its developing power at about 50 degrees; but its combination with metol works well, though naturally it takes longer, as for example, 6½ minutes at 60, 9¼ minutes at 50, and 13¼ minutes at 40 degrees. One of the greatest advantages of timing development by the Thermo System is that it quite removes the temptation — sure to bother when one is judging density by the ruby light — to take the plate out too soon. In working out the Thermo tables published in POPULAR PHOTOGRAPHY for June, 1914, I made a number of tests of pairs of plates from the same box exposed exactly alike and developed for the table times at temperatures over 70 and under 56. In every case, the only way the negatives could be identified was by a penciled memorandum placed on the face before development. From this datum, readers can judge that the reason negatives are flat and thin in winter is because they take them out too soon.

On November 30, 1914, the exportation of lenses from Germany was again prohibited.

WARWICK AVENUE

This print shows rather a daring and unusual attempt to compose the lines of a road. What small measure of success it has is due to the presence of the line of lighter tone along the edge of the roadway. The principal highlight, however, is as badly placed as possible, as it occurs among the branches at the upper left corner. Apparently the trees along this avenue are good specimens, and doubtless by selecting a suitable viewpoint one could make an attractive record photograph of this street; but our contributor did not succeed at all well from the pictorial or from the technical viewpoint. The print is muddy and quite fails to suggest sunlight. Data: 3A Hawk-eye camera with 6½-inch R. R. lens; 1-25 second at *f*: 8 at 10 a. m. in September; bright sunlight; Standard plate; M.-Q.; print on an Artura Carbon Black postcard.

LUMBERING

Excellent judgment was shown by the maker of this picture in not withholding the exposure until the oxen came any nearer, for the leaders are almost too near as it is, and the first traces of violent perspective would soon have become evident. As it stands, the result is good, the exposure having yielded full shadow detail and at the same time having been fast enough to stop the motion and render the cloud of dust in a realistic manner. The placing of the object would be improved by trimming from the right enough to exclude the ends of the timbers. Data: 3B Hawk-Eye camera, fitted with a Voigtlander Collinear lens of 6½ inches' focus; 1-100 second at

LUMBERING EDWARD S. BECHTOLD

f:8 in August at 11 a. m.; bright sunlight; Eastman film; tank pyro; print on Normal Cyko Glossy postcard.

SOME HINTS ON ENLARGED NEGATIVES

MILES J. BREUER

For several reasons I was led to experiment with making enlarged negatives as a variation from the usual method of obtaining large pictures from small negatives by means of bromides and the enlarging lantern. The most important one is that I am at present situated so that an enlarging light is not available, and bromides are practically out of question. I have, however, found it possible to make enlarged negatives in a large camera, or with a small one after having fitted it with a pasteboard extension back which will hold a printing-frame containing the large plate.

Other arguments in favor of enlarged negatives are that, by this means, one is enabled to take advantage of various positive processes most suited to his subject and purpose. The various effects of P.O.P., platinum, carbon, gum, and the different self-toning papers may be obtained, and the worker is not obliged to confine himself to the monotony of bromide. It is a little more trouble to make an enlarged negative than it is to make a bromide enlargement, but, once it is made, we can make any number of copies with great ease. Handwork on the negative, as well as other devices, such as dodging, is much easier and more effective with an enlarged negative than with an enlargement on bromide.

Before attempting to do anything with enlarged negatives, I tried to read up on the subject, but I confess that I was able to find very little, outside the mere directions as to how to go to work. The directions read so smoothly that it looked easy. I found, however, that the methods one usually finds described, i. e., making a positive transparency by contact on an ordinary plate, and from this an enlarged negative on an ordinary plate, using the usual developer for both, resulted in a negative whose appearance was disheartening indeed. There was an immense reduction in the scale of tones; the negative was flat, muddy, to such an extent that there was no hope of printing it on any kind of paper.

Several reasons may be adduced in explanation of this. In the first place, if we attempt to reproduce a negative, even on the same scale as the original, by means of a transparency, and a second negative, the latter always shows an inferiority in its contrasts and gradations; the values are not as good as they are in the original negative. In speaking of this, we usually say that there has been a loss of "quality"; it is an inevitable result of reproducing a negative, though with proper plates and developers it may be minimized. Secondly

there are some who state that there is a loss of contrast due to the enlargement of the image, and the spreading of it over larger areas. I find this hard to believe, since the relative densities of the various parts are supposed to remain the same. I have seen enlargements on gaslight paper which had not one whit less contrast or "quality" than a contact print on the same paper. Thirdly, our ordinary plates, used by the amateur for his negatives, are fairly rapid, and coarse grained. They cut down the extremely long scale of tones found in nature, to a relatively short one, available for the average gaslight paper. It is no more than to be expected that there would be an analogous cutting down of the tones of a negative if we reproduce it on one of these plates. I may mention in this connection, and have it done with, that lanternslide plates, transparency plates, and process plates will doubtless give much better results in the making of enlarged negatives than the ordinary landscape plate. They have a much finer grain, and will preserve the scale of tones. However, I attempted very little in this direction, primarily because my efforts were directed to finding some means available for the average amateur, who can hardly afford to keep a supply of all the imaginable kinds of plates on hand, and who only occasionally makes an enlarged negative, and would therefore like to be able to do so with the ordinary articles always at his disposal. The advanced worker who has a well-equipped laboratory and unlimited supplies at his disposal has no need of my little article.

After numerous trials, and the expenditure of a large number of plates, I arrived at two solutions of the problem. The first thing that would naturally occur to one would be to modify the developers so that they might keep plenty of contrast in the negatives. If the original negative is crisp and vigorous, this method will yield a good enlarged negative from it. In making the transparency, do not overexpose; keep it as thin as possible, without leaving out any of it. Precisely the same thing applies to the making of the enlarged negative from the transparency. The developer used should be strong in the reducing agent, and weak in alkali. I use an edinol developer, but have tried others. The edinol formula is as follows:

A

Edinol	31 gr.
Sodium sulphite (dry)	155 gr.
Water	3½ oz.

B

Sodium carbonate	155 gr.
Water	3½ oz.

For ordinary work, I use 1 ounce each of *A* and *B*, and 2 ounces of water. For transparencies and enlarged negatives, use 2 ounces of *A*, 1 ounce of *B*, and 1 or 2 ounces of water, and 1 drop of saturated solution of potassium bromide to each ounce of the developer. The potassium bromide may be varied from 1 drop for every two ounces, to 2 drops for every ounce of the developer, according to the contrasts in the original negative and the quality of the negative desired.

The ordinary M.-Q. developer that comes in tubes may be used, with the addition of bromide as given above. Using less water than the directions on the tube call for increases the contrast. I have not tried pyro. The worker can very easily modify the developer which he is accustomed to working with to suit his purpose. I might suggest one more formula which I have found good:

Hydrochinon	15 gr.
Sodium sulphite (dried)	80 gr.
Sodium carbonate (dried)	60 gr.
Potassium bromide	1 gr.
Water	5 oz.

A second method for producing enlarged negatives is by making a contact print on gaslight paper and making an enlarged copy. Even though on casual thought it might not seem so, this method yields excellent enlargements. The print is best made on glossy paper. I have, however, made copies and enlargements from prints on semi-matte surface paper, using illumination from two sides, without getting the least bit of grain. I put my print behind the glass of a printing frame, make my exposures with magnesium ribbon, keeping the light outside the angle of incidence, and behind the line of the lens. To get the best results, it is necessary that one use a good grade of paper, rich in silver, in order to bring out everything in the negative. With a good, crisp print, an enlargement up to four or five diameters may be made on an ordinary plate, with little or no modification of the developer, which will surprise the worker with its quality and gradations. I have really come to prefer this method to the one given above. It may not look quite as scientific, but I am better satisfied with the results I get from it.

Even a print which is quite soft and flat may be made to yield a good enlarged negative by giving the lowest possible exposure which will get all of the picture, and then using a

strong contrast developer. I have in this way gotten enlarged prints which were really improvements over the original negatives.

I might conclude with a word on a point which the worker is cautioned against every time enlargements are mentioned, and which, in spite of it all, keeps on giving him trouble. Be careful to keep your negative free from specks and dust. Even though these may be unnoticeable on a small picture, the enlargement contains them magnified to an extent that may spoil it entirely. The greatest caution is necessary. I have repeatedly supposed everything to be quite clean, and have been astonished to see my enlarged negative come out with big snakes on it, caused by little pieces of thread and lint from the cloth on the back of the printing-frame getting on the face of the print or negative; they are so inconspicuous as to be almost invisible, but they appear very distinctly on the negative after enlargement.

AN OCTOBER SKY

(*See page 175*)

Mr. Fortenbach has furnished an excellent example of the use of a graded or foreground ray screen. As many of our readers know, this variety of filter is deep orange at the top and diminishes gradually downward to a faint tint and finally to clear white glass. The advantage is that the foreground receives full exposure while the sky is held back, and often no factor need be employed, though we have found with one variety that doubling the usual exposure does no harm. In this instance, the filter has very properly brought out the sky in a higher key than its reflection in the water, as is true to nature. A reflection is always darker than the object itself. Something has to be sacrificed in view of this nature, so we do not mind the lack of shadow detail so long as the sky is truthfully rendered. Data: 5 x 7 No. 9 Premo camera with Planatograph lens, of 8½ inches' focus; Royal Foreground ray screen; ½ second at 4.30 p. m. in October with sun behind clouds; Seed L Ortho plate; pyro tank development; print on Seltona Matte Smooth. The exposure was calculated by means of the Imperial meter, which uses P.O.P. to test the light.

SPEEDS BETWEEN

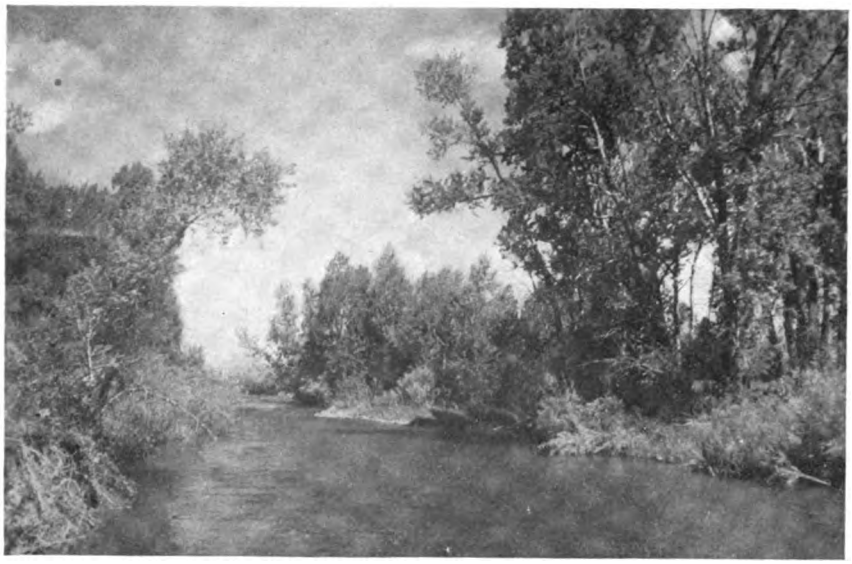
Can a Compound shutter be set between 1-100 and 1-250 to get a speed of 1-175 or between 1-50 and 1-100 to get 1-75, etc., or must it be set only on the marked speeds? asks a correspondent.

MOTHER AND TWINS CHARLES LEISING

This is an interesting point. We know a great many users of this shutter who believe that it is possible to set for speeds between, as suggested by our correspondent. There is reason to believe that the exposure is modified in the supposed ratio, as the braking mechanism acts at all points and other speeds might perfectly well be marked did not convention demand those which are indicated.

MOTHER AND TWINS

Although this picture has good points, we believe the maker could have improved it greatly by spending more time on the pose. As it is, the arrangement is almost perfectly symmetrical, generally a fault, even though committed in a few famous paintings by the Old Masters; in the second place, the background is too "blobby." In the absence of an opportunity to stop down to at least *f*: 32 (at which aperture both foreground and distance can be focused), a more suitable background should have been chosen. It is often an advantage to make a slow snapshot in the shade outdoors; but the background must always be watched. Data: No. 4 Kodak with R. R. lens; 1-25 second at *f*: 11; May, 11.30 a. m.; bright sunlight; Eastman film; tank development; print on Platora Grade D, Medium Soft emulsion.



A SUMMER'S DAY C. K. BAKER

A SUMMER'S DAY

Perfect technique in the use of a rayfilter has given this print a quality which should make snapshooters ashamed of their eagerness to take things without the bother of a tripod. Perfect tonal values like these in a single print are worth a whole albumful of the ordinary undertimed and overdeveloped soot-and-white-wash prints which most people turn out. This print is not only an almost perfect rendering of nature's values; it has excellent composition, too, and is therefore worth enlarging and framing for daily inspiration. Data: 4 x 5 Goerz Ango camera with Goerz Celor lens of 6 inches' focus; 1-15 second at *f*: 4.8 in July at 11 a. m. through a Goerz 5-times rayfilter; good sunlight; Cramer Medium Iso plate; M.-Q.; print on Normal Studio Cyko.

OUTFIT FOR WINTER PHOTOGRAPHY

To those of our readers who have gone through the summer without any other equipment than their hand camera we would say that the time has now come to lay in some necessary accessories. The first and most important of these is a tripod. The exact kind does not matter, so long as it is rigid, and the expense need not be great, for light wooden tripods suitable for small cameras are available in several patterns at moderate prices. The tripod will be found far more convenient than a piece of furniture in making time exposures indoors and it is almost indispensable outdoors in the dull light of winter, unless one has an *f*: 4.5 lens. Even the dollar Brownie, Buster Brown, Cub, or Scout camera will do splendid work if used on a tripod with a small stop and a quick time exposure.

The second necessity is a color-screen or rayfilter. The film manufacturers now furnish screens adapted to their films and capable of giving proper correction. Snow scenes, above all, require the filter for the best work. Unless the blue in the snow shadows is held back by a filter, the snow comes out flat and lifeless. The Kodak screens need only about 5 times' increase, which is almost compensated for by the fact that snow scenes take one-fourth the exposure of ordinary landscapes. Plate users can obtain a large variety of filters from different manufacturers. Sometimes the graded or foreground form will be found a tremendous advantage, as the snow can be held back by putting the filter on upside down. In other circumstances, regular filters will prove better.

And finally, if you use plates, add as a third necessity, a supply of double-coated Iso plates, all loaded and ready for work.

PHOTOGRAPHING A SHOP WINDOW

A great many readers have been asking of late for directions to help them in securing satisfactory pictures of shop windows. In the June, 1914, issue, on page 353, we published a note on this topic, and in the September, 1914, issue, on page 471, an article on the photography of machinery, etc. Both of these papers should be read by everyone desiring to succeed in making window pictures.

MORNING IN WOODLAND KEN MUCHIMA

MORNING IN WOODLAND

A color-sensitive plate, fully exposed according to our tables, is largely responsible for the very satisfactory values shown by this picture. The subject itself was chosen with rare discrimination and the exposure made at an hour when the lighting gave concentration of interest. The placing of the principal mass is correct, too, hence the result is praiseworthy from all points of view. Data: 5 x 7 Empire State camera with 3¼ x 5½ plate in kit; 7 1-16-inch Bausch & Lomb-Zeiss Tessar lens; 1 second at 8.30 a. m. in October in bright light at *f*: 8; Seed L Ortho plate; pyro; print on Normal Matte Cyko, trimmed to 2⅞ x 5 inches. The factors used for calculating exposure were: — subject, 7; light, ½; stop, 5; hour, 2; plate, 1½; sum 16.

PRINTS FOR THE COMPETITION

A reader asks the following questions about prints for the monthly competition:

Should prints for reproduction be mounted or not?

Should there be writing on the back of the print?

Should I send green-toned prints?

Should I send sepia prints?

Should I address the letter to The Editor or simply to POPULAR PHOTOGRAPHY?

Readers will find all necessary directions on the new form of coupon which appears in this issue. Answering the specific questions given above, we would remark that they apply to non-essentials. Mounts are necessary only when the printing-paper shows a tendency to curl and crack unless mounted. Postcards and double-weight papers may be mounted, if preferred; but the judges consider chiefly the picture itself, and the engraver can handle unmounted prints perfectly well if they don't curl.

If you pay first-class postage, you can write anything you desire on a print. You will probably prefer to write only the title of the picture, your name, and the words, "POPULAR PHOTOGRAPHY Competition." This will allow the print to go third class. The coupon, filled out as fully as possible, should be sent in a separate letter of notification. Most readers send postcards, and everything comes in one envelope for a single two-cent stamp.

Send all the colored prints you wish, provided you enclose also another print in black and white for reproduction. Although glossy paper makes the best reproductions, Velvet does almost as well. Use enough bromide in the paper developer to give the print a warm black tone, as it reproduces better than a blue-black.

Prints and letters relating to them should be addressed, "POPULAR PHOTOGRAPHY, 221 Columbus Avenue, Boston, Mass."

It will help the office force in handling your prints if you do not include in the same letter any other business, or at least if you make a separate letter, including your name and address, of anything bearing on subscriptions, questions to be answered, etc. All of these things are handled by different departments,

PALS A. R. BROWN

and if they are all written on a single sheet of paper it means delay in caring for them. The best way of all is to enclose unmounted prints and coupons in the same envelope and pay first-class postage, which will seldom exceed four cents. One or two good prints stand more chance of the prize or an Honorable Mention than a dozen poor ones.

PALS

It is refreshing to present a snapshot in which the sitters are both looking at something outside the picture and not at the lens. Mr. Brown made the exposure about thirteen years ago with a Bullet Kodak, which made a square picture 3½ x 3½. Probably this accounts for the crowding of the man in the picture space. The enlargement is on Montauk bromide and shows excellent technique.

PARTIAL REVERSAL AND DENSITY

A correspondent takes exception to a statement which we made in criticizing "Prize Winners," reproduced on page 471 in the September, 1914, issue. We said, "The trouble comes when the picture has received a short exposure, just enough to allow the highlights to develop to the greatest possible density, so that even the normal tank time brings them out very dense. Fuller exposure would bring out more shadow detail and at the same time cause the highlights to reverse partly, the effect being to thin them and allow the details to print through." Our correspondent sent a six-exposure roll of film given exposures from about one sixth normal to about 9 times normal and pointed out that the density of the highlights increased uniformly with the increase of exposure. He argues that partial reversal has certainly not occurred and that the chalkiness in the white pigeons was the result of overdevelopment, not underexposure.

It is certainly true that increase of exposure, within limits, gives increased density with the same duration of development. It is also true that when one is timing fully for the shadows, the exposure for a bright light may actually exceed the amount which would produce a further increase in density; in other words, that light alone is slightly overexposed and begins to reverse. Instead of developing a greater density, it develops thinner. The phenomenon is most commonly seen in the sky in landscape. Assuming that a bright sky takes about one tenth the exposure needed for an average foreground, normal exposure for the latter gives 10 times' overexposure for the sky, which generally comes a trifle thin and prints out with a decided tone. This is partial reversal. When the exposure is too generous, the sky prints dark and muddy, with plain plates, at any rate.

Tank development, of course, makes the density of any given tone greater so long as the exposure, though greater, does not reach an amount large enough to cause definite reversal; but in tray development by inspection undertimed pictures are likely to be developed too long, thus piling up density on the highest lights. The operator unconsciously or consciously develops the lights too far while watching for shadow details which he failed to expose properly. If the exposure is full, on the other hand, he takes the plate out sooner because he sees that he has secured ample detail and fears that the negative as a whole will become too dense.

Perhaps a better statement would have been that a negative of a subject of abnormal contrasts is generally developed too far in tank pyro if the standard time is given. Readers of the magazine will doubtless recall many instances in which we have suggested giving 17 minutes instead of 20, particularly if the

AN OUTDOOR PORTRAIT H. D. METCALF

negatives are to be used for normal gaslight papers or enlarging. Many amateurs have informed us that they had already worked out this point; in fact, it was first suggested to us by an expert amateur, and we found by trial that he was correct regarding the advantages of a shorter time.

AN OUTDOOR PORTRAIT

No data came with this print, but it is a piece of professional work and is worth careful attention. The placing of the figure is good, for although it is not far from the middle line, the spacing of the tree trunks helps divide the background in such a way as to destroy any sense of too much symmetry. The exposure was long enough to register the full amount of detail in the dark velvet, and the print gives the right impression of its texture. The highlights along the top should be trimmed off.

CLOSING OF THE COMPETITIONS

Readers who hope to have prints selected for reproduction should get them mailed in time to reach our office before the twenty-fifth of each month, as the judges make the awards and select Honorable Mention pictures for reproduction on that date.

COPYRIGHT AND ITS ADVANTAGES

A reader reminds us that we have published nothing about copyrighting photographs and suggests that a statement on the subject might benefit others besides himself.

NATIVE ALASKANS — ORIEL SHADE

A photograph can be copyrighted by securing the proper blanks from the Register of Copyright, Washington, D. C. The photograph to be copyrighted may be marked, "Copyright, 191 ," with the maker's name, or simply marked with a C surrounded by a circle. All copies must bear the copyright notice. As soon as possible after issuing of copies for display or sale, the blank, accompanied by two prints, must be sent to the Register, with the fee of 50 cents (or $1.00 if a certificate of registration of copyright is desired). Full particulars are contained in the literature which will be supplied from Washington on request.

The advantage of copyrighting a picture is that no one can lawfully copy it and make a sale of a print from the copy negative. This makes it impossible for a publisher, for instance, to reproduce a copyrighted picture without the permission of the owner. If the print has any market value at all, it is often made greater by copyright; but it is a needless expense in most cases.

NATIVE ALASKANS

This print is a record of a sort which is interesting only because it shows something foreign to the experience of most of us. It is, naturally, without any attempt at composition. The technical work is satisfactory. Data: 3A Kodak with R. R. lens; 1-25 second at *f*: 20 in April at 3 p. m.; sunlight; Seed 30 plate; pyro tank development; print on Azo E Hard postcard.

STALE METABISULPHITE

A reader complained that he could not get all the hydrochinon into solution in mixing his Thermo developer, so we suggested that perhaps the metabisulphite had gone bad from age. In his reply, he said that our suggestion was doubtless right, for the sample he used had been on the dealer's shelf for a long time, probably years. We have observed this trouble in the case of an aged specimen, but never with a strong, fresh sample. In the latter case, the developing agents dissolve with stirring inside of a minute or two, even at 48 degrees.

There is no objection to using warm water in mixing a metabisulphite solution, but the temperature should not exceed 90 degrees or the salt will be decomposed and will throw down a precipitate of sulphur. If the metabisulphite is stale, add more, until the hydrochinon will dissolve, and then filter out any sediment which may have formed.

KNOW YOUR CAMERA

A correspondent writes that he has a folding film camera fitted with an *f*: 6.3 lens in Compound shutter, but would like to know "what kind of lens and shutter I need for it to get a good picture on dark, cloudy days. I cannot afford a very high-priced one, but am willing to pay $50.00 or $60.00 to get one which will give results."

It is rather difficult to understand just what our correspondent has in mind. Possibly he is dissatisfied because the pictures made on dull days are not snappy and brilliant, like

A DISCORD NICK BRUEHL

those produced on sunny days. We have, strange as it may seem, known beginners who complained on this ground, when, if they had stopped to think and had looked at the actual view with seeing eyes, they would have realized that a brilliant picture would not truly represent the condition of light prevailing on a dull day. It is true that we can exaggerate the contrasts by timing slightly under and developing too long; but the effect is harsh and unnatural.

It may be that our correspondent has not been giving enough exposure — a fault easily overcome by consulting the Monthly Exposure-Tables. The lens and shutter fitted to his camera will give him almost any time he wishes; in fact, the Compound shutter is particularly valuable because of the wide range of exposures for which it can be set. A tripod is often needed in dull light. The thing to do in this case is not to look for another camera but learn to know thoroughly the instrument at hand, as it will make perfect pictures if properly manipulated.

BROMIDE IN AMIDOL FORMULAS

A reader asks if potassium bromide is necessary in the Piper formula for amidol published in the September, 1914, issue on page 482.

This formula figures out about a grain of amidol to the ounce, which is considerably weaker than most amidol recipes. The neutral sulphite has some restraining tendency, so it is not necessary to add bromide unless a trial proves that the whites fog without it. This English formula, it should be noted, means crystals of sodium sulphite, so in using anhydrous sulphite take only 2 ounces instead of 4. All sulphite is alkaline, an ounce of one brand which we recently tested being equivalent to 36 grains of dry granular sodium carbonate. This form of carbonate is exactly double the strength of prine crystals and is neutralized grain for grain by potassium metabisulphite crystals. If, then, one took an ounce of metabisulphite to 2 ounces of sulphite, the excess acidity would be that due to about 368 grains of metabisulphite, and the developer would be strongly acid. It might be an improvement to use considerably less metabisulphite, say 80 grains, or just enough to make the solution slightly acid. In using crystal sulphite, however, an ounce of metabisulphite might not be excessive, as crystals are likely to be much more strongly alkaline than the anhydrous salt.

A DISCORD

Although this print merited an Honorable Mention (and received it), there is one bad piece of misjudgment in connection with it. The maker neglected the obvious improvement which could have been made by trimming off a large portion of the background to the left of the figures. In all other respects, the print is highly satisfactory. Data: 3A Graflex; July, 5.30 p. m.; 1-75 second at *f*: 6 on Speed film; tank development with pyro; print on Azo Soft Rough.

THE CHANNEL LIGHT V. K. THOMPSON

THE CHANNEL LIGHT

This is a good record photograph for use as a postcard, and we are gratified to note that the tower of the light was placed to one side, instead of right in the middle. There seems to be little room for improvement in this subject. Data: 3A Kodak with R. R. lens; 1-25 second at 1.30 p. m. in July in bright sunlight; Eastman film; metol-hydro.-pyro; print on an Azo E Hard X Medium postcard.

CLASSIFICATION OF PLATES

One of our readers thinks that red-sensitive plates are not amenable to treatment by the Thermo system, because when he used a developer at MQ strength, as suggested by us, he got a heavy, dense negative. For his next trial he used the Q dilution and the results were satisfactory.

Readers who use panchromatic plates for the first time are warned that the negatives they produce look very different from those made on ordinary plates. The only test, however, is the print. The user should carefully compare the values in his print with those in the scene before him and modify the development only if the values are wrong, provided a properly adjusted filter was used and a correct exposure given.

MT. LASSEN IN ERUPTION

Mr. Mullen kindly sent a most interesting set of prints of Mt. Lassen both before and after the spectacular eruption which occurred during last August. The one we reproduce seems to us best to represent the general situation, though it is not quite so pictorial as some of the others. Considered purely as a record, however, the view is satisfactory. The only data are: 1-100 second at *f*: 11; Premo pack; 5 x 7 Turner-Reich anastigmat lens. The film from which the print was made would seem to have been subjected to too high a temperature at some stage of the process, for the print is grainy. This defect is likely to occur if pyro is used at a temperature higher than 70 degrees; it also crops out if the drying takes place too slowly in humid, hot weather.

HORSESHOE FALLS

Niagara, as we pointed out some time ago, is a very hard subject, requiring full exposure for the dark rock masses and oftentimes a ray screen to differentiate between blue sky and white foam and spray. The print here reproduced is not at all satisfactory in the shadow rendering, though the orthochromatic film has saved the sky. One should live with a subject like this and study it at all hours in order to do it justice. The casual visitor seldom brings away perfect records. The most noted example of this last statement was the case of the late A. Horsley Hinton, then editor of "The Ama-

Copyright, 1915.

MT LASSEN IN ERUPTION C. MULLEN

HORSESHOE FALLS WM. J. MORRIS

teur Photographer," who made a photographic tour to Niagara and didn't get any satisfactory pictures. His trouble was overexposure, because not using a meter, he failed to appreciate the high actinic power of American as compared to English light. Mr. Morris exposed carefully, giving 1-25 second at *f*: 10.8 in dull light, but he admits that the focus is poor and would like to try again. The developing and printing were done by a firm of finishers.

COMFORT IN THE DARKROOM

The average darkroom is often an uncomfortable place, but in seeking to remedy this state of things it is useless to proceed on wrong lines. Ventilation, or the want of it, is, of course, one of the chief defects, but unfortunately so little is generally known of the first principles of good ventilation that the remedies attempted are often ineffective. There is in general a vague idea that the discomforts of bad ventilation are due to the exhaustion of the oxygen and the increase of carbonic acid in the atmosphere. In a hermetically sealed room both things will doubtless happen in course of time, but no ordinary room, not even the average darkroom, is hermetically sealed, and the result is that a certain balance between the two gases is always preserved, the carbonic acid never increasing beyond a certain very small amount, and the oxygen never diminishing below a quantity that is amply sufficient for breathing purposes. The experiments of Dr. Leonard Hill have shown that even in the worst cases of want of ventilation the discomfort felt is due to want of movement in the air and to unsuitable temperature, the immediate cause of the discomfort being the stoppage of evaporation from the body. It can easily be understood that if a man is in absolutely still air at nearly body temperature all evaporation will cease, and so he will develop symptoms of self-poisoning. To explain in other words, the effects of want of proper ventilation are simply an exaggerated version of those produced in all people in still, hot, damp, muggy weather. We may be out in the open air and yet experience just the same sensations as those felt in a close, unventilated room. The lassitude which all attribute to the weather is only a first stage of the exhaustion felt in the room, and in neither case can the bugbear of carbonic acid be justly credited with the discomfort. This unfortunate gas has even been credited with the property of causing prints to fade and with various other crimes beyond that of suffocating darkroom operators, but such theories may safely be disregarded. We have also quite recently seen an article in which the well-known headache effects produced by the red lamp on some persons have been attributed to carbonic acid and bad ventilation. There is, however, no room to doubt that the light itself is prolific cause of darkroom headache.

The chief ills of the darkroom may be enumerated as follows: 1, Stagnation of the air or

want of movement; 2, excessive warmth; 3, excessive moisture; 4, foulness of air, due to lack of proper ventilation in the form of exhaust; and 5, eye strain due to too feeble or bad lighting, or to red light. Taking these in order, the most efficient remedy for the first defect is a fan inside the room, arranged to keep the air circulating, independently of any similar apparatus that may be used for pumping air either into or out of the room. A less effective, but still a working substitute, is an open coal or gas fire in cold weather, while a running tap or a gas burner will even help somewhat. The second trouble of excessive warmth is somewhat difficult to deal with. Cold air pumped or drawn into the room is, of course, effective, but in our experience a continual stream of cold water running through a large dish is by no means to be despised as a cooling agent. Excessive dampness will only lead to discomfort when combined with intense warmth, and while a darkroom is always damp, as evidenced by the readiness with which metals rust, this will not lead to oppression until the air becomes warm and also saturated with extra moisture given off by exhalations. Foulness of the air is best dealt with by a good exhaust system. Pumping fresh air into the room will not get rid of the foul smell so rapidly, while it tends to add to discomfort by increasing the atmospheric pressure. Exhaustion relieves the pressure and also rapidly sucks out all foul-smelling emanations. Gas burners are also a good remedy for foulness, as they create a big draft and purify the air by burning up offensive matter. The last cause of trouble, the light, is one that is much neglected. Eye strain is the commonest cause of headache, and this may be induced by endeavoring to see either by a feeble, inefficient light or by a red light, in which many people are quite unable to see acutely without very great effort. The main reason is simply that the eyes cannot accurately focus themselves upon red, and the continued effort to do so soon gives rise to headache. As a matter of fact red safelights might well be dispensed with altogether. Neither yellow nor green light seems to have any injurious effects on the eyes, and with the yellow and the green safelights now upon the market all the requirements of safety as regards plates can be complied with.

While on the subject of light it is also worth while considering the white light employed, for in some cases when no development is going on the darkroom is used for other purposes for long periods of time. There is no doubt whatever that many people find electric light very trying to the eyes, but whether this is due to the nature of the light or to the form of the lamp is a little uncertain. The trouble due to the electric lamp has often been obviated by resorting to the old type of upright incandescent gas-burner, the illumination from which is mostly reflected from the ceiling. The more modern inverted burner, however, imitates the electric lamp in form, and there is some reason to believe that this form of gas lighting gives nearly as much worry to some people as the electric lamp. There is no doubt whatever that the best way to light a room is by light reflected from the ceiling, and no room of any kind can be considered to be properly or safely lighted if the ceiling is in shade. Half the trouble with electric light is probably due to the fact that the lamps are nearly always in full view and not properly arranged so as to be invisible, while the other half may be due to the composition of the light, which is not nearly so white as that given by gas.

To sum up the conditions conducive to comfort we may put, first, the provision of a fan to keep the air circulating. This need not always be going, and a clockwork fan can be run at no expense. Second, an efficient exhaust is wanted, with adequate fresh-air inlets. Owing to the necessity of keeping out light we cannot well rely on so-called "natural" ventilation, which is dependent mainly on the provision of large and ample openings for the admission and exit of air. We must have some artificial system, and an exhaust fan is certainly the best, while we strongly deprecate any attempt to force air into the room. The inlets should, of course, be fitted with dust-filtering screens which should be renewed frequently. An efficient exhaust near the ceiling will also keep down the temperature of the room, while it will also keep the room free from chemical fumes. As regards lighting, we would much like to see the abolition of red safelights altogether, and the substitution of green lights in their place. This we would recommend, and also the abolition of all open, unscreened white lights. The general illumination of the room should be solely by light reflected from the ceiling. Open lamps may be required for printing purposes, but these should also be so far inclosed that the worker may not see the lamp itself while he is making the exposure.

One other item conducive to both physical comfort and health is the abolition of cold or damp floors. The floor should be waterproof, so that any spilt fluid may be readily mopped up or swept away. Neither stone nor cement, nor any similar cold material is at all advisable,

BILLIE GORDON KENT

even if covered with wood grids, for these latter prevent the mopping up of liquids, while they are painful to the feet after long standing. There are some patent compositions that make very good floors, but in general we think there is nothing will beat, as regards efficiency and cheapness, a wood floor covered with good linoleum, well cemented down with waterproof joints, and waxed over now and then on cleaning days. One more matter often neglected is the height of sinks and benches. These should never be so low as to necessitate stooping over the work. For standing work 3 feet to 3 feet 3 inches is the proper height for a bench, and a developing sink may be 3 feet 6 inches, with advantage. The ordinary table height of 2 feet 6 inches is too low for any work that is not done sitting, while if seats are required high stools can be used with the higher benches. Too low a bench means backaches as well as headaches, and it is detrimental both to health and efficiency.

BILLIE

Mr. Kent has produced a most attractive calender which is very suitable as a New Year's gift to all his friends and will doubtless be treasured by all who know this bright-looking doggie. The print is a good record snapshot. It was made with a Vest-pocket Kodak.

A camera operated by electricity has been invented for lowering into oil wells to photograph the conditions surrounding broken tools.

EXPOSURE AND DEVELOPMENT FOR RESULTS

CHARLES H. PARTINGTON

In putting before my readers an article under the above title, I do not wish to have it misunderstood as giving directions on how to expose and develop to get a perfect negative. What I do intend is to give the results of my experiments for getting results that tend toward a more pleasing and truthful reproduction of the subject. I make no claims to novelty, and some workers may have had experience with manipulations such as I shall describe; but to those who have not, I suggest that they give them a trial.

I do not wish to imply that you know nothing of exposure or development, but will say that a good form of light-measuring meter is a great help, especially in subjects where I have found it advisable to under- or over-expose to secure the desired results. Development also has been put before us in late years by the tank method, which, to my mind, will give the best results for the average worker. Nevertheless, I have found that there are special conditions which cannot be allowed to take care of themselves automatically, and in these circumstances better results are obtained by special treatment.

The formula put out by the manufacturer is about as good as you can find for whatever brand of plates and paper you are using. Serious work is hardly possible if you constantly change your developer, plates, or paper, and I have made it a point to stick to one brand. Learn to handle a certain one and hold to it, or in other words, be thoroughly familiar with your tools so that waste and disappointment will be brought to a minimum if not entirely eliminated. Disappointment, by the way, comes from a great number of sources, one in particular, mentioned in magazines many a time, is our old friend, the pinhole. Personally I have very little, if any, trouble in this form, but I have seen many a fine negative with such ruinous marks. Attention to two things practically does away with such spots, namely, clean plates before both exposure and development and the filtering of solutions. I have found that the best method to clean plates is to dust with a camel's-hair brush, wide enough to cover over half the plate. By holding the loaded plateholder upside down and giving two strokes across the length of the plate, the whole will be cleaned; and, being inverted, the particles cannot fall on the surface from which they were removed. As to filtering, almost any one has done that, but the question is, "how often?" In my own case it is almost a habit, born of experience, to filter all solutions for all purposes at all times. Filter paper does not cost much, but is capable of saving many a dollar's worth of plates.

As to what plates to use, I shall not argue the merits of any particular brand, although like many other workers I have my choice. Nevertheless I will lay stress on the "kind" of plate and say that no serious work should be attempted on other than a color-corrected one for anything such as landscapes, portraits, etc., in which color and tone predominate. Filters also are valuable, but in many cases are used to excess, resulting in overcorrection. In many cases the filter need not be used, owing to the very excellent qualities of the present-day isochromatic or orthochromatic plates.

These plates are to be obtained in both the single- or double-coated variety and as I mention the uses of both for different results further along it may not be amiss to mention a few things with reference to the latter.

The distinctive quality of a double-coated plate is of course that it is nonhalation; but to infer that the difference stops there is wrong. They require a slightly longer exposure, longer development with a weak solution, and longer fixing and washing in order to affect the lower, slow coating. I have found them able to produce a softer yet snappier result than a single-coated plate, while their printing qualities are more easily judged by reflected light than by transmitted light. Better still, if your negative looks thin and lifeless, place it in contact with a sheet of white paper or cardboard and you will begin to appreciate the printing-power of a double-coated plate. Personally, I have found that flashlights, portraits, and landscapes taken on this kind of plate are more pleasing than when made on the single-coated variety.

Of papers there are a great many brands, most of them good, but the fact is that many who use them never stop to realize that it is possible to vary the finished result by such simple means as the changing of strength and temperature of the developer, and the distance of the printing light. The two latter conditions will have the same action on all papers, so far as I know; but the first varies with different makes. In other words, dilution in some cases increases contrast and concentration increases softness, while in others the reverse is true. Those to whom this fact is new are advised to experiment a little along these

WINDOW PORTRAIT CHAS. H. PARTINGTON

lines, when they will find that it is possible to obtain several degrees of contrast or softness on one grade of paper. In other words, instead of being limited to the average grades of soft, normal, and hard, you can get from one to four kinds of prints from each or three to twelve from one negative.

My intention, therefore, is to give the results of my experience along the lines of getting what you want, without special formulas, by getting away from ordinary exposure and development simply by altering those in use as standards. Chemically, only one change is suggested, which is the use or omission of a cheap article, potassium iodide. Its use in developing solutions tends to soft effects without loss of detail for both plates and paper, while at present most workers know it only as a preventive of abrasion marks on glossy papers.

Preliminary remarks now being finished, I can go into detail on various conditions, taking the main ones only.

For a start let us consider a window portrait, that is, one in which the window is included. As a rule the space occupied by the window itself is usually white paper, the lace curtains and even the window frame being sometimes the same. Of course, the outside light and that of the frame and curtains is much stronger than the light on the subject, resulting in overexposure of the window. This brings to mind the so-called golden rule of photography, "Expose for the shadows and let the highlights take care of themselves." This saying seems odd to me and in my estimation is misleading. My rule is, "Expose for the shadows and *develop* for the highlights."

Your exposure should be long enough to register the shadow detail of the subject, paying absolutely no attention to the window. Simply forget that it exists and give enough time for the dark places.

As to development, two methods are at hand. The first I describe as the "flat-tank" method.

Your exposure was made on a double-coated plate, of course, to prevent halation; and as these require long development with dilute solution, arrange accordingly. With a Cramer plate I use this standard pyro-acetone formula diluted as per directions. Not only does the developer need attention but the tray also, care being taken to see that it rests as level as possible in a place where it will not be shaken or the solution it contains agitated. When ready, immerse your plate, see that surface is covered and free from air bells, cover the tray and leave it *absolutely alone*. With the plate and formula mentioned I let it stand for twenty minutes. After that time fix and wash in the usual manner and you can make straight prints which will show detail outside. To be sure, it will not be as perfect as a picture taken outside, but the suggestion of trees, sidewalks, or buildings will be there strong enough to break the glare and monotony of a chalky window.

Now that I have told how, I can hear some asking, "Why?" In answer I can only give the theory which suggested my trying the experiment in the first place, and my reason

for its results; the former being that developer in action on a certain spot would exhaust itself and its action stop, provided the spot mentioned was exposed long enough to take most if not all the good out of the solution. Then, if no more fresh solution was allowed to act on the spot, its development would cease. Therefore when the whole plate is put into the solution, development starts. With no agitation the solution attacks only the surface that is directly under it, and no other parts, as when the tray is rocked. The blackening of the places where highlights appear causes the developer at that location to weaken gradually and therefore instead of overdeveloping the overexposed part you merely allow it to tear down the solution and prevent, to a great extent, a blocked portion. The shadows and halftones during this time are still in contact with a stronger solution and continue to build up.

Before leaving this method I might add that certain things are necessary to its success. Your solution must be one that will stand dilution and the plate must be given plenty of time, also the depth must not be more than enough to thoroughly cover the negative, say about one-quarter inch. This is to prevent the highlights from having too much developer to exhaust.

Another method which brings better results but requires more work on the part of the photographer is that of using an ordinary solution with the accelerator cut to a minimum, details of the operation being as follows:

The developer should be one in which the developing agent and the accelerator are mixed in separate stock solutions. Place the plate in the tray and pour in the portion containing the developing agents. After about a minute start the action of the second part of the developer by adding only a *few drops* of the accelerator. Rock the tray steadily, and if the image does not appear in about one to two minutes, add a little more. Of course the appearance may be slow, but it is advisable to wait the length of time mentioned before adding more. Finally, when action has started, allow the tray to rest most of the time, an occasional tilt now and then being sufficient to keep the solution agitated.

Development will be slow indeed and may last for thirty minutes, but details and halftones will show up just the same as with ordinary methods. As soon as development is finished, add quickly as much accelerator as your regular formula calls for, rock the tray for five or ten seconds and immediately wash the plate thoroughly, when it is ready for the fixing bath. This last operation is to add a little snap to detail so as to prevent a flat-printing negative. Give this a trial and be convinced. Your finished picture is made by straight printing and developing, and should work out nicely on a soft grade of paper.

In pictorial work, one finds that conditions are not always suitable for bringing out a result to do full justice to the subject, especially if straight exposure and development are used. Therefore it is useful to know how to alter these conditions to bring out a print which will lend more interest to the picture.

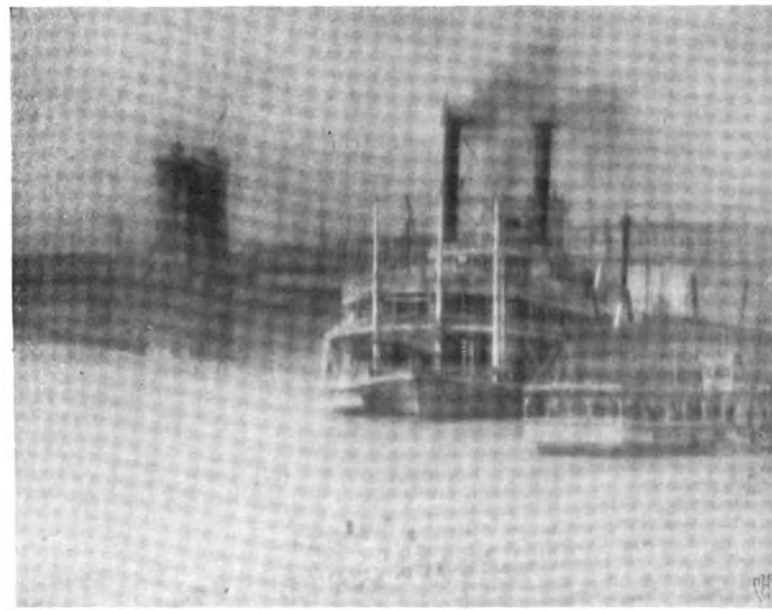
Consider the illustration of the river scene, "Steaming Up," which was made about 9.30 a. m. in midsummer and with a clear sky. Although taken under these conditions it is presented as an impression of a dull, hazy day. If the final print had shown the subject as it really appeared, the result would have been merely a record.

Considering the effect as being untrue to actual appearances at the time of exposure may cause some to label it as faking, but as this classification can be applied only to such things as printing in clouds, marking on negatives, etc., it should not be applied to such a method as I will describe. That which makes such a result possible is straight photography only, without recourse to anything except attention to exposure and development.

When the exposure was made it was necessary to use a filter strong enough to cut down the intensity of the bright blue sky, and only half the time required for regular work was given. This helped to cut down the tone of the sky and the underexposure of the rest of the subject was left for proper development to care for. What I wanted to obtain was an atmospheric effect in order to help depth and breadth.

The question of proper development arises next, and for such conditions I have found nothing to equal the tank method with a few alterations. The plate should be double-coated and the developer very dilute. Pyro works best and should have in its make-up about one grain of potassium iodide to twenty ounces of solution. This will bring about a soft result and also allow a temperature of 70 to 75 degrees Fahrenheit without fogging. The high temperature will tend also to bring out all possible from the underexposed portions.

In most cases a print on a normal grade of paper will bring the desired result without recourse to any special handling, while for an



STEAMING UP CHAS. H. PARTINGTON

enlargement it may be necessary to use the developer somewhat diluted so that it works slower. The purpose of this is to prevent the print's coming up too fast and overdeveloping.

You may at some time go for a trip on a dull day out through the woods and along the creek. A scene will present itself and show chances of a good picture maybe with pictorial possibilities and then again only an interesting record print. Nevertheless, you would like to make an exposure, but owing to the dismal weather will wait for a brighter day, not knowing or considering that a bright, snappy print can be easily acquired then and there.

A single-coated Iso plate of the fast variety and a deep filter is all that is required. Your exposure in this case should be about fifty per cent larger than normal (taking the filter into consideration) in order to overcorrect the various colors or shades of leaves, grass, etc. The plate is developed with a normal strength, quick-acting developer such as metol-hydro. The formula given in Cramer's manual with liquid acetone as the accelerator can be used minus the bromide, without fogging. Omitting this restrainer tends to produce a more snappy negative. As the plate was overexposed, developing must be watched and not allowed to go too far. After fixing, you will find that you have a negative full of snap and detail but very dense, which will require from three to five times longer to print than the average.

When it comes to making the print, a normal grade of paper is the best and if the result happens to be a little too harsh, don't turn to a softer grade of paper, but soften your developer. This is done quickest by adding one or two crystals of potassium iodide, or else by making the solution stronger or more dilute according to what your brand of paper requires. The picture "A Quiet Stream" was made under the conditions mentioned and with the method just described.

Many other conditions prevail which cause worry and disappointment to the photographer, and a book might be written on handling different effects. It would hardly be possible to go into details of any other in this article, but the principles described can be applied to almost anything you may encounter. For instance, I have heard it mentioned that a scene in the woods with the sun streaking through the trees, especially at early morn, is a beautiful sight, but when a photograph is attempted the results are discouraging. This statement is all true enough if you simply "push the button" and trust to luck, but you should consider what you are dealing with.

Your highlights on the leaves and ground are strong and the streaks of sunlight are more so. If you expose for them you will have no halftones or shadows, whereas if you expose for the latter, your highlights are hopeless. Therefore if you study a minute you will find that the window portrait presented prac-

tically the same conditions and the solution of the problem is the same. So next time try this method and see the improvement. because all you want is sufficient exposure to take care of the shadows, and a developer to take care of the highlights.

On some occasions it may be necessary to combine the principles of two or even the three conditions I described, or part of one with part of another, so that if you will take the time to consider what is wanted and remember the results to be obtained by under, over, or correct exposure and what developing action you require, your results will be more satisfactory.

The foregoing hints give means of meeting obstacles from the start to finish, but should you have missed what you wanted or should some condition have prevented proper handling of the subject, you must turn to your

A QUIET STREAM CHAS. H. PARTINGTON

developing paper as a means to rectify part, if not all, of the trouble. Or again, you may have negatives on hand from which it is impossible, to your knowledge, to obtain a satisfactory print. It would be more to your liking to get a softer or more contrasty result, and although you tried hard, normal, or soft paper the jump from one to the other was too abrupt. To modify such conditions I will describe the possibilities with paper that my experiments have disclosed.

The printing light is something that very few pay any attention to, and it is not uncommon to see in use an outfit in which the distance from the light to printing-frame is fixed. In my case, I can vary the distance, and I find it an advantage in that a slightly softer print is obtained by the frame's being close to the illuminant. The control obtained in this way is not great, but for certain things it allows just enough change in contrast or softness to bring the desired result.

Next, let us consider the cheapest of all things used in photography, *water*. As mentioned earlier, softness or contrast can be modified by using a strong or a weak developer, according to the brand of paper. Take Velox, for instance. This printing medium will show a decided difference in prints on the same grade, from the same negative, if developed, one in normal developer, one in a solution of half strength and one in double strength, the results showing decided contrast with dilution and softness with concentration. Some papers work the reverse. With the paper mentioned, the final appearance can be so altered that one can make a print from the same negative on regular and special grades and results cannot be distinguished. For instance, develop the regular grade in full-strength Velox liquid developer and the special in half-strength.

Temperature also has its possibilities and should not be wholly neglected. Considering 65 degrees as normal, it is not safe to use higher than 75 degrees, while it may be worked as low as 48 degrees. The higher it is raised, the more softness, and vice versa; also the developing time decreases when temperature is raised and the print flashes up in a hurry. A cold solution works in the opposite way.

Last but not least is the change in chemical composition. This is effected by the use of potassium iodide, but no definite amount can be given. In experimenting with it, I find that with eight ounces of developing solution, one single crystal added will show decided results toward a soft print. The use of more than this amount does not produce any softer effect and therefore its action seems limited simply to its presence in the solution and not to the quantity. A print flowed with an iodide developer flashes up very quickly in an even gray color, but builds up at the ordinary speed and under perfect control, an examination showing it to be of a canary-yellow color, which is entirely eliminated in the fixing bath. I might also add that a print is not thoroughly fixed if any of this color is apparent.

The foregoing gives an idea of the chances for correction in printing, and a little juggling around will show things to which quite a few workers have never given a thought. Applying these methods may be deemed a nuisance, but for the serious worker the results surely justify the means employed. The majority of camera users are in the game for pleasure only,

which means that they find photography an interesting pastime. Considering it as such, you will find it interesting indeed after you get started working along such lines as I have put before you. When the methods are properly managed and you become more familiar with them, exposure and development for results will help you over many a hard spot.

"MUM" SEASON

Greenhouse exposures are in a class by themselves, owing to the entrance of light from all sides, so they are particularly likely to bother the novice, who is at a loss to determine how short a time exposure to give. The eye is not so reliable a guide as an actinometer in such a case; but experience gained by trying a few exposures will soon put one on the right track. Mr. Kimrey's exposure was 1-5 second with *f*: 32, equivalent to 1-100 at *f*: 8, from which it will be seen that snapshot exposures are not out of the question when the full sunlight streams in and the foreground is light in color. The exposure might possibly have been a little longer for the greens — though with a non-color-sensitive plate they would still have been relatively too dark — but in that case the halftones in the whites would have been lost. The exquisite gradation in the flowers is the result of exposure exactly right for the whites and development short enough to avoid forcing them. The picture was made to be used as a lanternslide, for which purpose it should be most effective. Mr. Kimrey used a 5 x 7 Conley camera with 8-inch Orthographic lens and gave 1-5 second at *f*: 32 in October at 3.30 p. m. in intense sunlight to a Stanley 50 plate, which was developed with pyro and printed on Azo F. Hard.

TRAY VS. TANK

A correspondent writes that he has made some careful tests and is satisfied that he gets better gradation in his negatives with tray than with tank strength of developer. His two tanks are now relegated to washing purposes only.

It is generally stated that a tank gives better gradation because the weak solution does not "plug" the highlights. The truth of the matter seems to be that a well-balanced developer will produce identical results from equal exposures of the same subject if the development is stopped at exactly the same stage of contrast in both tray and tank development. By overdeveloping in the tank, one can "plug" the lights just as effectively as in tray development. The advantage of the tank is that one does not see the results and cannot be tempted to force development in the hope of bringing out a little more shadow detail.

"MUM" SEASON F. L. KIMREY

WILLOWS BY THE LAKE E. A. ROBERTS

WILLOWS BY THE LAKE

We trust that all our readers will appreciate to the fullest extent the perfect technique shown in this rayfilter photograph, with its perfect values in greens and blue and its transparent shadows. It was taken to show the play of sunlight on the willows. Owing to proper handling, the object was fully attained, though the reproduction, which was made from a sepia print, does not do full justice to the original. Data: 5 x 7 Seneca No. 9 camera with 8-inch R. R. lens; three-times ray screen; 2 seconds at *f*: 16 in June at 7 a. m.; bright sunlight; Cramer Medium Iso plate; dilute pyro; print on Professional Studio Cyko, hypo-alum toned.

A REFLECTOR FOR A WELSBACH BURNER

No matter how many different schemes are advanced for securing uniform illumination in enlarging, someone always wants something different. In the October issue on page 86, we reprinted from *American Photography* a diagram showing an adaptation of mirrors to a single Mazda bulb so as to throw the light evenly upon a sheet of flashed opal glass. Under this article we state that this plan ought to give equally good results with the vertical type of Welsbach mantel, and now a reader asks how he can arrange a similar apparatus without using mirrors.

Leaving out the mirrors, one could use tin or even white blotting paper or cardboard, but the illumination would of course not be so strong, and the middle of the sheet of opal might pass too much light and print the middle of the enlargement too dark in proportion to the edges. A good arrangement would be to get a tinsmith to bend a sheet of tin into a parabolic curve and fix it in position in place of the mirrors shown in the diagram.

HOW TO TAKE YOUR OWN PHOTO.

Many schemes have been devised by persons wishing to photograph themselves, but the most unique scheme is to use a clothespin and a fuse. This is done by taking a wood clothespin and shaping one end so that it grasps the bulb of the shutter and the spring tends to press the bulb. The other ends are brought together so as to release the bulb and are tied with a string or thread. On this is put a fuse of some length. Peering through the camera and discerning the object by which you can focus yourself into the camera's eye, you light the fuse. Then placing yourself in position the fuse gradually burns until it reaches the clothespin, which springs, pressing the bulb and taking the picture.

KEEPING PASTE

Starch paste can be made to keep by adding a drop of pure liquefied phenol (95 per cent carbolic acid, a deadly poison), or almost any of the aromatic or essential oils, such as oil of rose, peppermint, etc.

WATER CONSIDERED AS A PHOTOGRAPHIC CHEMICAL

A. H. CLARK

The following paper is extremely timely, since we are apt to blame everything except the water when a chemical reaction in our everyday laboratory experience goes wrong. Professor Clark shows us that in the delicate chemical operations of photography the use of tap water is a cause of much of the trouble. And what obtains in photography is equally true in the case of our prescription and laboratory work. So be sure the water is right before you go ahead.

The operations of photography are concerned with some of the most delicate and intricate chemical reactions with which we are familiar (or, more correctly speaking, with which we are not familiar), and therefore the quality of the chemicals used in these operations should be carefully guarded.

Because of the questions of ionization, dissociation, and similar phenomena, one of the most important chemicals per se is water (pure H_2O). We all know that it is the one chemical most frequently and widely used. For cleansing purposes, for drink (although I have a friend who says that it is only useful to put under bridges), for pharmaceutical operations, for the laundry, for boiler purposes, and all chemical operations, as well as countless other uses, water is an everyday necessity, exerting in every case where it is applied its peculiar chemical action. It is with its use in photo-chemical operations that we are here concerned.

It is a peculiar fact that the things which are the most common or abundant, and with which we are the most familiar, are the things we consider the least seriously. The old adage that "familiarity breeds contempt" seems to be well founded. The air we breathe and the water we drink probably receive as little serious thought from the average person as any two things with which we have to do. These two substances are absolutely necessary to our presence upon this busy planet, yet the former we inhale constantly with never a thought of its real nature — unless we happen to be near some particularly offensive source of supply, such as the stockyards or the Illinois Cinders Railway (with apologies to McCutcheon). The latter we imbibe with still less thought of its composition. The slight attention given these two substances is shown by the fact that their composition was not fully established until a little over a hundred years ago. All the people upon the earth for the thousands of years previous to that time had used air and water, but did not know what they really were.

Perhaps the pharmacist or the chemist, even if he drinks water but seldom, and that seldom with the indifference mentioned above, does think seriously about it when he uses the liquid for the manifold purposes of the pharmaceutical and chemical laboratory. The pharmacist knows that for manufacturing operations, such as the making of aromatic waters, elixirs, syrups, liquors, and many other preparations, even those for the toilet, he must use water that is "pure," as he terms it. He must at least be as careful of his supply as the laundryman or engineer. What pharmacist will not instinctively hunt the distilled water when he desires to prepare a solution of silver nitrate? The chemist uses nothing but distilled water for his operations. The reason for all this is plain.

There are many kinds of "water,"— river water, lake water, spring water, rain water, well water, and distilled water being the most common. All these, save freshly distilled water, contain substances other than H_2O, either as dissolved salts or gases or solid matter in suspension. These other substances are liable to interact chemically with the material we add to the water, producing very undesirable effects, ruining our pharmaceutical preparations, destroying the accuracy of our chemical analysis, decomposing the soap used in the laundry, producing caking and foaming in the boiler and in other ways causing untold trouble.

When we realize that in practically every photographic operation we are dealing with the delicately constructed and easily affected compounds of silver, gold, or platinum, the necessity of protecting these compounds from the action of substances other than those purposely used to bring about the desired chemical changes becomes apparent to the pharmacist who understands something about the material he is handling. Not so, however, with the average amateur photographer with whom the pharmacist does practically all his photographic business. The amateur photographer does not understand the nature of the material he is using, and usually does not take the trouble to become informed, so it is to the interest of the pharmacist to supply the facts. What is the use of recommending to a customer some particular brand of chemical in which we have absolute confidence, or some pet formula which we know will give perfect results if properly handled, and then have the

customer defeated in his efforts to obtain results because he ruins the fine materials we sell him by mixing them with impure water? Pure water is certainly as necessary to the success of photographic operations as it is to the success of the most exacting pharmaceutical or chemical operations.

For most of the purposes of photography there are but two kinds of water, the best water and that which is not the best. Distilled water is *the best;* all other types are not. For every developing and toning solution, either for plates, films, or paper, distilled water should be used. Ordinary rain water will do if *fresh* and *clean.* It is so liable to contamination with dirt and organic matter that very seldom is it fit for use. Organic matter is particularly objectionable, causing a too rapid reduction of the silver and resulting in fogging or streakiness of the films or prints. The tap water in most cities is liable to be bad because of the salts naturally dissolved in it, and also because of the contamination likely to occur from the water mains, pipes, faucets, etc. Organic matter may be present, and iron rust from the pipes frequently causes trouble, producing black or red spots and streaks on the prints. Lead and oil or grease may also get into such water through the material used by the plumbers in joining the pipes. Grease is particularly objectionable, as it sticks to the films and paper, preventing the proper access of the developing solutions. Water direct from the lakes and rivers usually contains organic matter, or suspended solid matter, either of which is liable to cause fog, streakiness or muddiness of the prints in particular. However, I found the water from the streams in the section of Colorado that I visited to be perfectly satisfactory — it being nothing but melted snow. Well water and spring water are seldom if ever satisfactory. They frequently contain chlorides and other salts — which readily precipitate the silver or act upon it in other ways to the detriment of the finished picture. Dissolved gases, such as ammonia or hydrogen sulphide, are particularly objectionable and should never be allowed in the rooms where pictures are being made. Illuminating gas escaping in the room has been found to be the cause of yellowish prints.

Some may raise the objection that distilled water is too expensive, but it may be purchased for less than twenty cents a gallon, very little is needed for the solution mentioned, seldom more than a pint, and the investment will save dollars in films, plates, and paper, which might otherwise be wasted in the production of poor pictures. Aside from this, the customer will derive added pleasure because of the increased beauty and perfection of the finished product, for all of which he should reward the pharmacist from whom he receives the information, by his continued and more frequent visits to his photo-supply department.

For many purposes other than those mentioned ordinary tap water will do, unless it contains suspended solid matter. If not clear, proper filtration is necessary. A "patent" filter attached to the faucet is an excellent remedy, but a strainer made of some rather heavy closely woven cloth, tied over the faucet, will answer unless the water is very bad. Such water is all that is desired for the fixing bath particularly the acid variety. After fixing, the danger point is about passed, but still the wash waters for both films and paper must be free from metallic salts in solution, and from suspended matter, particularly iron rust, grease or lead oxide from the pipes.

From what I have said above one must not be discouraged over the prospect of making a failure of picture making, neither must one give up the undertaking because of any difficulties in the way of obtaining distilled water. Far from it. Do the best thing possible to overcome the difficulties or to remove the causes of failure and then keep on trying even if the product is not perfect. 'Tis better to have tried and failed than never to have tried at all. Many good pictures have been made without the use of distilled water, but it is equally true that the best ones result from its use.—*The Druggists Circular.*

A CAUSE OF POOR FOCUS

Two instances have recently come to our attention of film cameras which have been issued with their focusing scales wrongly placed, so that to secure a sharp image of distant objects it was necessary to set the pointer to 8 feet. Luckily, in both cases the cameras fell into the hands of experienced workers who knew how to correct the adjustment, but we can imagine the trouble they might have caused if some tyro had taken them on a trip and waited until reaching home to have his films developed.

Nor are focusing cameras the only ones subject to this defect. We have often seen "fixed focus" cameras with the focus wrongly fixed, so that no sharp pictures could be taken. It is well, when purchasing a film camera, to insist on the dealer's testing the correctness of its focusing before accepting it.

EDITORIAL

OUR COMPETITION

The prize in our December Competition was awarded to William C. Herchenhahn, for a photograph entitled "Dorothy." The following prints received honorable mention: "Making Ready for the Mail Train," by B. Harrison; "Minnehaha Falls," by A. D. Tinklepaugh; "Sweet Memories," by G. R. Choinard; "Distant View of Mr. Treat's Residence," by Leo Lee; "Mantee Lake," by Stark Weatherall; "Ancient Cliff Dwellings," by M. E. Smith; "A Country Road," by N. E. Robbins; "Ripples," by J. D. Ficklen; "The Walk," by J. Heckingbottom; "September," by N. G. O. Pleydell; "A Country Road," by L. L. Emmons; "The Colosseum," by Ford E. Samuel; "Wrecked Aeroplane," by E. C. Prusia; "The Precious Doll," by F. L. Weaver; "A Pair of Twin Skaters," by Andren Andreen; "Christmas Card," by Peter Schimmel; "He Would Not Smile," by H. Rodick; "Friends in Estes Park," by Grace L. Cheney; "On the Fence," by Mrs. J. A. Denovan; "River in Early Morning," by Ralph Beebe; "The Frozen Shore," by A. Lloyd Shultz; "The Sylvan Bridge," by W. F. Lindstaedt; "Going to the Sun Mountain," by G. K. Baker; "December Twilight," by Eliot C. French; "At the Well," by G. E. Alling; "Deep in the Shady Ravine," by J. H. Hensel; "Sharpening Up," by A. A. Furman; "Landscape," by Frank L. Bey; "The Automobile," by William Cox; "Electrical Display," by S. E. Byck; "Autumn," by Geo. S. Buell; "The Gathering Storm," by M. E. Smith; "Raining Again," by H. L. Schulen; "Rock Creek in Winter," by C. F. Marvin; "Summer," by D. C. King; "Crocheting," by E. F. Bailey; "A Winter Scene," by B. J. Hurcker; "The Christmas Tree," by Norman G. Chinn; "Home Portrait," by Frank Lens; "Artist's Glen," by Hugh Palmer; "Autumn's Mist," by Wilford Jost; "Our Thanksgiving Dinner," by F. M. Black; "Auditing Daily Savings," by Geo. L. Chouinard; "The Last Snow," by John Markley; "Margie," by Ray Stow; "Homesteading," by Erling Berg; "How It Works," by Howard B. Adams; "After the Blizzard," by Marion Smith; "The Swimming Hole," by J. R. Clair; "A Naturalist's Aids," by Henry Link; "Ausable Chasm," by Geo. N. Griffin; "The Swamp," by Charles D. Meservey; "Waiting for a Bite," by W. H. Grischele; "The Yacht," by Ludwig Krebser; "The Farm Road," by S. R. Kitchin; "Early Snow," by E. S. Booth; "In the Rockies," by Grace L. Cheney; "The Road," by Frank E. Whiting; "My Turn Next," by L. W. Stevenson; "A Home Portrait," by Fred B. Walker; "Outdoor Portrait," by Frank C. Dagan; "A Game of Cards," by Jesse C. Van Wye; "A Young Beginner," by Wm. Ludlum; "Maiden Meditation," by W. F. Baker; "A Kiss," by H. A. French; "The Returning Prodigal," by R. K. Wood; "Little Sport," by Nettie Singlestad; "Binks," by M. A. Clark; "The Honeymoon is Over," by Charles D. Meservey; "Home Portrait," by Dr. H. Viehe; "Flower Girls," by John W. Horn; "Missed," by G. M. Loeb; "Still Life," by Louis O. Bogart; "Through the Garden Gate," by Wm. B. Merriman; "Day Dreams," by F. A. Northrup.

THE EASTMAN COLOR PROCESS

A new process of coloring photographs developed by the Eastman Kodak Company has been introduced to the public by about forty photographs in the Art Gallery of the University of Rochester. These pictures were most beautifully arranged and illuminated, and the exhibition was one of the most popular ever given in Rochester, the gallery being crowded day after day by the public, which showed a great interest in and appreciation of the beautiful effects produced. The results as shown are most lifelike in appearance, and though under the conditions it was difficult to judge as to the accuracy of the color rendering, the pictures are sure to be most pleasing to the public and therefore commercially profitable. The color analysis is by means of two filters and the synthesis is performed by the juxtaposition of two dyed plates. It is, of course, impossible that true color rendering can exist under the circumstances, and the blues will naturally be the weakest point. The process, however, is at present designed to be used mainly for portraiture, and the rendering of blue is of secondary importance in this work. Though some of the practical details remain to be perfected, the process contemplates eventually the taking of two negatives in one camera, through two appropriate filters, the separation of the images being effected by suitable prisms. The negatives will then be developed, the silver image

removed and replaced by suitable dyes, and the two transparencies bound into contact face to face. No prints will be made and each transparency will be an original, as with the autochrome process. They are, however, much more transparent than autochromes, and better adapted for illumination by electric light. We foresee a large future for this process in the hands of the professional photographer.

A SPECIAL COMPETITION

Some of our readers have thought thay they do not have an equal chance in competition, because they are unable to find interesting subjects for pictures. We therefore propose a competition open to readers of *American Photography* and POPULAR PHOTOGRAPHY which is not subject to this criticism. A first prize of $15.00, a second of $10.00 and a third of $5.00 will be awarded to the maker of the best set of three or more prints sent in to us before March 25, 1915. The subject of the competition is "My Own Home," and the set of prints must contain at least two interior views and one outside view of the home of the maker. The interior views will test the contestant's ability to deal with halation, if taken by day, or the use of a flashlight if taken by night, the arrangement of the furniture to make a good composition, and possibly a wide-angle lens. The outside views must be carefully planned to show the building to the best advantage. More than three pictures may be submitted if desired. We reserve the right to withdraw the prizes unless at least twenty-five entries are made, but if this competition is successful, we shall be encouraged to propose other special subjects. The rules of the competition, except as specified above, will follow our usual practice, and competition coupons must be submitted with each print.

READERS' FORUM

EDITOR OF POPULAR PHOTOGRAPHY

DEAR SIR: Dr. Miller's article in your October number, entitled, "Time Development with Pyro," in which he deals with Professor Wall's formula, caused me to figure the constituent parts of the Wall formula and some other well-known developers with a (to me) surprising result. My knowledge is too limited to permit of my being critical, but in common with thousands of others I am compelled to learn from the experience and teachings of others with expert knowledge. Some of the formulas put forth by men rated high in the craft are, to say the least, confusing to the investigating tyro. When these formulas are reduced to the quantities of the different components to the unit of developer it is seen that the relative strength, other factors of development considered, differs widely.

For the purpose of illustration I will cite three tank formulas for the slow emulsion.

Kodak Film Tank Formula for 3½-in. (40 oz.) Tank

Pyro..... ½ gr. plus to oz. of developer
Sodium sulphite, anhy.... 1 gr. plus to oz. of developer
Sodium carbonate, anhy.. 1 gr. plus to oz. of developer
Time: 20 minutes at 65 degrees.

Watkins's Thermo Tank Formula

Pyro..... 1 gr. to oz. of developer
Sodium sulphite, anhy.....2.74 gr. to oz. of developer
Sodium carbonate, anhy. ....4.37 gr. to oz. of developer
Time: 24 minutes at 60 degrees.

NOTE — For the purpose of comparison, the sodas have been reduced to anhydrous quantities.

Professor Wall's Formula

Pyro.....1.12 gr. to oz. of developer
Sodium sulphite, anhy.....3.35 gr. to oz. of developer
Sodium carbonate, anhy....2.23 gr. to oz. of developer
Time: 20 minutes at 65 degrees.

Allowing for different temperatures the time of development advocated for all of the above solutions is practically the same.

The kodak formula for ten-minute development contains double the quantities prescribed for twenty-minute development, and, if I remember correctly, Mr. Watkins, in his manual, stated that dilution of the developer with an equal quantity of water practically doubles the time of development.

In view of the above the logical inference is that the time of development when using the Watkins or Wall formulas would be ten minutes; and if ten minutes be sufficient, double that time would seem to be too much. Again, if twenty minutes be correct for the Watkins and Wall formulas forty minutes would not be too much for the kodak developer.

Mr. Watkins gives the temperature coefficient of pyro-soda without bromide as 1.5, but Dr. Miller states that he found the temperature coefficient of the Wall developer, which does not differ greatly from the Watkins Thermo Pyro, to be 2.6.

All this tends to confuse those who, though their experience is not wide, take a deep interest in photography.

This letter is submitted in no spirit of controversy but rather in the hope that the writer will learn something of value in regard to this vexing development problem which doubtless is perplexing thousands of others.

I may add that I have used only two developers — the kodak for tank and the Watkins for tray.— L. P. CONWAY.

Our correspondent has raised some extremely interesting points, and, inasmuch as similar theorizings may trouble other readers, we think it well to consider them in order. It is not a safe thing to argue from formulas. As a matter of fact, one cannot use any guide but ex-

periment in determining times of development. Thus, if the regular kodak tank formula takes twenty minutes and Mr. Watkins's formula also takes twenty, it makes absolutely no difference what the proportions are: the twenty minutes is the starting-point, not vice versa. Professor Wall's formula also is standardized for twenty-minute development at 65 degrees, and even though it may not contain the same proportions per ounce, it will be found to work perfectly when used as prescribed. Some time ago Dr. Mees pointed out that the rule for doubling the time when the water was doubled held good only for pyro and glycin. With other developers, the amount of air dissolved in the water altered the time of development out of all proportion to the dilution. Another influence, in the case of the Watkins formula, is the bromide, which was added in order to make the T. C. 1.9 the same as that of M.-Q., rodinal, etc., and allow them all to be used with the same time thermometer.

The T. C. of Wall's pyro was determined with several pairs of plates given normal exposures and developed for first appearance at temperatures exactly 18 degrees Fahrenheit apart, as directed in the Watkins Manual. What formula Mr. Watkins used to get a T. C. of 1.5 for pyro is not known. In any case, a formula has to be tested, not theorized about, and, no matter what the apparent variations in grains per ounce, the experimenter can rely on the times being right if the Thermo tables we have published are followed.

NEWS AND NOTES

Now that the holiday season is over and we've all made more money than we expected to do, it is the time to turn our thoughts to the help of others. That is what Papa Cramer always did as soon as he was through with a hard job — as soon as he had made a bit more money than usual, his heart expanded and he hunted around for someone that he could make happy. How much more fortunate are we who have no necessity for hunting around!

The Cramer Memorial Committee, headed by such men as Phillips, Core, Harris, Noble, Clark, Strauss, Stein, Steckel, Walinger, Knaffl, Hammer, Topliff, Rinehart and MacDonald — men who, every one of them hard workers, are spending their time and giving their money to make the memorial not alone a fitting tribute to the dear old man, but to show the world that photographers are first of all men who are sympathetic, strong and generous, as of course you are.

The signing of the pledge for an unknown sum is in a characteristically American spirit. The sporting instinct in the real American is so strong that the idea was taken up immediately and enthusiastically by dozens of men whom one would have been inclined to set down as conservative. If your business on May 20 amounts to only six dollars, you have only to be glad that you are able to contribute six dollars, and if it amounts to sixty or six hundred, there is all the more reason for being thankful that you have been given the opportunity of being really generous.

As the money will be sent to "Pop" Core, he being the treasurer, and as it has been agreed that the amounts sent in will not be published, the only embarrassing feature has been eliminated. So fill in the adjoining pledge and send it to the treasurer to-day.

A PLEDGE

E. B. Core, Sec.-Treas. Gustav Cramer Memorial Fund,
76 Landscape Ave., Yonkers, N. Y.

I agree to send at the close of business on May 20, 1915, a check equal to the gross amount of the orders received in my establishment during that day, as my contribution to the Gustav Cramer Memorial Fund.

Date .....

Signed .....

We are advised by the Obrig Camera Company that a used No. 3A Folding Pocket Kodak bearing serial number 1638A, and fitted with Goerz Dagor lens, has been lost or stolen from their store. If presented for sale or exchange they would be glad to have it detained and receive notice of the fact.

A new fast plate has been introduced to the American market in the form of the Seed Graflex. In testing this for our Exposure-Table we made comparative exposures of this plate, the Lumière Sigma, Marion Record and Wellington Extreme. In perfectly steady unclouded sunlight, at about 11 A. M., the plates were rapidly exposed in rotation on the same subject, with unchanged shutter speed. The exposures at *f*: 8, *f*: 11, *f*: 16, and *f*: 22 were made with each plate, and all the plates were developed together in a tank. Examination of the negatives showed that the Sigma plates had somewhat greater density in the lights than the other brands, but that this was not accompanied by any increase of shadow detail. The other three plates were so much alike in all respects that it would be impossible to distinguish the negatives if the plates had not been marked in advance. From the standpoint of practical photography, we could detect absolutely no difference in speed between the four brands, which are correctly classed as ½, corresponding to Watkins 500 or Wynne F 156.

"The Cirkut Camera and Its Uses" is the title of a new catalog of the Century Camera Division, which lists the whole line of Cirkut cameras, including not only the familiar large sizes, but also increasing the line so that it now includes cameras for film 5, 6½, 8, 10 and 16 inches in width. We have personally inspected the new models designed for amateur use or the making of narrow panoramas, and they are certainly masterpieces of the camera-maker's art. The No. 6 camera is fitted with a rapid rectilinear lens giving two possible focal lengths, while each of the other numbers is equipped with a convertible lens giving three focal lengths, and therefore three different sizes of image on a single camera. The catalog explains this more fully than we can attempt to do, and we would suggest that all interested readers obtain one from their dealers or by writing to Rochester.

EXPOSURE-TABLES *for* FEBRUARY

DIRECTIONS: Find in the tables printed below the NUMBERS for SUBJECT, STOP, LIGHT, HOUR, and PLATE. Add them, find the sum in the last table, and give the exposure indicated. When the exposure fails to correspond with the speed-marking on shutter, use the nearest shutter-speed, preferably the lower. If sunlight falls over one shoulder, add **0**; if straight across subject, add **1**; if sun is ahead, add **2**. When using back combination only of lens, add **2**.

EXAMPLE

Average landscape	3	July, 11 A. M.	0
Stop U. S. No. 8	6	N-C film	1½
Intense light	0		

Adding these numbers, we get **10½**, and on referring to the last table, under **10½**, we find **1-40** second, which is the exposure to give. In this case you would use the speed marked **1-50** and open the lens a little, if possible; say, half-way to U. S. No. 4.

SUBJECT

Sea (only) and clouds	½	Street scenes, buildings, groups	5
Sea-views, snow-scenes, distant landscape	1	Portraits in shade	7
Open landscape, without foreground	2	Indoor portraits	8 to 10
Average landscape, with foreground	3	Interiors	16

STOP: —

f:2	*f*:2.3	*f*:2.8	*f*:3.3	*f*:4	*f*:4.7	*f*:5.6	*f*:6.7	*f*:8	*f*:11.3	*f*:16	*f*:22	*f*:32	*f*:45	*f*:64
				U.S. 1	U.S. 1.4	U.S. 2	U.S. 2.8	U.S. 4	U.S. 8	U. S. 16	U. S. 32	U. S. 64	U.S.128	U.S.256
1	1½	2	2½	3	3½	4	4½	5	6	7	8	9	10	11

LIGHT: Intense sunlight (inky-black shadows), **0**; Bright sunlight (strong shadows), ⅓; Faint shadow cast by sun, **1**; Dull (no shadows), 1⅓; Very Dull (whole sky very dark), **2**.

HOUR: 11 a.m. to 1 p.m., ⅓; 10 a.m. and 2 p.m., **1**; 9 a.m. and 3 p.m., **1**; 8 a.m. and 4 p.m., **2**; 7 a.m. and 7 p.m., **5**.

PLATE: AMERICAN, 1⅓. ANSCO FILM, 1⅓. BARNET — Film, 1⅓; Superspeed Ortho., **1**; Ortho. Ex. Rap., **2**; Red Seal, **1**; Red Diamond, 1⅓; Self-screen Ortho., **2**. CENTRAL — Special XX and Sp. Home Portrait, ⅔; Special, **1**; Comet, Colornon, and Pan-Ortho., 1⅓. CRAMER — Crown, **1**; Anchor, **2**; Banner, 1⅓; Inst. Iso., 1⅔; Med. Iso., **2**; Commercial Isonon, 2⅔; Portrait Isonon, 1⅔; Trichromatic, **3**; Slow Iso., **5**; Contrast, **9**. DEFENDER — Vulcan, **1**; Vulcan film, 1⅔; Ortho., **2**; Non-hal. Ortho., **2**; Slow, **9**; Process, **9**. DUFAY DIOPTICHROME, **7**. EASTMAN — Motion Picture Film, **1**; Portrait Film, **1**. ENSIGN FILM, 1⅓. FORBES—Challenge, 1⅓. HAMMER—Sp. Ex. Fast, **1**; Ex. Fast, **1**; Aurora Ex. Fast, 1⅔; Ortho. Ex. Fast, 1⅔; Ortho. Non-hal. **2**; Fast, **2**; Ortho. Slow, 2⅔; Slow, 2⅔. ILFORD—Monarch, **1**; Zenith, 1⅔; Sp. Rap., **2**; Chromatic, 2⅔; Ord., **3**; Process, **9**. IMPERIAL—Flash-light, **1**; Spec. Sensitive, **1**; Orthochrome S. S., **1**; Spec. Rap. 225, 1⅔; Spec. Rapid 200, **2**; Non-filter, **2**; Process, **9**. JOUGLA — Violet Label, 1⅔; Green Label, **2**; Omnicolore, **7**. KODAK—Speed Film, **1**; N. C. Film, 1⅓. KODOID PLATES, 1⅓. LUMIERE—Sigma, ⅔; Blue Label, 1⅔; Film, 1⅔; Ortho. A, **2**; Ortho. B, **2**; Panchro. C, **2**; Autochrome (outdoors), **8**, (indoors) **9**; Process **9**. MARION — Record, ⅔; P.S., **1**. PAGET—XXX, 2⅔; XXXXX, **2**; Swift, **1**; Ex. Spec. Rapid, **1**; Ortho. Ex. Spec. Rapid, 1⅔; Panchro. Ord., **2**; Panchro. Colour (no screen), 2⅔; Spec. Rapid, 1⅔; Hydra Panchro., 3⅓; Hydra Rapid, 3⅓. PREMO FILM PACK, 1⅓. ROEBUCK—Blue Label, **1**; D. C. Ortho., **2**; Ortho., **2**. SEED — Graflex, ⅓; Gilt-edge 30, **1**; Color Value, **1**; Gilt-edge 27, 1⅔; L. Ortho., 1⅓; 26X, **2**; Non-hal., **2**; Non-hal. L. Ortho., **2**; Tropical, **2**; C. Ortho., 2⅔; Panchromatic, 2⅔; 23, **3**; Process, **9**. STANDARD — Extra, 1⅔; Imperial Portrait, 1⅔; Orthonon, 1⅔; Polychrome, 1⅔; Thermic, 1⅔. STANLEY — 50, 1⅔; Commercial, **4**. THORNWARD — Regular, **1**; Orthochromatic, **2**; Orthochromatic N. H., **2**. WELLINGTON — Extreme, ⅔; 'Xtra Speedy, **1**; Film, 1⅔; Iso. Speedy, 1⅔; Portrait Speedy, 1⅔; Anti-screen, 1⅔; Speedy Spec. Rap., **2**; Ortho. Process, **9**. WRATTEN & WAINWRIGHT — Panchromatic, 1⅔; Process Panchromatic, **3**.

3½	S 1/3000	4	S 1/1000	4½	S 1/2500	5	S 1/3000	5½	S 1/1250	6	S 1/1000	6½	S 1/700	7	S 1/300
7½	S 1/350	8	S 1/250	8½	S 1/150	9	S 1/100	9½	S 1/75	10	S 1/50	10½	S 1/40	11	S 1/25
11½	S 1/30	12	S 1/15	12½	S 1/10	13	S 1/8	13½	S 1/5	14	S 1/4	14½	S 3/8	15	S ½
15½	S ¾	16	S 1	16½	S 1½	17	S 2	17½	S 3	18	S 4	18½	S 5½	19	S 7½
19½	S 11	20	S 15	20½	S 23	21	S 30	21½	S 45	22	M 1	22½	M 1½	23	M 2
23½	M 3	24	M 4	24½	M 6	25	M 8	25½	M 12	26	M 15	26½	M 24	27	M 30
27½	M 45	28	H 1	28½	H 1½	29	H 2	29½	H 3	30	H 4	30½	H 6	31	H 8

These tables are based on the 1914 edition of the "American Photography Exposure-Tables," a new and revised form of the "Photo Beacon Exposure Card." Owing to the great increase in the speed of lenses and plates since the original compilation of these tables, it has been necessary to completely change the system of numbers corresponding to stops, plates and exposures, so that exposure numbers from this table are 5 units higher than in the old tables. The complete tables, in pocket form, 3 x 5 inches, containing full directions for obtaining correct exposure under all conditions, may be obtained from our publishers at the price of 25 cents postpaid.

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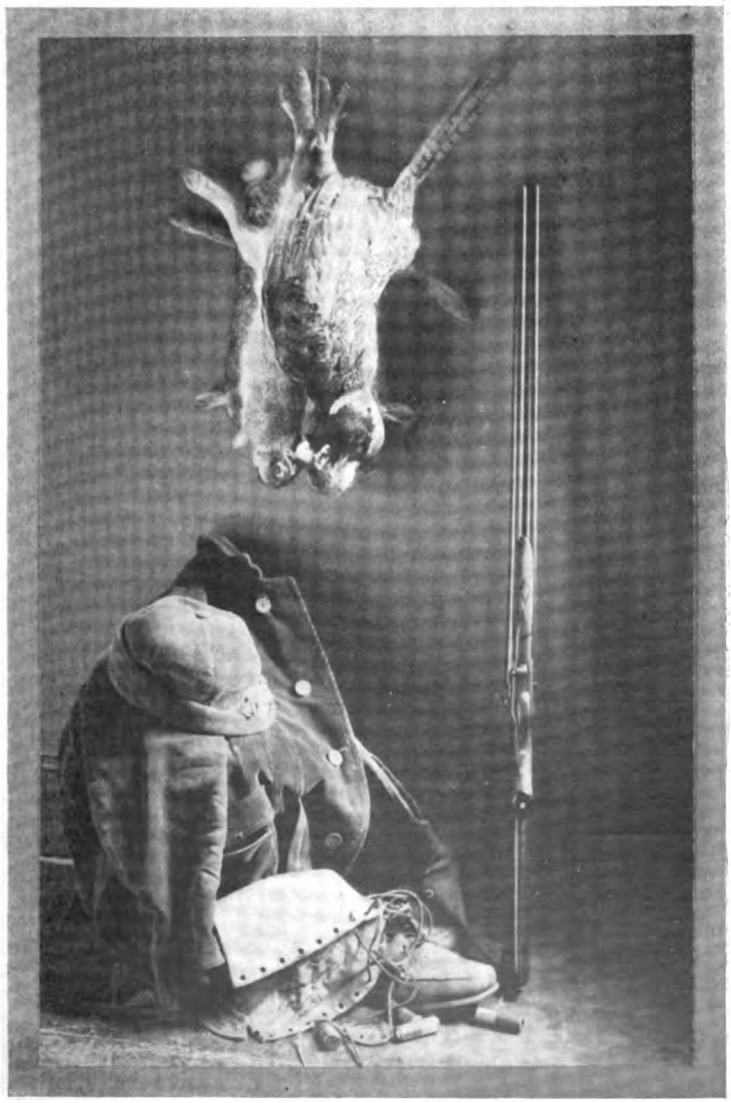


STILL LIFE — L. O. BOGART

(See page 225)

SPEEDING STARK WEATHERALL

SPEEDING

Many of our older readers are not as careful in their technique as Master Weatherall, who is only sixteen and has not been making pictures very long. He sends in every month something good from a photographic point of view, and his compositions are generally simple and well planned. The picture reproduced here is no exception. Data: 3A Ansco with 6½-inch R. R. lens; Eastman film; 1-50 second at *f*: 8 in intense sunlight in October at 10 a. m.; pyro tank development; Normal Studio Cyko postcard.

THE TWO THERMO PLANS

One of our readers is disturbed because in his article on Thermo Development Mr. Charles W. Fricke gives but one strength of developer, instead of a series of strengths. as in Dr. Miller's article.

Mr. Fricke's table is worked out on Mr. Alfred Watkins' original plan of Thermo Development, which is now called Method A. The other plan is Method B. Either one is perfectly workable. In fact, a reader recently objected to the dilution method because it was so expensive to employ a strong rodinal for the slow-developing plates. He asked for a method by which he could use a fixed dilution of rodinal and vary the time for each temperature. Full information by which the user can draw up his own tables is given in *The Watkins Manual*, which we can supply at 60 cents a copy, postpaid. As Mr. Fricke's article shows, each group of plates has a different time for every degree of temperature but this would not bother a person who used but one brand. A simple way of obtaining the sliding scale which allows drawing up a table, or can be used direct, is to expend 25 cents on a package of Watkins Time Developer. This comes in powder and liquid forms, each accompanied by a sliding scale for calculating times, and these times will be found correct for all developers having a T. C. of 1.9, viz., Thermo pyro-soda, M.-Q.; and the rodinal group.

We experimented for several years with Method A without definitely adopting Thermo development; but when Method B was introduced, we took it up and worked on it for a year under all conditions and then became convinced that it was the only scientific method of development which was quite simple and convenient in practice. For instance, a fixed time for *all* plates at a given degree is easy to remember; also the dilutions stick readily in one's mind. When room temperature is accepted as the standard and water is kept standing ready for use, development is simplified because a given room will not vary greatly in temperature and a glance at a thermometer hanging beside (or immersed in) the water establishes the time. There is a myth that development at 65 degrees gives a better negative than can be secured at any other temperature. Thermo development disproves that idea. Too hot a developer, of course, may injure the gelatine or make the negative coarse-grained. With D.-Q., however, we have got most excellent negatives at 80 degrees. Too cold a developer taxes one's patience; but it gives just as good a negative as a solution at 65 degrees if the time is correct. Life is too short for most workers to attempt to use any system which expects one to *keep* a developer at 65 degrees, unless that happens to be the temperature of the room.

A few readers think the Thermo system is too expensive because only one plate is developed in a given portion of solution. In a flat-bottomed tray, 1½ oz. will cover a

MILDRED
MRS. WILMA B. McDEVITT
First Prize, January Competition *(See Page 227)*

"OO! PICTURES!" CHAS. BRODSKY

4 x 5 or 3¼ x 5½ plate. Saving the used developer for paper is entirely practicable, with D.-Q., at any rate. The used M.-Q. does not keep so well and cannot be used until exhausted without danger of stain. To our mind, it is the most certain economy to use a new developer for each plate, as it costs only a fraction of a cent and is worth a great deal in the saving of expensive plates.

CHOOSING A MINIATURE CAMERA

One of our subscribers writes: "Having looked through scores of catalogs of the various types of miniature cameras on the market, and having corresponded with several dealers, I am still in darkness about a vital point, and that is whether to choose an *f*: 4.5 or an *f*: 6.8 lens. My idea is a camera 2¼ x 3¼ fitted with a 3½-inch lens.

"My present outfit consists of a 4 x 5 long focus camera with 7-inch Zeiss Protar in Volute shutter. I get perfect enlargements to 16 x 20, and most of them I enlarge to 6½ x 8½; but this outfit being rather heavy, I cannot carry it constantly and so lose many a good picture. I would also intend to use the small camera for enlargements, probably to 5 x 7.

"As miniature cameras are very expensive, I would greatly appreciate information as to whether an *f*:4.5 lens is of very much greater advantage than an *f*: 6.8, having already read in Popular Photography that negatives made with *f*: 6.8 lenses were better timed than those made with *f*:4.5 lenses. How does this hold up if an *f*:4.5 lens is stopped to *f*:6.8? Is the No. 00 Compound shutter preferable to the No. 0? What film is the finest grained?"

A good way of settling the question of speed is to figure out the hyperfocal distances for the two lenses. A 3½-inch lens at *f*:4.5 has a hyperfocal distance of about 22 feet, but at *f*: 6.8 the hyperfocal distance is 14 feet. In other words, the smaller stop gives much greater depth of field, and distances do not have to be estimated with so great accuracy. The question then becomes, is it worth while to sacrifice the wonderful power of extra exposure offered by the large aperture in favor of increased depth of field? The answer depends chiefly on the depth of one's pocketbook. The *f*: 4.5 lens must be focused with greater precision for enlarging or the negatives will not stand much amplification: stopped down to *f*: 6.8, it gives exactly the same results as the cheaper lens. If money is no object, the faster lens should be chosen.

We think our reader is mistaken about *f*: 6.8 negatives being better timed. A lens working at *f*: 4.5 of course allows much shorter snaps to get the same amount of exposure on the plate: the chief difference is in the brilliancy and roundness of the image, which is certainly better with the faster lens. At the same stop both lenses require precisely the same time.

The 00 Compound works slightly faster than the No. 0, the shortest exposures being respectively 1-300 and 1-250; but there is otherwise nothing to prefer in one as compared to the other. It is simply a question of the actual free aperture of the shutter needed to give the full speed of the lens. Some *f*: 4.5 lenses cannot be fitted into the 00 size without having their speed reduced, so the No. 0 would have to be used if the camera was large enough to receive it.

We have never tested the different films for fineness of grain but believe any of the regular films would be quite satisfactory for enlarging without showing grain, unless developed in pyro at too high a temperature.

"OO! PICTURES!"

The general spacing of this picture is good, but there are some minor details which should have received attention before the flash was fired. One is the piece of paper under the

chair. The other is the concentration of the reflected light in one patch on the wall. This looks, however, as though it had been done by local reduction on the negative. The white stockings are unfortunate, one way, as attracting too much attention, though from another point of view they serve as a connecting value in carrying the eye from the floor to the book, whence it travels to the face. The maker can probably improve on this result by studying different posings and lightings without making exposures. Data: 5 x 7 Korona VI camera fitted with Series IIb Tessar lens of 7 1-16 inches' focus; flashlight; *f*: 8; Hammer Special (Red Label) plate; Hammer pyro formula; print on Azo E Hard X.

PAPA'S PET

Mr. Nelson has fallen into a pitfall which lies in wait for the amateur when he first essays to use a background in his portraiture. A glance at the reproduction shows that the ground was altogether too near the figure. The fault of having the ground in focus was made worse by the use of *f*: 16, which unnecessarily increased the depth of the field of sharp focus. The ground should have been at least three feet behind the child and stop *f*: 8 should have been used, in which case 1-5 second would have been ample and several minor faults of pose could have been avoided. A medium stop should never be used for a portrait if a larger one can be made to give sufficiently good definition, for the small stop tends to exaggerate skin defects and to give a generally hard effect. Data: 3¼ x 5½ Seneca No. 9 camera with R. R. lens; ½ second at 12.30 p. m. in June in shade of north porch; Hammer Red Label Plate; tank development (negative very dense and a slow printer), Normal Cyko Semi-Matte.

THE NEW THERMO CARD

One of our readers, representing many who have made similar requests, says, "The article on Scientific Development in the June, 1914, issue lifted me out of the depths of ignorance when I was using pyro powders and having an awful time to keep the water at 65 degrees. Could you not furnish the Thermo tables for several developers, including pyro, in a form suitable for hanging up in the darkroom where they would be handy for instant reference?"

We originally copied out all the Thermo data on a large sheet of paper for our own use and pasted it to the wall. The next step was to cut two copies of the magazine and paste the printed data on a single sheet. Then, when the demand for back numbers threatened

PAPA'S PET · G. A. NELSON

to exhaust the small surplus of the June issue, we had the material set up in the form of a large, heavy card, with eyelet for hanging. This will be found advertised in this issue at 25 cents a copy postpaid. It gives full directions for Watkins Thermo Pyro-Soda, Modified Thermo M.-Q., and the rodinal group of concentrated one-solution developers, all of which have a temperature-coefficient of 1.9. It gives also Modified Thermo D. Q., which has a different table of times, as its T. C. is 2.6.

We believe that readers will find this card of the greatest assistance in their work, as it concentrates in one place all the information needed to work the Thermo system successfully. It should be noted particularly that the remedy for fog in tank development, viz., extra sulphite, is given on the card.

PLATE SPEEDS IN YELLOW LIGHT

Supplementing our remarks on the relative speed of class ½ and class 1½ plates in blue and yellow lights, a subscriber writes: "I was very much interested in your results with ortho plates in the yellow light we have in the

"YOU'RE IT" GEO. VERBER

winter. I loaded my plate-holders on Thanksgiving Day with Lumière Sigma, Seed 30, and Barnet Super Speed Ortho and took 12 exposures one after the other at 1-800 second. There was not any perceptible difference in the deposit on all three brands of plates, although there was some difference in the degree of contrast."

A PORTRAIT

Judging from the data, this is professional work, a fact which is made more evident by inspection of the carefully-done retouching of the face. There are, notwithstanding, two faults which even professionals sometimes allow to creep into their work. The first is the close trimming at the bottom; the second, the failure to even up the focus by use of the side swing. We well remember hearing a photographer of national prominence exclaim with astonishment when shown the action of the vertical and side swings on his portrait camera, he having used the instrument for years without daring to touch either adjustment and having, of course, unnecessarily handicapped himself by using small stops to secure depth when he might have focused with the swings. Although that particular man was the most glaring example we have ever seen, there are plenty of other workers, both professional and amateur, who neglect to use their swings. A point to note particularly is that the hand toward the lens is not exaggerated in size, due to the use of a lens of long focus at a sufficient distance from the subject. Data: 8 x 10 Century camera fitted with a Cooke portrait anastigmat lens of 14 inches' focus and *f*: 5.6 aperture; 3 seconds at *f*: 5.6 at 10 a. m. in November in bright north light; Central Special plate; pyro; print on Studio Cyko.

"YOU'RE IT"

The object in making this picture, we are told, was to experiment in posing. Disregarding all other criticisms, most of which we have repeated so often that our readers must know them by instinct when they see the background, let us take up this one point. The pose is excellent in all respects save that the child does not look animated enough for the supposed circumstances of a game of tag. A more natural effect could be secured with a reflecting camera during an actual game. The foreshortening of the figure is good, showing that the lens was placed at about the right height. The picture was made with a 5 x 7 Seneca at 3.30 p. m. in August, an exposure of 1-5 second at *f*: 16 having been given to the Eastman Plastic plate, which was developed in M.-Q. and printed on an Azo Hard Gloss card.

A PORTRAIT C. E. HOPSECKER

WATER NYMPHS O. HOLMES

WATER NYMPHS

An otherwise excellent enlargement has been spoiled by the failure of the contestant to follow one of the absolutely inflexible rules, viz., that the horizon line shall be parallel to the base of the print. There is about 1-8 in. difference between the two ends, measuring to the top. Trimmed square, there would be nothing to criticize. Data: 1A F. P. K. with R. R. lens; 1-25 second on a July afternoon in bright sunlight; Ansco film; M.-Q. tank; rough bromide enlargement.

STILL LIFE

(*See page 219*)

Mr. Bogart points out the following faults in his picture: First, underexposure and overdevelopment; second, "the gun should have been in a position less stiff and formal, thrown carelessly across the coat"; third, development was carried too far, and, though the highlights have been somewhat reduced, the print is not entirely satisfactory.

The basic difficulty, of course, is poor arrangement. The line of the gun, parallel to the margin, is bad. The massing is too heavy on the left. A better arrangement would have been to hang the game about where the muzzles of the shotgun come and move the clothes in a bit, allowing the gun to rest diagonally across them so as to point toward the game and furnish thus a line connecting the two related masses. The second difficulty was found in the coloring and lighting of the subject. The best possible effect could be obtained only by using a red-sensitive plate with a fully correcting filter. Good combinations are Cramer's Spectrum plate with Isos III filter and Wratten Panchromatic with K 3 screen. Second choice would be an orthochromatic plate with filter. The lighting; in any case, should have been softened by using a white reflector to break up the dense shadows. Overdevelopment could have been avoided and reduction of dense highlights obviated by Thermo development. Mr. Bogart's data show that he made the picture at *f*: 11 on a Stanley plate, giving 70 seconds in very poor light at 3 p.m. in November. The camera used was a Premo with R. R. lens. Overdevelopment was with pyro, and the print is on Azo B Soft.

AN ALL-ROUND CAMERA

A physician writes that he has several times got himself into trouble by buying cameras without advice, so this time he asks us to help him. He wishes to secure an instrument with which to do landscapes,

IN THE WOODS P. J. SMITH

pathological work, interiors, portraits, etc. — in fact, a camera which will do general photography and do it as well as a general-purpose instrument can do it. He is thinking of a 5 x 7 with convertible anastigmat lens, and price is a secondary consideration. He concludes, "If you will give me the information I need, just as though you were buying the camera yourself, through POPULAR PHOTOGRAPHY, I shall be greatly obliged to you."

There is only one general type of camera which will fully cover all the subjects mentioned, and that is a triple-extension instrument. Of this there are two sorts, the folding box form and the view camera. Each has its advantages; but the view camera is generally lighter and handier, and we are inclined to give it the preference. View cameras have been greatly improved of late years, so that most makes in the 5 x 7 size are extremely desirable.

Regarding shutters, almost any form will do, though of course the high-grade Compound, Optimo, and Acme are preferable.

The lens, too, should be the best obtainable. One having the convertible feature is to be preferred, and the speed should be at least *f*: 6.8. A faster lens, for instance a Collinear *f*: 5.4, or a Euryplan *f*: 4.5 of 8¼ inches' focus would be of great advantage in portrait and pathological work. There are several other good convertible lenses which would give the necessary speed for the doublet and double the focal-length for the single combination and which can be found by reference to the catalogs of makers advertising in this magazine and in *American Photography*.

Regarding pathological work, we would refer the Doctor to two articles by Dr. Malcolm Dean Miller, on "Medical Photography," printed in the June and July, 1912, issues of "The American Journal of Clinical Medicine," published at Chicago.

A good anastigmatic wide-angle lens would be a useful addition to the outfit. The slow convertible anastigmats, such as the Dagor, are particularly good as wide-angle lenses on a larger plate. A 6-inch would be excellent for this outfit.

IN THE WOODS

As a record, little fault can be found with this postcard except that it is not properly finished. A suitable mask to produce a clean white margin should be cut from the black needle paper in which the postcards were wrapped and carefully glued to a sheet of plain glass. Then all the prints would appear with a neat margin. No data were sent with the picture.

THIN NEGATIVES

Most of the old-fashioned instruction books say that, on account of the cold, negatives are likely to be thinner in winter than in summer. The reason for this is that the operator loses patience because development is so prolonged by the low temperature, and takes them out too soon. Thinness, then, may be the result of insufficient development, when the exposure, all along, has been sufficient.

Another cause for thinness in negatives is taking overexposed plates out as soon as the image is buried. If the overtime has been moderate, development for the same time as in the case of a correct exposure will give a very dense negative.

Both of the kinds of thin negatives mentioned above are the result of mistakes in judging development. When the Thermo system is used, thinness is invariably the result of underexposure, as any reader can prove by exposing two plates on the same subject, giving one the full time called for by our tables, and the other half as much. It is advisable, in all cases, to reduce photographic processess to certainties, so the tables or some other method of estimating the normal full exposure should always be used. Then, if one desires, for a particular purpose, a thinner negative, the developer may be used weaker and the result attained with precision. At the same time, should one decide in favor of a heavy negative, it could easily be produced from a fully-timed plate by using the developer stronger and developing for the same time. The undertimed plate, however, would give a thin negative even in a strong solution.

MILDRED

(*See page 221*)

We take pleasure in awarding to this charming home portrait the first prize in our current competition. There is nothing in this picture which could not be duplicated in any household with even the simplest outfit. One great charm of the picture is that sufficient exposure has been given so that there is full detail even in the shadows, and the texture and quality of the various essentials of the picture are satisfactorily rendered. The white bow on the little girl's hair would better have been removed, but is not obtrusive, and the two most serious defects are the dark chair back and their regular shadows on the wall. Neither of these however really divert the attention very much from the face, which is the principal part of the picture. The picture was taken with a 4 x 5 Eastman camera, fitted with a rapid rectilinear lens. The exposure was one second at stop U.S. 4, at 1 p. m. in February, with bright sunlight, and snow outside. The Eastman film was developed in Eastman film tank powders. The print is an 8 x 10 Enlargement on Studio Enlarging Cyko.

A GROUP OF TREES

A full description of the circumstances convinces us that this picture could have been improved only by giving more exposure. There is, however, no adequate reason stated for the maker's not having had a tripod along so that a better viewpoint might have been adopted. Lately some ingenious clamps have been marketed, available for supporting a camera

A GROUP OF TREES E. V. BOWERS

on a treetrunk, so next season tripod advantages will be available even on camping or hunting trips. The negative as it stands at present can be greatly improved by local reduction of scattered highlights. Data: 3A Kodak with R. R. lens; 2 seconds at *f*: 45 in September at 11 a. m. in bright light; Eastman film; M.-Q. tray development; print on Instanto Soft Semi-Matte.

AN OUTFIT FOR HOME PORTRAITURE

One of our readers has been working with a triple-extension 4 x 5 camera and has reached the point where his neighbors are asking him to make pictures of their children in home surroundings. He is much perplexed over the choice of a better outfit. One scheme is to get a fast anastigmat for the 4 x 5; another, to get a 5 x 7 outfit with R. R. lens. A dealer has a bargain in a good *f*: 6.3 4 x 5 anastigmat in a poor shutter, the price of which is about the same as that of a 5 x 7 outfit.

FOUR-MILE CREEK CARL BUCKEL

When one is selecting an outfit for just one kind of work and must make every cent go as far as possible, it is very hard to decide what is best. We feel, however, that our reader would make a great mistake to get a lens as slow as *f*:6.3 if the work is to be mostly on children, for what is needed for them is certainly an *f*: 4.5 objective in a perfectly silent shutter in front of a class ½ plate. In the circumstances, we should retain the 4 x 5 and advertise in the Classified Department for a 6- or 7-inch *f*: 4.5 lens and shutter, at the same time watching the ads. and writing to the various dealers for a second-hand lens of this description. The small outfit, with its results enlarged, would answer admirably and would soon bring in enough money to allow the user to select any camera or accessories which his experience pointed to as valuable. Many of the best pictures of children are made with a reflecting camera, but the noise of the focal-plane shutter is sometimes disastrous.

FOUR-MILE CREEK

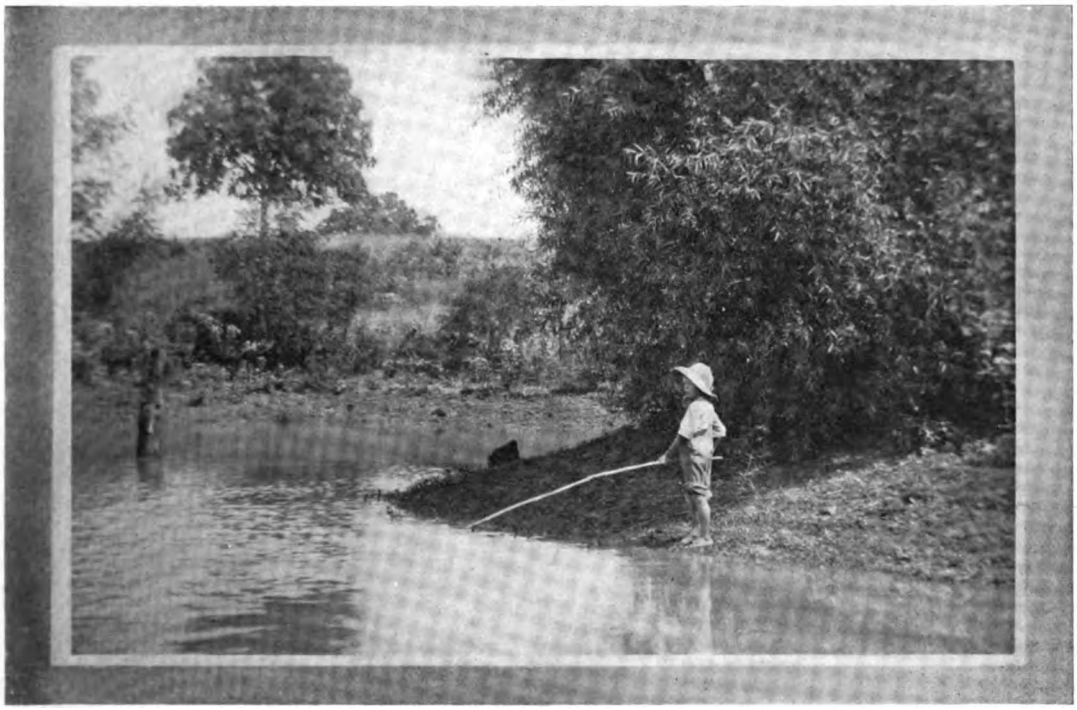
The maker of this print thinks that he printed too deeply, in which we agree with him. The remedy, when one has to overprint the shadows in order to get all the gradation in the lights, is to use the softer grade of paper. The exposure was correctly calculated by our tables for an average landscape with foreground (as there is a patch of dark color in the near foreground), but the print is blocked up so badly that one would think the negative undertimed. The point of view was not the best possible, as it included a patch of white sky right on the left margin (removable by trimming) and brought the exit upstream too far to the right. A position just a foot or two farther to the left would have made a vast difference. Data: 3¼ x 5½ Ansco No. 10, with R. R. lens having a focal length of 6½ inches; 1-5 second at *f*: 11 at 4 p. m. in October; faint shadow cast by sun; Ansco film; print on Regular Velvet Velox.

JUST FISHING

This interesting landscape is a good example of how to make a small figure effective by means of contrast. The boy and his fishing rod in full sunlight are very effectively relieved against the shadows just behind him and consequently are strong enough to hold the attention and dominate the whole print. The picture has story telling value and is technically an excellent print, the exposure and printing being entirely satisfactory. Taken with a 5 x 7 No. 9 Seneca camera, with Eurynar *f*: 5, 4 lens, 7 inches front combination. The exposure was 1-5 second at stop *f*: 11, at 10.30 a. m. in August in bright light. The Stanley 50 plate was developed in Hydrometol and the print is on Argo Normal Velour.

COMPARATIVE EFFICIENCY OF SHUTTERS

A user of a focal-plane reflecting camera writes as follows. "In the article on Efficiency of Shutters in the January, 1915, issue, did you put a fair test up to the focal-plane shutter



JUST FISHING F. O. SCHOEPPAL

Second Prize, January Competition

when you used a speed as slow as 1-10 second? — especially as you conclude the article with the statement that '*this test* confirmed what we had so often proved in a practical way, that it (the Multispeed) gives extraordinarily full exposures and doubtless has an average efficiency *on all speeds* fully equal to or greater than that of the focal-plane.'

"As I understand it, the focal-plane has its alleged superiority in light-passing qualities from the fact that the lens is wide open during the entire exposure. This, I believe, is not true of the Multispeed. I quote from their catalog: 'If a between-the-lens shutter, even ours, consumes a certain time before coming to a full opening and a certain time for closing again, the lens will not be fully open during the whole length of the exposure but is opened to *its maxium* only during a short interval.' I believe I could take just a cap and get as full exposure as you would get with your Multispeed, provided we made exposures of, say 5 or 10 seconds. Conversely, I think I might get better exposures with a high-grade focal-plane shutter at 1-500 than I could get with a Multispeed, as theoretically at least the time consumed in opening and shutting the blades in the Multispeed at that speed would be greater in proportion to the full time of exposure than it would be at 1-10 second. I think possibly the trouble in a lot of these comparisons between focal-plane shutters and such a shutter as the Multispeed lies in the fact that any shutter which works on the focal-plane principle is classed as a focal-plane, whether it happens to be cheap and inefficient or not, and it is compared with the Multispeed, which is probably the most efficient of the between-the-lens shutters.

"I have a Marion & Company Soho Reflex with a very smooth-working focal-plane shutter with speeds from 1-16 to 1-800 second, which are guaranteed to be correct, and some day I hope to 'stack it up against' a Multispeed. When I do, I'll send you the negatives. If you had criticised the focal-plane on account of distortions, I would not have had a word to say. Personally, I've never had any trouble from that source, but from the very principle upon which it works, distortion is bound (sic) to occur in some cases."

Now, as a matter of fact, the test described in our January issue was under conditions favorable to the focal-plane and unfavorable to the Multispeed, for the latter is unquestionably working at its lowest efficiency on slow speeds, whereas the opposite state of affairs holds for the focal-plane shutter. One has only

THE BANDSTAND F. A. DOBBERMAN

to watch the opening and closing of the blades at 1-10 second to observe that they open with fair rapidity, remain open a relatively long time while being carried along with the blade ring, and then close very slowly and gradually against the resistance of the retard pump. We have not measured the efficiency, but it is the opinion of a competent physicist who has tested many shutters of both types, that the Multispeed is very inefficient on its retarded speeds, as compared to the speeds above 1-100 second. At the same time, it proves in practise to give very full time, partly, no doubt, because of the peculiar travel of the wide-open aperture and closing from a different point, and partly because the very powerful spring, even on the lowest tension, does open the blades quickly. Still, assuming its efficient exposure on the retarded speeds as only 50 per cent, let us next examine the facts regarding the average data of both classes of shutters.

Some years ago there was published in *The British Journal of Photography* an article by a worker at the National Physical Laboratories at Kew, based on tests of 11 focal-plane and a larger number of between-lens shutters. It showed an average efficiency for all speeds of about 85 per cent for both types. It was pointed out that the efficiency of the focal-plane was greatest when its slit was widest and least when it was narrowest. It was further pointed out that most between-lens shutters had a real advantage in the possession of the slow snapshots and were reasonably efficient on them, there being practically the same percentage of efficiency on both high and low speeds.

Tests made by the American physicist already alluded to, Mr. J. P. Maxfield, formerly an instructor at the Massachusetts Institute of Technology, proved that his own reflecting camera, an expensive sort, had an efficiency of only 50 per cent on the highest speed and actual duration of about 1-400, hence the marked 1-1000 was about 1-800. The highest actual exposure given by any focal-plane shutter tested was 1-500 second. A number of Multispeed shutters were also tested for actual duration of exposure. The particular shutter mentioned in the article in the January issue was reported on as follows by this investigator:

No. of Turns	*Rated Speed*	*Total Duration*
½	1–200	1–135
1	1–500	1–195
1½	1–800	1–256
2	1–1300	1–275
2½	1–2000	1–325

Our own tests of the retarded speeds proved that when the spring tension was adjusted so as to make the 1 second accurate within 5 or 10 per cent, all the other speeds were accurate within the same limits except the marked 1-25, which was about 1-18.

If we assume an efficiency of 85 per cent for the Multispeed when not operated with the retard, the highest efficient exposure would be about one quarter that claimed in the catalog. This marked extravagance of assertion has always injured this shutter in the opinion of judicious persons; but the fact remains that the shutter performs the feat of "stopping motion" which cannot be handled with the focal-plane shutter. Then too, if the efficient exposure be so far below what is claimed, it explains why the shutter gives such full exposures on high tensions, for the talk about 1-1300 etc. is all moonshine. The fact is that a shutter working at the lens does not have to work so fast to stop the motion as one operating at the focal-plane, and work can be done on tensions 4 and 5 with a Multispeed which cannot be done at all with any focal-plane shutter, at the same time giving absence of blur and adequate exposure.

HALF DOME, YOSEMITE VALLEY C. F. ROBERTS

THE BANDSTAND

Considered purely as a record for a collection of park pictures, this print is fairly satisfactory. We notice, however, evidences of considerable granularity in the negative, probably caused by the running together of tiny globules of gelatine owing to development or drying at too high a temperature. As the plate was exposed in August, the latter alone may be responsible for the coarse grain, or both causes may have been contributory. In hot weather, particularly if the humidity is high, a fan is sometimes worth a great deal to the photographer. Data: 5 x 7 Premo camera with planatograph (R. R.) lens of 8 inches' focus; 1-25 second at *f*: 16 in August at 3 p. m.; good light; Seed Color Value plate; M.-Q.; print on Instanto Hard Gloss.

ORTOL IN TABLET FORM

A reader asks whether ortol developer can be obtained in the form of tablets. We find that it is furnished by Burroughs Wellcome & Company as "Tabloid" Ortol at 35 cents a carton. Any photographic dealer can obtain it direct from the New York office of this noted English house.

Another convenient form, the one we have always used is Hauff's ortol tubes. One tube contains one-third ounce ortol with some metabisulphite; the other tube, the sodas. Each is dissolved in 20 ounces water and kept as a stock solution.

HALF DOME, YOSEMITE VALLEY

This print is a perfect bit of technique, with no faults worth mentioning save minor points in composition. It is a very pleasing thing to us to be able to point out nothing but excellencies in a picture. Here exposure, development and printing have combined to render a soft, harmonious effect with a maximum of atmosphere. Data: 3A Brownie camera with R. R. lens; 1-25 second at *f*: 16 in July at 3 p. m.; Eastman film; Nepera solution; print on Instanto Soft Semi-Matte.

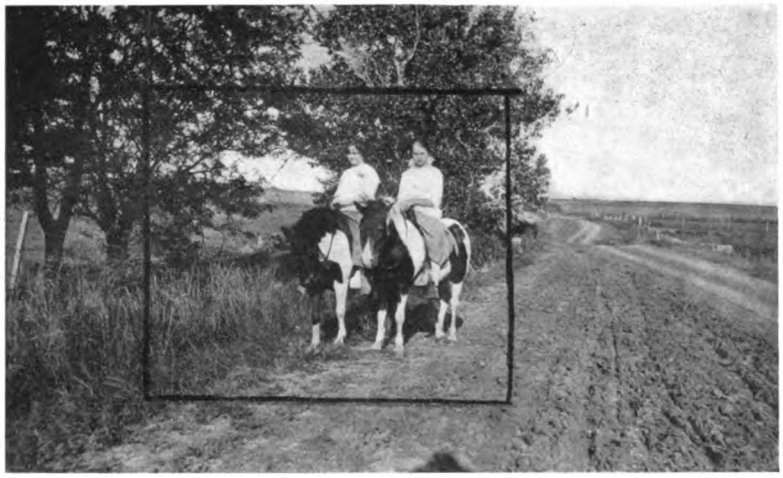
STICKING OF PRINTS

"Constant Reader" inquires for a remedy to prevent his glossy prints from sticking to the ferrotype or squeegee plates.

Our inquirer's pseudonym is not a good one, for we have several times published notes on this subject. The way to prevent sticking of prints is to treat the plates *each time of use* with a waxing solution. A good formula is

Beeswax	20 grains
Turpentine	1 ounce

The well-washed ferrotype plate is dried and then a few drops of the waxing solution are sprinkled on and polished off with a soft cloth free from lint. An old silk handkerchief is best. If the prints are dried and rewetted before squeegeeing, they will not stick to plates prepared with this wax.



SIDETRACKED FOR A PICTURE A. A. JELLISON

SIDETRACKED FOR A PICTURE

The maker of this print says in answer to question 3, "One pony's head has too dark a background to show the outline of the profile clearly. The girls are facing the sun and have to squint too much." These defects could have been seen before taking the picture if the maker had taken a few moments to study the view, and then he would probably have deferred making the record until he could have found a more suitable background and lighting. The small portion included within the lines drawn on the print might, however, make a satisfactory enlargement on bromide paper. The print itself is altogether too black. Data: 3A Kodak with R. R. lens; 1-50 second at *f*: 16 in September at 6 p. m. in intense sunlight; Eastman film; Eastman Special developer; print on Normal Cyko Plat, developed with M.-Q.

RULES FOR PRINT CRITICISM

A reader brings up the point, so we think it well to explain again the rules regarding print criticism in both POPULAR PHOTOGRAPHY and *American Photography*.

Prints sent to POPULAR PHOTOGRAPHY will be criticized *only* if they are selected for reproduction. If a criticism is desired in any event, prints MUST be sent to the Portfolio Department of *American Photography*. Full rules for each magazine will be found printed in the proper coupon, a copy of which appears in each issue, or a supply of which will be sent to anyone on receipt of a 2-cent stamp to pay postage.

It is, of course, possible to send a print to the POPULAR PHOTOGRAPHY Competition and to enclose with it also an *American Photography* Portfolio coupon, properly filled out, in order that it might afterwards be entered for criticism if it failed to be selected for reproduction. Such a course, however, involves delay, and it would save time and trouble to send two separate prints.

REFLECTOR AND GROUND GLASS

A subscriber is using a south window for enlarging. The window is glazed with ground glass and is also provided with a reflector outside; but at times it is impossible to prevent the reflector from casting a shadow on the ground glass. The problem is, whether to dispense with the reflector or not?

If a north window cannot be found, and the south window faces quite unobstructed sky, the reflector can be done away with; but otherwise it will be necessary to use the enlarging apparatus only at such hours as shadows do not form. If artificial light is not available, a better arrangement would be a vertical enlarger.

SULPHITE SOLUTIONS

Anhydrous sulphite is capable of making a 25 per cent solution in water at 65 degrees, but when the temperature falls to about 50 degrees, a part crystallizes out. A 12½ per cent solution, however, remains stable at low temperatures. To make it dissolve 600 grains of dry sulphite in warm water and make up to 10 ounces. This keeps well, does not crystallize out, and should be used in double the quantities called for when using the 25 per cent solution. Four drams of the 12½ per cent solution in 3 oz. of developer gives a sulphite strength of about 10 gr. per oz., which absolutely prevents sulphite fog.

KATHRYN E. B. WOTKYNS

KATHRYN

Our first thought on looking at this portrait is that there is a great deal of unnecessary space above the head. The second is that the emphasis of the lighting is placed on the unimportant part of the figure, throwing the face into subordination. Whether the second objection is a good one or not depends on the thought in the maker's mind. If the idea was to emphasize the act of looking at the lilies, the lighting is the best possible. If the portrait is intended to reveal the personality of the sitter, it is not so suitable. The first principle of portraiture is that the face is the most important portion, so it should generally receive the emphasis of position and of lighting. Notwithstanding these remarks, we hope the reader will not infer that we disapprove of Miss Wotkyn's effort. In the endeavor to counsel perfection we perhaps find fault more freely than readers always like; but we learn by trying to eliminate all defects, not by being satisfied with "good enough." The picture as a whole is well-conceived and well executed. the placing is good. The technical work has been very carefully carried out and as a result the finished print has distinction and charm far above the average. Data: No. 3 Kodak with R. R. lens; 1 second at 3 p. m. in September in bright light at *f*: 16; Eastman Speed film; 5 x 7 sepia enlargement.

THE RACER PETER HINE

THE RACER

Marine views have been rather scarce in our competitions and their quality not up to standard. Here, however, is a good example which teaches several important lessons. The first is that sails against the sky show to greatest advantage when the exposure is made against the light. The second is that the sun may safely be ahead if it is concealed by a cloud, as here. One principle of composition, the placing of the boat with more space ahead than astern, has been followed; but the horizon line comes too near the middle for the best effect. The dark patch at the bottom would seem to have been caused by uneven development. Data: 3A Hawk-Eye camera with 7-inch R. R. lens; 1-25 second at *f*: 11 at 4.15 p. m. in October; Eastman film; M.-Q.; print on Contrast Studio Cyko.

TESTING SHUTTER SPEEDS

Expert mechanics say that it would be impossible to produce a photographic shutter which should be absolutely accurate at *all* speeds from a short snapshot to 1 second without its costing a great deal more than anyone could afford to pay. In the circumstances which surround modern factory practice, however, it is not difficult to make fairly accurate shutters, and modern designs are really remarkably uniform in their excellence, when compared to older styles. Nor is it essential to have the speeds absolutely accurate. It is almost impossible to show in a negative any *slight* variation between exposures, so for practical purposes a change of 50 per cent may be considered the smallest useful variation. The important thing is to know at what speed the shutter really works when it is set for its various marked speeds. The next most important thing is to know whether this speed will be given every time at the same setting. A few plates expended in shutter testing will amply repay the amateur by putting his exposures on a basis of knowledge instead of guesswork. For instance, if the marked 1 second is really ½ second and the marked ½ second is the same, one would resort to a bulb exposure when a real second was wanted, or give two exposures if the shutter were automatic and could be operated without jarring the camera. The marked 1-25 might really be an actual 1-33 or possibly 1-12 or 1-10; similarly, the 1-5 might be anything from 1-20 to 1-2.

As we said before, it does not really matter much what the actual speed is, so long as we know its value and can count on getting it every time. The easiest way to find out is to secure from your dealer a shutter speed tester, which costs two dollars or less. This instrument consists of a pendulum lever, stand, and printed chart. The speed is read off on the negatives by reference to the number of lines, representing hundredths of a second, crossed by the image of the pendulum mirror in its vibration. It takes but a short time to set up the outfit and make a number of readings of each speed on one plate, thus checking the actual duration of exposure and the uniformity of successive exposures.

Users of film cameras would have to provide a supplementary plate back, in most cases, or else devise some means of holding a plate in position in place of the film, unless a portrait attachment or a supplementary copying lens is used to enable focusing at short range so as to make the image of the chart fill the picture space. Knowledge is power, however, and even a considerable amount of trouble would be repaid to the investigator by the improvement in results which would follow the application of known instead of supposed exposures to his work.

WASHING AFTER DEVELOPMENT

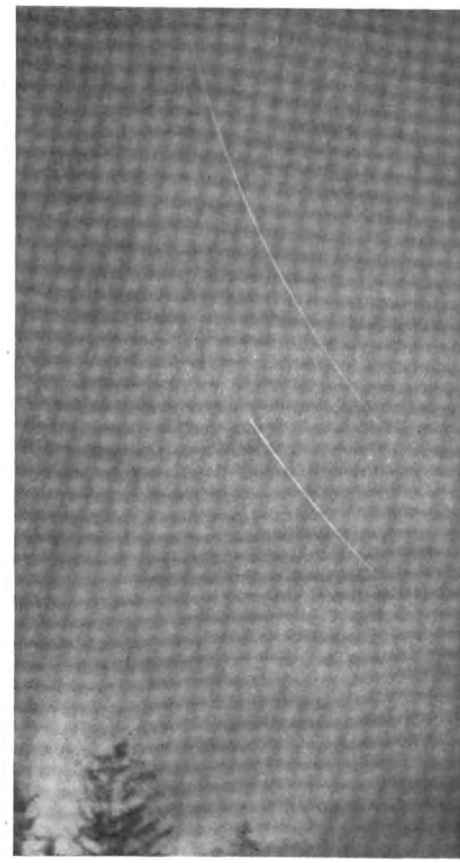
Too long a washing after development is distinctly injurious, if pyro has been used, as it fixes the pyro stain. Most of the other developers require only a brief rinsing. Eikonogen seems to be an exception. We have lost a great many negatives developed in this agent three years ago from stains which have appeared within the last year. Without exception, the stained plates were rinsed by dipping into a tray of water, as at the time no running water was available. A good washing under the faucet would have saved them.

UNAPPRECIATED

It is not strange that few people appreciate this picture — for which reason Miss LaGrange entitles it "Unappreciated." We trust that the readers of POPULAR PHOTOGRAPHY, however, will appreciate it and reproduce herewith the data letter supplied by the maker.

Enclosed you will find a picture of the sky taken on October the twenty-first or twenty-second. The night was somewhat foggy at ten p. m. and only four or five stars were visible from the window from which this picture was taken. I had just begun the study of astronomy and a picture of the five-hour trails of the northern circumpolar stars led me to attempt to take a picture of the stars to prove the diurnal motion of the circumpolar stars. I opened the camera at ten p. m., when it was a little foggy and left the film exposed until 4 a. m., when there was a very, very dense fog. *Why did the fog not destroy the trails of the stars?*

Following are the answers to the questions on the coupon: (1) My curiosity prompted it. (2) Yes. (3) None, because I tried to focus it on one star as I did. (4) Yes indeed, I could improve on it. I would know what stars I was focusing the camera on and would try for a picture on a clear, moonless night if possible. (5) Yes. (6) I do not know. (7) Pretty well. (8) No, I am an amateur, never having taken over two dozen pictures in my life, and had never heard of your magazine until my attention was called to it by a photographer.



UNAPPRECIATED R. S. LA GRANGE

The light coming from below the tree tops came from an electric light. Next time I will endeavor to get above tree tops and street lights, if possible.

Yours truly,

(MISS) RHEA S. LA GRANGE

While developing a photograph in his studio, James Rickert, a photographer of Pennsylvania, thought he recognized a watch and chain dangling from the vest of a foreigner who had recently had his picture taken.

The watch was taken from the studio and the police were unable to find any clew. Securing a warrant the police made a search at the boarding house of the foreigner and discovered the watch, which was returned to Rickert.

IN MADISON SQUARE PARK B. J. WEEBER

IN MADISON SQUARE PARK

In defence of his arrangement, Mr. Weeber says, "It was impossible to get far enough away from the skyscraper to include all of it and still have the Farragut statue of a presentable size." It does not have seemed to him possible to make two pictures, which would have avoided the divided interest which mars his attempt to include both subjects on one plate. The print is not good of either the statue or the Metropolitan Building. Halation mars the figure against the sky. Part of this fault is due to the pinhole. The picture was made at 3 p. m. in April with a No. 9 needlehole 1½ inches from the plate. The exposure was 1 minute on a Standard Extra plate, which was developed with Rodinal and printed on Normal Studio Cyko.

MANY IN ONE

Oftentimes, by a little ingenuity, one can manage to simplify one's equipment by making one chemical perform several duties. For instance, suppose one is using sulphuric acid to preserve a pyro stock, acetic acid and powdered alum for the fixer for paper, and sulphuric acid and chrome alum for the plate fixing bath. One can substitute potassium metabisulphite as a preservative for the pyro and use the same chemical in the fixer for both plates and paper, omitting two kinds of alum and two acids from the chemical shelf.

Liquid bisulphite, or commercial bisulphite lye, as used in the bleaching industry, is another useful chemical with many applications. Its acidity, as usually supplied, is just one fourth that of metabisulphite crystals. It can be used as a preservative for developers, as a substitute for sodium sulphite, and as an acid hardening and clearing agent in the fixing bath. It has also the property of removing stains. This substance is manufactured in this country — in fact, there is one establishment within a few miles of our office which makes it — and we now have samples of its product under investigation with a view to inducing the makers to enter the photographic field, as many dealers do not keep the liquid bisulphite in stock, though they can furnish the granular.

A complete developing and printing outfit can be made up with only the following chemicals: metol, hydrochinon, potassium metabisulphite, potassium bromide, sodium sulphite, sodium carbonate, and hypo, and even the sodium sulphite could be replaced by the metabisulphite.

Another simplification could be effected by substituting ortol for metol and hydro, thus reducing the list to five items. Suitable formulas are:

Developer No. 1

Potassium metabisulphite..1 oz. or 440 gr.
Ortol.....140 gr.
Water.....20 oz.

No. 2

Sodium carbonate, anhy., 3 oz. or 1320 gr.
Water..... 20 oz.

Use equal parts, or 1 part No. 1, 1 part No. 2, 1 part water.

Bromide Solution, 10 per cent

Potassium bromide.....48 gr.
Water to make.....1 oz.

Acid Fixing Bath

Hypo.....1 lb.
Water.....4 pts.

Dissolve and add

Potassium metabisulphite, 2 oz. or 880 gr.
Water..... 1 pt.

In all of the formulas given above, 440 grains is considered to be the weight of the avoirdupois ounce, as usually furnished with sets of weights for photographic purposes.

WOBBLY FRONTS

A reader sends in a negative one half of which is fairly sharp, but the other half of which is wofully fuzzy. He believes that he

THE 2 30 TROT A. R. BROWN

has been deceived into buying a defective anastigmat lens, when the entire trouble is in the front of the camera. The lens and shutter together weigh an appreciable amount, and the old-style camera to which he fitted them has a front too weak to stand the pull. It therefore sags and the axis of the lens is no longer perpendicular to the film. With his old R. R. lens, the definition was not good enough to notice much difference in the two ends of the plate, but with a highly corrected anastigmat, the slightest displacement makes itself evident at once. This reader will have no trouble if he purchases a new model camera with its strong front and replaces its R. R. lens with the anastigmat.

THE 2.30 TROT

Centering of the principal object is a fault which is less to be excused in a picture made with a reflecting camera than in one fitted with a small finder. By trimming off about half an inch on the left one gets far better placing of the racers. It is interesting to observe that although the horses are sharp as regards their bodies, the extremities show movement, most marked in the nigh fore hoof of the horse at the pole, though the nearer animal shows it too. This proves that the rated speed of 1-1,500 given by the focal-plane shutter was not fast enough to "stop motion" completely. Mr. Brown states that the picture was made with a Reflex camera fitted with a 7-inch Wollensak Velostigmat Series II. The exposure was the nominal 1-1,500 at *f*: 4.5 on a Wellington Extreme plate; intense sunlight; sometime between 2 and 4 p. m. in September. The development was in the tray with Imperial Standard pyrometol. The print is on Normal Glossy Cyko. Mr. Brown says, "I think this negative a good example of lens work on the part of the Velostigmat, as the plate was 4 x 5 and I was working close to the subject, yet it carries good depth at full opening. I disposed of a number of enlargements to horse owners, who were very well pleased with them, so I feel that although I have not been able to capture one of your monthly prizes, your advice through POPULAR had not been entirely wasted in my case."

UNEVEN DENSITY

In developing plates in the tray, it is important that the entire surface be evenly and quickly covered with developer. From time to time we have published the correct method of flowing a plate, but circumstances make it seem advisable to give it again. Lay the plate face up in the tray, holding it in the left hand with the nearer right corner lowest. Hook the rim, not the pouring lip, of the graduate over

VAN CORTLAND MANSION C. W BECKER

the right edge of the tray and pour the developer in one motion, without pausing. At the same moment, tilt the tray up and away so as to correspond with the wave of developer. If properly done, the plate will be completely covered at all points within a second and on completion will be of even density.

VAN CORTLAND MANSION

Once in a while we come across a print in which the centering of the principal object is made less objectionable by the handling of the rest of the space. This print is one in which the symmetrical look is taken off by the filling of the edges with foliage. The effect of pale sunshine has been admirably preserved by proper exposure, development, and printing. Besides being an excellent bit of technique, it is a valuable record of an old colonial mansion which played no minor part in the history of the glorious Revolution of 1688 in the colonies. Data: 3A Special Kodak with Kodak anastigmat lens; ½ second at 4.45 p. m. in September in weak sunlight with stop *f*: 32 on Eastman film; pyro tank; print on Normal Glossy Cyko.

BLAMING IT ON THE DEVELOPER

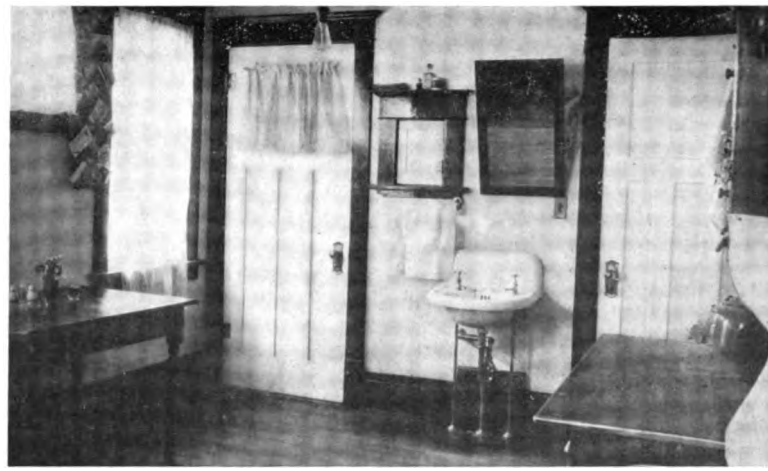
Not long ago a reader asked for a remedy for fogging of films and we suggested that he might find the addition of sulphite to his developer would cure the trouble. A second communication has just arrived, stating that the following test had been made. "I developed a film and it was fogged. Then I put a plate in the camera and made an exposure, developed this in a part of the same solution and got a dandy negative. I took a second roll of film and got a fogged result just the same as the first one."

Here the poor result could hardly be blamed on the developer, since the same solution worked clearly on a place, hence it must have been a faulty emulsion or a stale, spoiled one which caused fogging of the film *unless* — and it's a big question — the darkroom light fogged the film. The fashion, however, is to blame all fogged results on the developing agent. We have even been told that metol-hydrochinon is entirely unsuited to tank development because when diluted it causes fog, the assumption being that it is the fault of the developing agents. As a matter of fact, the fog is caused by an insufficient quantity of sodium sulphite. When a developer is diluted, extra sulphite should be added to keep the proportion always 10 grains of the anhydrous sulphite to each ounce of developer. Used in this manner, we have found that sulphite will cause old, stale plates to develop clearly. With films, however, we should add a sheet of postoffice paper or of yellow darkroom fabric to the ruby light before condemning the developer. All modern films are orthochromatic and will not stand the quality and amount of light which used to be safe for older varieties or is still safe for non-color-sensitive dryplates.

When all other causes of fog can be excluded, it is time to investigate the developer. If it is found that it contains less than 10 grains of sulphite to the ounce when diluted for use, make up a solution of 120 grains of anhydrous sulphite to each ounce of water and use 2 drams of this to each 3 ounces of developer.

ACID PERMANGANATE REDUCER

For reducing the highlights without affecting the shadow details, or in other words for treating overdeveloped negatives such as most beginners are likely to produce if they depend



THE SPOTLESS KITCHEN S. E. HALLS

on inspection, acid permanganate is more reliable than ammonium persulphate. Three stock solutions are the handiest form in which to keep the reducer.

No. 1.

Potassium permanganate.....10 gr.
Water.....10 oz.

No. 2

Sulphuric acid, C. P.,.....100 min.
Water.....10 oz.

No. 3

Lumière's liquid bisulphite.....1 oz.
Water.....10 oz.

For use, one takes 1 dram of No. 1, adds 1 dram of No. 2, and water to make 1 or 2 ounces. The reducer is flowed over the plate and its action closely watched. It will cut down a dense highlight in a few seconds if the gelatine of the plate has not been rendered too hard in an acid-alum fixer. As soon as the reduction is sufficient, throw out the spent reducer, rinse, and treat with No. 3 until all brown stain is cleared. Finally wash well.

MORE ABOUT WINTER LIGHT

Full sunlight in summer is about 2½ times as strong as the strongest winter sunlight. The strength of light in the shadow of one's body is generally about half that of the direct sunshine. With the sun shining in winter, then, exposures will generally be from two to four times those required in June, according to the amount of shadow in the scene and its nearness to the lens. We are constantly checking the Monthly Exposure Tables, and recent experiments have demonstrated again that they are accurate and correspond closely with the exposures indicated in winter by an actinometer meter, such as the Watkins.

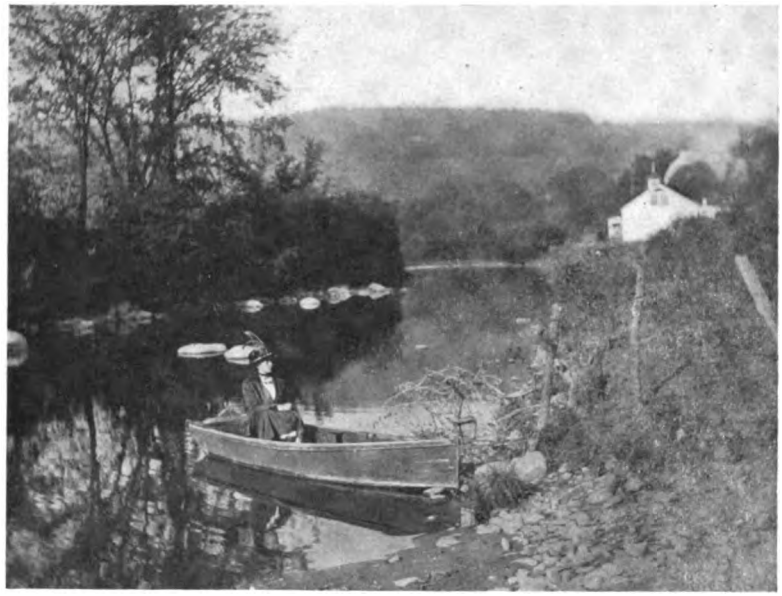
THE SPOTLESS KITCHEN

Interiors made with ordinary outfits are often superior to those made with wide-angle lenses. This example shows a concentration of interest which is the result of using the ordinary lens and the narrow angle included by it. Considering the limitations of the instrument, the result is particularly good, though it is a pity the print was not trimmed to make the perpendicular lines really vertical instead of slanting. The exposure was well adapted to get the maximum amount of gradation in the middle tones. Data: Postcard Ica film camera with 8-inch R. R. lens; 15 seconds at *f*: 11 in August at 3 p. m.; bright diffused light; Vulcan film; developed and printed by a professional.

WORKING AT INTERVALS

One of our charter subscribers writes, "I am watching and waiting for some one to get up a developer which will not spoil for a month or six weeks after it is made up. I do not often have more than two or three plates to develop at once, unless I keep them so long that I lose all interest in the picture before it is made, and so often let good chances go by because of the labor and time required to fix up fresh solutions for one or two pictures."

This reader should not bother with stock solutions at all. Anyone situated as he is had better use his developer in tablet form, though it will doubtless be more convenient to keep an acid fixer in stock solution. There are three good kinds of tablets on the American market: Burroughs Wellcome "Tabloids," Burke & James "Ingento" Tablets, and Johnson & Sons' "Scaloids." Most dealers keep the first, many are stocked with the second, and the



AT THE LANDING R. W. DE LA MATER

third can be obtained of the American agents, Ralph Harris & Company, of Boston, if dealers are not stocked.

Developers made up in two or three separate stock solutions, however, will keep in good condition for months or a year if well corked. The Thermo formulas published in the June, 1914, issue are of exceptionally good keeping quality, owing to the use of metabisulphite as a preservative. Readers who prefer pyro will find an equally good-keeping formula on the new Thermo Development Card, a copy of which will be sent postpaid to any address on receipt of 25 cents. This system is particularly valuable to the occasional worker.

AT THE LANDING

It is often quite out of the question to take a photograph from any but one point of view; but it is not at all hard to correct the faults in a picture by trimming, local reduction of scattered highlights, spotting, etc. This print is full of defects which could be removed in a few minutes. The highlights are scattered around in places where they don't belong, speaking pictorially. To make a beginning, trimming off about ¼ inch on the left gets rid of a very bad white stone. The spotting brush and a little india ink will get rid of two more behind the lady's head, and a soft stick, such as a match, dipped into alcohol, will reduce the density of the others, as well as that of the fenceposts which stick up like sore thumbs on the right bank. The house needs a little treatment with alcohol-moistened chamois skin pulled over a cork and used like a plane to cut off the surface deposit of silver. The house is now the principal light, which it should not be. The empty sky corner can be filled by reduction with a chemical reducer and the building up of clouds on the back by means of a retouching pencil of wax composition sold for marking on glass. Nature is seldom sufficiently well arranged to make satisfactory pictures without resort to some such means as already hinted at, and it is the amateur who learns to study and to alter his pictures who produces results of true pictorial quailty. After the technical part of photography has been learned the artistic side opens up endless vistas of work and enjoyment. Data: 4 x 5 Seneca camera with R. R. lens; 1-5 second at *f*: 11 in October at 7.30 a. m.; medium sunlight; 3-times rayfilter; Cramer Iso plate; metol-hydro. developer; print on Argo Soft Velours.

EXPOSURE TROUBLES

It is seldom that we have a complaint like the following. "I have a camera which I bought second-hand. It has a 'high-grade symmetrical' lens, the opening at the end of which is about 1 inch in diameter, but I do not know its focal length. The shutter is marked 1 to 1-100, but I find that I have to use the bulb or time for at least 2 seconds or longer to get a good negative on ordinary plates, unless in full daylight. Whether the fault is in me or in my developing, I do not

know, though I get a good, clear picture on the ground glass every time."

We should imagine that the difficulty in this case arises from the fact that the stop lever has been pushed down to a small opening and has been allowed to remain there. The stops on the camera are marked in the Uniform System from 4 to 128. We should advise the user to set the shutter to T, open it, and then move the stop lever to see that it works properly and does actually set the iris diaphragm to the different openings from large to small. If the shutter is not capable of working in this manner, it should be sent to the makers for repairs. If it is, the user will find no difficulty in securing proper instantaneous exposures by following our monthly Exposure-Tables.

The focal length of an R. R. lens is generally marked on the front lens-cell, and 5 x 7 cameras are usually fitted with lenses varying from 8 to 8½ inches in focus. The 4 x 5 size ordinarily has a 6½-inch, and the postcard size the same or even a 7-inch lens. The catalog description of the camera should give the focal length of the lens supplied with any camera.

LITTLE SUNSHINE

Photographing against the light is a very difficult technical task, but often produces most beautiful results. In this case the glints of sunlight on the hair, right shoulder and dress most effectively relieve what would otherwise be a very flat lighting. The picture is one of a large series of portraits of this little girl and we are sure that it will not prove the least interesting. One of its great charms is the absolute naturalness of the pose. The picture was taken with a 4 x 5 Cycle Poco camera, fitted with 12 R lens of 6½ inches' focal length. The exposure was 1-5 of a second at stop *f*:11 at 2 p. m. in August in bright sunlight. The Standard Polychrome plate was developed in D. Q. and the print is made on Azo F Hard X.

THE INSTRUCTION BOOK

A new reader writes: "I have a camera No. 1 and I have not worked it yet. I received it in January, 1914, and have not yet taken any pictures. I want you to picture out this matter and tell me just how to make the picture. Please let me know what I have to get before I can start to taking pictures — whether or not I need oil paint."

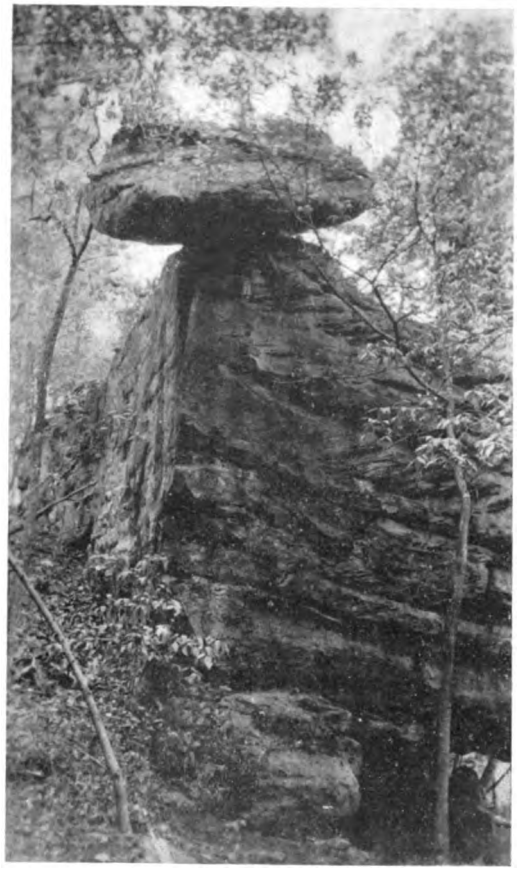
Every camera when sold should be accompanied by an illustrated instruction book. If yours is lost, examine the camera and ascertain the maker's name, then write to him inclosing 10 cents in stamps and asking for an instruction book for that particular size of camera. You will find in the book a list of materials and full directions for taking, developing, and printing the pictures.

LITTLE SUNSHINE C. D. MESERVEY
Third Prize, January Competition

BLISTERS IN COLD WEATHER

Changes of temperature are the commonest cause of blisters on prints. Blisters on paper correspond to frilling of negatives. Most people have trouble in summer, when the temperature of all baths as well as that of the wash-water, is high; but the trouble sometimes comes up in winter, too. Recently we had occasion to make a few 8 x 10 enlargements on glossy paper. The darkroom and all solutions were at a temperature of 53, but the water from the faucet was 41 — a difference of 12 degrees. As a result, a crop of fine blisters formed on the prints.

The blistering could have been prevented by taking several precautions. The first would have been to treat the prints in a separate alum bath after rinsing and before fixing, or to add alum to the fixer, with liquid sodium bisulphite to keep it from acting on the hypo.



BALANCED ROCK M. BROOKHART

We use a plain hypo and bisulphite, generally without alum. The second precaution would have been to use a fresh fixer instead of one which had been used several times. The ordinary acetic-acid-alum fixer actually softens the gelatine and causes blisters if used too many times. The bisulphite fixer has never before in our experience allowed blisters to form. The third precaution is to fix about double the usual time, to insure hardening. The fourth is to remove the prints from the fixer to a tray of water at room temperature and add the colder water from the faucet gradually. If these precautions, or part of them had been taken, there would have been no blisters.

BALANCED ROCK

Taken as a record of one of Nature's freaks, this print shows very good handling. The maker considers the shadow in the foreground too dark, but it is doubtful whether this is a good criticism, for in such situations a chasm or cranny may be absolutely black — one of the few places where a pure black exists outdoors. The values in the remaining tones show that the exposure was ample, as, indeed, one may judge by the signs of movement in the trees. The dark tone of the sky, due to partial reversal from overexposure, is another good feature. This is very good work for a beginner. Data: 3A Seneca with 7-inch Rapid Symmetrical lens; ½ second at *f*: 11 in May in dull, cloudy light; Vulcan film; Thornward tank developer; Azo card.

ADOPTING CONSTANTS

"I have a lingering hope," writes a reader, "that I can find one plate to which I can finally settle down to use on all occasions and subjects. With two factors constant, Thermo development and one plate I can feel that the millenium is not so far off."

We have several times expressed the opinion that most workers will find a fast double-coated or orthochromatic plate suitable for everything but speed work. For the latter purpose, an ortho plate, preferably backed, of class 1 will be found almost ideal. In blue light (strong summer sunshine) it is almost as fast as the class ½ plates: in yellow light, early or late in the day or in fall and winter, it is fully as fast as these so-called ultra-rapid plates, which, being, as a class, insensitive to yellow, are relatively slower in poor light. There are several class 1 ortho plates, and occasionally a batch of Cramer's Portrait Isonon will fall within this class.

COLOR FOR DIFFUSING SCREENS

A young professional asks what color of cloth is best to diffuse the light in a studio.

Blue can be used to render the light more actinic to ordinary plates, thus strengthening it on the side toward the skylight.

Yellow is suitable to employ for blonde sitters when orthochromatic plates are used, as it takes the place of a ray screen on the lens.

Ecru, obtainable by staining in coffee, is often used to subdue a very strong light, as it slows it down greatly.

For average purposes, a very light cream color is suitable. Or a faint tint of green may be used, especially if the studio is finished in a medium green — the most restful color to the eye.

ARTIFICIAL LIGHT FOR THE STUDIO

A reader asks for advice about fitting up a scheme of lights for a studio at a beach resort to secure 1- or 2-second exposures at *f*: 5 on a postcard. We assume that he wishes to use the Positype cards, which are reversed to yield a positive picture. Our experience with this card is that it would take about a 300-watt

THE LOG CAMP J. H. HENSEL

nitrogen-filled bulb to get the right illumination and a simple, cheap, and satisfactory fixture would be the Studio Parallax Reflector.

One of our readers recently demonstrated a fixture he made for a 250-watt Mazda. It was simply a stand to hold the bulb with a white card bent into a curve behind it for a reflector and cheesecloth in front to diffuse the light. He made a portrait on an Instantaneous Iso D. C. plate in 2½ seconds at *f*: 5. From this we should judge that a number of lights placed in an "artificial skylight" would do the work nicely. It is important not to have the light so strong that the subject blinks.

Any portrait lens would be suitable for this kind of portraiture if it brought the actinic rays to the visual focus; but a color-corrected anastigmat would, naturally, be better.

THERMO DEVELOPMENT OF AUTOCHROMES

We gave recently the time of development for Tabloid rytol in autochrome work. A reader asked for data to enable him to use Modified Thermo D.-Q. for this purpose, so we worked it out and got some perfect autochrome snow pictures as follows.

The best dilution was found to be the S, with extra sulphite to make 10 gr. sulphite to the ounce. The 60-degree time is 8 minutes. Applying this datum to the diagrams in *The Watkins Manual*, we secure the following times: — 65°, 6¼ min.; 64°, 6½ min.; 62°, 7⅓ min.; 60°, 8 min.; 58°, 9 min.; 56°, 10 min.: 54°, 11 min.; 52°, 12 min.; 50°, 13½ min.

The plates were exposed by taking the average between the sunlight and shadow tests, using the Watkins Color-Plate Meter, and dividing by 4 for snow scenes. This plan gave good shadow detail without overtiming the sunlight on the snow.

THE LOG CAMP

This is a well-arranged and well-taken record photograph. The placing of the cabin is particularly good, with the tall tree in the background setting it off to the greatest possible advantage. The technical work seems to have been very well carried out, though possibly a trifle less development would have answered as well, for the soft paper is still a trifle chalky in the whites and solid in the blacks. The picture was made with a 6½ x 8½ Korona camera fitted with a Perigraphic Convertible *f*: 5.6 lens. The exposure was ½ second at *f*: 22 in bright (intense, we should say) sunlight in August at 2.30 p. m. on a Hammer plate of unstated brand. Development was with Mitchell's edinol-quinol and the print for reproduction was made on Soft Azo Glossy.

METABISULPHITE AS A PRESERVATIVE

Last August we made up and set aside several batches of Modified Thermo A solution of the D.-Q. formula. Tests made about the first of February showed that the only alteration was in the deposit of a very slight white sediment, probably sulphur from partial decomposition of the metabisulphite, possibly

TAKE ME TO YOUR ARMS, LOVE W. G. WHALE

lime salts. Development tests on both plates and paper showed that there was no loss of energy.

Many years ago, when we used pyro, we found by trial that 120 grains of metabisulphite to 1 oz. pyro kept the stock in good condition, with only slight loss of energy at the expiration of a year.

"TAKE ME TO YOUR ARMS, LOVE"

Mr. Whale sent in this picture to supplement the one reproduced in the October issue. It is an interesting record, but still the technical faults of underexposure and too black a print, along with the patterny background, make it not wholly satisfactory. It is too bad to show only a portion of the dog, particularly as he looks slightly more as if in pain than pleading his cause with the charmer. Data: 3½ x 3½ Ensign camera with R. R. lens; 1-25 second at *f*: 16 in October at 3 p. m.; Eastman film; tank development; print on Regular Velox.

THERMO DEVELOPER FOR PAPER

Several readers have asked what strength of Modified Thermo D. Q. and M.-Q. is advised for use on D. O. P.

For the contrast grades of gaslight paper, the S dilution, viz., an ounce each of A and B with an ounce of water, with bromide if necessary, will be found good. More water should be used for normal and soft grades, up to as much as 4 ounces for soft effects on bromide papers. The developer saved after use on plates can be utilized by adding some fresh stock to strengthen it as required. We keep the used D.-Q. going (filtering when necessary) until it is deep yellow and deposits considerable brown sediment.

FIXING AUTOCHROMES

A reader asks if we did not let an error creep into the article on "Autochrome Photography in Winter" in the January, 1915, issue by neglecting to say anything about fixing in acid hypo.

It is not necessary to fix an autochrome plate unless it has to be intensified. Part of the silver bromide is used to make the negative image, which is then dissolved off by the acid bichromate. All of the remaining silver bromide is reduced to metallic silver by the second development, so there is absolutely no light-sensitive substance left, if the action has been complete.

Intensification is necessary only if the image is too thin from overexposure. It is absolutely necessary to get the exposure for an autochrome correct within a very small error. Our tables work well for large stops; but if apertures smaller than *f*: 8 or *f*: 11 are used, the autochromist had better get a Watkins Color-Plate Meter, which is more accurate for weak light and small stops. Our most successful autochromes this winter have been made

INTERESTED JOHN J. NEUER

using a Watkins P number of 4 and taking the *average* between the direct sunlight test and the shadow test for calculating the exposure. The usual factor of one-fourth the full time was of course applied for the special subject of snow scenes. With no snow on the ground the full meter time would be correct.

INTERESTED

Miniature cameras being all the rage at present, it is interesting to note the good results of one in Mr. Neuer's hands in the print reproduced herewith, the same being a $4\frac{1}{8} \times 5\frac{1}{2}$ sepia enlargement on Professional Cyko Buff from a portion of the $2\frac{1}{4} \times 2\frac{1}{4}$ negative. The camera was Butcher's Watch-pocket Carbine, fitted with a Cooke anastigmat of 3 inches' focus and working at *f*: 5.6. An exposure of 1-25 second was given at *f*: 8 in dull light at 4.40 p. m. in October on Eastman film, which was developed in pyro. The focus seems to have been placed a little too far forward, and, the camera having been held low, the upper part is not so sharply defined as the lower part of the figure. The spacing is good, but the house in the background interferes with the dog's head and should have been spotted out. On the whole, although the picture is excellent in many respects, we do not see that the miniature camera was in this instance quite so advantageous as many of its advocates would have us believe. A direct 4 x 5 with a 6-inch lens would probably have been quite as good.

STUDY IN STILL LIFE R. W. TYLER

A STUDY IN STILL LIFE

This print is one which requires to be looked at from a distance, so the reader should hold the magazine away when studying the reproduction. The dead matte surface of the paper, with the somewhat granular appearance of the draperies of the setting, gives somewhat the effect of a "gum" print. This picture, though it does not bring out the greens and reds in their true values, is a very good example of the effective arrangement of spots and shows considerable artistic feeling on the part of its maker. The data show that the picture was made with a 6½ x 8½ view camera fitted with R. R. lens of 10¼ inches' focus, an exposure of 1-5 second having been made in a poorly-lighted room at 10 a. m. in October with stop *f*: 8 on a Stanley 50 plate, which was developed in M.-Q. and printed on Instanto Soft.

H. AND D. NUMBERS

A reader asks for H. and D. numbers of a list of plates.

We regret that it is impossible to answer such a question satisfactorily. Most makers do not give true H. and D. numbers, so there is no basis for an intelligent comparison. Two English makers, Imperial and Wratten, give figures which are obtained in accordance with the specifications of Hurter and Driffield; but most are not accurate and really amount to about the same as the Watkins numbers, only not conservatively stated. For instance, a certain plate for which "500 H. and D."is claimed will be found listed as 500 Watkins, and this is really a fair rating, as if used with a Watkins meter it will be found to indicate full exposure.

Makers naturally try to impress users with the idea that their fastest plates are faster than other makes, hence if they give speed numbers they make them as high as possible. Thus, if a plate will stand half the meter time without being noticeably underexposed, they are likely to give its Watkins number higher than it is printed on the Watkins card or to increase its alleged H. and D. number. The truth of the matter is that it is best to stick to the Watkins card, as that is an independent authority, and make whatever variation experience proves necessary. For instance, if a plate is listed 180 by Watkins and one habitually uses half the Bee meter time, don't list the plate as 350, but simply say that half the full time is generally sufficient in making shutter exposures. Then, if a plate is really Watkins 500 and will stand half full time, there is an intelligible basis for comparison.

SECURING CLOUD EFFECTS

A reader asks why he is not successful in securing cloud effects with a three-times filter on ortho plates and asks our advice about using an 8-times screen instead.

Our experience has been that an 8-times screen, as ordinarily supplied, gives much stronger contrast between the blue sky and the white clouds than the 3-times kind. The latter, however, gives a more delicate, airy effect—in other words, better atmosphere. The Ingento Series B filter, also called the Visual Luminosity, is to be preferred if one can give the long exposure and does not wish to exaggerate the sky but have it remain in harmony with the landscape.

Our reader has probably been overdeveloping his negatives and thus getting his skies too dense to print well. The readiest way to overcome the trouble is to give a series of exposures, using factors from 2 to 6 for the screen, develop the plates together by the Thermo system, and select the negative which gives the truest print.

STAINED FILMPACKS

A reader sent in a filmpack exposure which was not only badly stained but had a rainbow-hued deposit on the film side. It was developed in a metol-hydro, tray solution. All the exposures in that pack case outstained, but several other packs and rolls of films handled at the same time came out all right. The only

ROAD BY THE LAKE H. D. LAFAYETTE

suggestions offered by a supposed authority consulted by our reader were that he use the prepared developer and acid fixer put up by the makers of the packs, and that the stains and iridescence might have been caused by attempting to intensify with mercuric chloride.

From the examination of the film, we should think that the stain was due to using the developer until it was exhausted, not rinsing before fixing, and fixing in an old hypo containing a great deal of dissolved silver. The stain may, however, be due entirely to staleness of the emulsion, combined with overworked fixer. The peculiar iridescent appearance is called dichroic fog. It is due to a deposit of metallic silver in the form of minute scales. Sometimes it can be removed with the ferricyanide-hypo reducer. Great care must be taken not to use a hypo bath too long, nor should a developer be used over and over.

ROAD BY THE LAKE

Having attained a full exposure, normal development, and a print a shade too dark, as regards the nearest mass of foliage, the maker of this print pronounces it rather flat. To our eye it seems excellent in all respects save the heavy black silver deposit in the foreground. This shadow could have been held back by shading during, say a quarter of the printing time, using the fingers in front of the frame and keeping them in motion. With this improvement and a suggestion of clouds worked into the sky, the effect would be almost perfect. As a composition, the scene lacks unity, particularly as the highest lights, water and sky, are massed to one side. The view really contained two pictures, obtainable by cutting most to the left of the path. Data: No. 4 Kodak with 7-inch R. R. lens; ½ second at 11.50 a. m. in August in bright light on a Stanley 50 plate; pyro tank development; print on Normal Studio Cyko.

ANSWERING QUESTIONS

As most of our readers know, we do not run a special department of questions and answers. The reason is that almost everything in the magazine is published in answer to some question by a reader. Sometimes we have the material all ready. Sometimes we have to undertake a considerable amount of research to get the facts. Sometimes we have to work out a problem in the laboratory. In every case, we try to cover the question fully and to give reliable information. A copy of the article is mailed direct to the reader who asks the question and then, if its appearance in our pages is delayed, he does not have to wait. The courtesy of a self-addressed stamped envelope is always appreciated.

Good taste precludes our recommending the goods of any manufacturer by name, and readers will please note that they can save themselves embarassment by not asking us to choose materials for them.

THE OLD DAM W. H. BRISTOL

THE OLD DAM

This picture represents one of the subjects which justify the designers in providing a side swing on a view camera, though it was not used in this instance, if present. The patch of leaf-strewn bank in the lower left corner does not begin to be sharp until the bushes are reached, that is, at about the same distance from the lens as the edge of the right bank where it cuts the margin. This left bank lies so near the lens that its sharp image is formed farther behind the lens than is the image of the right bank, hence, to focus them both at once, the ground-glass screen should be, not at right angles to the axis of the lens, but inclined. By pulling the right end of the screen back and thereby pushing the left end forward, the image of both parts come into sharp focus at once without requiring stopping down. Similarly, by throwing the screen out of its vertical position, the difference of focal position of the images of foreground and distance may be compensated for to such an extent that a large stop, with its better "atmosphere" may be utilized. Outside of the minor defect of soft foreground focus, there is little else to be criticised in the print, considered purely as a record. From the pictorial point of view, the subject is not so successful, on account of the scattered lights and the absence of clouds. The data show that a 6½ x 8½ Conley View camera fitted with a Wollensak Velostigmat lens of 9½ inches' focus was used. An exposure of ½ second, calculated by our tables, was given at *f*: 16 to the Standard Polychrome plate, which was tray developed in pyro and printed on Soft Studio Cyko.

OUR HOUSE

Mr. Behr sees two faults in his print: first, absence of clouds; second, the blotting out of a portion of the house by the tree. Both of these could have been avoided by taking the picture on another day and from a different viewpoint. The real faults are: first, centering of the house; second, inclusion of foreground containing paths running at different angles and leading the eye away from the house; and third, poor focusing. There must be a point of view which would give a better result, for instance, the corner of the grassplot just this side of the bush, even though one had to climb a stepladder with the camera to get the roof in. Or perhaps a view more from the front would be better, with the house spaced nearer one margin than the other. In focusing, the curvature of field of the R. R. lens should be compensated for by securing the sharpest definition about an inch and a half in from each margin and then stopping down. The clouds, if present, could be preserved by using a ray screen and a color-sensitive plate. Data: 4 x 5 Seneca camera with R. R. lens; ½ second at *f*: 8 in bright July sunlight at 10.30 a. m.; Stanley 50 plate; Tabloid Rytol; print on Special Portrait Velox. N. B. If the data were correctly given, 1-50 second at *f*: 8 would have been sufficient, hence ½ second represents an overexposure of considerable degree, yet the print is fairly correct. Did not the maker mean to write 1-25 second?

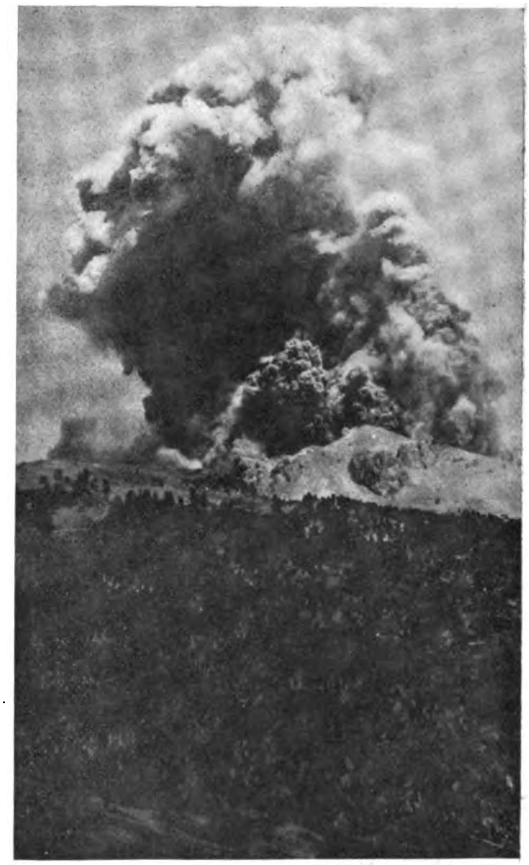
OUR HOUSE T. J. BEHR

BETWEEN-SEASONS PHOTOGRAPHY

The month of March is in many ways the least profitable of the year from the photographer's standpoint. Then it is seldom attractive enough outdoors to tempt one forth with a camera in quest of landscapes. The chill winds blow too freshly to make time exposures feasible, and the bare, wind-lashed trees are seldom inviting. Clouds, however, occur in multitudinous forms. Those whose interest in nature prompts them to perpetuate the glories of the sky may well venture out and, well armed with orthochromatic plates and a good rayfilter, secure many fine cloud negatives to use for printing-in or bald-headed landscape negatives.

Indoors in March one may still continue the pursuits of portrait, genre, and still-life photography; the making and projecting of lanternslides; enlarging; cataloging and filing negatives, and preparing for the outdoor season. The thoughtful worker will find plenty of indoor subjects to fix his attention, and he may, in truth, be glad that there is a between-season period for taking stock and perfecting his technique. With all the loose ends gathered in, he will approach the spring with fresh confidence and enthusiasm.

March is a good month in which to study catalogs and inspect new apparatus, so that any deficiencies in the old may be made up for by the addition of accessories or the purchase of new instruments possessing a wider range of movements. For instance, you may have found the postcard film camera ideal for snapshot work, but when it came to using it indoors noted the lack of ground-glass focusing. A plate attachment will solve that problem. Then again, you may wish to do copying and find the single-extension plate camera which served you so well not quite satisfactory with a supplementary lens. A double- or triple-extension model may better fill your newly found needs. Again, the faithful old R. R., which has made so many successful pictures in your hands, may now for the first time cause you to feel handicapped by its low speed when used for portraiture and its curved field when copying or enlarging. Now is the time to read the Classified Advertisements and to send in that little "Wanted" which may just strike another reader who would like to dispose of a lens for which he has little use at present. Or, if you prefer new goods, there are our advertisers ready to send you any lens you may think you wish on a ten-days' trial basis. Possibly your anastigmat is causing you to do too much painful retouching and you would secure better results by using a special lens of less perfect corrections. Do these things now; if you wait until April, outdoors will entice you and it may be too late.



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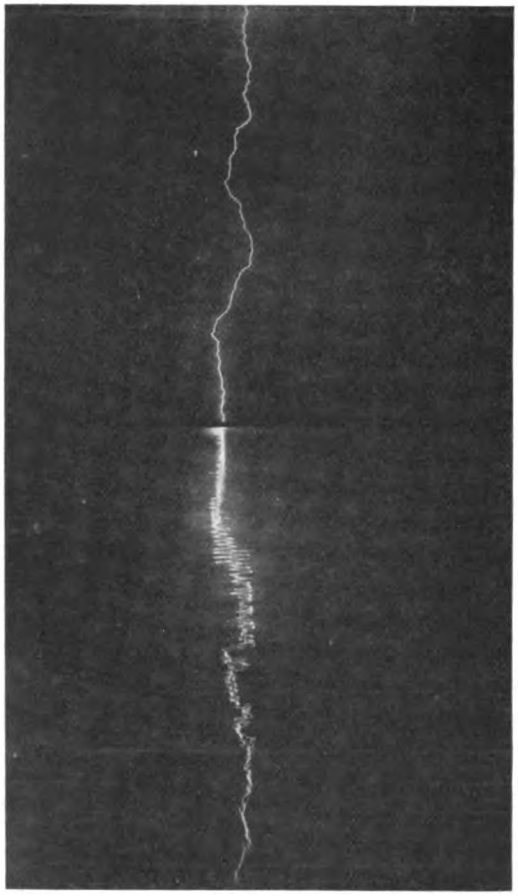
VULCAN'S FACE, Mt. LASSEN

VULCAN'S FACE

The picture which we have reproduced under this title shows a most remarkable smoke formation, and is doubly interesting for this reason and the fact that it portrays the only active volcano in the United States. The papers have been filled with news of eruptions of this mountain for the last year, and photographs of it have commanded a ready sale. As the example of the value of a good news photograph we may remark that the maker of this picture refused an offer of one hundred dollars for the negative. A careful study of the print will reveal at least two remarkable profiles in the smoke and others less perfect. The data of the print are unfortunately lacking.



LATE SUMMER STORM JOS. A. SEIDL

LATE SUMMER STORM

The combination of lightning and its reflection in water is a new one in our pages, the effect being very interesting and at first puzzling — if not looked at right side up. The method of securing the picture was the usual one of pointing the camera with the shutter open at the portion of the horizon where flashes had been appearing and waiting until one occurred. The camera used was an Ansco Speedex, postcard size, fitted with a Goerz Dagor lens of 6½ inches' focus. The stop used was *f*: 16. The Eastman Speed film was developed with pyro in the tank and printed on Normal Studio Syko.

WHAT DEVELOPER?

Every little while some subscriber asks us to recommend the "best" developer. This is impossible, because opinions differ; and, as a matter of fact, all developers will do all that can be asked, if properly handled.

The chief differences between developers are three in number and are as follows: (1) Time required to bring out the first sign of an image; (2) speed of working, or energy — that is, time required to develop the plate to a given stage of contrast; and (3) color of the the silver deposit. It is *not true* that there are any differences with regard to affecting the speed of the plate, bringing out detail, creating greater density, developing certain tones in a selective manner, or in freedom from fogging. Let us take up these points in order.

(1) Developers are divided into two classes, low-factor and high-factor developers. The former cause the image to appear slowly, but the total time of development is not on that account longer, because density builds up rapidly and a good stage of contrast is reached in from five to ten times the "time of appearance." The high-factor developers cause the image to appear almost at once, but density follows very slowly and is not sufficient until from 10 to 60 times the number of seconds it required for first appearance. If negatives are developed to the same stage of contrast, the results are identical with either class.

(2) The energy of a developer is affected by the amount of alkali, strength in grains per ounce of the actual developer substance, temperature, etc., but for general use a solution of moderate energy is generally preferred. Alfred Watkins gives the following energies for developers mixed to one and the same formula: Metol-hydrochinon, 1½; pyro, 1¾; metol, 1⅞; ortol, 2; adurol, 4; hydrochinon, 5¼; kachin, 6¼; glycin, 7. The figures represent the minutes needed to reach the same stage of contrast, that is, to complete development. It is easily possible to mix a developer too energetic for anything but ultra-rapid focal-plane exposures and thereby "plug" negatives by overdevelopment.

(3) Advocates of pyro point to its printing color, or the well-known pyro stain, as one of its chief merits. They assert that a pyro negative has better printing quality than any other. This is untrue. The only difference is well expressed by Paul Lewis Anderson, in his article in the February, 1915, *American Photography*. He says, "It is usually claimed for pyro that the brownish color of the image gives more 'snap,' that is, more contrast, . . . but this means simply that the actinic density of the negative is greater than its visual density, so that the negative prints with more contrast than it appears to have, and exactly the same result may be attained with any other developer by developing for a slightly greater apparent contrast."

BLUE HILLS OBSERVATORY E. G. COOK

The choice of a developer, then, depends wholly on one's taste. It is far better to select any developer whatsoever and stick to it than to keep changing and trying new formulas. A so-called universal developer, that is, one adapted to both plates and papers, is certainly a great convenience, hence the widespread popularity of M.-Q.

WORKING WITH CONSTANT FACTORS

As the season for outdoor work is rapidly approaching, now is a good time for every serious worker to ask himself whether he cannot improve his technique by adopting factors based on scientific facts instead of mere opinion. Time for experimentation is abundant, and before the outdoor beauties begin to call, one can have the questions of exposure and development standardized.

The simplest way to standardize exposure is to adopt the *American Photography* "Exposure-Tables." Make a test by giving several different exposures on the same subject, developing the negatives by the Thermo Card, and pick out the one which gives the best print on your choice of paper. You may find that half the table time gives you ideal printing quality for enlargements and prints on D.O.P.; you may find that the full time is just right for matte self-toning paper. In any event, by performing a few experiments on different subjects, you can settle on exactly the right exposure standard for your individual needs. These tests, at the same time, will disabuse your mind of the notion that modifying the developer has any particular value. You will find that you get invariably the same stage of contrast and that, with fixed development, density is a matter of exposure. In other words, having made development a constant factor, give your standard exposure and you will invariably secure a negative exactly suited to a particular printing process; vary the exposure, and you can make the negatives thinner or denser at will. Or, giving always the full table time, you can produce thinner negatives by using the developer a class more diluted without altering the time of development.

BLUE HILLS OBSERVATORY

This building is a familiar sight (at a distance) to most residents of Boston. From our office windows it is visible on clear days, topping big Blue Hill and looming up as sentinel over a wide stretch of country. Mr. Cook's record is an excellent one. The camera used was a 5 x 7 Century Grand Senior, fitted with a German-made Goerz lens of 8½ inches' focus. The exposure was ½ second at *f*: 16 on a Lumière Sigma D. C. plate at noon in May in good light. Ferrous oxalate developer was used for the plate and edinol-quinol for the print, which is on Normal Studio Cyko.

A HOME-MADE PRINTING MACHINE

A reader asks for diagrams and directions for making a printing machine suitable for 5 x 7 and smaller. We have no article on this subject at the present time, so here is a good chance for readers who have built themselves satisfactory printers to send in an illustrated article. We shall be glad to pay for acceptable material on this topic.

PHOTOGRAPHING THE BIRDS

JAMES M. BELLWOOD

It seems strange that more amateurs do not try to get pictures of birds and our other little wild folk. To me it is one of the most fascinating branches of photography. All, or at least most, of us have seen a robin feeding her hungry youngsters or watched a bluebird trying to get the young to fly. Why not take a picture of them? It isn't so hard to do.

OWL—No. 1 JAMES M. BELLWOOD

How many of us have come upon a nest of little rabbits in our garden? How many times have we seen a squirrel scamper off the walk, run up the side of a near-by tree, and stop a moment to watch us? What better chance for a picture?

On a day's outing in the country we can find interesting subjects for a picture if we keep our eyes open. Sometimes it is a quail's nest under a low-lying tree trunk. Often it is a big yellow-hammer with his red cap. Focus your camera on his nest if it happens to be low enough, and snap him as he pokes his head out. He won't mind you much if you are quiet about it. Excellent subjects are not hard to find. An old orchard will furnish material for a whole summer.

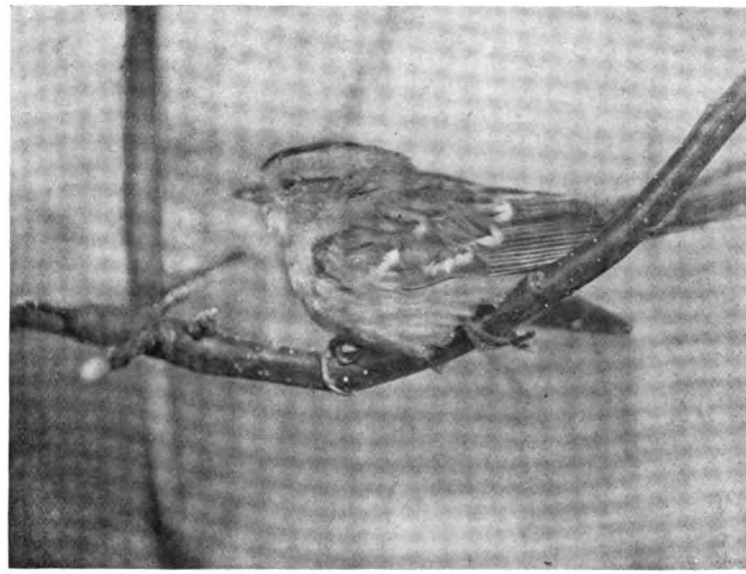
One learns so many things about these little friends of ours; their habits, their peculiarities, the kind of nest each builds, and many other interesting things. Such study is worth more than reading even the best books on the subject.

A reflecting camera is probably the best for such work, but most of us cannot afford them, and they are not necessary anyway. Neither is a long-focus lens necessary. Most of the pictures with this article were taken with a 5-inch lens.

An ordinary focusing camera, tolerably rapid plates, a good tripod, love for the birds and "beasties," and one is equipped for many a pleasant hour in the orchard or woods. A spool of No. 8 thread is useful sometimes when the bird is wild. Focus the camera on the nest, attach the thread to the shutter trip, and unwind it as far off as you please. When she returns pull the string and you have her safe. Some birds will not return for fear of the camera. In this case a green or inconspicuous focusing cloth, or a leafy branch, placed carefully over the camera will help.

Of course it requires patience, a little knowledge of birds, and some ingenuity in placing the tripod and camera, but the experience is worth the trouble it takes. There will be failures, but one good picture is worth a dozen spoiled plates or films.

The dove, already reproduced on page 15, October issue, had her nest in an old peach tree close to our back door. It was about 10 feet from the ground, so I got a large goods box and placed it directly underneath, being careful not to frighten the old bird. Then I set the tripod on the box and arranged the focus. There were several twigs in front of the nest, and I even reached over and gently bent them out of the way, without alarming the bird. But finally a dead one snapped and away she

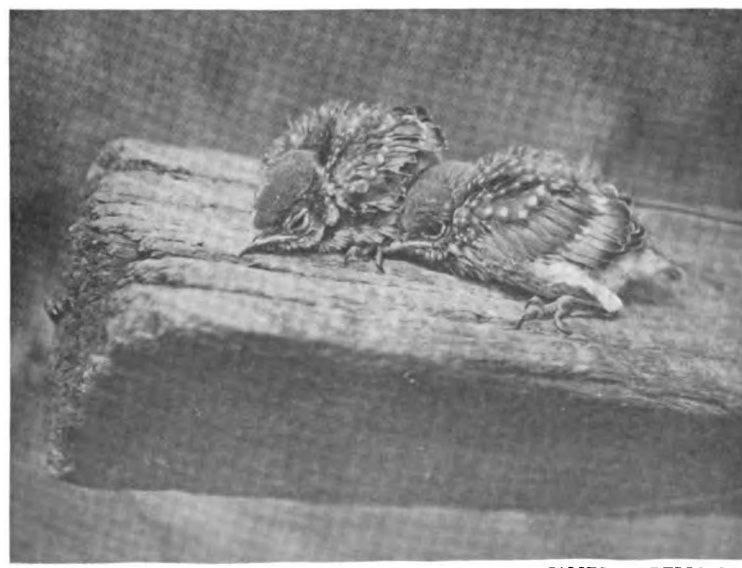


CHIPPY SPARROW—No. 2 JAMES M. BELLWOOD

fluttered, falling to the ground as with a broken wing, hoping to attract me from the two little ones. I went away for about an hour, and then returned to find the old bird on the nest. Quietly arranging the camera again, I took the picture without any trouble this time.

Picture No. 1 of the old owl I got on a quail hunt. Some one shot the owl while we were going through a neck of woods. Only the last joint of one wing was hurt, so I thought this was a good chance for a picture. The old fellow was pretty lively on his feet, but finally he stopped and stared at me with his wild-looking eyes. It was a dull day, so I took a short bulb exposure with the camera on one knee. Then he hopped up on a charred stump and I got another picture.

No. 2. Poor little chippy sparrow; he didn't want his picture taken, but the camera fiend will resort to anything for a picture. Notice closely and you will see a piece of cotton cord around the twig. This held him prisoner. We caught him one cold, white morning in a brush pile and took him home and fed him



YOUNG BLUEBIRDS—No. 3 JAMES M. BELLWOOD

BABY RABBITS—No. 4 JAMES M. BELLWOOD

some timothy seed. He soon became lively as ever, so we took his picture.

No. 3 is a picture of the two little bluebirds just before they learned to fly. They were weak and would not sit on a twig, so I just placed them on the end of an old rail.

No. 4 is a nest of little rabbits, found in the garden. Of course they are not in the nest, for that was a snug little pocket lined with the mother's fur and sunk just below the level of the ground. I should never have found them if I hadn't noticed the soft fur lining move. It came up over and covered them completely.

These are just a few experiences of this delightful pastime. Let every camera user take out his camera and do likewise, for it is one of the best of sports in all our great out-of-doors.

Following are the data of the pictures accompanying this article, should they be of interest to some. None of the prints are enlargements; all are contact prints.

"Dove on Nest," in October issue, was taken with Seneca No. 32, *f*: 6.3 anastigmat lens of 5-inch focus, compound shutter, bright sun. 8.30 a.m. ¼ second, *f*: 8. Dove in shade. Vulcan plate.

SCREECH OWL—No 5 JAMES M. BELLWOOD

No. 1. "Old Owl." Premo film camera, R. R. lens; short bulb at *f*: 16; cloudy.

No. 2. "Chippy Sparrow." Same equipment as No. 1. Bright sun, noon, January; ¼ second, *f*: 6.3.

No. 3. 5 x 7-inch Seneca, R. R. lens; bright; 1-50 second at *f*: 8. Eastman plate.

No. 4. "Baby Rabbits." 3¼x4¼ Seneca, R.R. lens; snapshot at *f*: 8; bright sun. Seed 30 plate.

No. 5. Same as No. 4, except Vulcan plate.

AN EASY WAY TO MAKE A PRINT TRIMMER

ALBERT E. JONES

Here is a way that anyone who can use a jackknife can make a good print trimmer without much trouble, only a little time and at little or no cost.

Take a block of wood (soft preferred), which should be about 2 inches square and ⅞ of an inch thick; measure up from the bottom about ½ an inch on one face and draw a line across, then measure back the thickness of a piece of cigar-box wood, and with a jackknife cut-out this portion, as shown in Fig. I.

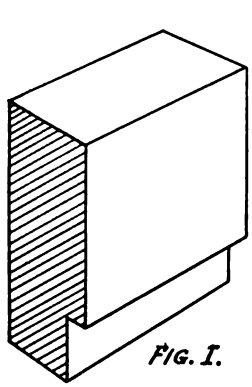


FIG. I.

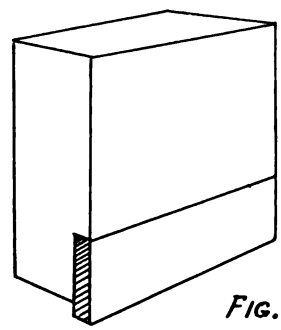


FIG. II

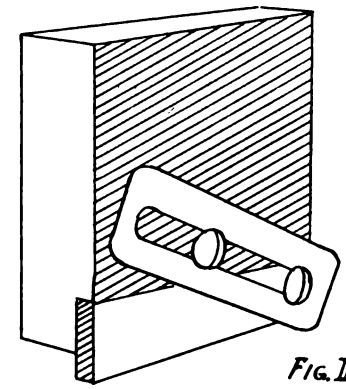


FIG. III.

Next take a piece of cigar-box wood and glue it into this cut-out place, letting it come a little more than ⅛ of an inch below the bottom of the block. Trim it off even at the sides and sandpaper the whole, being careful not to round the edges of the glued-in piece nor the bottom portion of the block. When this is done it should look as shown in Fig. II.

Next take a Durham Duplex safety razor blade and place it in position, as shown in Fig. III. Mark places for the two screws, and drill holes a little smaller than the screws. This will keep the wood from splitting when the screws are put in place. The blade should next be put in place and the screws put in. The screws should be of the round-head variety and have a good flange, so as to firmly grip the razor blade.

A Durham Duplex blade will be found to have a long, narrow piece cut out along its length, and if the screws are placed as they are shown in Fig. III, it will allow the blade to be adjusted so that it will cut at different depths. All of the exposed edges of the blade should be dulled with a file, except the one used for cutting. This will probably save a good many accidental cuts on the fingers.

The cutter being now complete, it only remains to get a piece of soft wood, the size of which will depend upon the size of the print to be trimmed. This will be used as a cutting board and it will be better to cut across on it, as cutting with the grain might have a tendency to draw the razor blade a little to one side.

Now, if the print to be trimmed is placed on this board and a straight edge or triangle used, the cutter will slide along it straight and true, making a good clean cut on the print. The little flange on the cutter keeps the blade perfectly true, as shown in Fig. IV.

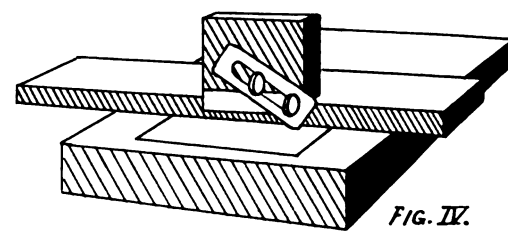


FIG. IV.

The razor blade can be changed as often as it becomes dull or can be sharpened and used again just as you prefer. I have used my cutter for cutting drawing paper and even Bristol board with perfect success, and have been well repaid for the little time it took in the making.

EDITORIAL

The largest number of pictures which we have ever received in one month had to be considered when selecting the three prizes that we awarded for the first time, and announcement is made of the prize winners as follows: The first prize was awarded to "Mildred," by Mrs. Wilma B. McDevitt; the second prize to "Just Fishing," by F. O. Schoeppel; and the third to "Little Sunshine," by Charles D. Meservey. The subjects of the pictures were most interesting, and the variety ranged from "the sublime to the ridiculous." We are very much impressed with the large number of pictures taken in and around the home. The presentation of simple home scenes and studies in every-day life are particularly attractive, and some of the finest paintings ever presented have portrayed homely scenes.

Honorable mention was awarded to the following pictures: "Lucha," Juventino Ocampo; "In Brookside Park," Sam Brugger; "Still Waters," Ikko Kurachi; "Ready for Lunch," W. P. Forbes; "Hotel Victory," Lawrence Mack; "Christmas Eve," Ralph C. Littlefield; "Willow Creek," E. C. Prusia; "Canadian Lilies," E. A. Roberts; "Ruth," Robert Raslar; "The Rocks," Merrill S. Clark; "Outdoor Portrait," B. A. Boate; "See the Pretty Water," H. D. Lafayette; "Wonder What They're Saying," E. E. Shoemaker; "Outdoor Portrait," W. B. Merriman, Jr.; "By the Fireside," Burdette Harrison; "Pulpit Rock, Nahant, Mass.," E. G. Cook; "Still Life," C. J. Webb; "His Pal," Stark Weatherall; "Lightning," Robert H. Hoyt; "The Old Shed on the Hill," Francis Parrish; "The Tie Rush," Harold B. Adams; "Stripping the Christmas Tree," T. J. Greaney; "The Day After," J. E. Meehan; "American Game," J. W. Witikka; "A Cape Cod Cottage," A. C. Brooks; "The Return from the Bath," P. D. Booth; "By the Fireplace," A. Dearing; "Grace," William Ludlum, Jr.; "Scene at Plantogenet," D. M. Viau; "Catchin' Suckers," O. L. Hengsteler; "Max," Susanna Hayes; "Abandoned," Clarence N. Smith; "A Cloudy Day," C. M. Vander Veer; "Tire Trouble," H. A. French; "A Home Portrait," Fred Hausman; "The Bride," R. W. De La Mater; "Looking Up East Street," Chas. D. Nowell; "A Warbler's Nest," Ralph Beebe; "Gifts for My Photographic Friends," O. B. McRae; "Portrait Study," Roy J. Gaines; "Nature's Stage," R. E. V. Cook; "Out for Pleasure," Albert E. Neely; "Newaygo, Mich.," C. B. Parsons; "Narada Falls," E. C. Prusia; "Sidney," Louis Rommel; "Cutting Ice," Leo Lee; "Mike," Carl Struck; "A Holiday Gem," J. Varen; "In the Woods," G. Anderson; "Musconetong River," Fred W. Hardy; "Peach Orchard," J. B. Fogle; "Curiosity," Geo. F. Ferguson; "Boys," Stark Weatherall; "The Cahil Creek Cabin," L. Eddelbruttel; "Winter at Shady Falls," R. W. De La Mater; "At work," L. I. Snodgrass; "Paul at the Window," R. S. Miller; "A Winter Sport," R. E. Patrie; "Some Blizzard," John Kinsler; "Bluffs, Ill.," Wild Bob Burman; "A Pose," Wm. J. Dahler; "At the Pier," F. Marcille; "The Bridge," E. B. Osgood; "Moonlight and Clouds," R. B. Williamson; "Pigs," Juanita Ariebel; "First Aid to the Wounded," Karl E. Spear; "The Fountain," C. E. Longfellow; "Ready for Another Trip," H. Mortonson; "The Gathering Storm," Jas. Owens; "January Morn," W. Sheinicke; "After Dinner," Raymond Kegley; "Hang on Tight," Marion P. Smith; "Watching the Old Year Out and the New Year In," Earl O. Baird; "Outdoor Portrait," Wm. R. Slicer; "Thunder Heads," J. R. Ziegler; "Waiting Our Turn," Harry Hoffmeyer; "Lakeside," J. J. Hollar; "A Summer Home," C. L. Williamson, "Our Pet," A. C. Bellett; "Winter Scene in Sylvan Park," J. F. Eden; "Mount Royal," H. O. H Egan; "Winter Sports," M. Harbolick; "From My Window," Oran Smith; "A Near View of the *Kansas*," Howard Seely; "Lost Run by Moonlight," Tracy Hetrick; "Moonrise," M. Janowitz; "In the Fire Engine Parade," Robert Guitarman; "Good Morning," Robert Roth; "Log Cabin," J. H. Cunningham; "Out for a Drive," Chas. Armstrong; "After the Day's Work is Done," R. E. Wilson; "The Old Mill Wheel," Thos. C. Cunning; "Papa's Little Man," Mrs. Luther L. Killam; "Muir Woods, California," E. J. de Repantigny; "Chrysanthemum," Henry Scholz; "Zona Lorraine Wheeler," Carl Wheeler; "A Modern Gun," M. Harbolick; "The First Snowfall," Walter C. Rowe; "The Pine Grove," John M. Dailey; "Saving the Fur," G. E. Blancett; "The Red Mill," W. G. Winters; "Firelight," Ralph L. Bancroft; "Two in One," R. W. Brown; "Milwaukee," J. H. Becker; "The Children's Delight," W. A. Evans; "The Bridge," S. J. Henderson; "Tango Tommy," J. S. Palmer; "In Creskeld Woods," F. W. Kaye; "The Old Dock," T. W. Lindsell; "Happy Hours," F. E. Howe; "Comrades," Mrs. Eugene

Herman; "Squirrel Shooting," P. C. Cornell; "The Lovers' Quarrel," G. A. Morris; "Spring," W. E. Taylor; "Santa Claus Was Here," Charles Brodsky; "Maine Beauties," A. P. Hall; "Sunset Scene," L. J. Mathewson; "A Reverie," H. T. Middleton; "A Rubber Building," C. R. Davis; "Off for the Fair," Robert Curry; "Well I Should Say It's a Good One," W. H. Pennayer; "Watch Him," H. Palmer; "As Big as Dad," C. E. Kieler; "Orphans," J. M. Matchette; "The Falls," Reuben Zucker; "An Interior," J. M. Conklin; "A Happy Family," C. W. Becker; "Curiosity," J. D. Ficklen; "Stone Bridge," G. S. Obear; "Good Friends," M. D. Gore; "Pauline June," Axel Anderson; "A Memory Dear," Harriet E. Williams; "Chrysanthemum," Elizabeth Wotkyns; "Outdoor Portrait," Bert Davidson; "Outdoor Portrait," Charles Brodsky; "Bobby at the Gate," W. W. Mikesell; "Outdoor Portrait," R. Wildermuth; "Home Portrait," Wm. H. Flett; "Winter Sport," F. E. Dewart; "Window Portrait," H. H. Friedrichs; "Snow Scene," N. J. Young; "On the Alert," Lou E. Hurst; "Willing Posers," Wm. L. Bennett; "Luncheon," K. E. Spear; "The Stepping Stones," E. A. Doolittle; "Summer," H. B. Rudolph; "Where the Sunlight Falls," F. A. Northrup; "An Ohio Vista," Herbert Jackson; "Mount Jefferson and Marion Lake," A. G. Prill; "Where Lilies Grow," Wm. Ludlum, Jr.; "The Kodak Fiends," O. Holmes; "In the Pasture," Margaret Hitchcock; "A Summer Landscape," Alvin W. Prosse; "I Don't Like to Have My Picture Taken," Mrs. Cora Rudreed; "Picturesque Canal," Chas. A. Quinn; "Watching the Pig," A. R. Brown; "Portrait," S. J. Whelan; "Locust Trees," F. S. Green; "The Woods in January," H. C. Lang; "A Dead Shot," W. E. Whitaker.

READERS' FORUM

ORIGINAL NEGATIVE—No. 1 T. T. STURGEON

SOME SKILFUL FAKING

EDITOR POPULAR PHOTOGRAPHY:

I am enclosing you two prints from the same negative, entitled "Sunrise in the Gap" and "Moonlight on the Lake." They are the result of an accidental overexposure and considerable faking, and I thought that mayhap they would be of interest to some of your readers who like to experiment. The data on them are as follows:

Original scene, No. 1, Westlake Park, Los Angeles, taken about 4.30 last August on half of a 6½ x 8½ plate with Premo view, shot against the sun, although the sun was too high to fog the picture. In shooting through some tree limbs inadvertently knocked the stop wide open; as a result I had a bad overexposure, and, as the other half of the plate was slightly underexposed, to save it the overexposure was lost. It was so dense and with such little detail that it could not be printed. After throwing it around the darkroom for a month I wanted to try out some reducer, and used the overexposed half for the trial. It came out so good that I intensified it and made a print of it, but found that the sky printed too dark. I then saw the possibilities of an art picture and proceeded to use divers means, as follows to get the two effects.

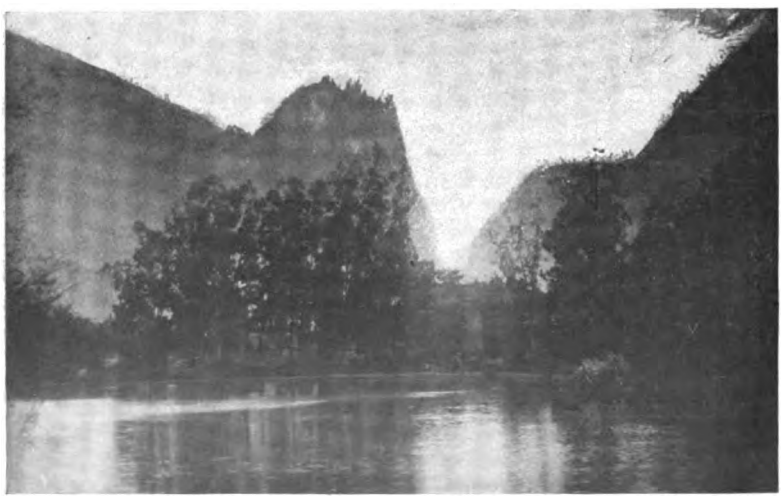
For the sunrise picture, No. 3, I smoked the back of the negative with candle smoke after I had put the fake sun in, which was a piece of paper pasted on the back. Where I wanted the mountains I rubbed out the smoke and let the sky print through. The trees

MOONLIGHT ON THE LAKE—No. 2 T. T. STURGEON

along the ridge were done with a stiff brush and the clouds with a little wad of cotton, just touching the smoke very lightly, with a circular motion.

The moonlight picture, No. 2, was accomplished by wiping off the smoke used in the previous picture and reversing the negative in the printing frame. The clouds were bunches of cotton, formed and laid on the negative in such a way as to give the impression of reflected light from the moon, which was the sun in the other print. The sky, being very thin, printed through to give the appearance of night except where the cotton made it opaque. I forgot to state that a piece of clear glass was placed on the cotton to hold it in place and the print made through it, giving greater diffusion Incidentally, there was a blemish on the plate from some factory cause, and by skilful manipulation I managed to kill it with the cotton and smoke. The moonlight was printed on Normal Cyko and the sunrise on Soft Cyko

T. T. STURGEON.



SUNRISE IN THE GAP—No. 3 T. T. STURGEON

EDITOR POPULAR PHOTOGRAPHY:

Please allow me to express my heartfelt thanks to you for the very agreeable surprise you handed me in the form of awarding me the prize in the December Competition published in the January issue of the magazine. I will not attempt to convey in mere words how good I feel about this matter (being my first experience as a prize-winner), but suffice to say that a small child with a new toy is as a piker in comparison.

I cannot help recalling at the present moment one of your little editorials on the Competition which has stuck by me, and which seems to describe more nearly my feelings than anything else I could say, the gist of which was that the winning contestant should not consider the money value of the prize so much as he should the satisfaction that goes with the knowledge that he has come out on top against competitors from all over the country. It is this satisfaction that prompts me to write this letter of thanks.

I might also add to the foregoing my praise of your magazine for the help it has been to me in bringing me from the stage of the ordinary snapshooter to that stage where I am anxious to get everything possible out of each and every picture I try to make. It is only by applying what I have learned from others through the magazine to my own work that I have reached my present stage of advancement in the art of photography.— WM. C. HERCHENHAHN.

EDITOR POPULAR PHOTOGRAPHY:

Your little magazine is priceless to me, and your article in the June issue would be worth the price of a year's subscription to anyone who does not master the art of correct development.— J. L. GALLAGHER.

EDITOR POPULAR PHOTOGRAPHY:

I hope the magazine will maintain the same high standard in the future that it has in the past. The most interesting part to me has been the pages devoted to "Causes of Failures," and although I have been an enthusiastic photographer for twenty years, I have gained a great deal of information and very much interesting reading from your bright little magazine; so continue my copies, as I don't want to miss a number. — GEORGE C. HELD.

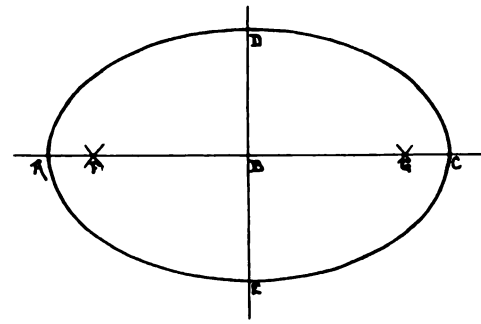
EDITOR POPULAR PHOTOGRAPHY:

Having been troubled with metol poisoning I purchased some wooden spring clips costing about one cent each. I immerse the exposed print in the developer by means of the stirring rod. When developed I remove it by means of a clip, pass it through the rinse water, and drop it into the hypo without moistening the fingers, avoiding not only the injurious effects of the developer but the making of finger prints upon negatives and paper.— RALPH BEEBE

EDITOR POPULAR PHOTOGRAPHY

GENTLEMEN: I note in the November issue the directions given by Mr. Chapman for drawing an oval, and would submit below my method of doing the same, believing it to be the simplest method.

Draw the lines AC and DE at right angles with each other and locate the points A, C, D, and E, in accordance with the dimensions desired, with B as a center. With AB as a radius and D as a center, intersect AC at G and F, repeating the operation with E as a center.



intersecting at the same points. The points F and G are where the pins should be placed. By driving a pin temporarily at C and looping the thread around the pins F and C, the tying of the knot will be more easily accomplished, afterwhich the pin C will be removed and a pencil substituted. During the actual drawing of the oval the thread will not so easily crawl under the point of the pencil if the latter is placed through the hole of a washer made of heavy paper or light cardboard, letting the thread ride on the upper side of the washer. — F. D. BURT.

NEWS AND NOTES

Rexo Paper. — We have recently tested a sample of the new gaslight paper manufactured by Burke & James, Inc., under the name of Rexo. Rexo certainly seems to be a paper of first-class quality throughout, and it has a wide latitude in exposure and development. The printing-speed is quick, yet it can safely be handled a few feet from an ordinary artificial light. Although development is of moderate speed, it may be forced, if necessary, with little danger of fogging or staining. The paper well combines brilliancy with softness, the old-time chalky effect of gaslight paper being absent. Our trials to date have been made with the Normal grade, and a further note will be published when we have had an opportunity to test the three grades and compare them with other papers on the same negatives.

Mr. Herbert Salzgeber, grandson of "Papa" Hammer the venerable and well-known head of the Hammer Dry Plate Company of St. Louis, had enrolled at the Illinois College of Photography for a thorough course in photography preparatory to going into the service of the company, of which his father is the general manager.

The rules and regulations covering the photographic competition to be held at the Exposition at the Grand Central Palace, March 27 to April 3, are now ready for distribution, and may be had by addressing I. H. Payne, Grand Central Palace, New York, N. Y.

One of the subscribers to POPULAR PHOTOGRAPHY writes us as follows: "Please change address of POPULAR PHOTOGRAPHY from above to below." Were it not for the fact that the gentleman's two addresses were in the proper places on the postal card, we should have imagined that he had suffered a fall from rectitude and that his conscience was troubling him.

Indianapolis, Ind., Jan. 15, 1915. — The executive board of Photographers' Ass'n of America has selected July 19 to 24 as the time for the convention of the association, which will be held in this city.

EXPOSURE-TABLES FOR MARCH

DIRECTIONS: Find in the tables printed below the NUMBERS for SUBJECT, STOP, LIGHT, HOUR and PLATE. Add them, find the sum in the last table, and give the exposure indicated. When the exposure fails to correspond with the speed-marking on shutter, use the nearest shutter-speed, preferably the lower. If sunlight falls over one shoulder, add 0; if straight across subject, add 1; if sun is ahead, add 2. When using back combination only of lens, add 2.

EXAMPLE

Average landscape	8	July, 11 A.M.	0
Stop U. S. No. 8	6	N-C film	1½
Intense light	0		

Adding these numbers, we get 10½, and on referring to the last table, under 10½, we find **1-40** second, which is the exposure to give. In this case you would use the speed marked **1-50** and open the lens a little, if possible; say, half-way to U. S. No. 4.

SUBJECT

Sea (only) and clouds	½	Street scenes, buildings, groups	5
Sea-views, snow-scenes, distant landscape	1	Portraits in shade	7
Open landscape, without foreground	2	Indoor portraits	8 to 10
Average landscape, with foreground	3	Interiors	16

STOP: —

f:2	*f*:2.3	*f*:2.8	*f*:3.3	*f*:4	*f*:4.7	*f*:5.6	*f*:6.7	*f*:8	*f*:11.3	*f*:16	*f*:22	*f*:32	*f*:45	*f*:64
				U.S. 1	U.S. 1.4	U.S. 2	U.S. 2.8	U.S. 4	U.S. 8	U.S. 16	U.S. 32	U.S. 64	U.S.128	U.S.256
1	1½	2	2½	3	3½	4	4½	5	6	7	8	9	10	11

LIGHT: Intense sunlight (inky-black shadows), **0**; Bright sunlight (strong shadows), ⅛; Faint shadow cast by sun, **1**; Dull (no shadows), 1⅛; Very Dull (whole sky very dark), **2**.

HOUR: 10 a.m. to 2 p.m., ⅛; 9 a.m. and 1 p.m., **1**; 8 a.m. and 4 p.m., **2**; 7 a.m. and 5 p.m., **3**; 6 a.m. and 6 p.m., **5**.

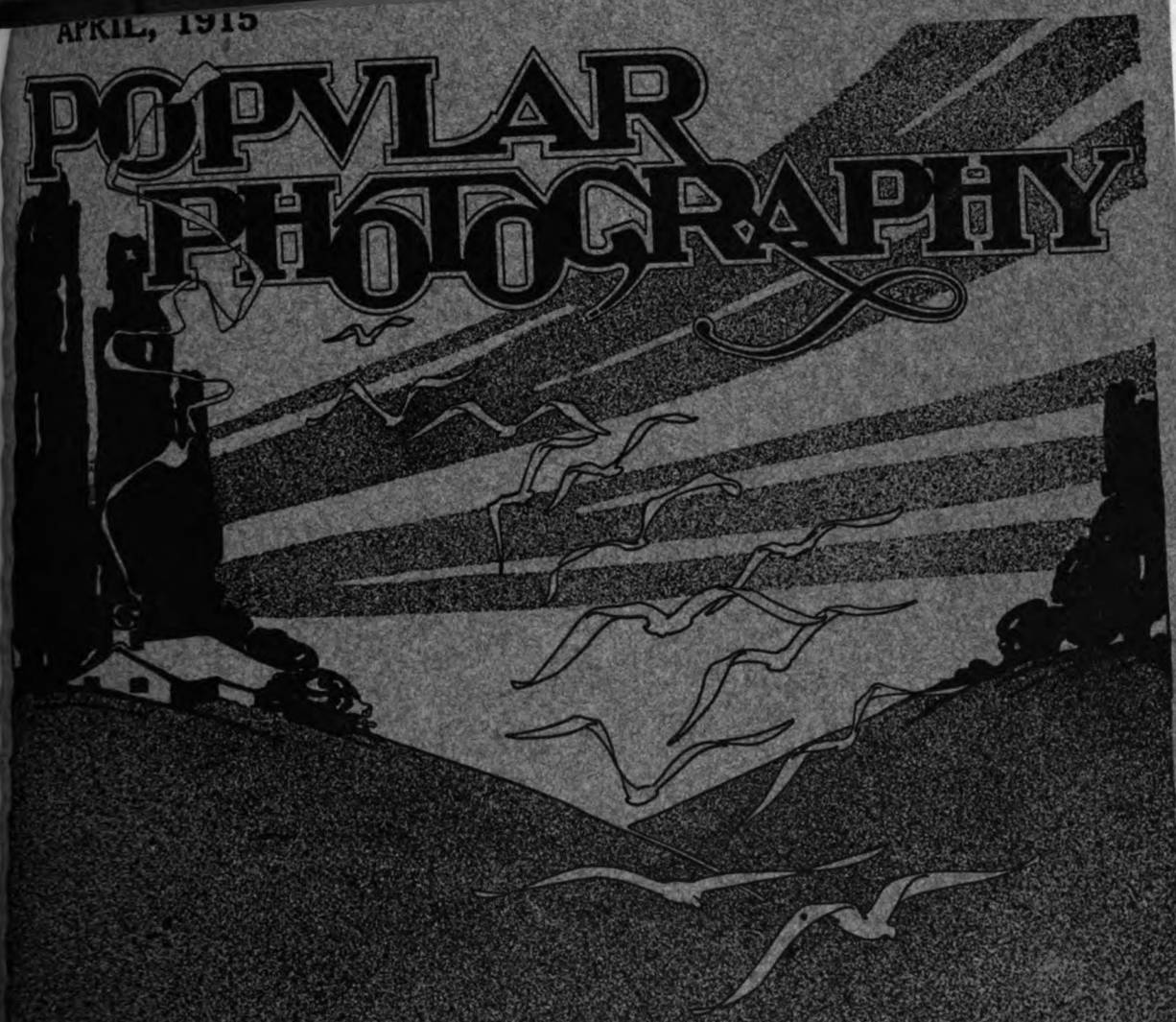
PLATE: AMERICAN, 1⅛. ANSCO FILM, 1⅛. BARNET — Film, 1⅛; Superspeed Ortho., **1**; Ortho. Ex. Rap., **2**; Red Seal, **1**; Red Diamond, 1⅛; Self-screen Ortho., **2**. CENTRAL — Special XX and Sp. Home Portrait, ⅛; Special, **1**; Comet, Colornon, and Pan-Ortho., 1⅛. CRAMER — Crown, **1**; Anchor, **2**; Banner, 1⅛; Inst. Iso., 1⅛; Med. Iso., **2**; Commercial Isonon, 2⅛; Portrait Isonon, 1⅛; Trichromatic, **3**; Slow Iso., **5**; Contrast, **9**. DEFENDER — Vulcan, **1**; Vulcan film, 1⅛; Ortho., **2**; Non-hal. Ortho., **2**; Slow, **9**; Process, **9**. DUFAY DIOPTICHROME, **7**. EASTMAN — Motion Picture Film, **1**; Portrait Film, **1**. ENSIGN FILM, 1⅛. FORBES—Challenge, 1⅛. HAMMER—Sp. Ex. Fast, **1**; Ex. Fast, **1**; Aurora Ex. Fast, 1⅛; Ortho. Ex. Fast, 1⅛; Ortho. Non-hal. **2**; Fast, **2**; Ortho. Slow, 2⅛; Slow, 2⅛. ILFORD—Monarch, **1**; Zenith, 1⅛; Sp. Rap., **2**; Chromatic, 2⅛; Ord., **3**; Process, **9**. IMPERIAL—Flash-light, **1**; Spec. Sensitive, **1**; Orthochrome S. S., **1**; Spec. Rap. 225, 1⅛; Spec. Rapid 200, **2**; Non-filter, **2**; Process, **9**. JOUGLA — Violet Label, 1⅛; Green Label, **2**; Omnicolore, **7**. KODAK—Speed Film, **1**; N. C. Film, 1⅛. KODOID PLATES, 1⅛. LUMIERE—Sigma, ⅛; Blue Label, 1⅛; Film, 1⅛; Ortho. A, **2**; Ortho. B, **2**; Panchro. C, **2**; Autochrome (outdoors), **8**, (indoors) **9**; Process **9**., MARION — Record, ⅛; P.S., **1**. PAGET—XXX, 2⅛; XXXXX, **2**; Swift, **1**; Ex. Spec. Rapid, **1**; Ortho. Ex. Spec. Rapid, 1⅛; Panchro. Ord., **2**; Panchro. Colour (no screen), 2⅛; Spec. Rapid, 1⅛; Hydra Panchro., 3⅛; Hydra Rapid, 3⅛. PREMO FILM PACK, 1⅛. ROEBUCK—Blue Label, **1**; D. C. Ortho., **2**; Ortho., **2**. SEED — Graflex, ⅛; Gilt-edge 30, **1**; Color Value. **1**; Gilt-edge 27, 1⅛; L. Ortho., 1⅛; 26X, **2**; Non-hal., **2**; Non-hal. L. Ortho., **2**; Tropical, **2**; C. Ortho., 2⅛; Panchromatic, 2⅛; 23. **3**; Process, **9**. STANDARD — Extra, 1⅛; Imperial Portrait, 1⅛; Orthonon, 1⅛; Polychrome, 1⅛; Thermic, 1⅛. STANLEY — 50, 1⅛; Commercial. **4**. THORNWARD — Regular, **1**; Orthochromatic, **2**; Orthochromatic N. H., **2**. WELLINGTON — Extreme, ⅛; 'Xtra Speedy, **1**; Film, 1⅛; Iso. Speedy, 1⅛; Portrait Speedy, 1⅛; Anti-screen, 1⅛; Speedy Spec. Rap., **2**; Ortho. Process, **9**. WRATTEN & WAINWRIGHT — Panchromatic, 1⅛; Process Panchromatic, **3**.

3½ S 1/3000	4 S 1/1000	4½ S 1/2000	5 S 1/2000	5½ S 1/1250	6 S 1/1000	6½ S 1/700	7 S 1/500
7½ S 1/350	8 S 1/250	8½ S 1/150	9 S 1/100	9½ S 1/75	10 S 1/50	10½ S 1/40	11 S 1/25
11½ S 1/20	12 S 1/12	12½ S 1/10	13 S 1/8	13½ S 1/5	14 S 1/4	14½ S 2/5	15 S 1/2
15½ S 2/3	16 S 1	16½ S 1⅓	17 S 2	17½ S 3	18 S 4	18½ S 5½	19 S 7½
19½ S 11	20 S 15	20½ S 23	21 S 30	21½ S 45	22 M 1	22½ M 1½	23 M 2
23½ M 3	24 M 4	24½ M 6	25 M 8	25½ M 12	26 M 15	26½ M 24	27 M 30
27½ M 45	28 H 1	28½ H 1½	29 H 2	29½ H 3	30 H 4	30½ H 6	31 H 8

These tables are based on the 1914 *edition of the "American Photography Exposure-Tables," a new and revised form of the "Photo Beacon Exposure Card." Owing to the great increase in the speed of lenses and plates since the original compilation of these tables, it has been necessary to completely change the system of numbers corresponding to stops, plates and exposures, so that exposure numbers from this table are* 5 *units higher than in the old tables. The complete tables, in pocket form,* 3 x 5 *inches, containing full directions for obtaining correct exposure under all conditions, may be obtained from our publishers at the price of* 25 *cents postpaid.*

APRIL, 1915

POPULAR PHOTOGRAPHY



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POPULAR PHOTOGRAPHY

Volume III | BOSTON, MASS., APRIL, 1915 | Number 7

A DEAD SHOT — W. E. WHITAKER

See page 262

LITTLE SPORT N. SINGELSTAD

LITTLE SPORT

The only criticism one can offer in judging this picture is on account of its poor spacing for the technical work is very good. In order to include all of the tail, the maker has left too little space in front of the body. There is also too much height, and trimming off about half an inch from the top would eliminate a distracting patch of light tone. Data: 4 x 5 Conley camera with R. R. lens and portrait attachment; 1-25 second at *f*: 11 on a cloudy day in May at 9.30 a.m.; Roebuck Blue Label plate; pyro tank development; print on Soft Instanto Glossy.

TYPES OF LENSES

A reader asks whether there is any difference between the R. R. and symmetrical lens.

Except for anastigmat lenses there are practically only two types supplied with any cameras. There is, first, the single meniscus achromatic lens, generally arranged to work at a fixed focus — that is, the camera has no focusing arrangement. The R. R. lens is sold under a great many different names, but it is always essentially the same. It consists of two single meniscus achromatic lenses, mounted at opposite ends of the lens tube. When both of these single combinations are of the same focus, the lens is called symmetrical; when they are of different foci, it is called convertible. There is little difference between the price of these types, as they are extremely cheap to turn out.

Anastigmat lenses, however, are very much more expensive to make, as they require a special kind of glass and special formulas in order to secure the very fine correction of optical errors, which makes them so much better than the rectilinear lens.

BULBS AND TIME EXPOSURES

One of our readers is in doubt about the proper action of the bulb movement of his shutter. On an old camera, when the shutter was set at B, the blades remained open as long as the antinous release was pressed; in his present shutter, fitted with bulb and tube, the shutter gives a snapshot.

This shutter is out of order. It should work exactly the same as the other one set on B; that is, as long as the bulb is pressed. Perhaps your bulb or tube is leaky. If fitting new ones does not correct the trouble, you will have to take the shutter to a dealer for repairs.

A DEAD SHOT

(*See page 261*)

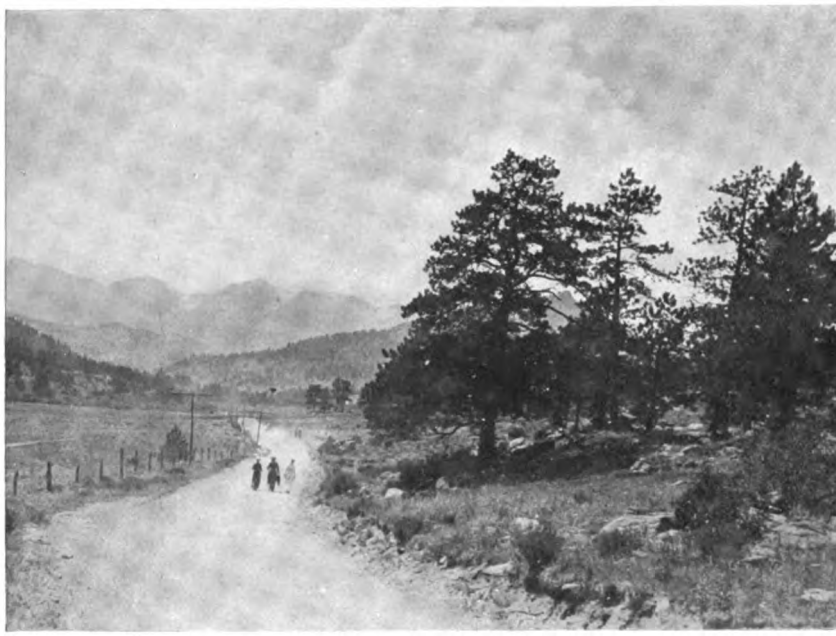
It is hard to understand why amateurs are so averse to trimming their prints. Mr. Whitaker's self-criticism is largely based on the defects which he sees in the marginal parts of his print, yet he lacked the courage to trim them off and mount the enlargement on a piece of plain card. The arrangement is so good that it should be presented to the best advantage, with all the scattered highlights removed. The spacing of the young marksman and the wounded owl shows that Mr. Whitaker understands how to seize the right viewpoint even when working in a hurry. Note the great amount of halftone in the boy's clothes — the result of full exposure and proper development — and the transparency of the shades. Data: 3A Kodak fitted with a Beck Isostigmar lens of 6¾ inches' focus; 1-25 second at *f*: 8 in September at 10.30 a. m.; bright sunlight; Seed Non-Halation L Ortho plate; development with Modified Thermo M.-Q.; enlargement on Velour Black Glossy.

RAPID DRYING OF PLATES

A reader sends in the following hint.

"After some annoying experiences in drying my plates, the atmosphere being very damp where I live, I began to use Cramer's pyro-*acetone* developer, and the plates dry in a reasonable time." He adds that he would like a set of Thermo tables for this developer.

A WINTER GIRL
WILMA B. McDEVITT
First Prize, February Competition. *See page 270*



IN THE ROCKIES G. L. CHENEY

IN THE ROCKIES

Balance of the steelyard, as described in Poore's "Pictorial Composition," is illustrated in this picture. The large dark masses of the evergreens are balanced by the tiny dark figures of the ladies in the road, where, on account of their light surroundings, their value as a spot of dark is greatly increased. Without these spots, the composition would be too heavy on the right. The print is unnecessarily black in the undertimed green of the trees as a result of using Regular paper when Special would have given, if no more detail, at least a less heavy black. Data: 3A Kodak with R. R. lens; snapshot at 2 p.m. in July at an altitude of 8,000 feet; Eastman film; tank pyro; Regular Velvet Velox postcard, trimmed.

A KISS

This picture is purely a record, and has numerous faults when considered from a pictorial standpoint. The maker states that it is a record of the old family mare in the act of teasing for a lump of sugar, and he recognizes that it could have been better arranged, had time been available, but he was obliged to take it then, under unfavorable circumstances, or not at all. Data: No. 3 Kodak fitted with Goerz Dagor lens of 5 inches' focus; 1-25 second at 9 a.m. in July in bright sunlight; *f*: 6.8; Eastman Speed film; pyro; print on Professional Cyko Matte.

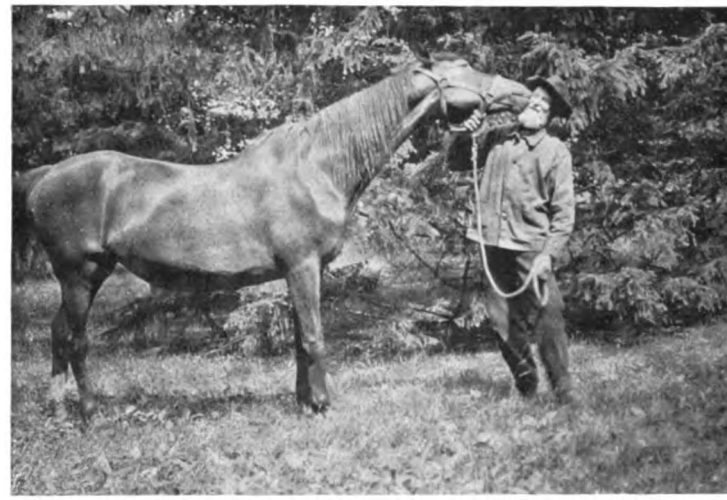
THERMO DEVELOPMENT

Surely it is unreasonable for so many of our readers to expect us to devote our time and materials to testing pet formulas for temperature coefficients. We have published in the Thermo Card all the information which is necessary, with a choice of four excellent developers. These will do all that any other formulas will accomplish, and it is absurd to talk about some other pyro, for instance, as giving any better result than the Watkins. The Card costs only 25 cents postpaid and contains all the information needed for successful development. If, however, you wish to draw up a special table to fit some other formula, 60 cents invested in a "Watkins Manual" will give you the directions and diagrams by means of which you can determine the temperature coefficient and construct the table.

There is no advantage in using a developer with a low temperature coefficient. The developer matters very little. Thermo development teaches the importance of correct exposure and demonstrates that any developing agent will give excellent negatives.

Metol, duratol, hydrochinon, and other chemicals are coming down in price, as can be seen by reference to the advertising columns in the March issue.

Formulas of English origin always intend crystal sulphite and carbonate to be used, even if not specified, whereas American formulas generally specify anhydrous.



A KISS H. A. FRENCH

Temperature coefficients must be found by experiment and cannot be calculated from the formulas. They have nothing to do with the Watkins factorial numbers. When the strength in grains per ounce is once fixed for the stock solutions, we cannot find that alterations of the sodas make any appreciable difference in either the temperature coefficients or the times of development at any given temperature.

We cannot explain why different pyro formulas have different temperature coefficients. We have checked and rechecked the temperature coefficient of each formula given on the Card. The temperature coefficient does not alter with dilution for different classes of plates, nor is it different for tray and tank strengths.

Regarding setting an Improved Interval Timer for fractions of minutes, one can estimate closely enough by setting the hand by eye between two of the minute divisions. An error of one fourth to one half minute is negligible at ordinary temperatures. Dealers should now be able to obtain these timers promptly from the manufacturers, Edwards Manufacturing Company, Westfield, Mass.

In making up the formulas, avoirdupois ounces are intended, but the use of apothecaries' ounces would make no practical difference in results.

In recalculating the Modified M.-Q. formula, we added enough carbonate to make the total amount 1½ ounces (660 grains), simply to get an even quantity. We are aware that the Modified formula is stronger in carbonate than the Watkins formula from which it was derived; but this need not alarm anybody, for reasons already stated. If readers will kindly try the formulas instead of theorizing about them and calculating grains per ounce, they will find that their difficulties are imaginary.

The same plate at the same classification will give more contrast with the 1.9 table than with the 2.6 table. The reason for this is that we followed Mr. Watkins on the 1.9 developers and made the standard time at 60 degrees six and one half minutes. This gives a strong negative suitable for P.O.P., still the most popular paper in England. The duratol 2.6 table, on the other hand, was adjusted to give a negative of exactly the same printing quality as was yielded by *one class more dilute* developer of the 1.9 class — in other words, a quick printer for P.O.P., Normal gaslight paper and bromide enlarging. This made the 60-degree time five minutes. Persons requiring denser negatives will find it better to secure full time than to change the developer. Thinness, in the Thermo system, is the result of underexposure. All the test exposures developed with the tables were given *half* the Watkins Bee meter times, in accordance with the directions under "Shutter Exposures" for the meter. In fact, if readers would make this their standard outdoor exposure, they would find that it would solve at once all questions about uniform printing quality.

Panchromatic plates vary more from batch to batch than other plates, yet if the system is rigidly followed, the same development speed will be found to give satisfactory *prints*, even if the opacity varies greatly from batch to batch. In other words, by standardizing exposure with the meter and development by the Thermo Card, one secures good prints, forgetting about the appearance of the negative. The meter readings will be found to correspond

MARGARET K. P. MORAN

closely with the exposures indicated by the *American Photography Exposure-Tables.*

MARGARET

This portrait was taken by way of experiment to find whether a Vest Pocket Kodak of the $6.00 variety would make a good portrait. The result, both in the contact print and in the enlargement, is satisfactory, though the spacing is poor. It is difficult to tell from the minute image in a finder just where the figure will prove to be on the film, because there is always a sufficient difference of position between the camera lens and the finder lens to make their images include a different amount and bring the principal object in an unexpected place, unless one allows an amount determined by experience in placing the finder image. The remaining data are: portrait lens used; 1-5 second at *f*: 11 at 3 p. m. in August; bright sunlight outside; Eastman film; pyro; print and enlargement on Special Portrait Velox.

EATING APPLES

This is one of those pictures which hundreds of thousands of beginners annually turn out as a result of snapping something which takes their fancy or happens to appeal to them at the moment. The trouble with all such hasty snaps is that one seldom sees the obnoxious features; but we thought all beginners by this time had learned not to take portraits or genres with a clapboarded house behind the figures. The oval mask used in the present instance renders the horizontal lines a little less striking by reducing their extension toward the margins. Data: 3A Brownie camera with R. R. lens; 1-25 second at *f*: 11 in bright sunshine on Eastman film; Nepera developer; print on Regular Velox.

TEMPERATURE COEFFICIENTS

How to Find and Utilize Them

MALCOLM DEAN MILLER, M.D.

The Editor has asked me to answer a number of queries about temperature coefficients and Thermo development by writing an article which will enable readers who simply *will* not use the developers given on the Thermo Card to utilize their pet developer by the Thermo system. I ought to say, first of all, that for negatives, at any rate, there is no virtue in any particular developing agent. It's chiefly a matter of taste. Workers who habitually give correct exposures get perfect negatives with any developer. The Thermo Card has presented a choice of four types of developer, and any reader who has not yet tried some one of them is earnestly advised to use a few plates, correctly (fully) exposed by the *American Photography Exposure-Tables* (or meter) in experiments to fit the printing quality to his own needs. For example, the 1.9 tables give a strong negative, ideal for P.O.P., and those who use the D.O.P. may prefer to class their plates one group towards VVQ, in order to produce a quicker printer for Normal paper. The 2.6 tables, on the other hand, are adjusted for Normal paper, so the habitual user of P.O.P might wish to use the developer one class more concentrated. In any event, each user has to find by actual trial the combination which best suits his own taste.

It is by actual trial, not theorizing about the strength of a developer in grains to the ounce, that temperature coefficients are found. A definition may be in order. The temperature coefficient is simply a ratio between the times of development for a difference of 10 degrees Centigrade or 18 degrees Fahrenheit. The way to find it, then, is to develop two plates

at any two temperatures exactly 18 degrees apart and note the times. The greater divided by the lesser gives the temperature coefficient. But it is not necessary to carry the plates to full development. The time of appearance of the image is all that needs to be noted, if the accompanying diagrams are used.

Let us now see what happens in an actual case. Two plates from the same box are exposed exactly alike on a landscape with sky. One is developed at 76 degrees, and the image appears in 16 seconds. The other is developed at 56 degrees, and its image appears in 41 seconds. Turn now to the logarithmic scale. Take a sheet of paper and lay it along the scale. With a hard pencil, make dots opposite the 16 and 41 marks. Now lay the paper on the temperature scale and let the 16 mark fall on the 76-degree line. Move the paper up or down, always with its edge parallel with the horizontal lines. When it reaches the position where the 41 mark falls on the 56-degree line, it will be found to coincide with the horizontal line marked 2.4. Therefore 2.4 is the temperature coefficient of the developer.

It should be unnecessary to say that very large errors may be introduced by the slightest inaccuracy in counting seconds for the time of appearance. It is therefore advisable to perform the experiment at least three times, taking the average if the results are reasonably harmonious; if not, more trials should be made, with extra care in the following points of technique.

First, check the time of appearance more carefully. If a seconds timer is not at hand, and a stop-watch cannot be borrowed, use a pendulum.

Second, allow more time to secure a constant temperature. The cold trial should be at the temperature of the room, and tray, thermometer, graduate, etc., should be at the same degree *exactly*. Setting everything in a large pan of room-warm water for ten or fifteen minutes is the best plan. The plate should be in the tray (covered light-tight, of course) so that it, too, will be exactly the same temperature as its surroundings. Frequent observation of the thermometer will show when the temperature has become constant; but any large variation between two trials would seem to point to the plate's not having been left long enough to reach the common degree. It is better to do the cold trial first. The warm trial should be controlled by watching the thermometer until it is falling very slowly. At least two quarts of hot water should be used in the bath, everything being immersed in it until it is only about 22 or 24 degrees above the cold trial point. The tray should then be floated on the hot water and the plate unloaded and placed in the tray so that it may warm to the same degree. In ruby light, of course, the thermometer is now watched until it is almost 20 or 19 degrees above the temperature of the cold trial. The developer is then poured over the plate and the time of appearance of the image in seconds noted with the utmost accuracy. The moment the time is secured, the white light should be turned on and the temperature recorded, as the error is thus minimized.

EATING APPLES E. HERMAN

Third, standardize the idea of "first appearance" in your mind so that you will not introduce any error by varying your estimate of when the "first highlight" is actually visible.

These directions may sound a trifle complicated, but the process, in practice, will be found simple enough. Uniform temperature for the plate and all utensils and accurate timing are the essentials.

The temperature coefficient being found, it now remains to utilize it for drawing up a Thermo table. The first thing to do is to find

IN THE PIGPEN A. L. HORROBIN

the exact time at room temperature for perfect development. A normal (full) exposure is made and developed by inspection of the factorial system until it is exactly right. The time is then noted. Should this negative be too contrasty or lack contrast, another trial should be made. When at last a perfect negative is secured, judging by the prints it makes, the time of development is used as a starting-point for constructing the tables.

Take a sheet of paper and lay it along the line of the proper temperature coefficient on the temperature scale. Mark on its edge the temperature divisions from 80 to 40. Mark also at least the even tens, 80, 70, etc., as guides. Now lay this scale against the logarithmic scale and slide it along until the time of development and the temperature coincide. Thus, returning to our example on the 2.4 developer, it was found that the 76-degree time was 6 minutes and 45 seconds. The paper is adjusted so that the mark for 76 degrees comes exactly opposite (by eye) a point three quarters of the way from 6 to 7 on the logarithmic scale. Against each temperature mark will now be found the time of development, and the table is made by copying them down on the paper. It is hardly necessary to estimate fractions of a minute and closer than the nearest quarter.

In the same manner, to construct a tank table, having found the right dilution and the time it requires at room temperature (to avoid change of temperature during development), set the scale of degrees so that the chosen temperature will come opposite its number of minutes on the logarithmic scale. For instance, I found that tank strength Modified Thermo D.-Q. took thirty minutes at 54 degrees. This brought the 65-degree time out as seventeen minutes, which was exactly what I had been using at that temperature. This result naturally confirmed my calculation of the temperature coefficients.

The table thus drawn up by the reader is not a complete Thermo system, but it applies to the particular plate used as long as the developer is always mixed of the same strength. A complete system can be calculated by experiments to find by trial the proper dilutions for each class of plates. It took me most of my spare time for over a year to work up and check every detail of the Modified Thermo formulas, although I had Mr. Watkins's work to go by. Readers can accordingly see that it is, to say the least, inconsiderate for them to write me personal letters asking me to furnish them with Thermo tables for their own pet formula.

IN THE PIGPEN

Record snapshots like the present example are seldom as well arranged, particularly when the difficulties are great, as they were here. The lens had to be pointed through an interval between two stakes of the fence and the exposure made without attracting the attention of the subjects. Any attempt to arrange the

A YOUNG BEGINNER WM. LUDLUM

subject would have destroyed its present spontaneity, for, as Mr. Horrobin says, "Pigs are obstinate beasts, and more often than not they do just what you don't want them to do." Data: 5 x 7 Film-Plate Premo with 8½-inch R. R. lens; 1-50 second at *f*: 16 in September at 11 a.m.; intense sunlight;Premo pack; M.-Q.; print on Normal Cyko Glossy.

A YOUNG BEGINNER

This is a genre of unusual merit, for not only does it tell its story to great advantage, but also shows unusually good composition. The figure is almost in the middle, it is true, but the shadow on the wall extends its mass to the right and thereby destroys the sense of too much symmetry. The lines of the stonework are rendered less objectionable by being treated as diagonals, and the background masses are well placed. Even the empty patch of sky is given a good tone, suggestive of dark blue, not of white paper. Mr. Ludlum made the picture with a 3A Kodak and gave the Eastman film 1-25 second at *f*: 8 in November at 10 a.m. in good light; he developed with duratol and printed on a Normal Cyko Glossy card.

DIRECTION OF THE LIGHT

Its Influence on Exposure

A subscriber writes, "In computing necessary time for exposure from your guide, I note it states, 'If sunlight falls over one shoulder, add 0; if straight across subject, add 1; if sun is ahead, add 2.'

"I do not quite understand this statement

THE HONEYMOON IS OVER C. D. MESERVEY

and will appreciate it if you can make it clearer.

"Am I to understand that after computing time according to subject, stop, light, time, plate, etc., I am then to consider location of sun and add that to the total already calculated?"

The answer to this question is "yes."

Probably only about one photograph out of a thousand is made with the sun in any other position than behind the camera. All the instruction booklets point out that the light should come from diagonally behind the lens. The purpose is twofold: first, to secure enough illumination; secondly, to secure pleasing modeling of the subject by means of shadows. If, now, the exceptional photograph is to be made, the proportion of shadows is so much greater than normal that the former exposure would yield undertimed results. The more dark values there are in a picture, the more perfect must be the presentation of details in the dark parts. Hence, when the sun casts the shadows directly across the view, the exposure needs to be doubled. Readers have doubtless noted that a change of one half in the sum, in our tables, indicates an exposure-difference of 50 per cent, so that adding 1 means doubling the exposure. The other case, "when sun is ahead," is encountered chiefly in pictorial landscape work. The lens must of course be shielded from the direct sunlight. The illumination, when pointing toward the sun, is found by experiment to be so low, and the proportion of shadow to light so high, that nothing less than a four-times increase will give fair shadow rendering. Hence the direction to add 2 to the first-found sum.

We have repeatedly checked these exposures by actual field tests under the conditions named, using a Watkins Bee meter to supplement the tables, and in every case we have found that we got the same readings. Exposures made in accordance with the tables were correct and could not be diminished save at the expense of imperfect shadow rendering.

THE HONEYMOON IS OVER

As usual, Mr. Meservey's contribution shows fine technique and considerable invention. Subjects out of the ordinary, if they possess any value as genres, seem invariably to attract him. In this case, however, the picture was deliberately posed "to get something comical," and the result is certainly a fair approach to the end sought. Mr. Meservey sees a fault in his handling —"the girl should have turned her face up and be screaming with rage, though I don't know as I could have got the scream on the negative, as POPULAR PHOTOGRAPHY teaches us to strive for soft and harmonious prints." Data: 4 x 5 Cycle Poco with 6½-inch lens; 1-5 second at *f*: 11 in August at 3.30 p.m.; bright sunlight; Standard Polychrome plate; D.-Q. developer; print on an Azo E Hard postcard.

A WINTER GIRL

(*See page 263*)

Mrs. McDevitt seems to have excellent success in the photography of children, for with such pictures she has not only taken first prize in our competition this month but received it last month also, and in addition we learn that one of her child portraits has been awarded first prize in the February competition of *American Photography*. It doubtless will seem unfair to some that one person should receive so many prizes in succession, but the awards were made with entire impartiality, and the judges did not know of this fact until after all the awards were made and the pictures reproduced. We extend Mrs. McDevitt our heartiest congratulations, especially as her name is one which has been known to us as a maker of prize-winning pictures only recently.

AT HOME DR. H. VIEHE

While there is no question of the charm of the picture awarded the first prize, many of the readers would doubtless like to know what the judges have seen in this picture to make it so successful. It seems to us that, first of all, the maker must be greatly in sympathy with the children whom she photographs, for all her pictures show her little subjects quite at ease and thoroughly happy in expression. The character of the sitters is well portrayed in these pictures, and in addition the technical work is thoroughly well done. In the prize-winning picture this month, though the clothing is rendered with beautiful texture, there is absolutely nothing which competes in interest with the face, the principal point of interest in every portrait. The picture was made with an 8 x 10 Studio camera, fitted with Voigtlander lens of 14 inches' focal length. The exposure was 3 seconds at stop *f*: 6.3 at 1 p. m. in January, with very dull light. The Seed Gilt Edge 30 plate was developed in Eastman plate tank powders, and the 8x10 enlargement printed on Linen Enlarging Cyko from a 5 x 7 plate.

AT HOME

Flashlight interiors are seldom quite satisfactory unless one's interest in them is purely to note the exact recording of every detail. Almost always they contain too much. The present example is no exception to this last statement. If the table and the multitudinous vases of withered flowers had been taken away, the rest would not have been so bad. The picture was made by firing the flash by means of a candle, a thread being led to the chair. The camera used was the 3A Special Kodak. The Eastman film was tank developed with pyro-metol and printed on Glossy Velox.

TRANSFER PHOTO TO WATCHCASE

Here is a way to transfer a photograph to a watchcase, watch dial or any other similar object that is extremely simple. By use of this method anyone can do good work from the start, without experience in photography. It makes a perfect, transparent film that appears as if the photograph were taken directly on the watchcase or dial.

First, prepare this mixture: Collodion, 4 ounces; Vence turpentine, 1 dram; camphor spirits, 10 drops; and 95 per cent alcohol, 1 ounce. Flow this solution over the photograph that is to be transferred, and carefully lay it aside to dry for fifteen minutes; then paste the print, face down, on a smooth piece of plain glass, using ordinary library paste. Allow it to dry for at least one hour; then, with the bowl of a spoon, or a finger, rub the picture from the center out, wetting with cold water until all the paper backing is removed, and place the glass with the picture into a bowl of hot water. The composition will free itself from the glass.

Place the film on a piece of ordinary paper and cut it to the desired size. It is usually best to cut it in the shape of a disk to fit the watchcase. Place this disk back into the warm water, and the film will soon float while the paper sinks to the bottom.

EARLY SNOW C. S. BOOTH

With a solution of gum acacia, grease the case that is to receive the picture, then carefully place the picture in the right position and attach it firmly by pressing with a silk cloth.

The best place to put the picture is either on the inside of the cover or on the dial. If placed on the dial, the picture will show up in every detail, yet the figures can be seen through the picture.

A WINTER LANDSCAPE

It is very natural that at this time of year a very large number of snow pictures should be entered in our competition, and Mr. Kempin's brook scene appears to the judges as the best of many interesting portrayals of snow, partly because of its interesting composition and partly because of its excellent rendering of the crispness of sunlit snow without sacrificing details in the shadows. The tendency in the snow pictures which we receive is toward inky black tree and rocks and blank paper for the snow. This is not what one sees in nature, and in a good snow picture there should be very little pure white paper and very little dense black silver deposit. A soft-working grade of paper almost always is to be recommended for printing such subjects. Though the brook in Mr. Kempin's picture is a trifle too near the center in the foreground, the graceful curve to the left and back again to the right makes up for this slight fault, and the vertical trees effectively break up the horizontal lines.

EARLY SNOW

Two prints of this scene were sent in, one being just a tint too light and the other, on a rougher paper, a shade too dark. The smooth print was selected for reproduction, in spite of its lacking a touch of crispness in the snow detail, for probably more contrast of the right sort could only have been obtained by using a filter. The effect as a whole, however, is very well rendered, particularly the atmosphere which seems to enshroud the more distant trees. The composition is good. A postcard-size Ansco camera with 6½-inch rapid symmetrical lens was used. The exposure was 1-5 second at *f*: 22 in November at 10.30 a.m. in "medium" sunlight, and Mr. Booth thinks it was a little too full. The Eastman Speed Film was developed with pyro in the tank and printed on Noko Medium A.

NON-POISONOUS DEVELOPERS

One of our readers asks for a formula, published in our columns in 1914, for a plain hydrochinon developer, as he has been poisoned by metol. He says he cut the formula out and used it successfully, but has now lost it.

A hydrochinon formula was published on page 65 of the November, 1913, issue. Another was printed on page 190 of the February, 1914, issue. We have been unable to locate any formula such as our reader vaguely describes as a 64-ounce single-solution developer made up with both sodium and potassium carbonates.

As a matter of fact, no developer is known which has not at some time caused skin irritation for somebody, though metol is the worst offender. We have been told of poisoning by hydrochinon, though we are inclined to think it was the alkali which caused the irritation.

A good single-solution hydrochinon developer is, as given in November, 1913:

A WINTER LANDSCAPE — W. F. KEMPIN

Second Prize, February Competition

Water (warm) to make . .	20 ounces
Hydrochinon	1 ounce
Sodium sulphite	2 ounces
Potassium carbonate . . .	3 ounces

For use, dilute one ounce with five ounces of water.

BISULPHITE OR METABISULPHITE?

A captious critic takes us to task for publishing in one issue a formula with metabisulphite and in another one with liquid bisulphite as the hardening and clearing agent in the acid fixer. He asks why we do not recommend one in preference to the other.

Potassium metabisulphite is an expensive chemical just now, as Germany is the chief source of potassium salts. Sodium bisulphite, liquid and granular, is manufactured in large quantities in America for use in bleaching, etc., and is relatively cheap. The standard granular bisulphite is Mallinckrodt's or Lumière's; the standard liquid, Lumière's. The latter keeps better than the former and is also considerably more efficient, as it contains an excess of sulphurous acid.

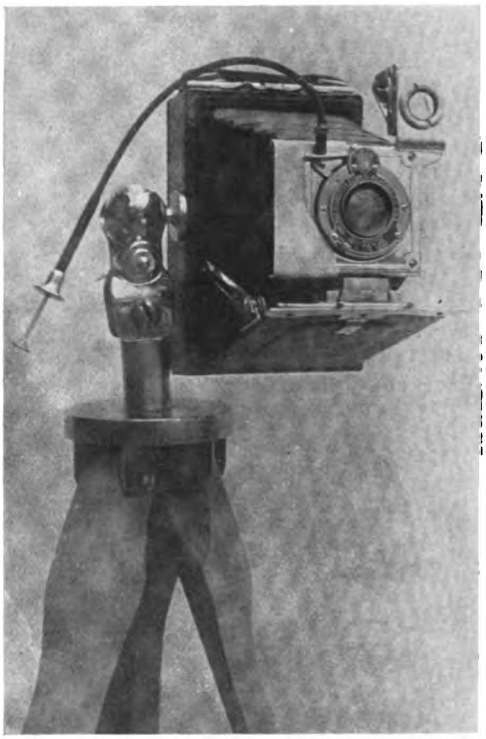
The choice between these two chemicals is largely a question of convenience. We keep both on hand, using the metabisulphite preservative for the developer, and the liquid bisulphite as an addition to the plain hypo bath. Sometimes we use the metabisulphite in the hypo. They act equally well. One has to avoid dissolving metabisulphite in hot water, or it will decompose. The liquid bisulphite is quick and easy, as an ounce or two is simply stirred into a pint of water and added to a pound of hypo dissolved in four pints to make an acid fixer. The metabisulphite crystals have to be crushed in a mortar, dissolved in warm water, and added in the same way. An ounce of fresh metabisulphite crystals is equivalent in acidity to

four ounces of liquid bisulphite, but the proportions do not matter much.

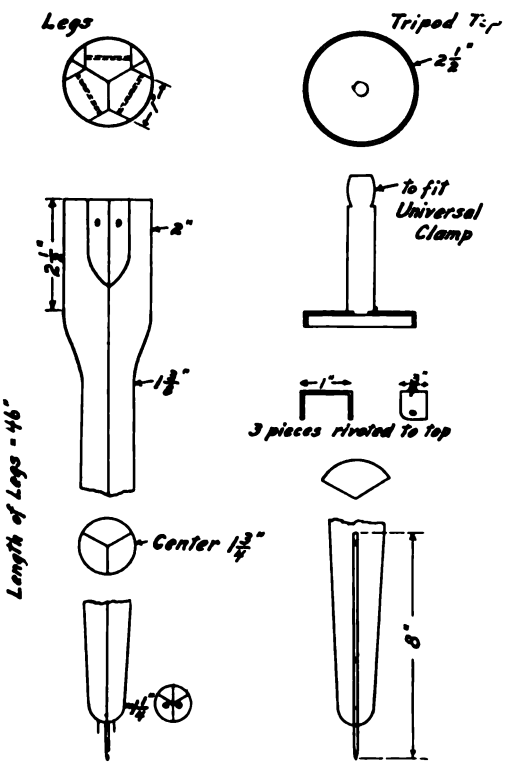
WALKING-STAFF TRIPOD AND CABLE RELEASE

I have a Premoette, Jr., No. 1, which has only one tripod socket and the shutter fitted with finger release only. I made a staff tripod of which I am sending a photo and drawings. The legs are made of cedar and are light and stiff. They are forty-six inches long, which is about right for a reflecting finder. I riveted an eight-inch piece of steel umbrella rod to one leg; in the other two I drove short pieces of nails, which are used only when open as a tripod. I have a leather strap that fits over the lower end to hold the legs shut. I had a piece of brass for the top as in the drawing and photo, but a flat piece would do as well. I screwed a two-inch piece of brass rod into the top and fastened a universal clamp on the upper end, then took three strips of brass three inches by three-fourths and bent them U-shape and riveted them to the top after drilling holes for the leg bolts.

For cable release I took a piece of aluminum (brass is as good) and bent it so as to fit over the front of the camera, screwing the release in so as to come over finger release, as shown by the illustration.— F. H. Van Hise.



WALKING-STAFF TRIPOD AND CABLE RELEASE



TONING BLUEPRINTS

A method of turning the rather crude blue of the ordinary ferro-prussiate process into a pleasanter violet-blue or grayish-blue is by placing the print, as it comes from the frame, in a very dilute hydrochloric acid; five minims to the pint of water is a suitable strength. After remaining in this until all the soluble salts have been washed out, it is placed in a very dilute ammonia solution — say ten minims of strong ammonia to the pint. In this bath it turns to a violet-blue color, and the whites speedily become cleaner. The action must not be allowed to go too far or the image will be weakened. As soon as the unexposed parts are white, the print is laid, face upwards, in bright sunlight, in a dish with a solution of one ounce of alum and thirty grains of tannin in half a pint of water. In a few minutes it will be noticeably increased in strength; and when no further grain is observable, it is put once again in dilute ammonia, until the color of the image has changed as much as seems desirable, the change being from blue to violet, and ultimately to gray.

THE FARM ROAD S. R. KITCHIN

THE FARM ROAD

A poor viewpoint was taken up for this picture, for it has the defect of including too much, in fact, of being two pictures instead of one. Starting with the idea of the road as our theme, we at once trim off the entire left half of the print, leaving only the road and the tree. This is not satisfactory. The left half is no more so, because it has a blocked entrance and the farm buildings are too much out of focus. The camera should have been planted farther to the right so that the road could have been placed nearer the middle of the print or an entirely new place chosen at some point where the road would have led the eye naturally toward the farm. Mr. Kitchin made the picture with a 4½ x 6½ Seneca camera fitted with a 7-inch Euryplan lens, using the Wellington Anti-Screen plate with a 3-times filter in bright light in October at 2 p.m. The exposure was 1-5 second, stop not stated. The plate was developed in the tray with amidol and printed on Platora Medium Soft.

TROUBLES OF A BEGINNER

One of our new subscribers appeals to us, as follows, to help him out of his troubles.

"Not having any supply shop within several miles, I am writing to you. My kodak, which is a No. 1 Folding Pocket, was given to me by one who had used it somewhat, and no book of instructions came with it. In reading the remarks about a picture, I do not understand certain terms given under the data. If I were submitting a print I should not know what to put for lens, focus of lens in inches, stop used for exposure, *f*: . Can you tell me what I wish to know about my kodak with what information I have given?

"The remarks about the pictures in the magazine have helped me concerning the position of objects."

Anyone situated as this reader is, should at once expend 12 cents and a little time and letter-paper in writing to the makers of the camera, inclosing 10 cents in stamps, and asking for an instruction book and a catalog. Between these two publications, on careful reading, one can secure the needed information. As, however, there may be others who would appreciate an explanation, let us consider this particular type of camera in detail.

Practically all the low-priced cameras are fitted with a single meniscus achromatic lens which has its largest opening or stop *f*: 16 (U. S. 16). This kind of camera shows no glass except when the shutter is open for a "time" exposure, when the lens can be seen through the opening of the shutter blades. Many cameras with single lenses are fitted either with three unmarked stops or with stops marked 1, 2, 3. In either case, the largest is *f*: 16, the next, *f*: 22, and the smallest,

THE RETURNING PRODIGAL R. K. WOOD

f: 32. Reference to our monthly exposure-tables will show that any of these openings requires just twice the exposure of the next larger. We do not approve of the Uniform System (U. S.) numbers and never refer to them in the columns of the magazine, in spite of the fact that most cameras made in the United States are marked with U. S. stops. The latter system is based on the *f* system, but has no particular advantages and several disadvantages.

A few models of cheap machines are fitted with double or R. R. lenses. These can be told instantly by the fact that a part of the lens is plainly visible in front of the mounting. These instruments are generally provided with shutters on which a scale of U. S. stop numbers is engraved. The largest opening, *f*: 8 ordinarily, is marked 4. The remaining numbers of the series are not only actually double their preceding companions, but they require double the exposure of the next larger. Thus, U. S. 4, 8, 16, 32, 64, 128, and 256 correspond to *f*: 8, 11, 16, 22, 32, 45,and 64, as may be seen by consulting our tables.

Sometimes the shutter is simply marked I for "instantaneous" or snapshot exposures; but the better forms have marked speeds, 100, 50, 25, for example, denoting 1-100, 1-50, and 1-25 second. The "I" is generally 1-25 second. When a reader states that he is using one of the cheap cameras which lacks these stop and speed markings, we generally pay no attention to them in the data. To be precise, the user can enter under lens, meniscus; under focus of lens in inches, the focus stated in the catalog, or the distance from the stop to the film; under stop used for exposure, *f*: , whatever the *f* value is, as explained above. Generally, however, the exact designation of a camera with meniscus lens, as No. 1 Folding Pocket Kodak, is all that is needed. Users of more elaborate instruments, however, should not fail to enter as complete data as possible.

The most important precaution to be taken is to make sure that the letter *f* is crossed out and U. S. substituted if the reader wishes to designate the U. S. stop used. This prevents mistakes on the part of the critic; but the data will in all cases be given with the correct *f* number instead of the U. S. number.

Several of the kodaks are furnished with either meniscus lenses, (fixed-focus style) or with R. R. lenses (focusing by scale). The latter are listed as R. R. type, hence the user should have no difficulty in finding the proper data by examination of his instrument and reference to his instruction book.

The U. S. numbers do very well for R. R. lenses working at *f*: 8, for there the series is simple, and the idea that each mathematical doubling represents a need for doubling the shutter exposure (using a speed marked twice as slow) is readily grasped. The moment one goes to a larger stop than *f*: 8, however, the

THE LAST SNOW JOHN MARKLAY

simple relations are lost and confusion worse confounded is the result of trying to figure relative exposures for the larger openings. For many reasons, the *f* values are greatly to be preferred, and we wish that it were possible to persuade all makers to use them to the exclusion of other systems.

THE RETURNING PRODIGAL

Precise data are lacking for this picture, the maker simply saying, "This negative is a little light-struck and thin, but a new negative can be made of the subject. How should it be composed?" There is one good point about the present arrangement, and that is the arrangement of the two main tree masses, which are well placed to effect a pleasing balance. The empty white sky, however, is bad. Every picture has its theme, or idea, and, since Mr. Wood wishes to express that of the return of the prodigal we would suggest taking the picture with the subject just opening the gate and looking toward the house. Probably a suitable viewpoint could be found, either on the main road or at the side gate. The present arrangement shows both road and path to disadvantage.

THE LAST SNOW

The composition of this print is very satisfactory, as the principal masses are well spaced and the long, curved line of the stream is finely managed. In fact, there is almost nothing about the print to criticize adversely. The exposure was calculated by our tables, using the following factors: Subject, 5; hours 1; light, 1; stop, 6; plate, 1½; sun, 14½. This called for ¼ second, so two exposures of 1-5 second were given. The other data are: 6½ x 8½ Seroco camera with 10½-inch R. R. lens; 5 x 7 Wellington Anti-Screen backed plate; 9 a.m. in March; faint shadow cast by sun. Development was with Eastman's M.-Q. and the print is on Normal Cyko Semi-matte.

A DEVELOPER WITHOUT SULPHITE

Referring to the question of fog caused by sulphite, a subscriber writes that his favorite modification of D.-Q. seems to him superior because, having substituted potassium metabisulphite for sodium sulphite, he gets negatives entirely free from even the slightest traces of fog. While he was using the standard formula, he suffered from skin irritation; but on returning to the metabisulphite formula, "not only have all signs of poisoning disappeared, but my fingers, which were very badly stained, are getting normal, and the developer seems to be non-poisonous. Now, as previously mentioned, this may be a coincidence, but the facts are that I never was poisoned until I added sodium sulphite to a developer contain-

BINKS W. A. CLARKE

ing metabisulphite; neither was I poisoned when I used sulphite alone as a preservative. . . . I wish you would work out the T. C. of duratol-hydro., leaving out sulphite, formula being as follows."

A. LIVINGSTON MASON'S DURATOL-METABISULPHITE

A

Water to make	20 ounces
Potassium metabisulphite	300 grains
Duratol	30 grains
Hydrochinon	90 grains

B

Water to make	20 ounces
Sodium carbonate, dry	2½ ounces

This has been used exactly the same as the Modified Thermo formula on the Thermo Card with fair average results, so it seems probable that its T. C. is 2.6 or thereabouts. We should be glad to have readers report on this as compared with the regular recipe.

BINKS

Animal portraiture, like that of human beings, is marred by the inclusion of any accessories which have a pattern. Experienced professionals generally pose their canine sitters on a box covered with a plain gray blanket or a piece of the thick felting used for silence cloths on dinner tables. Here, the lace cloth, the stand, and the poor spacing of the figure combine to mar the otherwise excellent result — the first trial of flashlight by the maker. The data are: 4 x 5 Seneca No. 9 camera with 6½-inch convertible lens; *f*: 16; Standard Polychrome plate; tank pyro; Azo E Har postcard.

FINISHING FOR AMATEURS

To the many readers who are asking for methods of handling films for the amateur trade we would say that they can get information about the best methods by corresponding with the Eastman Kodak Company or Burke & James, Inc.

MISSED (THE CAKE)

Mr. Loeb states that this was his first attempt with a new reflecting camera and he therefore waited a moment too long before releasing the shutter and caught the dog in an awkward posture just after his leap for a piece of cake. He also considers that a speed of 1-1000 second was unnecessarily high, though he used it on the safe side in getting the figures as near the lens as possible. Half of the art of making successful action pictures lies in getting the moving figure at some point of arrested motion which experience and study show will convey the impression of motion without displaying an awkward posture. This print, therefore, may be of value in teaching others the same lessons which Mr. Loeb has drawn from it to apply to his future work. Data: 3¼ x 4¼ Auto Graflex with Ic Tessar lens of 5 inches' focus; 1-1000 second at *f*: 4.5 in December at 10.30 a.m. in clear but not strong sunlight; Marion Record plate; pyrometol; print on Professional Cyko Glossy, developed with Tabloid rytol.

MISSED (THE CAKE) G. M. LOEB

MY TURN NEXT L. W. STEVENSON

MY TURN NEXT

This excellent genre study is defective in spacing in both directions. There is not enough space above the head of the taller boy, but there is too much on both sides. The camera, in this case, ought to have been turned over for a vertical panel. This change would have allowed better spacing of the figures from side to side without making it necessary to put them right in the middle. The quality of definition given by the single meniscus lens is in this instance very pleasing, as the details are there without being too microscopic. The picture was made with a No. 2 Brownie, and was a snapshot in August at 8 a.m. The light was "faint shadow cast by sun." The Eastman film was developed with Cyko H.-M. developer and enlarged in a Brownie enlarger on Instanto No. 16.

NEGATIVES FOR P.O.P.

P.O.P., in the form of the many excellent self-toning brands on the market, is becoming popular again. During the last decade, however, workers, with gaslight paper, in mind, have got into the habit of producing thinner negatives than are entirely suited to give the best results on P.O.P. Users of such papers as Artura Iris, Professional Cyko, and the other soft-working special grades of D.O.P., find that their negatives are ideal for P.O.P., also. The type of negative may be well defined as one fully exposed and fully developed. To produce this kind, give the full time called for by our exposure-tables and develop somewhat farther than you are in the habit of doing for ordinary negatives. Then the negative will look rather heavy and dense but will yield a clear, brilliant result on P.O.P.

Users of the Thermo Card will find that the times given for the developers having a T. C. of 1.9 are correct for negatives for P.O.P., without changing the classification of the plate. The 2.6 times, however, were adjusted to give a *quick* printer on P.O.P., so to suit some tastes it might be necessary to class a given plate one concentration of developer higher — though not if *full* time is given. Within the latitude of the plate, when development is fixed by the Thermo system, underexposure gives thinness; hence, to get a denser, slower printer, simply expose fully, that is, give the time calculated by our tables. Similarly, to get a denser negative of greater contrast, employ a stronger concentration for the same time.

When these facts are understood, the worker will find himself better equipped than many professionals to turn out any sort of work which he may fancy. Where technical excellence is his aim, he will unfailingly attain it; when pictorial effects are in mind, he can

FLOWER GIRLS J. W. HORN

modify the results by altering the exposure. In short, by making the exposure a constant and, in ninety-nine cases out of a hundred, the development also a constant, the worker will soon teach himself that the exposure is all-important. He will then expend infinite pains in getting the time exactly right for each subject and automatically carry all his plates to the same standard contrast without straining his eyes in a ruby light. And if, through exigencies beyond his control, he is compelled to give an incorrect exposure, he will find it simpler and more certain to modify the resulting negative by after treatment than to attempt to "control" it in development.

Modifications should be carried out on the wet negatives as they come from the fixer or the wash-water. Mercuric iodide will be found the most convenient intensifier, as hypo does not interfere with its action. Ferricyanide can be used to the best advantage immediately after fixing. Other processes require the washing of the plate; but even here it is best to work on the wet negative, as a preliminary drying will allow the film to become too hard, with most acid fixing and hardening baths.

FLOWER GIRLS

Mr. Horn sent in this picture for criticism with the statement that he finds the background unsatisfactory and would like our opinion regarding other faults. He adds, "I have been reading POPULAR PHOTOGRAPHY for a short time and am very much interested in the pictures exhibited each month and to note the faults pointed out in each case. It is certainly a help to anyone to know the defects in pictures, and many who claim to be professionals could be enlightened considerably by your valuable magazine." Besides the fault of a distracting background, there is one other, so common that even relatively new readers should recognize it at once. We refer to the centering of the two figures. They are placed just as near the middle of the space as possible and are also gazing at the camera. In a group of two figures one should always be made more prominent than the other in pose or in lighting. These two little girls could have been placed on the steps and attractively posed to secure the needful variety by letting one sit on a higher and one on a lower step. The technical work is very satisfactory, the values and textures of the costumes being well brought out. Data: 5 x 7 Century camera with Goerz lens; 1-25 second at *f*: 16 in shade at 2 p.m. in July on an unnamed Eastman plate; pyro; print on an Azo D card.

HOME-MADE PAPERS

An Ohio reader postcards us for a formula for making his own gaslight paper at home.

Evidently our reader does not realize how difficult the process of making sensitized goods is, or he would not ask such a question. One must have a good knowledge of chemistry and a practical training in laboratory methods to make even the simplest emulsions successfully; and then the problems of coating and drying would vanquish anyone who was not prepared to spend a great deal of money in equipment. The product would certainly be inferior to that of the many factories which now turn out such splendid goods at a remarkably low figure. Gaslight and bromide papers simply cannot be made successfully at home.

DAY DREAMS

In conception, this picture is original and fine; in execution, there is a defect which is avoidable. We refer to the fact that the sitter's face is of nearly the same tone as the background that its outline is lost. Possibly lighter print would make the face stand out better. The print is a very dark one on Velvet

DAY DREAMS F. A. NORTHROP

Green. If not, a little retouching, for instance, a thin deposit of candle smoke over the back of the negative, could be utilized to hold back any desired portion. In short, this subject happens to be one in which the use of a filter by insuring correct values has unexpectedly made the rendering less good than it would have been without the filter. The composition is so good that a little work on the negative should be undertaken in order to make the prints as perfect technically as the picture is attractive as a design. Data: 5 x 7 Seneca camera fitted with a Rodenstock Eurynar anastigmat lens of 7 inches' focus; 5-times ray-filter; 1-5 second at *f*: 11 in June at 2 p.m.; bright (intense, we should say) sunlight; Standard Orthonon plate; pyro-metol; print on Kodak Velvet Green.

HUNTING WILD GAME WITH THE CAMERA

HOWARD TAYLOR MIDDLETON

I consider searching for the timid folk of the forest, field and stream with a camera, the most exhilarating sport imaginable. I have no fear of game wardens; no irate farmers order me off their land; I pay no exhorbitant license fee to my state, and the photographer's shooting privileges are never curtailed.

Another thing: When I compare my season's game bag with that of the fellow who stalks abroad with shotgun or rifle during the month or two he is allowed to use them, I am content indeed. He has some good yarns to spin, it is true, of the cottontail he knocked over at thirty yards and the wild gander he winged from the flock so high up in the blue he could'nt even hear 'em honk, but when I open my portfolio of prints and show him, not the mangled carcasses with which he has been accustomed to associate hunting, but their photographic reproductions while alive, I feel that I am the better gunner of the two.

A great many amateur photographers have failed to take up wild life pictures because of the difficulties which they have been led to believe make this princely pastime prohibitive. I am very glad to say that this is far from being the truth. Anybody who is fond of the outdoors and has a certain amount of patience can be, to an encouraging extent at least, successful as a game photographer. As a beginning for the average nature lover in the country who owns and knows how to use a camera, I would suggest the gray squirrel. He is as a rule very accommodating when asked to pose for his portrait. A small limb falling across the trunk of a tree at the height of your tripod and baited with nuts will usually make possible a series of interesting pictures of his squirrelship. He will be timid at first, of course, but after the camera has been focused upon the bait, the shutter set and plateholder slide removed, the sight of the banquet spread in tempting array for his special benefit will eventually draw him within range of the lens. Then the string attached to the shutter, if you are stationed at a distance so as not to frighten him, is pulled, and he is yours. It is also possible and very often more convenient, as the camera needs no human assistant in this case, to allow Mr. Gray to etch his own beautiful image upon the plate by attaching the end of the string to one of the nuts or drawing it across the path he is obliged to traverse while enroute to the feast.

Squirrels can be photographed at night also by means of the Nesbit High-Speed Flashlight Apparatus. "This machine," to quote from Nesbit's handsome catalogue, "causes the shutter to act automatically in a simple and reliable manner at the exact time the flash is at its greatest value." However, for the fellow who does not care to spend twenty-five dollars for this device, there are many ways of manufacturing crude but fairly satisfactory substitutes. Probably the best method is to send a spark through an electic squib into the flashlight powder—a switch opened by the game when the string is pulled causing the explosion. Another string running from the lid of the powder box to the camera shutter enables the flash and lens to operate synchronously.

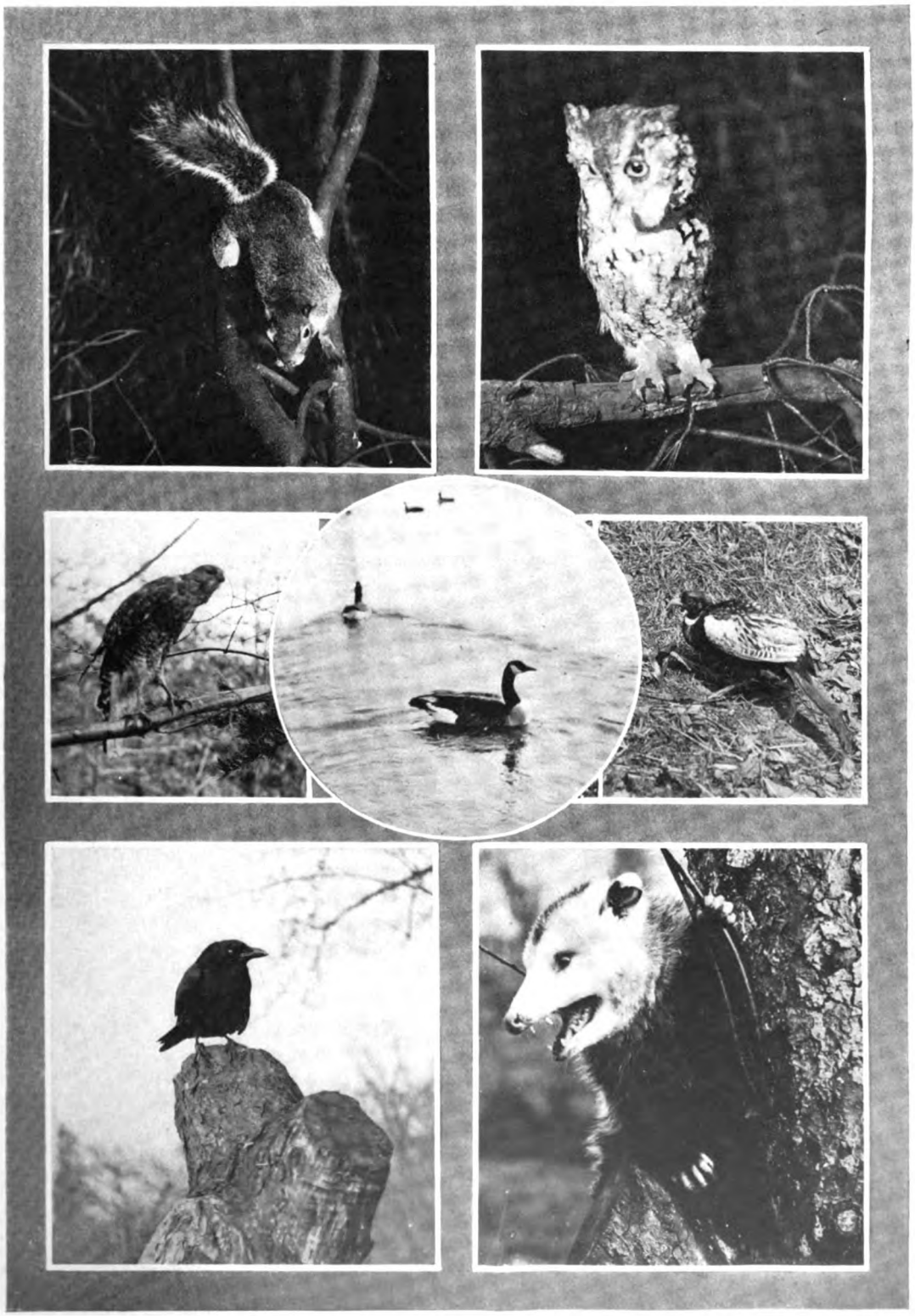
Mr. S. F. Aaron, naturalist and author, who is responsible for the interesting column, "Out-of-Doors in Winter," published daily in the Philadelphia Evening Bulletin, contends that squirrels are nocturnal. I procured the photograph of a gray squirrel by flashlight, accompanying this article, to substantiate his theory. His article upon this subject and illustrated by my photo appeared on January twenty-eighth.

The screech owl picture was obtained by a hand flash machine, for of all birds, he is the easiest to photograph. Even at night, when he is the most timid, I have often been close enough to almost touch the fluffy little fellow with my hands before he would flit away on silent wings.

The only way to photograph hawks successfully is through the medium of a blind, set camera with bait attached, or with a powerful telephoto lens. They are wary and exceedingly hard to approach.

Jim Crow has a timid way about him also. The easiest way to photograph him, or rather to let him do it for you, is to string grains of corn on a thread and connect it with your camera which has been masked behind a bush or obscured in some way. At this season of the year the crows are always hungry, and if you reside near Jim's haunts, and are endowed with sufficient patience, you should eventually get a series of good pictures. I was even fortunate enough this winter to procure a close view of a crow sitting upon a "warning for gunners" sign,

Pheasants, quail, grouse and plover can be photographed by the same method as employed with the crow. The wild English ring-neck pheasant on page 283 was caught in the act of walking across the thread attached to camera shutter.



Pictures of wild geese, ducks, and, in fact, all water-fowl, can be secured only by arduous stalking, or from a blind. It required an hour's work among the reeds bordering the Rancocas Creek at Hainesport, New Jersey, to obtain the picture showing a wild gander and his consort with mallards and broadbills in background. See page 283.

"Ole brer" 'possum will prove a good subject if you are fortunate enough to know "whar he is at." Ask Mose; he'll tell you. Then when this amiable darky is made to understand that you are eager to see a real live one, and that you are willing to pay something for the privilege, his black eyes sparkle and his white teeth gleam, as he whistles for Music, his dog, and lo! the hunt is on.

Down near the edge of the swamp at the foot of an old gum tree, the branches of which have at some time been shattered by lightning and the trunk rotted by time and weather, Music stops with ears erect and sensitive nose sniffing the tainted air. Then he begins digging frantically with both forepaws at the entrance of the hole between two great roots. Mose kneels down beside the dog and gazes earnestly at that hole. Suddenly he yells with delight: "He's in dar! He's in dar!" and points in triumph to the particles of grayish hair clinging to the sides of the cavity. "Git out dar, Music, an' let me at 'im." He shoves the impatient dog away and thrusts his arm to the shoulder in the hole. A growl resembling that of a miniature bear issues from the subterranean chamber beneath the gum tree, followed in turn by its owner with much kicking and snapping of jaws.

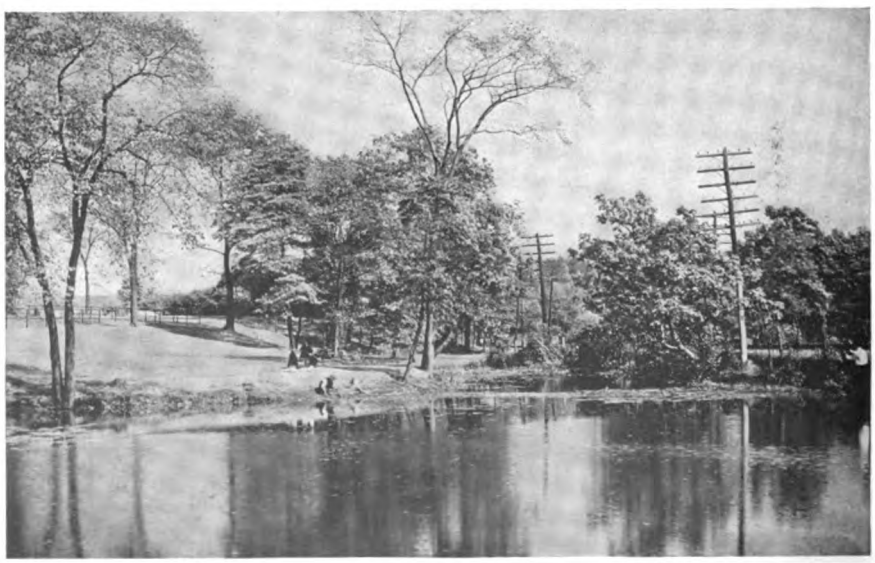
The camera is ready; you are gazing into the mirror, your fingers caressing the focusing screw. "Start him up the tree, Mose; I want to get him climbing."

"All right, boss; I'll start 'im," and the long rat-like tail is released. The Didelphis Virginiana shambles up the trunk and pauses at the first crotch to glare and growl. Click goes the shutter. "All right, Mose; he's mine."

"I done reckon he's mine now, boss, exclaims your guide ecstatically as he shinnies up the tree in pursuit of his gray-coated prize. As he once more takes possession of the tail and drags the shaggy animal to earth, you hear him remark joyfully: "You kin have de picter, boss, but dis nigger gits de 'possum."

LANDSCAPE REFLECTIONS

This print is an ordinary view without any redeeming features. It lacks good composition and shows false values, although it was made on an orthochromatic plate. The trouble seems to be in the printing, for the negative was apparently properly exposed and should make a good print on a softer paper. In using color-sensitive plates, if development is not performed by the Thermo system, it is best to dilute the developer with two or three parts of water in order to counteract the tendency to yield too much contrast. Nature never showed such blacks as these. Data: 5 x 7 Conley camera with 8½-inch Orthographic lens; 2-times filter; 1-5 second at *f*: 16 at noon



LANDSCAPE REFLECTIONS F. BEY

in October in strong light on a Cramer Medium Iso plate; M.-Q.; print on a Normal Cyko Glossy postcard.

AN ADVERTISING PICTURE

Many of our readers who are in business will be interested in noting the way in which Mr. Purllant uses photography to gain profit as well as pleasure. The example we reproduce is one which he used as an advertising slide at the local "movie" house. He colored the flowers only, leaving the remainder of the picture black and white. He states that it took well. He has used this form of advertising to a considerable extent, making his own illustrations. Another form of photographic advertising which he has found profitable is the taking of designs and set pieces to show prospective customers the styles which can be furnished.

AN ADVERTISING PICTURE S. F. PURLLANT

A PLEA FOR THE HOUSEKEEPER

"HENPECKUS"

We see much in the journals now on the subject of enlarging. If as one writer says, most amateurs use the kitchen for this work, it is high time for a word of warning from one who has had sad experience.

Don't. For your own sake and that of mother, landlady, wife that is or is to be — DON'T! If a hired Gretchen, Thelma or Nora presides over the culinary department, then you surely have no business puttering around and (if nothing worse) hindering the poor girl.

Did someone say, "How about the ladies?" Well, if Mary wants to do photographic work in her own kitchen, that's *her* business. You fellows better take my advice and stay out. The writer has worked in all sorts of places from cellar to attic, and if driven to it could use any of them again — except the kitchen.

Cookery won't mix with kodakery —(somebody said that before, but it is still true). There is little difference, in the can, between carbonate and bicarbonate of soda. But in the biscuits, Oh, my! Liquid hardener and Nepera solution are more like lemon and vanilla extracts in looks than taste. Enameled baking pans are good for hypo and johnny-cake if used separately, but don't try to put both in the same dish. The cook thinks she is doing you a favor when she washes your graduate in soapy dish water, but you had better clean it with acid afterward!

If you can't possibly keep out of the kitchen, by all means have a cupboard of your own which can be locked up when not in use, and a cook who can be locked out when it is in use. Make your outfit as "brief" as possible. A $4.00 Brownie enlarger used to give good satisfaction. True it has its limitations, but so has the kitchen. What woman will ever take kindly to sulphide stains in her white porcelain sink or hypo polka dots on her clean floor?

The time you waste in one winter season carrying in from their several places of concealment all the necessary articles and getting ready for work, then after one brief hour of actual enlarging the agony of clearing up the clutter when you are half asleep, multiplied by the number of times you go through it, will be ample to do all the work of fitting up a real enlarging room in attic, basement, or unused bedroom. And a few dollars spent for waste lumber and beaver board will be the best investment you ever made.

Running water is of course almost a necessity, but there is usually a laundry faucet in the basement, and the cost of a small sink for the attic is not prohibitive when the plumbing pipes run conveniently. If the attic is not heated, two or three dollars will buy a decent little second-hand stove, and all modern basements are sufficiently warmed by furnace or

A HOME PORTRAIT F. B. WALKER

steampipes. The writer has been able to find most of these conveniences even when living away from home. If you are located in a town which supports a good camera club you will probably find such accommodations there.

But the ideal way is to have your own exclusive room. Then when 11 P. M. arrives and tired Nature begins to assert herself, you can leave everything just as it is, lock the door and retire to rest secure in the knowledge that your precious belongings safely await your next period of leisure.

A HOME PORTRAIT

Although this print is on a smooth paper, it is so granular that it resembles a badly done copy. Consideration of the data gives a clue which may account for this appearance. The plate used is one which sometimes has a tendency to give a very coarse grain, and in this instance no other cause can be found. The maker thinks he could improve on his result by giving more exposure and including more of the chair on the left. The picture should be made over, as a coarse-grained negative is of little use, even for a rough paper. Data: 3¼ x 4¼ Butcher Popular Pressman camera with Aldis-Butcher anastigmat lens; 1 second at *f*: 4.5 in November at 1.30 p.m.; bright light; Sigma plate; development by the Thermo system; print on Graffo Dead Matte Soft.

AN OUTDOOR PORTRAIT

It is seldom that a user of a reflecting camera can restrain himself from going altogether too close in making portraits of people, simply because it is a temptation to work close when the focusing can be controlled up to the moment of exposure. Mr. Dagan, however, has accepted the small head which his lens gave him at a reasonable distance for good perspective drawing and has wisely trimmed for a small print. The retouching of the background is rather too much in evidence. Data: 3¼ x 4¼ Auto Graflex fitted with a Goerz Celor lens; 1-50 second at *f*: 6.3 in hazy light at 2 p.m. in December; Lumière Sigma plate; metol; print on Azo Soft.

SATURATED SOLUTIONS

A solution is said to be saturated when it has undissolved crystals remaining in the bottom. Other things being equal, it is not good practice to use saturated solutions in photography, unless one has a workroom which remains at the same temperature all the year around, for the amount of substance in solution varies with the temperature. For instance, at 65 degrees, a 25 percent solution of anhydrous sodium sulphite can be made; but at 50 degrees a portion of the salt crystallizes out and the solution contains considerably less than 25 per cent of dissolved salt. The addition of an equal volume of water, reducing the strength to 12½ percent, allows one to keep all of the sulphite in solution even at 40 degrees. To use the latter strength, one would of course take twice as much as of the 25 per cent solution.

A reader asks why his Watkins Thermo Pyro-Soda has crystals in the bottle, stating that he has used 2 ounces of dry sodium carbonate in the 10-ounce stock. The reason

OUTDOOR PORTRAIT
F. C. DAGAN

A GAME OF CARDS J. C. VAN WYE

is that the solution has been kept in too cold a place. One hundred parts of water at 65 degrees will dissolve only 16.2 parts of dry carbonate, and this formula calls for 20 parts in 100, hence the stock bottle must be kept in a warm place or the strength will fall below what is needed, The simple way to get around the trouble in cold weather is to increase the water in each stock solution to 20 ounces and measure out twice the usual amounts of each stock for use.

TELEPHOTO ANIMAL PHOTOGRAPHY

A new reader asks for advice about attaching a telephoto arrangement to a small folding film camera with anastigmat lens and Compound shutter so as to enable him to secure pictures of birds and animals.

A film camera, at least the ordinary kind with single extension of bellows, is hardly suited for telephotography. The larger sizes, such as 3A, might be adapted if they had double bellows extension and a plate back; but a far simpler way to get good pictures would be to get a special camera for the work. A long-focus reflecting camera, fitted with a fixed-magnification lens like the Ross Telecentric, would be excellent for all snapshot work. The same lens in a fast between-lens shutter would be a good combination for a folding camera. For the higher magnifications, the latter style of camera with the adjustable styles of telephoto lenses would be necessary. A very fine article on telephoto work was published in the 1913 edition of "The British Journal Photographic Almanac." It is by Capt. Owen Wheeler, F. R. P. S., one of the foremost authorities on this particular branch of photographic art.

A GAME OF CARDS

Flashlight offers many opportunities for indoor work and is the method of choice for obtaining pictures like this. The arrangement of the group is good, in the main, though possibly a suggestion of arrested motion, such as having one of the players putting down a card, would have improved the result, which now looks posey. Including a little floor base for the two rocking-chairs would have bettered the spacing. Data: 3A Kodak; Eastman flash cartridge; print on a Normal Studio Cyko postcard.

CRAMER'S PYRO-ACETONE FORMULA

In response to several readers who have asked for the Cramer pyro-acetone formula used by Mr. C. H. Partington as per his article in the February, 1915, issue, we would say that they will find it on pages 26 and 27 of the October, 1914, issue. The formula is also to be found in Cramer's Manual, a copy of which will doubtless be forwarded free on request by addressing The G. Cramer Dry Plate Company, St. Louis, Mo., and mentioning POPULAR PHOTOGRAPHY.

INTENSIFICATION DURING PRINTING

A reader asks whether it is practicable to print through yellow glass to obtain more contrast, instead of intensifying the negative.

This scheme is often recommended in English books on P.O.P. printing. The glass should be yellow or signal green, either of which, by cutting out the actinic rays, acts as a medium to slow down the printing. Another favorite dodge is to flow the back of the plate with varnish tinted with aurantia or some other yellow dye.

FIG. 1.

A BUNCH OF TROUBLES

One of our readers sent in the print which is reproduced herewith (Fig. 1), along with the film and the following letter:

"The films enclosed received 1-25 second exposure at *f*: 16 between 11 A. M. and 1 P. M. in September; bright sun; however, very heavy smoke from forest fires, which can be seen to hide the distant mountains and trees on the opposite side of the river. Would you consider the films overexposed for river scenes, and what would be the correct exposure to show good water effect? Are the films too dense? They were developed in the tank, B. W. & Company's Tabloid rytol, for 30 minutes at 65 degrees.

"The prints were made by a finishing firm. What causes the mottled appearance of the sky?

"What would be the correct time of development, using Cramer's Iso plates and Watkins's Thermo prepared devloper at 60 degrees?"

Calculating by our tables for average landscape without foreground, the exposure would be 1-29 second, hence the marked 1-25 of the camera would be right, and this we find to be the case by examining the film negative. The shadows are full of detail, even to the dark mass in the lower right corner, and more time would have been useless. Half as much time, that is, 1-50 second with the same stop, would have given almost as much foreground detail and would have had a tendency to make the distance a little clearer. The smoke of course diffuses the light and makes for overexposure, hence flatness and mottling are particularly likely to occur; for this reason we think the bad sky was due to insufficient agitation of the developer in the tank. If the tank is not reversed at frequent intervals, bromide is released and settles on some point in the film, restraining development there more than at the neighboring point. This leads to mottling. The defect is visible in this film when it is carefully examined by strong artificial light reflected from a sheet of white paper. On the whole, shorter time would have been better under the conditions.

The development, assuming that the regular N. C. film, not the Speed film, was used, should have been 21¼ minutes at 65 degrees, according to the rytol tank tables published by B. W. & Company. This time should have given a clean, bright negative of moderate density if the tank had been regularly reversed at, say, three-minute intervals to insure even action.

The print, in this case, is certainly not the best which could be produced from this negative, for we had the curiosity to make a print and found that the same defects came out on some perfectly fresh paper; yet, by printing lighter, they were minimized. The overdevelopment of the negative made it too hard for a contrast grade, but it yielded a fair print on a normal paper, if not exposed too long. The negative, however, is too streaky to do anything with. Figure 2 is from the best of several prints. It lacks halftone; but a darker

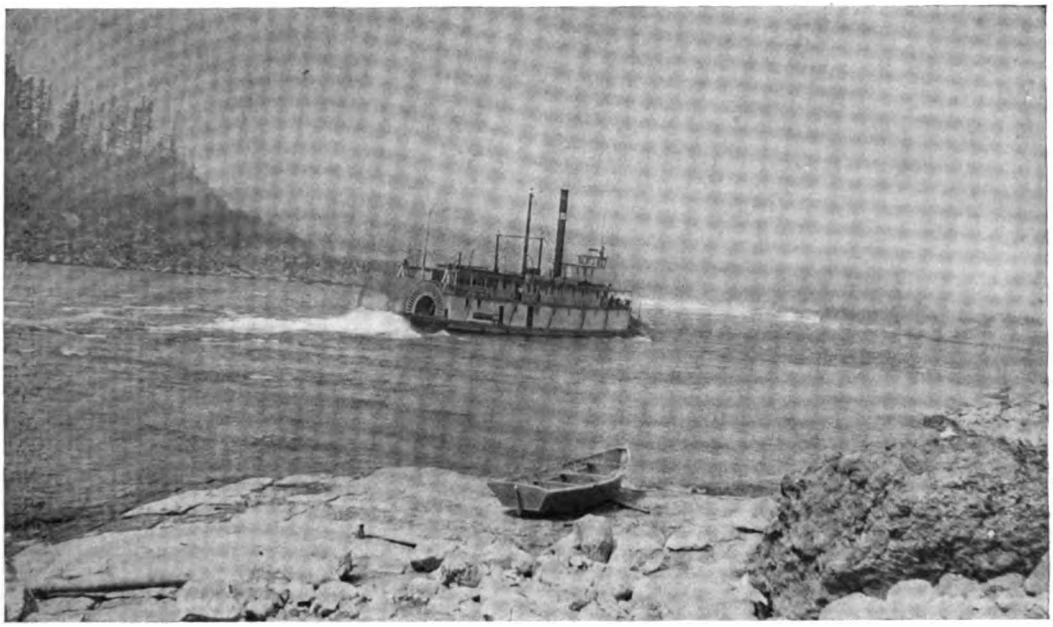


FIG. 2.

print is as bad as the one sent in by our subscriber.

The 60-degree time for Cramer Iso plates in Watkins's Time Developer (liquid or powders) is 4 minutes.

MAGAZINES FROM DEALERS

One of our subscribers suggests that we place Popular Photography on sale with a certain dealer in his home town. We should be glad of the names of dealers who might be interested in supplying the magazine, and will at once communicate with any whose names readers send in to us. Don't be afraid to give the other fellow a chance to get hold of your favorite magazine!

THE YACHT

Effects like this are of the more theatric sort which do not always photograph well, and Mr. Krebser is to be congratulated on the relative success of his effort. The amount of halation shown by the sunflecks is no more than is to be expected. We wish to call particular attention to the good effect of filling the lower left corner with a bit of shore which not only acts as a strong contrast to the lights but also balances the boat and to some extent compensates for its being almost exactly in the middle of the picture space. If there were more sea and sky to the right the balance would be better, for an area of flat tone can be made to compensate for a contrast on the other side of the fulcrum. Data: Rodenstock Semi-Anastigmat lens *f*: 7.2; 1-100 second at *f*: 11 on Premo filmpack; Agfa developer; print on Azo Hard.

THE YACHT LUDWIG KREBSER

MAIDEN MEDITATION W. F. BAKER

MAIDEN MEDITATION

This is a highly successful portrait, which needs only trifling modifications; for instance, spotting out the patch of highlight in the background. The trimming is particularly intelligent. It is unfortunate that the hair-ribbon could not have been dispensed with or one of a less actinic shade, ecru for instance, substituted. The chief fault the maker sees is in the stiffness of the pose, which he excuses by saying that the subject is a hard child to pose. Really, the best way to pose children is not to pose them at all, but to stalk them with a camera and "shoot" when they do not realize that a picture is to be taken. The technic work is very satisfactory. Data: 3A Special Kodak with 6½-inch Zeiss-Tessar lens; second at *f*: 8 in August at 11 a.m.; bright light; Eastman film; M.-Q.; print on Special Rough Velox.

MENISCUS ACHROMATIC AND R. R. LENSES

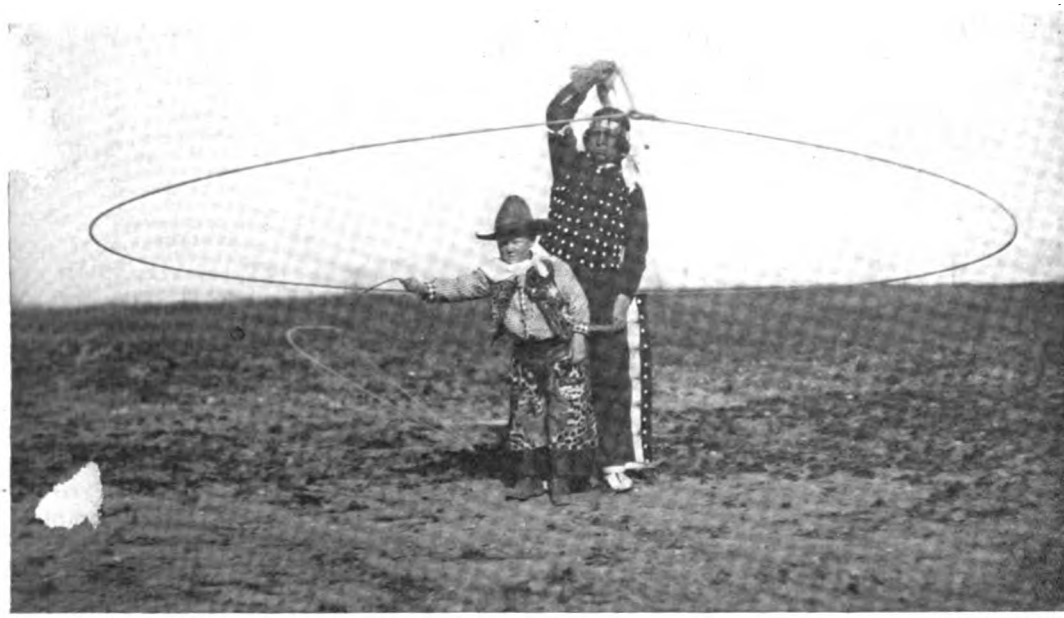
Several readers wish to know the difference between meniscus achromatic and R. R. lenses

The meniscus is so called because it resembles the meniscus formed at the surface of water in a glass. It is a single combination formed by cementing together two separate lenses, one of crown and the other of flint glass. These two kinds of glass correct each other's errors, so that the visual and the photographic images come to a focus together. A lens composed of only one kind of glass has not this property of bringing different colors to a focus, or achromatism; for instance, a common spectacle lens can be used for photography; but after focusing, the lens must be moved toward the ground glass a distance equal to about 1-40 or 1-50 of its focal length, the violet rays coming to a focus that much nearer the lens than the yellow rays by which the eye sees the picture.

An R. R. lens consists of two meniscus achromatic lenses mounted at opposite ends of the shutter tube. It "works faster," that is, has a larger *f* value than the meniscus. In order to get a sharp image with a meniscus lens, it must be used with a stop in front not larger in diameter of opening than one sixteenth the focus of the lens, that is, *f*: 16. The R. R., on the other hand can be used with an opening of *f*: 8 with fair results; hence it is four times as fast as the meniscus. It has also the property of rendering straight lines as such, even at the margins of the picture, hence its name of rectilinear. It is a far better all-around lens than the meniscus, though it cannot be used, like the latter, as a "fixed-focus" lens, on account of its larger opening.

THE HEIGHT OF THE CAMERA

In taking interiors, especially of living rooms, it is important to have the camera at the ordinary eye level. If not, the chances are that the picture will not look very natural, objects we are accustomed to look down upon appearing unduly foreshortened.



SPINNING THE LARIAT HARRY BAUER

Third Prize, February Competition

SPINNING THE LARIAT

Our third prize this month is awarded to a picture which is an excellent representation of a very interesting feat of skill. To get a picture of this kind the maker had first to find the subjects, next to get them well into action, and finally to make a technically perfect photograph. He has stopped motion admirably and produces a very interesting record, which well shows his skill in photography. The picture was taken with a 4 x 5 Hall camera, fitted with Velostigmat *f*: 4.5 lens of 7 inches' focus. The exposure was 1-800 second at stop *f*: 5.6, at 3 p. m. in April, 1914, with bright light. The Hammer R. L. S. plate was developed in pyro in tray, and the print was made on Enlarging Cyko.

STOPS FOR OUR TABLES

"I do not understand your exposure tables. For example, with an *f*: 8 lens and stop number 4, a certain subject calls for one fifth of a second exposure. What exposure must I give with a number 8 stop or smaller for the same subject?"

The distinction between the F. and U. S. numbers is one which continually bothers our readers, and we wish that American makers would follow the example of the Royal Photographic Society of Great Britain and abandon the uniform system number U. and S. As long as anastigmats were relatively rare, and almost all amateurs used R. R. lenses working at *f*: 8, the U. S. numbers were sometimes convenient; but now that anastigmats are so common, they are a nuisance. The standard English F. system should be adopted by all for the sake of simplicity.

If our readers will examine the tables they will observe that *f*: 8 is exactly the same as U. S. 4. They will also see that each pair of stops represents a difference of one unit for each size from *f*: 8 to *f*: 64, so that the same is changed by unity each time the size smaller stop is used. This indicates an increase of exposure of 100 per cent. Stops larger than U. S. 4 and *f*: 8 are not regular in their proportion, but the same principle holds good; the difference of one half in the number representing the stop indicates a difference in exposure of fifty per cent.

SOOT-AND-WHITEWASH OR SOFTNESS?

It is a distinguishing thing about beginners in photography that they prefer prints of extreme contrast. The truth of this statement would at once be evident to any reader who

had the opportunity to inspect the hundreds of prints which come in monthly in our competition. The beginner's work is invariably printed on the Contrast grade, developed in strong M.-Q., and therefore has very black shadows and white-paper lights. Sometimes there are only three, sometimes four, tones or steps of gradation. To suggest that a better print could be made is often, we fear, to incur the contempt of the novice. Yet, after a time, even the novice learns to use his eyes. This is one of the most inspiring things about photography — it teaches the blind (artistically speaking) to use their eyes. When eyes are used, the owners of them finally learn to see values in nature. They learn that pure, deep blacks are almost never present. They learn also that even white objects are full of wonderful gradations of light tones — not to be represented by white paper. They learn, finally that a picture in, say, six tones is more true to what they see than one in four, with both ends of the scale wrong at that!

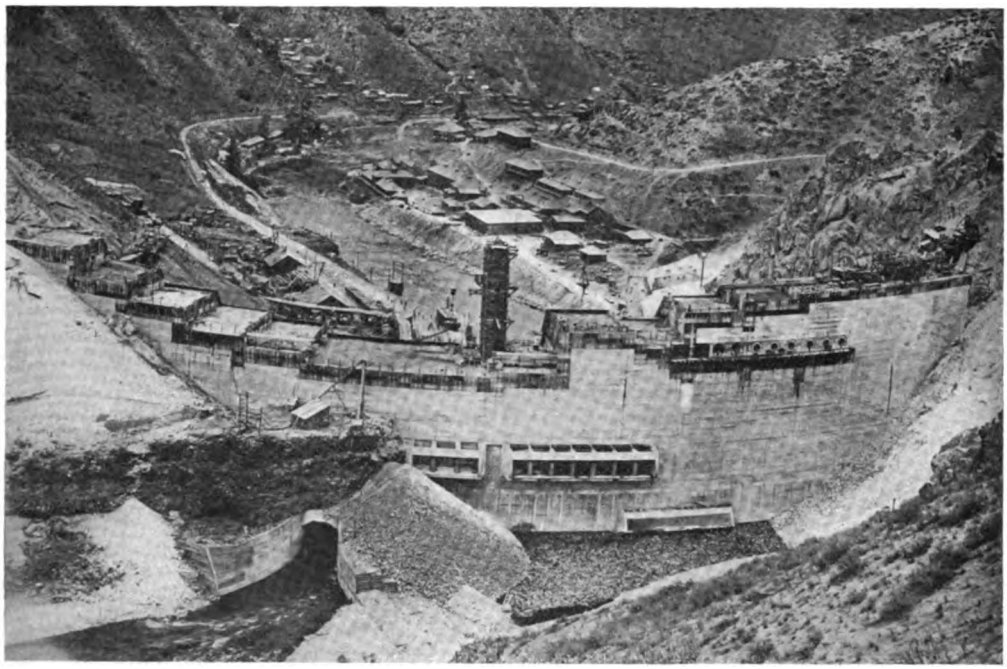
After a beginner has been making pictures for a time with his eyes open, he loses his liking for the soot-and-whitewash which at first called forth delighted exclamations of "How clear!" His taste, in other words, becomes refined. He uses the Contrast paper only when the negative lacks contrast and gives a flat, gray print on the Normal grade. He learns to time his films fully, and accordingly secures negatives which require Normal and Soft grades far more often than Contrast. He starts, in other words, with Regular Velox and ends with Artura Iris or Professional Cyko. The Editor then notes that this contestant's work is falling more often within the Honorable-Mention class. If he persists, and if he learns to compose as well as to master technical problems, he finally wins a prize.

The two prints which serve as a pin on which the foregoing discourse may hang were sent in with the following complaint. "Why is the one on Hard paper of a gray color and not black and white? I have always noticed that when I attempt to use a softer paper the prints turn out gray and not black and white." No. 1 is on Extra Hard and No. 2 on Hard Instanto. The engravings have, inevitably, softened the contrast in each case, but enough difference remains to show that the softer print is actually more like the subject than the other. Where one has only a harsh, unnatural look, the other carries gradations. No. 2 is gray because the emulsion is designed to give values as the negative has recorded them, not to force them violently away from the truth. Without seeing the negative, we should, judging from past experiences, estimate its quality as being suited even to the Soft grade. A sheet of Soft, properly timed, would get more gradation in the white shirts and at the same time build up the shadows to a sufficiently black color to represent the interior values nicely. Such a print would flatten out too much in reproduction, however, unless given a decidedly brown color by the use of considerable bromide in the paper developer. The negative here is very fully timed (flashlight) and must have been correctly developed, as it was done in the tray by our Modified Thermo M.-Q. The times for this developer are Mr. Watkins's own standard of 6½ minutes at 60 degrees, and we find that they give an ideal negative for Soft Instanto or Professional Cyko, as well as P.O.P.

Our reader, then, should be glad that he has found a means of getting what he calls a gray print instead of the soot-and-whitewash kind. The inquiring spirit which he shows is certain to lead him to better things. If he wishes a blacker deposit on the particular brand of paper he uses, let him simply time carefully and develop until the print will go no farther, even if it takes several minutes. We have no difficulty in getting a clear, deep black in the deepest tones on even the Soft grade; but it must be developed slowly. Every make of paper has its individuality, and that of Instanto is peculiar in that it is a fast-exposure and slow-developing kind. Overtimed prints develop too fast and come out gray. Prints exposed exactly right build up very slowly and stop when just black enough. Another cause of gray prints is too strong a light during developing. This paper should always be worked in orange light. Too little bromide may also cause graying.

HOME-MADE MOUNTING PAPERS

A writer in an English periodical gives details of a new method for securing a series of mounting papers of the same general tone which will harmonize throughout, something which cannot always be obtained in commercial papers. The suggestion is that a supply of white blotting paper of the desired thickness and texture should be obtained. In order to give this the necessary color, purchase a ten-cent package of cheap dye, brown or any other shade which may be selected. If the desired tone cannot be obtained in a single dye, two or more colors may be mixed to get exactly the quality wanted. In addition to the dye, an ounce of gelatin is required. This may be obtained at any



FACE VIEW OF THE WORLD'S DEEPEST DAM, ARROW ROCK, IDAHO M. B. HOWARD

grocer's. A dram or so of the gelatin should be put to soak in cold water until swelled and then dissolved by gentle heat and added to the dye, which should be dissolved in the usual fashion, using about a half to a pint of hot water in the first instance, in order to secure the maximum depth of color in the first batch of paper. The solution should be poured into a dish or tray a little larger than the paper to be dyed. The blotting paper is then drawn rapidly through the dye and pinned up to dry, care being taken to leave a couple of inches at the top unwetted, as otherwise the paper is so soft when wet that it would be impossible to handle it. When sufficient of the deepest tone required has been secured more water should be added to the dye and another batch made, and so on until the lightest tint required is reached. A series of papers made in this manner is hard to beat, for all the tints are variations of the same color and therefore in perfect harmony with each other. The brown dye may be modified by adding a little black or a little red as desired to give a different quality of color.

THE WORLD'S DEEPEST DAM

This is one of the cases where the photographing of an enormous stretch of country is necessary to fully record a subject, and while a panoramic view is to be avoided when possible because of the general tendency to flatness, the selection of an appropriate time of day has redeemed this picture from this fault. The lights and shades are well managed, and the picture is an excellent record of a mammoth engineering work, well on the way toward completion. The picture would doubtless stand a great deal of enlargement, and, because of the many details, would be well worth such treatment.

CORRECT DEVELOPMENT OF GASLIGHT PRINTS

The first note this week has to deal with a request from a reader who is anxious to know how to develop gaslight or bromide prints correctly. Let us assume that a good negative is being printed, say, on Velox Paper, and that the brand of paper is the best for that particular negative. Velox is made in two grades — the vigorous, for rather weak negatives; and the soft, for slightly stronger negatives. A little experience is needed to decide which is the proper grade to use for any given negative Under these conditions the whole matter depends on proper exposure of the print, and not on development. This is the point which it is so very difficult to get workers to understand. Have the negative reasonably right, give a correct exposure, and development of the print should possess no difficulty whatever.

"WELL, I SHOULD SAY IT'S A GOOD ONE"
W. H. PENNOYER

On the other hand, with a bad (that is an unsuitable) negative and a wrong exposure, no worker can get good and uniform results with any method of development.

The points to observe in development of the paper are that the developer must be quite fresh, and that it must not be left on the print for more than, say, ten seconds in the case of the vigorous Velox, and, say, twenty seconds with soft Velox. Any longer development than this will be almost certain to give yellow stains. Any longer development is absolutely unnecessary if the exposure has been correct. It is, therefore, certain that a print too light at the end of these respective times is useless, because exposed for too short a time. The remedy is, use another sheet of paper, and expose correctly. Recent "Notes" have shown the worker how correct exposure for the print may be determined. Our answer, therefore, to the question, "How should one develop vigorous Velox correctly?" would be as follows: Soak the exposed print for about half a minute in clean, cold water, drain, and flow over it the properly mixed developer, which must be fresh; rock the dish for ten seconds, pour off the developer, rinse the print, and fix. If the print is too light, make another, giving more exposure. If the print is too dark, make another, giving less exposure. Never try to develop an overexposed print for a shorter time (that is, to stop it before it gets too dark). It can't be done without producing unevenness of image and irregular color. Never try to get more out of the print by prolonging development. It can't be done, and stains will result. This applies to practically all the makes of gaslight papers which will give vigorous results from soft negatives.

Gaslight papers of the soft grades take a longer time for full development. We have given twenty seconds as an approximate time. Some makes will stand thirty or forty seconds without staining. As we pointed out in a recent issue, each worker must determine for himself for the brand of paper he is using the time during which it is safe to continue development. A few tests will show, let us say, that forty seconds tends to give stain, which twenty-five seconds never does. Having found this out, avoid giving longer time than the twenty-five seconds, and adjust exposure to get the proper depth of print in this time of development.

To put the time matter in a nutshell, and this might well be printed in large type; have the negative reasonably suited to the paper, ascertain the correct exposure by a test in strips, and develop for a definite number of seconds.

It will sometimes happen when using a paper which will take twenty to thirty seconds' development, that the print appears dark enough before this time has elapsed. Suppose the paper will stand thirty seconds without staining, and that exposures are usually adjusted to give a print of the proper depth in the thirty seconds' development. Now suppose a print is being developed, and that at the end of twenty seconds the print appears dark enough, what are we to do? Need we ask? If our eyes tell us the effect is right, we remove the print, rinse, and fix it. Why should we do otherwise? Why continue development and get a print too dark? But if we find our print shows signs of uneven development, we may attribute it to the fact that the development was stopped before it was complete, and that parts went on developing, due possibly to uneven rinsing. That is, we run a risk in this way that we do not run if we adjust our exposures for a constant

time of development which allows for full or complete development.

The correct development of bromide paper is a matter of much greater elasticity. Development may be very prolonged, using a dilute developer or a restrained developer, and various modification of exposure and development may be made in order to secure different shades of black or brown, instead of a pure gray black. A similar method may be used for working gaslight papers, but before these variations are attempted the ordinary straightforward method of obtaining good prints of a black color should be mastered.

"WELL, I SHOULD SAY IT'S A GOOD ONE"

There is something almost statuesque about this figure. The idea is an excellent one, and it has been well carried out. The chief criticism is that there is not enough room above the head. The figure is nearly centered, but the pose, and particularly the attitude of head and arm, cause the interest to rest to the left, hence we do not feel the centering too strongly. Data: 3A Kodak with R. R. lens; good light; Eastman Speed film; Ingento developer; print on Azo D. Mr. Pennoyer has entered "fifteen feet" in his data opposite "local length." This is, of course, a misapprehension. That blank is intended for the focus of the lens, namely, for the R. R. supplied with the 3A, 6¾ inches, not for the distance from lens to object marked on the focusing scale and used in taking the picture.

OUTDOOR PORTRAIT

Technically and pictorially, this group of two children is one of the best portraits which has been submitted to us in the Competitions. The lighting is very good. Mr. Brodsky used a painted ground outdoors and secured the soft light of a sinking sun. The retouching, done by himself, is not distinguishable even on the velvet-surfaced paper used for reproduction purposes. Altogether, though we might say much more, we feel that the picture itself is so good that it can tell its own story of excellence to the reader who studies it. Data: 5 x 7 Korona VI camera fitted with a IIb Tessar lens of 7 inches' focus; 1 second at *f*: 6.3 in September at 4.30 p. m.; Cramer Instantaneous Iso plate; M.-Q.-pyro developer; print on Artura Iris A.

USING A CAMERA UPSIDE DOWN

When photography has to be done in a crowd, or when a high fence or wall is interposed between us and the view we wish to secure, it is an old dodge to turn the hand camera upside down, hold it over the head and look upward into the finder, which is then underneath. It is not very easy to manipulate a camera while in this position; but it is quite possible to do so, and is often the only available course. There are some magazine and reflex cameras the mechanism of which will not allow them to be used in such a way; and it is well to make quite sure that the camera will operate in the upside-down position before attempting to use it for serious work in that way.

OUTDOOR PORTRAIT CHARLES BRODSKY

SOAP BUBBLES

Ordinary soapsuds hardly give a sufficiently tenacious film for those who wish to photograph a bubble; but a solution made on the following lines is said to be very effective: A quarter of an ounce of yellow resin and a quarter of an ounce of potassium carbonate are boiled with three ounces of water until they are dissolved, and the liquid is then left to settle. The clear solution is diluted for use with three or four times its bulk of water.

EDITORIAL

WANTED—A POISON SQUAD

Our correspondence of late has had so many inquiries about poisoning by developers and other chemicals that we have planned, with the assistance of Dr. Malcolm Dean Miller, to collect and study the evidence of as many cases as possible. Results, in modern medicine, are arrived at only by study of large series of cases; so to make the investigation of value in finding the causes and working out the treatment, there should be at least a hundred cases of metol poisoning, for instance. Probably a smaller number will have to answer for other chemicals. While we are engaged in this research we will include all forms of skin irritations from photographic chemicals.

Readers who have ever suffered from poisoning are therefore urged to send in their names and addresses in order that we may make a preliminary survey and lay out the necessary blanks for taking histories. The expense should not exceed a dollar for postage, mailing case for specimens, etc. We will bear the rest of the cost equally with Dr. Miller, who offers his services in return for the opportunity to study a large series of cases. It is hoped that research will bring out the best methods of not only treating but preventing these annoying skin irritations.

OUR COVER THIS MONTH

We are very much gratified to be presented with a design from Mr. Charles Bergen, which is shown on the cover of this issue. Mr. Bergen wrote, when sending it, as follows: "I have obtained your magazine for some months past, and, having done extensive work along amateur photographic lines, took a lively interest in it; in fact, so much of an interest that I have drawn a cover for it, which I am submitting to you by this mail, under separate cover. If you care to use it, it is yours, cost free." Mr. Bergen's kindness and interest is greatly appreciated.

OUR COMPETITION

As is usual with this publication, we have a very large number of photographs sent in each month, and those portraying home life are always of great interest to us. They are full of human interest and have a story-telling quality that many of the more ambitious ones completely lack. Now that it is possible in nearly all parts of the country to be out of doors more, we anticipate receiving some very interesting landscapes and marines. The first prize this month has been awarded to Mrs. Wilma B. McDevitt for "A Winter Girl." Technically this is a very fine print. Second prize for "A Winter Landscape" was awarded to Mr. W. F. Kempin. This is a fine snow scene, showing a frozen brook in winter. The lines of competition in this are particularly pleasing. Third prize for "Spinning the Lariat" goes to Mr. Harry Bauer. The honorable mentions are as follows: "Wood Road," L. A. Bagley; "The Bedtime Story," C. K. Baker; "The Brook," Charles Bean; "The Alcazar — Florida," Charles W. Becker; "The Old Cottonwood," C. S. Booth; "The Interesting Story," Percy D. Booth; "Arthur," H. G. Bristow; "Scotch," Charles H. Carroll; "Coming in Home," Carl W. Clepper; "The Bridge Over the Ravine," E. W. Cochems; "Ostrich Tree, Monterey, California," Dorothy Dobbins; "Outdoor Portrait," D. Duffield; "The Range Rider," Mrs. J. A. Donovan; "Sisters," W. Donaldson; "Investigating," J. C. Edwards; "The Hillside Path," O. E. Erickson; "The Canal," F. H. Estabrooks; "Number 2," Rolland H. Fellers; "Out for a Walk," O. Fortenbach; "Winter Afternoon," Clifford G. Franklin; "Out in the Snow," R. H. Franzier; "Espying the Rodent," Joseph Freilinger; "Cousins," R. Gronbrack; "Portrait," M. Frey; "Look Pleasant," G. Goskosky; "A New England Road," D. H. Harrington; "Golden Rod," Geo. T. Harrison; "Watch Us Dance a Two-Step," Paul H. Hartwig; "You're as Welcome as the Flowers in May," Aug. Hemann; "Somebody's Coming," Margaret Hitchcock; "Pheasants," Fred W. Hogg; "Our Pond in March," J. A. Hollabaugh; "Sunset," Thomas Hughes; "A Portrait," Herbert Johnson; "Greenhouse Scene," Wm. E. Kearns; "Solitude," R. W. De La Mater; "Watching," F. C. Legard; "Going Up," T. W. Lindsell; "Some Slide," W. D. Long; " Get Up, Charlie Tom," James Lund; "Canterbury Bells," D. Macdonald; "Playmates," Charles Martensen; "Engine 2169," C. F. Marvin; "Resting," Gladys A. Mattson; "Blue Tom," Clyde Merritt; "The Song

of Childhood," C. D. Meservey; "In Nature's Playground," F. O. Nelson; "The Road in Winter," John J. Neuer; "At Work," William Niehans; "Minnehaha Falls," Henry Noordhoff; "74th Eruption of Mt. Lassen," R. S. Northrup; "Cousins," R. R. Patterson; "Moonlight," W. H. Pennoyer; "Sentinels of the Desert," Hugh W. Proctor; "Papa's Boy," F. T. Porllion; "The Woods in Winter," Z. T. Rawlston; "Breakfast," William H. Rice; "Awaiting the Touch of Spring," Isabel Ross; "Clouds," F. W. Russell; "Baby's Walking Lesson," Ford E. Samuel; "Meridian Street, Indianapolis," John H. Seamans; "Birch Corner," A. C. Sheldon; "Harold," George C. Sheppard; "Shiprock," M. E. Smith; "Caught in the Act," Paula Stockstrom; "Carter Notch Road," G. Arthur Tuttle; "Indoor Portrait," Edwin Viggers; "Who Said 'Come'?" A. M. Vinge; "The Speed King," Stark Weatherall; "Going Hunting," Mrs. H. H. Wilson; "Interior," Fred E. Wood; "Nature's Mirror," Kathryn F. Wotkyns; "Woodland Glen," W. E. Wotkyns; "The Smithy," George S. Buehl; "The Starboard Light," A. R. Brown; "The Glen in Winter," Garnet E. Jacques; "In Winter's Grasp," William F. Lindstaedt; "The Snow-Bound Brook," Charles E. Maxwell; "Investigating," O. S. Wilson.

READERS' FORUM

D. Q. THERMO DEVELOPMENT

A	Pot. Metabisulphite..... 60 grains Duratol..... 30 grains Hydrochinon..... 90 grains Water to make ..... 20 ounces	B	Sod. Sulphite (dry).... 1½ ounces Sod. Carbonate (dry) 2 ounces Water to make 20 ounces	USE — 1 ounce A 1 ounce B 8 ounces Water	Temperature Coefficient 2.6

DEVELOPMENT TIME TABLE BY MINUTES AND SECONDS

PLATE	80°	78°	76°	74°	72°	70°	68°	66°	64°	62°	60°	58°	56°	54°	52°	50°	48°	46°
VVQ	1'25"	1'36"	1'45"	2'	2'12"	2'24"	2'42"	3'	3'20"	3'42"	4' 6"	4'30"	5'	5'36"	6'24"	7'	7'42"	8'30"
VQ	1'57"	2' 8"	2'20"	2'39"	2'57"	3'15"	3'36"	4'	4'30"	5'	5'30"	6' 6"	6'42"	7'30"	8'24"	9'18"	10'24"	11'30
Q	2'24"	2'42"	2'57"	3'15"	3'36"	4'	4'30"	5'	5'33"	6' 6"	6'48"	7'36"	8'24"	9'24"	7'30"	11'36"	13'	14'20"
MQ	3'24"	3'42"	4' 9"	4'36"	5' 6"	5'42"	6'18"	7'	7'48"	8'36"	9'36"	10'45"	11'48"	13'12"	14'42"	16'20"	18'20"	20'
M	4'24"	4'48"	5'20"	5'54"	6'30"	7'12"	8' 6"	9'	10'	11' 6"	12'12"	13'42"	15'12"	17'	19'	21'	23'30"	25'45"
MS	5'42"	6'24"	7' 6"	7'54"	8'48"	9'42"	10'54"	12'	13'24"	14'54"	16'30"	18'24"	20'20"	22'30"	25'	28'	31'30"	34'30"
S	7'45"	8'30"	9'30"	10'30"	11'45"	13'	14'30"	16'	18'	20'	22'	24'30"	27'	30'	33'30"	37'30"	42'	46'
VS	9'45"	10'48"	11'48"	13'12"	14'40"	16' 6"	18'	20'	22'15"	24'30"	27'30"	30'30"	33'30"	37'30"	42'	46'30"	52'	57'
VVS	11'48"	13'	14'24"	16"	18'	19'40"	22'	24'	27'	30'	33'	37"	41'	45'30"	51'	56'	63'	68'

EDITOR POPULAR PHOTOGRAPHY:

Dear Sir: I notice in March POPULAR PHOTOGRAPHY some notes anent Methods A and B of Thermo Development. I have tried both, and comparative tests show the results of both methods are the same. When developing roll films or when using the plate tank filled with only one kind of plate, I use the dilution system. When, however, I have plates of two or more different development-speeds to develop at the same time, I use Method A; I put all the plates in the tank at the same time and withdraw each plate when its development period has expired. I enclose my Method A table adapted to Dr. Miller's Thermo Duratol which you are at liberty to use if you desire to do so. I regret that the copy is such a poor one but it is the only duplicate I have at present and am not now in a position to make a better one. I find the three-solution D.-Q. an improvement over the two-solution formula.— CHARLES W FRICKE.

EDITOR POPULAR PHOTOGRAPHY:

I am once more submitting two prints for your consideration, entitled "The Lookout" and "A Sun Portrait," and at the same time I thank you for informing me that my print "At the Pier" is to receive honorable mention in the March number of your publication.

By the way, last July I adopted photography as a hobby and pastime, and quite naturally my knowledge was very limited along that line until an acquaintance (who knew I always had a "load" on my mind since I purchased my small No. 1 F.P.K.) loaned me POPULAR PHOTOGRAPHY for June, 1914. It is a very short story, for now I am sometimes two weeks or more ahead of time trying to obtain the next issue, and of course being an enthusiast have several other photographic magazines; but let me say that POPULAR PHOTOGRAPHY is my reference library or "my friend in need."

In response to your valuable criticisms and helpful articles in the said magazine, I have purchased a 4 x 5 Seneca plate camera and hope in the near future to send in some prize-winning prints. I fully believe that POPULAR PHOTOGRAPHY will help me with any difficulties which may turn up.

I shall await eagerly the next issue of POPULAR PHOTOGRAPHY.—FRED MARCILLE.

EDITOR POPULAR PHOTOGRAPHY:

Dear Sir:—Please allow me to express my heartfelt thanks to you for the very agreeable surprise you handed me in the form of awarding me the prize in the December Competition published in this month's issue of the magazine. I cannot help recalling at the present moment one of your little editorials on the competition which has stuck by me, and which seems to describe more nearly my feelings than anything else I can say, the gist of which was that the winning contestant should not consider the money value of the prize so much as he should the satisfaction that goes with the knowledge that he has come out on top against competitors from all over the country. I might also add my praise of your magazine for the help it has been to me in bringing me from the stage of the ordinary snapshooter to the stage where I am anxious to get everything possible out of each picture I try to make.—WM. H. HERCHANHAHN.

EXPOSURE-TABLES FOR APRIL

DIRECTIONS: Find in the tables printed below the NUMBERS for SUBJECT, STOP, LIGHT, HOUR, and PLATE. Add them, find the sum in the last table, and give the exposure indicated. When the exposure fails to correspond with the speed-marking on shutter, use the nearest shutter-speed, preferably the lower. If sunlight falls over one shoulder, add **0**; if straight across subject, add **1**; if sun is ahead, add **2**. When using back combination only of lens, add **2**.

EXAMPLE

Average landscape	3	July, 11 A. M.	0
Stop U. S. No. 8	6	N-C film	1½
Intense light	0		

Adding these numbers, we get **10½**, and on referring to the last table, under **10½**, we find **1-40** second, which is the exposure to give. In this case you would use the speed marked **1-50** and open the lens a little, if possible; say, half-way to U. S. No. 4.

SUBJECT

Sea (only) and clouds	½	Street scenes, buildings, groups	5
Sea-views, snow-scenes, distant landscape	1	Portraits in shade	7
Open landscape, without foreground	2	Indoor portraits	8 to 10
Average landscape, with foreground	3	Interiors	16

STOP: —

f:2	*f*:2.3	*f*:2.8	*f*:3.3	*f*:4	*f*:4.7	*f*:5.6	*f*:6.7	*f*:8	*f*:11.3	*f*:16	*f*:22	*f*:32	*f*:45	*f*:64
				U.S. 1	U.S. 1.4	U.S. 2	U.S. 2.8	U.S. 4	U.S. 8	U.S. 16	U.S. 32	U.S. 64	U.S.128	U.S.256
1	1½	2	2½	3	3½	4	4½	5	6	7	8	9	10	11

LIGHT: Intense sunlight (inky-black shadows), **0**; Bright sunlight (strong shadows), **½**; Faint shadow cast by sun, **1**; Dull (no shadows), **1½**; Very Dull (whole sky very dark), **2**.

HOUR: 10 a.m. to 2 p.m., **½**; 9 a.m. and 3 p.m., **1**; 8 a.m. and 4 p.m., **2**; 7 a.m. and 5 p.m., **3**; 6 a.m. and 6 p.m., **5**.

PLATE: AMERICAN, **1½**. ANSCO FILM, **1½**. BARNET — Film, **1½**; Superspeed Ortho., **1**; Ortho. Ex. Rap., **2**; Red Seal, **1**; Red Diamond, **1½**; Self-screen Ortho., **2**. CENTRAL — Special XX and Sp. Home Portrait, **½**; Special, **1**; Comet, Colornon, and Pan-Ortho., **1½**. CRAMER — Crown, **1**; Anchor, **2**; Banner, **1½**; Inst. Iso., **1½**; Med. Iso., **2**; Commercial Isonon, **2½**; Portrait Isonon, **1½**; Trichromatic, **3**; Slow Iso., **5**; Contrast, **9**. DEFENDER — Vulcan, **1**; Vulcan film, **1½**; Ortho., **2**; Non-hal. Ortho., **2**; Slow, **9**; Process, **9**. DUFAY DIOPTICHROME, **7**. EASTMAN — Motion Picture Film, **1**; Portrait Film, **1**. ENSIGN FILM, **1½**. FORBES—Challenge, **1½**. HAMMER—Sp. Ex. Fast, **1**; Ex. Fast, **1**; Aurora Ex. Fast, **1½**; Ortho. Ex. Fast, **1½**; Ortho. Non-hal. **2**; Fast, **2**; Ortho. Slow, **2½**; Slow, **2½**. ILFORD—Monarch, **1**; Zenith, **1½**; Sp. Rap,. **2**; Chromatic, **2½**; Ord., **3**; Process, **9**. IMPERIAL—Flash-light, **1**; Spec. Sensitive, **1**; Orthochrome S. S., **1**; Spec. Rap. 225, **1½**; Spec. Rapid 200, **2**; Non-filter, **2**; Process, **9**. JOUGLA — Violet Label, **1½**; Green Label, **2**; Omnicolore, **7**. KODAK—Speed Film, **1**; N. C. Film, **1½**. KODOID PLATES, **1½**. LUMIERE—Sigma, **½**; Blue Label, **1½**; Film, **1½**; Ortho. A, **2**; Ortho. B, **2**; Panchro. C, **2**; Autochrome (outdoors), **8**, (indoors) **9**; Process **9**., MARION — Record, **½**; P.S., **1**. PAGET—XXX, **2½**; XXXXX, **2**; Swift, **1**; Ex. Spec. Rapid, **1**; Ortho. Ex. Spec. Rapid, **1½**; Panchro. Ord., **2**; Panchro. Colour (no screen), **2½**; Spec. Rapid, **1½**; Hydra Panchro., **3½**; Hydra Rapid, **3½**. PREMO FILM PACK, **1½**. ROEBUCK—Blue Label, **1**; D. C. Ortho., **2**; Ortho., **2**. SEED — Graflex, **½**; Gilt-edge 30, **1**; Color Value, **1**; Gilt-edge 27, **1½**; L. Ortho., **1½**; 26X, **2**; Non-hal., **2**; Non-hal. L. Ortho., **2**; Tropical, **2**; C. Ortho., **2½**; Panchromatic, **2½**; 23, **3**; Process, **9**. STANDARD — Extra, **1½**; Imperial Portrait, **1½**; Orthonon, **1½**; Polychrome, **1½**; Thermic, **1½**. STANLEY — 50, **1½**; Commercial. **4**. THORNWARD — Regular, **1**; Orthochromatic, **2**; Orthochromatic N. H., **2**. WELLINGTON — Extreme, **½**; 'Xtra Speedy, **1**; Film, **1½**; Iso. Speedy, **1½**; Portrait Speedy, **1½**; Anti-screen, **1½**; Speedy Spec. Rap., **2**; Ortho. Process, **9**. WRATTEN & WAINWRIGHT — Panchromatic, **1½**; Process Panchromatic, **3**.

3½ S 1/3000	4 S 1/1000	4½ S 1/2500	5 S 1/2000	5½ S 1/1250	6 S 1/1000	6½ S 1/700	7 S 1/500
7½ S 1/350	8 S 1/250	8½ S 1/150	9 S 1/100	9½ S 1/75	10 S 1/50	10½ S 1/40	11 S 1/25
11½ S 1/20	12 S 1/12	12½ S 1/10	13 S 1/8	13½ S 1/5	14 S 1/4	14½ S 2/5	15 S ½
15½ S ⅔	16 S 1	16½ S 1½	17 S 2	17½ S 3	18 S 4	18½ S 5½	19 S 7¼
19½ S 11	20 S 15	20½ S 23	21 S 30	21½ S 45	22 M 1	22½ M 1½	23 M 2
23½ M 3	24 M 4	24½ M 6	25 M 8	25½ M 12	26 M 15	26½ M 24	27 M 30
27½ M 45	28 H 1	28½ H 1½	29 H 2	29½ H 3	30 H 4	30½ H 6	31 H 8

These tables are based on the 1914 edition of the "American Photography Exposure-Tables," a new and revised form of the "Photo Beacon Exposure Card." Owing to the great increase in the speed of lenses and plates since the original compilation of these tables, it has been necessary to completely change the system of numbers corresponding to stops, plates and exposures, so that exposure numbers from this table are 5 units higher than in the old tables. The complete tables, in pocket form, 3 x 5 inches, containing full directions for obtaining correct exposure under all conditions, may be obtained from our publishers at the price of 25 cents postpaid.

POPULAR PHOTOGRAPHY

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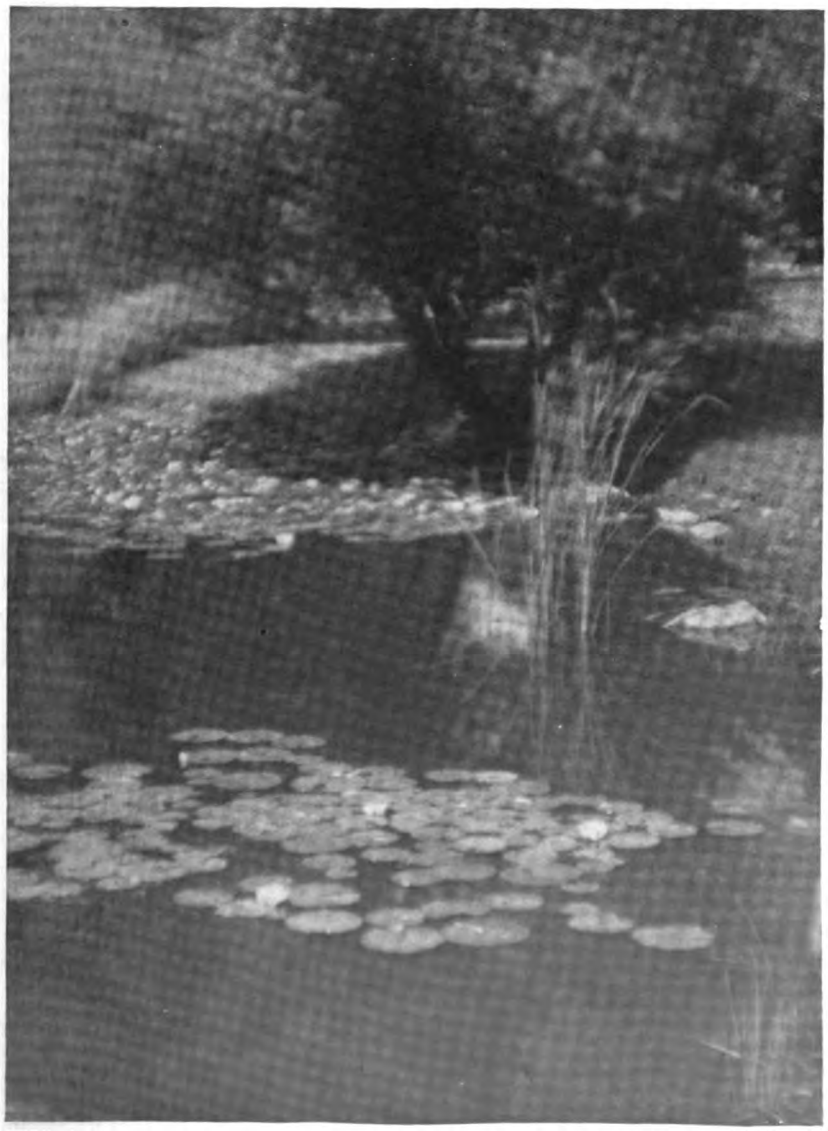
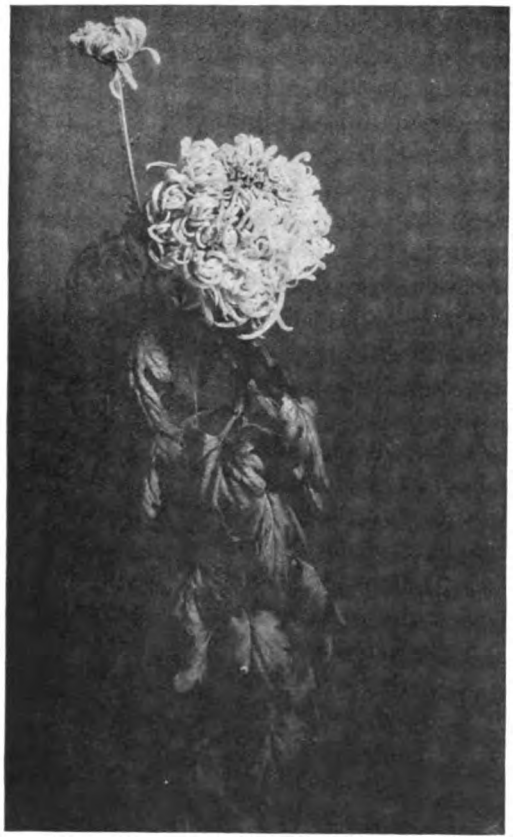


WHERE LILIES GROW. WM. LUDLUM

(See page 308)



CHRYSANTHEMUM E. B. WOTKYNS

CHRYSANTHEMUM

Miss Wotkyns has omitted, in composing this picture, to look out for the element of balance of spots of light and dark. The composition is too one-sided and lacks the interest and variety which could easily have been secured by careful arrangement of three blooms. The lighting is also somewhat too harsh and too much across the picture plane. A reflector was needed. After all, success in flower photography depends first of all on infinite care and skill in arranging the flowers; secondly, on lighting them softly yet brilliantly, without decided heavy shadow masses; and finally, on correct exposure. As Miss Wotkyns uses the Wynne meter, the last element should cause no concern; but the other two need attention. Data: No. 3 F.P.K. with R. R. lens; 25 seconds at *f*:16 at 3 p. m. in November in cloudy (dull?) light near window; Speed film; 5 x 7 sepia enlargement.

SILVERING TRANSPARENCIES

A reader asks for a method of silvering a transparency on the back. He tried flowing the glass side with Martin's silvering solutions and got only a dull, foggy deposit.

It is hard to understand how a transparency could be improved by silvering, as it would lose half its beauty by reflected instead of transmitted light. We should think the inquirer could easily get the results he aims at by making his prints on opal transparency plates instead of the regular kind. Though we have never tried it, we should imagine that a satisfactory reflecting surface could be secured by first flowing the plate with varnish, letting it dry until tacky, and then applying aluminum enamel paint.

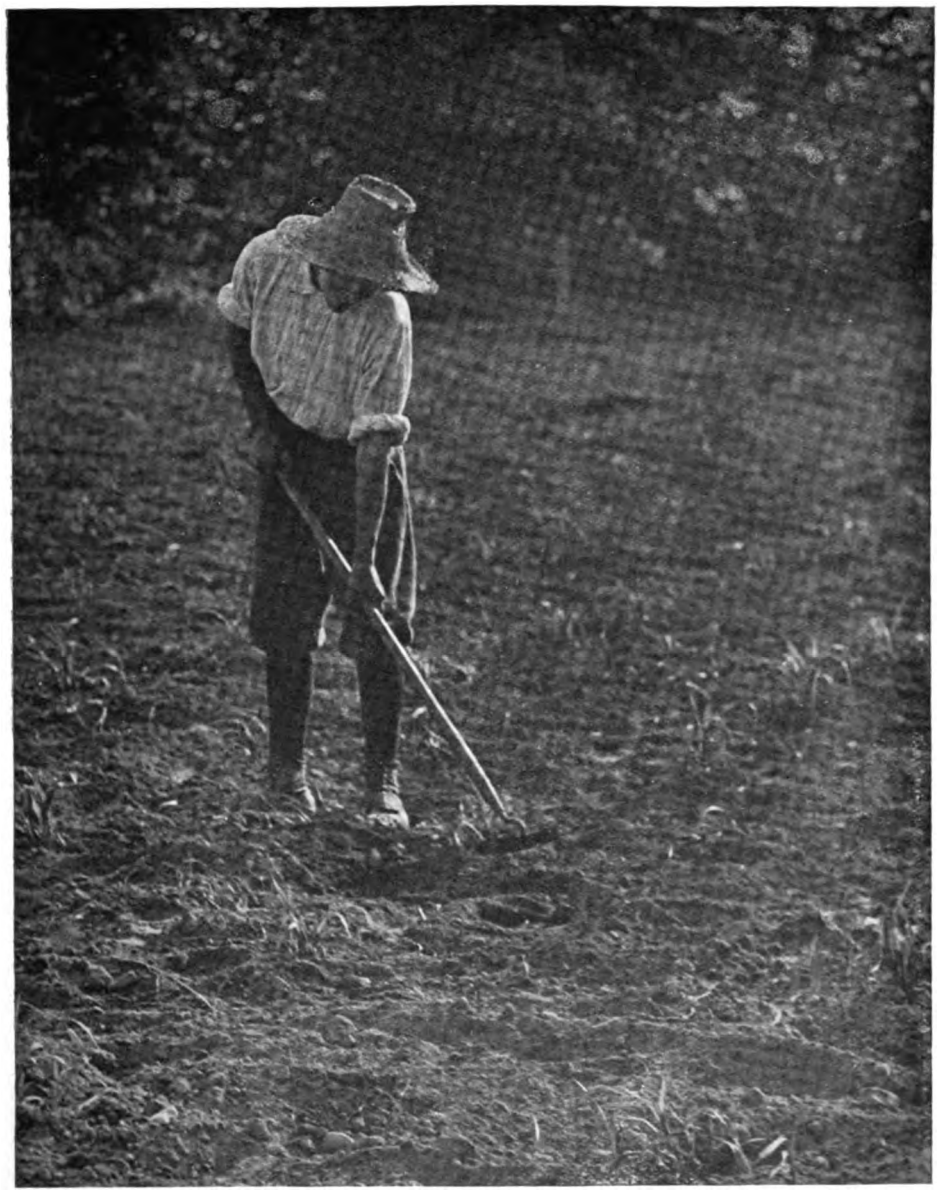
Plates could be silvered by Martin's solutions, given a coating of bichromated gelatine on the face, and the transparency film stripped and mounted on the prepared surface. Formulas for stripping will be found in the same almanac which has the methods for making and using the silvering solutions. The latter were published in a recent issue at the request of a reader. Carbon transparencies would be particularly suitable for mounting on mirror glass.

TEMPERATURE COEFFICIENT OF DURATOL-METABISULPHITE

A Correction

We made an error in giving the probable temperature coefficient of Mason's formula, which is to be found on page 278 of the April, 1915, issue. Mr. Mason writes that he has been using the 2.6 table of dilutions with the *1.9 table of temperatures*. The longer times indicated have produced a negative of greater contrast which is more suitable for the softest grades of D.O.P.

On receipt of this correction, we came to the conclusion that we had better test the formula for its temperature coefficient, and, to our astonishment, found that it is 1.7. A repetition of the test gave the same result. This is contrary to our former experiences, namely, that altering the sodas did not alter the temperature coefficient after the strength of the developing agents had been fixed. Metabisulphite, however, being a strongly acid salt, probably forms a different combination with the duratol, as indicated by the nature of the crystals formed when this salt only is present and the VVS dilution is allowed to evaporate. The duratol-metabisulphite crystals form in star- or chestnut-burr-shaped masses of fine needle crystals. Under the microscope, many single crystals with lance-shaped contour are to be found. It is these sharp crystals which undoubtedly cause the symptoms of "poisoning" when they



HOEING CORN
EDWIN A. ROBERTS
First Prize, March Competition
(See page 311)

THE STEPPING STONES E A. DOOLITTLE

form in the skin. The formula with metabisulphite alone is now poisoning Mr. Mason, by the way.

At present we are working on a further modification of the Mason formula, with bromide, in the attempt to make its temperature coefficient 1.9 so that it can be used with the 1.9 table of temperatures. This investigation will be published when completed.

THE STEPPING-STONES

Our first volume contained several good pictures by E. A. Doolittle, but of late nothing had come in until we received this contribution. We are glad to note that it shuns some of the faults which we were formerly obliged to point out in this contributor's work. We are always pleased to watch the progress of individuals, and so feel particularly gratified to point out the very satisfactory placing of the figure and the evidences of improved photographic technique. The chief criticism is that the spotty background is distracting. Local reduction and retouching would pull the composition together by darkening the lights on the foliage. Data: No. 4A Kodak with R. R. lens; 1-5 second at *f*: 16 in June at 4 p. m.; bright sunlight; Eastman film; tank pyro; print on Soft Studio Cyko.

AS BIG AS DAD

The maker of this print suggests that if the ground had not been muddy it would not have photographed so dark, and says he would like to make it over on a dry day. The remedy is to print on a softer paper and develop with more water, in order to reducer the intensity of the black deposit. The use of an M.-Q. with a large proportion of hydrochinon tends to give too deep a black. The spacing of the print is very poor indeed, as there is too little room in front of the group and too much behind. The drawing, however, is fair, due to the use of a supplementary telephoto lens, which allowed the operator to secure a large image without taking the camera so close as to cause false foreshortening. The camera was a 4 x 5 Premo with 6¼-inch R. R. lens, and the exposure of 1 second was made just before sundown on a Thornward Ortho plate with the lens wide open. The negative was developed with pyro and printed on an Instanto card of unknown grade.

ACID AMIDOL DEVELOPER

Several readers have asked for the formulas for acid amidol and ortol. One wishes Thermo data for both.

The formula for Balagny's acid amidol was published in this magazine for June, 1914, page 345. A note on preserving amidol solutions appears on page 247 of the April, 1915, issue of *American Photography*. The whole question was exhaustively discussed in *The British Journal Almanac* for 1911, pages 545-546.

AS BIG AS DAD C. E. KULER

THE KODAK FIENDS O. HOLMES

Ortol formulas have been given in this magazine within a few months.

Thermo data cannot be furnished offhand. It is a matter of considerable laboratory work to determine temperature coefficients, work out formulas and check the dilutions and times over a wide range of temperatures. We would not undertake to perform this work for fifty dollars a formula; but any reader can do it for himself by following the simple directions in *The Watkins Manual* (price 60 cents postpaid from the publishers) and drawing up a table according to Method A.

The old superstition that there is some magic virtue in formulas dies hard. Each reader seems to think his own pet recipe will do things that no other developing solution can accomplish. As a matter of fact, the developers given on the Thermo Card will be found entirely satisfactory, and we cannot do better than recommend its use.

THE KODAK FIENDS

Excellent spacing characterizes this print, as presented by the maker in his contact print from the whole negative, showing that the arrangement was carefully thought out. The poses of the two "fiends" are good, though perhaps the thought suffers from one's facing and the other's receding from the camera, and the distant man might better have been posed looking back at the other as if wondering at his delay. The concentration of most of the lighter values in the upper right corner is somewhat regrettable. The technique is very good. The camera used was a 5x7 Seneca with triple convertible lens. One second was given with stop *f*: 22 in June at 2 p. m. to a Standard plate, brand not stated. The plate was developed with M.-Q. and printed on Royal Velox.

WHAT LIGHT TO TEST

After reading "The Secret of Exposure," a subscriber thought he would secure a meter; but he found some ambiguity in the directions on page 39 of the booklet regarding what light to test. The passage reads, "Take sunlight for all average subjects. Where full detail is wanted in shadows *near the camera* in outdoor work, the meter should point to the sky in a direction at right angles to the sun's rays, which should not fall upon the paper." He says, "Most of my work is cement urns, vases, etc., out in the sun. Now, I just can't understand how I must hold this meter by an article of this kind out in the sun and have the proper light strike the sensitive paper and not let the sun strike the paper."

The difficulty is apparent only. It is always easy to improvise a shadow by utilizing that cast by the body. We have repeatedly tested direct sunlight and this shadow- or sky-light and found that the second is always just half as strong as the first. The same effect is secured if the meter is turned so that its face is, as directed above, at right angles to the sun's rays. An example will make this clearer. Suppose the objects are due north from the camera and the sun is due south. To take the direct sunlight, the face of the meter would also be pointing due south. To take the sky-light, it would be necessary to turn it to either

GOOD FRIENDS M. D. GORE

east or west, in which position it would be shaded by the case of the meter and would receive the general sky illumination, not the direct sunlight. If preferred, one could let the shadow of the body fall on the paper while still holding the face of the meter in a general southerly direction.

Our seeker after "correct exposures every time" might, however, fall into an error if he used the ordinary meter time calculated by this actinometer test. It all depends on the scale of his image as compared to the original. Cement vases should be classed as light-colored objects, for which the correct exposure is half that required for subjects of average color, for which the meter is adjusted. Turning to the Copying Table in the meter instructions, we see that if any object is closer to the lens than 15 times its focus, an allowance must be made. In this instance, we might call the subject black and white, omitting the allowance just spoken of. An example, worked out with the meter, is: March 19, 2 p. m.; bright sunlight with clear blue sky and very small white clouds — actinometer time in direct sunlight 6 seconds (pendulum count); in shade of body, 12 seconds; meter at right angles to sun's rays, paper in shade of case, 12 seconds. In each case, this was the full time required to match the standard or dark tint. Assuming now a 12-inch lens at 5½ feet from the subject, the copying table indicates under black and white that we should give three eighths the calculated exposure. Two trial exposures should be made, one calculated for the sunlight and the other for the sky test, the better negative being chosen and the factor noted for future use. After that, exposures made at all seasons would be uniform and would need no thought in developing. Standard contrast would be insured by using the Thermo Card.

GOOD FRIENDS

The bright, alert expression of the little girl is something which overshadows the technical defects of this print, defects which the maker sees and points out as well as we could do, explaining that he had to take the picture that way or not at all. Mr. Gore made the picture for commercial purposes with a Six-Three Kodak with Cooke anastigmat lens of 5 inches' focus. He gave 1-25 second at *f*: 6.3 in very dull light outdoors on the north side of the house and surrounded by trees at noon in August. The Eastman film was developed with pyro and printed on an unnamed grade of glossy Darko paper.

BROMIDE OR NO BROMIDE?

There seems to be still a widespread popular misconception of the properties of bromide in a pyro developer. A considerable number of readers have asked for Thermo tables for a pyro-soda without bromide, stating, in almost every case, that they object to the use of bromide because it "holds back some details in the shadows from developing." This conception is not true.

When bromide is added to a developer, its chief effect is to restrain the development of the shadows during the early stage of development; but if development is carried on for the normal time, the details and fog make their appearance exactly the same. Thermo development insures that the plate shall be carried to the normal time for the particular temperature. The *only* effect of bromide in the Watkins Thermo Pyro-Soda formula is to raise the temperature-coefficient to 1.9 and allow it to be used with the same table as the M.-Q. without bromide. It does *not* suppress shadow-detail. It does *not*, in other words, reduce the speed of the plate appreciably.

Bromide is not nearly as effective in preventing fog as sodium sulphite. When fog occurs, always try increasing the sulphite. Most developers will work perfectly fog-free

if the ready developer contains 10 grains of anhydrous sulphite to each fluidounce. With less, fog may occur. This explains why it is necessary to add sulphite when any developer is diluted for tank use.

Repeated comparative tests have proved that the pyro with bromide gives exactly the same detail from equal exposures as a formula without bromide, so our doubting friends can rest assured that the regular Watkins formula printed on the Thermo Card will give them perfect results. Of course, if they are in the habit of undertiming, they will find it easy to imagine that the developer is at fault. A few test exposures made with our Tables, as published in every issue of the magazine, will quickly demonstrate to them how a well-timed negative should look. Remember that no developer can "bring out" shadow details unless they have been sufficiently exposed. Add to that thought the one that bromide can suppress them only if development is terminated before the normal time. Then try the Watkins formula with bromide and you will have no reason to complain of the results.

TO DRAW AN OVAL OF DEFINITE DIMENSION

E. B. COLLINS

On page 137 of POPULAR PHOTOGRAPHY for January, 1914, appear instructions for drawing an oval. But from these instructions it is not possible to draw such a figure of a given length or width.

To do this — first draw two lines of the required dimensions of the ellipse (commonly called oval). These lines of course cross each other at right angles at their centers. From either end of the shorter line as a center, and a radius equal to half the longer line, describe an arc, or part of a circle, cutting longer line at two points. These points will be the foci of the ellipse. With a pin at each of these points and another pin at one end of either line, tie a string tightly around the three pins; remove the third pin and draw the figure as described in the previous article.

DIRECTIONS FOR USING ACETONE-SULPHITE AS A RESTRAINER

Acetonesulphite is made up in a concentrated solution by dissolving an ounce in 2 ounces of cold water. This is kept in a dropping bottle, ready to add to the developer when a plate which is known to have been overexposed is to be developed. The amount to be added varies with the degree of overexposure. A few drops to 3 ounces of solution will take care of the average case, and ½ to 1 dram will save overexposures thousands of times normal. We once secured a landscape with an unreversed image of the sun in the picture by using the larger amount. This was years before Hydra plates had been heard of.

LONESOME AXEL ANDERSON

LONESOME

Mr. Axel's print is well adapted for reproduction, though a shade too dark and contrasty for other purposes. It is a very good example of window portraiture, part of its success being due to the diffusion of light caused by a rainy day. The composition, too, is well thought out, the little girl and her doll together forming a pyramid, but not too obvious a one to be unpleasant. The background, however, is not very successful. The large and roughly triangular black area needs to be broken by a hint of halftone, say something suggesting a framed picture. The strong highlight above the head needs toning down; and the one of the window just on the margin might also stand a little handwork on the negative. Data: 4 x 5 Korona camera with R. R. lens; bulb exposure at *f*: 11 in February at 3 p. m.; raining; Seed 30 plate; M.-Q.; print on Normal Cyko Glossy.

BACKGROUND PAINTING

A subscriber who has been reading the directions in *American Photography Handbook*

THE WOODS IN JANUARY HARLAN C. LANG

No. 3 on making backgrounds asks the following questions: (1) Would you recommend a blue-white instead of a plain white? (2 Would a little blue be of any benefit to a dark background? (3) In one place it says that the sizing should not be used before it is cold, and later it says to add the whiting to the hot sizing. Is there not a contradiction here? (4) Why does not the formula state the exact quantities of each ingredient to use and the portions into which the sizing and the different colors are to be divided? (5) Should the unbleached muslin be tacked to a frame for painting? (6) Would it be feasible to use the cold-water paints or ordinary fadeless dyes for background painting?

(1) Unless orthochromatic plates are always used, a white ground for photographic purposes should be blue in tone rather than pure white or creamy.

(2) A blue-black would have a tendency to photograph in good detail with less exposure than a reddish black would require. Warm blacks, in general, are very inactinic, and backgrounds should not be too contrasty.

(3) There is no contradiction. One takes parts of the hot sizing to suit one's taste and mixes the different tints, reserving the rest of the sizing to become cool before giving the ground its priming coat of uncolored sizing.

(4) It is not possible to prescribe the amounts of each color and of sizing to be used, as the proportions would vary according to the amounts needed for lighter or darker grounds, etc. If one were doing mostly dark grounds, the amount of sizing taken for mixing the black might be more than for the other tones together, and vice versa.

(5) It is immaterial whether the cloth is stretched on a wall or on a frame, if it is taut when wetted. If a frame is used the muslin should be stretched while wet and allowed to dry before sizing.

(6) We see no reason why the cold-water paints could not be used if enough size were added to prevent them from flaking off. Probably a little dextrine or glucose would act as an efficient binder.

Finally, background painting is a mussy job, and most amateurs can get better results at less expense by getting grounds of the "Velveta" type, which stand folding without chipping. A head ground costs about $1.50.

THE WOODS IN JANUARY

Taken as a record, to preserve the memory of a fine old estate about to be cut up, this print yet shows a feeling for the pictorial which should make the record valuable to its maker and to others. Mr. Lang points out a number of small defects, particularly the obtrusiveness of the tree nearest the left margin in the foreground. The values of the trees against the sky are, as he says, very true. He used a three-times filter and calculated with our tables as follows: Subject, 3; stop, 8; light, 1/2; month and hour, 1 1/2; plate, 1 1/2; sum, 14 1/2, or 2-5 second. Allowing for the filter, 1 second

PICTURESQUE CANAL CHAS. A. QUINN

was deemed near enough. Some readers may wonder why this subject was not classed as a snow scene, factor 1; but the presence of the inactinic evergreens so near to the lens explain why it was put into the average landscape class. The camera used was a 5 x 7 Korona with 8-inch Scientific lens used at *f*: 22 at 2 p. m. in January in bright light. The Cramer Instantaneous Iso plate was tanked in pyro and printed on Professional Studio Cyko, which was developed in a special metol formula for soft effects.

A PICTURESQUE CANAL

The composition of this picture is radically wrong because the larger mass of halftone representing sky shows through the trees on the distant bank near the right margin and is more interesting than the smaller sky patch downstream near the vanishing point. A position of the camera farther out toward the waterway might have allowed a more satisfactory arrangement of light masses. Data: No. 3 F.P.K. with R. R. lens; 2 seconds through three-times filter with stop *f*: 16 in November at 9 a. m.; bright light; Eastman film; D.-Q. tank development; enlargement by a professional.

LENSES AS FURNISHED ON CAMERAS

"Is the lens furnished with the camera as it comes from the factory usually suitable for all amateur work, or is it better to change lenses to suit what you are working on?" asks a reader. He is thinking of getting a moderate-priced postcard-size camera now, and a 6½ x 8½ view camera later.

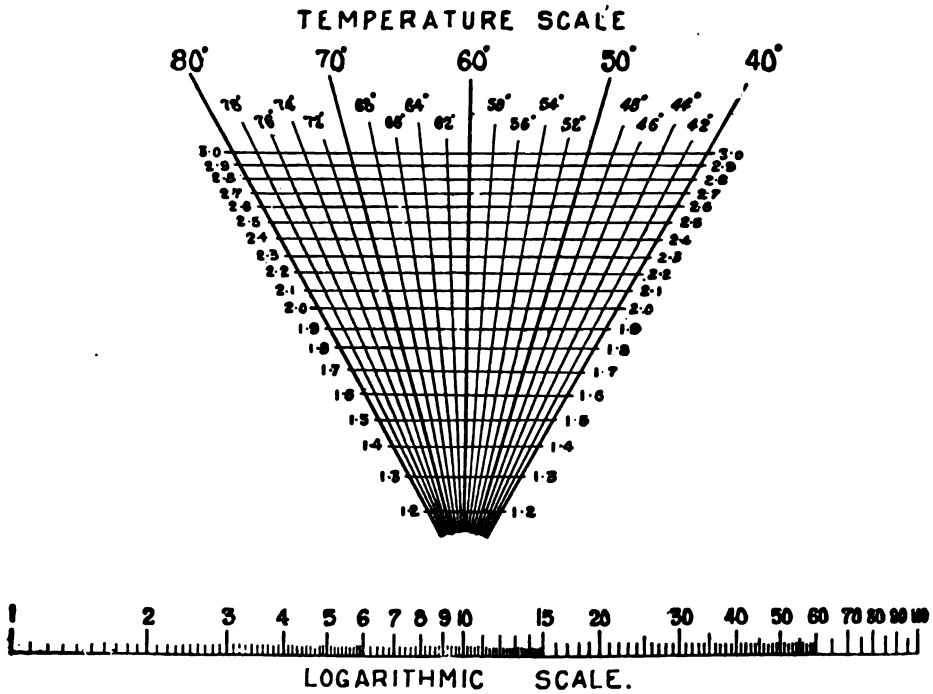
In the postcard size, particularly if the camera is intended for films, either roll or flat, the ordinary R. R. lens furnished by the maker will be found satisfactory. We have made thousands of beautiful pictures with such an equipment. For average amateur work, the R. R. is good enough, unless price is no object, when one might profitably get an anastigmat. It is not necessary to pay a great deal of money for an anastigmat. The Kodak people furnish one working at *f*: 8 at less than an R. R. used to cost. Several other firms have brought out *f*: 6.8 lenses at very low figures. An extra five or ten dollars is worth putting into an equipment if it can be spared.

The best average focal length is that furnished in postcard-size cameras, namely, equal to the diagonal of the plate.

For the view camera, an 11-inch convertible anastigmat would be most satisfactory. The complete lens would give good average angle of view. The rear combination would give telephoto effects. The anastigmat lens from the postcard camera could be fitted for wide-angle work. If price were an object, a three-focus rectilinear would answer well even for the view camera, as speed would not be the chief object.

WATKINS AND WYNNE NUMBERS

Several readers have asked for the Watkins or the Wynne speeds of favorite plates or films. If, through some inadvertence of the meter



people, any brands are omitted, their speeds can easily be figured from our listings in the magazine. The fastest plates, class ½, are equivalent to Watkins 500 or Wynne *f*: 156. Each class slower is 50 per cent slower, so the next lower number of the regular Watkins or Wynne listing will apply.

Readers can always obtain the latest Watkins card by sending 5 cents to Burke & James, Chicago; and Wynne users can get American or English cards direct from George Murphy, Inc., 57 East 9th Street, New York City, by sending cash with order. The English edition of the Watkins card is published eight times a year and can be subscribed for by Canadian readers for a shilling and postage extra, by sending direct to the Watkins Meter Company, Ltd., Imperial Mills, Hereford, England.

CALCULATING TEMPERATURE COEFFICIENTS

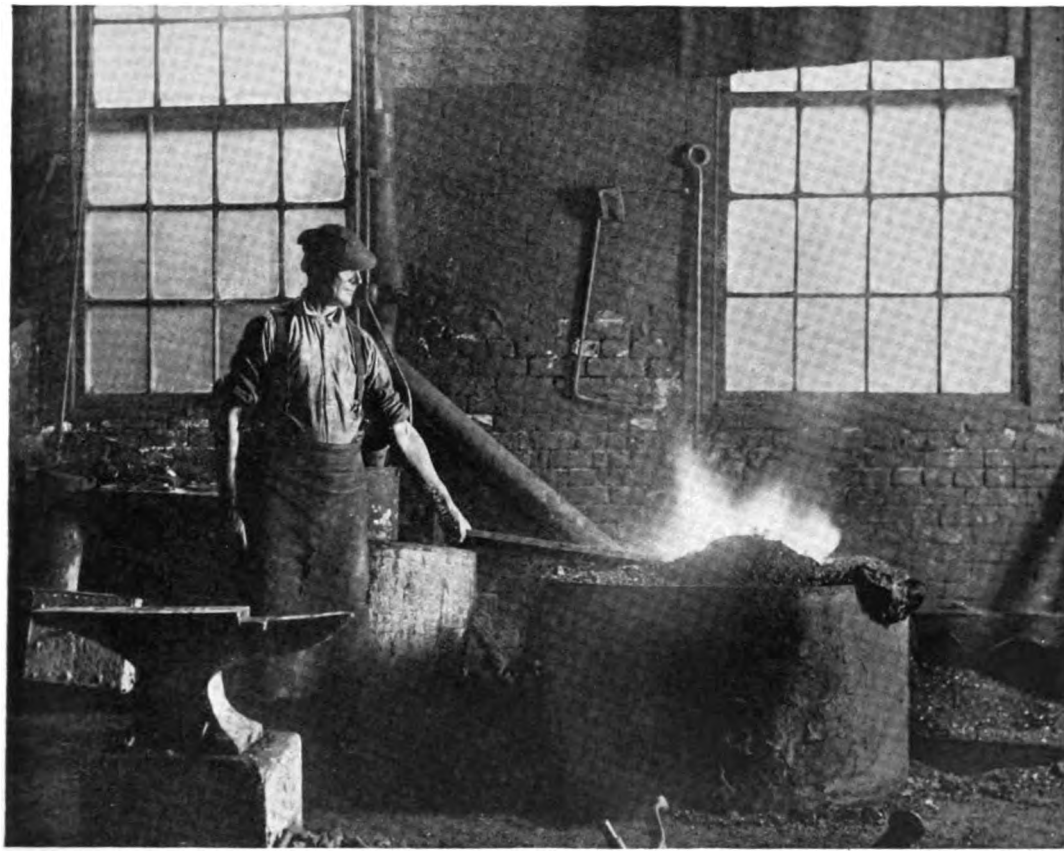
Through an unfortunate mistake, the accompanying diagrams, which should have been used with the article on page 266 of the April, 1915, issue, did not reach us in time to be used. Readers who wish to find the temperature coefficient of their developer should use these diagrams in connection with that article.

The fan-shaped scale is used for plotting out the temperature coefficient from the two times of appearance. For example, at 52 degrees, time of appearance is 46 seconds, and at 70 degrees it is 22 seconds. Mark on the edge of a slip of paper the points 22 and 46 on the logarithmic scale, then lay the paper with one mark on the 70-degree line of the fan-shaped scale and slide it along, keeping the dot always on the line, until the other dot comes on the 52-degree line. The edge of the paper will then be found to lie on the horizontal line marked 2.1, which is the temperature coefficient of that particular developer.

WHERE LILIES GROW

(*See page 299*)

Not long ago we called the attention of an inquirer to the fact that most landscapes could with advantage be made with the single combination of the lens, even though not a hundred feet distant, as he had misunderstood some catalog to state was necessary. Mr. Ludlum's charming foreground study of water and lilies is a fine example of the use of the long-focus, narrow-angle lens to concentrate interest. A complete lens would have given the same objects on a smaller scale, at the same time including a great deal of useless material around the real subject. Data: 5 x 7 Premo camera; rear combination of a Wollensak Velostigmat used at the full opening of the iris diaphragm; 1 second through Burke & James 6-times rayfilter; Standard Orthonon



BLACKSMITH AT THE FORGE — W. C. WHITTAKER

Second Prize, March Competition

plate; pyro; print on Professional Cyko Semi-matte, developed with duratol.

BLACKSMITH AT THE FORGE

Mr. Whittaker feels that one of the principal faults in this picture is the fact that the window at the left was too light at the top. Perhaps it would have been better if a curtain had been hung over this, as is the case with the right-hand one, but a little darkening of the paper in printing will easily remedy this fault. We do not find that the objects below the window are conspicuous enough to warrant their removal, though we would suggest that some of the highlights on them could well be toned down. In regard to the fire, this is of course produced by flash powder, and the original print shows clearly the blowing out of a large number of burning grains of powder, which rather injures the realism of the fire effect on close study, though they are not apparent in the reproduction. The maker, however, suggests that he could have made a better picture by putting more coal on the fire and making it smoke a little, and using a flash outside the range of the camera. We are inclined to believe that this is true, for the effect of a flame is almost impossible to get in a photograph, even with the use of flash powder. The picture was made with a 3A kodak fitted with R. & J. Beck Isostigmar lens of 6½ inches' focus. The exposure was 1 second, assisted with flash powder at stop *f*: 8, at 4.30 p. m. in March, in dull light. The Seed 27 backed plate was developed with Modified Thermo M.-Q., and printed on Artura Carbon Block, extra heavy.

GROUND GLASS IN ENLARGING LANTERN

A piece of finely ground glass inserted between the lenses of the condenser of the enlarging lantern will be found a great help toward securing a perfectly uniform illumination on the easel. It increases the exposure required slightly, and may be left permanently in place, for when once tried, one is not likely to attempt to do without it in future.

LOCUST TREES F. S. GREENE

LOCUST TREES

The spacing and arrangement of the old trees are good, except for the empty sky corner, and that is toned down enough not to be staring white. The placing of the distant house is particularly well managed. The technical work is good. Data: 5 x 7 camera fitted with a Wollensak Velostigmat lens of 7 inches' focus; 1-25 second at *f*: 8 in bright light at 2 p. m. in October on a Central Comet plate; print on Normal Studio Cyko.

ANHYDROUS OR CRYSTAL SODAS?

A correspondent takes us to task for not printing in every formula the following information: —

(1) Whether the sodium sulphite is crystal or anhydrous.

(2) Whether "dry" or "anhydrous" sodium carbonate is intended to mean the truly anhydrous, containing no water of crystallization, or the "dry granular," containing one molecule of water.

We have repeatedly published the statement that in all unspecified formulas anhydrous sulphite is intended. Chemically, the name of a salt, not followed by the word "crystals" or by the number of molecules of water of crystallization, always means the anhydrous form, if such exist. We know of no photographic formula, however, which would be impaired even if the sulphite were inadvertently doubled.

Anhydrous carbonate is but a small fraction stronger than the monohydrated when perfectly fresh, and few specimens retain their strength after being exposed to air. The dry granular does not change. We invariably purchase the latter form. It would, however, make no difference which form is used, as the difference in strength at most is quite negligible.

This same reader seems to think it would make a difference in the working quality of a Thermo formula if one form of carbonate were taken instead of the other. This is not so. The carbonate can be varied between the limits of ¾ ounce and 2 ounces without showing any noticeable difference on plates exposed exactly alike and developed for the same time.

EQUIVALENT PLATE-SPEED NUMBERS

American Photography Exposure-Tables	Watkins P Number	Wynne F Number
½	500	156
1	350	128
1½	250	111
2	180	90
2½	130	78
3	90	64
3½	65	56
4	45	45
4½	32	39
5	22	32
5½	16	28
6	11	22

CLEANING A LENS

More injury is done to lenses by cleaning than in any other manner. Though glass is a hard substance, quartz is a harder, and city dust almost always contains quartz particles. Consequently, rubbing the glass with any dusty object, such as even a freshly washed pocket handkerchief, is very likely to produce minute scratches, and in course of time the polish of the glass will be materially injured by such careless cleaning. Fine silk tissue, such as jewelers use for cleaning their stock or opticians for wiping spectacle glasses, is the best material for wiping a lens.

SUMMER H. B. RUDOLPH

SUMMER

This print is a startling object lesson in the art of letting well enough alone. Mr. Rudolph writes that it is from the same negative as was used for his Honorable Mention print reproduced on page 101 of the December, 1914, issue, only he hoped to improve it enough to win a prize by printing in a sailboat from another negative. This sailboat absolutely and completely destroys the unity of the composition by attracting the eye away from the natural center of interest. If it had been differently placed, possibly it might have improved the effect by adding human interest, but we doubt it. The printing-in, furthermore, has falsified the separation of the planes by rendering the foliage behind the boat too light. That mass should be darker than any of the more distant ones, as there is less air between it and the lens. Mr. Rudolph used a 5 x 7 Century camera, fitted with a Euryplan lens of 7 inches' focus, and gave 1 second through a Burke & James Ingento Series B (8 times) filter with *f*: 16 at 4 p. m. in August to a Standard Ortho plate, which was tray-developed in pyro and printed on Azo E Soft.

A DEAD BLACK FOR METAL

A reader asks for a formula for a dead-black paint with which he can blacken metal parts of his camera where the finish has been rubbed off by long wear.

Optical black matte varnish, as it is called, can be obtained of dealers for 25 cents a bottle. It consists of lampblack held in suspension in "banana fluid." The user could easily mix up small quantities as required, as the proportions would not matter as long as it flowed properly from the brush.

HOEING CORN

(*See page 301*)

Here is an example of a subject of the most simple and commonplace nature made into a picture by a little study. In the placing of the figure, in the boy's intentness on his work, in the effective and brilliant lighting and in the subordination of the background, the picture is well worthy of careful study. Taken with a 5 x 7 No. 9 Seneca camera, fitted with a convertible rapid rectilinear lens of 8 inches' focal length. The exposure was ½ second at *f*: 16 at 4.45 p. m. in July with bright light. The Cramer Medium Iso plate was developed with diluted pyro, and printed on Velour Black Silk, enlarged from part of negative, hypo alum toned.

ENLARGING LANTERNS

A reader in the West Indies asks for the names and addresses of United States firms

BABY AT THE GATE W. W. MIKESELL

making enlarging lanterns suitable for 3A and smaller films.

The H. C. White Company, North Bennington, Vt., makes a good line under the name of Radion Enlarging Printers, adapted to regular and special nitrogen-filled bulbs. The prices run from a few dollars to about $90.00.

Bausch & Lomb Optical Company, 565 St. Paul Street, Rochester, N. Y., makes a most complete line of Balopticons, at prices from about $22.00 for the simplest to several hundreds for elaborate instruments intended for all kinds of projection in the lecture-room. This line is unexcelled.

Burke & James, Inc., 242–246 East Ontario Street, Chicago, Ill., makes Ideal and Ingento enlarging lanterns and outfits which are well designed, especially with the requirements of photographic enlarging always in mind, and are justly popular.

Each of these firms publishes booklets and catalogs of its line and will be glad to send them to our readers on receipt of a request mentioning the magazine.

BABY AT THE GATE

The maker of this picture says that he recognizes the centering of the figure is a mistake, yet it does not seem to have occurred to him to trim the print. Part of the amateur's aversion to the trimming board doubtless arises from the fact that he works with such small sizes that he dreads to sacrifice any of the area of his prints. Enlarging usually teaches him that a portion of the negative contains the picture. The other method of working is to get a 5 x 7 or larger and work with the single combination. Data: No. 3 Special with 5¼-inch Zeiss-Kodak lens; 1-25 second by our tables at 2 p. m. in June; Eastman film; tank pyro; print on Special Velvet Velox.

THE ROAD

The first defect which strikes one in glancing at this print is that one of the lightest halftones, almost a highlight, the sunlighted tree-trunk, comes very near the left margin. This light line tends to draw the eye away from the natural entrance into the picture along the road. The fault is one of improper selection. At a different hour, with the sun in a different quarter of the heavens, the lighting would have been better. The picture really lacks a principal object and would have been better if a figure could have been included walking away from the camera along the right side of the road just beyond the second patch of sunlight. Data: 5 x 7 camera with 7-inch Eury-plan lens; 4 x 5 Wellington Anti-Screen plate; ½ second at *f*: 16 at 1.30 p.m.; bright sunlight; print on Soft Studio Cyko.

THE ROAD FRANK E. WHITING

WHERE THE SUNLIGHT FALLS F. A. NORTHRUP

WHERE THE SUNLIGHT FALLS

With a few minor exceptions, there is nothing to criticize in this print. The handling is very fine, particularly the rendering of detail in the darker tones silhouetted against the light. It was made with a Wollensak Verito lens of 7 inches' focus stopped down to *f*: 8, with an exposure of 2½ seconds on an Orthonon plate; the lens pointing toward sunlight at 1 p. m. in January. The plate was developed in pyro-metol and enlarged on Velour Black.

PROFITABLE PHOTOGRAPHY

As an example of the value of timely negatives for photographic illustrations, we may instance the good fortune of an English officer who was able to take a snapshot of the overturning of the German cruiser "Bluecher," which was sunk by the English during the recent fleet action in the North Sea. This photograph, which shows the sinking ship just as she turned turtle, with members of her crew scrambling over her hull and swimming in the water beside her, was sold to an English newspaper for the sum of fifteen hundred dollars. Doubtless many of our readers have seen it, for it has been extensively reproduced in the American press as well as in the foreign newspapers. While such prices for photographs are uncommon, from twenty-five to a hundred dollars is often paid for a negative in the United States, when these are timely or exclusive pictures of important events, such as accidents of national importance and other subjects which the metropolitan press is willing to use.

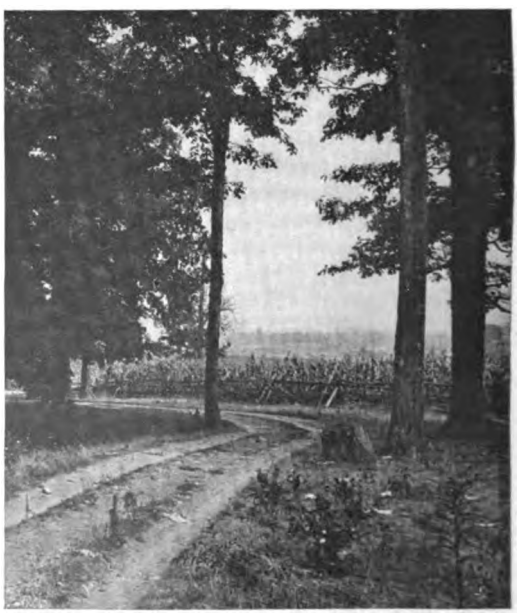
IN THE PASTURE M. HITCHCOCK

IN THE PASTURE

This enlargement has some very good points, but the technical work is not quite perfect. The exposure, according to our ideas, is only about half as long as was really needed to "dig into" the shadows. The two principal shadow masses are that cast by the bunch-grass at the lower margin and that of the heavy group of trees at the right. The direction of the light, then, is such that the shadows fall almost "straight across subject." Reference to our Exposure-Tables shows that this contingency is provided for by the direction to add 1 to the sum found for the five factors of subject, stop, light, month and hour, and plate. The sum for the conditions of the data given, then, would be 14½, calling for 2-5 second, or 6-5, when the multiplying factor of the filter is considered. An exposure of 1 second, then, instead of the ½ second which was given, would have brought out plenty of transparency in the shadows without destroying their general effect of darkness. Some readers may possibly consider such a picture as this to be in the "open landscape" class; but the dark mass near the lens, namely, the bunch-grass with its shadows, certainly demands excellent rendering of shadow detail and therefore brings it into the average landscape group, in spite of the open nature of the rest of the foreground. This bunch-grass, by the way, is objectionable from the standpoint of composition, because any isolated object which catches the eye and tends to halt its observation instead of pointing toward the principal object is unfortunate. Trimming away a large portion of the foreground helps the composition and shows that a horizontal position of the plate would have allowed better arrangement. The picture was made with a 4 x 5 6B Seneca camera fitted with a 9¼-inch R. R. lens. The plate was a Defender Ortho, given ½ second at *f*: 16 through a three-times filter in late July afternoon sunlight. The enlargement is on Velour Black.

AN OHIO VISTA

The trimming of this enlargement has been very carefully and conscientiously thought out by the maker, but he overlooked one small patch of highlight at the right. By covering this, the reader can note how the picture gains in unity. The dark treetrunk then serves as an effective frame and throws the eye back into the picture. There are a few scattered patches of light which would stand toning down, but the print as a whole is extraordinarily good. It carries the dark values without losing the sunlighted distance. This can only be the result of good, full exposure. The time given was 1-5 second with stop *f*: 22 on Eastman film, which was exposed in a Delta camera, 4 x 5 size, with 6¾-inch lens. The time was 8 a. m. in August. A part of the tank-developed negative was enlarged on an 8 x 10 sheet of paper and trimmed to 5¼ x 6¼.



AN OHIO VISTA HERBERT JACKSON

MT. JEFFERSON AND MARION LAKE A. G. PRILL

MT. JEFFERSON AND MARION LAKE

Dr. Prill's picture is of the mountain in Oregon, not the well-known peak of the White Mountains in New Hampshire. It has merit as showing the envelopment of a distant peak by the atmosphere so that one gets the sense of haze blurring the details. There are two serious faults of composition: First, the slanting horizon line; second, the empty, featureless foreground of water with wave-lines parallel to the base. The picture was made with a 5 x 7 camera on a Lumiére Ortho A plate.

ROCKING THE DISH

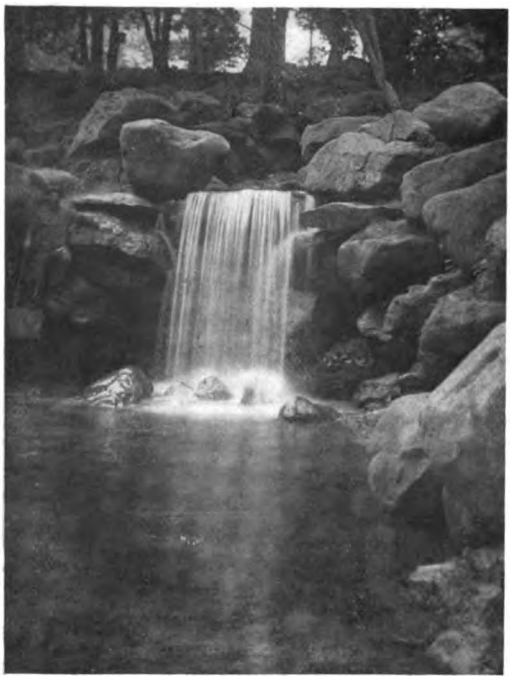
One of the first instructions in photographic processes which the novice reads is that directing him during development to "rock the dish," and if by any chance he omits to do so, he may get a sharp reminder of the omission in the shape of a negative spoiled by the defect known as "mottling." There is no need to describe this result; its name sufficiently indicates its nature. It is most conspicuous as a rule in areas where there is a good deal of deposit, as in the sky, and there is only one known cause of its production — omission to rock the dish.

As the best way of impressing upon one's mind the necessity for some precaution is to point out its nature and the way it operates; it will be well to note why it is that rocking the dish is so necessary. Of course, at the outset, one realizes that the purpose of rocking is to keep up a continual interchange of the solution, so that it shall not be allowed to become stagnant in any one part, but although this is evident enough, it is not so evident why it is in development that rocking is so necessary, whereas in many of the other operations of photography, as, for example, in fixing a negative, there is no such need.

If we consider the nature of the action of the developer, we shall find the reason for the difference. Without going deeply into the chemistry of the changes which take place when we develop a plate, we may say that the result of the action of a developer on that part of the film which has been exposed to a good deal of light is to convert the exposed silver bromide into metallic silver, which is the dark substance which forms the visible image which we develop on the plate. The bromine is thus separated from the silver with some of the alkali in the developer, and when this is sodium carbonate it forms sodium bromide. If the alkali is potassium, or ammonium, the salt formed is potassium or ammonium bromide. All these bromides are what are known as restrainers, holding back the developer and modifying its action very considerably.

If we turn to some part of the plate where there has been much less light action, much less bromide will be formed, and so the developer in the neighborhood of such parts is not so strongly impregnated with a restrainer.

The consequence is that after we have been developing for a very little while, we have a developer in one part of the plate which is, in a very important respect, different in composition from that in another part. Where the developer has done most action it is most restrained;



THE FALLS REUBEN ZUCKER

where it has done less action, it is least restrained. By rocking the dish, and so keeping the developer flowing backward and forward over the surface of the film, we do a great deal to equalize matters. Nothing that can be done can quite prevent there being a difference, but it can be kept within limits.

If the dish is not rocked, not only is there a great risk of mottling, but even if this does not take place, the plate will not be developed evenly. If two plates are given exactly the same exposure and are developed for the same length of time in identical solutions, we shall get two very different negatives if the dish is rocked with one and is allowed to rest with the other. That which has rocked will have more contrast, and will be altogether cleaner and brighter; and even if we endeavor to correct the want of contrast by leaving the other plate in the developer for a longer time, we shall not be able to get the same result.—B. N. WOODING.

THE FALLS

In taking waterfall pictures, the tendency generally is to get the fall itself too nearly centered, but with enough scattered highlights to upset the unity of the composition. Mr. Zucker has avoided all pitfalls and produced a technically perfect print of great merit from every point of view. He used a 3¼ x 4¼ Century camera with R. R. lens and gave 1-5 second at *f*: 16 to a Stanley Commercial plate at noon in August. He used M.-Q. for the plate and printed on Noko Soft Glossy.

A REFLECTING CAMERA AT THE PANAMA-PACIFIC

A reader asks for advice about using a recently purchased Popular Pressman for view work around the Panama-Pacific Exposition. The camera has an *f*: 4.5 lens, and the three slowest speeds of the focal-plane shutter are 1-15, 1-30 and 1-60 second. He asks what stop will be best in good light for general views; also what stop to use for portraits.

Picture making at an exposition requires good depth of sharp field. There are always people walking into the foreground at critical times, so a medium stop is best. We should feel inclined to stop down to *f*: 11 and use the nearest shutter speed which would give proper exposure. The 1-30 is about the slowest which can be relied on for rendering walking people free from blur. In the open courts it may be possible to stop down to *f*: 16 for some of the subjects, or use a faster speed of the shutter with a larger stop.

Portraits should always be made with a large stop. The largest is best for this camera in either 3¼ x 4¼ or postcard size. In this connection, we may say, we have found the 1-15 second of this camera excellent for snapshot portraits indoors in strong light. It did not blur the image. Many reflecting cameras cannot be used for snapshots in the hand at a lower speed than 1-75 without spoiling the image, owing to the shock of the curtain.

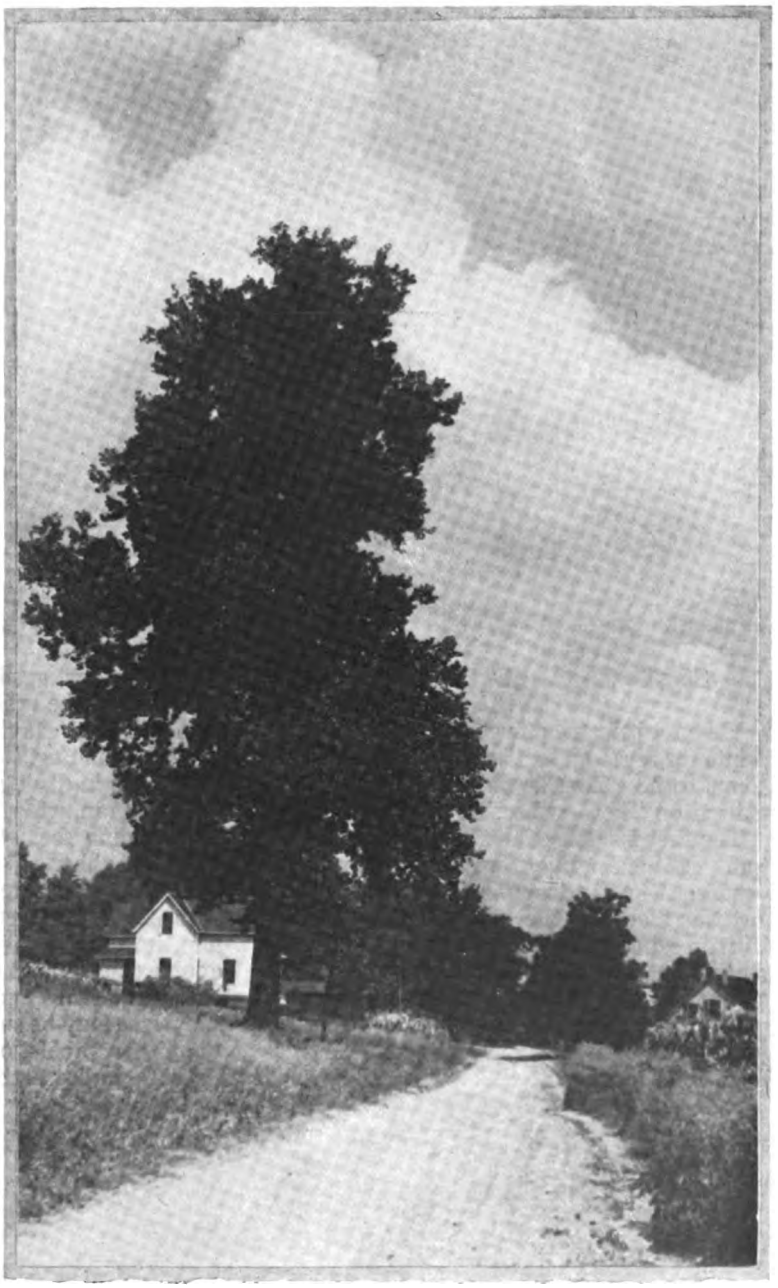
UNMARKED INSTANTANEOUS SPEED

"At what speed," asks a reader, "would a T I B shutter be working if released on I?"

Most "instantaneous" shutters, if unmarked, work at approximately 1-25 second. Some, of course, are slower, down to perhaps 1-12 or 1-10, and a few may run as high as 1-33 or even 1-50; but if exposures are calculated on a basis of 1-25, they will not be far from right.

A SUMMER LANDSCAPE

Lack of balance prevents this print from being a good composition. There is nothing on the right strong enough to contend against the tremendous pulling power of that immense and lofty black tree, thrown into startling relief by the house, the strongest highlight in the view. Even the interest of the cloud-forms is concentrated directly over the tree, so that everything pulls to the left and weighs down



A SUMMER LANDSCAPE ALVIN W. PRASSE

that side of the picture. Trimming would not help this print. It is vitally bad from the choice of a poor station-point for the lens in the first place. The exposure seems to have been made about as if calculated by our tables but the inactinic blue-green of August foliage would have stood at least twice as much. Perhaps the negative was overdeveloped; at any rate, the blacks of the enlargement are altogether too solid. The negative was made with a 4 x 5 Seneca No. 8 camera fitted with an Ilex anastigmat lens of 6 inches' focus through a three-times filter. The exposure was 1-5 second at *f*: 11 at 10 a. m. in July in bright sunlight on a Hammer Extra Fast Ortho plate, which was developed in dilute ortol and enlarged on Silk Surface Velour Black to 5½ x 9½ inches.

A REVERIE — H. T. MIDDLETON

SOME INTERESTING FREAK PICTURES

We have selected a few unusual competition prints for reproduction and comment, as there seems to be a considerable demand for information on "how to" secure fakes.

The first is "A Reverie," by H. T. Middleton. This is a straight example of double exposure. The outdoor view with the bathing girl was made on the beach at Atlantic City with an exposure of 1-100 second. The interior received 10 seconds. The effect of the overlapping images is excellent. An improvement would have been to have the girl and the young man both facing inward so as to suggest that he is looking at the vision. This could have been managed by marking the relative positions on the ground glass.

Mr. C. R. Davis ably seconds with "A Rubber Building." Here the effect is due to mischance in drying the plate. The film softened and ran, with the result shown of making the building seem to be sliding around as if made of rubber.

The third picture, by Mrs. Phil. C. Smith, is rather more mystifying. Inspection of the film, however, proved that there had been a double exposure, as double lines could be made out in the twigs and in the child's coat. The snow face may be simply a coincidence, though the other proofs of double exposure would seem to indicate that the lady's head might

A RUBBER BUILDING — C. R. DAVIS

THE FACE IN THE SNOW MRS. PHIL. C. SMITH

have been held up during a part of one exposure, not stationary, but in the act of moving to the pose which appears below. Movement during exposure produces many strange freaks. Too slow a snapshot, accompanied by a jerk of the camera, may have been responsible in this case for the double outlines, but not for the face in the snow.

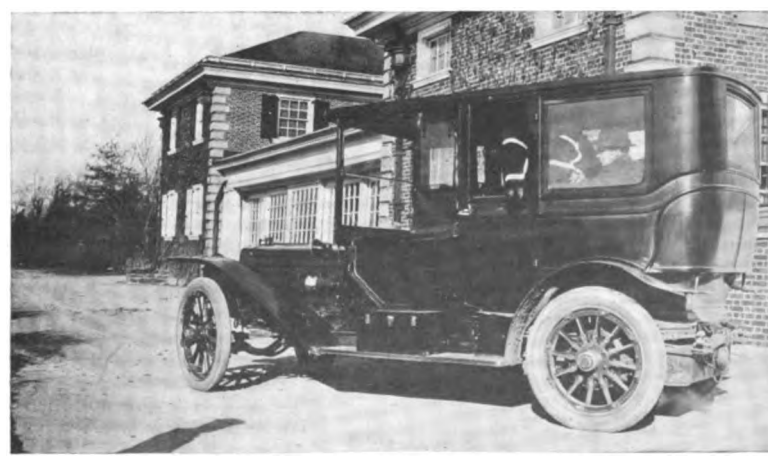
Ponies riding in a closed car, as in the fourth picture, would seem to suggest double printing; but a close look shows that the effect is unfaked, or there would not be the difference in value between the head in the door opening and that behind the window glass. We are informed that these ponies were actually taken in the machine to the fair, to be raffled off for the benefit of the Belgians.

Double exposures are best worked with a plate camera by planning both pictures carefully and marking on the ground glass the positions of the principal objects. Other methods of faking are described at length in a book entitled "Photographic Amusements," by W. E. Woodbury, published by the *Photographic Times*. Price $1.00.

REFRACTORY NEGATIVES

Why is it, asks a subscriber, that certain negatives refuse to intensify when treated with mercury and sulphite?

Generally, when a negative does not respond readily to the solutions used in intensification or reduction, it is because the gelatine has never been tanned too hard by the acid fixing bath. Such negatives may be softened by treating with very dilute nitric acid.



OFF FOR THE FAIR ROBT. CURRY

AN INTERIOR J. M. CONKLIN

AN INTERIOR

The exquisite delicacy of fine gradation in the whites of this picture is so degraded by reproduction that we feel we ought not to call too much attention to this feature of the rendering; but we agree with Mr. Conklin that his print shows to great advantage the benefit of using, habitually, a double-coated ortho plate. The values in the greens of the plants are particularly good, though no ray-screen was used. Technically, the work is perfect. Data: National camera fitted with Aldis anastigmat lens *f*: 6; 4 seconds at *f*: 22 in July at 1.30 p. m.; fair light; Standard Orthonon plate; M.-Q.; Azo Hard X Glossy.

COLORING LANTERNSLIDES

One of our readers desires a formula for making liquid lantern colors and we take this from the English *Amateur Photographer*. Take a wide-mouthed two-ounce bottle and over the neck fasten a piece of thin, not too fine-mesh, muslin with a bit of string or an elastic band. Fix this muslin rather loosely so that you have a kind of sagging bag, about equal in size to the end of your thumb, of the muslin hanging down into the mouth of the bottle. Wet this muslin well with warm water. Then into the bag put one-half ounce of gum arabic tears; that is, clear pieces as nearly colorless as possible. Pour over this, slowly, tepid water to reach about halfway up the bag. Set the bottle on a warm mantlepiece and cover with a bit of paper to keep out the dust. As the water in the bottle dissolves the lower pieces of gum, it is strained by the muslin. The upper pieces may clog together and require a little assistance on their way down to the bottom of the muslin strainer. When the gum is all dissolved you should have a perfectly clear and practically colorless solution. To this, add twenty-five minims of glycerin. If you try to mix this in by shaking you will find that it will produce a great amount of froth and bubbles. The secret of avoiding bubbles in all such viscous liquids is quite simple. Never shake them at all, but mix entirely by using a glass stirring rod, always moving the stirring rod one way only. Then add five drops of carbolic acid, one drop at a time, stirring well after each addition. The muslin strainer has, of course, been removed as soon as the gum was dissolved before adding the glycerin, being careful to prevent any of the solid particles, which it held back, from getting into the bottle. This medium may then be mixed as required on the palette with any water soluble, nonfading transparent colors, such for instance as nigrosin, methyl blue, methyl violet, brilliant yellow, methyl green, transparent platinum scarlet. After use, wash your brushes carefully in tepid water and dry them on a clean rag. Be careful after using the bottle of medium to wipe the inside of the neck and also the outside of the stopper quite dry or you are likely to have trouble when next you want to take out the stopper. Do not use a cork stoppered bottle, for in his case your medium will soon become contaminated with broken pieces of cork. The kind of slide suitable for coloring is one that is quite free from fog, fully exposed, lightly, that is underdeveloped and not too crowded with minute detail. Broad masses of color are more effective than fine detail.

SAGGING BELLOWS

However good a camera may be, there comes a time when the continual use of it has so far softened the leather of its bellows that they tend to sag, and one may find one end of a picture cut off from this cause. The ends are apt to be dark, and so the fault goes unnoticed, very likely, when the focusing is done, and is only discovered when a negative has been ruined. The failing is most often met with in large cameras, since the bellows of small cam-

STONE BRIDGE G. S. OBEAR

eras are made proportionally much stouter, in comparison to their weight.

Temporarily, sagging may be remedied by putting something under the bellows to prop them up; but this is only a makeshift, to be used for the time being, and as soon as possible they should be stiffened. It may be that they are worn out, and need to be replaced altogether; but it is best to see first whether something cannot be done with them.

Having a whole-plate camera which suffered badly from this defect, I recently tried how far it could be remedied by stiffening the leather with varnish. Shellac was dissolved in denatured alcohol, so as to make quite a thick solution, a thing which requires a few days with occasional shaking. The bellows were then stretched out, and the varnish brushed over the outside of them, and allowed to get quite dry. A little was freely diluted with alcohol, some lampblack mixed up with it, and the interior coated with the mixture. The result of the treatment was to give the bellows as much stiffness as they had when new, and to stop the sagging entirely.

THE STONE BRIDGE

A poor viewpoint, in the main, makes this print unsatisfactory. The sky and trees divide the upper part into a series of patterny spots which cause the eye to skip about. The strong highlight near the lower right corner detracts from the principal light under the larger arch. It might have been possible to find a viewpoint farther to the left which would have given a better line for the bridge; but the postcard shape might have proved impossible of preservation even then. A view of this sort really needs prolonged study before it is taken. The picture was made with a 3A Kodak with R. R. lens at 2 p. m. in August in bright sunlight on Vulcan film, which was given 1-25 second at *f*: 8 and developed with M.-Q. The print is on Argo Matte.

HOW TO DISTILL WATER

A reader who cannot readily obtain distilled water asks for a method of distilling it himself. A description of the process will show how expensive and tedious the process really is and why it cannot be recommended for home use.

A still consists essentially of a vessel, in which the water is boiled, a condenser, in which the steam is condensed to water, and a receptacle for catching the distillate, as the product is called. The apparatus generally utilized for work on a small scale is the Liebig condenser, which consists of a glass tube passing through a larger tube which acts as a water-jacket and is provided with inlet and outlet tubes. Water is boiled in a flask over a Bunsen burner and the steam passes through the inner tube of the condenser. The cold water in the jacket converts the steam to water, which drips into a vessel at the farther end. Owing to the need of a constant stream of cold water, the cost is great, particularly when water is metered. Liebig condensers of various sizes and prices can be bought of the Bausch & Lomb Optical Company.

"I DON'T LIKE TO HAVE MY PICTURE TAKEN"
MRS. CORA RUDRUD

Rain water, boiled for fifteen or twenty minutes in an earthenware crock and filtered through sand and animal charcoal, is almost as good as distilled water. Most waters will answer admirably for photographic purposes if boiled as above and allowed to cool without agitation or bottled and well corked while hot. Filtering solutions is a useful expedient when the water is not of the best quality.

"I DON'T LIKE TO HAVE MY PICTURE TAKEN"

The humor of Mrs. Rudrud's presentation of a refractory youngster must be evident to all parents. It is an excellent genre study. Besides that, it is a perfect piece of technique. In addition, the composition is original, daring, and completely successful. The use of the shadow on the snow to balance the figure so far to the right is perfect. Data: 4 x 5 Conley Model IX camera with Orthographic lens; 1-25 second at *f*: 8 in bright February sunlight at 3 p. m.; Vulcan plate; pyro; enlargement on Instanto.

LUNCHEON

Mr. Spear's print was a postcard, but he had marked it "trim here," so we followed his suggestion and cut it down for reproduction. He was correct about the advisability of trimming, as the spacing is much improved and a considerable amount of rather patterny detail is eliminated. The print as it now stands has only one grave defect, namely the stiffness of the pose, shown in the parted lips and the position of the hands, particularly the nearer one, which is too broad. There can hardly have been distortion, as a 12-inch lens was used, a Dagor, fitted to an 8 x 10 Century camera. The other data are incomplete or illegible. The technique, however, speaks for itself, and indicates full exposure, soft development, and excellent printing.

WATCHING THE PIG

The figure is well placed in the picture space, but the pose is poor, causing the legs to appear deformed, and the many strips of light tone running in all directions are too distracting. The technical work is good. Data: 5 x 7 Long-focus Graflex camera fitted with a 9½-inch Goerz Dagor lens; 1-100 second at *f*: 6.8 in October at 1 p. m. in dull light; Cramer D.-C. plate; Imperial formula pyro-metol; enlargement on Montauk Glossy bromide paper.

FIXED FOCUS ENLARGERS

From the number of inquiries which have reached us lately, it is evident that many ama-

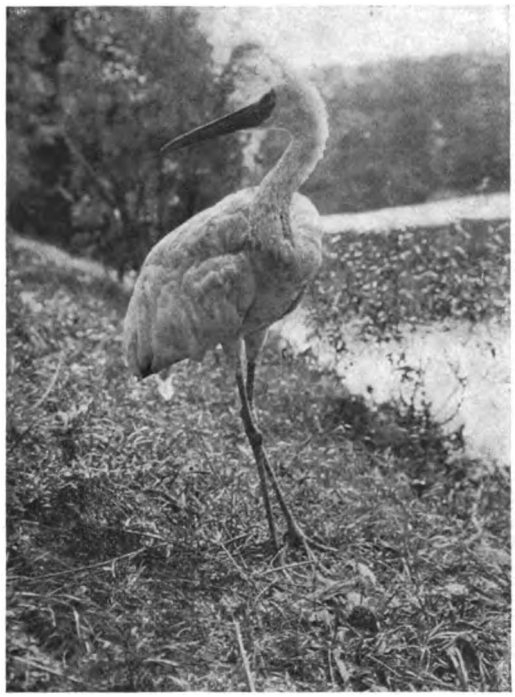
LUNCHEON CARL E. SPEAR

WATCHING THE PIG A. R. BROWN

teurs have been turning their attention to the use of enlargers of the fixed-focus type with artificial illuminants. If there were to be any great demand for apparatus for the purpose, it would not be difficult to supply it at a reasonable price, with a rapid rectilinear lens or something similar, so that exposures might be brought within moderate limits. Fixed-focus enlargers as now used are supplied primarily for daylight use. Here there is plenty of light and to spare, so that they can be fitted with the cheapest single lenses, which, provided with a very small stop, will do the work just as well as one of a more costly character working at a much larger aperture. When artificial light is used with such enlargers, it has to be very powerful and the exposure very prolonged. Such a change as we have suggested would easily reduce the exposure to one-sixteenth, or even less, of what the single-lens enlargers require, and this, while still being much longer than would be given with a lantern and condenser, would still bring them well within the range of utility. Those who make such enlargers themselves should construct them to take the camera lens. They will then find that exposures by magnesium ribbon or even by incandescent gas are not out of the question.

PHOTOGRAPHING COINS AND SEALS

It is often very difficult to get a photograph of a coin or seal on account of the color or the surface of the material interfering with the image of the design, and it is therefore usual when the best results are required, to have recourse to a plaster cast. To make this, the original coin is first given the slightest possible coating of greasy matter, for which purpose a fragment of wax dissolved in an ounce of benzole may be used. This is carefully brushed into every corner of the pattern. The coin is then made the bottom of a box by binding a strip of paper round it. Into this box is poured a thin cream of the finest plaster of Paris, which is left to get quite dry and hard. The cream is made by putting an ounce or two of water into a cup and stirring steadily while the plaster is allowed to run into it in a thin stream. No time must be lost, as the cream soon solidifies. The cast so made is removed from the original, brushed over in its turn with the wax solution, and supplied with a paper edge. The plaster this time should be made with ink and water so that the cast has a gray color, as this makes it much easier to make a successful photograph.



CURIOSITY J. D. FICKLEN

CURIOSITY

Crispy definition and good gradation in the feathers of this great bird make the effect one worth more than passing attention from beginners, who are generally inclined to think that if a thing is white in nature it should be white paper in a photograph. The pose, though, is so awkward that one wonders whether the picture would not soon become displeasing. The arrangement of strips of highlight in the background, too, would help wear its welcome out. Data: 3¼ x 4¼ Ica Trona camera with Zeiss Amatar lens of 5¼ inches' focus; 1-25 second at *f*: 8 in August at noon in bright sunlight; filmpack; pyro; print on Azo A Soft.

ON THE ALERT

Parallel lines in the background mar what would otherwise be a perfect picture. The technical work is very good, so that the record side of the print is uninjured, but the steps would seem to grow in importance every time the print was looked at until they would stand out in the mind as more important than the puppies. Handwork on the negative would reduce the background to an even tone and enormously strengthen the pictorial value. Data: 4 x 5 Auto Graflex fitted with a Cooke Series II anastigmat lens of *f*: 4.5 speed; 1-50 second at *f*: 11 in October at 10 a. m.; intense sunlight; Eastman film; tank development; print on Normal Studio Cyko.

PIFFLE!

THE WALRUS

I have just been reading about photographic shutters. I never miss reading anything on that topic if I can help it, because I am deeply interested in the varieties of mechanical devilment that the study reveals. For some reason, or more probably for no reason, I began to think of an entirely different kind of shutter — the arrangement that fits, or was intended to fit, the scullery window when I hang up the label "darkroom" on the outward bastions.

I remember making that shutter. I mortised and tenoned together four lusty timbers into a frame that fitted the window frame so well that it took two men and four days to get it out for me to finish. Then I damped two sheets of brown paper, and glued one to each side, and when it was dry a mere tap of the finger made it reverberate through the county like an Ashantee war drum thwacked with a missionary's thigh bone. I next shaved some timber off the edges, found that it fitted the window frame more easily, and launched forth on some developing. Just as the first plate was as good as done, a playful gust of wind entered the crack of the window. I was much surprised. The screen descended on my bent head, which went through the drum with a report like an explosion at a dynamite factory; everything in the room that would smash promptly did so, and everything was upset, mostly on and over me.

Having recovered my equanimity I recovered the drum; and next time I put it up (and every time since) I surreptitiously plugged a push pin into the window frame. I heard the wind whispering outside while I was developing another plate, and just at the appropriate moment I heard it swoop through the crack. The drum rumbled a bit, but budged not, and the wind howled with baffled rage. Next time I came to use the screen there was a hole right through the middle of one of the sheets of brown paper. I assembled the other inhabitants of the house, directed their careful attention to the hole, and made a short but vivid oration with a peroration of blood-curdling threats. I mended the hole, and did some more developing. Next day there was some more hole in the same place. Before reassembling the audience I spent some time thinking what to say, and found it difficult to improve on my previous harangue.

ON THE ALERT LOU E. HURST

Just as I had thought out a new threat which ought certainly to have been effective, it dawned on me that the hole was made by a knob on the window. It would have been sheer weakness to explain this to the others, so I plugged the hole once more, and whacked the knob off with a coal hammer. Now the shutter is all right. On bright days a good deal of sunshine comes into the scullery round the edges of the screen, but I like sunshine. I always think it makes a darkroom much more cheerful.

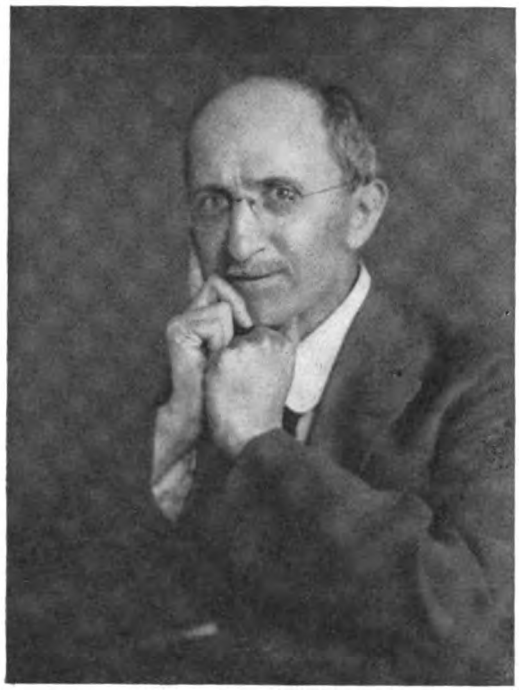
But this was not the sort of shutter I was reading about, and there is no sane reason why I should have been reminded of my window shutter. There is something funny about my brain. I fear it has passed the ripe stage and gone a good many stages farther. I only admit this to please certain readers. But there is the fact. I may be reading about the differential calculi, and I find it reminds me of the time I fell off a seesaw, and if you can see any connection between the two, I can't.

As I said (or have I omitted to say it?), I was reading about the focal-plane shutter. This is one of my prime favorites. It is a perfect terror amongst shutters. Its very name is a lie, and it lives up to it. No shutter is, or can be, in the focal-plane. Hence its name.

The first focal-plane shutter I possessed had only one slit originally, although it developed many others, entirely of its own volition, during its ill-spent career. It was supposed to have only one speed also, but I doubt if any other shutter had more variations in that respect. Sometimes the blind would move slowly and majestically about halfway down the plate, and then stop; at other times the spring would haul the blind down like a flash of greased lightning and tear as many as ten new slits in it at one go. The thing entered my service as the non-speed focal-plane shutter (patent) and left it as the multi-slit (accursed).

Then I had a shutter with an adjustable slit. At least that is how it was described. By dint of a few hours' persistent work the blind could be coaxed out of its grooves, and there was a device of chains and hooks which could be so manipulated that when the blind was got back into its grooves after the labor of a month or so the width of the slit was visibly altered. It was very wide at one end and very narrow at the other. It was of no use in that condition, but by performing the hook-and-chain trick a sufficient number of times it was quite possible to get the slit back to what it was at first.

A much better shutter, as I was told, was the one that had over a million different speeds, each of which was catalogued in a volume supplied with the shutter. All I had to do was to set some pointers, levers, wheels, disks,



PORTRAIT OF J. E. S. J. WHELAN

and notches opposite various figures and then try to find these figures in the book. They were never there; but if they had been they would have told me candidly what was the nominal speed of the shutter in those particular conditions. I burned the book and rubbed the figures off the camera, and when the shutter was in the mood to work, which I admit was not too often, it gave some very good exposures indeed. True they never happened to suit the particular set of circumstances, but they were excellent exposures in their way, and would have been very effective if they had happened to occur on suitable occasions.

I simply love focal-plane shutters.—*Photography.*

PORTRAIT OF J. E.

In its maker's mind, the serious defect in his production is the left sleeve, the wrinkles in which seem to him too prominent. There is no question that this feature is unfortunate, but rather because of the distortion, or false foreshortening so often seen in portraiture when a short-focus lens is brought near enough for a medium head. The arm nearer the lens always looks too large, compared with the more distant one, and using the side swing is the only way to diminish the defect. It is better to go farther back with the camera, accept a small image in good drawing, and enlarge to the required size. The lighting of the face and hands is extremely fine, and Mr. Whelan is to be congratulated on his technical work throughout. His data show that he took the portrait with a Cooke Series II anastigmat lens of 8¼ inches' focus on a 5 x 7 Auto Graflex. He gave 1-5 second at *f*: 5.6 in September at 3 p. m. indoors in good light to a Standard Orthonon plate, which was developed with M.-Q. and enlarged on P. M. C. Bromide No. 8.

OUTDOOR PORTRAIT

If any improvements can be made in this picture, they consist in trimming it into a narrower panel and toning down the backs of the hands. The two strips of lighter tone marking the doorway are better removed. The hands should have been reduced by swabbing the negative as it came from the hypo with a tuft of cotton soaked in ferricyanide solution. Mr. Davidson questions whether the figure would not have been in better drawing if he had used the rear combination at double the distance. There is no doubt that standing figures should always be taken with a long-focus lens, if possible, as it certainly does give a more natural perspective. Mr. Davidson used a half-plate (4¾ x 6½) Sanderson camera fitted with a Seneca three-focus lens of 8 inches' focus. He gave ½ second at *f*: 8 in November at 1.30 p. m. in diffused light. The Imperial S. S. plate was developed for soft results in the regular Imperial pyro formula diluted to quarter strength. The print is on Professional Cyko Plat.

CHEMICAL FOG; AN INSIDIOUS FOE

J. H. WATTS

We are constantly being advised to protect our plates and films from the action of light until the hypo has settled once for all the fate of the negative; and the advice given is both sound and timely — sound, because no negative which is in any way what we call light-fogged can be regarded as perfect; in fact, it is generally very imperfect; and timely, because the amateur, dealing for the first time with such extremely light-sensitive substances as the emulsions which the plate-maker prepares can hardly have impressed upon him too strongly their nature and the precautions which he must take to protect them.

Fog is the deadly enemy of the photographer; but light fog is not the only form it takes. It is the most common, that is all. The other kinds of fog, and there are more than one, are

lumped together under the collective title of chemical fog; and it is to warn the photographer against this section of his enemies that this article is written.

Excessive strength in the developer may cause chemical fog. Any great excess of alkali or of alkaline carbonate beyond that given by the maker in his instructions will lead to it. The presence of any free alkali at all in the case of certain developers, such as amidol, leads to the formation of chemical fog. A developer which is not too energetic at ordinary temperatures may be quite strong enough to cause fog when it is at all warm. Another cause of chemical fog is the use of an excessive proportion of sulphite. It is only of recent years that photographers seem to have become alive to the injurious action of too much of this very useful salt. Speaking generally, the published formulas should be regarded as giving the maximum sulphite which should be present; less than the quantity given is, on the whole, to be preferred. The action is more manifest when development is prolonged, as in the case of slow tank development. In order to prevent staining in such cases with a very weak developer, the recommendation was made to dilute the developer with a solution of sodium sulphite instead of with water. The result was that the negatives obtained by the method were never so clean and bright as those obtained by the ordinary form of development. It would be better to use plain water, and, if need be, to use a stronger developer applied for a shorter time.

Chemical fog shows itself when development — even with solutions which, in the ordinary way, are quite satisfactory — has been unduly prolonged. The developer in the case of underexposed plates has little image it can develop, and consequently there is little or no bromide formed in it, as there is with a fully exposed plate. This bromide would moderate its energy and so prevent fogging. In its absence the full-strength developer applied for too long reduces the silver even where the plate has not been exposed. This fog is often reddish in color on looking through it, and may give the negative a reversed or positive appearance.

One form of chemical fog is an insidious one because its cause approaches literally on the wings of the wind. Impurities in the air may lead to the injury of the sensitive film just as effectively as impurities in the solution. When we remember the composition of the emulsion which is put upon the plate we can easily understand this.

OUTDOOR PORTRAIT BERT DAVIDSON

In sulphide toning, we convert the image into a salt of silver which can be attacked by sulphuretted hydrogen and turned by its agency into silver sulphide. There are many silver salts which can be used for this purpose, amongst them silver bromide, silver chloride and silver iodide. Now these are the sensitive preparations which are used in plates, films, and papers; and it follows, therefore, that such preparations can be darkened by the action of sulphuretted hydrogen; just as in toning a bromide print the bleached image is darkened by sodium sulphide, which is merely a convenient method of applying sulphuretted hydrogen to it. There is no need for the sulphide to be in liquid form; gaseous sulphuretted hydrogen is quite capable of acting in the same way, and it is from gaseous sulphuretted hydrogen that we must protect our sensitive materials.

Such sulphuretted hydrogen may have two likely sources of origin. It may proceed directly from the sodium sulphide which we keep in stock for toning purposes. This has

a smell of rotten eggs, because it gives off sulphuretted hydrogen, which reaches our nose. In like manner it may reach our plates and papers. It may not be so sudden in its action, for it has to work its way through boxes and wrappings; but sooner or later, if there is an appreciable quantity of sulphuretted hydrogen in the atmosphere which surrounds the plate box, it will make its way in, and do harm. The direction of its approach is indicated by the fact that such deterioration as is caused in this way starts at the edges of the plates and works inwards.

The other likely source of contamination of the air with sulphuretted hydrogen is from gas fumes. The quantity may be very minute; but if it is allowed plenty of time to act, as it may be when plates are put on one side for weeks or months, it will make its presence felt. Moreover, it may exist in larger quantities than we realize at the moment. Let anyone go up some steps to the rop of a room in which gas has been burning for some time, and note how hot and foul the air is near the ceilings, although those who are in the room down below this may not be able to notice such a thing at all. To them the air will seem to be quite pure.

The lesson from this is to keep sensitive materials where gas is not burned, where they are out of reach of the fumes which emanate from certain of the dark room chemicals, and not to put them on a high shelf. There are plenty of places in every house where they can be stored so as to keep almost indefinitely. A drawer in a passage or bedroom does as well as anywhere; while the darkroom is about the worst place of all.

While the fog which is caused by sulphuretted hydrogen may be visible before the plate is developed, there are certain other agents which will fog a plate in an equally subtle manner, but which do not manifest their results until the plate is developed. There are certain common substances which give off emanations which have this injurious effect; amongst these may be mentioned brown, or other common impure paper, cardboard, printing ink, turpentine, aluminium and zinc.

The writer can speak from experience, as he has lost the fruits of a photographic holiday abroad from no other cause than repacking the plates in common brown paper before putting them into the boxes. The paper, of course, was not in contact with the actual film itself; the plates were put face to face with nothing in between them; but whatever it was which the brown paper gave off, it worked its way inwards from the edges, and for a width of nearly an inch all around the plates were ruined.

Another curious action is seen in the case of zinc, a metal which is sometimes used by the amateur who constructs his own apparatus. Normally the surface of the zinc is grayed over by a protective film of oxide, and it does no harm; but if by chance this film gets scratched, then the bright metal of the scratches is quite capable of fogging a plate near it. Contact is unnecessary. If a sheet of zinc is scratched and supported for a few hours close to the surface of a plate, but not touching it, and the plate is then developed, it will be found to bear a record of the scratches in the form of streaks of fog.

There is no need to go on at greater length. Of course, the intention of this article is not to alarm the amateur, or to suggest to him that all kinds of elaborate precautions must be taken by him, but merely to put him on his guard. With reasonable care, chemical fog should not put in its appearance; while, if it does, what has here been written should suffice to put the photographer on the track of its cause, and help him to ensure against it in the future.

STAIN FROM INSUFFICIENT TO TOO PROLONGED RINSING

Referring to a note in the March, 1915, issue on "Washing After Development," a reader says, "Does this mean that when pyro and eikonogen are used the negatives will stain in the course of time? I use pyro in tubes and have no running water for rinsing and washing."

Pyro is in a class by itself, as regards rinsing before fixing. The rinsing should be thorough, but not too long, or the stain will be made worse. In the absence of running water, the best technique is to rinse in a large trayful of clear water for about ten seconds, keeping the plate in constant motion, and then immerse at once in a fresh, strong acid hypo. The negatives should be fixed at least twice as long as they take to clear, and washed in twelve changes of water, taking an hour. They will be permanent after this treatment — that is, the pyro color or stain will not alter with time.

Eikonogen, on the other hand, seems to require more rinsing than pyro. We have never had any stain from it when using running water and holding each plate under the faucet for about half a minute. The stain followed rinsing such as described above for pyro, using a tray of water.

SCOLDING THE BABY H. B. RUDOLPH

Third Prize, March Competition

SCOLDING THE BABY

This study by Mr. Rudolph is a very pleasing piece of child photography, and the picture is certainly of more permanent value and interest to the parents because taken in the child's playing clothes and when he is interested in his own concerns than it would be when taken in a studio in the youngster's best attire. Homely records of everyday life are really the most satisfactory photographic records. The picture was taken with a 5 x 7 Graflex camera, fitted with B. L. Zeiss Tessar IC lens of 8¼ inches' focus. The exposure was 1-75 second at stop *f*: 4.5 at 10 a. m. in August in hazy light. The plastic was developed in metol hydro, and the enlargement is on Velour Black Royal Silk.

SOME SUGGESTIONS FOR THOSE ATTEMPTING PORTRAITURE

R. H. J. CROSS

Why are the amateur portraits we usually see such very poor affairs? I do not refer to such details as the gloss on the prints, the neatness of the mounting, or even the retouching, but to the problems with which the amateur ought to be able to grapple as well as the professional, to the getting of true likeness, simple and effective lighting, and pictorial arrangement. As far as likeness is concerned, the amateur who can pick his sitters from amongst his personal friends is at a very great advantage over the professional, who must take people as they come. In the simplicity and effectiveness of the lighting, again the amateur should score. I expect this opinion will not be accepted offhand by those who remember that the professional photographer has a studio, while the amateur, as a rule, must be content to work in ordinary rooms, but it is my deliberate opinion all the same. The professional's studio serves him to shorten exposures, and to that extent is a help. He can get any lighting he requires very readily, and the studio is again a convenience. But in addition to those arrangements of light and shade which we are accustomed to see upon our friends, which can be obtained both in ordinary rooms and in studios, there are countless arrangements we can only get in a photographic studio, which are therefore liable to be regarded as unnatural. The task before the professional photographer in his studio is to get the natural and usual effect of room lighting with his windows and skylights, only much more powerfully, that exposures may be reduced. Putting exposure on one side, while in the facility of altering lighting his studio may assist him, the very readiness may be a hindrance. All these bring us back to the question with which I started these notes.

WHY ARE AMATEURS' PORTRAITS SO OFTEN A FAILURE?

The first reason is one which spoils many; it is unsuitability of background. There is no need to buy a background for home portraiture, nor even to make one with distemper or oil color, though such backgrounds at times are a convenience. But if natural objects are to form the background, they must either be so indistinct as to make no definite suggestion at all, or they must be so plain that we see at once what they are, although at the same time they are not insistent, and do not take attention from the sitter. The simplest background of all is an open doorway leading into a dark room. Some lighting arrangements are very effective with such a background, while all trouble of suppressing details is got over. Of course, the print must be so trimmed that none of the door or door-posts is visible. Such a background will only do for heads and busts, or for little more; and its darkness of tone makes its application a limited one. The negatives must on no account be overdeveloped with such a background, or the sitter will be made much too prominent, even startlingly so. A black velvet focusing cloth makes a good black background if big enough, and if it is kept well in the shade.

BACKGROUNDS OF MEDIUM TONE

The next kind of background to consider is one which has some medium tone value, and at once we meet with trouble, because it is not always easy to get this without the background being too noticeable. How often is the wall of a room used as a background? If the paper has no pattern at all, it is particularly suitable, but in most cases it does have a pattern in color, and so is still more prominent on the plate. In such a case we must avoid two things. If we focus sharply on the background the pattern comes out in the photograph, and almost hits one in the face. If we throw it very much out of focus, people ask, "What has she got over her shoulder, a rake or an umbrella?" and the photographer has to point out that it is neither, but a design on the wall, or the cord of a picture, or whatever it is. Much can be done with wall-paper backgrounds by throwing them into shadow by arranging the curtains, getting the sitter as far away as possible, so that his or her lighting can be arranged irrespective of the lighting of the background. A common fault in amateur portraits at home is the inclusion of a whole lot of frames and other ornaments on the walls. The corner of one frame, if the picture is only suggested, and not sharply defined, is often very useful, as providing a patch of light or dark where it may be wanted, and giving the background just the required suggestion of a room wall, but anything more should be avoided altogether. The same applies to ornamental chairs and tables, ferns, pots of flowers, vases, photographs in frames, curtains, antimacassars, and all the other bric-a-brac which is crammed into some portraits, amongst which the sitter looks quite as strange and "un-at-home" as the proverbial bull in the china shop.

THE IMPORTANCE OF OMITTING THE UNNECESSARY

There was a little bit of advice given recently by Mr. A. J. Assheton, which might well be laid to heart by the amateur trying to take portraits. He said that it was as important to study what not to take as what to take, and the photographer ought to keep a sharp look out to exclude from his picture the things which he did not want in it, which might be injurious to its general effect. Let the sitter be arranged amidst such things if you like, but study the picture carefully on the focusing screen, and take away everything likely to attract attention from the subject. Keep a sharp look out for bright spots on furniture. Some chairs, table legs, and such-like things have curved patterns turned on them, which have the undesirable property of reflecting into the camera a single bright spot of light whatever the angle made by the illuminant. It may be possible to detect these spots and hide them, but is it very difficult to prevent them from appearing except by using other furniture, and this is just what should be done.

BROWN PAPER AS A BACKGROUND

Many workers have to take what portraits they do take just inside the window of an ordinary room, and the wallpaper beyond the sitter may be altogether insuppressible by focusing or by shading. When this is the case, a sheet or two of brown paper must be pinned up — the darker the brown the better. In pinning it, if we have to use more than one sheet, it should be so arranged that the outer sheet does not with its edge cast a dark shadow on the underneath one, or we may get a black line that no possible throwing out of focus will obliterate. These dark backgrounds, whatever their nature, must on no account be used for vignettes, as with them it is almost impossible to avoid the dark border to the face which is so objectionable in a vignette.

LIGHT BACKGROUNDS: THE USE OF A SHEET

The simplest light background is a sheet, which must be so stretched that its nature is not suggested in the print. If the folds cannot be got rid of, the sheet may be hung from a rod of wood, which is hung like a picture from a nail on the wall, and is kept moving during the exposure. This makes a very effective background indeed, but here again we have to be very careful not to over-develop, or the shadows of the sitter will seem quite too harsh against the delicate tone of the rest. We must not forget that the background ought to print out a little — *how* little is not so important — so that the sitter does not look as if he had been blocked out on the negative as skies are blocked out.

THE SITTER'S CLOTHES: WHITE TO BE AVOIDED

Too many ambitious photographers take their sitters, especially their lady sitters, in white dresses, or with white lace round their necks. Children too, are dressed up in white pinafores to be photographed. This is all very well when the difficulties of rendering white properly have been got over, but at first it is simply courting failure. The white comes out an intense glaring white, beside which the flesh tints of the face look muddy and dirty. The darker the garments, at any rate, at first, the better, since it makes the photographer's task so much easier.

ABOUT THE SUPPOSED NECESSITY FOR RETOUCHING

It is supposed to be a very great handicap to the amateur portraitist that he cannot retouch his negatives; at least, as a rule, he is not able to do so. There is always the possibility of sending them out to be retouched, if the process is felt to be necessary at all. But it is often not at all necessary. A rough printing paper dispenses with much of the need for retouching, even if it is not more rough than rough (not extra rough) bromide paper. A piece of sheet celluloid, either matte or otherwise, placed between the negative and the printing paper, when this is platino matte, will in like manner get rid of all need for retouching, if the negative, to start with, is a good one. If it is under-exposed and then developed up to such a point as to exaggerate all the contrasts throughout, and if the sitter's skin has been focused microscopically sharp, and a very short exposure given so as to minimize all risk of movement, there is nothing for it but to resort to the retoucher. I do not wish for an instant to advocate fuzziness — fuzzy prints are quite offensive to me — but a little softness is in itself an improvement in a portrait photograph, and it also helps by doing away with the need for retouching. This softness is got by using the lens at its largest aperture, and by taking care that the exposure is long enough for a slight movement on the part of the sitter. Here it will be seen we are making an advantage out of the drawback of no studio, under which so many amateur photographers suffer. The idea that the diffusion or softness can be got by focusing one part of the sitter and letting the rest blur is quite a mistake. By giving some things the maximum of sharpness, everything else looks

even more blurry than it is. Besides, we cannot concentrate the sharpness upon just those parts where it is most necessary, but we shall find that other and unnecessary parts are also sharply defined, and therefore more prominent than they should be.

POINTS TO BE REMEMBERED

Let me recapitulate, in closing, the points to which the amateur portraitist should turn his attention at the very start, if he would avoid the faults which are so plainly to be seen in so much of the work turned out to-day:

Too much prominence in the background, attracting attention from the sitter.

Too little definition in the background, causing enquiry in the mind of the spectator as to what it represents.

Prominent accessories, spotty furniture, and the like.

White clothing on the sitter, making the skin appear too dark.

Too much definition, making retouching a necessity.

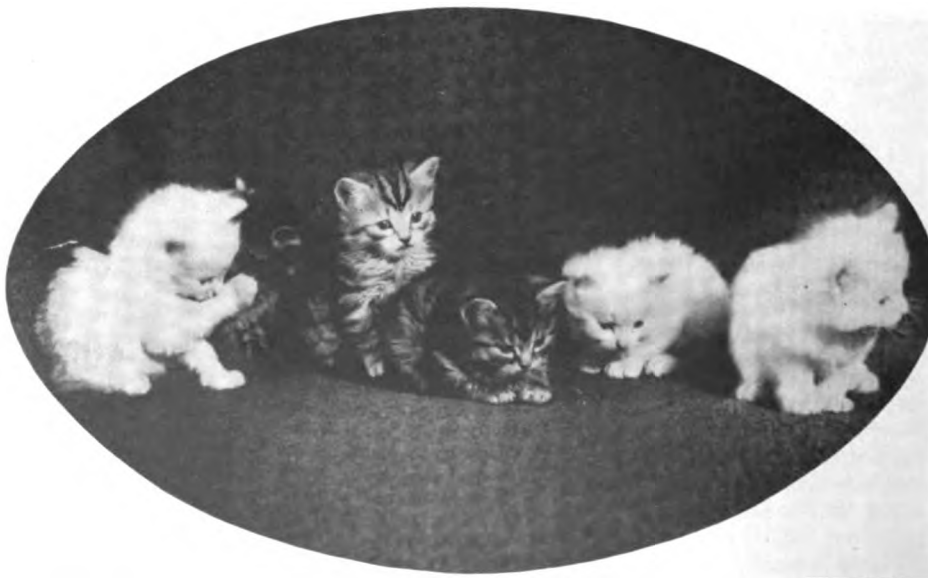
Under-exposure and over-development of the negative. I find I have said very little on this point. It is a safe rule, at first at least, to stop developing portrait negatives when they seem little, if anything, more than half done, if the amateur has been accustomed to landscape work.

A HAPPY FAMILY

Pictures worth taking at all are worth taking as well as possible, so we think Mr. Becker would do well to try these kittens again, with a different grouping. The placing of the white kittens is unfortunate, as they make two detached spots of highlight at the margins of the picture. The darker ones would serve better at the ends, with the white ones massed near the middle. The technical work is good, though a softer-working paper would have produced more detail in the whites. The exposure was a flashlight with an 8¼-inch R. R. lens at *f*: 8. The 5 x 7 Imperial S. S. plate was developed in duratol and printed on Normal Cyko Glossy.

A NOTE ON FIXING

Examination of the back of a negative during the fixing operation shows that the creamy white substance which appears to underlie the image on the film gradually disappears. That creamy white substance is silver bromide or whatever mixture of silver salt forms the sensitive compound; and, as everyone knows, the function of the hypo-bath is to dissolve it and remove it from the film so that this shall no longer be sensitive to light. A very important point to remember in this connection is that the sensitive substance is not removed by the time that the whole of the white appearance has vanished. The operation is only half completed. The negative must be left in the hypo for at least as long again if the fixing is to be complete. An even better plan to make quite sure is to replace the hypo solution with fresh as soon as the whiteness is gone, and to leave it in the fresh solution as long as it was left in the first.



A HAPPY FAMILY C. W. BECKER

WILLING POSERS WM. L. BENNETT

Suppose a negative were to be taken out of the hypo as soon as the whiteness had all gone and were thoroughly washed and dried; in what way, we may ask, would it be inferior to one which has been fully fixed? Time would supply an answer. Very soon, indeed, if it were much printed by daylight. Later on, even if it is kept in complete darkness, patches of brown stain would appear in those parts where the whiteness was the last to go. This brown stain has no well-defined edges, but vignettes off into the unaltered parts. It may be only a faint tinge of brown or it may be a stain almost as deep as the image itself. In any case, the negative is quite spoiled, for faint though the coloration may be, it is powerfully non-actinic and is bound to show in any print. Moreover, there is no method by which it can be removed without also removing the picture. If, therefore, we want to be able to go to our negative file and take out a plate a year or two old, confident that it will still be in good condition for printing, complete fixing is quite as important as thorough washing.

WILLING POSERS

The title of this picture is most appropriate, for the posers, both human and bovine, are honestly that, and the record is one which is highly satisfactory from the points of view of likeness, arrangement, and technical perfection. The picture is worthy careful study by beginners, because it shows the advantage of a good color-sensitive plate, even without a filter, in its soft, yet brilliant, rendering of values. Data: 1-25 second at *f*: 8 with double anastigmat lens; 11 a. m. in July in bright light; Standard Polychrome plate; pyro; print on a Cyko postcard, grade not stated, but probably Soft or Professional.

THE MULTIPLICITY OF DEVELOPERS

The comparative scarcity of some of the developing agents, which we learn has been greatly exaggerated, may help to force upon photographers a fact which expert workers have recognized for a long time now, that there is nothing to choose, as far as results go, between most of them. They differ among themselves in trifling details, ready solubility, keeping properties in solution, proportion of alkali needed, and so on; and on these grounds some workers prefer one and some another. But as far as the purpose for which they are used is concerned, to convert an exposed plate or film into a negative, one is just as good as another, and the result obtained from any one, properly used, is just the same as the result obtained from any other. In the case of prints, there is little more to be said, since here color of the image must be taken into consideration; but even with prints the range is wider than many suspect. Except that most of us would have to familiarize ourselves with the use of a different re-agent, there would not be any great hardship if nine out of ten of the developing products now available were taken off the market to-morrow.

EDITORIAL

OUR COMPETITION

The first prize this month was awarded to Edwin A. Roberts for a print entitled "Hoeing Corn." This is a very simple composition, and attracted our attention because of the excellent placing of the figure in the picture. All the interest is centered on the figure of the young man, and we wish more of our readers would try for this sort of arrangement. The second prize, "Blacksmith at the Forge," is awarded to W. C. Whitaker, and is an excellent piece of work. The third prize, "Scolding the Baby," goes to H. B. Rudolph, and is also a simple bit of composition and good photographically.

The number of pictures submitted to us for this magazine is very large, and we are sorry that we are not able at present to handle and criticize the work faster. We hope that your continued patronage and the increase in our subscription list, as well as increased business will warrant our making in the very near future a larger magazine. Many of our readers believe that we should criticize the prints in a week or ten days, but this is an impossibility, as it is at least two months before they can be presented in the pages of the magazine, owing to the large number of contributions we have to handle.

The following pictures received honorable mention in our March competition: "The Young Deer," J. S. Carlson; "Reflections," Mrs. Carl Wheeler; "Golden October," J. E. Meehan; "A Quiet Evening," O. Fortenbach; "Best of Friends," Edna A. Frank; "The Winter Trail," Francis Parrish; "Rose-Snow Queen," E. N. Edwards; "The Swan," Alvin W. Prasse; "On a Winter Afternoon," Marten Janowitz; "On Parade," Thomas Hughes; "Salting the Sheep," Sylvia L. Avery; "Off for a Ride," Andrew Andreen; "Wait Till I Smile," W. C. Peterson; "Rapids," Lee K. Coffin; "By the Side of the Road," L. Benedict; "Twins," Wm. Short; "Grant's Tomb," Frank S. Bey; "Blossoms," F. H. Estabrooks; "His Majesty," Louis J. Voelz; "Begging Squirrel," Jos. R. Smith; "Won't You Have a Cup?" Wm. G. Petersen; "His First Suit;" J. S. Banta; "Schmidt," S. F. Duckworth; "Village Green," Chas. S. Preble; "The Old Canal at Sandwich," Charlotte Woodward; "Bear River," Wm. L. Granville; "Hoosier Hillside," Edwin J. White; "The Race," Chas. Schmolling; "Hybiscus," B. C. Eddy; "A Gloucester Fisherman," H. S. Maddix; "Somebody Knows What's Good," Margaret Hitchcock; "Pine Canon," Paul H. Hartwig; "The Gathering Storm," C. S. Booth; "Spring Run," Wm. Smith; "A Good Ride," F. B. Wadley; "A Native Missionary," H. B. Miner; "In Meditative Mood," F. A. Northup; "Chrysanthemums," W. G. Winters; "The Old Hunter," Earl Burton; "A Quiet Winter Morning," L. M. Sibert; "A Portrait," William R. Read; "Miss Erna," Ben F. Winans; "November," Ralph Weeks; "Nature's White Month," Ernest G. Cook; "Bedtime," Ed. Herzog; "Fording the Creek," H. W. Mansfield; "On Lake Como," Leonard L. Witting; "A Kodak Girl," E. A. Doolittle; "Gum Portrait," Otto Burgermeister; "Grandma's Birthday," Harriett E. Williams; "Absorbed," Belle M. Whitson; "Modern Indians," Thos. A. Garlick; "Off for a Cruise," N. T. Peterson; "Among the Roses," L. B. Salter; "Chums," V. K. Thompson; "Self Portrait," Stark Weatherall; "Going for the Boat," D. Harrington; "Feeding the Chickens," F. E. Dewart; "Loaded Down," J. O. Angstadt; "Elizabeth's First Skates," B. C. Wall; "The Mills," Ralph Albee; "A Good Pair to Hold," T. P. Stewart; "Gertrude," R. G. McDonnell; "The Brook," Cecil B. Parsons; "A Colorado Stream," G. E. Shallenberger; "Portrait," Wm. R. Lindsey; "A Story," D. H. Stinson; "Mayflowers," A. C. Smith; "Interested," George Senior; "Going Visiting," Cora Rudrud; "In a Backwood Town," H. B. Miner; "The 'Chess-nuts,'" Van B. Cloud; "Roses," J. C. Wright; "Chicago River," J. B. Goshorn; "A Game of Billiards," Ford E. Samuel; "Gerald B.," E. C. Garner; "Japanese Temple," Robert Curry; "The Woods in Winter," Allan Dunn; "French Cruiser," Joseph Coley; "The Shanty," Charles Bergen; "Clouds Off River Drive," Harold B. Adams; "In the Pines," Charles S. Ansley; "Slugs," B. R. Mansfield; "Her Baby," J. C. Quinn; "Soldiers' Monument," W. S. Jones; "The Willows in Autumn," Earl A. Newhall; "Jacqueline," J. D. Tompkins; "Scene from Train Window," W. M. Bell; "Japanese Garden," A. Warrington; "Woolworth Building, New York," E. A. Waterman; "Portrait," Fred B. Walker; "The Fighting Tug," John H. Seamans; "On Guard," Mrs. Wm. Durrant; "In the Boiler Room," Nathaniel Mortonson; "Swampscott's Rocky Shore," Ernest G. Cook; "The

Best Hand Wins," John B. Carr; "A Pointer," Alex. Anderson; "Home Interior," Ed. Herzog; "Papa's Pipe," Wm. Ludlum; "On the Banks of the Little Cedar," J. F. Eden; "Portrait," Walter A. Dahl; "Four O'clock Tea," Charles D. Meservey; "Eve's Temptation," S. A. Rosenburg; "Max and the Cat," A. R. Brown; "Sons," F. J. Webster; "The Snowman," B. Brunner; "Companionship," T. E. Hazell; "Irene," C. B. Spooner; "Warming Up," F. L. Weaver; "Winter Scene," J. A. Carter; "The Palisades," F. Gordon; "The Dam," Wm. C. Cosby; "Reflection," C. A. Bellett; "Winter Sunset," Flood H. Rood.

ANSCO LOVELIEST WOMEN CONTEST

We take pleasure in reproducing the picture which won the first prize of $500.00 in the recent Ansco Loveliest Women Contest. This picture was made by Philip Conklin of Troy, N. Y., and is a portrait of Miss Justine Johnstone, of New York City. We learn that this picture was made with a Wollensak Verito lens, and the original print, from which the reproduction was made, was on Professional Buff Cyko. All the prize-winning pictures in this competition are now on exhibition at the Ansco Company's booth at the Panama-Pacific Exposition in San Francisco.

A SPECIAL COMPETITION

In our February number we announced a special competition to close March 25, but through inadvertence, the announcement of this, which should have been repeated in our March issue, did not appear. Probably our readers needed the extra stimulus, for we regret to say that we did not receive the specified number of entries, twenty-five, before March 25. We will consequently hold this competition open until May 25. The following is the original notice of the competition, with the exception of the change of date:

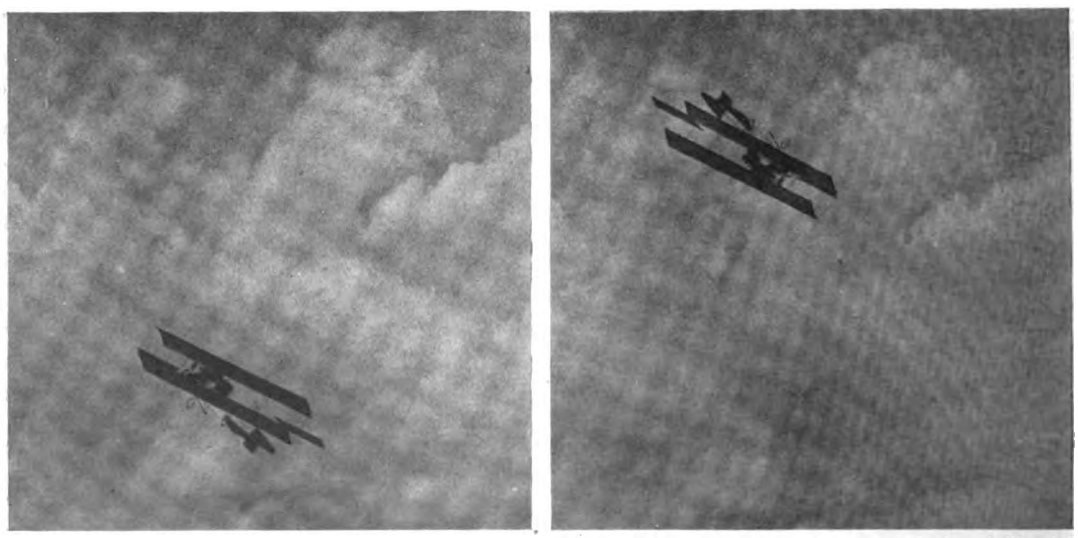
"Some of our readers have thought that they do not have an equal chance in competition, because they are unable to find interesting subjects for pictures. We therefore propose a competition open to readers of *American Photography* and POPULAR PHOTOGRAPHY which is not subject to this criticism. A first prize of $15.00, a second of $10.00 and a third of $5.00 will be awarded to the maker of the best set of three or more prints sent in to us before May 25, 1915. The subject of the competition is "My Own Home," and the set of prints must contain at least two interior views and one outside view of the home of the maker. The interior view will test the contestant's ability to deal with halation, if taken by day, or the use of the flashlight if taken by night, the arrangement of the furniture to make a good composition, and possibly a wide-angle lens. The outside views must be carefully planned to show the building to the best advantage. More than three pictures may be submitted if desired. We reserve the right to withdraw the prizes unless at least twenty-five entries are made, but if this competition is suc-

cessful we shall be encouraged to propose other special subjects. The rules of the competition, except as specified above, will follow our usual practice, and competition coupons must be submitted with each print."

METOL POISONING

In the few days since the April issue of POPULAR PHOTOGRAPHY was mailed, we have received a number of letters from readers who are afflicted with metol poisoning, and who are willing to co-operate with us in an effort to establish the cause of this unpleasant affliction and the best method of treatment. The number who have responded to this, however, is small in comparison with the number of cases which must be studied before any valuable conclusion can be reached. We feel certain that there are a very large number among our readers who have at some time had developer poisoning, the symptoms being the development of little water blisters under the skin, combined with itching, the drying up of the affected skin, peeling and the formation of a new cuticle often only after a long time. As those who are once subject to this complaint are never immune to it thereafter apparently, in their own interests readers who have had such poisoning will do well to communicate with us. Please bear in mind that there will be no publicity attached to the matter, that there will be no disagreeable inquisition, no experiments made, and no treatment given but that justified by the best medical practice. The matter is purely one of scientifically recording symptoms and the results of treatment in a large number of cases, for the purpose of drawing sound conclusions, and those readers who co-operate with us will not only help us but help themselves. We hope that a large number of cases will be heard from this month. The expense if you co-operate with us will be trifling, and you obligate yourself to nothing by writing us.

READERS' FORUM



THE DARING FLIGHTS OF LINCOLN BEACHEY — C. D. MESERVEY

The above picture was taken with a 4x5 Cycle Poco camera, fitted with rapid rectilinear lens of 6½ inches' focal length. The exposure for the aeroplane was 1/50 of a second at *f*:16, and the exposure for the cloud negative was 1/25 second at *f*:32. There was no dodging or retouching of any sort, simply double printing, being careful to get the negative, printing paper and mat snugly in the printing frame. The Standard polychrome plate was developed in M. Q. and the print is on Azo F hard X paper.

NEWS AND NOTES

Among recent photographic literature of value to every photographer which has come to our desk, may be mentioned a booklet entitled "Worth While Pictures, Especially Enlargements" from the Rochester Photo Works, 65 Atlantic Avenue, Rochester, N. Y.; "Photographic Enlargements with Instructions in the Use of the Parallax Condenser," by R. D. Gray Ridgewood, N. J.: "The Vista Motion Picture Camera

and Projector," giving much valuable information on motion-picture photography, from the Vista Cinematograph Company, 1446 Broadway, New York; a new and attractive booklet on Ilex shutters and lenses from the Ilex Optical Company, Rochester, N. Y.; "New Cameras for 1915," a supplement to their general catalog of last year, from Houghton's, Ltd., 88 High Holborn, London, W. C.; and a memorial booklet celebrating the twenty-fifth anniversary of its establishment from the dry-plate factory Berolina, J. Gebhardt, Berlin-Niederschönhausen. All of these pamphlets are intended for free distribution.

THE following Voigtlander goods have been stolen from the New York office of Burke & James, Inc., at 225 Fifth Avenue, New York City: One pair of 6-power 36 mm. Voigtlander & Sohn prism binoculars, No. 24090, 50-v., No. 5556; one Voigtlander & Sohn Model A Bergheil Tourist camera, 3¼ x 4¼ size, fitted with No. 2 Heliar lens, No. 124646, in compound shutter; one Voigtlander & Sohn Model C Bergheil Tourist camera, fitted with Radiar lens, No. 130778, fitted in compound shutter, size of camera 3¼ x 5½; one Voigtlander & Sohn Alpine camera, fitted with Series III No. 2 Collinear lens, No. 121600, in compound shutter, size of camera, 3¼ x 4¼; one Voigtlander & Sohn Vida Reflex camera, fitted with No. 3 Heliar lens, No. 114432, size of camera 3¼ x 4¼; one Voigtlander & Sohn metal folding camera, fitted with Series III No. 2 Collinear lens, No. 84060, size of camera 3¼ x 4¼; one Voigtlander & Sohn metal folding camera, fitted with Series III No. 2 Collinear lens, No. 76453, size of camera 3¼ x 4¼. If any of these goods are offered for sale, Burke & James would much appreciate having them detained and information sent them.

Among the interesting novelties shown at the recent photographic exposition in New York was the Imp Flashlight Gun, manufactured by the Imperial Flash Manufacturing Company of Chicago. This is the most dependable instrument of this type yet placed upon the market, being a thoroughly solid and business-like construction in every way. It not only ignites the flash powder infallibly at the proper time, but simultaneously operates the shutter trip to open the lens of the camera. There is nothing flimsy about its construction, so it is likely to wear indefinitely. It is perfectly safe in operation, as the trigger can be set at safety, so that it is impossible for it to go off accidentally before the operator is fully ready.

The Photographic Exposition, held in New York from March 27 until April 3 in connection with the annual convention of the Photographic Dealers' Association of America, enjoyed a success said by the Grand Central Palace authorities to be unprecedented for the first exposition in any industry, though the number of exhibits was less than had been anticipated, because of the inability of the English and German firms to be represented, as well as the absence of the Eastman Kodak Company and several other prominent firms. The floor space was nevertheless entirely filled. While not much of spectacular interest was shown, the visitors were mainly photographic enthusiasts who were much interested in the various types of apparatus displayed, and who showed great keenness to buy. That their interest in photography was pronounced is well shown by the fact that our publishers entered 921 subscriptions for *American Photography* and POPULAR PHOTOGRAPHY during the seven days of the show, and that the largest number was secured on the closing day, although New York was on that day in the grasp of the heaviest snowfall of the winter. Other exhibitors report heavy sales, and it is a noteworthy fact that the retail trade in New York City during and after the show, was very heavy. The pictorial exhibit contained nearly one thousand prints, but the standard was distinctly lower than had been expected. The awards were made by Messrs. Ackermann, Chambers, Fraprie, Tennant and Watkins of the photographic press, and were as follows:

Class 1. *Professional Portraiture.*— Gold Plaque: "Portrait of Girl," R. C. Nelson, Hastings, Neb. Silver Plaque: "Girl with Fan," Carl Klincheck, Philadelphia, Pa. Bronze Plaques: "Lady with Hat," Dudley Hoyt, New York; "Clytie," Gerhard Sisters, St. Louis, Mo.; "The Fra," R. Morris Williams, Evansville, Ind.; "The Sisters," J. H. Field, Fayetteville, Ark. Diplomas: "A Composition," M. Goldberg, New York; "Gypsy Girl," E. R. Trabold, Adams, Mass.; "Portrait," E. G. Dunning, New York; "Portrait," Clara E. Supprell, New York; "Miss Dorothy Wilson," Joseph D. Toloff, Evanston, Ill.; "Little Girl," W. Burden Stage, New York; "Baby and Bear," Ernsberger & Sons, Auburn, N. Y.

Class 2. *Amateur.*— Gold Plaque: "Russian Pilgrims," L. S. Kirkland, New York. Silver Plaque: "Portrait," T. W. Kilmer, New York. Bronze Plaques: "Silhouette," Sparks Freeman; A. E. Schaaf, Poughkeepsie, N. Y.; "Sunspots," Rodger B. Whitman, Flushing, Long Island, N. Y.; "Silhouette," E. S. Jaffray, Ardsley-on-Hudson, N. Y.; "Major Helping Himself," Alexander Murray, Roslindale, Mass.; "Winter's Night," Dr. Albert E. Benedict Montclair, N. J.; "The Windmill," Edith H. Tracy, Camera Club, New York; "Toward the Setting Sun" W. T. Knox, New York City. Diplomas: "The Crabbers," C. H. Judson, Lakewood, Ohio; "Our Baby," W. Halley Jacobs, Verona, N. Y.; "Mr. William Paul," Norman Butler, New York; "Along the Swiftwater," J. B. Thompson, East Orange, N. J.; "Passaic Falls," L. E. Wright, Newark, N. J.; "In the Wasatch Mountains," Wm. Gordon Shields, New York; "Michelangelo's Moses," Ford E. Samuels; Alameda, Cal.; "Rainy Night," Joseph A. Popino, "Madonna," Stephen W. Roach, Harrison, N. Y.

Class 3. *Commercial Prints.*— Gold Plaque: General Exhibit, "Press Photography," G. Cook, *Morning Telegraph.*

Class 4. *Scientific Photography.*— Gold Plaque: "Portrait of a Sunbeam" (spectrum analysis), Oscar G. Mason, New York. Silver Plaque: "Deer," Hobart V. Roberts, Utica, N. Y. Bronze plaque: "Timber" (Continental Divide), G. O. Shields, New York City. Diplomas: "Photo Relievo," Dorothy E. Wallace, St. Louis, Mo.; "Baby Squirrel," J. B. Strachota, Detroit, Mich.

The convention of the Dealers' Association was rather slimly attended, partly because a very large number of dealers who came to the exposition refused to pay the dues of $10.00 charged members of the association. Nevertheless, the meetings were of real value to those who attended. It was decided to hold the next exposition in Cleveland, Ohio, in March, 1916, on lines similar to this year's show. The officers of the association for the ensuing year are as follows: President, H. M. Fowler, Cleveland; vice-presidents, W. H. Pinkham, Boston; A. E. Gatchel, Louisville; F. Fuller, Rochester, and P. Hauenstein, Minneapolis; secretary, A. A. Chilcote, Cleveland; treasurer, George L. Kohne, Toledo.

EXPOSURE-TABLES FOR MAY

DIRECTIONS: Find in the tables printed below the NUMBERS for SUBJECT, STOP, LIGHT, HOUR, and PLATE. Add them, find the sum in the last table, and give the **exposure** indicated. When the exposure fails to correspond with the speed-marking on shutter, use the **nearest shutter-speed**, preferably the lower. If sunlight falls over one shoulder, add **0**; if straight across **subject, add 1**; if sun is ahead, add **2**. When using back combination only of lens, add **2**.

EXAMPLE

Average landscape	3	July, 11 A. M.	0
Stop U. S. No. 8	6	N-C film	1½
Intense light	0		

Adding these numbers, we get **10½**, and on referring to the last table, under **10½**, we find **1-40** second, which is the exposure to give. In this case you would use the speed marked **1-50** and open the lens a little, if possible; say, half-way to U. S. No. 4.

SUBJECT

Sea (only) and clouds	½	Street scenes, buildings, groups	5
Sea-views, snow-scenes, distant landscape	1	Portraits in shade	7
Open landscape, without foreground	2	Indoor portraits	8 to 10
Average landscape, with foreground	3	Interiors	16

STOP: —

f:2	*f*:2.3	*f*:2.8	*f*:3.3	*f*:4	*f*:4.7	*f*:5.6	*f*:6.7	*f*:8	*f*:11.3	*f*:16	*f*:22	*f*:32	*f*:45	*f*:64
				U.S. 1	U.S. 1.4	U.S. 2	U.S. 2.8	U.S. 4	U.S. 8	U. S. 16	U. S. 32	U. S. 64	U.S.128	U.S.256
1	1½	2	2½	3	3½	4	4½	5	6	7	8	9	10	11

LIGHT: Intense sunlight (inky-black shadows), **0**; Bright sunlight (strong shadows), **⅓**; Faint shadow cast by sun, **1**; Dull (no shadows), **1⅓**; Very Dull (whole sky very dark), **2**.

HOUR: 10 a.m. to 2 p.m., **0**; 9 a.m. and 3 p.m., **⅓**; 8 a.m. and 4 p.m., **1**; 7 a.m. and 5 p.m., **1**; 6 a.m. and 6 p .m., **2**; 5 a. m. and 7 p. m., **5**.

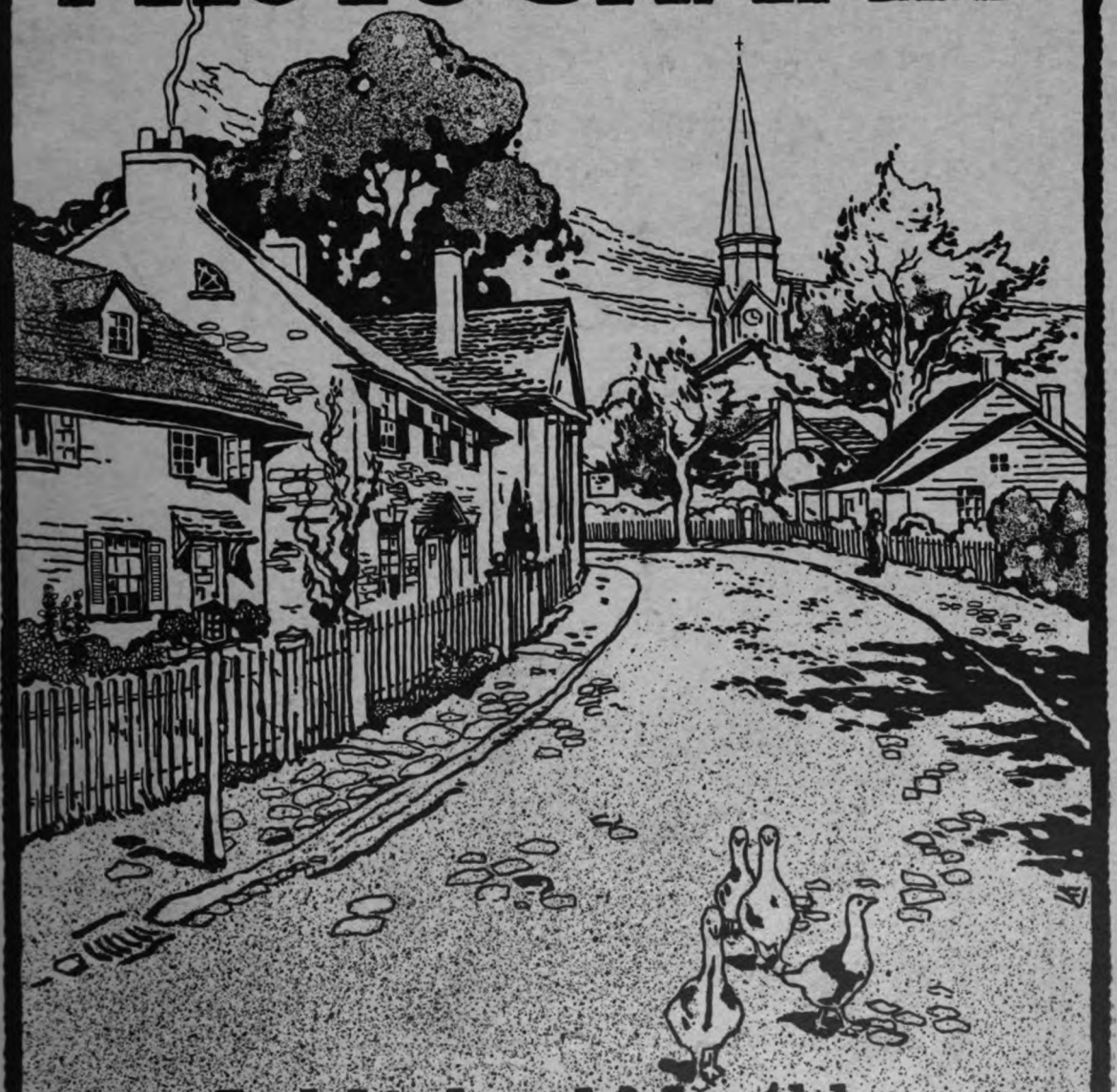
PLATE: AMERICAN, **1⅓**. ANSCO FILM, **1⅓**. BARNET — Film, **1⅓**; Superspeed Ortho., **1**; Ortho. EX. Rap., **2**; Red Seal, **1**; Red Diamond, **1⅓**; Self-screen Ortho., **2**. CENTRAL — Special XX and Sp. Home Portrait, **⅔**; Special, **1**; Comet, Colornon, and Pan-Ortho., **1⅓**. CRAMER — Crown, **1**; Anchor, **2**; Banner, **1⅓**; Inst. Iso., **1½**; Med. Iso., **2**; Commercial Isonon, **2½**; Portrait Isonon, **1½**; Trichromatic, **3**; Slow Iso., **5**; Contrast, **9**. DEFENDER — Vulcan, **1**; Vulcan film, **1⅓**; Ortho., **2**; Non-hal. Ortho., **2**; Slow, **9**; Process, **9**. DUFAY DIOPTICHROME, **7**. EASTMAN — Motion Picture Film, **1**; Portrait Film, **1**. ENSIGN FILM, **1⅓**. FORBES—Challenge, **1⅓**. HAMMER—Sp. Ex. Fast, **1**; Ex. Fast, **1**; Aurora Ex. Fast, **1½**; Ortho. Ex. Fast, **1⅓**; Ortho. Non-hal. **2**; Fast, **2**; Ortho. Slow, **2½**; Slow, **4**. ILFORD — Monarch, **1**; Zenith, **1⅓**; Sp. Rap,. **2**; Chromatic, **2½**; Ord., **3**; Process, **9**. IMPERIAL—Flash-light, **1**; Spec. Sensitive, **1**; Orthochrome S. S., **1**; Spec. Rap. 225, **1⅓**; Spec. Rapid 200, **2**; Non-filter, **2**; Process, **9**. JOUGLA — Violet Label, **1⅓**; Green Label, **2**; Omnicolore, **7**. KODAK—Speed Film, **1**; N. C. Film, **1⅓**. KODOID PLATES, **1⅓**. LUMIERE—Sigma, **⅓**; Blue Label, **1⅓**; Film, **1½**; Ortho..A, **2**; Ortho. B, **2**; Panchro. C, **2**; Autochrome (outdoors), **8**, (indoors) **9**; Process **9**., MARION — Record, **⅓**; P.S., **1**. PAGET—XXX, **2⅓**; XXXXX, **2**; Swift, **1**; Ex. Spec. Rapid, **1**; Ortho. EX. Spec. Rapid, **1⅓**; Panchro. Ord., **2**; Panchro. Colour (no screen), **2½**; Spec. Rapid, **1⅓**; Hydra Panchro., **3⅓**; Hydra Rapid, **3⅓**. PREMO FILM PACK, **1⅓**. ROEBUCK—Blue Label, **1**; D. C. Ortho., **2**; Ortho., **2**. SEED — Graflex, **⅓**; Gilt-edge 30, **1**; Color Value, **1**; Gilt-edge 27, **1⅓**; L. Ortho., **1⅓**; 26X, **2**; Non-hal., **2**; Non-hal. L. Ortho., **2**; Tropical, **2**; C. Ortho., **2½**; Panchromatic, **2⅔**; 23. **3**; Process, **9**. STANDARD — Extra, **1⅓**; Imperial Portrait, **1⅓**; Orthonon, **1⅓**; Polychrome, **1⅓**; Thermic, **1⅓**. STANLEY — 50, **1⅓**; Commercial, **4**. ROGERS — Regular, **1**; Orthochromatic, **2**; Orthochromatic N. H., **2**. WELLINGTON — Extreme, **⅓**; 'Xtra Speedy, **1**; Film, **1⅓**; Iso. Speedy, **1⅓**; Portrait Speedy, **1⅓**; Anti-screen, **1⅓**; Speedy Spec. Rap., **2**; Ortho. Process, **9**. WRATTEN & WAINWRIGHT — Panchromatic, **1⅓**; Process Panchromatic, **3**.

3½ S 1/3000	4 S 1/4000	4½ S 1/2500	5 S 1/2000	5½ S 1/1500	6 S 1/1000	6½ S 1/750	7 S 1/500
7½ S 1/350	8 S 1/250	8½ S 1/150	9 S 1/100	9½ S 1/75	10 S 1/50	10½ S 1/40	11 S 1/25
11½ S 1/20	12 S 1/12	12½ S 1/10	13 S 1/8	13½ S 1/5	14 S 1/4	14½ S 2/5	15 S 1/2
15½ S 2/3	16 S 1	16½ S 1½	17 S 2	17½ S 3	18 S 4	18½ S 5½	19 S 7½
19½ S 11	20 S 15	20½ S 23	21 S 30	21½ S 45	22 M 1	22½ M 1½	23 M 2
23½ M 3	24 M 4	24½ M 6	25 M 8	25½ M 12	26 M 15	26½ M 24	27 M 30
27½ M 45	28 H 1	28½ H 1½	29 H 2	29½ H 3	30 H 4	30½ H 6	31 H 8

These tables are based on the 1914 edition of the "American Photography Exposure-Tables," a new and revised form of the "Photo Beacon Exposure Card." Owing to the great increase in the speed of lenses and plates since the original compilation of these tables, it has been necessary to completely change the system of numbers corresponding to stops, plates and exposures, so that exposure numbers from this table are 5 units higher than in the old tables. The complete tables, in pocket form, 3 x 5 inches, containing full directions for obtaining correct exposure under all conditions, may be obtained from our publishers at the price of 25 cents postpaid.

JUNE, 1915 TEN CENTS

POPULAR PHOTOGRAPHY



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Boston, Mass.

POPULAR PHOTOGRAPHY

Volume III | BOSTON, MASS., JUNE, 1915 | Number 9

SOMEBODY'S GOING BY — MARGARET HITCHCOCK

(*See Page 348*)

OUT FOR A WALK J. FORTENBACH

OUT FOR A WALK

The combination of a fully-timed ortho plate, proper development, and a soft printing-paper has given Mr. Fortenbach a fine result. He has successfully carried every bit of highlight and halftone gradation, the effect being soft, yet brilliant. The faults which he sees in his picture are the obtrusive highlights of sky and background, particularly beside the lady's cheek; but he is afraid to rub them down lest he spoil the negative. In a case like this, the safe way is to make a positive by contact and from that a new negative, working on both positive and negative until the defects are eliminated. It should be stated that the softness of the natural lighting is responsible for much of this picture's quality; but Mr. Fortenbach deserves the credit for working when conditions were most favorable. Most amateurs think they must have intense sunlight. As a matter of fact, the diffused light of a cloudy day with the sun behind clouds is greatly to be preferred, and the exposure is not much greater. Data: No. 9 Premo camera with 8½-inch Planatograph lens; 1-5 second at *f*: 11 in August at 2.30 p. m.; sun behind clouds; Seed Ortho plate [L?]. pyro tank development; print on a Glossy Cyko card, apparently the Soft grade.

ARTHUR

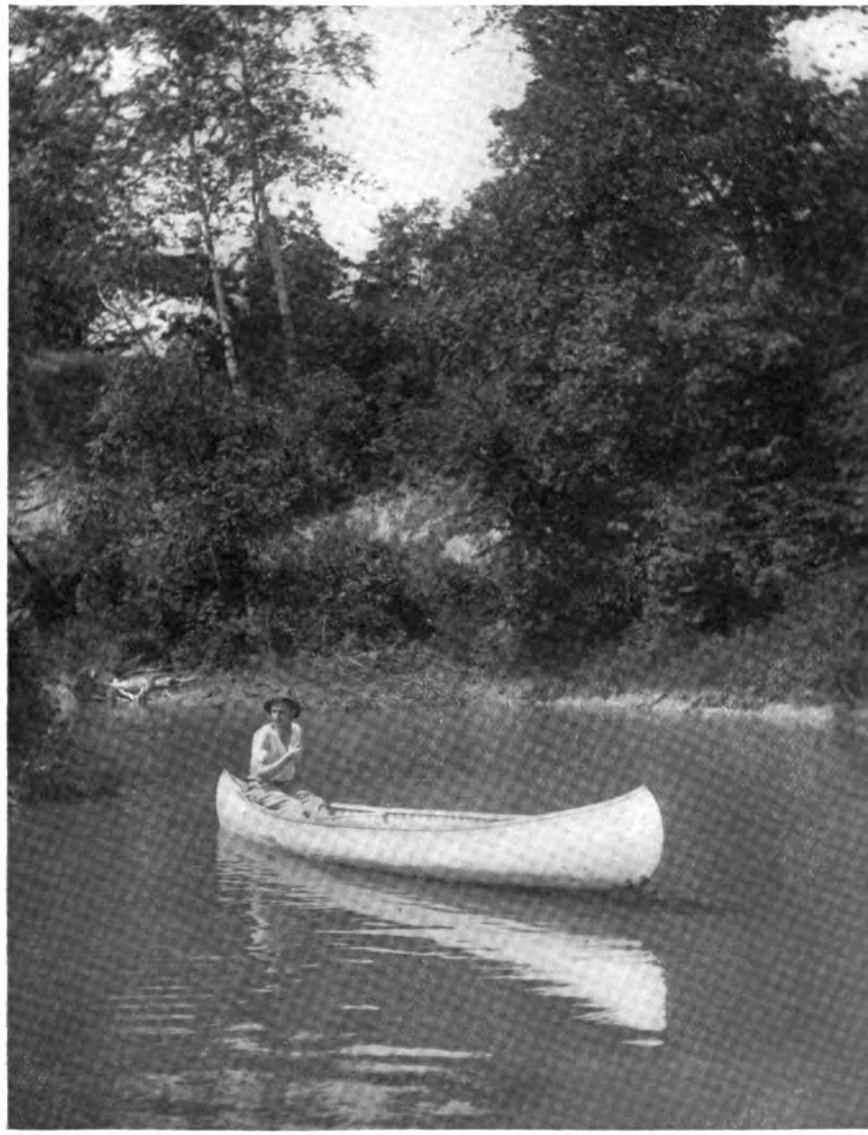
Arthur's expression would be better if one of the two catchlights in each eye were eliminated by careful spotting. As a record, the portrayal is undoubtedly satisfactory to the family, but the drawing seems a trifle forced. The technique otherwise is excellent. Data: Postcard Conley camera fitted with an Ilex anastigmat lens of 6 inches' focus; quickest possible bulb exposure at *f*:6.3 in January at 10.30 a. m. in good light in north room with three windows; unnamed plate; pyro tank development; enlargement on Instanto.

POCKET OR POSTCARD CAMERA

Several times, of late, readers have appealed to us to aid them in choosing between a small pocket film camera, the negatives to be, in most cases, enlarged to postcard size, and the 3A camera itself.

This is an extremely difficult problem for one person to solve for another. The miniature camera can seldom satisfy unless its pictures *are* enlarged. Anything smaller than 3¼ x 4¼ is hardly big enough for contact printing; but, of course, one wastes a great many films which are never printed, and the high cost of 3A films mounts up rapidly. The miniature films are cheap, but their cheapness tempts one to waste them. It is really six of one and half a dozen of the other. The miniature camera is wonderfully successful as a constant pocket companion. Its chief value is the tremendous depth of sharp field given by its short-focus lens. Good negatives have, in this respect, a real advantage over those made with the 3A, but after all, it is so purely a matter of personal taste that we feel unable to advise readers what choice to make.

ARTHUR H. G. BRISTOW



THIS IS THE LIFE
SAM BRUGGER
First Prize, April Competition
(See page 350)

A PORTRAIT H. E. JOHNSON

A PORTRAIT

Aside from the obvious crease in the background, this print is reasonably satisfactory, as it shows good handling of the lighting and fair technique. It is always difficult to manage a lighting of this sort, for the window itself comes out so much stronger than any other light that it upsets the composition. There is a noticeable amount of false foreshortening in knees, hands, and chair, due to working too near the subject. The picture was made with a 5 x 7 camera with Gundlach lens, an exposure of 5 seconds at *f*: 11 having been given at 10 a. m. in January to a Seed 30 plate in brilliant light; development was with pyro in the tank, and the print is on Instanto.

WATCH US DANCE

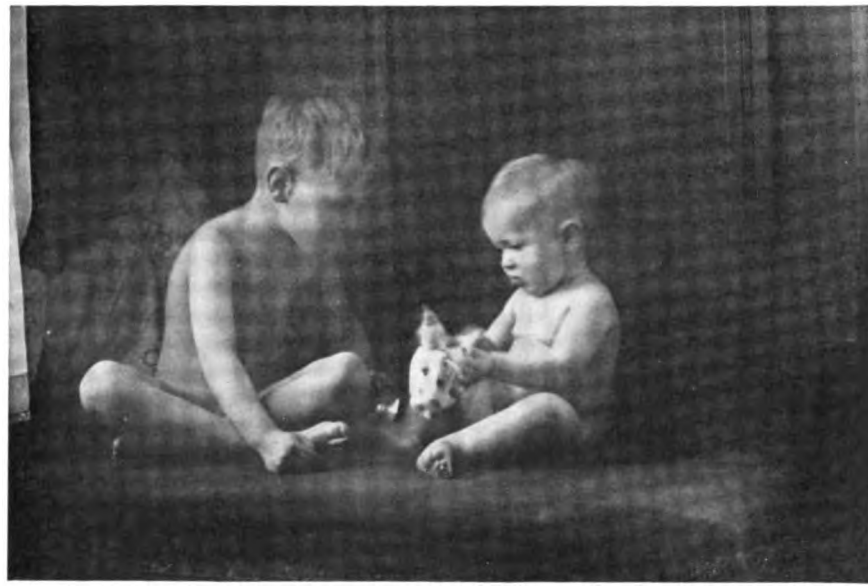
Mr. Hartwig writes, "According to the criticisms you generally make, Babe should not have looked at the camera. While this may be true of most genre pictures, are there not exceptions? This picture is a true reproduction of an actual daily happening. Babe always looks up and asks for appreciation or approval, and that seems to me the 'cutest' part of the performance." In the circumstances indicated by this quotation, the exception may be allowed. Certainly the expression on the youngster's face is worth recording, and the dog, too, looks as proud as can be of his part. The technical work is excellent. The horizontal spacing is good, but the print, being on a postcard, is unnecessarily tall. Data: 5 x 7 Black Beauty camera with 8-inch Wollensak R. R. lens; 1-25 second at *f*: 11 in September at 2 p. m. in bright sunlight on a Stanley 50 plate; M.-Q.; print on a Normal Studio Cyko postcard.

WORKING IN DARKNESS

A subscriber, in a letter asking for a safe green light, says, "I appreciate your method of working in total darkness, as suggested on the Thermo Card, but after some disagreeable experiences, such as upsetting the tank, scratching a few plates while loading them into the tank, etc., after traveling fifteen miles to 'The Hermitage,' the home of Andrew Jackson, I came to the conclusion that, after all, a little light would help matters."

We agree with this reader that it is a distressing experience to lose valued exposures owing to blunders in the dark; but such plates should not have been subjected to manipula-

WATCH US DANCE PAUL H. HARTWIG



INVESTIGATING J. C. EDWARDS

tion under an unknown and untried method. Working in the dark presupposes perfect familiarity with the implements, so that, having once placed each article in the light, the hand can unerringly find it in the dark. A few trials with old negatives would soon have established the necessary dexterity, provided the tank was equipped with a loading block. A tank without a block, as a rule, cannot be loaded properly without safelight and plenty of it. We ourselves use a tank which has a block and can unload twelve plates and put them into the tank inside a changing bag so readily that we prefer working that way to darkening the workroom and turning on a ruby light.

Really safe lights are generally so dim that one might as well work in total darkness. The best way to use darkroom light is to have it as far as possible from the tray — for instance, four feet from the table or where it will illuminate the whole room, rather than directly over or in front of the tray. A light which fogs even common plates at two feet may, with a little care in keeping the dry plates out of its direct rays, be found safe if it is moved to twice the distance. After a plate has been in the developer for a minute or two, it is much less sensitive.

Red safelights to be really safe must be very deep in color. A green light, on the other hand, though almost invisible at first, will give, to all appearances, much more light after the eye becomes accustomed to it. A green light, however, should not be used with ordinary plates, as its peculiar blue-green will affect them, though not orthochromatic or panchromatic plates. Either the Wratten safelight or the Lumière Virida papers makes an excellent and pleasant green safelight.

When one has an established place and method of working, all the mechanical part of developing becomes instinctive, and it is just as easy to unload a plate in darkness, lay it in the tray, flow it with developer evenly, and cover the tray, at once turning on the white light, as it is to work in dim colored light. Then, while the plate is developing, one can accomplish something else. If good deep trays are used, they can be picked up together for the occasional rock, which will prevent markings. The other day, though, we developed a plate for thirty-four minutes without rocking and it showed absolutely no unevenness. This could not have been done with pyro, of course, for pyro requires fairly frequent agitation.

INVESTIGATING

The most obvious defect in this picture is the strip of brightly-lighted curtain along the edge. When this is trimmed off, the rest of the composition is seen to be very well arranged, lighted, and handled. Data: 4 x 5 Premo camera with 6-inch R. R. lens; 1 second at *f*: 8 in January at 2 p. m.; Cramer Crown plate; pyro-metol; enlargement on Platora.

SOME SLIDE W. D. LONG

SOME SLIDE

The limitations of Mr. Long's apparatus prevented his getting a perfectly successful record of a rather daring (and, we should think, skin-destroying) feat. The distance from the top of the cliff to the water is about 35 feet, according to Mr. Long, and the depth of the water was only 4 feet. The R. R. lens did not give critically fine definition, and the speed of 1-100 (probably not more than 1-50 actual) was too slow to "stop the motion" and make the figure of the slider clear. A small stop was used for the exposure, hence the film is undertimed for the shadows. Tank development, notwithstanding, produced a result of proper contrast, as shown by the good values in the halftones. The picture was made with a 3A Folding Brownie in August at 11 a. m. on Eastman film. The print is on Azo.

THE SNOWBOUND BROOK

Inspired by a desire to "photograph snow as it really appears and not as so much blank-white paper," Mr. Maxwell approached the technical problem with a proper equipment and succeeded admirably, though our reproduction does not do him full justice. The reason is that his beautiful enlargement, measuring 7 x 12 inches, met the usual fate of carelessly-packed unmounted enlargements entrusted to the mails and was badly torn. We had therefore to make the reproduction from a Normal Cyko Glossy card — a print considerably too contrasty and dense in the shadows to be true to the values of the scene. The enlargement, on the contrary, showed detail in every tone from the dense black of the treetrunk to the lightest tones of the sun-lighted snow. Mr. Maxwell figured his exposure with the following factors, demonstrating that the "snow scenes" factor did not deceive him. Average landscape, 3; stop, 8; light, 0; month and hour, 1; film, 1; sun ahead, 2; sum, 15; exposure, ½ second. Multiplying for the 3-times filter, this gave 1½ seconds. The reason this view was properly an average landscape and not a snow scene was because it had very dark masses within about 15 or 20 feet of the lens, and these of course carried it into the "average" classification. The ortho film and the filter took care of the snow values. The composition is good, though we feel with the maker that something more decided than an area of gradation would balance the inky-black trees more effectively. The work as a whole, notwithstanding, shows intelligent and successful handling. Data: 3A Kodak with 6½-inch R. R. lens; 3-times filter; 1½ seconds at *f*: 22 in February at 10 a. m.; intense sunlight; Eastman Speed film; weak pyro tray development; Cyko.

A THERMO FORMULA FOR EDINOL-HYDRO.

DR. MALCOLM DEAN MILLER

Having had occasion lately to work out for a friend a modification of his favorite edinol-hydro. formula suitable for Thermo development of three-color negatives, I have found the following to give the best all-around results.

A.	Water to make	20 ounces
	Potassium metabisulphite,	60 grains
	Edinol	105 grains
	Hydrochinon	83 grains
B.	Water to make	10 ounces
	Sodium sulphite, anhydrous	600 grains
C.	Water to make	10 ounces
	Sodium carbonate, dry (or anhydrous)	440 grains

THE SNOWBOUND BROOK CHAS. E. MAXWELL

In this formula, the edinol and the hydro. are present in the proportion of their molecular weights, so that, theoretically, they should unite to form a new developer substance without leaving any uncombined chemical, thus doing away with the possibility of hydrochinon stain, for instance.

The temperature coefficient is 2.5. This is so close to the temperature coefficient of duratol-hydro. that the slight differences may be disregarded in practice, and the duratol tables of dilutions and times may be used precisely as printed on the Thermo Card. A great number of experimental plates developed by these tables gave excellent results at all temperatures from 54 to 80. The printing quality is the same, using the same dilutions for the same plates, though the edinol formula is less energetic and each dilution is accordingly stronger in grains per ounce of the developing agent — 188 as compared to 120 for the total volume of the A solution. Those who desire a stronger negative will have no difficulty in getting it if they class the plate one class nearer VS. A VVS dilution, equal parts of two stocks, can be obtained by combining the sulphite and the carbonate in one solution, thus: water, 20 ounces; sulphite, 1,200 grains; carbonate, 880 grains. It is, however, better to use a separate sulphite stock, made up in small quantities, and to use it always in the right volume to make the finished developer, irrespective of its strength in developing agents and alkali, contain 10 grains of anhydrous sulphite to the ounce. This end is attained by taking, for each 3 ounces of tray developer, ½ ounce of B. For each 10 ounces of tank developer, naturally, 3⅓ times as much has to be taken, namely, 1⅔ ounces. To mix the VS dilution, for instance, take 10 drams of A, 10 drams of C, and add 4 drams of B, the total volume being 24 drams or 3 ounces. The M.-Q. dilution would be: 4½ drams of A, 4½ drams of C, 4 drams of B, and water to fill the graduate to the 3-ounce mark.

Although it is possible to get a greater standard contrast by using, in the 20-ounce A, 186 grains of edinol to 110 grains of hydro., this makes a very expensive developer, and the advantages are not obvious. The same results can be obtained with the standard formula given above simply by altering the development speed of the plate.

CERAMIC PHOTOGRAPHY

"I have seen some porcelain trays with portraits burned in on them. Can you inform me how to do this kind of photography?" says a reader.

The process of making photographs in substances which can be fired and glazed like other colors used in china painting is a complicated one. Perhaps the best short description is given in Cassell's "Cyclopedia of Photography," which we can supply postpaid for

A PALM C. W. BECKER

$4.28. This is a work which every reader who cares for out-of-the-ordinary processes should possess. There have been handbooks published dealing with this application of photography, but so far as we know they are out of print now, though possibly a few copies might be obtainable from some of the New York dealers.

A PALM

Just when we were wondering whether we could find a suitable picture to illustrate what we meant by talking about the power of overdevelopment in the tank to "plug up" the highlights, we came across this print. Here is an exposure which was surely almost long enough, if not entirely adequate, for even in the dense black supposed to represent grass there is some trace of detail. Allowing for latitude 30 degrees north (Florida), by assuming that half our table times would be sufficient, we should have estimated the exposure as follows:— subject, landscape with dark, near foreground shadows, 4; stop, 6; light, 0; month and hour, 1; film, 1½; sum, 12½; exposure, 1-10. Hence the marked 1-25 of the shutter, which was what our contributor used, would have been to all intents and purposes half the table time and should have been ample. Development of the film for the full tank time, however, has produced a negative too dense for a Normal grade of paper, as proved by the print, which has a rather snowy appearance. The developer used for the paper was doubtless a strong M.-Q., for the blacks have that hard, impenetrable deposit characteristic of too much hydrochinon. The same negative, without doubt, would yield a much better print if it were given a chance on the softest-working grade possible to secure. Reproduction has of course grayed down the whites to a slight extent, but enough of the excessive contrast remains to show the tendency of slight overdevelopment in the tank to destroy the gradations in the lights. If the negative were on a plate, we should recommend reducing it with a selective reducer, such as acid permanganate; but films are extremely hard to reduce or intensify successfully, owing to the strong tanning effect of the usual acid fixers found necessary to keep them from frilling or from suffering mechanical injuries during handling.

A NEW ENGLAND ROAD

Mr. Harrington appreciates the fact that a suitable cloud sky would have improved the

A NEW ENGLAND ROAD D. H. HARRINGTON

THE STARBOARD LIGHT A. R. BROWN

effect, but he does not see any further room for improvement. It seems to us that the spotting is defective. All the lights are concentrated in the left half and all the darks in the right half. Taking the picture at an hour when the foreground foliage was well lighted by a sun behind the camera would help to equalize the values. Perhaps a better point of view could be secured, or the spacing arranged to greater advantage by turning the camera more to the left. Data: 4 x 5 Premo camera with 6½-inch R. R. lens; 5-times filter; ½ second at *f*: 16 in August at 11 a. m.; bright sunlight; Seed L Ortho plate; M.-Q.; print on Azo K.

THE STARBOARD LIGHT

Mr. Brown is to be praised for his bold handling of what to most workers would seem an insignificant theme. The fatal defects of scattered highlights and confusion of the many lines and masses of the surroundings, however, have prevented him from attaining the fullest measure of success, such as an artist might grasp by leaving out and vignetting. The technique is perfect. Data: 4 x 5

LOOK PLEASANT G. GOSHOSKY

Reflex camera with 7-inch Wollensak Velostigmat lens; *f*: 4.5; 1-100 second in strong sunlight at noon in February; development in Imperial Standard pyro-metol; enlargement on Montauk Cream bromide, developed with duratol-hydro.

LOOK PLEASANT

This print has obvious defects, but the maker is entitled to praise for the way he has handled the spacing of the two figures. Neither comes exactly at the middle of the picture. The relative positions are correct to secure the best possible observation by the spectator, who first sees the boy and then follows the direction of his gaze to his sitter. In composition, this sort of mental connection is called a line, just the same as if it were drawn with a pencil. Imaginary lines are just as important as real ones in putting a picture together. This is why we are continually warning our readers not to let their subjects look at the camera, as it creates lines of interest leading away from instead of toward the principal object. No data accompanied this print.

REHALOGENIZATION

A reader asks whether the process given in F. J. Mortimer's article on page 486 of the September, 1914 issue is to be preferred to that on page 282 of the April, 1914 issue.

There is little difference between the two formulas, as both require careful manipulation. Mr. Mortimer, however, is a very cautious worker, and we should expect less trouble when following his very precise directions. The process need not be carried out in ruby light, but the ordinary yellow light suitable for working bromide paper would prove both safe and pleasant.

SOMEBODY'S GOIN' BY

(See page 339)

Technically and pictorially, this picture presents many points of interest for our readers. The most noteworthy photographic lesson is the naturalness of the lighting — a result due to the skilful combining of flashlight and daylight exposures. Oftentimes, when one resorts to the flash in photographing against window light, the error of taking too much powder is made; but here the weight was calculated to a nicety and the shadows, though transparent, are not lighted up too much, though if we look closely we can see that there is a second set of shadows cast by the flash. Such a small item, however, is negligible when the success of the general effect is considered. A little retouching would eliminate the shadows cast by the dog and by the newspaper and make the result perfect. From the pictorial standpoint, the print shows fine appreciation of the principle of unity. Both the sitters are engrossed in the outside happenings. The spotting, or division of the space into masses of light and dark, is good. The two figures are placed just right, laterally, though possibly the vertical spacing would have been better had the camera been lowered, or pointed down and the swing used, so as to take about an inch of space from the top and add it to the bottom. Data: 4 x 5 Seneca No. 6B camera with 9¼-inch R. R. lens; *f*: 11; shortest possible bulb exposure, during which ½ a level saltspoonful of flashpowder was fired; bright sun outside; Standard Polychrome plate; pyro tank development; print on Instanto No. 16.

HARVEST TIME ALVIN W. PRASSE

Second Prize, April Competition

HARVEST TIME

This interesting genre was awarded second prize in our April competition, principally because of the welcome divergence from the usual corn shock and pumpkin pictures so beloved by amateurs, produced by the introduction of a properly placed figure. Our readers will notice that the focus in this case is sharpest on the figure or the plane a trifle in front of it, while the corn shocks and the landscape beyond them are enough out of focus so that they do not distract the eye, yet tell their story fully without undue obtrusiveness. This is the most satisfactory method of focusing with an anastigmat lens, which, when used at full opening, has much less depth of focus than the rapid rectilinear used at its largest aperture. The picture was taken with a 4 x 5 Seneca No. 8 camera, fitted with Ilex anastigmat lens of 6 inches' focal length. The exposure was 1-25 second at 10 a. m. in October, with hazy light. The Hammer Ortho plate was developed in diluted ortol, and the print is an enlargement on silk-surface Velour.

RENEWING THE PAINTED TINT

A meter user asks whether it is really necessary to renew the painted tint when adopting a new box of refills. He asks whether the old tint fades or darkens with age.

An interesting question is opened up by this reader's inquiry. We suppose that the meter manufacturers have a reason for advising the change and supplying a new tint with the refills. At the same time, we have kept in use for some three or four years the original tint we purchased at that time, simply because it has both full and quarter tints and is therefore useful in dull light. The refills, as now supplied, have the full tint only, occupying half of the circle. We have never been obliged to make any allowance for new paper, having always stuck to the factor of half the Bee (or the whole of the Focal-Plane Meter) reading for shutter exposures outdoors, and using the whole Bee time indoors. It is, of course, conceivable that a tint might alter in the course of years so as to be unreliable with a new issue of refills. The tints probably fade with age, unless they are made with lead pigments, in which case they might darken by sulphurization; but we have never yet seen one which had caused trouble, probably because the user followed the advice of the manufacturer and stuck on the new tint supplied.

SPINNING THE LARIAT HARRY BAUER

SPINNING THE LARIAT

This picture is similar to Mr. Bauer's third-prize picture in the April, 1915, issue; but it has certain defects which could easily be corrected. The figure is not well placed. Trimming through the tree on the left and also from the base would give better spotting. This portion would enlarge well. The rope is not absolutely sharp in all its parts; but, on the whole, the shutter-speed was adequate. Data: 4 x 5 Hall Mirror camera fitted with a Wollensak Velostigmat *f*: 4.5 lens of 7 inches' focus; 1-800 second in March at 8 p. m. in strong sunlight on an Imperial Flashlight plate; pyro; print on a Normal Studio Cyko postcard, developed with dianol.

THIS IS THE LIFE

(*See page 341*)

Mr. Brugger's picture, which was awarded first prize in our April competition, has great charm, both as an excellent photograph and as a call to the delights of nature. While the canoe is apparently exactly centered in the picture, as a matter of composition this is not really the case, for it and its reflections form a line running down toward the lower right-hand corner of the picture, and as the eye enters, it is attracted along this line to the figure in the stern of the canoe, which is the dominant note of the whole composition. Another entrance leading to the same point is made by the reflection of the sky, and all the other lines of the picture — the bank of the stream, the birches, the tree masses in the upper right-hand corner — lead inevitably to the same point. The values are well rendered; there are no heavy masses of shadow, and the sky is not overpoweringly white. The print from which we are making our reproduction is enlarged from 3¾ x 5 out of a 5 x 7 negative. The data are given by the maker as follows: 5 x 7 Korona camera fitted with 5 x 7 Goerz Dagor lens of 7 inches' focal length. The exposure was 1-50 second at stop *f*: 16 at 10 a. m. in September. The Hammer plate was developed in pyro and the print is on Buff Enlarging Cyko.

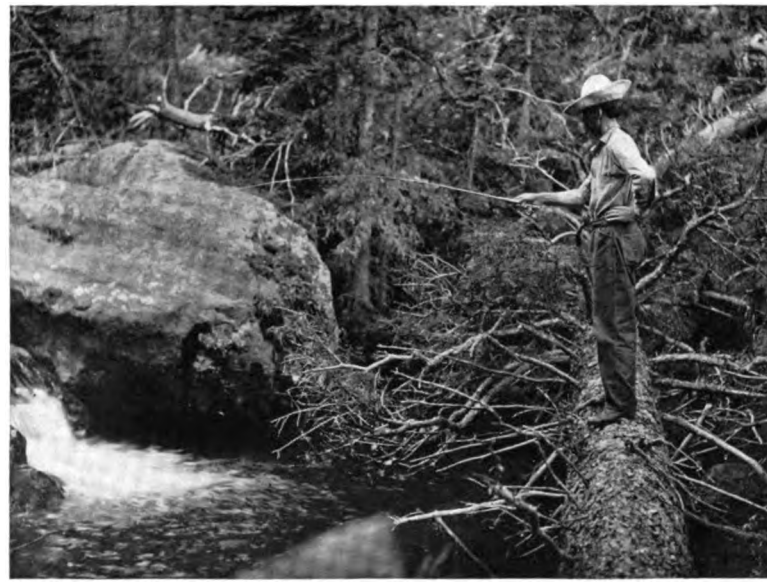
PHOTOGRAPHIC PAPER WEIGHTS

A pleasing method of mounting photographs is to put them into the bottom of a glass paper weight. Only single-weight papers should be used, as the thicker kinds cannot be rubbed into perfect contact in the concave portion at the bottom of the weight. The mounting medium employed must be perfectly transparent, hence gelatine is most suitable. A good formula is:

Nelson's No. 1 gelatine..... 4 ounces
Water..... 16 ounces

Soften the gelatine in the water, liquefy by heat in a double boiler, and add, a little at a time while stirring rapidly

Wood alcohol..... 5 ounces
Glycerin..... 1 ounce



IN NATURE'S PLAYGROUND F. O. NELSON

This is used hot. The clean glass and the print are immersed, freed from air-bubbles, and brought into contact under the surface of the mountant. When the print has been rubbed into perfect contact, the weight and print are withdrawn and the superfluous gelatine is removed with a cloth dipped into hot water or wood alcohol.

This mountant is the one ordinarily recommended for mounting prints on thin cards or papers without cockling. It is as effective as and much cheaper than dry mounting tissue.

IN NATURE'S PLAYGROUND

Mr. Nelson says the chief faults, in his eyes, are the out-of-focus rock and the (possibly) excessive contrast of his print. We are not at all sure that we agree with him. The rock might attract too much attention if it were sharper; it is rather light in tone as it is, and, with the tiny waterfall, attracts the eye at the expense of the figure. Still, had the camera been fitted with a side swing, the rock could easily have been brought into focus, and a larger stop used. The triangular spot of light in the foreground looks like a flare spot, but is said to be an out-of-focus point of rock. It should be spotted out. The picture was made with a 6½ x 8½ Pony Premo camera fitted with a Bausch & Lomb Plastigmat lens of unstated focus; 1-5 second at *f*: 32 was given to a Standard plate of unstated brand in dull October light at 4 p. m. The plate was developed in M.-Q. and printed on Normal Cyko Glossy.

PREPARED M.-Q.'S AND THE THERMO SYSTEM

A Canadian subscriber asks, "Can I use the 'ready-put-up' M.-Q. developer for the Thermo System? How shall I mix and dilute it for use?"

There are two forms of prepared M.-Q. which are sold complete with tables and calculators for Thermo Development. They are (*a*) the Watkins Time Developer, powder or liquid, with Thermo Calculator; and (*b*) Ingento M.-Q. Tablets, which are furnished with a time-table applying to average plates. Other commercial M.-Q.'s could be used, but you would have to find by experiment just what amount of water to use to make development consume the exact time indicated in the table given on the Thermo Card.

Should you not care to mix your own solutions, the best plan is to secure the Watkins developer, as that has a movable scale which can be used with any M.-Q. to determine the right temperature allowance, if you once find by experiment the exact time required for development at any stated degree. For instance, you might find that at 60 degrees a particular make of M.-Q. tubes dissolved in 6 ounces of water took four minutes for a given plate. By setting the 60-degree pointer of the indicator to four, you could read off the time for any other temperature.

AN INDOOR PORTRAIT E. VIGGERS

AN INDOOR PORTRAIT

The maker of this picture would have done better to dispense with an artificial background rather than to use so wrinkled a sheet in focus close behind the subject. One of the most essential principles in portrait work is to have the sitter several feet in front of the ground. Then, in focusing, one can use the largest stop and rack the lens out until the ground is softened, at least, even if not put quite out of focus. The placing of the figure is fine; the pose and expression are good; the technical work is very satisfactory. Data: 3A Graflex fitted with a 7-inch Goerz Celor lens; short time exposure at *f*:4.8 in dull light in January at 1 p. m.; Speed film; Cyko M.-Q. developer; enlargement from part of the negative on Wellington Cream Crayon Rough, redeveloped.

FOCUSING FOR FLASHLIGHTS

A reader desires to know the easiest way to get correct focus in a dimly lighted room when preparing for a flashlight photograph.

If it is necessary to focus without much light, the simplest way is to light a candle or match at the point in the room which should be in sharpest focus, and focus on this. It is a mistake, however, to extinguish all the lights when preparing for a flashlight photograph, that is, if persons are to be in the picture. In the dark the pupils of the eye dilate, and when the flash is taken the sitters have a staring and unnatural expression. It is much better to have all the light in the room as usual, during the entire time of taking the picture. It is perfectly safe in any ordinary artificially lighted room to open a lens for a few seconds or even minutes before the flash goes off.

BREAKFAST

Technically and artistically, this print is good, but there seems to be a defective strip along the right edge, perhaps due to staleness of the emulsion, perhaps to a leaky plateholder. There seem, too, to be some flare-spots above the pail. Possibly the lens was not shielded sufficiently from the direct light. A hood is almost a necessity when working outdoors. The exposure was calculated by our tables with the following factors: Subject, 5; stop, 7; light, 0; month and hour, 0; plate, 2½; sum, 14½, indicating an exposure of 2-5 second. The marked 1-5 of the shutter was used, the result being fully timed, as shown by the transparency of all the shadows. The other data are: 4 x 5 Seneca camera with 6¾ inch R. R. lens; 1-5 second at *f*:16 in July at 11.30 a. m. in bright sunlight; Imperial plate, brand not stated; M.-Q.; print on Colona Normal Gloss.

BREAKFAST WM. H. RICE

CHILD PORTRAIT M. FREY

A CHILD PORTRAIT

Professionals often allow themselves to be led into errors of composition by the desire to show the range of the process. Here Mr. Frey has introduced distracting accessories, in the form of drapery and flowers, which not only catch the light and draw the eye away from the figure, but also seem out of place. Technically, the lights lack gradation. The pose is good. The placing of the figure is fine, with very skilful handling of the background to supply balancing gradations. The picture was made with an 8 x 10 Century camera fitted with a Dallmeyer portrait lens on a Plastic plate, the print being on Azo H Special.

ADVANTAGES OF CERTAINTY IN EXPOSURE AND DEVELOPMENT

"What a satisfaction it is to go on a photo trip and know that with your exposure meter and Thermo development you have not the feeling that you ought to make two or more exposures on a subject in order to be sure you have timed correctly, and to feel that in developing you run no risk of spoiling your work by under- or over-development. The latter with me was a constant source of anxiety, as I never knew when to stop development, although I was familiar with all the so-called tests, image to show plainly on back of plate, fingers seen through the highlight

THE GLEN IN WINTER — GARNET E. JACQUES

to match the shade, disappearance of image as examined by reflected light, etc. *Now* I never expose but one plate on a subject, and in developing it I get the correct temperature of the developer to see if it compares with the temperature of the room, as it sometimes varies in sudden changes of weather (if there is variation I use the developer temperature), put the plate in the tray, start my time clock for the time indicated on the Thermo Card, and pay no further attention to the process except to rock the tray two or three times. When the bell on the time clock rings, I remove the cover from the tray, rinse the plate and put it into the fixing bath without examining it, as I feel sure that the plate has properly recorded all that the lens saw.

"A case like the above happened only a short time ago when I was out with a friend and took a snapshot of a certain view. It was a little thing that the friend wanted for advertising purposes, and he asked me if I had not better take another exposure. I said to him, 'don't get anxious; the picture will be all right,' and it was."—*From a Subscriber.*

THE GLEN IN WINTER

The maker of this print, in his endeavor to get the detail in the white snow crisp and sparkling, resorted to an unnecessarily hard-working paper and too strong a developer. The blacks have that peculiar intensity denoting a strong M.-Q. with about four times as much hydro. as metol. Adding water to the developer would have corrected this fault. The composition is good, as full advantage was taken of the lines of shadows to secure entrance into the picture. Data: 3A Special Kodak with Zeiss-Kodak anastigmat lens of 6¾ inches' focus; 3-times filter; 1-5 second at *f*: 16 in January at 3.45 p. m.; bright sunlight; Eastman Speed film; pyro; print on an Azo F Hard X postcard.

DENSITY AND EXPOSURE

"I used your Thermo formula exactly as directed on the Thermo Card, and the results were the *most terribly underdeveloped negatives I ever have made,*" writes a subscriber. The plates used were Class ½ S. "There is just enough showing on the plates, however, to prove to me that the plates were correctly timed," says our reader.

The last statement proves definitely that the plates were undertimed, as our tests of the same brand proved that they gave ample density when given a normal exposure. It is, unfortunately, sometimes true that Class ½ and even Class 1 plates will not attain the same contrast and density that the slower classes reach without any trouble. On speed work, in particular, they generally yield a thin negative with detail in the shadows. The only way to secure extreme contrast is to develop such exposures in double- or triple-strength solution until every particle of silver

THE ROAD IN WINTER JOHN J. NEUER

affected by light has been reduced, or omit sodium sulphite so as to get an image composed of silver plus developer-stain. In other words, the plates are abnormal when given exposures of say, 1-300 second or faster, and must receive abnormal treatment.

When plates are developed by the Thermo system, thinness is generally the result of underexposure. Any reader can prove this for himself by giving a normal exposure by our tables and then stopping down a little for each succeeding one until exposures 1-6 or 1/8 normal are reached. It will surprise most workers to note how little difference there is in shadow detail and how markedly the general density diminishes as the time is shortened. Except for its thinness, an exposure 1/2 or 1/3 the full table time can hardly be told from a normal one.

FOLDING VIEWFINDERS

Some of the latest models of pocket cameras are equipped with folding finders which go inside the box when the camera is closed. A reader asks where he can obtain one of these finders separately to attach to an earlier model.

Probably these finders have not been imported separately, and the present status of international commerce renders it unlikely that they can be obtained. An importing house which could give information on the point is the International Photo Sales Company, New York City.

THE ROAD IN WINTER

Several of our readers have confessed that they find question No. 1 is the hardest of the eight to answer. It is therefore very refreshing to the critic to come across such a clear and straightforward statement as this —"The road leading over the hill takes your eye right to the picture, starts you from the beginning of the road and leads you right on." Here is a man who puts thought into his work. He first found a theme, an idea to express, and then proceeded to work it out to the best advantage. Naturally, in the circumstances, there is little or nothing to criticize. The composition is as perfect as one often sees, and the same may be said of the technical work, though the matte print loses in reproduction. A Watkins Bee meter was used for determining the exposure. Data: 4 x 5 Reversible Back Cycle Graphic camera fitted with a Cooke Series IV *f*: 5.6 anastigmat lens

RESTING GLADYS A. MATTSON

of 6 inches' focus; Burke & James 8-times (Ingento Series B) filter; 1 second at 11.30 a. m. in January in bright sunlight with stop *f*: 11; Central Panortho plate; pyro tank development; portion of the negative enlarged on Professional Cyko Buff.

RESTING

This print is from a negative which was well timed but considerably overdeveloped, so that even platinum paper, which is rather soft-working, was not able to secure the detail in the highest lights. The arrangement is fairly satisfactory. Data: 5 x 7 camera with R. R. lens; 1-50 second at *f*: 16 in August at 4 p. m.; bright sunlight; Defender Ortho plate; pyro tray development; American platinum paper.

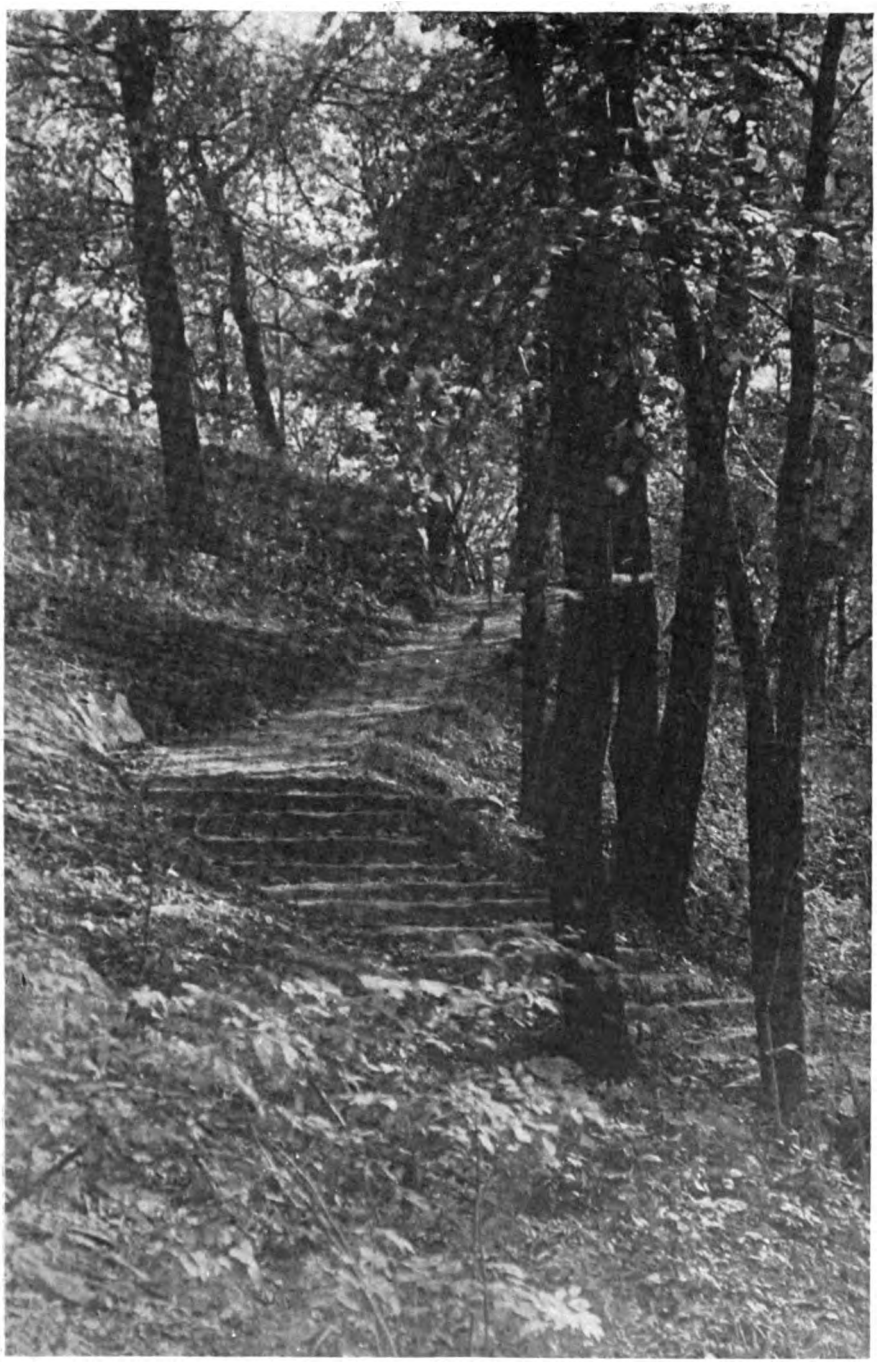
FIXER FOR SLIDES TO BE COLORED

A correspondent writes: "I have lately been bothered with my lanternslides. The emulsion comes up under the brush in coloring. I know from sad experience that any hardener containing alum will bleach the blues in a slide in a short time. How about this liquid sodium bisulphite? Have you any experience as to whether it will bleach the colors, or as to whether or not it leaves the gelatine so hard that the colors do not take well?"

We regret that we cannot give our personal experience on this matter, for we have not fixed any slides in the bisulphite bath. We should judge from our experience with it for ordinary plates, however, that it would be entirely satisfactory. The liquid bisulphite, as supplied by Lumière, has a moderate amount of hardening action on the gelatine, but it never tans the plate as hard as the alum baths. Our standard bath contains a pound of hypo and 1 to 3 ounces of liquid bisulphite, according to the season, in 5 pints of water. It keeps perfectly clear until the hypo is quite exhausted. For instance, a bath mixed in December and thrown away three months later was free from sediment, though so weak that it did not clear a negative for an hour. We should think slides fixed in it would color readily, as we find it allows easy intensification or reduction of ordinary negatives.

THE HILLSIDE PATH

An original and daring scheme of lighting makes this composition quite successful. One should, of course, begin observation of a print along its bottom edge, finding there some line or some mass of light tone which shall act to lead the eye into the picture toward the principal object. Here the path is that principal object, but it starts at the right margin above the base line. Evidently it would be awkward for the eye to have to grope around to find this point at which to enter. The maker, seeing that he had a solution in the sunlighted leaves, took up a point of view which brought them into the right place, used the rear combination of his lens to secure a narrow view-angle, and exposed so as to bring them clearly out as a series of light gradations, without much detail, which should pull the eye powerfully into the picture



THE HILLSIDE PATH O. E. ERICKSON

and up to the path. The dark tree stems aid by throwing the observation back from the right margin to the path. In short, this picture is a good essay in composition and its maker merits high praise. Data: Postcard Premo No. 9, fitted with Wollensak Velostigmat lens of 6½ inches' focus; rear combination used alone; nominal *f*: 16; 1 second at 8.30 a. m. in late September on a Standard Orthonon plate; tank pyro; enlargement on P. M. C. Buff bromide, developed in edinol-hydro. and redeveloped in Defender Redeveloper.

WHO SAID "COME"? A. M. VINJE

WHO SAID "COME"?

Two features of this print could be improved, the background and the spacing. A little could be trimmed from the top. In other respects the work is faultless. Note particularly the fine rendering of values in all the tones from almost white to moderate darks. Data: 5 x 7 view camera fitted with a Heliar *f*: 4.5 anastigmat of 9½ inches' focus; flashlight with about 4 grains of Victor flashpowder; Standard Orthonon plate; tray pyro; print on an Aristo Gold postcard.

LUMINOUS PICTURES

Luminous photographs, delicately reproducing with phosphorescent effect every light and shade of a landscape or a face, are new scientific curiosities that some practical photographer may develop into commercial use. Like many other practical devices now in common use, the luminous photographs were merely incidental to elaborate research work in a scientific laboratory. The scientist was studying the many odd effects of the light called cathode rays — the father of X-rays. He discovered that cathode rays will make various salts color vividly. For instance, common salt will quickly turn amber color under the rays, and potassium bromide will turn deep blue. Then, when the salts are later exposed to sunlight, they will gradually lose their new colors. He found, however, that these salts, when they lost their new colors, acquired a phosphorescent quality and glowed in the dark.

Based on these facts, the scientist succeeded in making some luminous photographs for his own amusement. First, he colored some salt under the cathode rays; then he proceeded to make a photographic plate of the salt. The easiest way to do this was to spread some of the colored salt on a glass plate, then place over it another glass plate, and fasten the two plates together so firmly that the salt would stay in position. Thus he had a crude photographic plate, which he placed in a camera.

A photograph was taken in the ordinary way, with a short time exposure. The daylight striking the plate faded out the color from the salt wherever it struck the plate, and in place of the color left a luminous effect. This was the luminous photograph.

By careful selection of all materials the scientist succeeded in making photographs that gave a fine phosphorescent picture when viewed in the dark; and the pictures proved to have better lasting qualities than expected, so long as they were properly protected from daylight after the photograph had once been taken. Whether the luminous picture in the salt can be fixed—like an ordinary plate—has not yet been determined.— *Saturday Evening Post.*

COUSINS

Handling one baby at a time is hard enough for most workers, but evidently not for Mr. Patterson, for he has attempted a more

COUSINS R. R. PATTERSON

INVESTIGATING OLIVER S. WILSON

difficult feat and come off victorious. The technique is very fine, as the values are excellent in all the tones. The arrangement of the accessories is as good as could have been managed in the circumstances. Data: Postcard Conley with 6½-inch R. R. lens; 1-5 second at *f*: 8 in shade outdoors in August at 4 p. m.; bright light; Standard Orthonon plate; M.-Q.; print on Argo Normal Velours.

INVESTIGATING

Mr. Nelson asks us to tell him how he could improve on his result in this case, and we must confess that we are at a loss to point out any serious defects. The minor one of too much contrast might be taken care of in enlarging, and the blank sky could have clouds printed in. The pole which sticks up near the garden fence might also be retouched out with benefit. In other respects, particularly the excellent placing of the figure the picture is very good indeed. Data: 2¼ x 2¼ Watch-pocket Carbine camera with Aldis Uno anastigmat lens of 3 inches' focus; 1-100 second at *f*: 11 in September at 10 a. m.; good light Eastman film; enlargement.

TROUBLES DUE TO STALE METABISULPHITE

A reader in Canada writes that he received from his dealer a bottle of potassium metabisulphite and found that it was in powdered form, not the large crystals he expected to see. He asks whether it is double the strength of the crystals and how much to use in the formula for Thermo developer.

This sample of metabisulphite is probably one which has gone bad through age, as the

HAROLD GEO. C. SHEPPERD

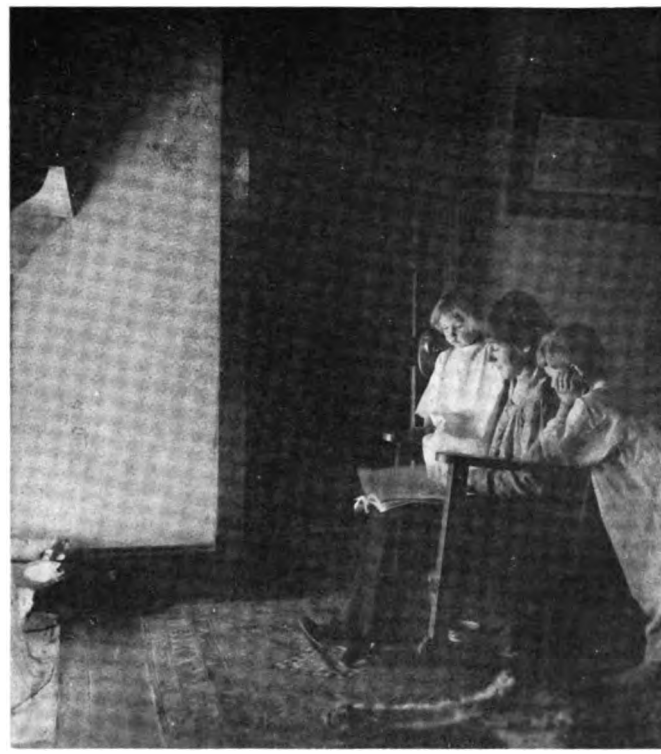
fresh salt comes in large, irregular crystals, with only a trifling amount of powdery deposit on them. This substance contains no water of crystallization which can be driven off by heat, as is the case with sodium sulphite and sodium carbonate, so its strength does not change except as it spoils through oxidation. Stale metabisulphite may cause the solutions to look opalescent, owing to the release of free sulphur from the salt. A similar change takes place if it is dissolved in too hot water, say over 100 or 110 degrees. In fact, we have several times observed this trouble with the last few crystals in a 4-ounce bottle, and a few readers have written in about it. Another trouble caused by staleness is that duratol will not entirely dissolve in the slightly milky solution produced by the spoiled metabisulphite, so that it is necessary to use more of the latter to insure its dissolving, or, better, to secure a fresh specimen. Milkiness due to sulphur cannot be cleared by filtering.

Assuming that a stale specimen is the only one available, we should pick out any crystals, rinse with clear water, and dry with a clean cloth or blotter before weighing out. The amount to be taken is that given in the formula; but if the developing agents fail to dissolve, a small additional amount may be tried, for instance, 5 or 10 grains where the original amount was 60 grains.

The same reader asks where he can obtain duratol, as he has not seen it advertised in POPULAR PHOTOGRAPHY and local dealers do not keep it. Canadian readers will probably be unable to obtain this developer until after the war, unless they order from dealers in the United States. Boston dealers all keep a good stock on hand and would gladly quote current prices on request.

HAROLD

In some ways this print is excellent; but there are a few points which are not entirely satisfactory. The first thing which strikes the observer is the staring expression of the little sitter. This is due to absence of the pupil of the eye, which has photographed of exactly the same value as the iris, so that they are equally black in the print. The sharp, round catchlight from the flash comes a little too far below the edge of the upper lid and also suggests that the eyes are open too wide. The lens, however, was not placed too low, as is proved by the perspective of the nose. Too low a stationpoint will make this organ look unnatural by showing too much of its under side, and here there is none visible. The blending of the artificial background into the image of the boy and that of the back of the chair is unfortunate, as is also the attractiveness of the several patches of cloud-effect. A straight print would probably have been better. A color-sensitive plate might



THE BEDTIME STORY W. R BAKER

have rendered the eyes to better advantage. Coming now to the good points, the exposure (amount of flashpowder used) was well adjusted and the flash itself was fairly well placed, so that the lighting is good. A little higher position of the flash, though, would have given better catchlights and modeling. The other technical points show excellent control of the photographic processes. The picture was made with a 5 x 7 Conley view with R. R. lens of 8 inches' focus. The lens was used at *f*: 8 and the exposure made with 3 grains of Victor flashpowder. The Stanley 50 plate was developed with pyro and printed on Azo E Soft, the background being secured through separate printing from another negative.

THE BEDTIME STORY

When one has gone to the trouble to construct a fake fireplace in order to make flashlight effects, criticism is more or less disarmed. Mr. Baker's handling of his accessories is excellent, and the lighting is very good indeed. The placing of the group is fairly good, though possibly a horizontal position of the plate would have made an improvement by giving more space behind the figures. Data: 4 x 5 Goerz Ango camera with *f*: 4.8 Celor lens of 6 inches' focus; flash cartridge; Standard Orthonon plate; development with Modified Thermo M.-Q.; print on Special Rough Velox.

IDENTIFYING UNDEREXPOSURE

"Can you explain exactly how I can tell from the appearance of a negative whether it is underexposed?" asks a subscriber.

It is worth the while of every reader to take a six-exposure roll of film or a half-dozen of plates and make the following experiment. Set up the camera on a tripod in front of an average landscape and calculate the exposure by the Tables in the magazine. Suppose, for illustration, that it works out as follows:

Subject, average landscape	3
Stop, *f*: 8 (U. S. 4)	5
Light, bright sunlight	½
May, 2 p.m.	0
Film, Ansco	1½
	10

The exposure indicated by the sum of 10 is 1-50 second.

Give this exposure on stops *f*: 8, 11, 16, 22, 32 and 45. This will give exposures which are,

PHEASANTS FRED W. HOGG

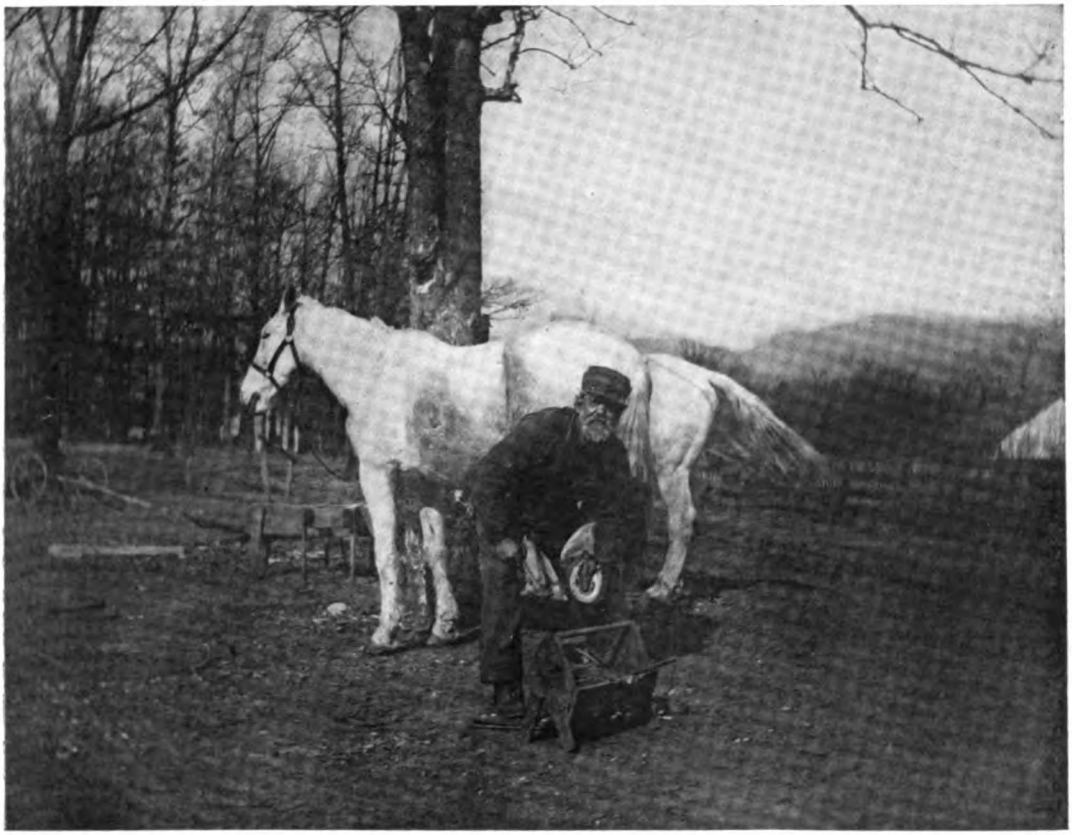
respectively, normal, half, one-quarter, one-eighth, one-sixteenth, one-thirty-second and one-sixty-fourth normal. Develop the roll for the usual time and compare the results. The full exposure will give a negative of moderate density with plenty of detail in all the shadows. The next will be almost the same as regards the amount of shadow detail, but possibly a shade thinner as regards its general opacity, though very little difference should be observable. The film given one-fourth the full time will be decidedly thinner throughout, and close inspection will reveal the fact that it is slightly less full of fine detail. Some of the very darkest spots of shadow will have none, and the rest of the dark values will have decidedly less than the other two films display. This film, one-quarter normal, is the typical snapshot which has had barely enough time to "get by." It will make the class of print beloved by the beginner, that is, one with coal-black shadows lacking detail and pure whites. The next film will have practically no shadow detail anywhere and will be very thin throughout, and the remaining ones will show just a trace of an image.

A series like this, then, teaches that the characteristics of underexposure are, first, lack of shadow detail, and second, thinness (provided that development is standardized by the tank or some other application of Thermo development).

When development is performed by inspection, the natural tendency is to overdevelop in the vain hope of bringing out more shadow detail. This tendency to overdevelopment leads to excessive density in the lights, but there is always a lack of shadow detail, proportionate to the amount of underexposure.

Normal exposure is not one single quantity. A normal exposure may extend from 1-50 second at *f*: 11 to 1-5 at the same stop, or ten times as much, without rendering the picture falsely. The negatives, of course, will not look alike, but by choosing different papers they can be made to print alike.

A negative should not be called overexposed unless two things are in evidence — first, too much detail in the shadows; second, thinning of the lights from partial reversal, so that there is a loss of contrast and gradation in the lighter tones of the print, which is flat and gray. These points are evident in tank-developed films or tray Thermo-developed plates, but may be obscured in development by inspection because the time is varied by the operator and



THE SMITHY GEO. S. BUELL

no two exposures possess exactly the same range of contrast. The most successful technical results are to be obtained only when both exposure and development are standardized.

PHEASANTS

Mr. Hogg did not give any supplementary data to explain how he was able to secure such a fine picture of these beautiful cocks; but we assume that he first accustomed them to the camera and then released the shutter from a distance — unless they are tame birds. At any rate, his result is very good indeed, with the surroundings as well as the birds presented in good value. He used a 4 x 5 No. 7 Premo camera with 6½-inch R. R. lens and 8-times rayfilter. His exposure was 1 second with *f*: 16 at noon in January in bright sunlight. The plate was the Cramer Instantaneous Iso, which was developed with an Ingento M.-Q. tube and printed on Azo A Hard.

THE SMITHY

This print would take considerable study to find the best possible trimming. Although the smith comes precisely in the middle, the group of which he is a part extends in both directions and therefore is not, as a whole, centered too obviously. A cut passing just inside the light beam of wood lying on the ground at the left would remove at least one scattered highlight and make an interesting disposition of the objects. The white spot of the house then acts to balance the head and neck of the horse. Data: 4 x 5 Premo, Model of 1902, with 6-inch R. R. lens; 1-50 second at 11 a. m. in November in hazy sunlight with stop *f*: 8 on a Stanley 50 plate; M.-Q.; enlargement on Monox bromide paper.

BROWNS FROM OVEREXPOSURE

A somewhat coppery brown color on D.O.P. is causing considerable worry to a few of our readers. One gentleman stopped using a certain make of extremely contrasty paper because he could not get black and white prints on it. We wrote to him to shorten his exposures to at least one-quarter what he had been giving. He did so, and the trouble disappeared, the result being that the manu-

BABY'S WALKING LESSON FORD E. SAMUEL

facturer (one of our advertisers) has retained his custom.

Now comes another reader. He got good black prints as long as he used his regular Welsbach printing light, but when he exposed some of the same paper to the light of burning magnesium ribbon, the prints developed up to a rich red-brown. His dealer told him that the brown color was due to overprinting, but "I do not believe this," says our reader, "for it took as long for the image to come up as those exposed to Welsbach light."

The dealer is right. The coppery color is due to an exposure at least four times normal. If the magnesium ribbon is to be used, burning the same amount at twice the distance will probably yield a black print. If it does not, the distance from flame to frame should be lengthened still more.

BABY'S WALKING LESSON

It is a pleasure to see work which has been thought out so well as this picture was. Every one of the eight questions is fully and illuminatingly answered. For instance, Mr. Samuel writes, in answer to 3, "I believe it might have been better had the part of the wall to the left not been included; however, I do not wish to trim this off, as it would make the figures too crowded. You will note that the baby's left arm was moving. [This could have been avoided by using the Imp Flashlight Gun.] Although the principal object is in the middle of the picture, I believe it is offset by the chair." Self-criticism like this is what we hope to inspire, ultimately, in every earnest worker by forcing his attention to concentrate on answering the eight questions. Mr. Samuel's work is good. His data are: 4 x 5 Century Grand camera, fitted with a Bausch & Lomb-Zeiss Protar lens of 6⅜ inches' focus; *f*: 8, ¾ teaspoonful Victor flashpowder; Cramer Instantaneous Iso plate; Modified Thermo D.-Q.; print on Platora Linen. Mr. Samuel adds, "I was never able to develop a portrait negative to suit me, and I owe my success with this one to the articles on Thermo Development in POPULAR PHOTOGRAPHY."

CAUGHT IN THE ACT

Data are lacking for this picture, but the presence of the shadow of the operator indicates that it was taken late in the afternoon, when, although the sunlight looks bright, it is photographically very weak. The snapshot given was not slow enough to get an adequate amount of detail. Development was probably forced. The print looks as though it had been made on the hardest grade of paper and developed in strong M.-Q. It is a most

CAUGHT IN THE ACT PAULA STOCKSTROM

HAVING A PICNIC — ALEXANDER MURRAY

Second Prize, Country Life Permanent Exposition

startling example of the "soot-and-whitewash" effect so much prized by beginners and so utterly to be condemned by more advanced workers. In other respects, the print is worthy of praise, for the figure is very well placed, showing an elementary understanding of composition.

TEMPERATURE OF THE DARKROOM

One of our recent prize-winners writes as follows: "I consider POPULAR PHOTOGRAPHY the best I have seen for the beginner. I got more than my money's worth from one article. Like many other people, I thought that the temperature must be as high as 65 or I would not get a good negative. The temperature of my darkroom would rise to 70 degrees or more in six minutes, and the result was a grainy negative. After reading your magazine, I dropped the temperature a few degrees, and the results are better.

"I don't see how the temperature of a small darkroom can be kept even. Mine cannot be ventilated without letting in light, and without ventilation the heat from the lamp and one's body will raise the heat a number of degrees."

For many years, we endured all sorts of discomforts in using a darkroom about 12 x 12 in the top of a French-roofed house. It was cold in winter and insufferably hot in summer. To be sure, it could be well ventilated when not in use; but it was never satisfactory. Our next move was to a cellar darkroom, which proved far better, being near enough to the furnace to keep warm in winter; and it was very comfortable all summer. It was not provided with running water, however, and we used an oil ruby lamp in the room. Our present darkroom is also in the cellar. It measures about 10 x 16. It has running water, electric lights, and heat. The average winter temperature is about 54 degrees. It has never gone over 72 in summer. It is almost impossible, at any season, to get the room more than 10 or 15 degrees away from the temperature of the running water. During the coming summer, we intend to put in a large radiator overhead (the present heating is by about 40 feet of flow and return pipes running to radiators in the rooms above), expecting to secure an average winter temperature next year of about 65 degrees.

From our experience, we unhesitatingly

WATCHING F. C. LEGARD

recommend the cellar as the best place for a darkroom, in a heated house. When, however, a small room must be utilized, the light should be placed on a shelf outside, to illuminate the darkroom through a ruby window cut through wall or door, as convenient. Light-trapped ventilators are not difficult to improvise. In fact, a combination of ventilator and ruby light can be installed in a door without much trouble, by framing the glass so that it is held with suitable zigzag light-traps at each end to allow free circulation of air. Separate light-trapped openings at top and bottom are better, of course.

Ventilation is the most important single element in the use of a small darkroom. It is far more essential to secure a well-ventilated room in which to work than to have it dark, for by using a changing-bag and a tank capable of being loaded in the bag, even the plate-user can get along without a darkroom. A ventilated room will keep reasonably cool, even if small. If the ruby light must be employed, by all means have it outside. If, even then, the room gets so hot that the negatives show grain, it will be necessary to use ice and start development at a low temperature. It takes at least two quarts of water to keep a trayful of developer at a temperature different from that of the room. Some developers are less likely than others to give grain. Duratol at 80 degrees, working in 1¾ minutes, is the best hot-weather developer we have ever handled.

WATCHING

Trimming would improve this picture greatly, for the interest is confined entirely to the right half, the left containing only a few scattered and rather meaningless masses. The print needs considerable work to be done on it with the spotting-brush. The subject is worth enlarging on glossy paper and working up with the air-brush, a copy negative being then made for producing duplicates. Data: 4 x 5 Premo B camera; Seed 26X plate; Eastman's hydrochinon developer; enlargement on P. M. C. Bromide No. 2.

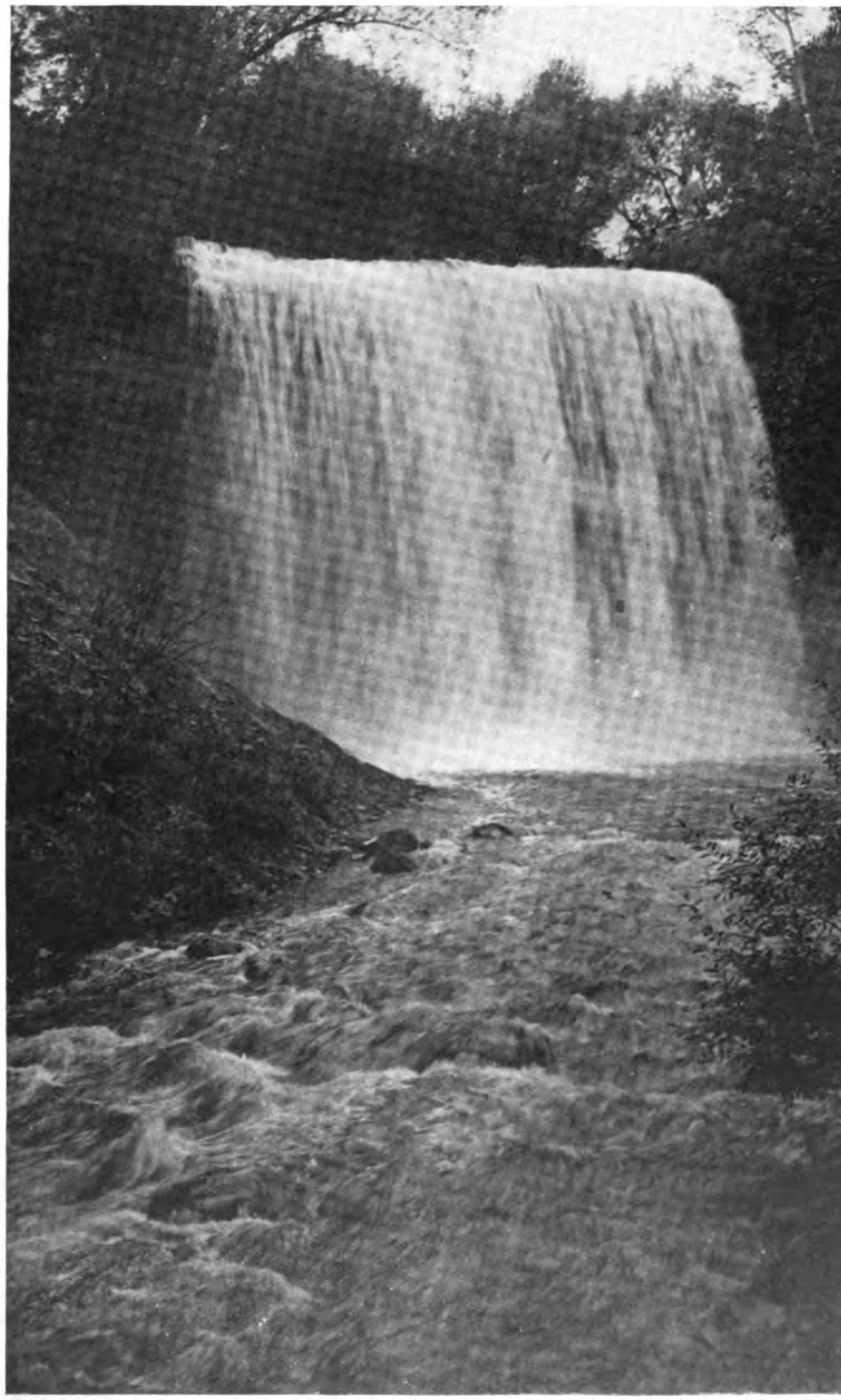
COMING IN HOME

Mr. Clepper has mastered one of the first principles of presenting his prints to advantage — trimming. This tiny print is all that is left of a postcard-size negative, and it certainly contains all that is essential. The figures are not in quite sharp focus and are also a little blurred owing to the slow shutter speed. The best way to focus for open subjects is to make on the focusing scale a mark for the hyperfocal distance for each stop. With a 6-inch lens at *f*: 8, the distance is 38 feet. This gives the best general distribution of focus from 19 feet to the extreme distance. The fastest speed of the shutter should have been used. Data: Conley postcard camera with 6¼-inch R. R. lens; 1-25 second at *f*: 8 in bright October sunlight at 3 p. m.; Roebuck Blue Label Plate; edinol developer; print on Glossy Contrast Darko.

MINNEHAHA FALLS

We have seen a great many pictures of this famous waterfall and must unhesitatingly award Mr. Noordhoff the palm for having produced the best which has come to our notice. He chose his point of view very carefully and has included just enough of the surroundings to make his view interesting without destroying its unity. The exposure has well rendered the effect of movement in the water and at the same time not allowed it to appear too blurry. The following factors from our tables were used to calculate the exposure:— average landscape with foreground, 3; stop, 5; light, 1; month and hour, ½; film, 1½; sum, 11; exposure, 1-25 second. The camera used was an Eastman No. 1A

COMING IN HOME CARL W. CLAPPER



MINNEHAHA FALLS HENRY NOORDHOOF

Special with 5-inch Zeiss-Kodak anastigmat lens working at *f*: 6.3 but stopped down to *f*: 8 for the exposure. The time was September at 10.30 a. m. The light was faint shadow cast by sun. The Eastman film was tank developed in M.-Q. and enlarged on Enlarging Cyko.

THE MOWER'S YOUNG ASSISTANTS MARTHA HUME

THE MOWER'S YOUNG ASSISTANTS

The chief fault in this picture is the spacing. Whether this defect is caused by the narrowness of the postcard-size film or by other considerations is hard to guess; but the enlargement is only 4¼ x 6½, hence we are inclined to think that there is room for better selection of the portion to enlarge and more effective trimming. The figures are too near the left margin. The trimming we favor is cutting off the space at the right to within a quarter of an inch of the standing figure and the bottom to within the same distance of the nearer wheel; but then the figures are too nearly centered, so more of the film to the left should be included, if possible. It is always difficult to estimate by means of a small finder exactly where figures will come in the negative; but pains should invariably be taken to see that they do not come exactly in the middle, and the trimming should afterward be studied with the help of two L-shaped pieces of card. Data: 3A Kodak with R. R. lens; 1-50 second at 11 a. m. in October in bright sunlight on Eastman film.

A NEGLIGIBLE TROUBLE

A correspondent writes that he had trouble in making up the A solution of the Modified Thermo D.-Q., as the duratol would not dissolve in the metabisulphite solution, though the hydrochinon readily dissolved. He then dissolved the duratol in warm water, next the metabisulphite, and finally the hydrochinon; but the solution was slightly milky and remained so after filtering.

This trouble is one which really does not matter. It is due to the use of stale metabisulphite. If the salt is partly decomposed by long exposure to the air, it will not make a clear solution, and warm water will then make it permanently milky. As long as the developing agents finally dissolve, however, the solution is not unfavorably affected.

We generally dissolve the metabisulphite in cold water by crushing it and stirring. Next we add the duratol and hydrochinon together (as we have found it more convenient to weigh them on the same pan one on the other), and stir for about a minute. The solution comes perfectly clear and bright and remains so for months. When the metabisulphite is stale or warm water is used, a minute amount of sulphur is set free and causes the solution to look opalescent. It does no harm and finally settles, leaving the stock absolutely clear. A good specimen of metabisulphite will dissolve, in the cold, many times the amounts of duratol and hydro. which are used in the Thermo formula.

COLORED CRAYONS

Novel questions come to us in abundance, but we cannot recall having one like the following. A subscriber asks, "What make of colored crayons is all right for coloring photographs? They must not contain injurious substances. Where can they be had?"

The standard school crayons are selected from nonpoisonous, permanent colors; but we have no idea about their effect on a photographic image of silver. Possibly the manufacturers could give information on this point. The Milton Bradley Company, the Prang Company, and Devoe are among the largest makers of such goods.

We should think that pastels, owing to their not being mixed with wax, as the crayons are, would be less likely to injure a picture. It might be necessary to flow the print with oxgall and water to make them take, and the finished work would have to be sprayed with fixatif to prevent rubbing.

AN EVENING SKY — CHARLES E. KUSE

Third Prize, April Competition

AN EVENING SKY

This notable cloud study is well worthy of the third prize awarded it in our April competition. Imitation moonlight effects are often markedly untruthful, but in this case the exposure has been sufficient to give a fairly satisfactory approximation of the transparency of shadow which is so characteristic of true moonlight, and this is really one of the best simulations of such an effect that we have ever seen. Plane beyond plane the woods and hills recede in the foreground, just as they actually do in nature at night under the rays of the moon. The composition is very attractive, though perhaps the sun could better be slightly more to the left of its present position. The exposure was made on the basis of our Exposure-Tables, as follows:

SUBJECT — DISTANT LANDSCAPE

Stop — *f*: 22	8
Light — faint shadows	1
February, 5 p. m	3
Hammer non-hal. ortho	2
Sun — directly ahead	2
	—
	16

The picture was made with a 5 x 7 Chicago view camera, fitted with R. R. Convertible lens of 8 inches' focal length. The exposure was 2 seconds at *f*: 22 at 5 p. m. on February 28. The Hammer Non-Halation plate was developed with pyro in tank, and the print is on white linen Enlarging Cyko.

LISTING NEW PLATES AND FILMS

A reader asks for the speed of the new Eastman Portrait (flat) Films.

If he had looked carefully at the Tables in the March, 1915, issue, he would have seen this film listed as 1. This corresponds to Watkins 350 or Wynne *f*: 128. The Watkins development-speed for Thermo development, according to our trials, is S.

We endeavor to test and list each new film or plate as soon as it comes on the market and are always glad to hear from readers if one escapes our attention. Some few makes are not advertised, and the manufacturers have not complied with our request for samples for trials. In such a case, we must leave it to the reader to make his own experiments and settle the speed rating and development-speed to his own satisfaction.

MOONLIGHT AND STARLIGHT E. A. ROBBINS

MOONLIGHT AND STARLIGHT

Emulation among our readers is responsible for many interesting happenings. Only the other day we published a star photograph called "Unappreciated" (see page 235 of the March, 1915, issue), and it quickly brought in a similar contribution from another reader who had evidently been stimulated by seeing the work of Miss LaGrange. The phenomenon of the earth's motion, as shown by the apparent movement of the fixed stars, is clearly brought out in Mr. Robbins's print. He writes, "The picture was taken by moonlight in the Hawaiian Islands. The camera was planted with the moon in the rear and focused on a bright star just at the top of the hill. The camera was left open for one hour and forty-five minutes, and the star referred to traveled the distance indicated in that time."

THE BRIDGE OVER THE RAVINE

There is one serious defect in the composition of this print. The strong light which leads the eye to the bridge is badly placed. It enters the side of the print, and the eye, seeking an entrance along the bottom margin, is forced to jump violently to the left to pick up the strong patch of sunlight on the grass. Later in the course of observation, the eye keeps returning to this patch and going out of the picture there. This is a case demanding deliberate falsification of values. A number of patches or flecks of sunlight should be worked in along the edge of the road and the light on the grass toned down. Data: Empire State View camera with R. R. lens; partly cloudy; ¼ second at *f*: 22; print on Noko.

AVOIDING HOT-WEATHER TROUBLES

M. D. MILLER

Amateur workers are peculiarly liable to trouble in hot weather, because they seldom have the facilities to provide against the tendency to softening of gelatine and staining of emulsions which accompanies temperatures in excess of the desirable normal of 65. Although the present summer has been exceptionally cool in most parts of the country, occasional hot days which sent workrooms over the 100 mark have not been rare, as was forcibly brought to my attention lately. A prominent newspaper photographer on the staff of one of the Boston dailies recently received a rush order for a hundred lantern-slides. On going to his darkroom upstairs, he found the temperature 104, so he moved his apparatus to the cellar, where he found it possible to work in comfort, with water and all solutions under 80 degrees.

The use of the cellar as a darkroom is seldom hard to arrange for, as a corner can be temporarily made dark with little trouble, even in the daytime. Running water is not an essential. A table on which to work, and a white light for use when no sensitive materials are exposed are all that are really needed. A very little ice will go a long way in keeping solutions below the danger point, though if Modified Thermo D.-Q. is used, no harm results if developer, water, and fixing bath are all at the same temperature and that temperature is not higher than 80.

Frilling, or separation of the gelatine from the support, is the worst of the hot-weather troubles. It arises from two main causes — too much heat and too great a difference in temperature between the various solutions. To these must be added the use of too concentrated a fixing bath. As already pointed out, having both developer and fixer at the *same* temperature is the best preventive, ice not being necessary as long as the limit of 80 is not exceeded. The hottest days seldom prevent work at night, and the tank user, in particular, can retire to the coolest available spot or immerse the entire tank in water containing a little ice to keep the temperature from rising. If the tank is not used, it is most important to avoid handling the plate in the

THE BRIDGE OVER THE RAVINE E. W. COCHEMS

tray, for the warmth of the fingers, added to that of a warm, alkaline developer, will cause the film to separate slightly at the edges and thus start frilling. The user of the Thermo system is exempt from this trouble, for the plate is not touched until it is ready to be lifted out and put into the hypo.

A warm hypo bath does no harm, provided it is not too strong or of a different temperature from the developer and the rinsing water. The best strength is 1 to 5, that is, 1 pound of hypo to 5 pints of water, the pint of water weighing a pound. The bath should be acid and may contain a hardener. Avoid the usual formula of sodium sulphite, acetic acid and potassium alum, as it is especially likely to decompose in hot weather and throw down a fine precipitate of sulphur, which settles into the soft gelatine and cannot be removed. It is annoying to have a roll of films rendered unprintable by sulphur, and films are more liable than plates to this defect, on account of the plain gelatine backing which is intended to render them non-curling. Liquid sodium bisulphite (Lumière), if it can be obtained, is the safest acid clearer and hardener, possessing no tendency to decompose hypo; potassium metabisulphite is almost as good if not itself

decomposed by dissolving it in hot water. I have several times published the formulas, but repeat them here for the benefit of readers who may not have seen them.

THE BEST ACID FIXING BATH

Hypo..... 1 pound
Water..... 4 pints

Dissolve and add

Liquid sodium bisulphite..... 2 ounces
(Or dry granular, 4 ounces)
Water to make..... 1 pint
(and if greater hardening action is desired)
Chrome alum..... 1 ounce

This bath works perfectly on both plates and papers, and I have never observed the slightest tendency for it to deposit sulphur, even when it was used until exhausted. If sodium bisulphite cannot be obtained, substitute for it potassium metabisulphite in the proportion of about 2 ounces to each pound of hypo.

The time of fixing and hardening is important. Half an hour is not too long, particularly with double-coated plates. Prolonged action insures thorough fixing and protects the plate from frilling in warm washing-water, as it materially shortens the time needed to eliminate traces of hypo. Another useful dodge is to swab the plates very nearly dry with tufts of absorbent cotton as they come from the fixer, when not longer than 20 minutes in running water will be found sufficient. Plates hardened with chrome alum are not likely to be attacked by molds, which often colonize in unhardened gelatine and liquefy it, forming semi-transparent or transparent spots. The disadvantage of thorough hardening is that it renders the negatives difficult to intensify or reduce without a preliminary soaking in very weak nitric acid.

One of the most fruitful causes of trouble is the careless habit of leaving the fixer in an open tray. Composition fixing boxes are cheap and are easily protected from evaporation by using an old tray for a cover, the latter serving also to keep out actinic light until fixing is complete. On warm, dry days, evaporation takes place so rapidly that a fixer of the right strength at the start soon becomes strong enough to cause frilling. The reason for this is that the film, saturated with a relatively weak developer, shrinks immediately when put into the strong hypo and pulls away from the support.

Staining is the second great hot-weather trouble. Here the use of ice is almost imperative, though an acid short-stop immediately after development, instead of a rinse in plain water, is an almost sure preventive. As good a one as any is an ounce of liquid bisulphite in a quart of water. Weak acetic acid is often recommended, say an ounce of the No. 8 acid (25 per cent) to the quart of water. The print is briefly rinsed in the short-stop and then fully and quickly immersed in the acid hypo, where it is kept moving during the first few seconds. Precautions must be taken to keep the prints wholly under the surface of the bath, a convenient way being to set a glass funnel, stem up, on the last print in. The time of fixing should not exceed that given in the directions issued by the paper manufacturers, generally 10 minutes for single- and 20 for double-weight stock. A handy method is to turn all the prints face down at the expiration of half the time and continue putting prints in face up until the full time is up. Then, every time another print is put in, one of the first lot should be removed, the second lot subsequently being turned face down and treated in a similar manner.

Washing in hot weather should be performed immediately after fixing, for if prints are allowed to lie too long in plain water, they often stain, owing to the presence of organic matter. An automatic print-washer, such as the Ingento, is convenient, because it accomplishes the elimination of hypo in 20 minutes, thus reducing the risk of staining. In the absence of a washing device which will keep the prints separated and on the move, the two-tray method should be used. Keep the prints moving from tray to tray, using 10 or 12 changes of water, and they will be more thoroughly washed than if they were allowed to lie for hours in running water.

Finally comes the drying trouble. Heat and humidity are almost synonymous terms in some regions, and when the relative humidity is high, drying takes place very slowly. Properly hardened plates and papers can be safely dried by means of heat — as used by large photo-finishers — but the amateur generally has to depend on a draft of air. If he is fortunate enough to possess an electric fan, the problem is readily solved; if not, he must select as dust-free a place as possible and create a draft by manipulating doors and windows. But in any case, plates should be well swabbed with absorbent cotton and placed not closer than 2 inches on the drying rack. Never put them where direct sunlight can fall upon them. If removed when partly dry to a place of higher

or of lower temperature, they will show drying marks which will ruin the print. Prints, too, should be swabbed to remove surface water and dried face down on cheesecloth-covered stretchers as rapidly as can be managed.

GRAY EDGES ON PRINTS

Looking through the Competition prints the other day, we observed that many of them had gray edges where the mask had protected the margins from light. This defect of fogged whites may be due to an unsafe light — we prefer to handle *all* kinds of D.O.P. in orange light — but is usually caused by insufficient potassium bromide in the developer. If the developer contains enough unoxidized sodium sulphite, namely 10 to 20 grains of the anhydrous salt to the fluidounce, and the edges turn gray during development, it is proof positive that more bromide is needed.

The bromide solution may conveniently be a 10 per cent one, made by dissolving 48 grains in an ounce of water (or 10 5-grain tablets would be near enough), or a "saturated" one. At 65 degrees, 100 parts of water will dissolve 65 parts of bromide. In a cold or in an unusually warm darkroom, the strength would be less or more than 65 per cent. A good dropping-bottle can be made by cutting two small V-shaped notches the length of a sound cork, one to admit air and the other, opposite it, to allow the solution to flow out drop by drop.

Taking M.-Q. as a standard, one regulates the color of the deposit and the clearness of the whites by adding more or less bromide.

To secure a blue-black tone, use strong, fresh developer with barely enough bromide to keep an unexposed piece of paper perfectly clear during the number of seconds required by the brand of paper in use for normal development. This time varies from about 15 or 20 seconds for Regular Velox to a minute or more for some of the more recent kinds. Certain makes are not intended to give this color, and one must accept a warm tone instead; but the principle is the same: enough bromide must be added to keep the whites clear.

More bromide than the minimum useful amount will make the color browner with each increase, until finally a really rich, warm brownish-black can be obtained with about 10 drops of 10 per cent solution to the ounce of developer, with most makes of paper. Some will stand a great deal more, up to several grains to the ounce. A few manufacturers state that most of the troubles amateurs have with their goods are due to their not using enough bromide in the developer.

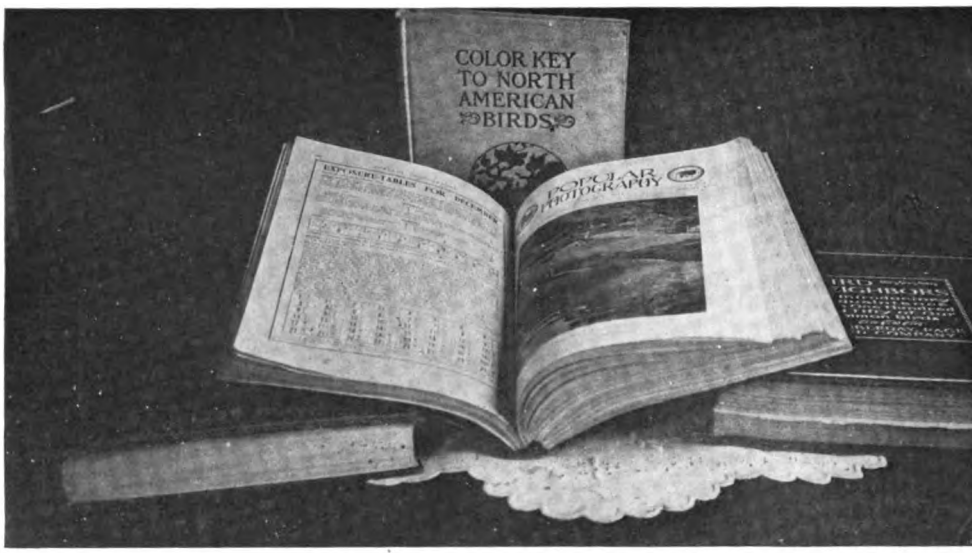
A good combination for the contrast grades is the S dilution of the Modified Thermo M.-Q. with bromide added to suit the paper. The M strength is good for the softer grades, as well as for bromide paper when rich blacks are wanted; but much more bromide is required than would be right for gaslight paper, about a grain (10 minims of the 10 per cent solution) to each ounce. If the used tray developer is kept for paper, it will often prove to have sufficient bromide and will make an excellent developer if kept up to full strength by timely additions of fresh stock.

A commercial photographer of our acquaintance keeps his used D.-Q. until it is almost black. We watched him one evening while he put through fifty-two 11 x 14 Professional Cyko Glossy prints in 44 minutes, keeping five in the tray all the time and adding a little fresh stock after doing ten prints. The uniformity of the tones was absolute. When he was through, he turned the muddy developer into a bottle, saying that it was too precious to throw away. He believes that the old, used developer works better than a fresh solution with the addition of bromide. He secures a good black with just enough warmth to make it particularly suitable for halftone reproduction, and cuts made from his prints carry all the detail present in the copy.

SIZE OF COMPETITION PRINTS

A reader asks whether there is any limit on the size of prints which are submitted in the contests of both magazines. He has a feeling, he says, that an enlargement is deficient in quality to a 3¼ x 4¼ contact print, yet the latter seems too small. He suspects that a 5 x 7 contact print would be the best all-around size and would impress the judges more favorably than a 6½ x 8½ or an 8 x 10 enlargement from 3¼ x 4¼.

The judges do not consider the data at all in making their awards. Each print, whether contact or enlargement, stands or falls by its own merit. A good enlargement to 5 x 7 should satisfy our reader. We are in the habit of enlarging a piece about 1½ x 2 from a 4 x 5 to 11 x 14 without loss of pictorial effect, so the question of enlargements depends largely on whether the negative is kept soft in development with a view to enlargement, in which case the resulting large print will not suffer from any lack of quality.



A VALUABLE REFERENCE BOOK GEORGE H. MURPHY

A VALUABLE REFERENCE BOOK

"I wish I could find some article on stops and their uses," I remarked one evening as we were talking of photography. "Can't you find something in POPULAR PHOTOGRAPHY?" asked my wife. Now, I hadn't thought of that at all, so I hunted up a year's supply of back numbers, and found just what I wanted. When I received those magazines I read every word, but I had forgotten a lot of things. I found I could find articles on almost any subject pertaining to amateur photography. In regard to "stops" I found on page 329, "Why I Should Stop My Lens"; on page 433, "The Stop Difficulty," and on page 480, "The Use of Stops."

I found it quite a task to look in the index of each number, so I thought of an idea. First I took the covers and staples out of a year's supply of magazines, then I removed the advertising pages; that left the pages numbered like a book. Beginning with page No. 1, I piled them up carefully. My last page was No. 558. At the front of the book I put the title page and index to the year's numbers. Next I got two pieces of cardboard, 7 x 10 inches. I laid one of these on top of the book and the other on the bottom.

With a sewing awl I punched fine holes along the edge where the staples were, about 1½ inches apart and ¼ of an inch from the edge. If one has a vise or clamp to hold the magazines, it will help a lot.

Now take a waxed thread or stout cord and sew through the holes the way a shoemaker does leather, but not too tight or it will bother in opening the book.

Take a piece of stout paper, about 3½ inches wide, and glue on the edge of the magazines and on to both covers about an inch. This will help to hold the covers and leaves and make a better-looking job.

Then around the edge of the cover I glued some black adhesive tape to make it look more finished. The result was a 7 x 10 book of 558 pages, full of valuable information and many illustrations, and an exposure-table for each month. The photo will show how the book looks. It is a great deal handier than looking into separate magazines.—GEO. H. MURPHY.

A WORD OF WARNING

Readers are advised to go slowly in using a saturated solution of potassium carbonate for rapid drying of plates and films. A correspondent writes that it caused the gelatine to strip from the plates he treated with it, though he followed the technique advised by its introducers, the Lumière Brothers. We had the same experience with a fancy scented solution of this character. It is an excellent medium for cleaning glass of its film, as it leaves the glass perfectly clear, and we can recommend it for stripping, though hardly as a drying medium.

RAYFILTERS

A correspondent asks what is meant by the expression "five-times rayfilter." Such a filter is one which requires with an orthochromatic plate five times the exposure which would be given without a filter.

EDITORIAL

OUR COMPETITION

The first prize in our April Competition was awarded to Mr. Sam Brugger for his picture entitled "This is the Life." The second prize goes to Alvin W. Prasse, "Harvest Time," and the third to Charles E. Kuse for his print "An Evening Sky."

The following pictures received honorable mention in our April competition: "Watchful Waiting," Harold Winslow; "Self-Portrait," Ernest Benson; "The Statue," C. K. McDonough; "Twins," F. L. Weaver; "The Floating Gardens of Mexico," J. H. Worden; "An Easy Rider," P. Spangenberg; "Edith," John H. Markley; "At Play," Cecil B. Parsons; "The Approach of Spring," Rudolf Schmidt; "Kennedy Ripple," J. R. Zeigler; "The Mill Stream," D. Sherman Babcock; "Winter Woods," C. S. Booth; "Posed for a Picture," Clifford G. Franklin; "Ladies' Band," J. H. Cunningham; "Where North Creek Turns," J. A. Owens; "The Shady Brook," J. A. Tiffin; "Window Portrait," Earl A. Newhall; "Smiler," Albert Linley; "Our Home," A. L. Canterbury; "The Pipe of Peace," Wm. Ludlum; "The Sun Dial," B. B. Jackson; "Stanbach Falls," F. W. Abendehein; "Dining Out," Lee K. Coffin; "A Home — One Hundred Years Ago," C. D. Parratt; "Siwash Rock," Joseph L. Healy; "The Old Mill," Geo. F. Penfold; "An Interior," John H. Seamans; "Bowed Down by Winter," Samuel J. Henderson; "Winter Scene," S. E. Byck; "Deserted," Wm. H. Rice; "Grandmother's Well," Gladys A. Mattson; "Morning in Early Spring," Wm. O. Yates; "Winter Haze," Francis Parrish; "Pilot Rock B. B. Club," Robert Resler; "The Park at Night," Herbert M. Perry; "Sunny Jim," Harry C. Rowe; "The Old Lighthouse," J. H. Peterson; "The Tourist," Leonard Stephenson; "The Little Street Musician," Walter Parnmill; "Window Portrait," C. E. Longfellow; "The Jungle Path," Don Harrison; "Mill and Dam," Sherman Hamilton; "The Choir Girl," Wm. O. Dauchy; "Portrait," R. Railton; "The Schryver Fire," Stark Weatherall; "The Oration," M. E. Smith; "I Want My Dinner," Geo. A. Nelson; "A Little Cliff Dweller," Wm. E. Hanssen; "Indoor Portrait," Fred E. Wood; "Hen Apartment House," J. R. McRae; "He Didn't Touch It," M. D. Gore; "In the Park," Stark Weatherall; "On a Swiss Lake," F. J. Craigie-Halkett; "Reflections," C. S. Booth; "The Snowdrifts on the River," Hans Einorson; "Mildred," Katharine Bermingham; "A Jolly Bunch," Guy L. Brown; "Fanning the Ballast," S. P. Osgood; "The White House," C. A. E. Long; "Feeding Time," R. F. Eckart; "Playing Chess," Ralph Beebe; "When the Cataract Froze," B. A. Ruple; "The Park Lake," H. E. Rogers; "In the High Sierras," R. B. Lawton; "Talking with Mamma," A. S. Currier; "Outdoor Portrait," Louis Gunter; "Interested," James Monahan; "A Cuban Country House," Angel Gonzalez; "Off for the Starting Point," Herbert O. W. Egan; "Water Lilies," W. H. Sargent; "The Cowboy," John S. Carlson; "Landscape," Ralph B. Williamson; "Symphony Theatre at Night," R. C. Heagy; "The Cigarette," F. A. Northrup; "Lake in the Woods," O. Fortenbach; "The Quiet Hour," Harriet E. Williams; "Portrait," E. M. Summers; "Flower Study," W. T. Kempin; "Listening to the Music," Wilma B. McDevitt; "The Guide," J. Everett Williss; "In the Early Morning," Charles D. Meservey; "Safety First," L. Benedict; "Who's Coming." Joseph C. Werner; "The Campfire," Stark Weatherall; "Still Life," Harry Sloan; "Hark!," Wm. R. Brackbill; "When the Fish Begin to Bite," George B. Spear; "My First Scenery," Wm. H. Young; "The Pine on the Rock," Kathryn F. Wotkyns; "Uncle Remus Stories," W. E. Whitaker; "Rose," A. R. Brown.

AN ADVERTISING EVIL

One of our readers calls our attention to the fact that certain photographers whose work is perhaps not of a high grade have been known to display in their show windows sample prints sent out by manufacturers for the purpose of advertising the quality of their plates and printing papers. This is unfortunately true, and many such samples bear upon their faces absolutely no distinctive indication of authorship, or even of the methods by which they are reproduced, thus lending themselves to an evil which has no reason for existence. An individual who, deceived by such specimens, gets a miserable portrait by a cheap jack, is likely ever afterward to shun the photographic studio as a fraudulent device for taking his money. Manufacturers have within their own hands the prevention of this evil, by seeing that the makers of their sample prints receive due credit on the face of the picture, and also by putting such legends upon them as will prevent their fraudulent use in this manner.

DELIVERY OF MAGAZINES

Our readers are so anxious to get their magazines that they often do not give us time to get them out. Our regular mailing day is the 25th of the month, but it usually takes us three or four days to get the mailing done, and then two or three more days must be allowed for the magazines to reach their destination, and more time if they have to go to the western part of the country. We think that if our readers will take these things into consideration they will wait more patiently for the magazine. however anxious they are to receive it.

READERS' FORUM

THE TRANSFER PROCESS

In the April 1915 issue of POPULAR PHOTOGRAPHY is an article on transferring photos to watchcases and dials.

I have tried this method and must confess that it is not as easy as it looks.

I saw the same article once before and that is where I got my formula.

I will tell you my difficulties and perhaps you can tell me what was wrong.

In the first place, I found that if I didn't let the picture dry several hours, instead of fifteen minutes, after covering with the collodion, that the paste would not spread over it at all, acting the same as if the picture was greased.

In the second place, I found that dampening the print, after I had rubbed off the greater part of the backing, caused the thin emulsion of the paper to swell and tear loose from the back of the collodion film.

I tried both semi-matte and glossy paper with same result. Also tried hardening the face of the print before flowing the collodion over it, but it didn't seem to do any good.

In the third place, when I placed the glass with the picture pasted on it in the hot water to separate the two, it softened the thin film of picture attached to the collodion until it looked like anything but a picture. I will tell you how I finally got a pretty fair picture on the dial of my watch.

After flowing the collodion solution over the face of the print (a glossy print), I let it dry several hours, then pasted it face down on a piece of firm cardboard (the smoother the better) and let it thoroughly dry. Then taking a very strong alum water I dampened the back of the print and began rubbing away the paper backing. When I got down to the picture, the alum seemed to harden the emulsion and prevent its swelling and leaving the collodion film. At that I had to rub very carefully to keep from tearing it loose.

After I had rubbed off all the paper backing I turned the picture over and dampened the cardboard and took the greatest part of it off, a layer at a time. When I had gotten off all but a very thin layer pasted to the collodion film, I trimmed the picture to fit the dial of my watch. With a solution of gum acacia I attached the picture to the dial, cardboard side up of course. After it was thoroughly dry I dampened the cardboard remaining on the picture and rubbed it off, leaving the picture on the dial.

I don't know whether the picture, with what little cardboard there is on it when it is glued to the dial, would bend to fit a curved case or not, but it certainly works all right on a flat surface such as the dial.

I thought from the way the article read, that water would have no effect on separating the picture from the collodion film, but I thought I mixed my collodion solution just as the formula called for.

I would like to know the kind of paper best to make prints on for transferring, whether they ought to be hardened or not, and what with, before covering with the collodion solution.

Would putting in too little turpentine or too much turpentine or too little or too much camphor spirits or alcohol cause the picture to fail to stick to the collodion film when it is dampened? In other words, what should I increase or decrease in the formula to make them adhere more firmly?— SHERMAN HAMILTON.

EDITOR POPULAR PHOTOGRAPHY:

It has given me quite a bit of pleasure to read over the data given on page 297 of the April issue of POPULAR PHOTOGRAPHY, as I have been intending for some time to try out the D.-Q. Thermo method of development.

In making a copy of the tables for my use in the darkroom, as I did not want to run any chances of spoiling the magazine, I ran across a few errors, and if these have already been called to your attention, as they no doubt have, then it is "on me" for being so slow.

For VVS under 74°, read 16′ instead of 16″.

For VVS under 58°, read 37′ instead of 37″.

For Q under 52°, the 7′-30″ should be 10′-30″ (I think)

While the table does not so state specifically, I take it that the time mentioned is for tank development Will you kindly advise if I am correct in my assumption.— L. A. STARRETT.

[The table is, of course, intended for tank development only.— ED.]

NEWS AND NOTES

The new catalog of Voigtlander lenses, cameras, binoculars and opera glasses for 1915–16 has reached our desk. Copies can be had from most dealers or by writing to Voigtlander & Sons, 240 East Ontario Street, Chicago, Ill. Like most lens catalogs, this is beautifully illustrated with attractive samples of work, and would form a pleasing addition to the amateur photographer's library.

The new Ansco catalog is ready at all Ansco dealers, or is obtainable by writing to the Ansco Company, Binghamton, N. Y. The cover is most attractively printed by offset process, and the typography is of the highest character. Numerous novelties are listed in this catalog, including a full line of round-cornered cameras, made possible by the expiration of the patent on such a shape — the Vest Pocket Ansco No. 1 with R. R. lens, No. 2 Vest Pocket with anastigmat, amateur printing machine and Ansco Filmpack.

THE REXO LINE.— We have lately made it a point to give every grade of Rexo paper a careful test. The complete line now includes: Regular Rexo in three grades of contrast; Professional Rexo, and Enlarging Rexo. These papers cover all the requirements of both amateur and professional photographers to perfection. We have always favored papers made in three grades for amateur use, as the soft sort is really essential for many negatives, if a result not "soot-and-whitewash" is to be produced. The three grades of Rexo will fill all requirements in average contact printing. The paper is fast, has remarkable latitude, and yields clean, brilliant prints of fine color. The Professional paper is slow printing, requiring about six times as much exposure as the Normal grade of the regular amateur paper. It is of high quality. The two grades of Enlarging Rexo, Normal and Soft, allow considerable latitude in making enlargements. The former gives very clear, brilliant results from negatives too soft for successful bromide enlarging, while its speed is 36 times that of the ordinary paper, or only about 1-40 to 1-60 the speed of bromide papers. For example, a two-diameter enlargement took 44 seconds with Parallax lighting. The same negative could not be timed short enough to yield a brilliant bromide print.

We have recently had an opportunity of working with an Ensign Popular Reflex Camera, marketed in the United States by G. Gennert, 24–26 East 13th Street, New York. Though the camera is sold at a popular price, it is an extremely well-constructed and efficient instrument. The adjustments are all that are required for practical speed work, and at the same time are so few in number and simple in operation that they minimize the chances of error in operation. The shutter runs at a uniform speed, and the exposure is varied by changing the width of the slit. This is affected by moving a single dial, and change to any desired speed can be made almost instantaneously, without the necessity of referring to any complex table of tensions and slit widths. Focusing, setting the shutter and releasing are accomplished by three simple operations, requiring only a fraction of a second. We can thoroughly recommend this camera to those desiring a reflecting camera fitted with a fast lens, at a moderate price.

We have received for test samples of the new Record Extra Fast plate, and after giving this a speed test find that it is to be listed in our tables as speed 2. These plates are made to satisfy the demand which exists for sensitive material of a moderate speed, and will doubtless prove satisfactory to many users whose demands call for such plates.

NEW PLATES AND A FILM.— Several new varieties of films and plates have lately been submitted to use and we have tested them by exposing a number on the same subject, each time with a size smaller stop, to find the Watkins speed which would allow one quarter the normal exposure without serious loss of shadow detail. It is fair to assume that a rating thus found will give good average results in the hands of users, and half the time thus indicated will answer some workers' requirements. Results are:

	Watkins	A.P.
Ansco Speedex Film	250 VS	1½
Barnet 550	500 VS	½
Imperial Duonon	250 MQ	1½
Marion's Brilliant (300)	350 M	1
New Record	180 VS	2

The development-speeds suggested above gave good contrast on the plates tested; but it must be remembered that some ultra-rapid plates are incapable of giving the same standard contrast which is easily yielded by slower brands. The same holds true of some of the slower brands which are weak in silver. In speed work particularly, where only the underexposure portion of the H. and D. curve is used, the only way to get normal contrast is to develop in a solution of double or triple the ordinary concentration or for a much longer time.

The Speedex film is slightly faster than the regular Ansco film, but in order to insure full exposures it should ordinarily be classed as above. The regular Ansco film, by the way, is rated by its makers S in development speed, instead of MS, as we have listed it. Possibly because we invariably give full time, we have had no difficulty in getting ample contrast with MS dilution of the Thermo developers; but the Speedex film will probably satisfy users better if developed as VS.

The Barnet 550 is fully equal in speed and density-giving power to the other class ½ plates (except Sigma as to density). It is an excellent ultra-rapid plate for all speed photography.

The Imperial Duonon is the first double-coated plate put out by any English platemaker, and was evidently undertaken at the solicitation of the American agent, G. Gennert, who appreciates the demand on this side for absolute non-halation quality in a color-sensitive plate. We understand that the outer emulsion is the Non-Filter. This plate is fully orthochromatic and has the usual Imperial qualities which make the various brands so popular.

Marion's Brilliant (H. and D. 300) is second to the Record in speed, being only 50 per cent slower. It is probably the same as the Record and consists of the slower plates from each run. It is very fast, clean and brilliant, and, like the Record, should not be overtimed, as it soon flattens out with increased exposure.

The New Record is our old Abington, Mass., friend, now being made for G. Gennert, who is exclusive trade agent. The quality is the same as when it was on the market some years ago.

The Illinois College of Photography held its commencement exercises on Friday, April 30, graduating a class of sixteen. The instruction in this college is continuous, and pupils may enter it at any time, graduating whenever they have completed the course.

The Kodak catalog for 1915 has been published, and can be had from any kodak dealer or by writing to the Eastman Kodak Company, Rochester, N. Y. As usual, it is a most beautiful production typographically, and contains much information of value to every photographer who is contemplating the purchase of a new camera. The great novelty in the kodak line this year is the Autographic Kodak, in various sizes, together with the autographic backs for cameras already on the market, and this improvement gets its due share of attention. As another improvement, we note that all of the kodaks are now fitted with metal shutter releases instead of rubber bulbs.

EXPOSURE-TABLES FOR JUNE

DIRECTIONS: Find in the tables printed below the NUMBERS for SUBJECT, STOP, LIGHT, HOUR, and PLATE. Add them, find the sum in the last table, and give the exposure indicated. When the exposure fails to correspond with the speed-marking on shutter, use the nearest shutter-speed, preferably the lower. If sunlight falls over one shoulder, add **0**; if straight across subject, add **1**; if sun is ahead, add **2**. When using back combination only of lens, add **2**.

EXAMPLE

Average landscape	3	July, 11 A. M.	0
Stop U. S. No. 8	6	N-C film	1½
Intense light	0		

Adding these numbers, we get **10½**, and on referring to the last table, under **10½**, we find **1-40** second, which is the exposure to give. In this case you would use the speed marked **1-50** and open the lens a little, if possible; say, half-way to U. S. No. 4.

SUBJECT

Sea (only) and clouds	½	Street scenes, buildings, groups	5
Sea-views, snow-scenes, distant landscape	1	Portraits in shade	7
Open landscape, without foreground	2	Indoor portraits	8 to 10
Average landscape, with foreground	3	Interiors	16

STOP: —

f:2	*f*:2.3	*f*:2.8	*f*:3.3	*f*:4	*f*:4.7	*f*:5.6	*f*:6.7	*f*:8	*f*:11.3	*f*:16	*f*:22	*f*:32	*f*:45	*f*:64
				U.S. 1	U.S. 1.4	U.S. 2	U.S. 2.8	U.S. 4	U.S. 8	U. S. 16	U. S. 32	U. S. 64	U.S.128	U.S.256
1	1½	2	2½	3	3½	4	4½	5	6	7	8	9	10	11

LIGHT: Intense sunlight (inky-black shadows), **0**; Bright sunlight (strong shadows), ½; Faint shadow cast by sun, **1**; Dull (no shadows), 1½; Very Dull (whole sky very dark), **2**.

HOUR: 10 a.m. to 2 p.m., **0**; 9 a.m. and 3 p.m., ½; 8 a.m. and 4 p.m., **1**; 7 a.m. and 5 p.m., **1**; 6 a.m. and 6 p .m., **2**; 5 a. m. and 7 p. m., **5**.

PLATE: AMERICAN, 1½. ANSCO FILM, 1½. BARNET — Film, 1½; Superspeed Ortho., **1**; Ortho. Ex. Rap., **2**; Red Seal, **1**; Red Diamond, 1½; Self-screen Ortho., **2**; 550, ½. CENTRAL — Special XX and Sp. Home Portrait, ½; Special, **1**; Comet, Colornon, and Pan-Ortho., 1½. CRAMER — Crown, **1**; Anchor, **2**; Banner, 1½; Inst. Iso., 1½; Med. Iso., **2**; Commercial Isonon, 2½; Portrait Isonon, 1½; Trichromatic, **3**; Slow Iso., **5**; Contrast, **9**. DEFENDER — Vulcan, **1**; Vulcan film, 1½; Ortho., **2**; Non-hal. Ortho., **2**; Slow, **9**; Process, **9**. DUFAY DIOPTICHROME, **7**. EASTMAN — Motion Picture Film, **1**; Portrait Film, **1**. ENSIGN FILM, 1½. FORBES—Challenge, 1½. HAMMER—Sp. Ex. Fast, **1**; Ex. Fast, **1**; Aurora Ex. Fast, 1½; Ortho. Ex. Fast, 1½; Ortho. Non-hal. **2**; Fast, **2**; Ortho. Slow, 2½; Slow, **4**. ILFORD — Monarch, **1**; Zenith, 1½; Sp. Rap,. **2**; Chromatic, 2½; Ord., **3**; Process, **9**. IMPERIAL—Flash-light, **1**; Spec. Sensitive, **1**; Orthochrome S. S., **1**; Spec. Rap. 225, 1½; Spec. Rapid 200, **2**; Non-filter, **2**; Process, **9**. JOUGLA — Violet Label, 1½; Green Label, **2**; Omnicolore, **7**. KODAK—Speed Film, **1**; N. C. Film, 1½. KODOID PLATES, 1½. LUMIERE—Sigma, ½; Blue Label, 1½; Film, 1½; Ortho. A, **2**; Ortho. B, **2**; Panchro. C, **2**; Autochrome (outdoors), **8**, (indoors)**9**; Process **9**., MARION — Record, ½; P.S.,**1**. NEW RECORD—Extra Fast, **2**. PAGET—XXX, 2½; XXXXX, **2**; Swift, **1**; Ex. Spec. Rapid, **1**; Ortho. Ex. Spec. Rapid, 1½; Panchro. Ord., **2**; Panchro. Colour (no screen), 2½; Spec. Rapid, 1½; Hydra Panchro., 3½; Hydra Rapid, 3½. PREMO FILM PACK, 1½. ROEBUCK—Blue Label, **1**; D. C. Ortho., **2**; Ortho., **2**. SEED — Graflex, ½; Gilt-edge 30, **1**; Color Value, **1**; Gilt-edge 27, 1½; L. Ortho., 1½; 26X, **2**; Non-hal., **2**; Non-hal. L. Ortho., **2**; Tropical, **2**; C. Ortho., 2½; Panchromatic, 2½; 23. **3**; Processs, **9**. STANDARD — Extra, 1½; Imperial Portrait, 1½; Orthonon, 1½; Polychrome, 1½; Thermic, 1½. STANLEY — 50, 1½; Commercial, **4**. ROGERS — Regular, **1**; Orthochromatic, **2**; Orthochromatic N. H., **2**. WELLINGTON — Extreme, ½; 'Xtra Speedy, **1**; Film, 1½; Iso. Speedy, 1½; Portrait Speedy, 1½; Anti-screen, 1½; Speedy Spec. Rap., **2**; Ortho. Process, **9**. WRATTEN & WAINWRIGHT — Panchromatic, 1½; Process Panchromatic, **3**.

3½ S 1/3000	4 S 1/1000	4½ S 1/2500	5 S 1/2000	5½ S 1/1250	6 S 1/1000	6½ S 1/700	7 S 1/500
7½ S 1/350	8 S 1/250	8½ S 1/150	9 S 1/100	9½ S 1/75	10 S 1/50	10½ S 1/40	11 S 1/25
11½ S 1/20	12 S 1/12	12½ S 1/10	13 S 1/8	13½ S 1/5	14 S 1/4	14½ S 1/3	15 S 1/2
15½ S 2/3	16 S 1	16½ S 1½	17 S 2	17½ S 3	18 S 4	18½ S 5½	19 S 7½
19½ S 11	20 S 15	20½ S 23	21 S 30	21½ S 45	22 M 1	22½ M 1½	23 M 2
23½ M 3	24 M 4	24½ M 6	25 M 8	25½ M 12	26 M 15	26½ M 24	27 M 30
27½ M 45	28 H 1	28½ H 1½	29 H 2	29½ H 3	30 H 4	30½ H 6	31 H 8

These tables are based on the 1914 edition of the "American Photography Exposure-Tables," a new and revised form of the "Photo Beacon Exposure Card." Owing to the great increase in the speed of lenses and plates since the original compilation of these tables, it has been necessary to completely change the system of numbers corresponding to stops, plates and exposures, so that exposure numbers from this table are 5 units higher than in the old tables. The complete tables, in pocket form, 3 x 5 inches, containing full directions for obtaining correct exposure under all conditions, may be obtained from our publishers at the price of 25 cents postpaid.

JULY, 1915 TEN CENTS

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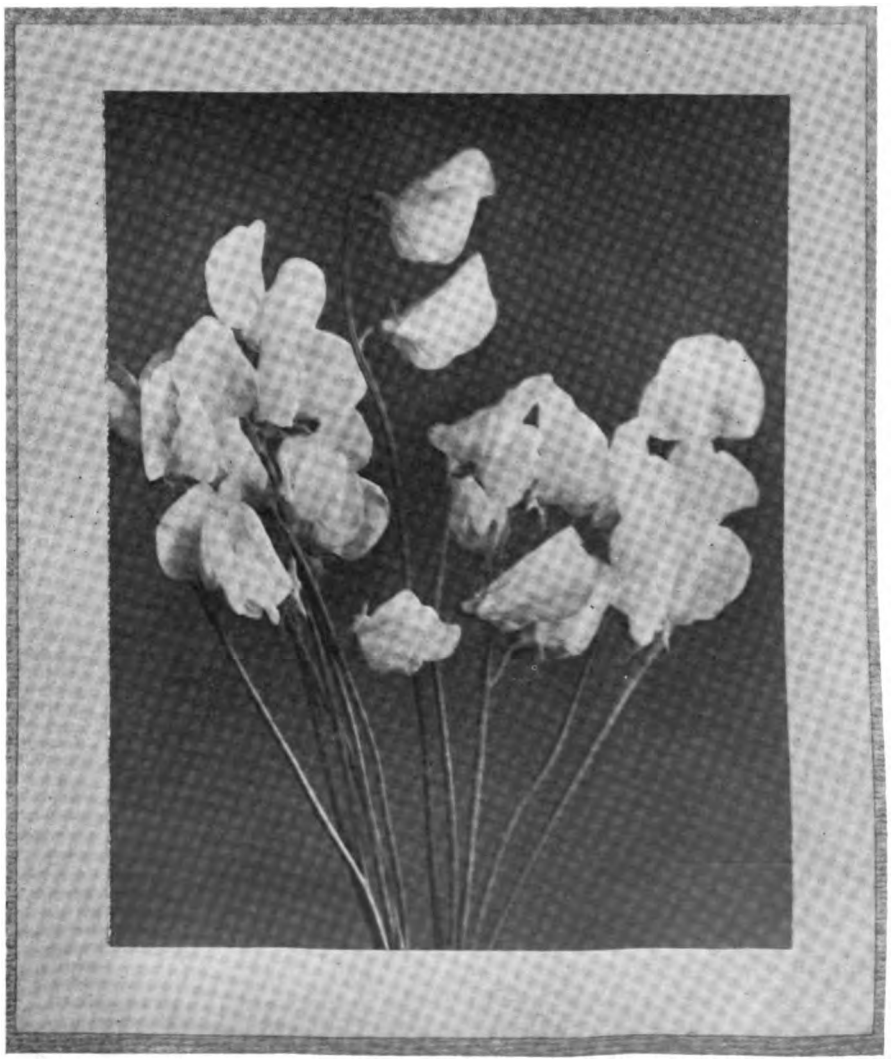


SWEET PEAS — W. T. KEMPIN

(See page 402)

AN INTERESTING TOY PERCY D. BOOTH

AN INTERESTING TOY

In some respects this print is very good, but the strip containing the reflected light on the chair back is not an aid to the composition in any way, so it had better be trimmed off. Removing the superfluous space at the left gives the figure a less central spacing. The concentration of light can be helped by spotting down the fleck just behind the shoulder. The technique in other respects is good, the rendering of the shadows being particularly worth the attention of beginners. Data: 4 x 5 Seneca No. 3 camera with 6-inch R. R. lens; 1 second at *f*: 11 in September at noon; bright sunlight; Standard plate of unnamed brand; M.-Q.; enlargement on Normal Cyko Matte, redeveloped.

EVERYDAY USES FOR PANCHROMATIC PLATES

There is a widespread impression that panchromatic (red-sensitive) plates are useful only in great emergencies, and certainly they are the only sensitive material which will always give proper results — when colors are dealt with. So firmly are we convinced of the necessity of knowing when and how to use these "sensitive-to-*all*-colors" plates that we reprinted in full, in the first volume of the magazine, a pamphlet issued by the Eastman Kodak Company on the use of Wratten Panchromatic Plates. Certain persons criticized us for so doing; but that readers appreciated it was shown by the large number of letters we received commending us for giving the information. This Eastman booklet is obtainable by writing direct to the company at Rochester and asking for the booklet on "Color Plates and Filters for Commercial Photography." We advise all readers who like to know all they can about their favorite amusement to obtain a copy and learn to use the red-sensitive plates whenever possible, if correct rendering of colored objects is desired.

The chief objection to the use of red-sensitive plates, namely, the impossibility of handling them in ruby light, is removed by using the Thermo system of development, as described in the magazine for June, 1914, and since republished in the form of the Thermo Card for darkroom use. If readers will take pains to expose correctly, according to the monthly tables, and to develop automatically in total darkness by the Thermo system, they will get perfect results with panchromatic plates.

That a knowledge of these materials and of the correct rayfilters to use with them will often save the day may be gleaned from the following letter.

"I took several photographs during the past week of a moving van and of an ice wagon. The owner had his name and the words, 'Furniture Cars for Hire' and 'Ice Delivery' painted on the sides of his wagons. They were painted a dark red, and the lettering was a blue not quite so dark. When I developed the plate there was no lettering to be found. The side of the wagon was one solid color. Please advise me if this fault can be overcome and whether there is a plate made to take the different shades of color separately. If so, please give the name of the plate and any information which you think would be helpful to me."

This case is, one may say, an extreme one; but many times one is confronted by other colors which photograph in what seems to the eye an unnatural manner. The sensitiveness of the eye and of the plate to colors is quite divergent. To the eye, yellow seems brightest, with orange and red also rather bright, and blue and violet rather dark. To the plate, the relation is reversed. Blue and violet "take" almost white; yellow, orange and red, almost black. The "ortho" and "iso" plates are more sensitive to yellow-green; but only the panchromatic or red-sensitive plates are fully

CHUMS
HARRY BAUER
First Prize, May Competition
(See page 390)

GOING HUNTING MRS. H. H. WILSON

sensitive to *all* colors. To get a perfect effect, they must be used with a suitable rayfilter.

There are two classes of filters — compensating, or correcting filters, represented by the usual yellow screens; and contrast, or separation filters, including sets of three-color screens, in blue-violet, green and red-orange. Most makers of panchromatic plates supply suitable sets of screens. For instance, one can get from Eastman a set of three yellow screens, K1, K2 and K3, for various degrees of correction, the K3 taking about 5 times' increase of exposure and rendering all colors in their exact visual brilliancy. There is also a set including the other colors for contrast work.

The contrast filters are used, in general, as follows: Suppose the red field of the wagon is desired light in tone and the blue lettering dark. Simply put on the red filter. The red will then photograph very light and the blue dark. To bring out the blue letters as if light on a dark ground, use the blue-violet filter. If, however, the contrast, as it looks to the eye, is fairly strong, one could make a successful record with one of the yellow screens — sometimes with no screen at all. A red-sensitive plate, *without a screen*, gives just as good color rendering as an ortho plate with an average (3 to 6 times) screen. Time and time again, the unscreened panchromatic plate will give sufficiently good color rendering to bring out the values satisfactorily. The only disadvantages of panchromatic plates are that they are not yet made double coated to prevent halation and that they do not keep more than three to six months.

Whenever we use panchromatic plates, we generally feel so much better satisfied with the results that we make an effort to keep a supply on hand for either landscape or portrait use. This generally means ordering some weeks ahead; but it pays in the power it confers to get correct rendering when it is desired. The cost per dozen is about the same as for films.

GOING HUNTING

A snapshot in bright sunlight generally gives the sitter what one of our readers calls the "sun-grins." The lighting is seldom favorable for bringing out the sitter's features. Here the charming Amazonian wielder of the pump-gun is not quite spoiled; but diffused light in the shade of the house with the same exposure would have been better. The usual amateur fault of centering the figure is evident. Data: 3¼ x 5½ Seneca with anastigmat lens; 1-25 second at *f*: 6.8 in August at 11 a. m. on a Seed 27 plate; Eastman Special developer; Normal Cyko print.

FIGURE STUDIES AND PORTRAITS

Referring to pages 269 and 295 of our April, 1915, issue, a reader asks how far away the camera was placed to get images of the size shown. His object is to learn how far away to stand when attempting similar subjects with a 3A camera with standard R. R. equipment. Another point in connection with the first of the illustrations is how it is possible to get sharp foreground definition and a soft or fuzzy distance.

We are glad that these questions have been asked, for they cover points which may well puzzle a beginner with a film camera, unable, as he is, to foresee the size of the image he is going to get. "A Young Beginner," on page 269, was probably made with the lens about 8 or 10 feet from the subject, and the focus set at one or the other of those distances. The "Outdoor Portrait," on page 295, is reduced from the original trimmed 5 x 7 print, and the size of the heads in the large-scale print would

lead us to estimate that the lens was about 6 feet from the children. The 3A is equipped with practically a 7-inch lens, such as was used by Mr. Brodsky for the second picture.

Most full-length figure studies, with a 3A, would be taken at from 8 to 12 feet. The figure should first be accurately located in the finder (using a "Finderscope," if available, to make sure the finder image corresponds to that on the film) and the distance then carefully measured. If it proved to be, say, 9 feet, the front should be set at the 8-foot mark. This would insure a sharp foreground and soft distance. If the figure was 11 feet away, on the other hand, the 10-foot setting would be the best. A good means of controlling the focus is to pace off the distance, using the regular military pace of 30 inches. A telemeter, which costs only 50 cents, is another excellent aid to finding the right distance.

The ordinary rule for focusing is to get the principal object in the sharpest focus; but the foreground should generally be almost as sharp as the principal object. This result is secured by focusing on a point a little nearer the camera than the principal object. In cases where there is much distance between the object and the nearer part of the foreground, the lens may need to be stopped down to secure sufficient depth of sharp field. When the difference is slight, a large stop is to be preferred, for by its use one secures the effect of softness in the distance. A good general focus for the 3A size in landscape work is secured by setting the lens at 25 feet and using stop *f*: 8.

THE SONG OF CHILDHOOD

Mr. Meservey is unusually fortunate in his portrayals of this child, and the present example of his skill is noteworthy for the unstudied pose and the excellence of the technique when working under difficulties. A great deal of the success which this contributor attains is due to the care with which he analyzes his results. Thus, he says, in answer to question 3, that one of the faults he sees in his picture is the patch of strong sunlight under the chair. "Still, this is the highest light and it is near the darkest dark." The reasoning is ingenious; but the true principle is to have the lightest light and the darkest dark together *at the center of interest*. In a portrait of the type of this one, the face, of course, is the most important spot. At the same time, to subdue the light under the chair would be to create a false lighting. Leaving the light as it is, then, is the lesser

THE SONG OF CHILDHOOD C. D. MESERVEY

of two evils. One might, as Mr. Meservey suggests, try again and again without getting the same expression or exactly the same pose, so praise is due to him for seeing the picture and snatching it at the right instant. Data: 4 x 5 Cycle Poco with 6½-inch R. R. lens; ¼ second bulb exposure at *f*: 11 in January at noon; bright sun outside; Standard Polychrome plate; duratol-hydro tray development; print on an Azo C Hard postcard, developed with M.-Q.

IMPROPER THERMO DEVELOPMENT

"I tried your Exposure-Tables recently and developed the Defender Ortho plates in tank pyro powders for 20 minutes at 65 degrees. The results were very dense. Can you tell me the reason?" writes a new subscriber.

The tables indicate full exposure, and that, naturally, insures ample density in the negatives, for the more light action (within the latitude of the plate) the more density when the time of development is fixed. The tank pyro, however, is put up for films, which are classed S (slow) in development speed, whereas the Defender Ortho plate is classed MQ

A GROUP OF COUSINS R. GRONBRACK

(medium quick). The time of development for the plate is only about 15 or 16 minutes instead of 20 to get the right printing quality.

Where more than one brand of plate or film is used, it is easier to develop with stronger or weaker solution, to suit each class of plate. This system is adopted on our Thermo Card. For instance, to develop a VVQ (very, very quick) plate, one would take 1 dram of each stock solution of the Watkins pyro-soda and dilute to make the total volume 3 ounces for tray development of one plate. The time for 65 degrees, according to the Card, is 5½ minutes. At the same temperature, the time remains the same for all plates, but one rated as MQ would require 2¼ drams of each stock, and a film rated as S, 8 drams of each stock. It is easy to select the strength which gives just the desired result by making a few exposures by our tables and developing them in say three different strengths.

A GROUP OF COUSINS

Even though the small sitters are placed in a row, there is sufficient variety in pose and lighting to make the arrangement less objectionable than usual. The exposure is not given in the data, but the lens was stopped down to *f*: 16, and the shutter evidently did not have a snapshot slow enough to secure really full time. It is in precisely such cases as this that one finds a good shutter having an accurate 1-10 second invaluable. One seldom uses speeds over 1-100 save in the photography of athletic sports and other forms of action work; but an accurate 1-10, 1-20, 1-40, and 1-80 would be used thousands of times in general work. Perhaps some day the manufacturers will furnish these speeds. Data: 3A postcard camera, make not stated, with Wollensak lens; snapshot at *f*: 16 on a Cramer plate of unstated brand; M.-Q. tray development [too long]; print on a Soft Semi-matte Kruxo card.

THE "BEST" DEVELOPER FOR FILMS

Having just received a copy of the Thermo Card, a subscriber hastens to write: "Which formula is the best for N. C. films — the Watkins Thermo pyro or the Modified Thermo M.-Q. or D.-Q.?"

Most film manufacturers recommend pyro. This is partly due to the fact that the "pyro stain" to some extent compensates for underexposure by giving more printing density than is apparent to the eye. Workers who habitually give full exposures, such as are indicated by our Tables, have no difficulty in getting perfect negatives with other developers. Our own experience with the Modified Thermo D.-Q. on films is that it gives soft, harmonious negatives which have a color just warm enough to insure good printing quality; but we invariably give not less than half the full Table time even for snapshots.

Films are not like some of the cheap plates, poor in silver. They contain ample silver to yield vigorous density if given anywhere near

TWO LITTLE SPANISH GIRLS MRS. WILMA B. McDEVITT

full exposure. Thin negatives, in Thermo development, indicate underexposure. The best plan is to use the Tables every time, as then one is sure of fine negatives with any developer.

TWO LITTLE SPANISH GIRLS

In the absence of data, we assume that this enlargement is from a snapshot which came perilously near underexposure, for there are only hints of details in some of the values which should have counted as dark middle tones. Possibly the print itself is too dark, the negative being contrasty and the effort having been made, in timing the enlargement, to get every bit of gradation in the highest lights. The reproduction, of course, is some-

THE RANGE RIDER MRS. J. A. DENOVAN

what grayer at both ends of the scale than the print from which it was made. The effect, therefore, is particularly good. The placing of the figures is excellent. The effect of sunlight is well rendered and the scheme of light and shade is one which looks well considered simply as a pattern. In other words, the "spotting" is good. There are a few minor defects, but on the whole the result is so good that we prefer to let readers find them for themselves.

THE RANGE RIDER

We have often called attention to the excellent results which can be secured with the low-priced, single-lens cameras. This enlargement from a No. 2 Brownie film is as successful as if a hundred-dollar outfit had been employed. The perspective is not good because the camera was shoved right under the horse's nose,—not used at a reasonable distance. The film was enlarged by a professional.

A GOOD GAIN

This picture is a fine piece of action photography. The handling of the figures reminds one of the elaborate groups which were so popular with painters of two generations ago. Many football pictures entirely lack composition. This one is well composed and fairly well focused and exposed. Data: 2½ x 3½ Cameo II camera with Beck Mutar Series II lens; 1-250 second; November, 3 p. m.; bright light; M.-Q.; Stanley plate; enlargement on Studio Cyko of unknown grade.

MORE ABOUT SHUTTER EFFICIENCY

Several readers have asked for definitions of some of the terms used in the article on pages 228–230 of the March, 1915, issue.

What is the difference between "rated speed" and "total duration"? asks one reader. The first term means what the manufacturers assert is the speed, not stating whether they intend to imply efficient exposure or actual time from opening to closing. The second term means the exact fraction of a second between the first admission of light and the shutting off of the light. It is evident that a shutter cannot open or close without losing a part of the time. The loss cuts down its efficiency from the theoretical 100 per cent claimed by the focal-plane advocates to an average of 85 per cent. In other words, an actual time of 1-100 second acts only for 1-85 second. The latter is called the efficient exposure.

We once asked the inventor of a certain between-lens shutter how he measured his speeds, and were forced to conclude from his angry and incoherent answer that he just guessed at them. Perhaps when he claimed 1-2000 second he meant that the efficiency, in preventing blur, was as great as could be obtained with a focal-plane shutter working at that speed.

Mr. Maxfield did not determine the efficiency of the between-lens shutters which he tested, as that would be an extremely difficult problem, involving special apparatus and higher mathematics, owing to the constant change of the shape of the aperture as the blades move. It is, however, very easy to

A GOOD GAIN WM. F. LINDSTAEDT

measure the efficiency of a focal-plane shutter, as that is dependent on the distance between the sensitive surface and the slit. To reach an efficiency of 100 per cent, the slit would have to work in the same plane surface as the film. It is, of course, always some distance, say ½ to ⅝ inch, in front of the film. Suppose the distance from lens to plate is 6 inches and the diameter of the diaphragm is 1 inch. The shutter slit cuts the cone of rays at a point where the bundle is about ⅛ inch wide. A ⅛ slit would, therefore, during its movement across the cone, allow the full amount of light to pass only during about 50 per cent of the time. The efficiency at highest speed is therefore 50 per cent. If the slit takes 1-400 second to travel a distance equal to its own width, the efficient exposure is 50 per cent of 1-400, or 1-800 second.

When the slit is wider than the cone of rays, it does not mask them during so great a portion of the time; and, with the widest possible aperture, the efficiency might rise above 85 per cent. The focal-plane shutter, as is well known, is splendid for moderate speeds; but it cannot, by most people, be used successfully on a hand camera for really slow speeds, such as 1-10 second. The jar of the curtain shakes the camera and blurs the image.

Another reader asks whether he only imagines it or whether there is a real difference in efficiency between an old automatic and an Ilex Acme. He has observed that the old shutter opens slowly and evenly, while the Acme seems to jump open quickly, stay wide open for some time and then close quickly.

This reader is a good observer. The old shutter has an efficiency of about 50 per cent and the Acme of about 85 per cent, in all probability. The old two-blade shutters are all relatively inefficient, and practically every modern shutter is designed to act like the Acme. The makers used to mark the old shutters faster than they worked, to allow for loss of light. Thus, the marked 1-100 was really 1-50 or 1-60 actual total duration of exposure, and the loss of illumination brought it to somewhere near 1-100 second efficient exposure.

Still another reader asks whether a Wynne pendulum shutter tester is suited for any but slow speeds.

The range of the Wynne tester is only from 1 second to 1-100 second. To measure shorter exposures, special motor-driven apparatus was devised by Mr. Maxfield, and by him described in an article in the May, 1913, issue of *American Photography*.

One of our leading American optical houses advertises abroad that it will mark its shutters with actual speeds when other makers agree to do so. In the meantime, it continues to furnish its goods with the conventional marks; though it should be stated that its highest-

THE GUIDE J. E. WILLISS

priced model is remarkably accurate and can ordinarily be relied upon without testing. The three good shutters on this market are the Compound, the Acme and Wollensak's Optimo. In England, there is obtainable the N. S. "Accurate" shutter, each instrument being marked with its speeds after testing and accompanied by a certificate from the National Physical Laboratories at Kew. A few of these shutters have lately been imported as samples by Eastern dealers.

THE GUIDE

It is hard to understand why so many workers refrain from learning to correct minor faults in their negatives by spotting and retouching. Mr. Williss says that he does not like the branch in the upper left corner, but hates to sacrifice the sky. It would be easy to paint out the branch; a little India ink could be mixed to match the tone of the sky almost exactly, or opaque used and the print afterward spotted with the faintest possible wash, applied in minute dots until the area was filled. Another fault seen by the maker is that the enlargement is a tone too light; but he does not criticize the too close trimming at the base. He would, he says, use a smaller stop if he were making the picture over. The difficulty, to us, would seem to be that he misjudged his distance and set the focus too far forward, so that nothing is really critically sharp. Data: Ica Ideal III, 2½ x 3½, with Heckla *f*: 6.8 anastigmat lens of 3½ inches' focus; 1-25 second at *f*: 8 in March at 9.30 a. m.; bright sunlight; filmpack; Eastman tank development; enlargement on Monox bromide.

UTILIZING A SPARE LENS

"Could a lens used in a box camera be used in a folding camera, and if so would it take the same size film? What length focus could I use? It takes 2¼ x 3¼ pictures now. Would changing the focus make any difference?" writes a subscriber.

We presume that the box camera has a single meniscus achromatic lens, worth only a few cents. Such a lens is not worth fitting to a different camera. If, however, the lens is a double, or rapid rectilinear one, it might be worth fitting to the folding camera if that box were complete except for the lens; but this would be true only in exceptional circumstances.

When a lens is once finished, it has its focus established for good. The principal focus is the distance from the surface of the sensitive film to some point in or near the lens (varying with different types of construction) when the lens is focused on a very distant object. The so-called fixed-focus cameras are arranged to give an average sharpness from 6 or 8 feet to 50 or 100 feet. If the lens is changed to a folding box, it must be placed at exactly the same distance as before in order to make a sharp picture. Then, too, the size film which a lens will cover will remain the same, except when some of the very expensive anastigmat lenses are used for larger plates than usual; for example, a 6-inch anastigmat ordinarily used for a 4 x 5 plate can be utilized as a wide-angle objective for a 6½ x 8½ camera. The focus can be changed only by using a part of the lens instead of the whole lens, or adding various supplementary lenses.

SIZE OF CONDENSERS

A reader asks for information about the right sizes of condensing lenses to use for different sizes of plates.

This datum is easily found by measuring the diagonal of the negative to be used with the condensers. Thus, as a 4 x 5 plate has a diagonal of approximately 6½ inches, the smallest pair of condensers which will "cover" is one having a diameter of 6½ inches. Similarly, for 5 x 7, 8½ inches; for 6½ x 8½, 11 inches; and for 8 x 10, 13 inches are the minimum sizes.

LADLING F. NISHINO

Second Prize, May Competition

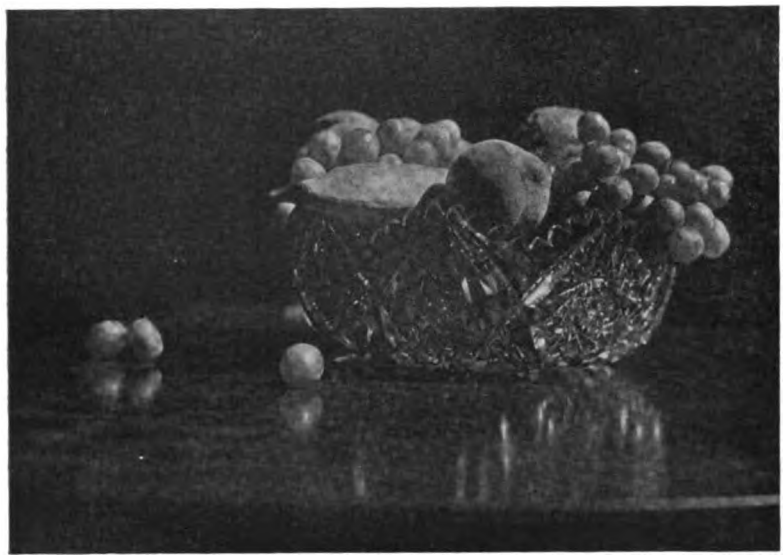
LADLING

The second prize this month is awarded to one of our Japanese subscribers for a charming genre study of Japanese village life. Whether the Japanese never take poor pictures, or whether they are so artistically trained that they are able to infallibly select the good ones, it is a fact that nineteen out of every twenty prints in our competitions sent in by Japanese readers are worthy of at least honorable mention, and that prizes are awarded to Japanese pictures in numbers far out of proportion to the number sent in. While the present picture may seem to have a great many objects in it, they are so harmoniously related that they make a coherent whole, as effectively placed as it would be possible to do it. Taken with a 5 x 7 Premo camera, fitted with Goerz Dagor Series III No. 2 lens. The exposure was 1-5 second at stop *f*: 8 at 3 p. m. in November, very cloudy. The Seed 27 plate was developed in amidol and the print is on Selta, a self-toning paper.

DEFECTS IN PRINTS

Due to Imperfect Paper Stock

A reader sends in a print which has cracked badly when subjected to the routine straightening by drawing it under a ruler. He



STILL LIFE HARRY SLOAN

states that the same trouble has occurred on spontaneous drying between blotters.

This trouble is one which has recently been called to our attention by a number of photographers. It seems to be due entirely to the cutting off, by the European war, of the normal supply of photographic raw stock. Manufacturers have apparently been forced to coat on other than their regular papers, and until they discover some method of treating which will overcome the brittleness of the new raw paper or its baryta coating, the trouble is likely to occur.

The addition of a small amount of glycerine to the last wash-water may possibly prevent the cracking, say an ounce to the quart. Reducing the amount of acid hardener in the fixing bath has seemed to aid some of our professional correspondents to minimize the trouble.

Streaks and blue spots in redeveloped prints is another recent trouble with many. Iron, either in the wash-water, as rust from the pipes, or in the paper itself, owing to failure of the usual raw stock, is the answer. Tying a flannel bag over the faucet will eliminate the spots if they are due to the first cause.

STILL LIFE

Choice of a suitable surface, not linen, for the print would have been in better taste, for fruit depends on its texture as much as its shape to convey the impression of its appearance. Probably the best all-around surface is the velvet, though a dead matte is not to be despised. A perfect smoothness without too much of the glossy effect is what is wanted, in order that the minute differences in refractive power of different portions of the surface of the fruit may be rendered in true value. Technically, the values are good, because Mr. Sloan used a trichromatic (red-sensitive) plate and gave almost enough exposure; but a better result, from all points of view, could be secured with little difficulty, solely by taking more care in arranging and exposing the group. Data: 3A Kodak with Wollensak Vinco lens; 1-5 second at 11.30 a. m. in September in bright light; Cramer trichromatic plate; tank development in Modified Thermo D.-Q.; enlargement on 5 x 7 Platora Linen Buff (G) from part of the negative.

CHUMS

(*See page 381*)

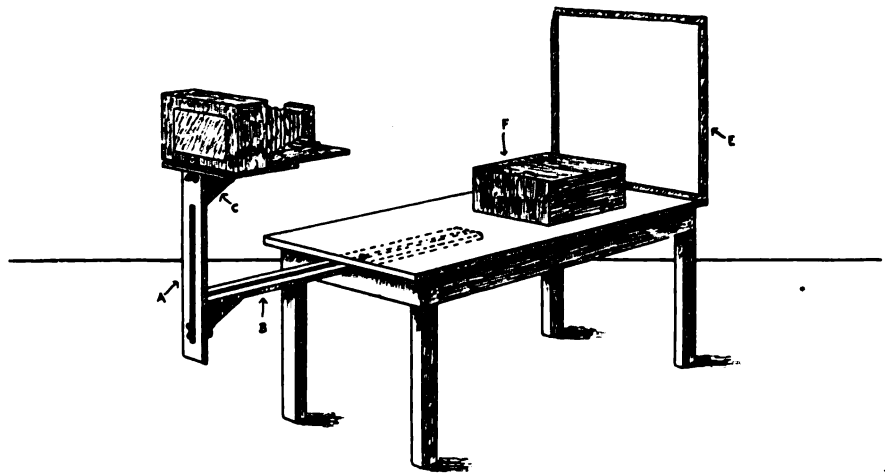
Our first prize picture this month is one of universal human appeal. Every normal-minded human being is attracted by the picture of a laughing child, and the helplessness of a young animal or bird is almost as universally appealing. Such a combination as we have here, therefore, if properly posed and photographed, is sure to make a pleasing picture. The photography in the present case is above reproach. Taken with a 4 x 5 Hall camera, fitted with a Velostigmat lens of 7 inches' focal length. The exposure was 1-50 second at stop *f*: 4.5 at 11.30 a. m. in April, with dull light. The Imperial Flash plate was developed with pyro in tray, and the enlargement is on P. M. C., glossy.

ADJUSTABLE TABLE FOR FLOWER PHOTOGRAPHY

WILLIAM H. POST, JR.

To take up the subject of flower photography systematically one ought to have an adjustable stand or table, the construction and the use of which I am going to try to explain; I will also give a few hints as to the method of procedure, for to go into the subject exhaustively would require a volume.

My first experience was with an ordinary tripod, a small table, and three sheets of colored cardboard, and many a time, after patiently arranging the composition, something would jar the background out of its carefully posed position, or I would accidentally kick one of the tripod legs, and the consequence



was that the whole thing had to be done over. One day while looking over a magazine I saw an advertisement of a stand for copying work, which, with but a few alterations, could be used for flower work; but the price, $35.00, was beyond my pocketbook for occasional use, such as I would do. So I decided to build one and the accompanying diagram shows the result of my endeavors. Although not elaborate, it does the work perfectly, which is all that is needed.

The table part is an ordinary kitchen table, 2 x 4 feet, the horizontal and vertical slides A and B being made of two strips each of ¾ x 1 inch material, separated at each end by a ¼-inch strip 3 inches long, so that there is a ¼-inch slot in the middle. These strips should be made of hard wood, preferably maple or red oak. The horizontal slide B is 4 feet long and the vertical slide A 3 feet long; the board on top of slide A is 6 inches square, and has a tripod screw inserted in the back portion to secure the camera. This 6-inch bed is attached to the vertical slide by means of the triangular bracket shown as C, the same construction being duplicated at the end of the horizontal slide B, with the exception that instead of a tripod screw we use a stove bolt and wing nut, also using a bolt and wing nut to secure the horizontal slide to the table.

For the screen E make a frame of ¾-inch material, 2 inches wide, which can be either permanently attached to the table or made to slide, whichever way best suits the operator. Now secure three pieces of cloth, 2 x 3 feet — one of white flannel, one of gray felt and one of black velvet — and attach them to the top of the frame, the white first, the gray second and the black last; this arrangement allowing the operator to adjust in an instant whatever background is best suited to the subject in hand, the screens not in use being thrown back over the top. When including in your composition a vase or a container, a larger piece of material should be used, draping it from the top of the screen down over the box F so that there will be no sharp divisions in your background, thus securing an even tone.

The table when completed can be finished as best suits the builder — stained, varnished or painted — the particular one that I have in use being stained, then varnished.

The beginner should confine himself as much as possible to the neutral ground, the gray, as this is the softest and does not offer so violent a contrast as does the use of the black or white, although I have seen some very beautiful effects using the black and white grounds.

but these were by experts in this particular class of work.

In the selection of material one should confine himself as much as possible to one color in his composition, avoiding extreme tints, and when using a vase or container it should be without pattern and as plain as possible. For the best of results the group should not contain more than two or three flowers, should show the different sides of the blossom except the back, and be placed as near as possible in one plane else we cannot obtain a sharp picture when working close to the subject.

The source of light should preferably be from a north window, and should be screened or softened by some such material as cheesecloth, and if the room has windows in only one side we will have to use a reflector to soften the shadows on the dark side.

The camera used should be, preferably, one with a long draw, so as to allow working close to the subject, although a short bellows draw can be used if fitted with a portrait or supplemental lens. The ordinary rapid rectilinear lens is entirely suitable for the work, although the anastigmat offers some advantages, such as shorter exposure, flatter field, etc.

The plate used should be orthochromatic in quality, not necessarily double coated, though this quality in a plate prevents halation; but then halation should not occur unless we are using a highly glazed receptacle in our composition. I have found the Standard Ortho, in the double-coated class, and the Cramer Instantaneous Iso, in the single-coated, to give as good results as any, but I think that I should mention here the Wellington Anti-Screen and the Imperial Non-Filter plates which are rapidly gaining in favor for this class of work, neither of them requiring a ray-filter in their use. The best all-round filter to use is one that necessitates an exposure of three times normal, this giving us ample correction for this class of work.

The matter of exposure is governed by so many different conditions that experience, which can be gained by a few trials, is the best teacher for this part of the work. The method of development is essentially the same as with other subjects, but care should be exercised not to carry development too far, as this would tend to block up the highlights and lead to a general flattening of the whole image. One of the best methods that I have yet heard of was that published some months ago in POPULAR PHOTOGRAPHY as employed by the English worker, Mr. Seymour, whose procedure was to stop development before being fully completed, afterward intensifying, thus securing brilliancy without clogging up his detail.

The printing medium employed is at the discretion of the worker, some preferring a glossy surface while others prefer a matte, but personally I like a surface similar to the Cyko Studio, and if the pictures are intended for reproduction they should be printed on glossy paper.

In order to have your flowers stand up well under the more or less lengthy exposure, they should be cut the day before you intend to use them and put into warm water, to which has been added a little salt, and set aside in a cool, dark place until used, when on bringing them out you will find that they are as fresh as when first cut. When the flowers have to be carried any distance, they should be placed in a box, an ordinary shoe box being suitable, in the bottom of which is a folded cloth well saturated with cool water, treating them on your return home in the manner spoken of in the previous sentence.

I have in the foregoing words merely skimmed the surface of the subject, in order to give the amateur an idea of the work, as many think that to accomplish such results as are seen in the magazines and periodicals requires years of experience, complicated apparatus, and exceptional ability. I think I would do well to mention the fact that unless one is a lover of Nature he will rarely succeed in obtaining pictures of his subjects in their best mood.

If one wishes to go further into the subject, he should read some of the many excellent books which have been written on this work, one of the best being "The Photographing of Trees and Flowers," by J. Horace McFarland, which may be secured at almost any photographic supply house.

GRAINY FILMS

A reader sends in a film negative which is very grainy all over, even the protected margins appearing mottled. The print, of course, shows the same granularity. Development was performed by a firm of finishers.

The cause of this defect is probably age of the film. Sometimes, however, it is due entirely to storage of a fresh film in a hot, moist atmosphere. The grain is a reproduction of the granular structure of the paper with which the film is rolled. The keeping quality of film is really remarkably good nowadays, compared to the old times before it was made noncurling, so if the roll is not exposed to heat and moisture, it should yield clear negatives until about

MODERN INDIANS — THOS. A. GASLICK

a year old. Of course, film which has gone beyond its expiration date should not be used for any important picture.

The way to prevent granularity is to keep the film wrapped in its original packet until wanted, and then keep the camera in a cool, dry place as much as possible until the film is used. Never leave it unnecessarily exposed to sunlight. When the roll is used, develop as soon as convenient.

MODERN INDIANS

This picture bears in itself evidence that it was a snapshot made without the knowledge of the children, and as such it is not subject to so many strictures as might have been made had it been a posed picture. The maker points out the following defects: Lack of detail in the snow for want of a rayfilter; need of local reduction of the snow; spotty background. The Wynne meter was used, taking one third of its reading to allow for the high efficiency of the focal-plane shutter, but the maker does not state whether he also made the usual allowance for snow scenes — which of course would have been incorrect, for the subject is of the average sort for which the meter is "set." This is because, in spite of the snow, the figures are near the camera and are of average color. The speed used was 1-100 second. The other data are: 4 x 5 Reversible Back Mentor reflecting camera fitted with a Series II Wollensak Velostigmat lens of 7 inches' focus. The stop used was *f*: 5.6. The light was diffused, in December at 10 a. m. The Standard Orthonon plate was developed in pyro and enlarged on Enlarging Cyko Linen, hypo-alum toned.

A QUIET WINTER MORNING L. M. SIBERT

A QUIET WINTER MORNING

Snow pictures made in a very dull light are seldom wholly successful in suggesting the actual quality of the snow. This example is no exception to the rule, though the technique is excellent. It simply does not, for no monochrome print can, convey the illusion of the lighting. The spotting is poor. Observe that the two darkest masses come right near the left margin, having nothing to balance them but the single line of medium dark formed by the log showing on the right. It is all right to employ a notched line as a diagonal by means of which to enter the picture, but it should enter nearer the middle of the base and, preferably, run toward what were here evidently intended to act as principal objects, the trees on the farther bank. The maker of this view attempted something beyond the possibilities of the photographic medium, which cannot express an abstract idea, such as the state of the weather in winter, without more concrete objects than were present here. The data are: Postcard Ansco No. 9, fitted with a Wollensak Velostigmat *f*: 6.3 of 6½ inches' focus; 10-times filter; 10 seconds at *f*: 64 in March at 10 a. m. in very dull light; Ansco film; M.-Q.; print on a Normal Studio Cyko card.

HYPERFOCUS AND FORWARD POINT

A reader sends in the following table submitted to him by a manufacturer, asking us to explain what is meant by "forward point." The table applies to a lens of 5 inches' equivalent focus.

	Forward Point	Hyperfocus
F: 6.3	42 feet	84 feet
F: 8	33 feet	66 feet
F: 11	24 feet	48 feet
F: 16	15 feet	30 feet

This table is evidently calculated for a circle of confusion of 1-250 inch, as the formula ordinarily used, allowing 1-100-inch blur, gives different results. The meaning of forward point is this: If the lens is set to its hyperfocal distance, say 48 feet for stop *f*: 11, the point nearest the lens (forward from that focused on) which will be sharp is 24 feet from the lens.

The ordinary formula for finding the hyperfocal distance is: Multiply the square of the focal length by 100, and divide by the *f* number of the stop multiplied by 12. The answer is the distance in feet at which the lens should be set to give the maximum sharpness of definition at the hyperfocal point and good definition from infinity to half the hyperfocal distance, or the forward point. A homemade scale marked for the hyperfocal distances for each stop will be found a great convenience in general landscape photography.

Infinity, of course, means objects extremely remote; but for most lenses it may be considered 100 feet or more.

SLIDES BY REDUCTION

A Canadian reader has been trying to make slides by reduction and writes as follows: "I have an enlarging lantern with 6-inch condensers and fitted for both electric and acetylene lights. The extension is 12 inches from condensers to lens and the same from condensers to light. My trouble comes when I begin to reduce the object. It begins to get out of focus and eventually I get nothing. There must be something I am lacking. Is there any ground glass or diffusion to put between the condensers? Is there any special lens that I should use? I have an R. R. and an Aldis anastigmat *f*: 7.7."

ON LAKE COMO L. L. WITTING

Reduction being just the opposite of enlarging, the distance from negative to lens must be greater than that from lens to lantern plate. The whole trouble here is in the short bellows available for the lenses in use. A shorter-focus lens will obviate this trouble. An easy way to shorten the focus of the lens in use is to add a portrait attachment or some other form of supplementary lens. The easel can then be brought up closer to the lens and will receive a reduced image of the negative. The Enlarging and Reducing Tables published in photographic annuals will be of assistance to any worker who wishes to make slides by reduction.

One of the best slidemakers of whom we know uses a lantern with about four-foot bellows and employs an 8 x 10 Dagor lens for reducing all sizes.

PACKING GLASS NEGATIVES FOR MAILING

We received, one day, a glass negative in so many fragments that we could not find one large enough to identify the defect about which a correspondent asked. Breaking of negatives is so common that we urge all readers to attend to the following remarks.

The negatives should be wrapped in writing paper or enclosed in negative envelopes. Take a plate box and put into it several thicknesses of corrugated board; cut on the print-trimmer to fit the box snugly. Then put in the negatives and wedge them lightly with narrow strips of corrugated board. Next cut more board and fill the box. The negatives should now be held firmly, yet with the elasticity of the packing allowing some chance for shocks to be absorbed without being transmitted to the glass. The box should be tied, wrapped in stout paper and tied again. If the negatives are at all valuable, this package should now be enclosed in a larger box, with plenty of excelsior or other elastic packing around it.

ON LAKE COMO

A picture without a sky is sometimes rather effective in giving the effect of great height to the surrounding hills, and this print is a good instance of the use of this device. The composition, the maker states, was the best he could secure from a passing steamer. The only room for improvement which he sees is in the use of the 100-foot focus and a size smaller stop with the same shutter speed. His data show that he gave 1-50 at *f*: 8 in April at 3 p. m. with a 3A Special Kodak. The print is on Velvet Velox.

CRYSTALS IN THE DEVELOPER

During the cold weather we have had a number of letters from readers complaining that their solutions crystallized out on standing in the cold workroom. Sometimes the stock solutions deposited crystals, and sometimes the trouble occurred only when the two stocks were mixed in equal portions and allowed to stand exposed to the air.

MISS ERNA B. F. WINANS

At low temperatures water will usually hold in solution far less of a given substance than it will at moderate degrees. For example, the Watkins Time Developer, which is an extremely concentrated single solution of M.-Q. with bromide, will deposit the sodas on cooling to 50 degrees; and the metol and hydro are in suspension even at 65 degrees. The same was true of the original Watkins Thermo M.-Q., 10-ounce standard. The Modified formula is made up to a 20-ounce standard to insure its remaining in perfect solution at all temperatures. The Watkins Thermo Pyro-soda, too, with 2 ounces of dry carbonate in 10 ounces of water in the B stock, will crystallize out at 50 degrees, so for winter work it may be advisable to adopt a 20-ounce standard and use double the number of drams indicated on the Thermo Card.

Duratol is much less soluble than most of the other developing agents. It refrains from crystallizing only when it is used reasonably dilute. The S dilution is not likely to crystallize during development of a single plate, nor is the VS; but the latter is the limit of concentration. Duratol is precipitated by either sulphite or carbonate alone, and the following plan will be found most effective in securing the maximum keeping quality. Use the three-solution form, as published on page 163 of the January, 1915, issue with the Table of Dilutions given on page 135 of the same issue. Measure out the sulphite, add water, then carbonate, and finally the developing agents.

MISS ERNA

As an example of home portraiture, this print is noteworthy for the good lighting, full exposure and excellent spacing. The maker evidently got his camera placed exactly right, for he has rendered the features well without exaggerating any of their defects. The large head, commandingly placed, gives the whole print an air of great distinction. It is, in fact, a "speaking" likeness. Data: Century View Outfit; subject posed 3 feet from a north window in front of a background of brown muslin stained with a gray dye; 2 seconds at *f*: 8 at 10 a. m. in February; cloudy; 5 x 7 Cramer Banner X plate; ortol; print on Glossy Seltona.

UNCLE REMUS STORIES

Mr. Whitaker, like many another convert to softness as a means of doing away with obtrusive detail, has resorted to a cheap and easy method of throwing a sharp negative out of focus — printing through ground glass. He says that he was inspired by the reproductions of Dr. D. J. Ruzicka's work in *American Photography* for April, 1915. The doctor, however, uses a special lens, the "Smith," made by a Boston firm, to secure the pleasing painter-like quality which makes his prints so unlike the ordinary photograph. Mr. Whitaker may like the sort of blur which ground glass gives — at first; but unless we are greatly mistaken, sooner or later he will find that a special lens is essential if a permanently pleasing softness of definition is to be secured at will. We have tried all the other methods of securing softness and rejected them all one after another in favor of the special lens. Even the ingenious argument of the learned professor of mechanical engineering in the May and June issues of *American Photography* in favor of producing diffusion by means of an anastigmat lens has failed to convince us, in view of our failure to obtain the *same* quality of diffusion which the special lens gives. As the maker of the "Smith" lens said in a recent letter to us, regarding the article by Professor Cardullo, "It is the old story, only the writer's profession entitles him to more attention than the usual kicker. . . . When he says he can get the same effect by throwing his anastigmat lens out of focus, it simply shows he does not know

UNCLE REMUS STORIES W. E. WHITAKER

a picture when he sees it. Ask Coburn, White, Holland Day, Duehrkoop and others. The same, of course, applies to bolting silk, reversed negatives and a dozen other dodges. You must remember that all the best workers are possessors of the best of anastigmat lenses and have been through the mill. As Mr. N. of Newton says, 'Here I have paid $250.00 for a lens which I discard for one of yours at $48.00'; but this does not signify that it is robbery. You, who have seen our lenses made and know the many years we have spent experimenting, certainly can vouch for the sincerity of our product; and a lens combination made of crowns and flints cannot be termed 'hocus-pocus' because it fails to fulfil the first condition requisite for that greatest of all optical achievements, the modern perfect anastigmat, of which there is no greater admirer than myself. Did Dallmeyer practice chicanery when he patented the BB lens in 1878, by securing a certain amount of diffusion by 'uncorrecting' his rear combination by separation and charging for it? or Taylor & Hobson when they introduced the R. V. P. lens, using an ordinary view lens and opening the diaphragm to *f*: 8? I think not, and they certainly broke the optical law to attain their ends.

"The name 'Semi-Achromatic' is the best description we could find of a lens which was not fully achromatic; and you know I've broken every optical law in the endeavor to attain our present success. I've even made lenses hyperchromatic, and have ranged from the fully corrected achromatic to 90, 80, 70 per cent, and so on, all along the spectrum, in the hope of getting the artistic quality the serious worker demands. If this is 'hocus-pocus,' then I'm guilty.

"But I must admit I agree with the learned professor, that deliberately to mount a single-spectacle lens, or ditto, of a larger diameter, and get full price for it, is all that he calls it and cannot help but discredit the other makers whose desire it is to give a fair value for money received."

So, after all, we must confess that the particular ground-glass out-of-focus quality presented here is not quite convincing. There is a loss of textures which is not found in soft-focus-lens work.

Mr. Whitaker sees the following faults: The parallel lines of the two doors are a little unpleasant and the broken plaster on the lower corner of the wall is bad. He would select a different viewpoint to secure a better background. To this we would add that he should at the same time place his group farther to the right, away from the middle of the space. The technical work otherwise is good. The

exposure was made by flashlight, with 20 grains of Victor powder at a distance of 10 feet, as directed by the Victor people for medium walls. The 3A Kodak used was fitted with a 6¾-inch Beck Isostigmar lens, used at *f*: 8. The Seed 27 plate was developed with Modified Thermo M.-Q. and enlarged through ground glass on Velour Black Velvet.

SIMPLE DIRECTIONS FOR MAKING LANTERNSLIDES

The making of lanternslides is an extremely simple operation, which may be compared to the making of gaslight prints, with the exception that the work must be done in a darkroom illuminated by a yellow light. These conditions are easily satisfied at night in the ordinary home, and a piece of post-office paper, obtainable at the photo supply store, rolled into a cylinder and placed around a small hand lamp or a candle, will give an excellent light. If an incandescent bulb is available, the piece of paper may be wrapped around it loosely. Of course, if one possesses a darkroom lamp, a piece of clear glass, on which is pasted a piece of the post-office paper, can be substituted for the red glass.

The other tools necessary for lanternslide making are two small trays, white enameled style preferred, one of which takes the developer and the other the hypo for fixing. Some kind of a dish for washing the slides should also be provided.

A printing frame, preferably 5 x 7 inches in size, with a glass, if films are to be used, and a little pad made of several thicknesses of black paper will be found convenient, as the lanternslide plate can then be placed upon any portion of the negative at will, and the lines which may be out of true in the negative can be straightened up on the lanternslide plate. The black paper is to prevent reflection from the back of the printing frame, which is often of a light color. This reflection makes the clear parts of the lanternslide smoky and reduces the contrasts of the slide.

The formula for developers will be found in every package of lanternslide plates, in case the amateur wishes to make up his own developer. You can buy prepared developers inexpensively, and the amount used is very small. All other specific information regarding the particular plate you may be using will be found on these directions. For fixing the acid fixing salts, which are found in every photographic supply store, the kind used for fixing your prints is excellent on account of its hardening properties.

In making exposures one must remember that the film side of the lanternslide plate goes in contact with the film side of the negative. You can readily determine which is the film side of the lanternslide plate under the yellow light, as this side is dull, whereas the glass side is highly reflecting.

Adjust the lanternslide plate on the negative until it covers the portion you wish to reproduce, and expose it at about 2 feet from an electric-light bulb or from a gas flame. It will probably be found convenient to step outside the room and use a light which is burning there, unless you have an electric light which can be turned off and on by a switch.

Exposure can be determined readily by experiment, as follows: Select a good negative and put it in the printing frame as suggested. Cover about two-thirds of the lanternslide plate and give an exposure of about five seconds. Then draw the shade back so that the second third of the negative is exposed for five seconds more. At the end of the tenth second remove the card entirely and close the exposure at the end of the fifteenth second.

You now have a test plate with strips of 5, 10 and 15 seconds. Develop the plate and you will at once have an idea of what is the right exposure. You must then work at the same distance in order that you may have the same intensity of light. After a little practice you will be able to judge the difference between your negatives just as in the case of gaslight printing. Your waste will be small if you observe the precaution of working at a constant distance.

After developing, rinsing and fixing, the plate must be washed and dried. It now needs protection from scratching. To do this place a lanternslide mat in contact with the film side of the plate, place a cover glass, previously cleaned, on top of the mat and bind the plate and cover glass together. The mats and binders are inexpensive and this work may be done at odd times.

As to expense, a slide plate will cost about four cents, chemicals one cent, cover glass two cents, mats and binders one cent. (Any plates which may be spoiled in the process make excellent cover glasses.)

All the work can be done in the home without creating any bother, as in the kitchen or the bathroom. The work is fascinating and the results are durable.

SOFT-WORKING LENSES FOR SLIDES

A reader asks for a soft-working formula for metol-hydro. to be used with Wellington

GRANDMA'S BIRTHDAY HARRIET E. WILLIAMS

S. C. P. lantern plates, which he has been using for reproducing negatives. The finished negatives are very contrasty.

This is a case for the use of water. The regular developer will give soft results if the plates are fully exposed and developed with the addition of several volumes of water. Or, by using metol alone, instead of hydro. and metol, a softer result can be obtained.

The S. C. P. emulsion is similar to the Contrast grades of D.O.P. Softer results can easily be had by using the regular fast bromide lantern plates. If, however, negative reproduction is the work in hand, better results will be secured by using an ordinary fast plate of Class 1½ for the positive transparency as well as for the final contact or enlarged negative.

GRANDMA'S BIRTHDAY

Genuine firelight pictures are not often seen, most workers preferring the easy method of faking them by means of a flashlight set off in the fireplace; but modern plates are so sensitive to artificial light that it is possible to get good results by the fire alone. The plate here used was, presumably, the Anti-Screen. The 45-second exposure it received proved ample to carry the lighting effect. A panchromatic plate, on the other hand, would have been fully timed in perhaps a tenth of that time, owing to its great sensitiveness to red. The sitters were exposed before the candles were lighted. When the long exposure was done, they moved away; the candles were lighted and given an exposure of 1-50 second. Were it not for the slight blurring of the little girl's face, the picture would be perfect, as the posing, lighting and general arrangement are all that could be desired. Data: 4 x 5 Korona camera fitted with a Euryplan *f*: 4.8 lens of 6¼ inches' focus; firelight exposure of 45 seconds and snapshot of lighted candles afterward; backed Wellington plate; tank pyro; enlargement by a professional, apparently on Wellington Carbon bromide.

THE PINE ON THE ROCK K. B. WOTKYNS

THE PINE ON THE ROCK

Miss Wotkyns has furnished us with a beautiful composition, strong in its massing and spacing, and at the same time perfect in its aerial perspective. Although the reproduction is not so black as the print, it still has sufficient depth of tone in the foreground shadows to throw the distant headlands back so that they seem miles away. The beginner, forgetting to use his eyes and observe how light in tone a distant object is, desires his distance to be as clear as his foreground blades of grass. He generally considers his film overtimed unless he can print the hills out almost as black as his middle distance, and he deliberately undertimes his foreground for fear his distance should not be clear enough. Here, however, is a perfect example of exposing for the shadows and letting the lights take care of themselves. There is detail in every dark mass. As the eye travels from the foreground toward the distance, each succeeding object is just one tone lighter, as it really is, in nature, owing to the increasing thickness of air between the eye and each more distant object. Progressive lightening of the tones is the only way in which a monochrome picture can suggest distance, or aerial perspective. The data show that the negative was a snapshot of 1-25 second with a 2¼ x 3¼ No. 1 Eastman, Jr., at *f*: 8 at 4 p. m. in September in partly foggy light. The print is a 5 x 7 glossy enlargement.

A WINDOW DISPLAY

Mr. Wood sent us a large number of very excellent window pictures, of which this seemed the most suitable for reproduction. He states that he has tried daylight and flashlight, but finds that the artificial lights in the window itself give the best results. He works late at night, as there are fewer conflicting lights and "rubbernecks" to get in the way. The ground glass of the camera is ruled both ways with lines half an inch from the margins to act as guides to keep the lines straight. He finds, on the whole, that he gets the best results with Cramer's Medium Iso plates [double-coated?], which are faster than one would think. He tries to get the reflected lights where they can be reduced to shadows on the negative or spotted out on the print. He gives full time and develops only about ¾ the usual time, exposures running about 8 to 12 minutes at *f*: 16. The present example, however, was made on a Standard Polychrome plate and the print is on a Soft Cyko Glossy postcard.

YELLOW IN COLORING

H. N. ANSTENSEN

More than likely at some time or other in your career you have sighed and said, "Oh, if it were only colored"— looking at some print that you have made. Possibly you had some one of the many transparent water colors that are on the market and tried coloring that

A WINDOW DISPLAY FRED E. WOOD

print yourself. Perhaps the result was not very good; maybe it was perfect — maybe! or else it did not look just right to you, although your admiring friends said it was "simply great."

The desire for color is inherent in all of us. Although some have not the idea of where this or that color goes in a print, they can tell if a colored print looks natural. It is all right, but they can not say just why it is so. With a certain amount of practice almost anyone can color a print so that it is more pleasing to the eye than the black-and-white or sepia tones, providing that they choose a print that would look better colored.

Some pictures are much better left without color, because in applying color to a photograph you do not aim to build up the picture; you merely add color and color perspective. The distant hills you make a light blue; for the nearer ones you add some green to the blue, increasing the green until you make the grass in the foreground very green. This is fine; it is very good in a print that has "atmosphere," as they say — where the tones ranging from the dark to the light very nearly correspond to the range of tones in nature, in which there are no extremely black contrasty tones and chalky whites. Such a print, with the correct range of tones —"atmosphere"— suggests color and will look good colored.

There is a pleasure in applying color to a picture. If you have not tried it, suppose you do. Among your collection of prints you surely have many that would look good with a little color added — little, I say, as it is harder and much better to suggest color than to apply too much. Enlargements, I believe, are better for coloring than contact prints, as you have more scope to work in; and in enlarging, atmosphere is brought out. If you have not tried coloring prints, you have missed something worth trying, as there is pleasure in it and maybe profit, as I have found.

Here is a pointer that I want to give you: The first applying of a weak lemon-yellow color to give life and atmosphere, I find works out very well, giving a sunlight look where other methods fail.

Before you try any coloring, procure colors that have a lemon-yellow in them; then lay out the colors as the directions accompanying them say. Now notice that nature has very little pure white in it; there is a yellow color that permeates everything. The interposition of atmosphere between the objects of nature and the eye breaks up the colors, so that a yellow color permeates the others. Then, too, a yellow tinge brightens up a picture without intruding on the other colors — it adds life and sunshine.

First make a weak solution of lemon-yellow

— one that is barely discernible after applied, but not too weak. When this is used, you will notice that the print has a suggestion of color, of sunshine, that it will retain after it is fully colored. Apply the yellow to any grass, trees, houses — in fact, everything in the foreground and middle distance except water. Do not put any yellow on the water, except in sunsets, etc., as your green will have enough, if not too much, yellow in it for the water, so you will have to add some blue to the green for this.

If your print has patches of sunlight here and there, as sunlight coming through the trees in a woodland scene, put an extra touch of slightly deeper yellow where the sunlight strikes; then add your other colors over the yellow.

Do not put any yellow over the sky except where you do not intend to put any blue, as the combination of yellow and blue makes green. Put a faint-yellow color along in the sky just above the horizon, shading it off into the blue of the sky. If there are any sunlit clouds, touch up the highlights of them with weak yellow; if it is a morning or evening scene, use stronger yellow, always being careful not to put yellow in the shadows on the clouds where you wish to put blue.

If your print is a sunset, you can be more free with the yellow, going over the entire print with it, and it can be stronger than the yellow for a daylight picture. If the sun shines on water, add extra strong color here and also along the edges of the clouds where the sun strikes them. In a sunset there are spots of light brighter than we are able to portray them in a photograph or painting, as they glare and dazzle the eye as no painting or photograph can. Extra strong color of yellow has much the effect of a glare. After the yellow is put over the entire print, add the other colors; then go over the print with more yellow here and there where you think it may need it.

The whole idea is putting the yellow on first, faint in a daylight picture and stronger in a sunset or evening picture. It shows through the other colors, giving the finished print a brightness and glow of life. It is worth your trying, if you do any coloring at all; and, further, it is well worth your time to try some coloring.

SWEET PEAS

(*See Page 379*)

Technically, the work shown here is almost perfect; but we feel that the arrangement of the flowers could have been more carefully and convincingly carried out. The radial arrangement of the stems is not quite in accordance with the manner of growth of this flower. Probably three sprays would have lent themselves more easily to artistic arrangement. Every reader, notwithstanding, should study the data of this print with care, for the use of a color-sensitive plate, a fully correcting filter — the "visual luminosity," which gives the right tone to blues and violets instead of overcorrecting them — and proper exposure have brought out the textures and values almost perfectly. The picture was made with a 6½ x 8½ Century camera with 10½-inch R. R. lens at *f*: 16; Burke & James Ingento Series B filter, x 8; 1½ minutes at 5 p. m. in April in soft, diffused light on a Cramer Instantaneous Iso plate; pyro tank development; enlargement from a part of the plate on rough P. M. C. bromide paper.

TRANSPARENT PRINTS

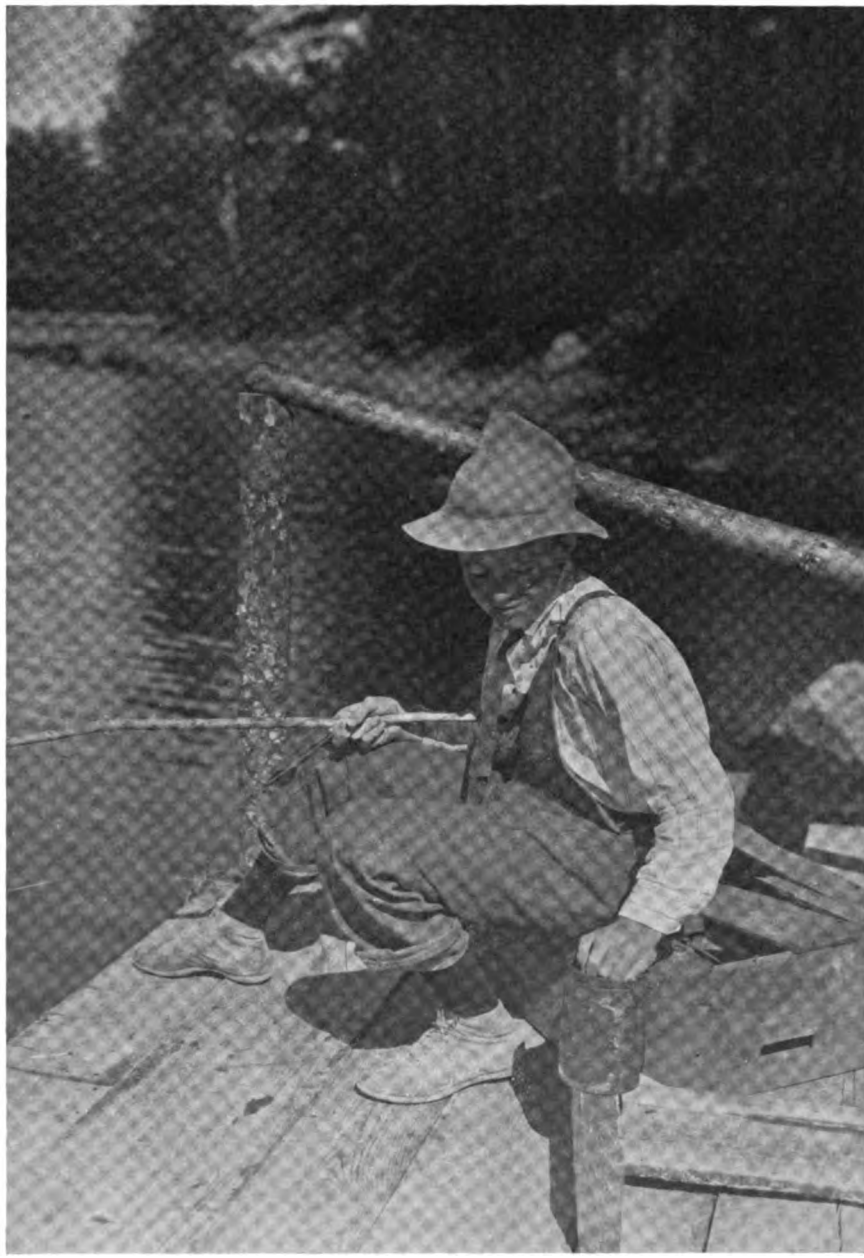
A curious request comes from a Philadelphia reader, as follows: "I should like to know how to get the film off D.O.P. so as to print pictures through instead of using plates, or how to make it strip off for transparencies. Please also let me know whether it is feasible to turn negatives on D.O.P. into positives."

It is most doubtful whether any advantage whatsoever could be obtained by experimenting with such processes as our inquirer suggests. Plates and films are furnished in qualities suitable for every conceivable use, and a good negative on the proper kind of plate can be used to produce beautiful transparencies on the special transparency plates on either plain or ground glass, opal glass or flat transparency film. The film on D.O.P. is so thin that it would be almost impossible to strip it successfully, and when it was removed it would have to be mounted on glass or on celluloid for use. On the other hand, even when a special negative paper is employed and rendered as translucent as possible by waxing, the remaining grain is objectionable for anything but big enlargements which can be viewed from a distance.

A special paper for reversing is manufactured by the Positype Company, Cleveland, Ohio. It is exposed in the camera, developed, reversed by treating with acid bichromate and redeveloped, thus giving a positive picture. For most uses, however, amateurs had far better stick to the regular films and plates.

WHEN THE FISH BEGIN TO BITE

It is seldom that we receive so pleasing a picture as this, for few workers are willing to give sufficient exposure to a near figure, with



WHEN THE FISH BEGIN TO BITE GEO. B. SPEAR

the result that they render the shadows unnaturally black and lacking in detail. The tones here are true to nature and the flesh values, in particular, suggest sunlight. Pictorially, the composition is good, but it suffers because of the presence of the two bark-covered stakes just beyond the figure. A professional retoucher could take them out so that they would not show in a print, or at the worst, the latter could be again spotted and copied so as to yield a negative of greatly improved concentration of interest. Data: 5 x 7 Century Grand camera with Zeiss lens; 1-25 second at *f*: 16 in June at 11 a. m. in bright sunlight; Kodoid plate; pyro; Seltona print.

A SELF-PORTRAIT STARK WEATHERALL

A SELF-PORTRAIT

"In Mississippi we can camp out in winter as well as in summer," writes Mr. Weatherall, on the back of his postcard print of himself. He states that he also made the exposure himself, by means of a spring clothespin which was allowed to act on the shutter release when a fuse burned out and let the spring snap. This method shows ingenuity, and it certainly has yielded as good a result as if one of the expensive foreign distant releases had been employed. The outfit used by Mr. Weatherall comprised a 3A Ansco with 6½-inch R. R. lens. He set the shutter for 1-25 second, the weather conditions being bright March sunlight. The Eastman film was developed in M.-Q. and printed on a Normal Studio Cyko postcard.

AN OUTFIT FOR HOME PORTRAITURE

M. B. DOUGHTEN

Your article on page 227 of the March issue under above caption seems to give your readers good advice as far as it goes. Some time ago I tried to find a 4 x 5 folding camera that would accommodate a 7-inch *f*: 4.5 lens in Regno shutter, and except in the more expensive instruments there seems to be no 4 x 5 camera that will serve the purpose. I eventually picked up a 4 x 5 Premo No. 6, and by mutilating the front managed to mount my 7-inch *f*: 4.5 lens; but, lo and behold! after the lens was mounted the camera would not close without removing the lens. I eventually discarded the carrying case, and now pack the outfit in a valise along with plateholders, focusing cloth, flexible background, flashlight apparatus, etc., and find it immensely satisfactory.

Another home-portrait outfit, and the best I ever made up, is composed of a 5 x 7 View camera and an old Darlot portrait lens of about 8¼-inch focus, with an effective aperture of from *f*: 4 to *f*: 4.5 and a Studio shutter.

Suitable view cameras can be obtained in the second-hand market at almost any price. I paid $8.00 for an 8 x 10, $12.50 for a 6½ x 8½ and $7.00 for a 5 x 7, all without lenses. One thing must be remembered; that is, get an instrument with sufficiently large lens board to accommodate a large lens, and one or two of the cheaper models are so equipped.

As to these old lenses — the Darlot, the Dallemeyer, the Ross and the Beck portrait lenses, that were marketed some fifteen to twenty years ago, in my opinion cannot be surpassed for portraiture. The speed, the stereoscopic effect, the modeling cannot be duplicated with the modern anastigmat. The covering power, while not as good as in the modern lens, is sufficient for portraiture; in fact, the falling of indefinition at the margins is a distinct advantage. These lenses can be bought for any old price. I paid $5.00 for my 8-inch Darlot.

GRADUATED RAYFILTERS

A subscriber asks for directions for using a graded or foreground filter, the kind tinted deep orange at the top and with the tint lightening until it gives place to clear glass below.

We are using one of these filters successfully with no increase in some cases and with only two times increase in others. When an Anti-Screen plate is used, the filter dye in the emulsion takes care of the rendering of color in the foreground and the filter tint holds back the excessive luminosity of the sky. With this

THE OLD HUNTER EARL BURTON

kind of plate, the graded screen acts simply as an equalizer of the illumination, so the ordinary exposure may be given with confidence that the foreground will receive the normal time. Other sorts of ortho plates (not containing a filter dye) according to our experiments require the exposure to be doubled except when photographing an open landscape without foreground nearer than a hundred feet.

If the user of our tables habitually gives all that they call for, no increase may be needed. If he uses half the table times for snapshots, he might have to fall back on the full times when using the graded screen.

These graded filters are useful for holding back one side of a picture; for instance, sky and water in a scene on the bank of a lake or a stream. We have made some very fine snow scenes with a belt of woods on one side and open fields on the other by taking advantage of this method.

Most of these filters have an orange tint and therefore do not give so much contrast between blue sky and clouds as some of the more popular American-made solid-color filters.

BOOKS ON COMPOSITION

A reader asks whether we would advise him, a raw beginner, to purchase Poore's "Pictorial Composition," or whether a less "deep" book is obtainable.

Poore is one of the best books obtainable for camera workers, but it is, perhaps, a little advanced, unless one is willing to look up anything not quite clear in dictionaries and encyclopedias — but any serious book may need such supplementary reading. Sadakichi Hartmann's "Landscape and Figure Composition" is a helpful work. It is perhaps second to Poore. Of really elementary books, our ten-cent Handbook No. 8 is the only one in print at present, though we are having a new book prepared on rather a different plan from anything yet attempted. We think it will be of direct help to every camera user, as it considers the subject of composition strictly from his point of view and is not burdened by a discussion of pictorial technicalities.

THE OLD HUNTER

Very often the postcard size proves too narrow, as it was here, giving no space above the rider's head. Since the original negative was made on a 6½ x 8½ plate, the print should be made on a larger piece of paper, so as to allow better spacing. The dogs, too, are rather crowded by the base line. One of them moved his tail during the exposure, causing a blur which could easily be remedied by a professional retoucher. Data: Clearview camera; single combination of R. R. lens of 26 inches' focus; ½ second at *f*: 16 at 3 p. m. in October in shade of trees; P.O.P. postcard.

DRYING FERROTYPE PLATES BY STEAM

A New York reader says that he has followed the suggestions given under "Sticking of Prints," on page 231 of the March, 1915, issue. He puts his ferrotype plates on a steam radiator to dry. He does not, however, dry his D.O.P. prints before squeegeeing. The trouble has occurred only with D.O.P., but never with P.O.P.

ROSE A. R. BROWN

Steam radiators are too hot for D.O.P. unless it has received an extra hardening treatment. A separate alum bath after fixing and rinsing may be needed. The prints should then be well washed in the usual way, dried, and rewetted before putting on the ferrotype plates. The prints should be set up on the floor near the radiator, not on it. Even thorough waxing of the plates could not prevent soft gelatine from melting when exposed to the direct heat of a steam radiator.

ROSE

Although this outdoor figure study has many commendable points, we cannot help but feel that the spacing would have been better if more room had been allowed to the right. If Rose rose, her elbow might strike the margin, one feels. Still, the careful placing of the butts of the two trees in the background helps to balance the figure, so that on the whole the handling is not bad. The technique is perfect. Data: 4 x 5 Century Grand camera with 6-inch R. R. lens; 1-5 second at *f*: 16 in March at 2 p. m. in bright light; Cramer plate of unstated brand; tray duratol; enlargement on Buff Montauk Bromide.

THERMO PYRO POWDERS

A reader asks why we do not publish a formula for making up pyro powders, ready to dissolve, for use by the Thermo system. To this query there are several answers. The first is, that the Watkins Thermo Pyro-soda has extraordinarily good keeping qualities on account of the use of metabisulphite as a preservative; hence powders are not necessary to secure fresh, active solutions. The second reason is that the 1.9 table of temperatures is correct for tank development with the Kodak 20-minute tank powders, when using film and the volume of water called for on the label. The third reason is that any reader who is willing to take the time and utilize his knowledge of arithmetic can quickly calculate the amount of each ingredient to use for a single charge at any given dilution. Most readers prefer to use the stock solutions on account of their convenience. If, however, the powders are to be made up, metabisulphite is not necessary, and the carbonate should be diminished 80 grains (the amount needed to neutralize the metabisulphite). The 20 ounces of the two stock solutions would make, for example, 20 batches of MS dilution (60 ounces for tray or 200 ounces for tank). From this datum it would be easy to calculate the number of grains of dry pyro, sulphite, carbonate, and bromide for each powder. An easier way would be to divide the whole mass of each powder in the way which any druggist will gladly show you some time when he is filling a prescription for powders.

COME AND SWING ME H. P. TURRELL

Third Prize, May Competition

COME AND SWING ME

Mr. Turrell's picture is an excellent piece of outdoor portraiture, and a good example of how a print may be improved by an appropriate title, which doubles the story-telling force of the picture. It would be well to remove some of the halation in the upper portion of the picture by local reduction, but this is a minor defect, and the print is an excellent example of sympathetic rendering of a child.

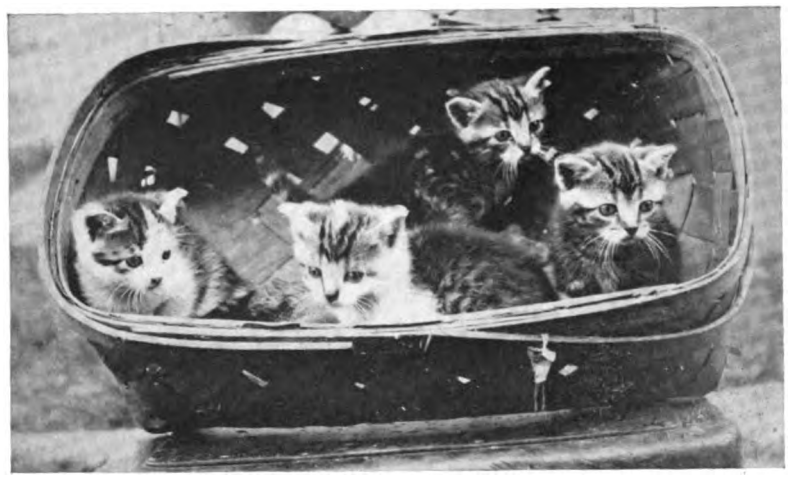
CAMERAS FOR "MOVIE" FILM

A reader asks where he can purchase a small pocket camera which uses a small reel of motion-picture film and has two tripod sockets.

A camera of this description has been put on the market by the New York firm of Herbert & Huesgen, Inc. It is beautifully fitted and finished and the cost is correspondingly great; but it compares most favorably with the best work of the high-priced European makers.

The same reader asks whether motion-picture cameras are of the fixed-focus type.

No; all "movie" cameras are fitted with extremely fast lenses, and, though they have an equivalent focus of only 2 or 3 inches, it is necessary to focus them with great precision, if the full aperture is to be used. Some types of motion-picture apparatus are fitted with a



ORPHANS J. M. MATCHETTE

prism or mirror reflector which can be used to focus accurately on the film surface. Others depend on a scale of distances marked on the lens mount. The former kind resemble the reflecting cameras of the ordinary kind in principle; that is, when the image is sharp in the finder it is in focus on the film surface.

ORPHANS

Mr. Matchette has entitled his basketful of kittens "Orphans," a name which may be justified by the facts, but which nevertheless seems to us unjustified as implying too great a strain on our sympathies without adequate cause. In other words, the title is strained, as ordinary observers are not supposed to know the family history of kittens. A simpler caption would have done better. The print is too hard, showing that the negative must be very contrasty, as the paper used was the Normal grade, and the data indicate full exposure of the plate. The picture was made with a 4 x 5 Graflex camera fitted with a Eurynar lens of 7¼ inches' focus, and had 1-40 second at *f*: 4.5. The hour was 6 p. m. The plate was the Seed 30, which was tanked in pyro and printed on Glossy Argo Normal.

UTILITY OF THE METER

A beginner asks whether we would recommend him to get a Watkins Bee meter. Yes, by all means. A meter simplifies exposure very much. More than 90 per cent of the subjects he is likely to take will come in the average classification, the exposure for which is found by testing the best light and giving half the full meter time (with a modern shutter).

PRECIPITATED SULPHUR IN FIXING BATHS

"I put two ounces of crystal hypo into a tray and added eight ounces of water. When it was dissolved, I added a small amount of acid hardener, such as comes in the fifteen-cent packages of acid hypo. When I went to use it, it had all turned a milky white. I was afraid to use it, not having had the experience before. Would it have been safe to use for fixing films?" writes a Western correspondent.

The trouble was due to adding too much of the acid hardener in proportion to the hypo. It is far safer to make up an entire package at one time and keep it as stock solution. Any acid hardener containing alum is likely to cause decomposition of the hypo and precipitation of sulphur. A milky bath is unsafe. It will partly tone paper and ruin films or plates fixed in it, as the sulphur sticks in and on the soft gelatine and is most difficult to remove.

There are only two acid-clearing and hardening substances which are free from the tendency to decompose hypo—sodium bisulphite lye and potassium metabisulphite. Formulas for both have been repeatedly printed in these columns. For hot-weather use, as much as three fluid ounces of the Lumière brand of the lye or two ounces of metabisulphite crystals may be used to each pound of hypo crystals in five pints of water. Although alum can be added to these baths, our experience is that it is not necessary unless there is a great difference between the temperatures of fixer and washing-water. A preliminary hardening of the plate in diluted formalin before development is a sure preventive of frilling and avoids trouble from the use of alum.

PHOTOGRAPHY IN THE SPRING

The real outdoor season may be considered to begin, around Boston, on the 19th of April, the date of the famous spring picnic of the British Regulars in 1775. Tradition states that on that morning, when they took up their march to Lexington and Concord, the countryside was fragrant with apple blossoms and the temperature was so high that they suffered severely from heat exhaustion in their winter regimentals. But, notwithstanding the exceptionally early seasons, April is the first definitely springlike month and

"Whan Zephirus eek with his swetè breeth
Inspirèd hath in every holt and heeth
The tendrè croppès, and the yongè sonne
Hath in the Ram his halfè cours y-ronne,
[April 11]
And smalè fowelès maken melodye,
That slepen al the nyght with open eye,—
So priketh hem Natúre in hir coráges,—
Thanne longen folk to goon on pilgrimages."

The amateur photographer of to-day feels the call of awakening Nature just as strongly as did Chaucer's Canterbury pilgrims. Armed with his favorite instrument, he wanders afield in search of pictures which shall record in permanent form for future enjoyment some of the evanescent charm of the springtide.

And what season is better worth portrayal? No worker yet has worthily caught the full impression of the spring atmosphere. The task is one beyond the range of an ordinary plate. Only a correctly handled autochrome can preserve the full beauty of the soft, moist warmth of the season, the glorious pearly and pink lights, the mellow young sunshine. Line, mass, and light and shade alone do not convey the impression. The color-values must be preserved in absolute truth to each other. Lacking a color-plate, the next best thing is a panchromatic plate. With a 5-times screen (K III for the Wratten, Isos III for the Cramer Spectrum), it is possible to secure all the atmosphere which is actually in the view, with absolutely true values. The spring haze will not be cut out by a screen which is adjusted to the plate; but one must not make the mistake of using *any* screen which happens to be on hand. A poor screen will falsify the values. Next to the adjusted filters, the 8-times B. & J. screen listed as Ingento Series B, or Wallace's Visual Luminosity, is best. The ordinary rayfilters, unless made of Filter Yellow K, cut out too much of the blue and the violet and thereby produce too much contrast between blue sky and clouds. The sky in spring is seldom intensely blue. The painters leave their ultramarine and other strong blues at home and depend on the delicate, gray-green-blue of cobalt or cerulean blues. In monochrome, the blue sky has to be a faint gray, not a strong tone, or it is out of key with the other tints of the spring landscape.

Beginning in March, the first signs of color observable in the dull brown landscape are the reds, yellows, and intermediate shades of the bark of trees and shrubs. Bits of swamp grow gorgeous with bright reds and clear yellows. Later still, in April, forsythia bursts out with its deep and glorious cadmium yellow. This is the signal for the bark colors to fade, for buds to swell and for the willows to assume a wonderful dun yellow which rapidly brightens to a tender yellow-green. Even before a single leaf has crept from its protecting sheath, the trees grow colorful. Red-brown is the tint of many of the buds. How can one expect to get color-values without a red-sensitive plate?

When May arrives, the colors change daily, almost hourly. The yellows of leaves change to yellow-greens, then greens. Flowers add their brilliant hues to the scene. What does the average amateur do? He gets a color-sensitive plate and a filter, expecting to record the values, and he gets — contrast and lack of atmosphere. The common ortho plates are chiefly sensitive to yellow-green. This is the predominating color in the landscape. The light looks bright. He times fully, he thinks, and develops fully. His print, even on the softest possible paper, shows the leaves almost as white as snow and the other values unnaturally dark.

The problem is really this: We have an excessive amount of contrast, more than a printing paper can handle, and we must somehow manage to shorten or compress the scale, while keeping the general key high. Experience teaches that although the exposure-tables and meters are generally correct in their listing of ortho plates, it is safe, in spring, to double or triple the indicated exposures in order to give, with a weak developer, a thin, brilliant negative. Suppose the tables call for 1-50 second. Make it 1-25 anyhow. Suppose the screen is cataloged as a three-times. Don't be afraid to multiply the exposure by 4, 5 or even 6! The plate will not be overtimed — it has more latitude than you believe. Don't

fog it by peering through it at the ruby light. Develop it in a covered tray by the Thermo system, mixing the developer at least one and preferably two classes more dilute than the plate is rated. The result may look anything but a "printer," but try it on a soft-working paper and at least once in your life appreciate what the color values of a landscape really are!

So far, the materials we have used have taken care of the predominating color only. As long as we are photographing only yellow-green foliage and cloudy sky, we shall not feel the lack of complete color-correction; but sooner or later we shall find that the other tones are not being rendered light enough or dark enough, as the case may be.

This is where our panchromatic plates and absolute filters come in. By using them we can secure precisely the right tone for every color in the view. The negatives may look very strange to one accustomed to ordinary plates, but the print is all that matters. Development, of course, *can* be done in a safe green light, but it is far better to time strictly by the tables and trust the plates to Thermo development, as then there can be no question of light-fog. The beginner with these plates can seldom tell anything by their appearance, anyhow. His only criterion must be the print. If he standardizes the development and leaves that factor unchanged, it is easier to master the art of exposing them just right. With an unchanged developer, give shorter time for a thinner negative and more time for a denser one. The exposure will regulate the detail and the density, the development will insure always attaining a standard contrast.

Oftentimes, in a spring landscape, there will be no tone, save possibly a cloud, which is as high or light in value as some portion of the landscape, but seldom bright enough to be represented by quite white paper. For this reason, particularly as color-sensitive plates have a tendency to work harshly, it is extremely important not to overdevelop. Most subjects will give the correct amount of contrast with the normal development speed of the plate, as the various ortho and iso brands are rated M or faster in order to compensate for their steep scale of gradation. As already suggested, however, don't judge the negative until you have taken off a print. Then compare the print, tone for tone, with similar objects in the same lighting and see how nearly accurate your values are. The results are sure to be unlike the black trees and grass of an ordinary photograph on a plain bromide plate, so direct comparison with nature should in every case be made for your own instruction.

Some years ago, the film manufacturers committed themselves to orthochromatic film, so the public is gradually becoming educated to see objects in nature reproduced somewhere near their proper tones without thinking the picture queer. Lately, a further step forward has been taken, and suitable color filters for the film have been put on the market. They are intended to give moderate correction with about 5-times increase of exposure. We have not given these screens a personal trial, but we note by data slips coming in that they give very satisfactory results.

When *not* to use a screen is as important a thing to know as when to use it. Many open landscape subjects can be given a short enough time to retain the clouds and get all the yellow-greens without bothering with the filter at all. It is only when a landscape comes at least in the classification of average landscape with foreground, factor 3, or with dark foreground, factor 4, that the difference in the exposures for foreground and sky becomes great enough to require much correction. It is even then more a question of compensating for the excessive *luminosity* of the sky rather than one of color correction; for the modern color-sensitive plates, particularly the ones prepared with a filter-screen in the emulsion, can take care of the color, though not of the illumination. Here a graded screen comes in handy. We have lately made some careful tests on Spectrum plates. When the full table time was given, the correction with a graded screen was as good as we got with an Ingento A filter, which required a factor of 2 times for the Spectrum plate. Half the table time, however, gave rather too thin a negative through the graded filter. Practically, then, the foreground filter requires no increase of exposure.

The ideal outfit would include red-sensitive plates, a graded screen to hold back the excessive luminosity of the sky, and a set of three Filter Yellow K screens having, for the panchromatic plate, multiplying factors of, say, 1½, 3 and 5. The lighter ones could be used whenever quick exposures were needed. It should be remembered that a good panchromatic plate *without* a filter gives color correction equal to that of an ortho plate with a 5-times filter. Most panchromatic plates are Watkins 180 in speed, corresponding to Wynne F 90 and *American Photography* Class

2, so they are fast enough for snapshots in the middle of the day, and relatively faster than Class ½ plates in yellow or reddish light early and late in the day. At 6 p. m. in May, for example, no extra allowance would have to be made for a Wratten or a Spectrum plate, but a Class ½ plate might need to have the exposure multiplied by five to compensate for its insensitiveness to yellow light.

Readers who are ambitious to produce beautiful spring scenes cannot fail to become deeply interested in the subject if they approach it with the proper equipment and master the technical problems involved in the use of the new materials. A single picture true to the values and atmosphere of springtime is worth a whole album of technically and therefore artistically defective snapshots.

POINTS ON HANDLING BROMIDE PAPER

Recent inquiries from readers show that some elementary information about bromide paper, its characteristics and how to work it, is greatly needed.

To begin with, bromide is not a paper of extreme contrast, like the chloride or gaslight papers. It is made in only one or at most two grades of contrast, and there is very little difference between these two when they are furnished. The quality of the emulsion is much like that of a fast lanternslide plate. It can safely be handled in orange light — post-office paper or yellow fabric — but is instantly fogged by the least trace of white light. It is so fast that a match or two burned several feet from the negative will give sufficient exposure for contact prints, depending on the density of the negative. It is useful for making contact prints from extremely harsh negatives which will not print on the very softest grades of gaslight papers. The Watkins P numbers for bromide papers run from 4 to 25 or 30, most makes being about 20 to 25, or as slow as most process or contrast brands of plates.

The orange glass provided in many styles of darkroom lamps is safe for bromide paper. A substitute for orange fabric can be made by dipping cloth into a solution of potassium bichromate and then into one of lead acetate (sugar of lead). Lead chromate is precipitated in the fiber of the cloth. The ordinary yellow rayfilter should be used over the lens while pinning paper into place on the enlarging easel, as this allows one to see where to put the paper and yet will not affect it at all. Yellow-stained pyro negatives are extremely slow printers on bromide paper. For example, a duratol negative took 30 seconds and a pyro negative of the same apparent density required four minutes for the same degree of enlargement.

The paper must be kept closely wrapped in its black envelope at all times except when being printed. It cannot be handled in safety if there is the slightest trace of white light in the room. Smokers should beware lighting a match until they have made sure the paper is covered.

Bromide paper gives contrast when it is given short exposure and developed in a strong solution. It needs much more potassium bromide in the developer than most other papers. Bromide in excess does not hurt the color by tending to greenish or brownish blacks, as it does with chloride papers. To get the beautiful pearly-gray effects for which the paper is most suited, use a great deal of bromide, say several grains to the ounce, dilute the developer with two or more volumes of water, and overexpose four to eight times. The result will be a soft, gray print.

The best formula for rich, contrasty blue-black prints is strong amidol. Either the Wellington formula or Balagny's acid amidol have given fine results in our hands. Amidol, however, stains the fingers pink and may stain the prints if not handled carefully. Both formulas were given on page 345 of the June, 1914, issue. Amidol is sensitive to bromide. Too much bromide and too long an exposure will give greenish blacks. Strong M.-Q., D.-Q., ortol and other developers can be used for contrasty effects. By "strong," in this connection, is meant the ordinary gaslight-paper strength diluted with an equal volume of water. Users of tubes, powders, and tablets will note the bromide strength directions. Johnson's Amidol Scaloids are a convenient form of this developer. They are made to the Wellington formula.

For enlarging, a negative should be fully exposed and not too fully developed. It should be of medium contrast and density. The Thermo duratol tables give excellent negatives for enlarging without change of plate classification; but the pyro and M.-Q. formulas yield better negatives *for enlarging purposes alone* if they are used one class more dilute than normal. See the Thermo Card, or the June, 1914, issue, page 369.

The Thermo formulas for M.-Q. and D.-Q. are suitable for bromide paper when potassium bromide is added and they are mixed about 1 ounce each of A and B and 4 to 8 ounces of

water, according to the depth of black required in the deposit. Even less water may be used for extreme contrast. Medium-strength rodinal is very fine. It gives pure blacks and grays.

Contrast equal to that obtained in contact printing on gaslight papers can be secured with bromide papers only when the negatives are very harsh. Undertimed and overdeveloped amateur negatives will generally give very snappy bromide enlargements. The same negatives can be made to yield detail in all the tones by longer exposure and weaker development.

When about to enlarge, take a test-strip and lay it where it covers the highest light and the deepest shadow of the picture. Expose it in sections by covering it up a little at a time. Exposures might be, say, 2, 4, 8 and 16 seconds. When developed, the strip will give an idea of the best exposure to try for the whole sheet. Exposure should be sufficient to penetrate the highest lights of the negative in which detail is wanted in the print.

Exposure varies approximately as the square of the distance; but the most reliable guide for relative exposures is the enlarging table given in the directions which come with the Watkins meters. From this it is easy to calculate the exposure needed for a different degree of enlargement if the correct time for any other degree is known. This table and excellent directions for daylight enlarging will be found in *The Watkins Manual.*

The correctness of the exposure can be checked by the following test. At ordinary temperatures, say 60 to 70 degrees, the image will not appear until the paper has been from 45 to 60 seconds in the developer. It will build up after that, most rapidly in the blacks, until they attain full strength at about 1½ minutes. The halftones and highlights keep on developing until 2 minutes is up. At this time every bit of detail exposed for in the highest lights should be out and the print should stop. If not, underexposure is the cause, and the print can safely be left, in the case of duratol, up to 5 minutes in the developer. This applies to a temperature of about 54, the average winter reading of our darkroom. At higher temperatures, stain would ensue from too prolonged soaking in the developer. At 54, complete development averages about 3 minutes instead of 2. When working for contrast, development should be terminated as soon as the blacks are dense enough, letting the highlights remain undeveloped and therefore lacking in gradation. If reducing the exposure and shortening the development will not make the print contrasty enough to suit, particularly when strong amidol has been used, resort must be had to the special contrasty enlarging papers which have lately been introduced to fill the gap in speed between bromide and gaslight varieties. Such are Artura Carbon Black, Enlarging Cyko and Velours Black.

Great loss of brilliancy results from rinsing a bromide print before fixing. It is best to drain the print and then immerse it quickly and evenly in an acid bath. We have found the plain hypo with liquid bisulphite sufficiently strong in its hardening action. Some may prefer the alum combinations. Never use a fixer which has just been dissolved and is therefore colder than the developer. Sufficient bath should be made up the day before and stored in a jug. Difference in temperature between the developer and the fixer is a prolific source of blisters.

Prints should fix not less than 10 minutes for thin and not more than 30 minutes for thick stock. At the end of the requisite time, they should be removed to a tray of clear water at room temperature.

Washing should be in twelve 5-minute changes in trays. This method avoids the blistering which is almost sure to crop out if a strong stream of water strikes the print. If the wash-water is much cooler or warmer than the baths, it should be added only a little at a time until the change is safely accomplished. The only other prominent source of blisters is too strong a hypo. Allow at least 5 pints of water to each pound of hypo and there will seldom be any trouble.

"Being a charter member of your magazine, POPULAR PHOTOGRAPHY, I feel it my duty to express my appreciation of what I consider the most valuable photographic magazine for the average worker, be he amateur or semi-professional, and I take three. I have every issue that has been published, and do not see how it could be improved.

"I take great interest in the various formulas which you publish from time to time, and long ago adopted your acid fixing bath mixed with sodium bisulphite lye. It is certainly great. I have been using a pyro tank developer for a long time, and to-day have received one of your Thermo Cards and think it great. I shall give the formulas and your new method a thorough trial."

[The credit should be given to Mr. Alfred Watkins, the inventor of the Thermo System. Our work was simply one of compilation and adaptation.— ED.]

FILING AND RECORDING NEGATIVES

DAVID W. STIMSON

A great many amateur photographers do not seem to appreciate the value of filing and recording their negatives, and as a result lose the benefit of one of the most important features in connection with amateur photography. This may be from lack of interest after the finished print is in their possession or because a simple and practical plan has not suggested itself.

It is the purpose of this article to outline such a plan, which can be easily followed by any one sufficiently interested in the work to give it the little amount of time required.

FILING

In the first place it is to be supposed that nearly all amateurs have albums or something similar in which to paste their finished prints. A print reference number should be shown. If the print has a white border, there is usually ample space for showing the number on the face of the print in a neat manner, preferably in the lower left-hand corner. If the print is trimmed, or for other reasons it is found objectionable to place the number on the print, it can be shown directly underneath or on the back, provided the print is pasted so that the lower portion is loose. The accompanying illustration, Figure 1, will show this clearly.

An envelope of suitable size should be provided for filing each negative. For the smaller sizes an ordinary manila pay envelope will answer the purpose nicely. In the corner of the envelope insert a reference number to correspond to the number shown on the print made from the negative enclosed. This will afford quick reference from print to negative, and make unnecessary the handling of a lot of negatives in order to find a particular one desired for reprint or reference. These envelopes or whatever else may be used can be filed in numerical order in very little space.

RECORDING

The recording of negatives is even more important than filing and is, therefore, well worth consideration by the careful amateur. All of us have negatives from which prints obtained show at a glance something distinctive. This is not always the subject or composition but rather a clearly defined negative or proper exposure and development.

In the absence of accurate information, the first question asked would be — I wonder what exposure I gave this negative, what stop was used, or under what light conditions was it taken? This is the kind of data that should be kept.

On the envelope containing the negative is a

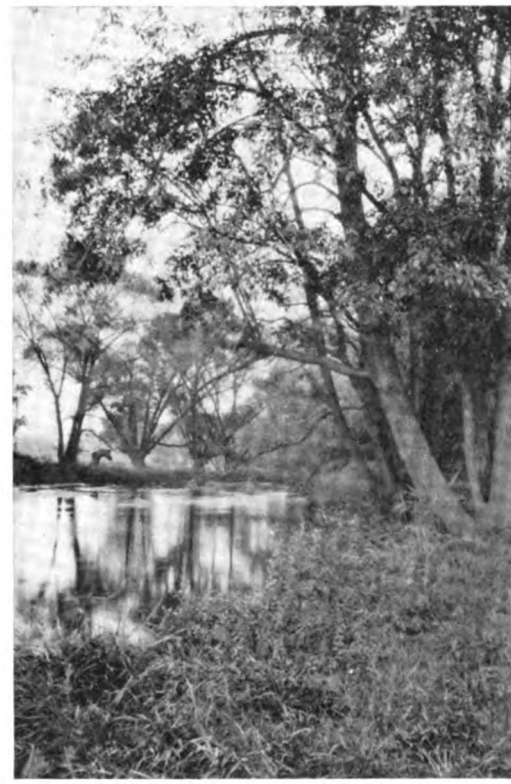


FIG. 1

good place to record data concerning it, and unless the envelope is very small, ample space will be found for the purpose. The facsimile of envelope shown in Figure 2 will suggest suitable captions. These, of course, can be changed to suit individual requirements, but ordinarily all the data here shown will be found desirable.

10 Print Title, "Along the River"
Where — Lehigh River
Taken — Allentown, Pa. Date — 9/13/14 Hr.— 5 P. M.
Camera — F.P.K. Size — 1A Lens — R.R.
Stop — U.S. 64 Exposure — ½ Second
Light Condition { Cloudy / Bright } { Filmor / Plate } { Eastman / N.C. }
Developer — Eastman, N.A.
Printing Paper — Velox, Hard
Property of — John Smith, Allentown, Pa.

FIG. 2

To obtain reliable negative data it is, of course, necessary that some record be made at the time of exposure or soon after, because the average memory cannot be depended upon for any length of time. Therefore, before starting out for pictures, some provision should be made for making this record. With some types of films an exposure record is supplied which will be found very convenient, but if this is not available the record should be made in some other form.

Undoubtedly some who read this will say that it is a great deal of trouble to keep accurate record of this kind because, ordinarily, fairly satisfactory results are obtained. This may be true, but the careful and particular amateur will soon discover the benefit to be derived from a reliable record of his work.

If you are interested enough in your work to send prints for criticism or desire to enter your prints in any of the amateur photographer competitions, it is essential that they be accompanied by complete data to receive recognition.

Keep accurate records and study your past work with the idea of improving it in the future. It may take a little longer to expose a film, but it stands to reason that if more time and consideration are given to the matter of correct exposure, better results will be obtained than is possible by haphazard snapshoting without any regard for a record of what is being done.

If you are neglecting this feature of your work, try this plan or something similar that it may suggest and you will surely find it profitable.

METABISULPHITE IN PLACE OF SULPHITE

"To minimize the number of photographic chemicals to keep in stock, what is to hinder the substitution of potassium metabisulphite for sodium sulphite in developers, merely neutralizing the former with the carbonate of soda or of potassium; if practicable so to substitute, what proportions should be used?" writes a subscriber.

The chief reason why metabisulphite should not be substituted is a question of its price. This chemical is now "going up," and likely to go "out of sight," as our chief source of potassium salts is cut off by the European War.

A friend of ours is a metabisulphite "fiend," and has ceaselessly urged the substitution asked about by our correspondent. We have experimented incessantly with metabisulphite for the last two years and have come to the conclusion that its advantages as a preservative are great, but that there is no special reason to replace the much cheaper sodium sulphite by this expensive salt. It does not keep any too well in the crystalline form.

The specimens we have had, when fresh, required for neutralization an equal weight of dry granular sodium carbonate (Na_2CO_3. H_2O). To secure adequate keeping quality, as for a paper developer, at least half as much metabisulphite as sodium sulphite should be used. Thus, to replace 1 ounce of sulphite (anhydrous is *always* meant when crystals are not specified), take ½ ounce metabisulphite and increase the carbonate (anhydrous or dry granular) ½ ounce. This gives a developer of approximately the same alkalinity as before.

One curious thing may happen. The temperature-coefficient, although it is not upset by altering sulphite and carbonate, may be changed by using so much metabisulphite. Thus, the temperature-coefficient of Thermo duratol is 2.6; but the same with metabisulphite in place of sulphite is 1.7.

USING THE FRONT COMBINATION

A reader asks whether he should remove the front combination of his Turner-Reich Convertible Anastigmat and put it into the place of the rear combination in the back of his shutter.

Our inquirer has the correct idea. A single lens gives a flatter field and better definition over the whole plate if it is used behind the diaphragm instead of in front of it.

When a simple, uncorrected lens, such as a spectacle lens, is used with a diaphragm in front, it gives what is called pincushion distortion, that is, straight lines parallel to the margins of the plate are bowed inward like the edges of an old-fashioned pincushion. If the stop is behind the lens, the bowing is in the opposite direction and is called barrel-shaped distortion. The half of a rapid rectilinear is an achromatic lens, but it has the same fault of distortion. Now, when the two halves are used together, with the diaphragm between, the two kinds of distortion neutralize each other, the result being that lines near the margin are rendered straight, or right-lined, hence the lens is called a rectilinear, or right-lined objective.

When a cemented anastigmat is used, the presence of three or more separate glasses in the combination allows the optician to obtain finer corrections throughout; but the same tendency to distortion will be found always present if the extreme margins of the circle of light are examined, as when using the single combination of a small lens on a large plate. Only the complete lens is quite free from distortion.

EDITORIAL

OUR COMPETITION

The first prize this month was awarded to Mr. Harry Bauer's picture "Chums," a most attractive study of little boy and little dog, appealingly natural. F. Nishino wins the second prize with his picture "Ladling," an artistic picture and interesting as a glimpse of foreign custom. The third prize was given to H. P. Turrell for his picture "Come and Swing Me," a charming photograph of child play-life.

The following pictures were awarded honorable mention: "Indoor Portrait," M. F. Eberly; "Lilac," A. A. Furman; "Our Lumber Camp," G. Fowler; "A Little Mother," Axel Anderson; "Helping Daddy," F. H. Estabrook; "Winter," G. H. Hale; "The Young Lookout," H. R. Spackman; "Papa's Little Man," F. B. Wadley; "A Portrait," A. W. Church; "Black Canyon Falls," Iver C. Mastrup; "Indian Blanket Weaver," Wilford E. Jost; "Waiting for the Bathers," G. S. Locker; "A Tree Fill," Carl Struck; "Look Pleasant," Wm. R. Brackbill; "That's My Name," C. R. Turner; "Take Your Arm Away," E. K. Warren; "A Coyote in a Trap," John A. Reichert; "I'd Love to Have My Picture Took," J. Peitzmeyer; "Hornets' Nest," P. Spangenberg; "Ruin," O. M. Nacker; "A Medieval Courtyard," J. M. Gregory; "Home Portrait," Paul H. Hartwig; "The Riverside Path," S. F. Duckworth; "Portrait in the Woods," Chas. F. Becker; "Buckner Hallow," Oran Smith; "Winding Road," Wm. Smith; "Our Boy," F. H. Jones; "I'm On My Way," V. K. Thompson; "Just Wading," D. Sherman Babcock; "Mildred," N. Bermingham; "Midwinter," R. R. Pratt; "Ready for a Ride," F. L. Weaver; "Behind the Bars," J. H. Porter; "Lilac Lane," Flora Roberts; "Papa's Rose," Mrs. J. H. Mills; "Jacks," W. E. Fowler; "A Bit of Russia," F. B. Walker; "Firelight," Alfred R. Jayson; "Two Kinds of Sunshine," J. B. Yates; "River Road," L. R. White; "Bay Fishing," Chas. Thomas; "The Farm Road," S. R. Kitchin; "Driving Hogs to Market," Edwin A. Roberts; "The Call of the Prairie," F. A. Northrup; "Dreaming," A. G. Prill; "A Double," R. A. Patterson; "Tiger Lily and Butterfly," W. L. Granville; "The Sisters," M. M. Siebert; "The Creek in Winter," Garnet E. Jacques; "Sunset on Lake Mattawa," D. H. Harrington; "Busy," F. M. Mallett; "Freak Photo," Percy F. Crane; "Submarines," Chas. W. Becker; "Peace and Solitude," R. F. Humphrey; "Horticultural Palace at Night," Thos. Bodley; "Mission — San Juan Capistrano," W. H. McCrum; "Battleship *Virginia*," Frank L. Bey; "Tacking a Comforter," Leon Lake; "Whitewashing," B. Brunner; "Ready for the Hunt," Carl W. Clepper; "Winter Moonlight," Clarence Bundy; "On Her Way," Peter Schimmel; "Good Picking," G. L. Lutterloh; "My Wife's Portrait," Herbert Jackson; "The Sentinels," Carl L. Richard; "Pussie," C. D. Meservey; "The Mountain Path," J. Peitzmeyer; "An Easter Offering," Wm. Ludlum; "Marris," E. B. Thorndenberg; "Twin Water Sprites," S. L. Avery; "The Park Fountain," B. B. Jackson; "Ice Cream Cones," A. M. Vinje; "Dawn," F. Marcille; "In the Pasture," R. W. Delamater; "There, Don't Move," Carrie C. Towne; "Out for a Walk," T. W. Lindsell; "The Yoke," A. R. Brown; "October," Wm. C. Herchenhahn; "Flower Study," W. T. Kempin; "On the Fence," H. L. Hurxthal; "Following the Leader," E. B. Wotkyns.

PRACTICAL PHOTOGRAPHY

As most of our readers doubtless know, we have for many years published a series of photographic handbooks at the low price of 10 cents each, and the fact that as many as 30,000 copies of one of these books and 24,000 of several others have been disposed of shows that they have met with appreciation from the photographic public. The original plan of these books was to utilize matter published in the magazine, at the time when it was set with two columns to a page, and the first editions of these books were merely reprints of these magazine articles. Later editions, however, have invariably been revised or rewritten to keep up with the progress of photography, and this fact has rendered their continued production at the price of 10 cents impossible, in view of the increased mechanical cost in all departments. Some of these books are already out of print, and a number of others will go out of print at an early date, so that those who desire to obtain them will do well to place their orders at once.

In place of these we purpose to issue, beginning at once, a series of 25-cent textbooks on

photographic subjects, to be known under the general title of "Practical Photography." The first number will be entitled "The Secret of Exposure," and will be a comprehensive treatment of this most important subject, based on the system of the *American Photography* Exposure-Tables and answering practically every question on exposure likely to arise in ordinary practice. Number two will be entitled "Beginners' Troubles," and will be practically a textbook on photography for the use of the average inexperienced amateur. The subject of number three will be the perennial topic, "How to Choose and Use a Lens," and this book will compress into a moderate number of pages all the practical facts about the construction and use of lenses which are of value to the average photographer. We are not prepared at the present time to announce the titles of numbers beyond the first three, but they will include the topics which experience has proved are most in demand by the photographers seeking information. For the present at least a number will be issued as nearly as possible every thirty days, and while the undertaking is not in any sense a magazine, we are prepared to accept subscriptions for twelve numbers in advance at a somewhat reduced rate. An exceptionally favorable special offer is being made to subscribers of record of *American Photography* and POPULAR PHOTOGRAPHY, and any reader who is not on our subscription list may obtain particulars of this offer, which will save him considerable money, by writing to our publishers.

OUR OWN HOME COMPETITION

We are finally able to announce awards in this competition, a sufficiently large number of entries having been received on the second call to comply with the conditions of the contest. As a matter of fact, the number was much larger than we had expected. It is, nevertheless, a curious fact that all the prizes were awarded to sets of pictures which came in before the first time limit expired. The judging of this competition was extremely difficult, for the prizes were given on the merits of sets of pictures rather than individual prints. The first prize, $15.00, was awarded to J. E. Carson, Charlotte, N. C.; the second prize, $10.00, to Carl A. Peterson, Scandinavia, Wis., and the third prize, $5.00, to Wm. Ludlum, Jr., Mt. Vernon, N. Y. Space forbids us giving a list of the honorable mentions this month, but it will be published next month with a fuller account of the pictures and reproductions of some of the best pictures submitted

COMPETITION BLANKS

We have received word from some of our readers that they wished to send in pictures for competition, but had no competition blanks. We are always ready to supply the coupons to any of our readers, and are very glad to do so. In regard to the receipt of photographs for competition, we prefer, on account of the large number which we have to handle, not to have more than two at a time sent in by one person.

READERS' FORUM

EDITOR POPULAR PHOTOGRAPHY:

In your last issue there was a picture of pheasants by F. W. Hogg, with a remark that he must have been very fortunate to be able to get so near them.

Now if any of your readers will notice carefully they will see that whoever posed the birds failed to shake enough snow over the wooden stand of the nearer bird, so that the corner of the block shows.— H. C. KENNINGTON.

FREAKS FROM OPEN SHUTTER OR LEAKS

A reader sent in the film from which the accompanying illustration was made, with the following data: "A friend brought the film to me to find what was the matter. Sometimes all the films are good but one, and it will look fogged and streaked; sometimes two or three are bad; sometimes all. The camera uses filmpacks. The lens was perfectly clean and the films were developed by a firm of finishers. It is a new camera, and I think it does not leak light. Can you explain the trouble in the magazine?"

There are two kinds of defect shown in the print, but both are due to some opening in the front of the camera, in all probability. The large patch of fog is probably caused by having the shutter open while pulling out the front after opening the camera. The darker streak, which pursues a serpentine course over the film, is probably due to a pinhole near the lens, either in the front or in the bellows. When the camera was carried, with bellows extended, the light came through the hole and focused on the film, giving a blurry image of the path of the sun as the camera moved. If there were a long enough exposure through the wide-open shutter (perhaps accidentally set to time or bulb) the whole film would be blackened. The chances are that a short bulb exposure has been made while the front was being pulled out. The camera, in this case, should be taken to the dealer for repair or replacement.

FREAKS FROM DEFECTIVE SHUTTER LEAKS MRS. L. L. KILLAM

NEWS AND NOTES

During the last month, in connection with the preparation of our new book, "The Secret of Exposure," we have had occasion to test various plates and films, and among them a number of emulsions of the Ansco Speedex Film. We find that these are considerably faster than the first emulsions tested and that this film is properly listed in our Exposure-Tables in Class I. The film has excellent latitude, so that good printing negatives can be obtained even under trying conditions, if development is done properly, preferably by the Thermo method.

The Eastman Kodak Company offers $3000 in cash prizes for pictures illustrating kodak advertising slogans; $300 and $200 prizes are offered for the two best photographs illustrating the following slogans: "Take a kodak with you"; "All outdoors invites your kodak"; "There are no game laws for those who hunt with a kodak"; "Let the children kodak"; "Write it on the film at the time"; and for the best new slogan with a picture illustrating the same $500 will be paid. Full details of the competition are given in a circular obtainable from any kodak dealer or by writing to Rochester, N. Y.

The Wollensak Optical Company has made a reputation for originality in its catalogs and booklets, and the 1915 Velostigmat booklet fully lives up to the reputation of the series. It is a surprise in photographic literature, and contains a number of useful articles and beautiful pictures, as well as the price listings of their lenses. Do not fail to get your copy from your dealer or by writing for it.

The 1915 Ingento Book, a catalog of the offerings of Burke & James, 240 East Ontario Street, Chicago, is now ready for distribution at dealers', or to be had on request. The outstanding novelty listed by them this year is the new line of Ingento Junior cameras, with round ends and opening vertically, selling for from $6.00 to $12.00.

The Bausch & Lomb optical department offers for free distribution the latest edition of "Useful Tables for the Photographer." This little pocket manual contains a large number of facts indispensable to every amateur. Write at once for your copy to 629 St. Paul Street, Rochester, N. Y.

The 17th annual convention of the Photographers' Association of New England will be held in Copley Hall, Boston, August 10, 11 and 12, 1915. The membership fees have been reduced, and every professional photographer and assistant in New England should join. The studio proprietors pay $2.00, assistants $1.00. Send for an application blank to Geo. H. Hastings, secretary, Newtonville, Mass.

The 1915 Graflex catalog is obtainable from every kodak dealer, or on request from the Folmer & Schwing Division, Rochester, N. Y. As attractively presented as usual, it will be of great interest to the photographic world for its list of new introductions, reductions in price of Graflex cameras, and the listing of Autographic Graflexes. The new cameras are the Compact Graflex, 3¼ x 5½, the 3¼ x 4¼ Telescopic Revolving Back Graflex, the Revolving Back Graflex, Jr., 2¼ x 3¼, and the Graflex Enlarging Camera. An interesting novelty is the new Graflex roll-holder, which will interchange with plateholders on Graflex cameras and take the new Eastman Graflex speed film.

H. S. Cresswell, National Hotel, Washington, D. C., had two cameras stolen from him in the month of May. The first was an Ica, 15 x 18 cm., Double Amatar lens M. 134855 and 134854. The second camera, stolen on May 10, was a Premo film plate with Carl Zeiss Protar lens IV, R. 350 mm., with front and back lenses bearing numbers 111754 and 111755. We shall be very grateful for any information regarding these cameras, sent to us or to Mr. Cresswell.

EXPOSURE-TABLES FOR JULY

DIRECTIONS: Find in the tables printed below the NUMBERS for SUBJECT, STOP, LIGHT, HOUR, and PLATE. Add them, find the sum in the last table, and give the exposure indicated. When the exposure fails to correspond with the speed-marking on shutter, use the nearest shutter-speed, preferably the lower. If sunlight falls over one shoulder, add 0; if straight across subject, add 1; if sun is ahead, add 2. When using back combination only of lens, add 2.

EXAMPLE

Average landscape	3	July, 11 A.M.	0
Stop U. S. No. 8	6	N-C film	1½
Intense light	0		

Adding these numbers, we get 10½, and on referring to the last table, under 10½, we find **1-40** second, which is the exposure to give. In this case you would use the speed marked **1-50** and open the lens a little, if possible; say, half-way to U. S. No. 4.

SUBJECT

Sea (only) and clouds	½	Street scenes, buildings, groups	5
Sea-views, snow-scenes, distant landscape	1	Portraits in shade	7
Open landscape, without foreground	2	Indoor portraits	8 to 10
Average landscape, with foreground	3	Interiors	16

STOP:—

f:2	*f*:2.3	*f*:2.8	*f*:3.3	*f*:4	*f*:4.7	*f*:5.6	*f*:6.7	*f*:8	*f*:11.3	*f*:16	*f*:22	*f*:32	*f*:45	*f*:64
				U.S. 1	U.S. 1.4	U.S. 2	U.S. 2.8	U.S. 4	U.S. 8	U.S. 16	U.S. 32	U.S. 64	U.S.128	U.S.256
1	1½	2	2½	3	3½	4	4½	5	6	7	8	9	10	11

LIGHT: Intense sunlight (inky-black shadows), **0**; Bright sunlight (strong shadows), ⅓; Faint shadow cast by sun, **1**; Dull (no shadows), 1⅓; Very Dull (whole sky very dark), **2**.

HOUR: 10 a.m. to 2 p.m., **0**; 9 a.m. and 3 p.m., ⅓; 8 a.m. and 4 p.m., **1**; 7 a.m. and 5 p.m., **1**; 6 a.m. and 6 p. m., **2**; 5 a. m. and 7 p. m., **5**.

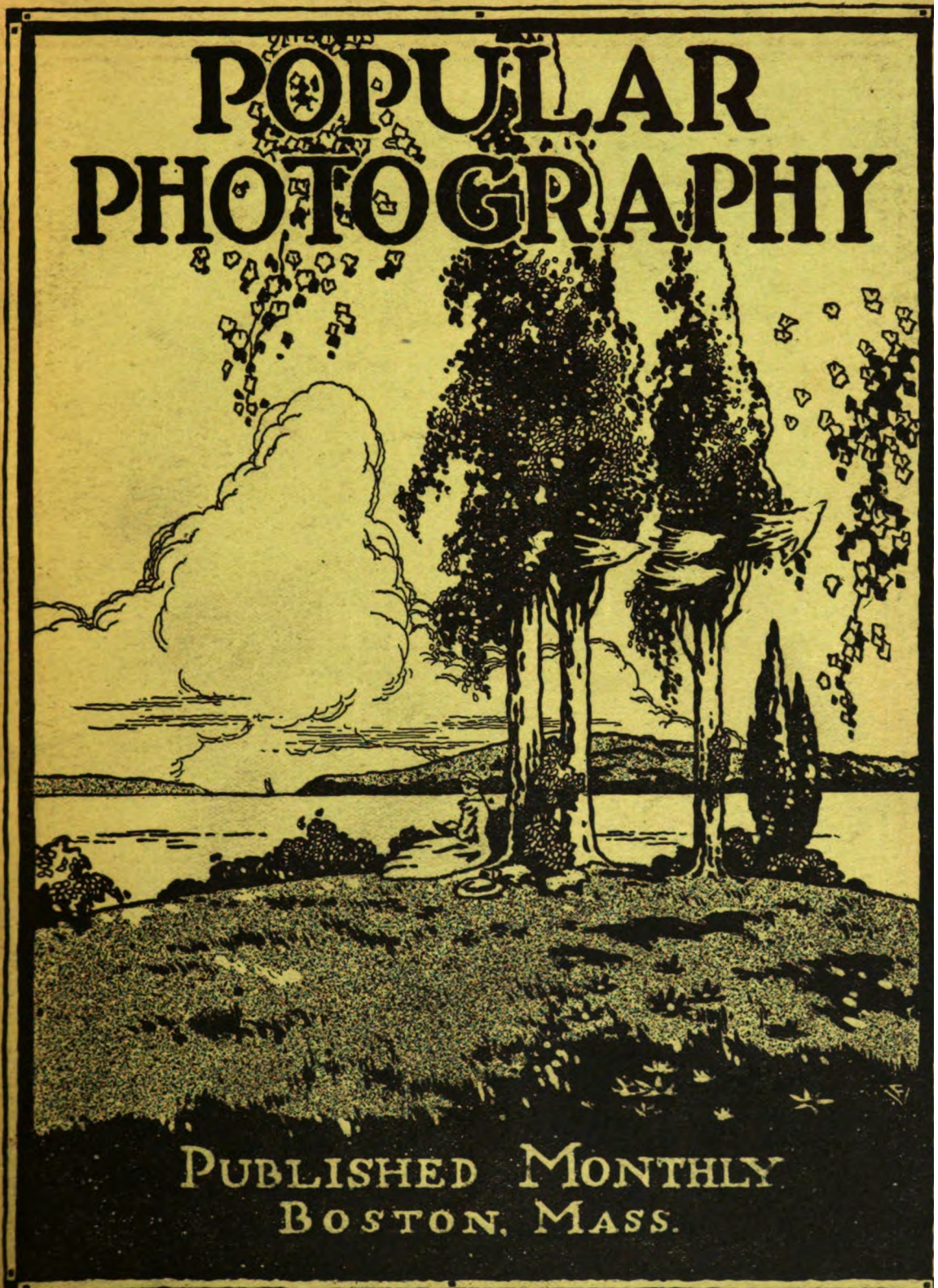
PLATE: AMERICAN, 1⅓. ANSCO FILM, 1⅓; Speedex Film, **1**. BARNET — Film, 1⅓; Superspeed Ortho., **1**; Ortho. Ex. Rap., **2**; Red Seal, **1**; Red Diamond, 1⅓; Self-screen Ortho., **2**; 550, ⅔. BURKE & JAMES — Atlas Film, 1⅓. CENTRAL — Special XX and Sp. Home Portrait, ⅔; Special, **1**; Comet, Colornon and Pan-Ortho., 1⅓. CRAMER — Crown, **1**; Anchor, **2**; Banner, 1⅓; Inst. Iso., 1⅓; Med. Iso., **2**; Commercial Isonon, 2⅔; Portrait Isonon, 1⅓; Trichromatic, **3**; Slow Iso., **5**; Contrast, **9**. DEFENDER — Vulcan, **1**; Vulcan Film, 1⅓; Ortho., **2**; Non-hal. Ortho., **2**; Slow, **9**; Process, **9**. DUFAY DIOPTICHROME, **7**. EASTMAN — Motion Picture Film, **1**; Portrait Film, **1**; Speed Film, **1**; Hawkeye Film, 1⅓; N. C. Film, 1⅓. ENSIGN FILM, 1⅓. FORBES—Challenge, 1⅓. HAMMER—Sp. Ex. Fast, **1**; Ex. Fast, **1**; Aurora Ex. Fast, 1⅓; Ortho. Ex. Fast, 1⅓; Ortho. Non-hal., **2**; Fast, **2**; Ortho. Slow, 2⅔; Slow, **4**. ILFORD—Monarch, **1**; Zenith, 1⅓; Sp. Rap., **2**; Chromatic, 2⅔; Ord., **3**; Process, **9**. IMPERIAL—Flash-light, **1**; Spec. Sensitive, **1**; Orthochrome S. S., **1**; Spec. Rap. 225, 1⅓; Duonon Plate, 1⅓; Spec. Rapid 200, **2**; Non-filter, **2**; Process, **9**. JOUGLA — Violet Label, 1⅓; Green Label, **2**; Omnicolore, **7**. KODAK — Speed Film, **1**; N. C. Film, 1⅓. KODOID PLATES, 1⅓. LUMIERE — Sigma, ⅔; Blue Label, 1⅓; Film, 1⅓; Ortho. A, **2**; Ortho. B, **2**; Panchro. C, **2**; Autochrome (outdoors), **8**; (indoors), **9**; Process, **9**. MARION — Record, ⅔; Brilliant, **1**; P. S., **1**. NEW RECORD — Extra Fast, **2**. PAGET — XXX, 2⅔; XXXXX, **2**; Swift, **1**; Ex. Spec. Rapid, **1**; Ortho. Ex. Spec. Rapid, 1⅓; Panchro. Ord., **2**; Panchro. Colour (no screen), 2⅔; Spec. Rapid, 1⅓; Hydra Panchro., 3⅓; Hydra Rapid, 3⅓. PREMO FILMPACK, 1⅓. ROEBUCK — Blue Label, **1**; D. C. Ortho., **2**; Ortho., **2**. SEED — Graflex, ⅔; Gilt-edge 30, **1**; Color Value, **1**; Gilt-edge 27, 1⅓; L. Ortho., 1⅓; 26X, **2**; Non-hal., **2**; Non-hal. L. Ortho., **2**; Tropical, **2**; C. Ortho., 2⅔; Panchromatic, 2⅔; 23, **3**; Process, **9**. STANDARD — Extra, 1⅓; Imperial Portrait, 1⅓; Orthonon, 1⅓; Polychrome, 1⅓; Thermic, 1⅓. STANLEY — 50, 1⅓; Commercial, **4**. ROGERS — Regular, **1**; Orthochromatic, **2**; Orthochromatic N. H., **2**. WELLINGTON — Extreme, ⅔; 'Xtra Speedy, **1**; Film, 1⅓; Iso. Speedy, 1⅓; Portrait Speedy, 1⅓; Anti-screen, 1⅓; Speedy Spec. Rap., **2**; Ortho. Process, **9**. WRATTEN & WAINWRIGHT — Panchromatic, 1½; Process Panchromatic, **3**.

3½	S ⅓000	4	S 1/4000	4½	S 1/2500	5	S 1/2000	5½	S 1/1250	6	S 1/1000	6½	S 1/700	7	S 1/500
7½	S 1/350	8	S 1/250	8½	S 1/150	9	S 1/100	9½	S 1/75	10	S 1/50	10½	S 1/40	11	S 1/25
11½	S 1/20	12	S 1/12	12½	S 1/10	13	S ⅛	13½	S ⅕	14	S ¼	14½	S ⅔	15	S ½
15½	S ⅔	16	S 1	16½	S 1½	17	S 2	17½	S 3	18	S 4	18½	S 5½	19	S 7½
19½	S 11	20	S 15	20½	S 23	21	S 30	21½	S 45	22	M 1	22½	M 1½	23	M 2
23½	M 3	24	M 4	24½	M 6	25	M 8	25½	M 12	26	M 15	26½	M 24	27	M 30
27½	M 45	28	H 1	28½	H 1½	29	H 2	29½	H 3	30	H 4	30½	H 6	31	H 8

These tables are based on the 1914 *edition of the "American Photography Exposure-Tables," a new and revised form of the "Photo Beacon Exposure Card." Owing to the great increase in the speed of lenses and plates since the original compilation of these tables, it has been necessary to completely change the system of numbers corresponding to stops, plates and exposures, so that exposure numbers from this table are* 5 *units higher than in the old tables. The complete tables, in pocket form,* 3 x 5 *inches, containing full directions for obtaining correct exposure under all conditions, may be obtained from our publishers at the price of* 25 *cents postpaid.*

AUGUST, 1915 TEN CENTS

POPULAR PHOTOGRAPHY



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POPULAR PHOTOGRAPHY

Volume III | BOSTON, MASS., AUGUST, 1915 | Number 11

CHRYSANTHEMUMS — W. G. WINTERS

(See Page 426)

GOING UP T. W. LINDSELL

GOING UP

The maker of this print felt like "passing up" the job before he was through, for he had to work under difficulties. He says, "It was taken during a heavy snowstorm, and I had my own troubles trying to keep the snow out of the camera and off the lens, and hardest of all was trying to get the subject in focus, as the ground glass was always covered with melted snow, making it almost impossible to focus. I made six exposures that day, and this was the only one which I can say was at all in focus." This is one time when a reflecting camera was at a disadvantage, owing to its lack of a focusing scale. We know several workers who have added a focusing arrangement, with lock, to the Reflex camera, so as to be able to use it by touch, merely pointing it at the object and not looking at the ground glass at all. In spite of the handicaps under which he worked, our contributor secured a good result. The spotting is fine. Data: 1A Graflex with 5-inch Cooke *f*: 4.5; 1-75 second in January at 3 p. m.; Speed film; pyro tank; enlargement on P. M. C. Glossy bromide card with homemade enlarger using the Cooke lens.

SOME PUZZLING LENS QUESTIONS

Stating that he has never yet been able to obtain from dealers, experts in his camera club or magazine editors a definite answer to certain lens questions, a reader writes to us as follows:

"I understand that anastigmat lenses are produced by combinations of glasses which will attain the corrections we call anastigmatic. Different firms have various methods of producing the result.

"*Question 1.*— Is any particular combination better than any other — except that one firm has one method, another another?

"*Question 2.*— If the excellences differ, where can one find out just what comparative excellence is in the different lenses?

"*Question 3.*— On the practical side.

"(*A*) The No. 1 Autographic Kodak is advertised with two lenses of the same opening, one listing at $45.00 and the other at $36.00. Is there any practical difference in results obtained by these two lenses? If so, what is the difference?

"(*B*) An imported reflecting camera is advertised with *f*: 4.5 lenses and the prices range from $57.00 up to $80.00. Will the $57.00 combination do as well as the $80.00 one? Is the difference just name or is it real and worth paying for? In my own case, I wish to make negatives for slides and for enlargements."

Answering these questions first in a general way, we would refer the reader to the files of *American Photography* for a perusal of the articles on optics by Dr. Harting of the Voigtlander Company. These papers appeared in 1912 and 1913. From careful reading of them or of any good textbook on photographic optics, the reader will learn that the principal errors inherent in lenses are chromatic and spherical aberrations, subdivided into several

A NEW ENGLAND HOME
HARRISON BROWN
First Prize, June Competition
(See page 429)

PAPA'S BOY F. T. POILLION

classes, including various types or classes of chromatic errors; and astigmatism, coma, spherical zones and many other varieties of spherical errors.

It is a comparatively easy matter to correct an unsymmetrical lens for the grosser errors and produce a real anastigmat at a reasonable price. Aldis did it years ago in England, and Wollensak has lately done it in America. Such lenses are far ahead of the best rectilinears in freedom from astigmatism, curvature of the field, and streaky marginal definition. They generally retain, however, traces of coma, or oblique spherical aberration, and may have spherical zones. These varieties of spherical error are extremely difficult to get rid of and necessitate special formulas and glasses. The construction of optically perfect lenses is an extraordinarily expensive process, hence the higher the price, in general, the better the corrections; though only the more recent types are entirely free from coma and zones.

For all ordinary photography, particularly contact printing, a common or low-priced anastigmat answers perfectly, for few amateurs are capable of working carefully enough to exhaust the possibilities of such objectives. Furthermore, if errors prove bothersome, they may ordinarily be got rid of entirely by stopping down a little; for most trouble is met in correcting for rays which pass through the margins of the lens. When, however, one intends the work to be enlarged, it may be a real advantage to have a lens which is quite free from coma and zones at its full aperture.

Coming now to the specific questions, we will endeavor to answer them frankly and fairly.

No. 1. Yes; certain types of construction are freer from errors than others. Only the most modern lenses are fully corrected, though there are a great many anastigmats which have a flat field and work very beautifully. Only by making test-chart exposures can it be demonstrated that they have any appreciable errors. A good, practical test is to paste a newspaper to a large sheet of cardboard and photograph it at full aperture, taking extreme precautions to have the lens exactly opposite the center of the chart and its axis perpendicular to the chart. The test, however, will be worthless unless the plate is in exact register with the ground glass. Methods of testing are well described in Prof. Louis Derr's book, "Photography for Students of Physics and Chemistry." Printed test charts can also be obtained on request from either the Bausch & Lomb or the Wollensak Optical Companies. A negative of the chart will reveal curvature of the field, astigmatism, coma and spherical zones, if they are present. A few trial exposures will often demonstrate that there is no appreciable difference between two lenses by different makers.

No. 2. Assuming that two lenses have been put through the tests mentioned above, there may still be a slight difference in their corrections which can be demonstrated only by special tests on an optical bench. Inasmuch as few users are in a position to make or to interpret such experiments, the only way to make a final choice is to make two negatives under identical precautions with the two lenses and enlarge them until the image begins to break down. If there is any difference in the scale of the enlargement reached by the two before this occurs, the choice becomes easy.

No. 3. (*A*) Yes and no. It is true that the more expensive lens is freer from coma and zonal aberration. It would give slightly finer detail for enlarging in test-chart work, but in general photography it would be almost impossible to detect any practical difference. The choice would really depend on whether one could spare the extra money without a thought, for the lower-priced lens is an extremely good one.

(*B*) In this instance there might be a few cases in which the lower-priced lens would show flare, as it is constructed with several air-spaces; but practically it would be most difficult to injure the definition, as the hood or shade above the lens would keep out the strong sky light and prevent any bad results from photographing against the light. As an illustration, we might mention that for many years we have used certain triplet lenses having two air-spaces and have never been able to make a picture which showed any flare spot unless the image of the sun or of an electric arc fell on the plate. Of course, the lens is always shaded with the holder slide or a collapsible aluminum-drinking-cup hood when taking pictures against the light; but these precautions should be taken with all lenses. We should expect to get very fine results, quite good enough for all work suitable for slides and enlargements, from the $57.00 outfit, for we have no difficulty in getting exquisite definition in four-diameter enlargements of a small part of the 4 x 5 negative made with a 6-inch triplet anastigmat, a Cooke Series 3F, *f*: 6.5.

PAPA'S BOY

With only two main defects, this print is deserving of great praise for its positive merits. The figure is well placed. The pose and the expression are easy and natural; the lighting is good; the exposure and the rest of the technical work are excellent. The two defects are: first, the "blobby," out-of-focus tree in the background; second, the lack of a trifle more ground under the feet. The first could be retouched out; the second, with a film camera, could be avoided only by applying a "finderscope." Data: 3A Special Kodak with Zeiss-Kodak *f*: 6.3 lens of 6¾ inches' focus; 1-5 second at 4 p. m. in October in fairly bright light; full aperture; Eastman Speed film.

HARK!

HARK! WM. R. BRACKBILL

Mr. Brackbill assures us that what may seem to us, as it does to him, poor spacing is due to the camera or the sitter's having moved after he had arranged the picture on the ground glass. He intended to cut into the right arm, not the left. The pose, expression and other points he considers perfect and typical of the youngster. We feel that if the picture had been made from a few feet farther back, the trimming might have been settled exactly in finishing the print. It is always dangerous to crowd the figure on the ground glass. The vertical spacing is poor. More of the empty space above the head should be trimmed off; but this is a fault of the unnaturally long panel shape of the undersized postcard used. It is instructive to note that the right hand appears slightly out of drawing, in spite of the use of the long-focus single combination, simply because the scale of the image is too large, or, in other words, the lens too close to the sitter. Data: Postcard Seneca No. 8 with 10½-inch single combination of regular R. R. lens; 1 second at *f*: 16; intense sunlight overhead, but sitter in shade of house at 1 p. m. in February;

WHO'S COMING? J. C. WERNER

Standard Orthonon plate; duratol; print on an Instanto postcard, developed with duratol.

WHO'S COMING?

The maker of this print wrote when he sent it, "I am not answering the questions because I prefer to leave the criticism to you." This is not the right position to take. Answering the questions does not preclude our criticism, for we may give one which will show that we have adopted an entirely different standpoint from that of the maker, but the answering of these questions makes the author reason out his pictorial ideas for himself, and if he finds that his own opinions coincide with ours, it may perhaps give him more confidence that he is on the right track. In many cases, the maker of a picture, if he carefully criticizes it himself, will discover some of its faults, and perhaps find it unnecessary to ask criticism of another. The present print is not a brilliant composition, but apparently an ordinary purposeless snapshot, with a road leading to the weakest point of the print, its center, with the principal object doubled and unfortunately placed. It could be greatly improved by very severe trimming. Cut down to a horizontal panel much smaller than an ordinary visiting card, which might be worth enlarging. Data: Taken with a 3A kodak fitted with rapid rectilinear lens. The exposure was 1-25 second at 3 p. m. in September with bright sunlight, on a Seed 27 plate; Seed's M.-H. developer; Contrast Studio Cyko print.

MATTE VARNISH

Those who like to make up their own varnish will find that the following formula gives a good matte varnish:

Sandarac	1 ounce
Mastic	¼ ounce
Ether	½ pint
Benzol	4 ounces

The vapors of ether and of benzol are very inflammable, so that the varnish must be kept in a very well corked bottle, and must not be made up or used in a room in which is a naked light. The gums should be given a day or two, with occasional shaking, to dissolve, and the varnish filtered through a plug of cotton wool inserted in a funnel, the funnel being covered over with a sheet of glass. A better, but tedious plan, is to put the varnish on one side for two or three weeks, and then to decant the clear solution from the sediment.

A SCREEN FOR TEMPORARILY DARKENING A ROOM

Those of us who are unable to put aside a room to be given over permanently to use as a darkroom find it necessary to darken a room temporarily now and again, and various expedients have been adopted for this purpose. Makeshift methods with curtains, focusing cloths, etc., are open to the objection that they take a considerable time to make quite secure, and if they are frequently adopted the paintwork of the window frame will soon get disfigured with pinholes.

It is worth the while of anyone who has occasional need for darkening some particular room to construct some appliance by which it can be done effectively, and at a moment's notice. One of the ways of doing this, which the writer has found perfectly satisfactory, is described below.

The measurement of the window frame having been taken, a picture frame of a plain light molding was made, of such a size to fit within the frame comfortably. The frame was then blocked up by means of a sheet of "three-ply," a thin wood built up of three veneers glued together. The material is very

MY FIRST SCENERY WM. H. YOUNG

light and perfectly light-tight. Under the influence of hot sun at times it has warped a little in the frame, but not enough to let in any light. A couple of brass handles are fitted to the frame for lifting it in and out, and the arrangement was complete. To hold it in position a fillet was nailed along the top frame of the window, and a small bolt attached to the bottom bar of the removable frame. It is put in place by lifting it so that the top edge comes between the window and the fillet, and then pushing the lower end of the frame forward until it touches the window, where it is bolted. Should it be necessary, it can be made light-tight by means of cloth strips tacked along the edges, but I have not found it so up to the present.

MY FIRST SCENERY

This print is a genuine first exposure by a beginner. It shows that it is reasonably easy to make a successful snapshot. Mr. Young thinks that he overexposed slightly and would have done better had he at that time been using our Exposure-Tables. Not overexposure, but overdevelopment is the only fault we can see, for the slight chalkiness in the lights on the foliage is due to this cause, and more time would have given a softer result. Data: Postcard Seneca camera with R. R. lens; *f*: 16; 9 a. m. in August in dull light; film; Eastman Special developer; print on an Azo Hard X Grade F card.

QUESTIONS ON THERMO DEVELOPMENT

1. Can I mix M.-Q. Thermo in one solution and in larger quantities than stated in the formula?

Yes. There would be no special object in doing so, as the keeping qualities would be reduced.

2. Can the M.-Q. be mixed without metabisulphite, using bromide; and if so, how much bromide?

If metabisulphite were left out, the carbonate would need to be reduced the same number of grains. Adding bromide would change the temperature and make the times incorrect. Bromide is of very little use, anyhow. Extra sulphite, not less than 10 grains of the anhydrous sulphite to each fluid ounce of completed developer, is a better preventive of fog, and it does not alter the speed of the plate.

3. To use the M.-Q for D.O.P., how much bromide should be used?

We use the solution which has been used once for a plate and add bromide only if it proves necessary in order to keep the whites clear or to secure some desired color. A drop or two of 10 per cent bromide solution to the ounce is generally enough. The M dilution is right for most soft-working papers, and the S for contrasty papers.

4. What dilution in the tank will give a negative suitable for soft D.O.P.? I use an 8x10 tank, which takes five quarts of solution,

Copyright, 1898
THE WAYNOKA CYCLONE G. F. GREEN

and do a dozen plates every day. Can I use the same developer for several days by adding sufficient fresh stock to the tank to keep the quantity up to five quarts? I wish to make a negative suitable for soft paper and showing detail in white dresses without the faces being too dark.

You should be able to get the results with the dilution recommended for the particular plate you use, as the table of times for the Modified Thermo M.-Q. normally gives just that amount of contrast. The repeated use of the tank developer is possible, if additions of fresh stock are made; but in that case the time of development would have to be found by inspecting the plates. The developer would work a little slower each day. Only when fresh solution is used for each batch of plates is the time given in the table correct.

THE WAYNOKA CYCLONE

This remarkable picture has been published very widely in this country, as well as abroad. Mr. Green states that the original negative was literally worn out by printing from it over 3,000 P.O.P. prints during 1898 and 1899, since when it has lain unused. No one, however, has since that time produced any more remarkable picture of a cyclone on land, and we take great pleasure in presenting a reproduction to our readers. The original was made with a 4¼ x 4¼ Vive camera and the exposure was determined by F. Dundas Todd's original *Photo-Beacon Exposure-Card.* Mr. Green, by the way, writes that he still uses our Tables. He says that he was unusually favored in the circumstances which enabled him to get so perfect a record. The sun was behind the clouds and low down, with clear sky near the ground, so that the cone was thrown out in sharp relief against the background and the foreground was in deep shadow. The picture was made from the door of a cyclone cellar three miles away from the cone. Our print is from a new negative secured by making a positive transparency, retouching it, and printing a new negative, which was also retouched. The rolls of clouds shown were all traveling in different directions. What a motion picture it would have made!

CHRYSANTHEMUMS

(*See page 419*)

The arrangement of two blooms is always a more difficult task than that of three. The minute flower, in this case, can hardly count as a bloom, it is so much smaller than the others. Mr. Winters has managed the grouping remarkably well and lighted the flowers most skilfully. The values are particularly good, as the exposure was ample. Data: 5 x 7 Seneca camera fitted with a Wollensak Vesta portrait lens of 10 inches' focus; 1 minute at *f*: 22 near a window on a Seed 30 plate; M.-Q.; print on Professional Cyko Matte.

FORMALIN AS A HARDENER

Now that the warm weather is with us, there comes a most distressing trouble which may well cause the amateur worker to gnash his teeth as he views a cherished negative ruined by frilling, or softening of the gelatine. The amateur, however, can wait until night and work in a cool cellar, with ice, if available. The professional, though, must develop at once, in most cases, and he cannot afford to lose his exposures at any cost.

Formalin, a 40 per cent solution of the gas formaldehyde in water, is a cheap and efficient hardener of the gelatine. The nearest druggist can supply it, and so can most large stock houses. For use, the 40 per cent solution is altogether too vigorous, so it is greatly diluted,

NATURE'S WHITE MANTLE ERNEST G. COOK

say an ounce of the solution to 20 or even 40 ounces of water. The gas, of course, soon escapes, weakening the solution, so the original stock bottle must be kept closely stoppered, and the diluted bath must be strengthened from time to time.

The best way to use formalin is to bathe the exposed plates or films in the weak solution for one or two minutes (in safe light, of course) and then rinse well before putting them into the developer. When this procedure is followed, developer at 80 degrees or higher has no softening effect. The formalin can be used, if preferred, after fixing, to prevent frilling during washing. This is the best course when the developer and the fixing bath are kept cold with ice.

Do not breathe the gas any more than you can help, as it has a very irritating effect on the membranes of the nose and throat.

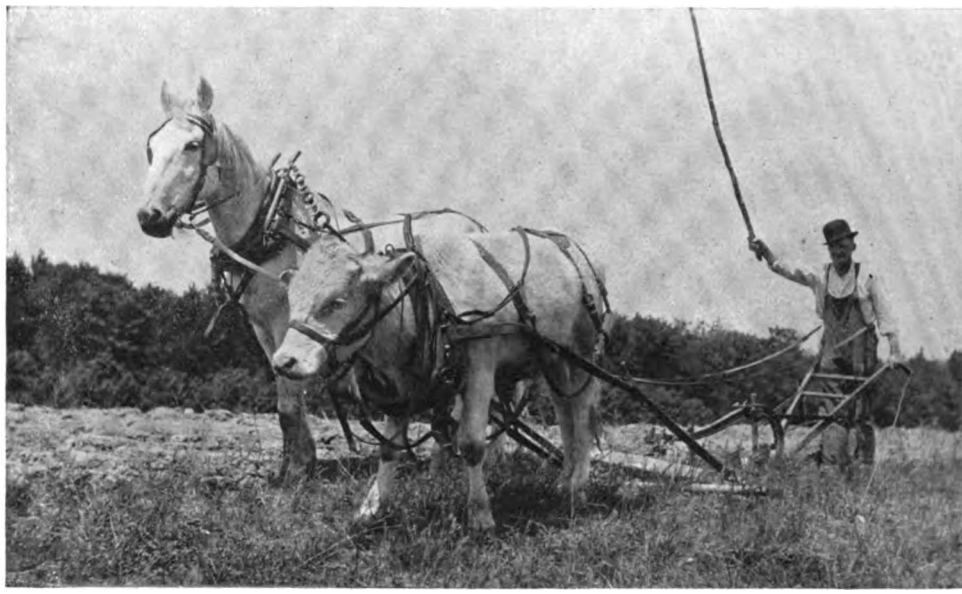
NATURE'S WHITE MANTLE

We are surprised to find a worker making the following statement, in answering question 8 of our coupon, "No; the human eye is the best exposure meter." Although a person who is making exposures every day may succeed in making them fairly uniform, there are many instances when the eye is quite incapable of gauging the actinic value of the light with sufficient accuracy. This is because it is chiefly sensitive to light to which the plate is insensitive. Mr. Cook's photography would succeed in the exceptional cases only because he disregarded the visual impression and followed the teachings of experience. A tinting meter, on the other hand, indicates the actinic strength so accurately that it may be relied on implicitly in the very circumstances when the eye fails.

The technique of the print before us is almost perfect, though possibly the blacks of the trees are a shade too solid, in spite of their full detail. A softer paper would give a less inky black, or using more water in the paper developer for the same grade would have the same effect. The rendering of the snow texture is particularly good, in view of the non-use of a filter, and is due to the home color-sensitizing of the Vulcan plate by the user. The composition is excellent, the point of view having been chosen carefully to give the best placing of the trees, the most useful diagonal of the banks, and the best vanishing point. Mr. Cook made the picture with a Century Grand Senior camera fitted with a German-made Goerz lens of 8½ inches' focus. He gave 3 seconds at *f*: 16 in February at 8.30 a. m. The plate was developed in ferrous oxalate and the print, on Normal Studio Cyko, in edinol-quinol.

A SUGGESTION ABOUT STAINED NEGATIVES

Should the photographer find himself in possession of a negative with a bad yellow stain in some part of it, and wish to make a print, there is always a possibility of making the stain of no effect in the printing, without the risk of wetting the negative to clear it, by taking advantage of a principle used in orthochromatic photography. Taking an unused plate, it is fixed out, washed, and its



GET UP JAMES LUND

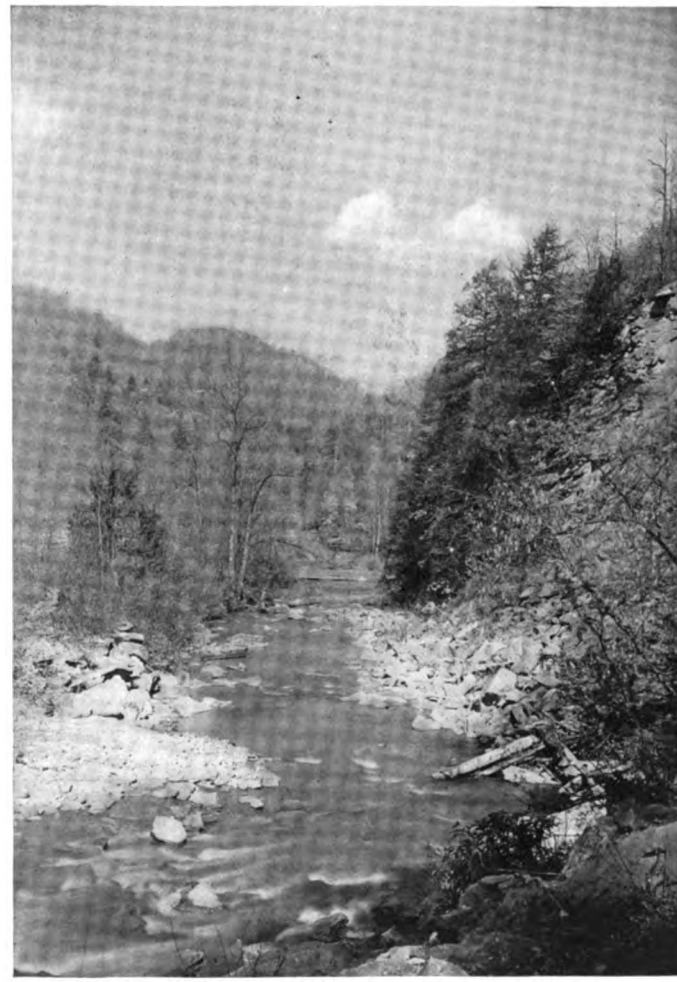
clear film is stained all over at least as deeply as the stain on the negative, and, if possible, with the same staining material. At all events, a pretty deep coloration should be aimed at. This is placed over the negative while printing it. Bromide paper is best used for the print, as such a screen prolongs the time required for printing enormously, but with rapid bromide paper the prolongation is not prohibitive. The stain in the print will be found to be almost, if not quite, invisible. An alternative method, which would reduce the exposure very much, and ultimately allow prints to be made by any process, would be to print on an orthochromatic plate and make a fresh negative from the positive so obtained.

LINES ON ROLL FILMS

Some readers of POPULAR PHOTOGRAPHY who are roll-film camera users may have trouble with fine straight line markings on their negatives, which run in the direction of the length of the spool, and print out as black lines. They may be caused by the rollers over which the film passes not being perfectly smooth and revolving freely as the film travels over them. If the lines are troublesome, the rollers should be seen to, and if they do not turn easily a very slight trace of oil should be put on their bearings. On no account, however, must any of the oil be allowed to get on the roller itself, by which it may reach the face of the film.— A. ROUSE. [Another cause of the same markings is the winding off of the film on a folding camera, when the camera itself is closed, and the bellows may be pressing on the face of the film. The winding off should be done immediately after each exposure and before shutting up the camera.— ED.]

GET UP

At the first glance, we thought this picture might have been taken on the Continent of Europe, where the bovine animals commonly share the field work with horses. Mr. Lund, however, lives in Wisconsin, and he states that he took the picture because it looked so comical to see the young bull hitched up with the old white horse. Technically, we agree with Mr. Lund, it would be almost impossible to improve on his result, as the exposure, development, and printing are perfect. The drawing of the animals, as well as their relative size when compared to the ploughman, would have been better if the picture had been made from at least twice the distance. When one is confined to a short-focus lens on a film camera, working close always causes distortion. The ideal camera is one with sufficient bellows to allow the use of lenses double the usual focal-lengths of the R. R.'s usually fitted. A 12- or 13-inch lens, operated from a greater distance, would have given correct perspective. The 6½-inch lens, at the same (greater) distance, would have given exactly the same perspective, but smaller objects with more surroundings, and the chosen portion could have been enlarged to advantage.



MOUNTAIN SCENERY HARRY STALEY

Second Prize, June Competition

Data: 3A Kodak with 6½-inch R. R. lens; 1-25 second at *f*: 16 in June at noon in bright sunlight; Eastman film; tank development; print on an Azo C Soft postcard.

MOUNTAIN SCENERY

This delicate landscape is a striking proof of the advantage of a color screen, although our own preference would have been to use a screen of somewhat less depth than a 10-times rayfilter, which the maker adopted. The rocks in the foreground are perhaps a trifle too light, though the values otherwise are very beautiful and pleasing. Though the river runs rather too centrally into the print, the eye travels from the lower left-hand corner down the stream to the dominant mass of the dark-toned trees on the right, and this line is counterbalanced by another strong directional motive, running from the lower right-hand corner along the bank of the stream to the crest of the hill at the left-hand side. The mass of sky is admirably balanced by the small dark mass in the foreground, and altogether the composition, though not simple, is exceptionally attractive. Taken with a No. 2 Century camera, fitted with an R. R. lens. The exposure was 2 seconds at 2 p. m. in April, at stop U. S. 32, using the 10-times rayfilter. Seed's L. Ortho 5 x 7 plate was developed in tray by time and temperature. The print is on C Hard Azo.

A NEW ENGLAND HOME

(*See page 421*)

This is an example of the beautiful effect often to be obtained by photographing directly against the light. Only, in doing this, special

INTERIOR — LIVING-ROOM CARL A. PETERSON

Second Prize, My Own Home Competition

precautions have to be taken to obviate the sun shining directly into the lens, and in this case the large elm tree at the left shields the camera from the sun. If some such natural screen as this cannot be utilized, a lens hood must always be employed in making such pictures, in order to prevent the sun's rays from shining on the surface of the lens. This is very important with modern lenses, where the total field of view is likely to be much larger than the plate, so that the bellows, no matter how black they are, can reflect a strong light onto the plate, and cause fog and grayness. Such a precaution is not so much called for in the present case, where the lens does not really more than cover the plate on which it is used. That this is actually the case may be observed by inspecting the upper corners of the picture, where will be found indications that the circle of illumination did not reach completely into the corners, owing to the fact that the lens was raised to its limit in order to cut off some of the foreground. It happens that these two patches come in masses of foliage, and do not materially detract from the picture. The picture is remarkable because of its pleasing framing by the trees on both sides, the skilful way in which the eye is carried up the road to the point of interest, the entrance to the house, and the charming quality of all the values in the print, largely due to extremely full exposure. *American Photography* Tables were used in calculating the exposure, as follows: Subject 3; stop 6; light ½; hour 3 p. m., ½; plate 1½; sun, ahead, 2; total, 13½, which equals 1-5 second. As the 3-times rayfilter was used, the nearest practical exposure was ½ second, and it will be noted that this was sufficient to give full shadow details everywhere except in the trunk of the elm tree at the left. The picture was taken with a 5 x 7 Cyco camera, fitted with a rapid rectilinear lens of 7 inches' focal length. The exposure was ½ second at stop *f*: 11, at 3 p. m. in May, using the 3-times rayfilter, in bright sunlight. The 1½ Standard Ortho plate was developed in M. W., and the print is on Argo Rough paper.

LISTENING TO THE MUSIC WILMA B. McDEVITT

LISTENING TO THE MUSIC

This interesting and finely handled genre study was evidently not posed, for the blur of the organ-grinder's hand shows that he was actually making music at the moment the 1-50-second snap was effected. If the print is trimmed at the left through the trunk of the palm, the portion which remains has unity, which quality it lacks at present, because the eye is drawn away from the main group by the patch of strong light to left of the tree and the figure there placed. Considering the suggested remainder, there is almost nothing to criticize, for the children are all intensely interested and even the organ-grinder, although he is looking at the camera, seems suitably occupied. The technical work is very good. Data: 3A Kodak with R. R. lens; 1-50 second at 2 p. m. in May in bright light at *f*: 8; Eastman film; tank pyro powders; 8 x 10 enlargement on Studio Enlarging Cyko.

ONE BEGINNER'S TROUBLES

What is a beginner to do when he has no instruction book and can't even find out who made his camera? The following letter explains itself.

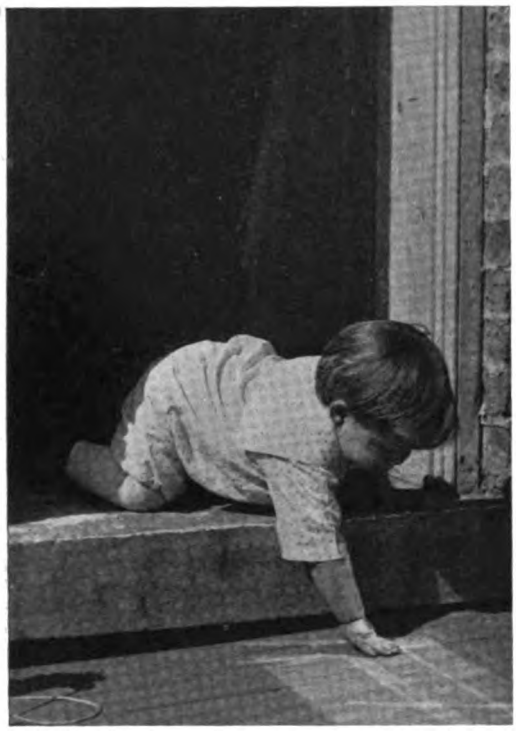
"I have a 4 x 5 camera. When I got it I was to have received instructions for using it; but I did not get any. I did not buy from the manufacturers and can not find them so as to get instructions.

"In January I got a dozen plates and tried exposing them anywhere from ½ second to 3 or 4 seconds as early in the day as 11 a. m. and as late as 1 p. m. when the sun was bright. I had my camera in several different positions.

"I put the contents of one developer cartridge in eight ounces of water and tried it. I did not get any pictures, so thought that it was too weak and put in another cartridge, making one cartridge to 4 ounces of water; but I did not get any pictures. All of the plates turned black on the outside and stayed white next to the glass. Was the trouble in the plates or was it in me? What did I not do rightly?"

When for any reason an instruction booklet written for the particular camera cannot be obtained, we recommend a general elementary instruction text like our ten-cent booklet, "A Manual of Photography." This covers all the points which a beginner should know in order to make his first pictures. Other booklets, including "The Secret of Exposure," "Practical Development" and "How to Make Good Prints," should also be read. The pocket edition of the Exposure-Tables published in the magazine also contains sixteen pages of explanation of how to expose correctly.

We should judge that the beginner in this case understands about the different speeds



SAFETY FIRST L. BENEDICT

which are marked on the shutter, from his mention of ½ second. The shutter has other marks indicating the stops or openings which can be used in the lens to regulate the amount of light which can pass through. These are probably Uniform System Numbers, as follows: 4, 8, 16, 32, 64 and 128. The reader will find these in the box under "stop" in the Tables in each issue. Following the Tables, open the shutter when set for "T" and work the stop lever so as to set the different stops and observe their sizes. Then close the shutter and prepare for an exposure.

The winter-light tables, last published in the January issue of the magazine, give us the following factors with which to work:

Subject, average landscape	3
Stop, U. S. No. 8	6
Light, bright sunlight	½
January, 11 a. m. to 1 p. m.	1
Plate, average speed, same as films	1½
Sum	12

Referring to the last table on the page, we find, in the little box with the large figure 12, 1-12 second as the proper exposure. The nearest exposure marked on the shutter is 1-25, so we look for that exposure and find it is with the sum 11. This means that we can use a larger stop, namely U. S. 4, and give 1-25, or stop down to U. S. 16 and give 1-5, which would be near enough. We see also that ½ second goes with a sum of 15, so to make that time correct it would be necessary to use stop U. S. 64.

The reason why the plates blackened all over and did not give an image was that they were greatly overexposed. No method of development would have made much difference, for even ½ second was several times too long, and the longer exposures, 3 or 4 seconds, would have been altogether too long even with the smallest stop in place.

Beginners like to watch the development of the image, but they seldom stop the action soon enough. We think they will in all cases get better results if they expose by our tables and use the Thermo method of development. It may seem more trouble to weigh out chemicals and make up the stock solutions; but the nearest druggist will generally be glad to oblige, and with a thermometer and a Thermo Card the beginner will then be in a position to "do the rest" with the utmost certainty. Prepared tablets, powders and liquids can also be purchased with directions for use by the time and temperature method of development. Film users will find the tank and its special powders quite the easiest way to develop. Plate tanks are also available for use with the Thermo formulas or the powders issued by their makers with full instructions about the correct times for different temperatures. In short, development of exposures which are correctly calculated is better for not being watched, with the risk of fogging the plate. Tray development is more convenient when only a few plates are to be done, but the tray should be covered light-tight with another tray and the plate left in the developer until the calculated time is up. If the exposure has been anywhere near correct, the resulting negative will give a good print.

SAFETY FIRST

It is too bad that this otherwise perfect genre is so poorly spaced. If the camera had been used with the plate in the landscape or horizontal position, there would have been a chance to leave more space in front of the baby's head, and at the same time the cutting down of the door space would not have injured the effect at all. Data: 4 x 5 Pony Premo with planatograph (R. R.) lens of 6 inches' focus; 1-25 second at *f*: 11 in July at 2 p. m. in bright sunlight; Cramer Crown plate; M.-Q.; print on a Seltona postcard.

ABSORBED BELLE M. WHITSON

ABSORBED

This portrait is an excellent example of professional portraiture, and shows perfect technical work as well as sympathetic handling of the small sitter. The pose is fully in accord with the title. The placing of the figure is particularly good, with but one slight defect, namely, that there is not quite enough space above the bent head to allow us to imagine its being raised without striking the top margin of the print. The picture was made with an 8 x 10 studio camera with Voigtlander 14-inch portrait lens working at stop *f*: 6.5. The Seed 30 plate was used and developed in tank pyro. The print is an enlargement on Artura Carbon Black Extra Heavy linen-surfaced.

EXTEMPORIZED SAFE LIGHT

Two thicknesses of white blotting paper stained with ordinary red ink, and when dry waxed with a little melted candle wax, make a red light, which, if not equal to a real "safe light," forms an excellent temporary substitute for plate changing, etc., if the more orthodox screen is not to be obtained. I recently developed a number of fast plates by means of a lamp screened with such a light, and so was able to fill in a wet day in the country usefully. Of course, care must be used, but the thing is perfectly practicable.

PLAIN BACKGROUNDS

Creases or marks in a background can be made invisible in the negative by getting someone to give the background a shake during the time of exposure. It is well to do this if there is any risk at all of their showing, even if the additional precaution of having the background well out of focus has been taken.

HOME PORTRAITURE

It is supposed by many amateur photographers that the reason why their portraits are not so good as those made by professional photographers is that they do not know how to retouch. Over and above this, there is the absence of a studio and a portrait lens. These are by no means the serious handicap which one is apt to think them; the studio and the portrait lens are more to reduce exposures than to confer any particular "quality" in the results, while retouching can be turned over to a professional or may be avoided by a little softening of the definition when making the print.

The great need for retouching which some negatives seem to present is due to defective technic, and may be summarized as underexposure followed by overdevelopment. Who is there who has attempted indoor portraiture and has not obtained prints in which the faces seem unnaturally dark and preternaturally spotty? This common fault is traceable directly to underexposure. Give four or eight, or perhaps sixteen times as long, and it vanishes. Everyone admits the importance of a full exposure, but this more often resolves itself into placing the sitter close to the window rather than anything else. In such a position, the shadows — and it is the shadows which we always have to consider in deciding exposure — will be no lighter than they would be were the sitter much farther in, but the highlights will be much lighter, and so one is tempted to give too short an exposure. It would often be far better to arrange the sitter two or three times as far from the window, even if the same exposure were to be given; better still to increase the distance and to increase the exposure as well.

Getting nearer to the window is not the only way of increasing the intensity of the illumination, and we have just seen that in portrait work it is not a good way. The cleanliness of the glass of the window is one very important point. In towns especially, glass very soon becomes coated with dirt; it is only a matter of a day or two for the coating to be sufficient to have a very distinct effect upon the exposures required. Long before the window is obviously dirty it is cutting off the effective light to an extent which is not perhaps realized. It is therefore essential in portrait work to see that the window is as clean as possible. If it can be opened, especially at the top, which in this connection is much the more important half, so much the better, since even perfectly clean glass cuts off a good deal of light.

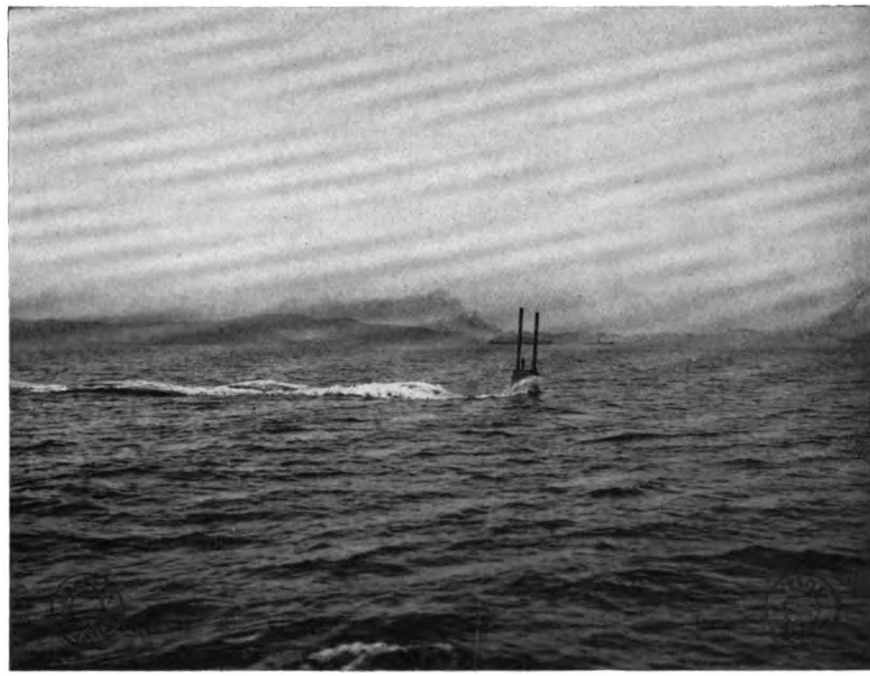
A still greater influence upon the exposures is exercised by the color of the walls and interior of the room generally. When we wish to get light into a shadow we use a white reflector as a matter of course. When taking an indoor portrait we must rely upon reflected light for the illumination of the shadows, and although some special form of reflector may be rigged up to help toward this end, still a great deal of the light must come from the ordinary boundaries and contents of the room. The use of white paint and light wall papers in decoration is, therefore, one which is helpful in indoor portraiture.

While in this way we must do all we can to help keep the exposures short, it is well to remember that they may be very much longer than is often given, without inconvenience to the sitter. Half a minute or a minute was a very usual exposure in the wet plate days, and, except for babies, was not considered impossibly long. We are constantly seeing amateur portraits which are underexposed, and have had exposures of two or three seconds, for no particular reason that we can see unless it were that the shortness of exposures out of doors led the photographer to take too sanguine a view of what would be sufficient inside.

Now with a lens working at f: 6.5 or f: 8, which is as fast as most amateurs can command, and with the fastest of modern plates, one may very safely say that no portrait in an ordinary room, however favorable the lighting, could be overexposed with an exposure of one minute. A plan followed by some who have been most successful with work of this kind is to arrange as restful a pose as possible, and then to watch the sitter closely for movement, giving just as long, within reason, as can be done.

It is said, too, that with very long exposures a better likeness is often secured than with very short ones. The latter are supposed to catch a fleeting expression, whereas the former give more of what might be called a general average of expression. But this is foreign to the topic of this article.

If work is done on the lines indicated above, it should be found that there is a decided improvement in the results; the need of retouching will no longer be so apparent, the face of the sitter will not seem unnaturally dark and there will be none of those solid blacks in the shadows of the hair and elsewhere which are so characteristic of the underexposed portrait.



SUBMARINE—MADE WITH 4 x 5 AUTO GRAFLEX CAPT. C. F. ARMSTRONG

RESTORING FOGGED PLATES

In the case of small plates, it is doubtful economy to trouble much about them, so the process described below would doubtless be found to be more trouble than it is worth; but with large plates, if they are accidentally light fogged, it might be used, as, if the plates are no longer sufficiently sensitive for ordinary work, they may be utilized for making enlarged negatives or for similar purposes where rapidity is of no great importance.

Twenty grains of potassium bichromate are dissolved in a pint of cold water, and when dissolved, two drops of strong sulphuric acid are added. In the darkroom the plate is immersed dry in this liquid, and left therein, with occasional rocking, for five minutes. It is then rinsed and placed in a dish of water, the water being changed at intervals for a couple of hours. The dish should be kept covered except just when the water is changed.

The last washing water, in which the plate must have been left at least five minutes, should be poured into a half-pint glass or measure, and taken out into the daylight and carefully examined. If there is the slightest perceptible yellowness in the water, one or two more changes should be given.

It will be found that six complete changes, draining the plate in between each, if spread over the two hours will eliminate it sufficiently. The plate has then to be dried in the dark.

Now that a "drying cupboard" is rarely met with, this will probably be the most difficult part of the proceedings; but it is comparatively easy on the following lines:

A cardboard box that will hold the plates to be dried standing around its sides — or in a plate rack if not too near together — is first made thoroughly dry and warm by leaving it open for an hour or two in front of the fire. The plates in the meanwhile should be left in a rack in the darkroom to drain, so that as little moisture as possible is taken into the box. Half an hour is usually sufficient, and the drop of water remaining at the lowest corner of the plate may then be removed, and the glass side wiped dry. The plates are then arranged in the box, which must not be warm or it may melt their films, the lid is put on, and if the box is not quite light-tight, it may be covered up with a rug or overcoat. If the plates are left like this for a day or two they will be found to dry thoroughly and evenly.

The correct exposure for plates which have undergone this treatment must be found by trial; it is not likely to be less than four times, probably much more, what it was originally; but fast plates are slowed down more than slow plates; and the thoroughness or otherwise of the washing affects the final sensitiveness of the plate.— ALAN BYRNE.

IN MEDITATIVE MOOD F. A. NORTHRUP

IN MEDITATIVE MOOD

Mr. Northrup has presented a figure study which has the merits of good spacing and skilful use of accessories to emphasize the lines and masses of a well-posed figure. The manner in which the post on the left frames the picture, added to the fearless way in which he has placed the sitter near the right margin, gives a most pleasing opposition of lines. The lighting, too, is well adapted to bring out the value of the flesh tones against the flat tone of the sky background. This is thoroughly original and effective handling, worthy of commendation. Data: 5 x 7 Seneca camera fitted with a Wollensak Verito lens of 7 inches' focus; 2-times filter; ½ second at *f*: 8 in March at 1 p. m.; bright light; Standard Orthonon plate (4 x 5); enlargement on Velour Black Matte.

A CASE OF PARTIAL REVERSAL

One of our readers asks whether he can blame his plate tank for what happened to his plates when he developed in pyro powders put up by another maker and followed the latter's instructions about time of development. What happened was that his plates came out partly reversed, that is, partly negative and partly positive.

He thinks perhaps the trouble may have arisen from hypo in the tank, as he fixed the first batch of plates in the tank; but he wonders whether the more prolonged development advised for the D. C. Ortho plates used could have been responsible.

It is rather curious that we should have had, during the last few years, about half a dozen cases a year of reversal, invariably in one maker's goods. The hypo might have caused the partial reversal, but so might exposure to actinic light while the plates still had traces of developer left in them. Without complete details of the method of working employed, we should hesitate to place the blame. We can, however, lay down a few rules which should invariably be followed. First, do not expose the plates to actinic light until fixed. Secondly, if the tank is used for fixing, use it also for washing, giving at least one hour in running water. Thirdly, clean the tank at intervals by scrubbing it well with a stiff brush and some mild oxidizing agent, such as a weak solution of potassium permanganate, and afterward wash well and set to drain.

In our own work, we give four changes of water and remove the plates to the hypo tank in darkness, leaving them covered light-tight until they are completely fixed, and we have never had reversal.

CLOUDS AND RUBY GLASS

I find that ruby glass makes a very useful appliance for photographing clouds against a blue sky. The glass, which need not be more than an inch or two square, must be selected so as to be as smooth and flat as possible, and is then fixed so that it can be supported an inch or two in front of the lens at an angle, so that the clouds are not photographed direct, but their reflection on the surface of the glass is photographed. The suppression of the blue sky varies according to the angle, but at anything near 45 degrees it is very marked, and will surprise those who have not yet tried it. The contrast is likely to be too great for cloud negatives that are to be printed in combination with landscapes; but for a record of cloud forms it seems to be unrivaled.—H. SONNING.

FORDING THE CREEK

With a few slight defects, when considered from the artistic point of view, this record picture is, notwithstanding, technically perfect. The maker showed a great deal of intelligence in his choice of the subject factor, hence he

FORDING THE CREEK H. M. MANSFIELD

secured a full exposure with correct rendering in all the planes from the darkest shadow under the foreground bowlders to the heavy shadows of the impenetrable pines. Some of our readers, unquestionably, would consider only the running water and feel inclined to consider this subject as no darker than an average landscape; but that would be a fatal mistake. The only correct way to classify a subject is to note the strength and nearness of the foreground shadows in which good rendering of detail is required. Here there are heavy masses within a few feet of the lens. The subject is as dark as a canyon-like city street, a brick building filling the plate, or an ordinary group, hence its factor is 5. Mr. Mansfield used this factor as follows: Subject, 5; stop, 16; light, bright, ½; July, 11 a. m., 0; Standard Orthonon plate, 1½; sum, 14, indicating ¼ second. He stopped to about *f*: 14 and gave the marked 1-5 of his shutter. Another noteworthy thing about the picture is the fine rendering of the youngster's yellow hair — showing the advantage of the color-sensitive plate for portraiture. The figures are extremely well placed. The camera used was a 5 x 7 Conley, which was fitted with a Voigtlander Heliar lens of 8¼ inches' focus. The plate was developed with D.-Q. and printed on Professional Studio Cyko.

LEARNING FROM DATA

Referring to Mr. Brodsky's portrait of two children on page 295 of the April, 1915, issue, a reader asks whether the same exposure, 1 second at *f*: 6.3, would be nearly enough approached by giving 1 second at *f*: 8 (U. S. 4) with a 6¾-inch R. R. lens as supplied on a 3A Kodak. He also asks about how far the children were from the lens in Mr. Brodsky's picture, and whether we think they were posed partly in the shade.

As we remember Mr. Brodsky's data, he posed the children in the open, but close to the house. Most of the light came from above, as shown by the slight shadows under the lower lips; but there was a great deal of general diffused light, which lightened the shadows, leaving just enough effect of shade to give modeling to the faces. These points would indicate that the children were in shade open to the sky.

BEDTIME ED. HERZOG

The relative exposures for *f*: 6.3 and *f*:8 are ⅝ and 1. The smaller stop would theoretically require about 1½ seconds; but the latitude of the plate would take care of a small variation, so long as 1 second was above an exposure approximately one-fourth normal. Of course, if the lowest minimum exposure needed were 4 or 5 seconds and 1 second were given, underexposure would result; but it would take an expert to choose between 1 and 1½ seconds if either were within the period of correct exposure. The reader is advised to watch for a new booklet on exposure which we shall publish shortly and which will cover all such questions very fully.

Judging from the size of the heads in the original print, the 7-inch lens used by Mr. Brodsky must have been placed about 7 or 8 feet from the sitters.

BEDTIME

Mr. Herzog has produced a good record flashlight. Its artistic merit, however, is diminished by his omission to remove the sofa pillow, which has no meaning in the composition and simply forms a distracting patch of halftone. The pictures, however, come at good points to aid in balancing the two light-colored figures. The boys are well posed and placed. Data: 5 x 7 Century camera with 13¾-inch Bausch & Lomb Protar lens; *f*: 8; Victor flashpowder; tank pyro; Artura Iris B.

DRYING MARKS

A drying mark, or line of uneven density on a negative, due to the rate of drying having changed when the action had extended as far as the mark, is very unsightly and quite ruinous if it cannot be removed. A parallel defect is caused when a negative gets splashed with a drop of water; no subsequent soaking of the whole of the negative will get rid of the mark left by the drop. There seems to be only one effective way of dealing with such cases, and that is to convert the whole of the image once more into chloride or bromide and to redevelop it. For this purpose it may be placed in a solution of the following composition, in which it is left until there is no doubt that the bleaching action is complete right through. Potassium bromide, 20 grains; copper sulphate, 20 grains; water, 2 ounces. It is then well washed and redeveloped, in daylight, in any ordinary non-staining developer, taking care in this case also to develop very fully. It does not require refixing, but if well washed after development is finished, the drying marks will have disappeared in the process, which also increases the density of the negative somewhat.

STAINS, ETC., IN REDUCING

For reducing negatives a mixture containing potassium ferricyanide and hypo is more extensively used than any other; and, as a rule, it works quite satisfactorily. Occasionally, however, the use of this otherwise excellent reducer will be found to result in stains being formed; and when stains do occur in this process, they are always very difficult to remove. In such cases also the action of the reducer seems at times to be a very irregular one. The source of both defects lies in the very haphazard way in which the reducer is made up and used. A little of the stale fixing bath is often the supply of hypo instead of some of the clean solution taken from the stock bottle for that particular purpose. The old hypo bath is not merely charged with the dregs of developer taken into it in the films of negatives which have been fixed with it, but also contains a quantity of dissolved silver.

Although hypo is present in the reducing solution itself, it does not follow from this that there is no need to wash out the hypo used for fixing before applying the reducer. The washing need not be quite so thorough as when the negative has been fixed and is being finished, but it should at least consist of several changes of water spread over a quarter of an hour or so, or else of that time under a gentle stream from the tap. If these two points have attention, and one takes care not to have the reducer quite unmanageably strong, there can be no doubt but that the reduction process will be found to work quite smoothly and without a hitch every time.

IN THE EARLY MORNING

Mr. Meservey does not intend this print to be anything but an essay in working against the light. The composition, as he points out, is poor because the small room forced him to work too close to the sitter. The distortion of the nearer foot must be evident to all observers. So far as the technique of exposure and development go, there is no fault to be found; but the figure is too near the middle line. Data: 4 x 5 Cycle Poco camera with 6½-inch R. R. lens; 2 seconds at 10 a. m. in August against bright outdoor sunlight; Standard Polychrome plate; tray D.-Q.; print on Artura Carbon Black, developed with D.-Q.

HYPERFOCAL TABLES

A reader asks how to use the following table of hyperfocal distances calculated for a 6¾-inch R. R. lens.

Stop		*Distance*
f	*U. S.*	*feet*
8	4	47
11	8	34
16	16	24
22	32	17
32	64	12
45	128	6

The first thing to do is to put on the plate attachment (if a 3A Kodak is used) and focus some object, such as a large poster, at each of the distances, using a tape measure to insure accuracy. Make marks for each of the distances not already found on the focusing scale. There are several ways of using the table.

The first, and probably the most generally useful, is for general snapshot work. Suppose that light conditions are such that 1-25 second at *f*: 11 (U. S. 8) is correct. The hyperfocal distance for this stop is 34 feet. Set the pointer to the mark you have made for 34

IN THE EARLY MORNING CHAS. D. MESERVEY

feet and everything will be sharp from half the hyperfocal distance, that is 17 feet, to "infinity," which means, practically, 100 feet. If, however, the light is so bright that you can use stop 16 with the same shutter speed, the lens can be set at 25 feet (found on the original scale) and everything will be sharp from about 12 to 100 feet. The largest stop, *f*: 8, has a hyperfocal distance practically coinciding with the 50-foot mark. Set the stop at *f*: 8 and the front to 50 feet, and the field of sharpness will extend from 25 feet to the extreme distance.

The second way to use the table is in finding what stop to use for a given field of sharp focus. For example, if the principal object is 12 feet away, one looks up 12 in the table and finds that stop *f*: 32 will give sharpness from 6 feet to the distance; or, using the next larger stop and setting the lens at 17 feet, the sharpness extends from 8½ feet to infinity, thus including the object at 12 feet. One's choice would depend on whether the whole of the foreground must be very sharp or whether a slight degree of unsharpness is permissible.

The convenience of the hyperfocal tables for general work in the open is great, as one seldom has to consider anything but setting the front

NOVEMBER RALPH WEEKS

in accordance with the stop to be used. The exceptional case, when the principal object is rather near the lens, say closer than 17 feet, may require careful estimation of distance and the use of a larger stop, to allow proper timing. For example, one could not use the hyperfocal table in making a snapshot at *f*: 8 of a full-length figure in shade but open to sky; intense sunlight; but would have to estimate or pace the distance and set the front to 8, 10 or 12 feet, as the case might be.

NOVEMBER

Inasmuch as many of our readers are engaged in mastering problems of technique, they will doubtless be interested in the essay made by Mr. Weeks and will note with care his self-criticisms. He says that he took the picture to see if he could handle such a subject and he realizes that the sky is too white and that he could do better the next time by using a backed or double-coated ortho plate with a filter. The placing of the shocks is poor. In fact, the vertical panel is most unsuitable for this subject. The lines of the plowed land lead across the picture almost parallel to the base. A different viewpoint, allowing them to lead into the picture and thus carry the eye to the shocks, was imperatively indicated. Data: 5 x 7 Black Beauty camera with R. R. lens: ½ second at *f*: 8 in November at 3 p. m.; very yellow light; Roebuck Blue Label plate; M.-Q.; print on Cyko.

TRIPODS

Except for work in the studio, the tripod forms the most convenient stand for the camera. Even the most confirmed hand-camera user will find that it is greatly to his advantage to have a tripod, and to put the camera on it and focus on the ground glass whenever the subject will allow of it rather than to rely upon the finder and the focusing scale. There is a tendency to give more thought to the selection of the viewpoint and the arrangement of the subject generally when this is done than when snapshotting is the method employed.

The tripod is not only the most portable form of stand that can be devised for general use; it is the most mechanically correct. It is strange that three-legged tables are not more frequently met with. The tripod system of support means that the object stands firmly on any surface, whereas with anything on four legs, unless the legs are all exactly the same length and the floor is perfectly even, very rarely the case, the affair is unsteady.

As far as rigidity is dependent upon design, there is generally not much fault to be found with the stiffness of the legs themselves. When they are clamped up, as intended for use, they are generally firm enough, the downward pressure of the camera tending to make the joints firm. It is at the junction of the legs with the head that there is more likelihood of shake; in fact, this is the point of weakness of all tripod designs, since a very little play here will allow a great movement of the camera.

For perfect steadiness, the legs should splay outward toward the top as much as possible. This means that the head or turntable must be of a fairly large size; in fact, the larger the better. It will be found that tripod legs that have to be sprung into position in the head, and exercise a strong outward pressure on the head when in place, are particularly steady.

The legs should be a good fit on the pins intended to carry them, the legs themselves being fitted with metal sockets or bushes to take the pins. Most photographers when doing landscape work find it convenient to

SUBMARINE — MADE WITH 4 x 5 AUTO GRAFLEX CAPT. C. F. ARMSTRONG

fold the three legs together and to carry the camera in that fashion on the stand. Some tripods allow this to be done quite easily; but some have a knack of coming undone when carried in this position. In one or two patterns the leg is locked to the tripod head, so that until it is intentionally liberated it is a fixture. If much landscape work is to be done, it would be worth while to fit the tripod with three little metal struts, which could be opened out between the two members of each leg when in position, and prevent it from coming undone.

Metal tripods are in a class apart. With them the head is reduced in size to the very minimum, for reasons of portability. Tested in the ordinary way, therefore — by opening the tripod out, placing the hand on top of the stand with a little pressure, and turning it backward and forward on the head as a center — metal tripods are found to have a good deal of play, even with the best of them. There is no way of avoiding this; it is best to recognize it and to remember that, while such light and compact stands are very useful in allowing time exposures to be given with small hand cameras, they will not hold an instrument of any size steady in the breeze. It is the function of the metal tripod to provide a stand for occasional use with a small camera. For regular work in 5 x 7 or larger sizes, a wooden stand is very much to be preferred.

Even in such a matter as setting up a tripod stand, one can usually tell the inexperienced hand at a glance. There is, of course, with some tripod legs, a front and a back, and they must be set upon the head the right way round; but this is evident enough from the design. Where the novice is apt to "give himself away" is in the position of the legs with reference to the view that is to be taken.

If we set up the tripod anyhow, we shall find that the leveling of the camera becomes a lengthy business, involving the adjustment now of this leg and now of that, and so on. The shortest way to do what is needed is to set the tripod up with one leg pointing out in the direction of the view which we intend to take. We will call that leg A for the moment, and one of the other legs B. Then the camera is turned away from A at first, so that its lens is over B, and while in this position it is leveled, as regards back and front, by moving B in or out. If the side of the camera carries a plumb indicator, we can use this, and as soon as we find that by moving B we can get the back of the camera vertical, we turn it on the tripod once more, so as to bring the lens over A, in the position which the camera will

A "GUM" PORTRAIT O. BURGERMEISTER

occupy for the work in hand. The plumb indicator, or the level, will now in all probability show that the camera is no longer level, and we make it level this time by moving leg A only. When we have done so, if we have not moved the other legs in the interim, the camera will be level in all directions.

The tripod will then be so placed that we stand between two of its legs to focus; and if we have occasion to tilt the camera up or down, we can do so by the movement of the front leg only, without disturbing the level in the other direction. For most work this is the most convenient position and it is certainly that which allows the necessary adjustments to be made most quickly.

When the camera is tilted a great deal, it will sometimes be found that the steadiest position is obtained by pulling the front leg back between the others. On uneven ground the sliding part of the legs should be used, when there is one, rather than putting the legs at very different angles to get the required level. The angle at which the legs are placed affects the steadiness of the whole very much. It will be found that the camera is firmest when the legs are opened out so that the space between the points of any two legs is a little less than the length of the leg itself. For work in which the camera has to be at a very low level, either a specially short tripod should be provided or the legs should be used folded at one joint, or not opened up to full length, as the case may be.

A GUM PORTRAIT

We give below the data sent in by Mr. Burgermeister for the gum-bichromate print reproduced herewith.

"The portrait I enclose is a gum-bichromate print made on Whatman's cold-pressed drawing paper printed in water-colors, Indian red and ivory black, in three printings, as follows:

FIRST PRINTING

Indian red.....15 minims
Ivory black..... 7 minims
Gum solution..... 2 drams
Sodium bichromate.....1½ drams
Exposed 3 minutes in sun.
Light test, 15 seconds in sun.
Date, February 14, 2 p. m.

SECOND PRINTING

Indian red.....15 minims
Ivory black..... 7 minims
Gum.....1 dram 40 minims
Sodium bichromate.....1½ drams
Exposure, 2 minutes in sun.
Light test, 15 seconds in sun, Bee meter.
Date, February 20, 2.15 p. m.

THIRD PRINTING

Indian red..... 5 minims
Ivory black.....10 minims
Gum.....50 minims
Sodium bichromate.....45 minims
Exposed 9 minutes to sky.
Light test, 1 minute, 30 seconds.
Date, February 21, 10 a. m.

"The print is from an enlarged negative, 8 x 10, on a Stanley 50 plate.

"I became interested in the series of articles on gum printing by Paul L. Anderson, commencing in the September, 1913, issue of *American Photography* and began to experiment with it soon after.

"The enclosed print is one out of the fifteen prints I made of this negative. I am trying to get in on the ground floor and hope to send better prints as I get better acquainted with the process. I used a little in excess of color, but that is what I was striving for — a low-toned portrait."

PORTRAIT

Although Mr. Read is eager for criticism, he omitted to send in full data with his print, as

PORTRAIT WM. R. READ

required by the rules of our competition. We gather that he used a 5 x 7 camera, as he states that he used a 5 x 7 Stanley plate and printed on Solio. Our first criticism is that the print needs trimming. The bottom contains three spots of rather light tone which draw attention away from the face. They are the left hand and light cloth near it, the triangular patch of the light skirt, and the right hand. It should, notwithstanding, be said that the hands are very skilfully posed. Probably the model herself let them fall naturally into a graceful attitude, and Mr. Read was wise enough not to alter the arrangement; but we think that the picture gains in unity by trimming off at the waistline. A little more may then be removed from the right margin, as this gives better spacing for the figure. The lighting is very skilfully managed, and the technical work in all other respects is masterly.

A KODAK GIRL E. A. DOOLITTLE

A KODAK GIRL

Previous criticisms of similar pictures taken at this spot have led Mr. Doolittle to make great improvements in this latest example of his skill. By a process of elimination, he has got rid of the faults one by one. This print is almost faultless, though if any criticism is in order it should be directed at the unpleasant quality of definition of the sunlighted foliage in the background. As Mr. Doolittle facetiously says, "A lightly overcast sky would have pleased me better, and the next day was just such a one. I spoke to the young lady about it, but she didn't want to stand there that long." The camera used was a 4A Kodak with 8¼-inch R. R. lens. An exposure of 1-5 second at *f*: 16 was given at 4 p. m. in September in bright sunlight on an Eastman film, which was tanked in pyro and printed on Soft Studio Cyko.

THE CAMP FIRE

Not long ago we had a self-portrait of Master Weatherall in camp, and now he sends us the present interesting flashlight effect. It is quite evident that the flash cartridge was placed in the fire. The method, though simple, is a trying one for the sitters. Inasmuch as the print is intended chiefly as a record, we shall not criticize the composition, but simply mention the oft-repeated words, "scattered highlights." Data: Postcard Ansco with R. R. lens; *f*: 11; one No. 18 Actino flash cartridge; Eastman film; M.-Q.; print on a Cyko postcard.

HAND CAMERAS: THE SIZE OF THE NEGATIVE

THOS. KINGHAM

When a hand camera is to be bought, one of the first questions which have to be settled is that of the size of the negative which it is to give; and as a good many photographers are thinking of getting a camera at the present moment, it will be well to run through the pros and cons of a small or large instrument. In doing this one may leave out of sight for the moment the size of the finished picture, since, other things being equal, it does not matter much whether the negative is 4 x 5 or 1 x 1½. A 12 x 15 or bigger enlargement of a perfectly satisfactory kind can be made from either, if the original negative is a good one. With quarter-plate or smaller negatives, size does not affect the cost of working proportionally, since the price of plates, films and of appliances generally does not diminish in anything like the same ratio as the size. Above the quarter-plate the case is different. The advantages of the very small camera, the vest-pocket instrument, therefore, lie principally in its extreme portability, which allows it to be carried at almost all times, and, in consequence, opportunities can be taken which with a bigger instrument, not at hand at the moment, might have to be missed.

As far as enlarging is concerned, much of the work done with a quarter-plate or larger camera may be printed direct; whereas with a very small instrument all, or nearly all, the negatives may be enlarged as a matter of course. This

THE CAMP FIRE STARK WEATHERALL

is a point to be remembered, although with a fixed focus daylight enlarger enlarging is rendered almost as simple as printing by contact.

With enlargements up to three diameters — that is to say, enlarging a picture 1½ inches long to 4½ inches or less — there should be little or nothing to choose between a contact print and an enlargement, if the negative is a good one. If it is not, then its defects are sure to be more conspicuous in the enlargement. With greater degrees of enlargement than this, when pictures are being made for framing, the case is a little different. One may say that for this purpose there is practically no limit to the size of print which can be obtained from a very tiny negative. Such enlargements will not bear the close examination which one gives to a little print; but then, no one attempts to examine them in that way. The larger the picture, the farther back must the spectator stand in order to take it all in, especially if it is a picture which is framed and glazed and hung on the wall. The consequence of this is that for such a purpose the size of the enlargement is governed by the wish of the maker or by the capacity of his enlarger.

If only a part of the small negative is required, so that, in spite of the high degree of enlargement, the print is a small one, and is examined in the hand, then one soon sees limitations. Such limitations are generally imposed, not by the quality of the camera that is used, but by the nature of the subject. If we can use a fine grained plate (which also has to be a comparatively slow one), stop down the lens and give a full exposure, much more enlargement is permissible than if the negative has been taken with a very brief shutter exposure on an extremely rapid plate; since in the latter case the negative will have a coarser grain, and is likely to have areas which are more or less blank from underexposure, and these will be evident in the enlargement, although, if small, they may be unnoticed in the direct print. The lens, too, for instantaneous work will have to be used at a large aperture, and therefore must be of a better quality than it need be when it can be stopped down

One of the most tempting features of the very small camera is that, being fitted usually with a lens of very short focus, it is quite an easy matter to get sufficient depth of focus to render everything sharply. Depth of focus, or the capacity for giving at the same time a sharp image of both near and distant objects, depends upon the size of the stop and the length of focus of the lens; for the same *f* number the shorter the focus of the lens the more perfectly will objects at different distances be defined. As the *f* number indicates the rapidity of the lens, it follows that the shorter the focus the larger may be the aperture for the same general definition. Hence on a very tiny camera it is perfectly easy to work with a focusing scale and a lens at *f*: 4, whereas with a quarter-plate or larger size an *f*: 4 lens would

INTERIOR — KITCHEN CARL A. PETERSON

Second Prize, My Own Home Competition

make a focusing screen indispensable; and even when one was used and the focusing done as carefully as possible, the general definition would still be much worse with most subjects than would be given by the vest-pocket camera.

A great many photographers very rightly regard this as one of the distinctive merits of the tiny camera. It is their ambition to get as clear and distinct an image of all that is before the lens as their outfit can give them; and if the little camera will do this with a large aperture, so that exposures can be short and with very little trouble of focusing, they decide that the tiny camera is what they want.

But it is only fair to point out that this has another side, and one to which a great many of the class who may be called "advanced workers" attach considerable weight. The definition obtained with these little instruments is very fine, but near and distant objects are rendered equally sharp in almost all cases. The consequence is that there is a uniformity of definition about the results obtained with them which is very conspicuous when the negatives are enlarged and which is often very far from being what is wanted. There are many cases in which the only chance one has of bringing out the subject and of keeping down the background is by getting the subject proper as sharp as possible, and by letting the distance remain soft and blurry. Outdoor portraiture is the class of subjects which most often demands this treatment, but it is not the only one by any means. It is evident that this cannot be done with the very small camera, at least in the form in which it is usually seen, although a comparatively few high-class instruments have been fitted with telephoto lenses which enable such results to be got.

For holiday mementoes and general work of that character, however, the vest-pocket camera will do marvels. Subject to the limitation which has just been mentioned, it is equally suitable for the beginner and the expert, while the size of the finished work from it is almost unlimited.

ON THEIR WAY — JOHN J. NEUER

Third Prize, June Competition

ON THEIR WAY

The maker of this picture took it because it told a story, and the story is well told. The picture needs no explanation to be interesting, with the strong perennial human interest. Doubtless, as its maker believes, the introduction of clouds would make an even better picture, but he has no cause to be ashamed that he took the opportunity, clouds or no clouds, and made this interesting genre study. The picture was made with a 4 x 5 R. B. C. C., fitted with a Cooke *f*: 5.6 lens of 6 inches' focus. The exposure was 1-25 second at stop *f*: 11, at 4.20 p. m. in June, with good light. The Seed L. Ortho plate was developed in pyro, and the print is on Studio Cyko.

STICKING BELLOWS

"I have a view camera in which the folds of the bellows stick together. Is there anything I can rub on or varnish it with to prevent this?" asks a reader.

This seems to be a curious sort of trouble. Certainly it is one we have never met before. We know of no method of fixing it except to have the bellows overhauled by a repair man. Probably he could cement in strips of card which would stiffen the bellows and get rid of the difficulty.

SOLVING THE AMATEUR PHOTOGRAPHER'S PROBLEMS

FELIX J. KOCH

THE VALUE OF SYSTEM IN PICTURE-TAKING

It was over at Roosa's one evening that we chanced upon it. Roosa, for one, was an enthusiastic amateur photographer; for another, the Roosas had just moved into the new little home Jack had built out in the suburbs. Discussion turned, as it naturally would, to the changes that come with moving — how objects once gracing the parlor gravitate to living-room, sewing-room, nursery, then maid's room, and, finally, having outlived their usefulness, are given away or destroyed and forgotten little by little — that is to say, they slip from mind, and only now and then by some chance in the lapse of decades will something occur to bring them to mind.

Charleen turned to the little fireproof cabinet in an alcove of its own in the hallway and suggested: "Do you know that we have a picture of absolutely everything that ever served to adorn the flats, the houses, the summer cottages we've occupied?"

We knew that Roosa took pictures *ad libitum*, but we suggested that the statement, as made, was rather broad.

Then, taking the cue from his wife's remark, Jack said, "One of the advantages of amateur photography is just that — preserving, in pictures, objects which through associations have become dear to you and yet which have outlived their time, grown tawdry or faded, or simply take up too much space. For example, the matter of a piano. When we were married wife's father gave us an old-style grand piano — then the height of style. By and by the upright pianos came in. We traded the big fellow off for such. Later we acquired a pianola. We attached that to this. After that we invested in an inner player. That displaced piano and pianola. Now, to go back a step, somehow a thousand associations cling to that first big piano. We could not keep it with the new ones, too, and so it's gone. But," and he thumbed an album from the drawer, "here it is as it stood the first week we were married."

Then, as he let us thumb the pages — draw comparisons between then and now — he went on:

"I'm a crank on using system in taking pictures. As soon as we move into a new home, be it for a month, a year, a ten-year lease, or, as now, perhaps for life, I start. I take the exterior, first front and right side, then rear and left side. Then I step on the porch and take the view upstreet, then the view down street. Crossing the street directly, I take the view, house included, upstreet, then down. So much for the front of things.

"I pass to the rear and take the view from a second- or third-story window, looking squarely upon the garden, looking up the street — the yards rather — looking down.

"So much for externals.

"I then enter the house and continue. I take the hall — front and right wall, rear and left wall. Where it's too dark for a time exposure I take a simple flash.

"Then the parlor. Parlor's largely a room for company, so wife fixes it as she would for the grandest fête. Flowers as we'd have them then, tidies, scarfs and so on. I take front and right wall, rear and left. If any objects in room-center prevent these angles, I move those and get the angles, then take an extra picture showing room-center with said object in place.

"Not to bore you, I repeat this system through the building. I have the table set in the dining-room, have cooking in progress in the kitchen, have the toys scattered in the playroom. So on through the house.

"Simple? Of course it's simple, only for some reason most amateur photographers never stop to think of it. They take now this, now that, then one day resolve to move, and some ornament breaks, or this, that, the other occurs, and the picture is gone for all time!

"I've had men — not rich men, either — tell me a year after they've moved that they'd give fifty dollars in gold for a set of pictures showing their first home, inside and out, as it was when first in shape."

He let us thumb the pictures; then went on:

"So much, of course, for the genesis of the collection. For many years I've kept a diary so long that it's become an actual part of my life, and I'd no more think of going about to-day without having first consulted it than I would of starting off undressed or without my breakfast. Now, if to-day I take, let's say, a complete set of pictures of my residence, and to-day is May 25, on the fly-leaf just after December 31 in my diary I place a wee note — takes just a moment —'May 25 photo house.' When December 31 comes along I transfer that to next year's diary, on May 25 of that book. Then when May 25 comes along the thing stares me in the face and will until it's done.

"The doing, of course, is simple. On a bright, clear Sunday morning I take last year's pictures and go the rounds of the house,

matching up. Where things are still absolutely the same, naturally I don't take a new picture. But if for Ann's birthday she received a new dressing-table, and this occupies the place of the bureau, while the bureau went to the corner where she had the cedar box, and the cedar box is now in her closet, you see two new pictures are required. So I take these, date them, and again we have the house as it changes along."

Charleen then took a hand in the conversation. "I think the most interesting thing is the way Jack applies his system when we travel. Photography, you know, means it's most next to these pictures of home things and home folks when one is away, and he does the same thing then.

"I remember his telling me on our honeymoon how, as the years go on, even the best of us forget, and how things we reveled over once will slip us so completely that in all good faith we'll declare we never saw them. I didn't believe that then, but I know so now.

"On the other hand, the things one has pictures of he sees over and over, not as postcard makers show them or guide-books give them, but as they appeared to *him*. For example, we have a picture of a farm where I played as a child, have had it these twenty years, and so that place is fresh in my mind, while my own actual home, at the same years of life, is the vaguest memory.

"So Jack insists that to see a thing without pictures of it is almost a seeing wasted, and that, while it may cost a bit more in money or time or often still more in trouble, the candle is worth the game in the end!

"Take now, for instance, the West. When we came to San Francisco to get our first view of the city, we took the sight-seeing car, then the sight-seeing automobile. As we went along, on a little inconspicuous pocket pad Jack jotted the things he wanted pictures of, and this in their logical order. Naturally, where he could take them then he did so — that is obvious; but as for the rest, he jotted them down.

CHINESE CHILDREN FELIX KOCH

"Then, that evening he arranged with a taxi driver (where there's none such, he arranges with some livery stable for a buggy) to come for him at six or six-thirty next morning. Over night he left with the man a duplicate of the list, telling him to arrange the shortest route to cover these points and paying him so much for the journey, with a dollar bonus if he saved him time visibly on it.

"Of course, that means rising perhaps at quarter to six — not very pleasant — but, as Jack says, once you're home two days and slept off all fatigue you're no worse because last April you exerted yourself a trifle, while for reward you have pictures you'll covet all your life — things that mean that trip left to you *forever*."

"So much, of course, for the places where one

needs first take a hasty survey. Naturally in a great many cases a little tip to the chauffeur of a sight-seeing auto or of a stage or wagonette — a bribe larger far than most people give, but cheaper than repeating the journey — will insure the stop for just a moment more while you get the pictures," Jack suggested.

"Again," he went on, warming to the theme, "I make the point of following the system of getting my pictures *first*. What I mean is this: To get back to the West, just because Charleen happened to mention that trip. When I sight-see, I'd rather see only one, two, three places, and have seen all there's there, never having to return to finish them, than to have dipped into a dozen and seen each only hastily, as time might allow.

"Well and good. We decamp now at San Francisco, knowing that at minimum we will spend a week there steady sight-seeing. We're sure to go a second time to the Cliff House to watch the sea lions. We're sure to come some other evening to Golden Gate Park and stroll through the aisles of aviaries to hear those singing birds. We're sure to return to the museum in the park, built like some Egyptian temple, if but to 'do' its collections. So why hurry to those points that second morning just to photograph them because they've been seen?

"Because," and he laughed, "because in this world there's just two things sure, and these are death and taxes! Because years ago, in France, I visited Napoleon's tomb one day and hadn't enough film along for it. Every day after I was going back just to take it, but didn't. Then one day a message came, calling me home, and I never got it. That day I learned a lesson. 'Take your pictures the first time you see the things' — it's the old motto of 'Do the hardest first.'"

We spent two hours — it must have been — just inspecting that California album. We marveled at the completeness of the pictures here — how in every city, village and town where they'd stopped they had everything halfway worth the taking. What was more, every picture was taken with care — not the hurried just-wait-a-moment hit-or-miss of the average amateur.

It was nine years now since they had made the trip. San Francisco had been changed by the earthquake; Los Angeles had lost much of her Chinatown; the Imperial Valley had no more desert; the windmill colony had deserted Deming. You couldn't take those same pictures again with the millions almost of Carnegie! And yet, thanks to *them*, that trip was as fresh and exact in the minds of the two as though taken last week.

Supposing that, on a trip of a day, it means an expense of two dollars extra — a buggy for an hour or two! Or suppose, on a week's jaunt, it means twelve dollars; on a two weeks' outing — the usual vacation time, twenty-five dollars. It shouldn't come to anywhere near so much, for, nine times out of ten, you need not repeat *every day* what you saw the day previous.

Even so, a year, two years after, twenty-five dollars, to have given you for life the vacation, the journey as *you* had it, perhaps to show places since destroyed, folks moved away, is indeed little! Add just a few years more, when some of these folks have passed into the Great Beyond, when the funny picture of Jess at the Fountain Geyser and the joke on Will at the big trees will be told with eyes dimmed in memory, and then the few dollars more that were spent for the trip will seem a mere pittance, indeed, when compared to the pleasures the memories aroused, as they show these loved ones at their best.

COPYING WITH THE CAMERA

Very few amateurs realize how useful the camera is as a copying agent and fewer still realize that this class of work can be done at night when as a rule the camera is left alone. Personally I use my camera more for this work than for anything else, and a good instance of the value of this class of work occurred about two years ago. In 1869 there was published in France a small pamphlet on photography in natural colors, the first work on this subject, which cost about 25 cents; for years I have been trying to purchase a copy of this, offering as many dollars as it costs cents, but the only copies in existence, and they are few, are in the public libraries of the British Museum and the Patent Offices of London, Paris and Berlin. As I have a copy of nearly every other work on this subject that has ever been published in any language, I determined that if I could not get hold of an original I would at least get a photographic copy, so I commissioned a friend in London to make me one, and the prints now bound up in book form repose in my bookcase. If any passage or article in a book or magazine strikes me as worth preserving in my records, I photograph it and can thus save the cost of the book or journal at the low expense of a plate or two and the

paper. The camera or the lens has the happy faculty of never making a mistake. It cannot misspell, transpose or otherwise mutilate an abstract. It records faithfully what is placed in front of it, even to the dirty thumb-marks and dog's ears or the grain of the paper stock.

But copying need not be confined to line work, as we call all type and diagrams; old photographs, pictures, china, coins, stamps or any other hobby may be tackled, for, after all, copying is merely photographing at close quarters. It is not difficult work, but there are one or two simple rules to follow, which make it easier. In the first place one has to decide the exact size of the resultant print, the ratio of image to object, or, as we generally term it, the "times" of reduction. One should know the equivalent focus of the lens. And, above all, one must know just the kind of plate to use.

The size of the print is naturally governed by the size of the camera, but even here one has considerable latitude. My rule is to fill the plate, full size of original, if possible. The ratio of image to object is found at once by dividing the longer side of the original by the longer side of the range. Area is not taken into consideration. For instance, 8½ x 10½ inches is the actual size of the page of a foreign journal, and I want to copy this on a 5 x 7 plate; then 10.5/7=1.5, which is the actual "times" of reduction. If one took into consideration areas, then we should have 8½ x 10½/5 x 7=2.55, and the absurdity of this can at once be seen by setting up a foot rule and measuring the image.

Of course every one knows the equivalent focus of his lens. This is the first thing that has to be determined by the camera user. But assuming that this has not been done, then it may be roughly determined by focusing an image of the clouds on the ground glass and measuring the distance between the stop or diaphragm of the lens and the focusing screen. This is not theoretically correct, but it is good enough.

Having determined these two points, one can at once determine the correct distances between the object and lens and lens and plate by the following simple rule:

$D=(r+1)f.$

$d=D/r.$

in which

D = the distance of object from lens.

d = the extension of camera.

r = the ratio of image to object or the "times" of reduction.

Optical formulas, even as simple as this, are sometimes stumbling blocks to a beginner; so to make it quite clear we will continue the actual case considered above; r=1.5 and assuming that the e. f. of my lens is 10.5 inches, then

$$D=(1.5+1)\times 10.5=26.5 \text{ inches}$$

and

$$d=26.25/1.5=26.5 \text{ inches.}$$

Therefore we at once know that the diaphragm plane of the lens must be 26.5 inches from the book, and that the extension of the camera must also be 17.5 inches and the image will be quite sharp, or a turn or two of the screw will make it so.

The next point is as to the size of the stop to use. This can be determined only by examination of the image itself on the ground glass, as no two lenses are exactly alike in covering power. For instance, a first-class anastigmat should cover the plate absolutely sharp at full aperture of *f*: 4.5, while a cheaper lens may possibly require stopping down to *f*: 16; but the rule is to use the largest aperture possible with sharp definition.

As to the exposure, but little help can be given. This must be determined with an exposure meter or by trial and error. I can only say that working in our studio and copying full size the exposure on a bright day with full aperture of the lens is five seconds; in an ordinary room near a window it would probably run to fifteen or twenty seconds. The question of lens aperture brings up an important point. Every one knows that the lens apertures, whether in the U. S. or *f* system, represent a definite ratio between the diameter of the stop aperture and the equivalent focus of the lens. In copying, however, we never use the lens at its e. f., for the camera is extended, yet the actual stop aperture remains the same. Reverting to the example quoted above, the lens works at an aperture of *f*: 6.3; therefore we say, though theoretically incorrect, that the actual aperture is 10.5/6.3=1.67; but as the camera was extended to 17.5 inches, the working aperture is 17.5/1.67 approximately. This reduction in aperture must be taken into consideration in estimating the exposure.

As regards the development of the plate, there is one rule and one rule only: Use a constant developer, fresh each time, at a constant temperature for a constant time. As an alternative rule, although I do not believe in giving a rule and then stating the next minute how to successfully break it, I may add that development should be continued as long as the white lines or lettering show no trace of a

deposit or grayness. The developer that we have adopted within the last month differs slightly from that given by me in my chat before the Central High Camera Club, and is as follows:

A. Sodium sulphite, dry.....54 g., 350 grains
Hydrochinon.....14 g., 98 grains
Water.....1000 ccs., 16 fld. ozs.

B. Caustic soda.....10 g., 70 grains
Potassium bromide.....5 g., 35 grains
Water.....1000 ccs., 16 fld. ozs.

For use, mix in equal parts. Temperature, 65 degrees Fahrenheit.

For a correctly exposed plate, development should be complete in two minutes.

Naturally, in printing from line negatives one uses a hard contrast paper, and for preference uses the same developer as for the plate.

To do such work at night the best thing to use is magnesium ribbon, and about six inches burned on each side on the subject will be about the right length to give a good negative. As the subject will not move, there is no necessity to burn both pieces at once; it makes a little smoke, but not much, and the only thing to be careful about is to place an old plate or thick card just below the place of burning so as to catch the hot ash. The exact place to burn the ribbon is on each side of the book at the same distance from it and not too near the lens, particularly if the paper is highly glazed, as there may be some slight reflection from the surface that will show in the resulting negative. One can use any ordinary table lamp, electric, gas or oil, giving half the exposure with the lamp on one side and then shifting it over to the other.

In the copying of halftone illustrations in a book or photographs, one should be rather more generous in exposures, as in these cases we want to reproduce the intermediate steps or halftones between black and white.

The copying of colored pictures is far too big a subject for me to tackle in the space at my disposal. It entails a knowledge of color, of color or rayfilters and the use of red-sensitive plates and a special darkroom illumination.

The most important point in copying black-and-white work is the plate. This must be a very slow one, and the so-called "process," "photo-mechanical" or "contrast" plates are the only ones that will give really satisfactory results. They are about one-fifth the speed of the ordinary kodak film, and are useful for this work only.

SPEED NUMBERS

BY ALAN FORSTER

When dry plates first came into use it was customary to describe them as being so many times as fast as a wet plate. They were spoken of as "thirty times" or "fifty times" or whatever it might be, it being understood that such plates required one-thirtieth or one-fiftieth of the exposure of a wet plate. As wet plates were at least variable in their sensitiveness as dry plates, the description was more than a little vague; yet it was not without its use. Later on a method of speed measurement was devised by the late Leon Warnerke, in which a plate was exposed under a tablet with various densities on it, numbered 1 to 25, the highest being 25, and the speed of the plate was indicated by the highest number visible upon it.

These methods were supplanted by the Hurter and Driffield system; and as a great many of the plates on the market are marked with "H. and D." numbers, a little must be said about this method of measurement, although, as it requires elaborate apparatus and some skill to carry out, the details of it need not be given.

The Warnerke system was found to be unsatisfactory, because it did not appear to apply to practical work. Two plates might give exactly the same speed reading when measured, yet one would be found underexposed or overexposed when given the exposure which was correct for the other. It even happened that of two plates one proved the faster in the camera, while the other was the faster when measured in the Warnerke sensitometer. The cause of this discrepancy was discovered by Hurter and Driffield to lie in the fact that to learn the sensitiveness of a plate what was necessary was not to ascertain the least light action which would give any trace of an image, but the least action that would give a usable image, which is quite another thing.

They worked out a system of speed measurement by which numbers could be given to the plates indicating the proportional exposures. Thus a plate marked "H. and D. 200" required half the exposure of one marked "H. and D. 100," and so on. In connection with these numbers they devised an exposure

calculator called the Actinograph, which is put on the market by Marion & Co., and allows the exposure for any subject to be worked out on the basis of the "H. and D." number of the plate.

It might be supposed that such a system provided all that was required; but it was soon found in practice that it did not. Some makers started to mark their plates strictly on the lines devised by Hurter and Driffield, but others, while putting "H. and D." numbers on the boxes ascertained those numbers by various modifications of the method of Hurter and Driffield, adopted for reasons which seemed sufficient. The result was, and is, that it does not at all follow that plates made by A and marked "H. and D. 250" are of the same rapidity as plates made by B and also marked "H. and D. 250," although, as regards the different plates made by A or by B, keeping to those of one maker, all those marked "H. and D. 250" are alike in speed and require half the exposure of those marked "H. and D. 125" and so on.

It might be said, why should there not be a central plate-testing establishment which should adopt some one definite system and mark all plates in the same way? The reply to this is that the subject is not capable of quite such hard and fast treatment, nor does this seem to be necessary. As far as it is necessary, it has been done by several plate makers for their own plates, and by the markers of certain exposure meters for plates in general.

Thus, by sending to the makers of the Watkins or of the Wynne exposure meters, one can get a card giving all the plates and films on the market with a speed number appended, which denotes its sensitiveness according to the particular systems of Messrs. Watkins or Wynne.

As a matter of fact, such a speed card is all that the practical worker requires, and the measurements of the speeds, being done by someone who is not interested in any particular plate or film more than another, may be taken as strictly impartial.

Some plate makers give the Watkins or the Wynne speeds on their boxes, but it is preferable to get the speed card, as in that case one has a guarantee that all the speeds have been ascertained in one and the same manner. There is nothing real in the objection that different boxes of the same brand of plates differ in their sensitiveness. Such differences exist, not merely in different batches of emulsion, but even in the same batch; they are far too small to need to be allowed for.

In his book, "The Watkins Manual," which ought to be in the hands of every photographer, Mr. Watkins states that the unit in his method is a plate which, in the best summer light, with a lens working at *f*: 8, would require for an average subject an exposure of two seconds. Such a plate would be extremely slow, and one does not come across anything, even in lantern plates, which could be marked "Watkins 1." The "ordinary" or "landscape" plate of most makers is about fifty times as fast, so that under the conditions just named it would require the twenty-fifth of a second. The intermediate speed of most makers, that is to say, that fastest plates sold at the same price as ordinaries, may be taken as being about "Watkins 150," and the fastest of all as "Watkins 300." There are plates marked with higher figures, but those just given are a generalization.

The Wynne speed numbers are usually preceded by "F," which must not be confused with the *f* numbers indicating the stops of a lens. Owing to the method in which they are used in the Wynne meter, the exposures are not proportional to the numbers, but this is not found to be any inconvenience in actual work.

A question which is often asked is how to convert speed numbers by one system into speed numbers by another; but it is one of those questions which are more easily put than answered. Manifestly, if the Watkins or Wynne numbers, as given on the Watkins or Wynne speed cards, are correct for the whole range of makes, while the H. and D. numbers as given by the makers hold good only for plates of their own make, no rule for converting H. and D. numbers into Watkins or Wynne or vice versa could be laid down. The true H. and D. numbers, that is to say, numbers obtained by working strictly on Hurter and Driffield's lines, may be said to be one-half the Watkins numbers. To obtain the Wynne number, the Hurter and Driffield number is multiplied by sixty-four, and the square root is taken. To obtain the H. and D. number from the Watkins number, the latter is halved; to obtain the H. and D. number from the Wynne number, the latter is squared and divided by sixty-four. To obtain the Wynne number from the Watkins number, the Watkins number is multiplied by thirty-two and the square root is taken, while to obtain the Watkins number from the Wynne number the latter is squared and then divided by thirty-two.

But although such information is often asked

for, the request is generally made under a misapprehension which should be pointed out. This is, that the speed numbers in these three systems are not directly and rigidly convertible in the same way that one may convert degrees Fahrenheit into degrees Centigrade, for instance. The user of either the Watkins or the Wynne system should keep his speed card with his meter, if he has occasion to use various makes of plates, and work by the speed card absolutely. If he uses only one brand, he can keep the meter permanently set at what he knows to be its speed, or he can remember the number. The trifling differences which appear on the plate boxes, when the speed number is not an unalterable feature of the label, are best ignored.

CUT-FILM DEVELOPMENT

One of our readers is in trouble from the use of aluminum cut-film holders which he has used to develop films in his plate tank. The exposures came out with a streak an inch wide across each end and a dark patch in the middle. He asks if it is the fault of the holder.

It is easy to see that if a film were placed with its face or emulsion side in contact with the holder, the ends would be prevented from developing fully, and the middle, where there is no metal, would develop to full density. This is what probably happened to our correspondent's films. If he had got them in face out, they would have developed evenly, as the metal itself should have no effect on the sensitive coating.

A SUBSTITUTE FOR MATTE VARNISH

If a negative is to be worked up, and matte varnish is not at hand for the purpose, ordinary mounting starch makes a perfectly practical substitute I find. It is brushed over the glass side as evenly as possible and allowed to dry. With the point of a knife it is then scraped off the parts which are required to print darker, or a pencil or stump is used to apply lead where necessary. The starch must be perfectly smooth and free from lumps, and if it is not in this condition is strained through cambric.— W. HOLLINGSHEAD.

MY OWN HOME — EXTERIOR

CARL A. PETERSON

Second Prize, My Own Home Competition

TREATING DENSE NEGATIVES

This is a chapter for beginners, a number of whose queries with regard to the reduction of dense negatives indicate to me that, in spite of all that has been written in the textbooks on this subject, there is still much misapprehension of the right procedure to follow in bringing an overdense negative to convenient printing depth and, incidentally, of improving its defect of insufficient or excessive contrast. And this brings me at the outset to distinguish, for the benefit of the beginner, between the two broad classes of dense negative.

The one is a negative which, though dense, is flat. Such a negative is produced more frequently at the present time, now that development by time is more widely practiced. It is, of course, the result of overexposure of the plate, but the time-development system has the merit of continuing development considerably beyond the point at which the inexperienced worker, if he were left to himself, would take it out of the developer because he saw the image "going all black." Let me tell the beginner that in such a case the best thing to do is to let the image "go all black." By so doing you do build up in the film an image which actually acquires more contrast the longer you develop, though you can't see it for the layer of superficial fog which the continued development induces. You can, however, very largely get rid of this superficial fog and often disinter a negative which is of quite presentable printing quality.

The other kind of dense negative is one which is the result of overdevelopment of a plate which has received fairly correct exposure, or perhaps has been exposed a little on the under side. In that case continued development leads to excessive hardness of the negative, or at any rate to a degree of contrast which renders the negative unsuitable for printing by most processes, with the exception of carbon. I ought perhaps to except also bromide paper, in exposing and developing which a great deal can be done in the way of obtaining harmonious prints from negatives of such excessive contrasts. But generally speaking, straightforward printing calls for a negative which is not of this excessive degree of vigor. It is difficult to describe these different types of negatives in words. I can usefully refer the reader to the excellent series of reproductions accompanying the article by Mr. C. H. Hewitt in the 1913 "British Journal Almanac." Figure 3 gives an idea of the sort of negative obtained by reasonably long development of an overexposed plate, while Figure 3A shows the kind of print produced. Figure 4, on the other hand, shows the kind of gradation produced by overdevelopment and Figure 4A the description of print resulting from it.

These two types of dense negatives require entirely different treatment in reduction. What will benefit one will aggravate the evil in the case of the other. Let me take the dense, flat, overexposed, well-developed negative first. The thing to do in this case is to use the hypo-ferricyanide or Farmer's reducer in strong form; that is to say, with a generous addition of the ferricyanide solution. No need to bother about any exact formula. A solution of hypo containing from 2 to 4 ounces hypo per 20 ounces water is placed in a measure and a fairly strong solution of ferricyanide added, a few drops at a time, until the mixture is of fairly deep orange color. Avoid using old hypo bath instead of plain hypo solution; also avoid an acid fixer containing sulphite or metabisulphite. The negative can be put to soak in this solution, but a far more effective plan is to apply it by going over the negative with a pad of cotton-wool soaked in the reducing solution. Have as little of the reducing mixture on the cotton as you can. Saturate the cotton in the reducer and then squeeze out most of it. In this way the reducer will clear off the surface fog to a remarkable extent. Let it act on the negative for a short spell only, say 20 seconds, then rinse well under the tap and apply the cotton-wool again after a further dip in the reducer. Two or three applications of the reducer in this way will bring down the density of the negative and at the same time will improve its contrast, as a result of the characteristic action which the ferricyanide reducer has upon the lighter parts of a negative as compared with the heavy deposit in the highlights. By applying the reducer in successive stages with ample rinsing between each we avoid the production of yellow stain to which the reducer when of great strength is somewhat liable.

It all depends on the amount of contrast there is in the image proper whether this reducing process is sufficient of itself or requires to be supplemented by intensification of the negative. If the overexposure has been too excessive and the plate has been thoroughly developed, the reducer alone will serve to

yield a negative which is fairly clear in the shadows but still has sufficient density in the highlights. In the alternative the negative requires to be well washed and further contrast obtained by intensifying it by way of the convenient formulas, such as the Lumière iodide of mercury or the chromium intensifier.

On the other hand, the method of treatment for a negative which possesses an excessive degree of contrast and at the same time has full density is by a reducer which has exactly the opposite effect to that of hypo-ferricyanide. Ammonium persulphate is the reducer which is the best for this purpose. In the case of negatives which are both hard and of full vigor its action is usually quite satisfactory, although it is difficult to account for its erratic behavior at times in the way of failing to exert a regular reducing action. The solution requires to be freshly made and to contain about 20 grains of the persulphate in 2 ounces of water, with the addition of a drop of sulphuric acid. A thing which must be watched for in using persulphate is that the action, unfortunately, makes a spurt toward the end, and therefore the plate requires to be removed somewhat before it is judged that sufficient reduction has been obtained and placed immediately in 5 per cent solution of sodium sulphite, which promptly stops the action of the persulphate. Another point: if the negative has undergone any considerable degree of reduction it is well to pass it for a minute or so afterward through an ordinary fixing bath in order to clear away any soluble silver salts which have been formed in the reducer.

I must confess that I am not particularly fond of the persulphate reducer, and in the case of the hard negative would sooner deal with it by modification of what long ago was named the "rehalogenization" process, which was devised a year or two ago by Mr. Welborne Piper. It consists simply in bleaching the negative in the ordinary mixture of bromide and ferricyanide as used in sulphide toning, washing thoroughly and redeveloping with a nonstaining developer strongly restrained with bromide. Such a formula is: Azol or rodinal, 1 dram; 10 per cent bromide solution, 5 drams; water, 6 ounces. In this developer the plate regains its density very slowly, so that it is an easy matter to arrest it at the required stage. The trouble with the old process was that in redevelopment you got the original degree of contrast almost before you knew where you were. The modified method is perhaps a little tedious, but it calls for no particular skill beyond taking a look at the negative every now and then and removing it when it has reached the lesser degree of density and vigor.

A PINHOLE STOP IN THE LENS

A pinhole itself does not give a perfectly sharp picture, although sharp enough for many purposes; but if a stop no larger than a pinhole is used in a lens, then the picture will be critically sharp all over, and at the same time the exposure required will be as long as if the pinhole were being used by itself. Ordinarily the photographer wishes to make his exposures as short as possible, but there are occasions when he requires just the opposite. For instance, if he has to photograph a shop front in a busy street he will find the traffic very troublesome. If he goes in the early summer morning, all the other shops in the view will be shut, and the place will look dead. But if he uses a pinhole stop and a slow plate, he can easily prolong the exposure half an hour or more, and in that time all the moving traffic will have become quite invisible. A similar result can be obtained by using a color screen with a plate that is not orthochromatic; a five-times screen may then prolong the exposure two or three thousand times, and so give what is required.

A USE FOR GROUND GLASS

Instead of matte varnish, which I find difficult to apply without spilling, I have a number of pieces of ground glass, made by grinding old negatives together with knife powder and a little water. One of these is laid with its glass side next the film side of the negative, and held in place with a couple of bulldog clips while the necessary work is done on the ground glass. When this is finished, I put the ground glass with its ground side in contact with the glass side of the negative, adjust it into register, and bind the two together with lanternslide strips. Gum water painted on the ground side makes the parts more transparent when dry, while much more pencil and stump work can be done than matte varnish itself will stand. If the work is only temporarily required, the ground glass can be cleaned with soap and a nail brush and used again; but sometimes the last traces of the black lead cannot be got off. It is very easy to make a dozen pieces of ground glass of perfectly even and fine texture in this way. I prefer to grind the two glass sides before cleaning off the film, as the gelatine gives the fingers a good grip, and seems also to be of service in reducing the chance of breakage during grinding.

EDITORIAL

OUR COMPETITION

The first prize this month was won by Harrison Brown's picture, "A New England Home," an attractive study of an old farm, with the house, the pump and the winding road leading into the picture nicely framed on each side by gracefully balanced clumps of trees. "Mountain Scenery," by Harry Staley, won the second prize. This picture is a carefully planned composition, with the dark group of trees at one side giving enough variety to its even balance to lead the eye away from the very center of the print where the stream takes it. The third prize goes to John J. Neuer for his picture "On Their Way," a true and interesting portrayal of two amusing little boys on their way for an afternoon fishing.

The following pictures were awarded honorable mention: "One Autumn Morn," Guy E. Osborne; "An Interrupted Outing," Louis Benedict; "The Road Through the Arch," Elizabeth B. Wotkyns; "Killing Time," Clifford Woods; "Fording the Creek," A. W. Ireland; "Harvest Time," Alvin W. Prasee; "Mr. Rabbit," Ralph Beebe; "Kodaking," Lou E. Hurst; "Francoise," Frank L. Bey; "Winter Sport," Paula Stockstrom; "Pals," Karl Bryan; "Watchful Waiting," Chas. W. Wolfe, Jr.; "A Survivor," H. Goeb; "An Early Tow Seeker," Wm. C. Herchenhahn; "The Frozen Falls," Garnet E. Jacques; "Daisies," Vernon Hutchins; "Motherless," H. L. Weaver; "Rats," A. C. Bellett; "Outdoor Portrait," S. J. Whelan; "A Professional at Labor," W. E. Fowler; "The Village Choir," Chas. Langer; "Sunset on Lake Nipmuc," Chas. L. Eaton; "Brothers," Mrs. H. E. Morgan; "Concentration," A. R. Brown; "A Crock Full of Sweetness," Burdette Harrison; "Raking the Fire," Edwin A. Roberts; "Octagon House," C. F. Miller; "Portrait," W. E. Peabody; "Satisfied," R. W. Brown; "By Electric Light," John H. Becker; "Study," C. D. Meservey; "Lady's Slipper," Vernon H. Hutchins; "Quietness," Clarence Shanks; "The Camper," Stark Weatherall; "Flower Study," R. E. Van der Cook; "Building Air Castles," Chas. Thomas; "The Old Stone Bridge," F. W. Brooks; "With Little Sister," W. M. Keheley; "A Country Home," Wm. H. Rice; "Dogwood," Warren R. Laity; "The Falls," F. W. Drexel; "Outdoor Portrait," Wm. H. Chestnut; "Where Rolls the Oregon," Ford E. Samuel; "Along the Shawangunk Kill," Kenneth D. Smith; "May Scenes," K. Tsubone; "Study," I. Higo; "Outdoor Portrait," J. R. Ziegler; "Mountain Scene," C. K. Baker; "Lunch Time," C. K. Booth; "Before the Storm," Frank A. Shappee; "Where All Is Peace," Wm. A. Hiller; "A Coos Boy Massage," Percy Gibbs; "Wolf Rock Road," Wm. R. Brackbill; "Iris," B. C. Eddy; "Maid of the Mist," G. J. Schnabel; "The Storm Is Over," Wm. H. Rice; "The Drink," H. B. Rudolph; "Contentment," Lena M. Tewkesbury; "Riverside Park," Robt. E. Wilson; "The Edge of the Woods," L. Benedict; "A Pinhole Picture," L. J. Mathewson; "Resting," Carolyn Bauer; "On the Beach," Harold Winslow.

HONORABLE MENTION

A reader writes us for an explanation as to the meaning of honorable mention in our competitions. He states that on two occasions he has received an honorable mention, of which he has boasted to his friends, promising them that they would see his pictures reproduced in the next issue. On both occasions the picture has failed to appear, much to his discomfiture, and he desires to know what value honorable mention is to him if his picture is crowded out by one which seems to deserve caustic criticism. In explanation to this reader and others who may have felt likewise, we will explain that the purpose of our competitions is to encourage our readers to do good work. We offer small prizes, more as an honor than as a reward, and the pictures which are, in our opinion, above the average, are accorded an honorable mention. It often happens that the number of these pictures in a given month is considerably more than sufficient to furnish all the pictures for a single number, and it also happens that pictures are given honorable mention for careful workmanship and good composition which might not prove of general interest to our readers.

Probably, therefore, not more than one third or a quarter of the pictures given honorable mention are ever reproduced, while many pictures which have not received this award, and perhaps have not been entered in the competition at all, are reproduced and criticized because of

some lesson which they seem likely to teach the average reader. We should be only too pleased if we could reproduce all of the honorable mention pictures, and favor each one of our subscribers during the year by reproducing one or more of his pictures, but this is unfortunately not possible, and when, as sometimes happens, a subscriber demands the cancellation of his subscription because we will not reproduce one of his pictures, we can only, though reluctantly, remove his name from that of our circle of readers.

MY OWN HOME COMPETITION

Elsewhere in this issue we have reproduced three photographs from the set winning the second prize in this competition, awarded to C. A. Peterson, and three of the first-prize prints are reproduced this month in *American Photography*, to which we would refer those who are interested in seeing them. Honorable mentions in this competition were awarded as follows: J. Adrian Cauzac, P. Conklin, C. M. Bagwell, Eunice B. Burk, Ethel L. Towar, E. A. Schall, Frank H. Oller, John H. Seamans, J. H. Field, Alexander Murray, Alice F. Foster, Roy Bigelow, Dr. Rupert S. Lovejoy, Wm. H. Broadwell, H. M. Edwards, Ray Lingwood, T. T. Nagorski, Olga M. Jarnes, George G. Gibson, W. W. Wilke. Some very excellent work was shown in these pictures, and it is our intention to use some of the prints as illustrations to an article on interior photography to appear in a later issue.

PRACTICAL PHOTOGRAPHY

Though the publication of numbers 1 and 2 of this series has been delayed far beyond the anticipated date, we feel confident that by the time this issue of POPULAR PHOTOGRAPHY reaches its readers "The Secret of Exposure" and "Beginners' Troubles" will be on sale by photographic dealers, and will have been mailed to those whose orders are on file. It is not for us to speak too enthusiastically of our own work, but we feel confident that every reader who purchases these books will be thoroughly satisfied with his bargain. We believe that "The Secret of Exposure" is the most complete treatise on this subject which is anywhere to be found in print. "Beginners' Troubles" is a perfect mine of information in regard to the troubles which beset the average amateur in making negatives and prints, and how to avoid these difficulties. A large number of photographic dealers will have these books immediately on publication, and we should be grateful for the addresses of any dealers who do not carry them in stock.

We are pleased to announce that not only will the books be published in paper, but that a clothbound edition is being prepared for the benefit of those who wish more durable volumes for the library, and these will be retailed at 50 cents per copy.

DEVELOPER POISONING

As we go to press this month, the number of cases of developer poisoning reported by readers has reached only about fifty. At least a hundred cases should be analyzed in order to arrive at any useful conclusions regarding the causes and prevention (if possible) of these skin irritations. We hope that any readers who have not already sent in their names will do so promptly, in order that we may make up a suitable history blank to send out to all. The problem is becoming more complicated with almost every answer.

We take this opportunity to thank those who have already answered our appeal and to ask them to be patient until the taking of fuller information can be started. We wish also to thank all who have sent particulars of remedies which have helped them. The great variety of the ointments which seemed to soothe the irritation is very remarkable and points very clearly to the need of a systematic study of the whole question, with precautions to exclude the errors which inevitably complicate a small series of cases.

READERS' FORUM

DICHROIC FOG

Several readers have asked the cause of a deposit similar to silver plating on their negatives. The deposit is called dichroic fog. It is generally iridescent, or rainbow colored, and consists of very minute scales or plates of metallic silver. Once in a while it is formed in the developer, but usually it deposits on the surface of the plate from an old fixing bath which contains a great deal of silver dissolved out of plates previously fixed. Often this form of fog does not affect the printing quality, even if it does not rub off easily when the plates are swabbed with a tuft of wet absorbent cotton. If the fog is so thick that it affects the printing quality, it can be removed by swabbing with a little ferricyanide-

hypo reducer. To a plain hypo 1 to 8 add enough ferricyanide to color it a light straw tint and use cautiously, rinsing frequently, until the fog is gone; then wash well.

HALFTONE SCREENS

A reader asks whether it is possible to make for oneself a crossline screen having 75 lines to the inch, such as is used for halftone work.

Special machinery is needed for ruling such a screen. The easy way and the cheap way is to buy the screen from either the New York Engravers' Supply Company, New York City, or Max Levy, 220 West Roberts Avenue, Germantown, Philadelphia, Pa. Mr. Levy is the manufacturer and can doubtless quote a price on any size or ruling desired.

COMPARATIVE SPEEDS OF D.O.P.

A reader asks for the relative speeds of the following, taking Normal Cyko as a standard: Enlarging Cyko; Enlarging Rexo; and bromide paper.

We have not the entire list of papers on hand at this time and cannot make fresh tests; but we think that if memory serves us correctly readers will find the following rating not far from wrong.

Normal Cyko	64
Enlarging Cyko	4
Enlarging Rexo	4
Wellington bromide	1

For instance, with the same negative, light, degree of enlargement, etc., if bromide paper takes 1 second, the other papers will require the number of seconds indicated above. The speeds might vary somewhat, but the data will be a guide to the first trial.

EDITOR POPULAR PHOTOGRAPHY:

Quite often I read inquiries asking what to do with a developing tank when the nickel plating has been eaten off, etc. It may be of interest to such people to know that such tanks coated thoroughly with paraffin give no trouble from oxidation. Enameled trays that have the enamel chipped off are prevented from rusting by the same method. Care must be taken not to heat these trays and tanks.— B. A. RUPLE.

NEWS AND NOTES

The Seventeenth Annual Convention of the Photographers' Association of New England will be held in Copley Hall, Boston, Mass., August 10, 11, 12, 1915.

Every photographer in New England and the Maritime Provinces is invited to become a member of the P. A. of N. E., and by their ability and numbers help to make this association strong and pronounced in the advancement of our beautiful and prominent art. It requires a large membership to meet the necessary expenses, to allow the executive board to engage talent to disseminate the knowledge necessary for our advancement.

This year we have secured for your benefit President Will H. Towles and Secretary Jno. I. Hoffman, of the National Association, to give addresses on subjects for the improvement of your business, artistically and financially.

Mr. J. H. Garo and Mr. Orrin Champlain will give demonstrations on the platform of their way of posing subjects, which has won them such high praise for the skill displayed. There are other very prominent artists in our work under consideration, and probably at least three others will be in attendance to help make this convention a memorable one.

The display of artistic work by the Clan Oil Club of Boston will be worth the cost of the trip, in giving you an opportunity to study the possibilities in our chosen profession of making productions which savor of the painters' skill in their use of the brush.

Many examples of artistic skill, by leaders of photography in America, will be displayed on our walls, and truly such work ought to bear fruit if carefully studied with a view toward emulating their talent. We are promised the pick of the exhibits from the National Convention. These should awaken a desire to improve upon your present work, and thereby add to your advantage.

The Wollensak Company have offered a trophy cup for the best three *portraits* made with their lenses.

The manufacturers and dealers will be on hand with a large number of *new appliances* by which the photographer can, with advantage and profit to himself, and satisfaction to his patrons, make better and finer pictures. It is for your pleasure as well as profit that we invite you to spend as much time as you can with the manufacturers and dealers, as they are on hand to interest you in what they have to show. They can demonstrate and explain matters to the satisfaction of all. *Give them your patronage, they deserve it.*

It will help the board if you will become a member at once, as a knowledge of the number expecting to attend assists the committee in arranging for talent for your benefit.

The buttons for 1915 are ready for delivery, and upon receipt of $2.00 the certificate of membership and the button will be mailed to your address.— GEO. H. HASTINGS, *Secretary.*

Burroughs Wellcome & Co. offer for distribution at the beginning of the photographic season a new and attractive booklet, "Photography in Five Lessons." The cover of this book is a magnificent reproduction of the Victoria Falls in South Africa. Copies may be had by addressing the publishers, 18–20 East 41st Street, New York City.

The Meyer Camera & Instrument Co., Inc., have changed their quarters from 18 West 27th Street to 31–33 East 27th Street, New York City.

On July 3 a camera was stolen from Mr. Harold B. Adams, 3100 Broadway, New York City. It was a Goerz Manufoc Tenax with Dagor lens. The camera was in a leather case together with six plateholders, a color screen and a portrait attachment. The numbers were: camera, 55495; Dagor lens, 317113; shutter, 371939. H. B. A. was scratched on the baseboard of the camera.

The Ansco Company, Binghamton, N. Y., has ready for distribution the new edition of their extremely successful manuals containing working directions for Cyko prints and Ansco films, as well as an attractive folder, "Who Won?" giving the awards in their $5000 Loveliest Women Contest, and containing reproductions of the five prize-winning pictures. These can be obtained from Ansco dealers or they will be sent from Binghamton on application.

EXPOSURE-TABLES FOR AUGUST

DIRECTIONS: Find in the tables printed below the NUMBERS for SUBJECT, STOP, LIGHT, HOUR, and PLATE. Add them, find the sum in the last table, and give the exposure indicated. When the exposure fails to correspond with the speed-marking on shutter, use the nearest shutter-speed, preferably the lower. If sunlight falls over one shoulder, add 0; if straight across subject, add 1; if sun is ahead, add 2. When using back combination only of lens, add 2.

EXAMPLE

Average landscape	8	July, 11 A.M.	0
Stop U. S. No. 8	6	N-C film	1½
Intense light	0		

Adding these numbers, we get 10½, and on referring to the last table, under 10½, we find **1-40** second, which is the exposure to give. In this case you would use the speed marked **1-50** and open the lens a little, if possible; say, half-way to U. S. No. 4.

SUBJECT

Sea (only) and clouds	½	Street scenes, buildings, groups	5
Sea-views, snow-scenes, distant landscape	1	Portraits in shade	7
Open landscape, without foreground	2	Indoor portraits	8 to 10
Average landscape, with foreground	3	Interiors	13

STOP:—

f:2	*f*:2.3	*f*:2.8	*f*:3.3	*f*:4	*f*:4.7	*f*:5.6	*f*:6.7	*f*:8	*f*:11.3	*f*:16	*f*:22	*f*:32	*f*:45	*f*:64
				U.S. 1	U.S. 1.4	U.S. 2	U.S. 2.8	U.S. 4	U.S. 8	U.S. 16	U.S. 32	U.S. 64	U.S.128	U.S.256
1	1½	2	2½	3	3½	4	4½	5	6	7	8	9	10	11

LIGHT: Intense sunlight (inky-black shadows), 0; Bright sunlight (strong shadows), ⅓; Faint shadow cast by sun, 1; Dull (no shadows), 1⅓; Very Dull (whole sky very dark), 2.

HOUR: 10 a.m. to 2 p.m., 0; 9 a.m. and 3 p.m., ⅓; 8 a.m. and 4 p.m., 1; 7 a.m. and 5 p.m., 1; 6 a.m. and 6 p. m., 2; 5 a. m. and 7 p. m., 5.

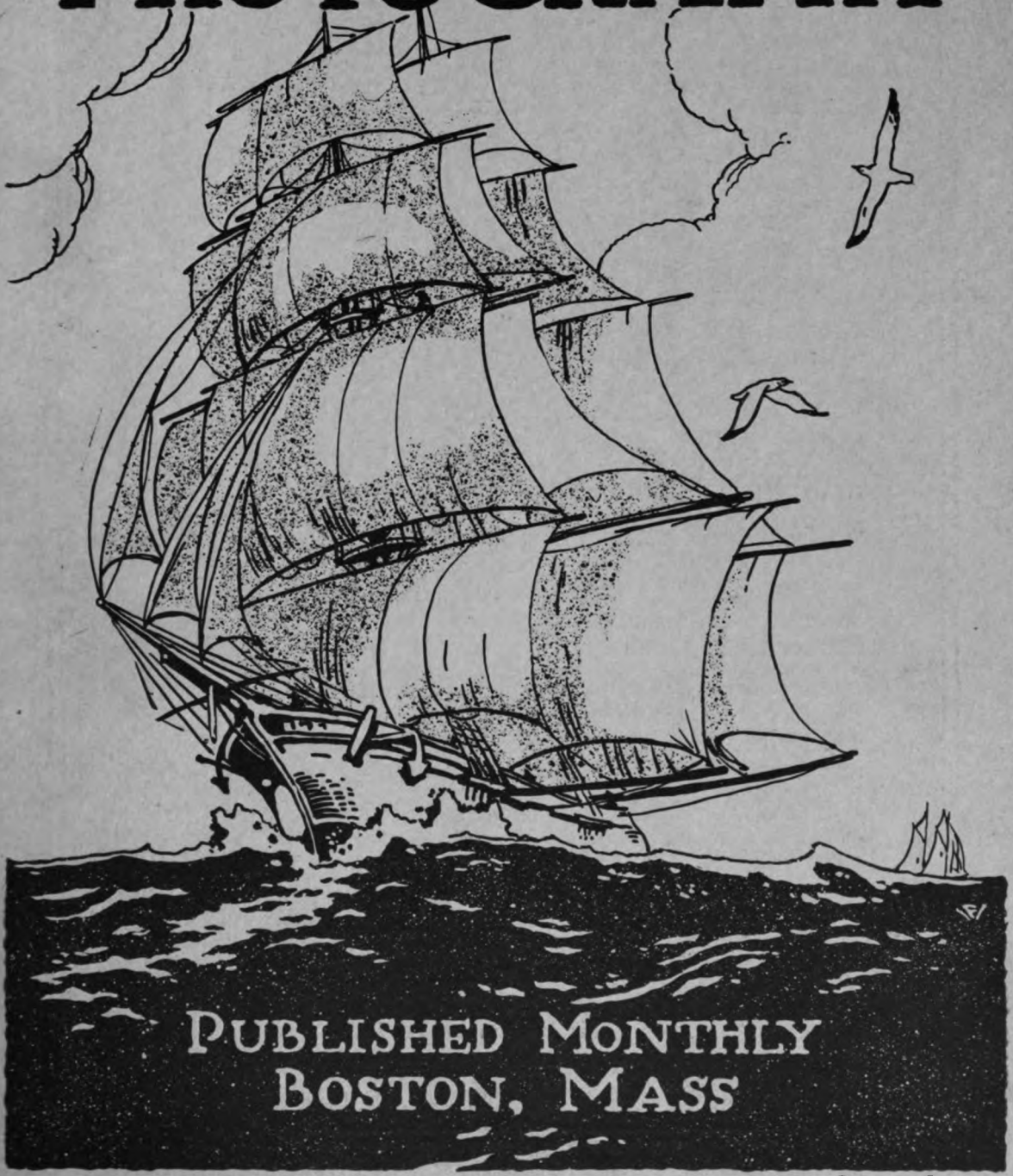
PLATE: AMERICAN, 1⅓. ANSCO FILM, 1⅓; Speedex Film, 1. BARNET — Film, 1⅓; Superspeed Ortho., 1; Ortho. Ex. Rap., 2; Red Seal, 1; Red Diamond, 1⅓; Self-screen Ortho., 2; 550, ⅔. BURKE & JAMES — Atlas Film, 1⅓. CENTRAL — Special XX and Sp. Home Portrait, ⅔; Special, 1; Comet, Colornon and Pan-Ortho., 1⅓. CRAMER — Crown, 1; Anchor, 2; Banner, 1⅓; Inst. Iso., 1⅓; Med. Iso., 2; Commercial Isonon, 2⅓; Portrait Isonon, 1⅓; Trichromatic, 3; Slow Iso., 5; Contrast, 9. DEFENDER — Vulcan, 1; Vulcan Film, 1⅓; Ortho., 2; Non-hal. Ortho., 2; Slow, 9; Process, 9. DUFAY DIOPTICHROME, 7. EASTMAN — Motion Picture Film, 1; Portrait Film, 1; Speed Film, 1; Hawkeye Film, 1⅓; N. C. Film, 1⅓. ENSIGN FILM, 1⅓. FORBES—Challenge, 1⅓. HAMMER—Sp. Ex. Fast, 1; Ex. Fast, 1; Aurora Ex. Fast, 1⅓; Ortho. Ex. Fast, 1⅓; Ortho. Non-hal., 2; Fast, 2; Ortho. Slow, 2⅓; Slow, 4. ILFORD—Monarch, 1; Zenith, 1⅓; Sp. Rap., 2; Chromatic, 2⅓; Ord., 3; Process, 9. IMPERIAL—Flash-light, 1; Spec. Sensitive, 1; Orthochrome S. S., 1; Spec. Rap. 225, 1⅓; Duonon Plate, 1⅓; Spec. Rapid 200, 2; Non-filter, 2; Process, 9. JOUGLA — Violet Label, 1⅓; Green Label, 2; Omnicolore, 7. KODAK — Speed Film, 1; N. C. Film, 1⅓. KODOID PLATES, 1⅓. LUMIERE — Sigma, ⅓; Blue Label, 1⅓; Film, 1⅓; Ortho. A, 2; Ortho. B, 2; Panchro. C, 2; Autochrome (outdoors), 8; (indoors), 9; Process, 9. MARION — Record, ⅔; Brilliant, 1; P. S., 1. NEW RECORD — Extra Fast, 2. PAGET — XXX, 2⅓; XXXXX, 2; Swift, 1; Ex. Spec. Rapid, 1; Ortho. Ex. Spec. Rapid, 1⅓; Panchro. Ord., 2; Panchro. Colour (no screen), 2⅓; Spec. Rapid, 1⅓; Hydra Panchro., 3⅓; Hydra Rapid, 3⅓. PREMO FILMPACK, 1⅓. ROEBUCK — Blue Label, 1; D. C. Ortho., 2; Ortho., 2. SEED — Graflex, ⅔; Gilt-edge 30, 1; Color Value, 1; Gilt-edge 27, 1⅓; L. Ortho., 1⅓; 26X, 2; Non-hal., 2; Non-hal. L. Ortho., 2; Tropical, 2; C. Ortho., 2⅔; Panchromatic, 2⅔; 23, 3; Process, 9. STANDARD — Extra, 1⅓; Imperial Portrait, 1⅓; Orthonon, 1⅓; Polychrome, 1⅓; Thermic, 1⅓. STANLEY — 50, 1⅓; Commercial, 4. ROGERS — Regular, 1; Orthochromatic, 2; Orthochromatic N. H., 2. WELLINGTON — Extreme, ⅔; 'Xtra Speedy, 1; Film, 1⅓; Iso. Speedy, 1⅓; Portrait Speedy, 1⅓; Anti-screen, 1⅓; Speedy Spec. Rap., 2; Ortho. Process, 9. WRATTEN & WAINWRIGHT — Panchromatic, 1½; Process Panchromatic, 3.

3½	S 1/500	4	S 1/1000	4½	S 1/2500	5	S 1/2000	5½	S 1/1250	6	S 1/1000	6½	S 1/700	7	S 1/500
7½	S 1/350	8	S 1/250	8½	S 1/150	9	S 1/100	9½	S 1/75	10	S 1/50	10½	S 1/40	11	S 1/25
11½	S 1/20	12	S 1/12	12½	S 1/10	13	S ¼	13½	S ¼	14	S ¼	14½	S ⅓	15	S ½
15½	S ⅔	16	S 1	16½	S 1½	17	S 2	17½	S 3	18	S 4	18½	S 5½	19	S 7½
19½	S 11	20	S 15	20½	S 23	21	S 30	21½	S 45	22	M 1	22½	M 1½	23	M 2
23½	M 3	24	M 4	24½	M 6	25	M 8	25½	M 12	26	M 15	26½	M 24	27	M 30
27½	M 45	28	H 1	28½	H 1½	29	H 2	29½	H 3	30	H 4	30½	H 6	31	H 8

These tables are based on the 1914 edition of the "American Photography Exposure-Tables," a new and revised form of the "Photo Beacon Exposure Card." Owing to the great increase in the speed of lenses and plates since the original compilation of these tables, it has been necessary to completely change the system of numbers corresponding to stops, plates and exposures, so that exposure numbers from this table are 5 units higher than in the old tables. The complete tables, in pocket form, 3 x 5 inches, containing full directions for obtaining correct exposure under all conditions, may be obtained from our publishers at the price of 25 cents postpaid.

SEPTEMBER, 1915 TEN CENTS

POPULAR PHOTOGRAPHY



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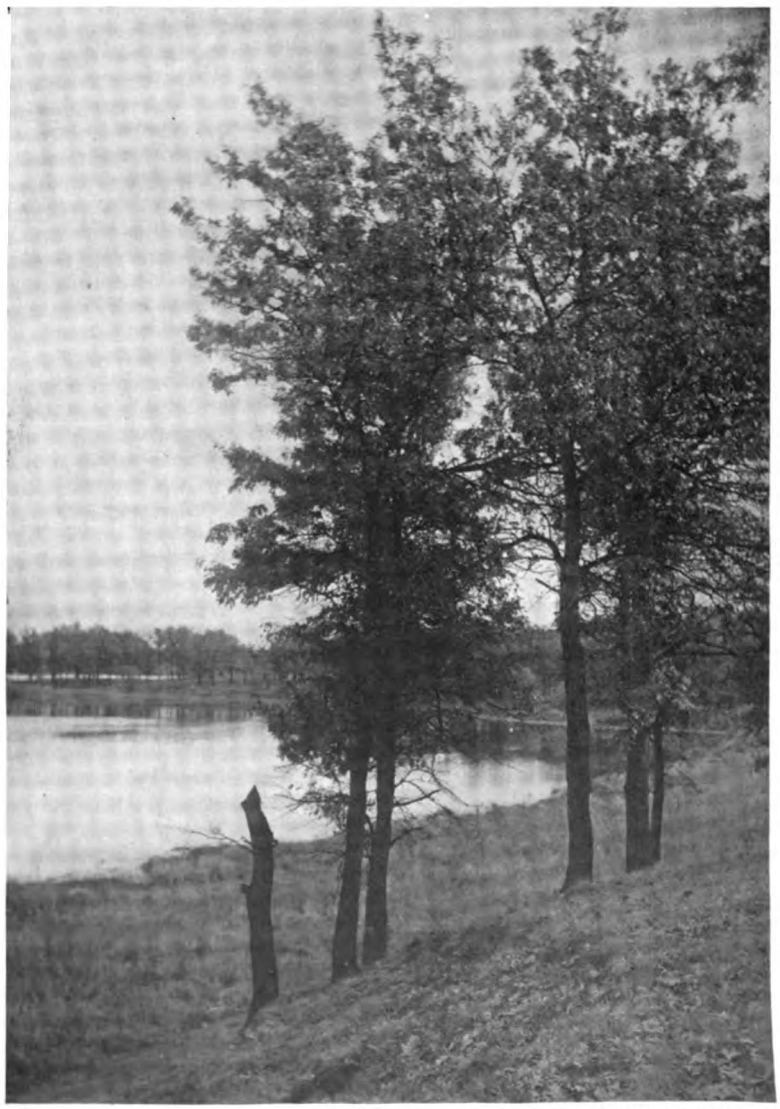


THE SENTINELS — CARL L. RICHARD

CATCH HIM, JUDY RALPH ALBEE

CATCH HIM, JUDY

The composition of this print is so good that we decided to reproduce it, in spite of technical faults. The exposure was too short for dark objects so near the camera, even in an open pasture, and the print, in turn, was carried too far in a developer too strong and is therefore unnaturally black in the dark passages. Taking the subject as an average landscape, on account of the dark shadows in the foreground, our Tables indicate an exposure of 1-25 second for this subject. Coming now to the composition, the maker has not felt bound to preserve the entire film, but has trimmed to 2⅞ x 5, thus getting the best possible placing of the figures. The blocking of both ends of the sky by trees is an excellent device, for the dark mass throws the eye back into the limits of the picture space instead of allowing it to go out at the side. The effect is particularly good on the downhill side, for the sloping line of the hill would otherwise rush the observer right out at that side. The placing of the large dark tree is just right to balance the two spots of boy and dog in the foreground. This is a fine example of Poore's "balance of the steelyard," with the line running diagonally into the picture. Altogether, the composition could hardly be improved upon.

DRYING PRINTS FLAT

Method No. 1

Remove prints from washwater and allow them to drain. Place them face down on some clean surface until nearly dry. Then place between blotters under pressure until thoroughly dry. Changing blotters occasionally will hasten the drying.

Method No. 2

Proceed as in Method No. 1 until prints are nearly dry. Finish drying by running prints through a warm burnisher with a piece of cardboard to protect the surface. Prints dried in this manner may be shaped with a slight backward curl and will remain as shaped. This method may be used to advantage when prints are wanted for quick delivery.

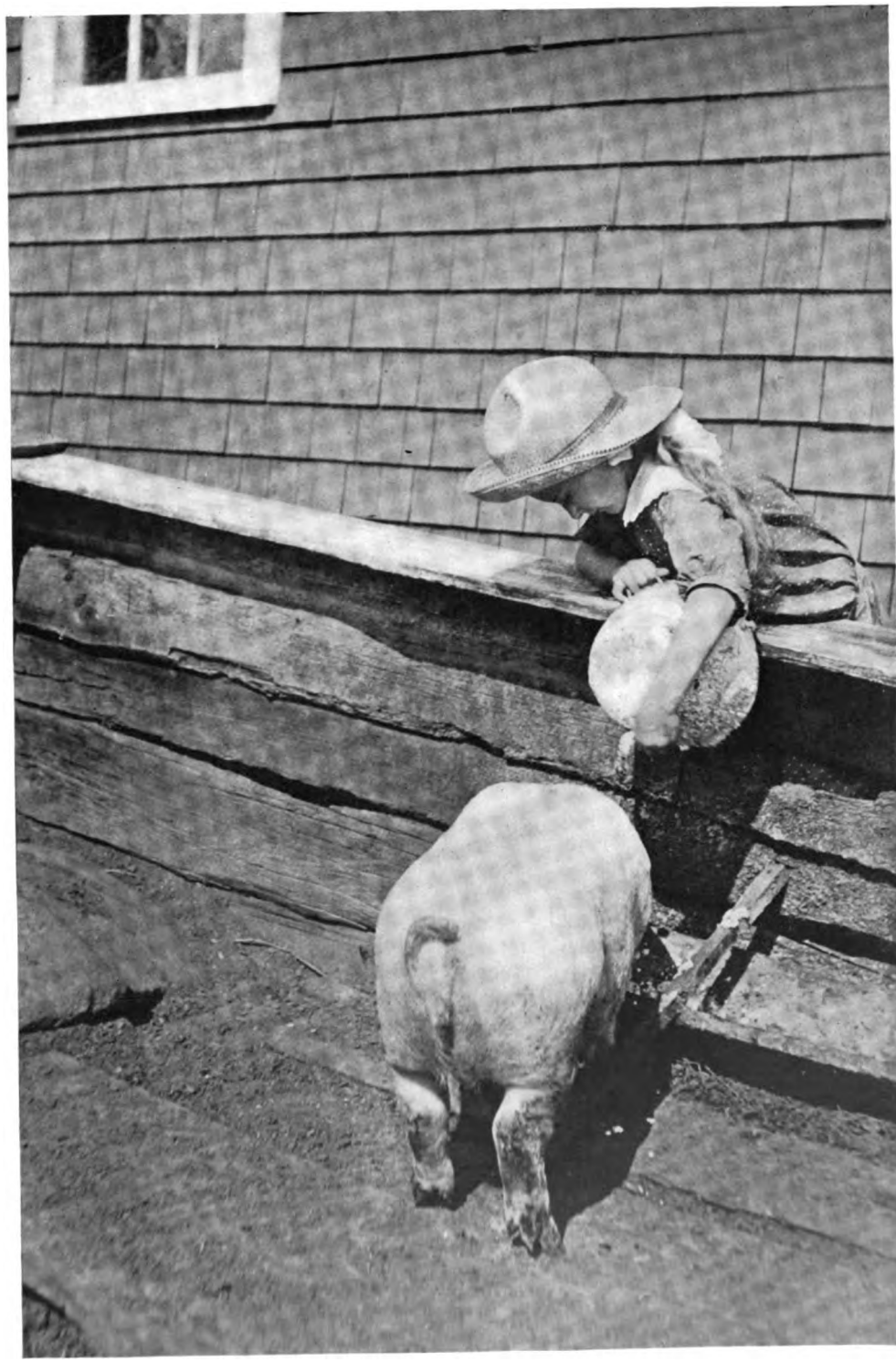
Method No. 3

Remove prints from washwater and allow them to drain. Place face down on some clean surface, or hang by clips on a wire back to back until thoroughly dry. The back of the print should then be moistened by rubbing it with a damp (not wet) sponge. It is important to moisten the entire back of the print to the edges and moisten it as evenly as possible. Prints should then be placed between blotters under pressure until dry.

Method No. 4

The principle of this method is to dry the prints in a roll with the emulsion side out. This keeps the emulsion stretched while drying and when the dry prints are removed from the roll there is no tendency to curl.

Wooden rollers of the desired length (say 20 inches) are used, and strips of ordinary manila wrapping paper of this width should be provided. The manila paper should be in one piece about five yards long.



LUNCH TIME
P. B. BACHELLER
First Prize, July Competition. (See page 472)

FLOWER STUDY W. T. KEMPIN

Start at one end of the strip of paper by winding it around one of the wooden rollers. The prints should be placed face down on two blotters with two blotters on top. These blotters and prints are then placed on top of the strip of manila paper and rolled in.

Be sure to place the prints in the roll so that the emulsion side is toward the outside of the roll. It is also advisable to place prints in the roll lengthwise, or, in other words, so that the long way of the prints is the same as the long way of the roll.

Do not make rolls too big or prints on the outside of the roll will not be dried with enough curve. Smaller prints should be placed toward the inside of the roll and prints of larger size placed toward the outside. This will give them the same relative curve while drying.

Before placing prints in the roll they should be partly dried, as any surplus moisture carried into the roll will lengthen the time required for drying. To accomplish this end, when prints are removed from the washwater they should be stacked and allowed to drain thoroughly. They may then be placed face down on some clean surface until partly dry, or, better still, be placed between blotters for about one hour previous to being rolled up.

Always use perfectly dry blotters and leave prints in the roll over night, so they will be dried thoroughly before being taken out.

Backing Heavy Prints

Prints on double-weight paper which are to be delivered unmounted can be backed with a light-weight linen paper without much increasing the weight of the print. This will insure flat prints. A paper suitable for the purpose is "onion skin" linen, which may be procured from any wholesale paper house or retail book store. Any strong, light-weight linen paper will do.

Prints are first dried flat between blotters. The light-weight linen paper is then cut the desired size, wet and pasted and placed in position on the back of the dry print.

Roll down and finish drying between blotters. The linen paper shrinks in drying and will counteract any tendency the print may have to curl.

The life and usefulness of blotters is increased by keeping them dry. Spread out to dry when not in use.

FLOWER STUDY

Mr. Kempin has succeeded unusually well with this arrangement of two blossoms, ordinarily a most difficult composition to manage, as most readers who have attempted flower studies well know. The great difficulty is to secure principality, but Mr. Kempin has done it effectively by placing one bloom higher than the other and lighting it more strongly. The effect is particularly pleasing, as every value is preserved and the differentiation of textures is perfect. The data are especially interesting: 6½ x 8½ Century camera with 10½-inch R. R. lens; 8-times filter; 1½ minutes at *f*: 16 in good but soft indoor light at 3 p. m. in April; Cramer Iso (what brand?) plate; tray pyro; print on Professional Cyko Linen.

SPOTTING ON THE PRINTS

Glossy P.O.P. prints are perhaps the most difficult to spot, and this reason alone leads many workers to use matte-surface papers, particularly platinotype, bromide and gaslight papers. When the spots appear in the lighter portions, as the sky, the face, or the light draperies, the easiest way of removing them is to use a sharply pointed lead pencil, an F or H being the best grade. The touches are made very lightly and do not show as shiny marks. In the deeper tones, a lead-pencil mark heavy enough to fill up the spot would shine, and so lamp black must be applied with a fine sable pencil. If the print is on one of the velvet or other semi-matte papers, such touches of water-color will appear dull, and

DAWN FRED MARCILLE

to prevent this a very little gum arabic or sugar should be added. The exact amount may be ascertained by experiment. As another alternative, a carbon pencil may be used, the crayon character of the pencil preventing any shine of the spotting. Such a pencil can only be used on quite matte surfaces, however. When spotting platinotypes great care must be taken to avoid getting too much color, as the paper is very absorbent, and once the color has been sucked up by the paper, it is almost impossible to get it off again. Great risk of damaging the print will be run if any sponging is done. Hence the color should be put on tentatively, the spotting being done by a sort of stippling or "building-up" method, one light touch being added after another until the full strength is obtained.

DAWN

We object to false titling of pictures. We can see no excuse for labeling this picture "Dawn" when a glance is sufficient to tell the observer that the sun is high in the sky. When one has really watched the dawn, whether in a ducking blind or on the edge of some mountain meadow where the deer cross, the impression made can never be forgotten, nor can any 10.30 a. m. picture be accepted as a genuine portrayal of dawn. Notwithstanding this mistake in titling, the picture is a good one. Somewhat less inkiness in the shadows would be truer to nature, for even when one looks at objects against the light and does not perceive every detail, they seldom look quite black. From the direction of the cast shadows, we should say that the maker neglected to apply that principle stated in our Exposure-Tables, "If sunlight falls directly across subject, add 1." The result here is underexposed, and the black shadows are due to printing too deep in order to get the clouds, even with the filter used to preserve them in the first place. Data: 4 x 5 Seneca No. 8 with 6¾-inch R. R. lens, 3-times filter; 1-25 second at *f*: 8 in April at 10.30 a. m.; bright sunlight; Standard Polychrome plate; M.-Q.; Azo C Hard.

BLURRED PICTURES

When a photograph is not as sharp as it should be, before we can avoid the defect in the future we must know what has caused it. There are different defects which manifest themselves in a want of sharpness; and it is possible to some extent to distinguish them by their results.

If the whole picture is blurred equally, but the blur seems to be in one particular direction, it is generally due to the camera being shaken at the moment of exposure. The direction of the blur is not always to be recognized, but it is sometimes clear and unmistakable. For instance, if a telegraph post and wires figure in a view, and the wires are blurred almost into invisibility, while the upright lines formed by the outline of the post are fairly

THE PARK FOUNTAIN B. B. JACKSON

sharp, it is clear that the camera was jerked up or down when the button was pressed. Other examples can be thought of, and the fault is one which is generally easy to recognize.

If one part of the picture is quite sharp, or at least is very much sharper than the rest, movement of the camera is evidently not the cause of the trouble, which may lie in the focusing. If the part which is the sharpest is not the part which was sharply focused on the screen, either the plate and the ground glass are not in correct register, or the distance between the lens and the plate may have been altered in some way after the focusing was done, or, what is very unlikely if a photographic lens is used, the lens is not an "achromatic" one.

When some particular area of the negative is blurred, while the rest is sharp, it may be, if it is on a film, that the film was not flat at the time of exposure, but unless the lens was a very rapid one, and the size of the film at least quarter-plate, probably much larger, this is not at all likely to happen. With glass plates it is impossible.

With a poor lens, when the center of the picture is sharp it is the edges which show bad definition, which is improved by stopping down.

If one end of the picture is sharp when the other is blurred, the front of the camera carrying the lens may not be parallel with the back or with the plate. But in these cases it is not safe to come to a conclusion from a single result, as the relative distances of the objects in different parts of the picture may cause a similar result.

When the negative itself is sharp, but the prints are partially or wholly blurred, this is due to the contact between the printing negative and the negative in the printing frame not being close enough. The remedy for this is to make a little pad of clean dry blotting paper, and put into the printing-frame behind the sensitive paper.

If, in addition to the blurring, the print shows everything reversed right from left, it is evident that the negative was put into the printing frame with its film side outward, instead of the glass side, as should be the case.

THE PARK FOUNTAIN

This print is very bad in composition, because the path at the lower right corner leads the eye directly out of the picture. The maker feels that this is a defect, for he wishes that the path might have come out darker in tone, also that the man had been sitting on the other side of the fountain. We are afraid that the only way to overcome these faults is by taking the picture over from a different viewpoint, with less foreground. Data: 3A Kodak with R. R. lens; 1-5 second at *f*: 11 in October at 3 p. m. in diffused light; Eastman Speed film; tank pyro; print on Rexo Normal matte.

THE MOUNTAIN PATH

Possibly the fact that he never uses any exposure-tables accounts for the defects of Mr. Peitzmeyer's print from the technical standpoint. He now thinks he should have given less exposure and developed for a shorter time. Let us see how this scene should be figured by our Tables.

Subject — landscape with dark foreground	4
Stop — *f*: 8	5
Light — intense sunlight	0
"If sun is ahead, add 2"	2
Month and hour — May, 11 a. m.	0
Plate — Cramer Slow Iso	5
Sum	16

THE MOUNTAIN PATH J. PEITZMEYER

The indicated exposure of 1 second has to be multiplied by 5 for the rayfilter used, thus making the correct time 5 seconds, or 25 times as much as our contributor gave! His result is the typical one which most novices obtain with ortho plates until they learn that they *must* be exposed fully to get all the shadow detail and overcome the tendency to render the picture in too steep a scale of gradation. It is too bad that such a good composition has been ruined by such false rendering of values. Data: 4 x 5 Graphic camera fitted with a Voigtlander Dynar lens of 6½ inches' focus; 5-times filter; 1-5 second at *f*: 8 in intense May sunlight at 11 a. m.; Cramer Slow Iso plate; M.-Q.; print on an Azo E Hard postcard.

CRIMSON TONES ON BROMIDE PRINTS

ARTHUR STOWE

Among the colors which can be obtained on bromide or gaslight prints by comparatively simple processes of toning, there is one which is due to Mr. Blake Smith, who first published his account of it, with full working directions, in the pages of *Photography* some seven or eight years ago. It gives the image a fine crimson-red tone, which is very suitable to certain forms of vignetted portraits. There are various methods by which it can be carried out, but in its broad principles the process consists of toning a bromide or gaslight print by the sulphide process, and then toning the image so obtained with gold. The rate of toning is increased by increasing the quantity of gold chloride in the toning bath; but there does not seem to be any real advantage in using more than is here stated.

As in all toning methods with prints of this description, it is most important to start with a thoroughly good plain black and white print, as with any other the time and materials spent on toning it will be wasted. The essential feature is that the exposure of the paper must be so timed as to allow of full development without the print becoming too dark; that is to say, the exposure must be such that the action of the developer seems ultimately to slow down and almost to stop. With prints which have been made in this way there is very little chance of failure; whereas with those that have had to be taken out of the developer quickly in order to prevent the action going too far, pleasant tones cannot be obtained at all, even if the appearance of the picture was quite good while it was in the black and white stage.

Prints to be toned must be well fixed in a clean hypo bath, whether a plain or an acid bath is not material. They are then toned by any of the usual sulphide toning processes, and after washing are allowed to dry. There is no doubt that this intermediate drying exercises some kind of hardening action upon the gelatine, and makes it much less susceptible to injury when re-wetted. It should, therefore, on no account be omitted. The dry prints may be trimmed before toning if they are much larger than they are required to be

when finished, especially if they have dark edges; as the toning process is one which takes a good deal of gold, and gold spent in toning parts that are to be cut off is, of course, so much waste. Vignetted prints need not be trimmed, as white edges do not consume an appreciable quantity of the precious metal, and a little surplus, at one edge at least, is useful for handling the print.

Several gold toning baths are available, ammonium sulpho-cyanide, thiocarbamide, and the "sel d'or" having all been used by different workers with success. The writer prefers the last named, as being easily made up from chemicals which every photographer has at hand, while the color which it gives is an excellent one. Its action also is very regular and uniform over the whole print; so that if some color short of the bright red which is ultimately obtained is wanted, it can be obtained by taking out the print at any stage which is desired and washing it.

To make up the toning bath two ounces of the ordinary stock hypo solution of a strength of four ounces to the pint is taken; this, of course, must be *unused* solution, but it need not be freshly made up. Six grains of sodium carbonate crystals are added to it, and when this has been dissolved, one grain of gold chloride dissolved in a dram or so of water is added, and the toning bath is then ready for use at once.

The dry, sulphide-toned print is placed in this solution, allowed to get thoroughly limp, and is then allowed to lie face downward until the desired color is reached. The action is quite a slow one, and the print need only be looked at every quarter of an hour or so to see how it is progressing. It is important, as it is left undisturbed for some time, that no air bells shall be enclosed beneath the print; and this can be ensured in a very simple manner. When examining the print it should be held by its top corners, so as to hang vertically downward, and then its lower edge being allowed to sink below the surface of the solution, it is steadily lowered until it is entirely immersed. In this way, if there are any air bells between the print and the surface of the solution, they will be pushed forward as the print descends, and finally driven right out. If the print shows a tendency to float, two or three clean pieces of glass laid upon the back of it will keep it sufficiently submerged.

It is important to keep the print underneath the surface of the liquid during the toning operation; but it should not have its face actually in contact with the bottom of the dish, or the toning action will in all probability be uneven.

Prints which are to be toned in this manner must not be piled one on top of another or the effect is bound to be irregular. As already pointed out, the process requires a good deal of gold in proportion to the area of prints toned; but as the method is only used for selected prints, this is no particular drawback. The cost for gold chloride for a half-plate print is something less than a cent; but varies greatly according to the character of the image, a light image with a good deal of white requiring much less gold, of course, than a heavy one. The toning solution does not keep more than a few days, but it can be used for a number of prints in succession as long as it will tone them.

After toning nothing more is required than to wash the prints well and dry them. There seems no reason to suppose that the results are not permanent. The writer has by him prints toned more than five years ago, some mounted and framed, and others lying loose, and they are quite unaltered. The comparatively large quantity of gold which the process requires is itself a strong reason for believing in the unalterable character of the image given, as it is generally accepted that gold, like platinum, tends to confer permanence.—*Photography and Focus.*

SCATTERED HIGHLIGHTS IN FOLIAGE

A reader sent in some prints with the following remarks: "You will say that the highlights on the foliage are bad. That is just why I am sending these prints in. Would overexposure have helped any? The negatives are very dense, though not overexposed. Or is the trouble with development?"

There is a lesson for all our readers in this contributor's prints, for we find, on inspection, that the trouble is entirely due to their having been taken in an unsuitable lighting, with the leaves of the garden reflecting the sky light in such a way that they came out almost white in the print. Exposure seems to have been correct, as the shadows have plenty of detail and all the intermediate values are about right. Development, too, seems to have been proper, as the prints on a soft-working D.O.P. are good with the exception of the staring highlights on the leaves.

Now, if one looks at a mass of foliage and sees hundreds of glossy surfaces reflecting bright light to the eye, it is certain that each brilliant point will photograph almost white. The result will be similar to our inquirer's prints — scattered highlights everywhere. The

A FREAK PICTURE O. N. MURPHY

subject, in short, is one which should not be taken at the time. Later, with the sun in a different quarter of the heavens, the reflections may be absent. Another way of getting rid of them is by changing the point of view. But in any case, the picture should not be taken unless the conditions are such that no scattered points of bright light are seen in the leaves.

A FREAK PICTURE

Pictures made with duplicators are common enough, but here is a real novelty, one made with a "triplicator." Close inspection of the reproduction will show that the work was not perfectly carried out, as one of the joins shows. Nevertheless, the effect is so puzzling that it is worth trying. Mr. Murphy states that he made the triplicator himself to use with an ordinary duplicator, so it should not be difficult for others to repeat his results. We suggest that a drawing and description be sent in to the Readers' Forum. The three exposures were made with *f*: 32 and were all 1 second. The picture was made in March at 1 p. m.

SOME "FALSE" EFFECTS AND HOW THEY MAY BE SECURED

In photography as much as in anything else it is true that "things are not what they seem," and it does not want very much experience of the camera to realize that it is possible, in fact easy, to use it to convey impressions very different from the actual facts on which they are based. Take, for example, what is called "wide-angle perspective." If we get a fisherman to hold one of his catch straight in front of him, and the camera with as short a focus lens as is at hand is set up in front also, so that the fish is a foot or two nearer the camera than the man, we at once get a greatly increased sense of its magnitude. We have heard that special "foot rules" have been made to be placed beside fish and photographed with them, the rules being actually about half size, but the story is not vouched for. Anyhow, in the wide-angle lens we have the means of conveying a favorable impression of the size of the fish without departing from the strict truth. Photography, as we all know, cannot lie.

In another direction we may also create an impression quite different from the reality. Let the sitter, which in this case should be a girl with her hair down, lie upon a couch so that her head and shoulders are beyond the couch with the hair hanging freely, and in this position make a head and shoulders portrait, using a background of plain character. The print is trimmed and mounted on its side, so that the hair, instead of seeming to hang downward, extends outward, and at once we get the effect of the wind blowing it straight out. The suggestion can be helped by posing the arm as if she were holding her hat from blowing away.

In this experiment there is the germ of quite a lot of interesting work. There is no need to trim and mount the print the same way up that the subject originally was. Even when no attempt to do a puzzle picture is being made, it may be helpful to the effect we are out to secure to trim the print on the slant. Anyone

AN OUTDOOR FIGURE STUDY MRS. E. R. THORDENBERG

who picks for the subject a portrait in which there is an ample margin for trimming and no unmistakable vertical or other lines to "give the show away," and then tries the effect of trimming it so as to alter the direction of the head, making the sitter look down or up more, and so on, will be surprised to find how much latitude such a method gives for modifying the results.

There are a whole series of modifications of a much greater character which can be worked out by means of an arrangement for holding the camera at a height, looking vertically downward. An amusing case of this kind was published some years ago, in which the photographer arranged his model on a floor covered with wallpaper with a dado, frieze, pictures, etc., to represent a wall. The figure appeared to be falling, as there was nothing in the print to suggest that what seemed to be the upright wall was actually the floor.

AN OUTDOOR FIGURE STUDY

There are two defects in this picture, both of them seen by the maker, who says she could not avoid them. The first is the somewhat strained attitude of the child, due to his being frightened at the picture-taking; the second is the poor spacing. The latter fault could be corrected by trimming, but this last resort seldom seems to occur to those who use postcards for their printing. The postcard, in fact, is the modern bed of Procrustes. All pictures have to be made to fit the card, and cover as much of it as possible. As a matter of fact, the number of pictures which can be well adapted to a long, narrow panel shape is relatively small. Data: 5 x 7 Premo B camera with 8½-inch R. R. lens; subject in shade; 1-5 second at 10 a. m. in April; Seed 26X plate; M.-Q.; Azo F Hard X postcard. This picture is a good illustration of a subject which is not a "portrait in shade," but should be classed 4 or 5, depending on the amount of obstruction to the sky light falling upon the subject. Or, if a meter like the Watkins is used, one would simply test the shadow light at the place where the subject stands and give the full meter time.

A DEAD BLACK

Now is the time when the interior of the camera, slides, etc., should be examined to see that there are no shiny parts which will reflect light on to the plate. It is all the more necessary since modern lenses generally include a much wider angle than the older patterns, and so throw a brilliant image on the bellows, as well as on the plate. With a perfectly dead black surface, most of the light that might be harmful will be absorbed; and for getting such a surface I have found nothing better than a shellac water varnish. It may not be well known, but shellac, which will not dissolve in plain water at all, freely dissolves in a hot solution of borax. Half an ounce of borax is dissolved in five ounces of boiling water, and half an ounce of shellac is added, well broken up, a little at a time, with constant stirring. After keeping the mixture hot for ten minutes or so, it is allowed to cool and then strained through muslin. A little of this is taken and well rubbed up with some vegetable black so as to make a thick, creamy paste, and when the black has been thoroughly incorporated, some more of the solution may be used to thin the mixture down until it is of the right consistency for application. It should dry with a dead black surface; if it does not, it is a sign that too much shellac has been used.

PORTRAIT STUDY MILTON M. BITTER

Second Prize, July Competition

PORTRAIT STUDY

The maker entitled this picture "A Study in *Pretty* Still Life," and emphasizes the point that prettiness is the keynote of this picture. We fully agree with him that he has selected a model who is essentially pretty and graceful, and that he has fully carried out his purpose of making a picture which would thoroughly please the parents of the little girl, and at the same time appeal to competent judges. Mr. Bitter does not like "pussy willow portraits" and thinks that a sharp picture can be as attractive as is necessary. This is perfectly true when there is nothing which the maker desires to tone down or eliminate, and in this case, sharpness in every detail is entirely essential and satisfactory. Our only suggestion for improvement would be to eliminate the hat at the bottom of the picture, though we do not see why the oval trimming is any improvement over a rectangular shape. The picture was taken with a 5 x 7 Wizard B camera, equipped with rapid rectilinear lens with 12 inches' focus. The exposure was quick bulb with stop U. S. 12 at 4 P. M. in July in bright light, the subject

THERE! DON'T MOVE CARRIE E. TOWNE

being seated in the shade, but not in heavy shadow. The Seed Nonhalation L Ortho plate was developed in Seed's pyro powder, one half strength, and the print was made on Special Glossy Velox.

LUNCH TIME

(*See page 463*)

This genre picture is one of those that need no explanation, but tell their story at a glance, and in such a way as to give pleasure and amusement to everyone. There is nothing dignified about the subject, but the story is one that is within the comprehension of even a child and is so well told that no explanation is needed. The maker thinks that perhaps the picture would have been improved by placing the principal figures somewhat nearer the center, but in our opinion this is not necessary. They are well placed and excellently balanced by the small spot of the window at the upper left-hand corner. Though this seems at first to add nothing to the composition, it will be found that if it is covered up the corner looks quite blank and empty and draws the attention altogether too strongly. The picture was made with a Seneca No. 8 postcard camera equipped with a symmetrical convertible lens of 6¼ inches' focus. The exposure was 1-25 second at *f*: 16 at 2 P. M. early in July in bright sunlight. The Standard Orthonon plate was developed with pyro and the print is an enlargement on Cyko Studio Normal.

THERE! DON'T MOVE!

The title of this print seems to be the injunction (unheeded) of the operator to the sitter. The latter shows a very distinct double outline, due to moving during the exposure of 5 seconds. The maker says that this was her first attempt at portraiture, so we shall not criticize her severely, particularly as she has gone to the trouble to analyze the picture for faults with some minuteness and a great deal of understanding. We recommend trying a larger room, so that there can be more space between subject and ground. There are many useful hints on portraiture in our ten-cent handbook, "How to Take Portraits," with diagrams of lighting arrangements. It pays the amateur to secure all the light possible, in order to shorten exposures and obviate blurred images. The other data are: 5 x 7 Premo camera; 5 seconds at *f*: 11; 3.20 p. m. in April; Seed 30 plate; print on Seltona matte smooth.

VALVERDE

(*See page 489*)

Mr. Booth states that he has made a study of this spot with the idea of producing a pleasing composition, and has made many exposures from this and many other points of view. He feels that the negative from which he has made this print is the best he can obtain under the circumstances, and while he does not admire the shape of the high light on the water nor think it is in the best position, it has not seemed possible to materially change this. The exposure checks with our tables as follows: subject, under trees, 7; stop *f*: 11, 6; light, 1; film, 1½; hour, 0; total 15½ = ⅔ second, times 3 for filter = 2 seconds. We agree with the maker that this is a very satisfactory print, and we chose to reproduce from a sharp print which he sent us rather than from a diffused one, made by the methods set forth by Professor Cardullo in a recent number of *American Photography*. It does not seem to us that there is any gain in the soft print over the one which we have reproduced, showing all the details which existed in nature. There are no disturbing features in this picture which need to be subordinated, or details which need to be obliterated, and with the truth of values here shown all of the details which nature shows is acceptable, producing a pleasing print. The picture was made with a 3¼ x 5½ Ansco, fitted with

WATCH HIM H. PALMER

Modico anastigmat of 6½ inches' focus. The exposure was 2 seconds with a 3-times filter at *f*: 11, at 9.30 A. M. in June, the light being good with light clouds. The Kodak film was developed with pyro in tank for 20 minutes, and the print was made on Kodak Velvet Green.

WATCH HIM

Here is a piece of work, good in some respects, which is marred by some extremely elementary errors. The distortion of verticals caused by tilting the camera is particularly bad. The only remedy is to trim somewhat as indicated by the penciled lines, taking the vertical of the post as a base. The suggested trimming has one fault — don't all speak at once, please — figures centered! Seriously, a subject of this kind is the sort the catalog writers have in mind when they recommend for "serious photography" plate cameras having all movements. To get a proper effect with a film camera it is necessary to hold the camera opposite the middle of the group and strictly level, subsequently trimming off the out-of-focus foreground. With a plate camera on a tripod, the legs are shortened, the lens dropped in the front as low as it will go, pointed down, and the vertical swing then used to secure a focus and keep the verticals strictly perpendicular. In our own work we use the swing so often that we would be at a loss to secure about 80 per cent of our pictures without its help. The data on Mr. Palmer's picture show that he used a 3A Special Kodak with 6¾-inch Zeiss-Kodak lens and gave 1-25 second at *f*: 16 in bright August light at 2 p. m. The Eastman film was developed in M.-Q. and printed on Normal Cyko Matte.

THE CAMERA AND THE PEN

Much attention has been directed recently to the sale of photographs to the press by amateurs, one of the results of which, the writer can testify from his own experience, has been the sending to editors of very large numbers of photographs which stood no possible chance of acceptance, not because of photographic shortcomings, which, from this point of view, are usually quite a minor consideration, but because, however perfect their technique, they did not suggest any opportunity for their use. The object of this article is to point out how this difficulty can be removed.

Briefly, it may be put thus, that in all cases in which magazines use illustrated articles at all, a contribution which consists of both pictures and letterpress is much more likely to be accepted than either sent alone. It may be that the article secures the acceptance of the pictures, or that the pictures carry the day for the article; certain it is that the two together pull far more powerfully than either will do by itself.

It would appear that amateurs are not yet fully alive to the value of such a double-barreled attempt, or, if they are alive to it, they do not see their way to bring it off. The photographer perhaps says to himself that he is no author, while the author very naturally hesitates about taking up a new hobby, a little out of his line perhaps. In such a case, the suggestion we have to make is that a partnership might often be attempted. There must be many amateurs who number among their friends those who have literary proclivities or ambitions. Ententes are the order of the day, and co-operation between the pen and camera has great possibilities.

By combining the camera and the pen, the chances of work finding a market are very greatly increased. The photographer no longer depends upon his pictures illustrating "news" which may by luck have come his way; he makes his news for himself. It needs only a glance through the contents of current papers and magazines to see how great is the demand for the illustrated article; and when the glance is prolonged into a careful study, it will be evident that a great many of these articles do not come under the head of news at all, but owe their acceptance to the fact that they give just the faintest flavoring of instruction.

Let the reader ask himself what he would do were he an editor charged with the task of finding a certain number of such articles regularly in a limited time. Some might find their way to him through the post, the knowledge that the paper accepts such bringing them from journalists who have made a study of its needs. He will also receive photographs without any article, although they may be suitable enough to illustrate one, and he will get articles which might be illustrated but are not. In each case he has to provide the missing partner in the firm, a thing which may be easy or difficult, according to circumstances, but which is bound to be more trouble than to accept a happy combination of both. Editors being human beings, one may safely forecast that a course which means the saving of labor to them has a strong recommendation in that fact alone; and an article which is provided with suitable illustrations, especially if it has enough of them to allow him to pick and choose those most to his liking, has far more chance of acceptance than either articles or photographs by themselves.

There can be no doubt that the most difficult part of the whole task is to find a suitable subject. It is not much use in such a case to depend upon chance; the work, if taken up at all, should be done systematically. A study of the papers themselves is the first necessity; one must know something of the requirements of one's prospective customers. A free library or club reading-room affords the best opportunities for this, as, of course, purchase of all the papers needed is out of the question.

A little notebook and pencil always carried is another important part of the outfit. As soon as a subject occurs, it should be jotted down, as it is easy to forget suggestions that have just floated through the mind and out again. The list of subjects so compiled can be consulted, and likely ones selected to be worked up as opportunity offers. Illustrations may offer themselves unexpectedly for subjects which when jotted down seemed not very likely; or one may think of a good topic at one season of the year for which the necessary photographs could only be obtained at another.

Novices are apt to attach too much importance altogether to minor points in connection with such work. The function of an editor to-day, at least as far as any of the leading journals is concerned, extends far beyond the mere acceptance or rejection of contributions; and, except from old hands who have learned to hit off exactly what a journal will print, and big guns whose work is printed pretty much as it leaves them, the contents of our magazines and journals undergo pretty wholesale revision and even recasting in the office.

The mere superficialities of construction and wording can easily be provided by a sub-editor, or the chief himself may undertake it; while photographs as a mere matter of course are worked up and modified to a very great extent so as to give a satisfactory block. Whether they are small or large, on smooth or on glossy paper, gaslight or P.O.P., are subordinate details, which would not be in the least likely to have any effect on acceptance or rejection.

The preceding remarks are not meant to justify carelessness or slipshod work; one should make a point of sending in a contribution in such a form as to carry its own recommendation with it, and to look as little amateurish as possible. But the governing principle of selection in every magazine office of any importance is whether or not the editor is of the opinion that the work sent is what his public like to read and to look at; and this, as has already been said, is not likely to be provided by contributors who have not been at the trouble to learn his views by studying the paper.

No great harm is done by a preliminary letter asking if an article on such and such a topic would be likely to meet with acceptance; but, on the whole, the writer's advice is that it is better to submit the complete contribution, or, failing that, either the photographs or the letterpress, as a suggestion for a subject to be treated by an unknown aspirant is rarely likely to call forth anything but a noncommittal reply.

DARK FACES IN PORTRAITURE

The one characteristic of underexposed negatives is that the contrasts between the darker tones of the picture are disproportionately small. A few examples will make this clearer. Suppose it is a snapshot of a team of horses plowing, we shall find in the print from

AN INDOOR PORTRAIT HARRY SLOAN

the underexposed negative that, although there is due contrast between the landscape and the sky, the horses, or at least any which are not very light in color, are not very clearly rendered.

The outline of a foreleg against a hind leg, or of the back of one against the back of another, may be quite lost. If it is a snapshot portrait against a hedge as a background, it may be difficult to see where the outline of any dark clothes comes against the hedge. One often sees beginners' portraits in which the faces appear too uniformly dark, as compared with parts of the picture which are of lighter tone. These are all examples of the effect of underexposure, which may be said to fail to give the darker parts of the picture with sufficient distinctness.

A little fog more or less will not make any difference in the result in this case; so that this test is the best which can be applied to a negative to recognize underexposure when it is present.

AN INDOOR PORTRAIT

Mr. Sloan's work has shown steady improvement since he changed from an R. R. outfit to his present equipment, though in the present instance his success is due more to his own excellent technique than to the mere possession of an anastigmat. The focus, although sharp, is not distressing. The placing of the figure in the space is fairly good, though we should prefer to see a little more margin at the right in front of the head. The lighting has been well managed to secure modeling and relief, and the technical part of the work was correctly carried out. It is interesting to note that the Thermo method of development gave true flesh tones throughout. Mr. Sloan made the picture with a 3A Kodak fitted with a Wollensak Vinco anastigmat of 6½ inches' focus. He gave 1-5 second at *f*: 6.8 at 1 p. m. in September with bright light outside to a Seed 30 plate and developed with Modified Thermo D.-Q. in the tank. The print is an enlargement to 4 x 6 on Artura Carbon black from a part of the plate.

SPOTS ON NEGATIVES AND PRINTS—THEIR CAUSE AND PREVENTION

When a beam of sunlight enters a room its path is rendered visible at once by a myriad floating particles in the air which its presence reveals. Now it is well for the photographer to remember that whether the sunshine is there to show them up or not, the particles are present, and, if of a kind to be actively injurious, must be kept from the extremely sensitive products which he uses.

Much of the dust in the air of the room arises from the floor being swept up by currents of air or disturbed by the movements of people. A great deal of the matter thus driven into suspension is no doubt quite harmless to sensitive materials; but some of it may be otherwise. When a little developer or fixer is spilled and allowed to dry, the solid ingredients of the solution will be left to form a fine dust, and this, if it reaches the surface of the plate or paper, is very likely to affect it. Here,

THE TOWER OF JEWELS REFLECTED THOS. BADLEY

then, is a reason for taking care not to slop over the contents of our dishes, and for wiping up carefully any solution which is unavoidably spilled.

Mere insoluble particles may do no harm at most stages of the work; but if they are present on the film or plate at the time of exposure, each little particle will prevent the light from reaching the sensitive substance beneath it, and when the negative is developed, it will be found to be covered with minute transparent spots or pinholes. These are often seen on negatives the plates for which have been carried for some time in the dark slides before exposure; and the first plate in a magazine camera is from this cause often marked by pinholes, of which the others show no sign.

Dusting the plate is not a course to be recommended. Gelatine, glass and celluloid are substances which a very little gentle friction will electrify, and cause to attract dust from the surrounding air, so that the net result of a gentle dusting may be to make the object actually dustier than before. There is also the difficulty of keeping the duster, whatever it may be, perfectly clean. At the most, one may hold the plate upside down and give the back a tap to dislodge any dust particles there may be on it; but this, although often done, is often omitted with no apparent difference.

In fact, the dust problem is best tackled at the other end, by prevention rather than the removal of dust. Camera and plateholders should be kept clean internally as well as externally. Before the plateholder is inserted, it should be dusted, so that no dust is carried into the camera to be wiped off into it on drawing the shutter. Shelves, table and floor should not be allowed to accumulate dust; and above all, the darkroom door should not be protected by a curtain, which may be regarded as an appliance by which the air receives a supply of dust whenever the room is entered.

THE TOWER OF JEWELS REFLECTED

Lack of a tripod, which instrument is prohibited in the exposition grounds, prevented the most satisfactory arrangement of this picture, which would, of course, have been with the horizon moved a little from the middle. The centering of the tower was intentional, as the maker thought it composed better that way. It is unfortunate that the left margin is marred by the flood of light from that side. We should judge that the negative would stand local reduction. The development was performed in Thermo pyro, but the maker does not say whether he used it in the normal way or not. Our practice is to use the developer one or two classes more dilute than ordinarily for interiors showing windows or subjects like this one, that is, those possessing an abnormal range of contrasts which need to be softened down in order to bring them within the range of a printing paper. Data: 3A Kodak fitted with 6½-inch Ilex anastigmat; 5 minutes at *f*: 16 in April at 9.30 p. m.; Eastman film; Thermo pyro; print on Instanto No. 2 Glossy, developed with duratol.

SPOTTY DEVELOPMENT OF FILMS

"Why," asks a reader, "do so-and-so's films invariably develop spotty, notwithstanding their formula is used? Numerous photographers advise me that they have the same troubles that I do in using this particular make of film."

We are rather interested in this complaint

because we have lately made it a point to develop samples just to see whether the film was running good. We found it excellent, so we think there must be something in the handling, or weather conditions, or some other reason than defective film. We did not, however, use a tank, but utilized the convenient Nussbaum tray of Burke & James, using tray strength Modified Thermo D.-Q., and passing the film through clear water until limp just before development. It may be that our friend in Arkansas would find that wetting the film before development would prevent the spottiness of which he complains.

ON HER WAY

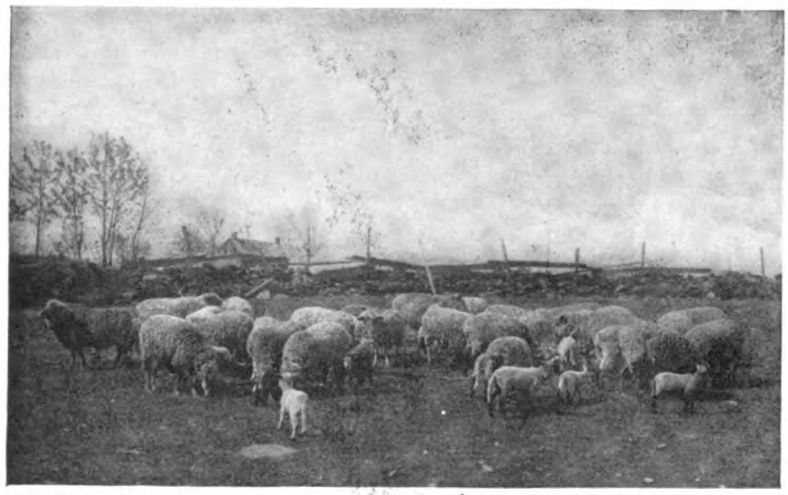
An interesting discussion of exposure is made in connection with this picture by the maker thereof. He thinks it somewhat underexposed, though he gave it 1-235 with a Telescopic Graflex, and our Tables call for 1-500 for the data he gives. Now, judgment of exposure depends largely on the amount of shadow detail registered in the film in the deepest tones. This subject has no very dark values anywhere — nothing as dark as the average tree shadows in a landscape. In other words, the scale of tones is a short one and near the upper end of the scale. If we imagine pure black to have a value of 1 and white paper a value of 100, this picture may be said to lie in the range from about 50 to 90. The darkest tones are fully timed in this instance. Even greater brilliancy would have been secured if the exposure had been 1-500. It is not common practice to use a stop as large as *f*: 8 for sea views. One generally stops down to about *f*: 22 so as to use a shutter speed of 1-100 or 1-50, depending on the light. The rather deep tone of the sky is perhaps what the maker bases his opinion on in considering his plate undertimed. Thinness of the sky is, in this case, due to the fact that it received approximately the correct exposure. In timing an average landscape, one gives the sky an overexposure of from 8 to 10 times. This results in getting too great density in the negative. If, however, the exposure for the foreground is so long that the sky gets more than about 10 times normal, partial reversal begins and the density diminishes instead of increases. This is why we advise full time — it helps prevent "bald-headed" skies. Everyone knows the character of the white-paper sky shown in Regular Velox prints from the typical amateur snapshot, namely, pure white paper. Ortho films have, of late years, done much to abolish the bald-headed sky, but full timing is also essential.

ON HER WAY PETER SCHUMMEL

Blue sky, though extremely luminous, is dark or low in value; but ordinary plates are too sensitive to blue and blue-violet, as compared to the other colors, so they render the sky too white. An ortho plate, particularly if used with a proper filter, say not more than 5 times, will render the blue thin enough in the negative to print with a decided tone.

What has happened here is that the exposure was just a trifle too much. The lowest tones are very fully timed, and the sky, though not more than twice too much time was given, has come just thin enough to print a bit muddy. The same thing often happens in speed work. In taking athletic sports, for instance, the skies generally are timed about right and print dark. The details in the foreground are generally all there, but if exposures higher than about 1-250 actually have been used, the negatives will lack printing contrast unless double-strength developer has been used. Normal exposures are capable of being overdeveloped; speed exposures must be carried as far as possible to secure any strength.

Data: 4 x 5 Telescopic Graflex fitted with Cooke Series II anastigmat lens of 8 inches' focus; 1-235 second at *f*: 8 in August at 1 p. m.; bright sunlight; Seed 30 plate; pyro tank development; print on a Normal Studio Cyko postcard.



IN THE PASTURE R. W. DE LA MATER

IN THE PASTURE

Although this group of sheep is composed of many individual animals, it counts as a single mass in the composition. The observation is circular. The eye enters at the bottom margin, catches sight of the white lamb, travels from it to the old ram at the left, and thence around the group. The background, without being particularly important, yet furnishes spots of accent and the misty cloud sky gives the feeling of air. The quality of the print is exquisite. Data: 5 x 7 Seneca camera fitted with a Wollensak Velostigmat lens of 7 inches' focus; 1-25 second at *f*: 6.3 in May at 9 a. m.; "medium" sunlight; Cramer Crown plate; pyro; fabric-surface Buff Kruxo.

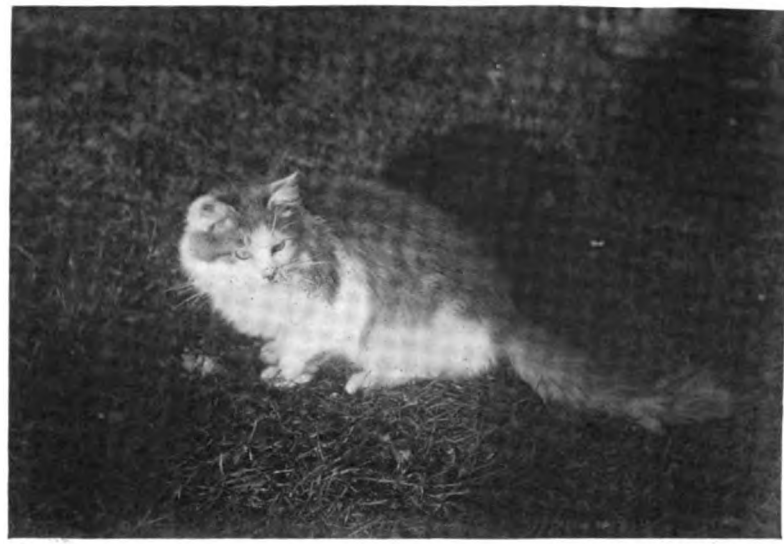
DEFERRED FIXING OR DEFERRED WASHING — A NOTE FOR TOURISTS

It has been suggested that the tourist who wishes to develop one or two plates while he is away from home, in order to see if his exposures are about correct, or for some similar purpose, will do well to make duplicate exposures on the subjects he proposes to test, so that the negatives after development need not be fixed, or if fixed, need not be washed, and having given the indication required, may be thrown away. It is not every traveler who will care to do this. Having once got a good negative of any subject, he will hesitate before relying upon the other undeveloped plate of the same thing, and thinking of the chapter of accidents, he will feel tempted to finish off the negative and keep it.

The real drawback to work of this kind away from home is the difficulty of washing negatives properly; and washing, it may be noted, is not an operation which can advantageously be split in two, drying the negative in the meanwhile. When once a gelatine film containing hypo and dissolved silver bromide has been allowed to dry it is doubtful whether any washing or after process will get rid of these by-products as effectively as they would have been removed had the washing been continuous and complete. Washing is therefore a process which should be carried out all at once. Manifestly, also, the plate cannot be fixed and then dried, to be washed subsequently. The hypo would crystallize in the film and completely ruin the negative, to say nothing of other results which would certainly follow. There remains only to defer both fixing and washing.

Although fixing is a necessity, if the negative is to be kept, there is no very great harm done in allowing a considerable interval between developing and fixing, so long as two conditions are observed. One is that the developer is as far as possible washed out of the film or rendered inert, the other is that the unfixed negative is not exposed for any length of time to a strong light. This latter does not mean that any great precautions are necessary. A little daylight does no harm. It will do if we treat it with as much care as we would a piece of P.O.P.— nothing more.

It is important, however, to prevent the developer from acting any further, and the simplest way of doing this with most developers — except those which have no alkali to act at all — is to neutralize the alkali. If this is done with sulphurous acid, not only do we neutralize the alkali and so stop development,



PUSSIE CHARLES D. MESERVEY

but we do so with an acid which is an active antistain, and which also, being volatile, removes all risk of the picture being injured by salts crystallizing in it. A weak solution of sulphurous acid is obtainable at almost any drug store, and will serve.

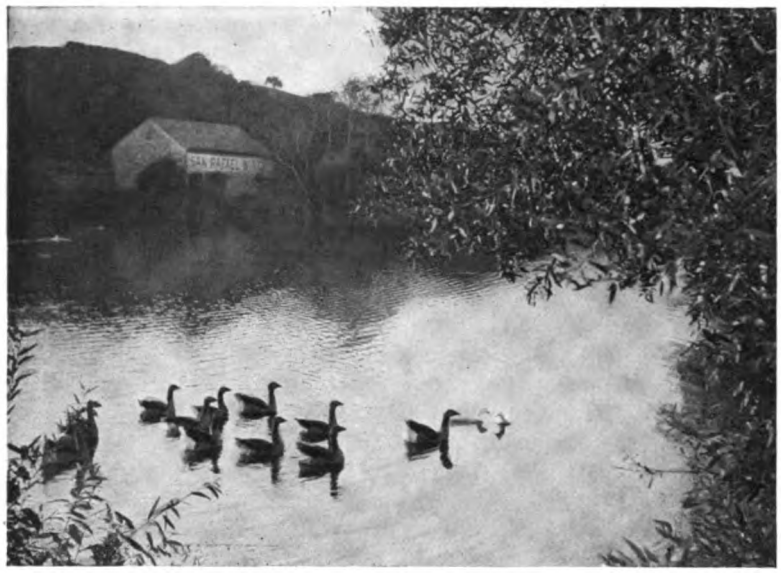
A method which has proved perfectly satisfactory in the writer's hands when touring is to have a spare dish in which is placed a mixture of one part of the sulphurous (*not* sulphuric) acid as bought and five parts of water. It should smell strongly of burning sulphur. The developed negative is rinsed for half a minute, and is then placed in the dilute acid, in which it may remain for five minutes or more. It can then be freely examined in daylight. Another rinse or two — more if opportunity offers — and it can be put up to drain or dry, and when dry can be packed away, film to film, with another of its kind, to be fixed and washed on the return home. The work has usually been done in a hotel bedroom at night, and the negatives stood up to dry over night, so that in the morning they have been exposed to daylight for some time; but no ill results were ever apparent.

PUSSIE

Mr. Meservey's work is always technically good, and he has learned to see values and endeavor to reproduce them accurately by using full exposure and short development, thus getting a soft, harmonious negative suitable for enlargement and yielding a well-balanced contact print on as harsh-working a paper as Hard X Azo is generally reputed to be. His prints are so characteristic that we do not have to look at the coupons to know who made them. The use of a color-sensitive plate in all of his work accounts for this characteristic quality, to a great extent. His portrait of the cat is distinguished by perfect technique. The arrangement is good, and the lines of the tail and the direction of the cat's gaze together make an effective line for entrance of the observer into the picture. It is interesting to note that an imaginary line, as in this case, may prove to be an important element in a composition. Data: 4 x 5 Cycle Poco camera with 6½-inch R. R. lens; 1-5 second at *f*: 11 in December at 2 p. m. in bright sunlight; Standard Polychrome plate; tray duratol; print on Azo F Hard X postcard, developed with duratol.

TO CLEAN PHOTOGRAPHIC TRAYS

To clean photographic trays add enough water to ordinary washing soda to make a thick paste and use this in scouring out developing and other trays. It is surprising how much dirt one can remove from a tray that is apparently clean, and this dirt, if not removed, is inclined to cause trouble that is not always traceable to the right source. The best method is to rinse the tray and then add about a tablespoonful of the soda. The rinse water adhering to the tray after it is emptied will be enough to moisten the soda sufficiently to form a paste. Common salt can also be used, but the soda is preferable. Trays should, of course, be thoroughly rinsed after scouring.



FOLLOWING THE LEADER E. B. WOTKYNS

FOLLOWING THE LEADER

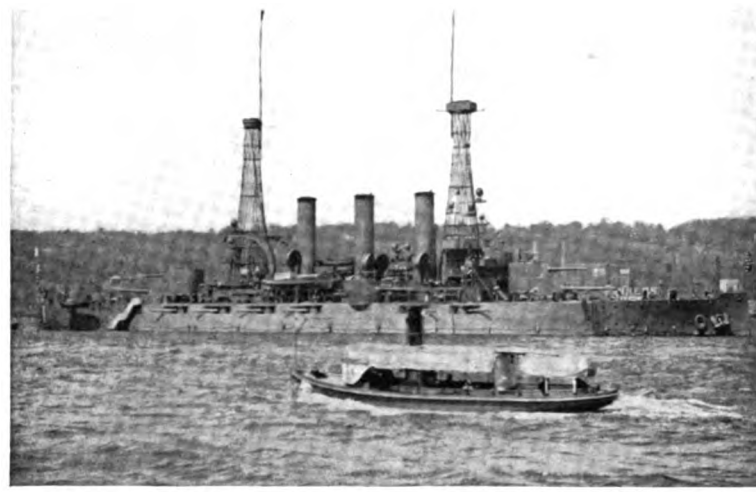
Often it is the surroundings which make the picture. That Miss Wotkyns appreciates this truth is evident from the place she chose from which to photograph these waterfowl. The framing effect of the foliage is such as effectively to fill the otherwise unimportant empty corners, yet not to overdo the matter, for the leaves, though attractive, are inferior in eye-compelling power to the large area of light gradation, the water, with the V of birds so strongly displayed against this medium background. The farther shore, with the old barn, gives the touch of human interest. Altogether, this is a most successful decorative landscape. The technique is perfect. Data: No. 3 Kodak with R. R. lens; 1-25 second at *f*: 8 at 3.30 p. m. in January (Southern California); Eastman speed film; 5 x 7 Glossy D. O. D. enlargement.

PERPLEXITIES OF A METER USER

A lady who uses a Watkins Bee meter has written to us for an opinion about what light to test in estimating exposure under the following circumstances. She has to take a white building in strong sunlight with good cast shadows. The foreground is open, but at each end of the building there are very dark masses of foliage. She is in doubt whether to take the open sunlight test or to expose the meter paper in the shade of the body. The next perplexity is whether the subject should be classed as an open landscape and given ¼ the full meter time or as an average landscape and given ½ the time. She states that she understands that if there are any dark objects within 25 feet the subject would belong in the average class and take half the full meter time.

Full meter time, in the case of the Watkins Bee meter, is correct for our class 4, landscape with dark foreground. The exposure for all objects more than 25 feet away is about the same, hence our standard exposure for average landscapes of our classes 3 and even 2 is *half* the meter time. In determining the strength of the light, we always test the *best* light, sunlight or skylight, as the case may be, unless the subject has dark objects within 25 feet, when we sometimes take the light in the shade of the body. Repeated trials have shown that this means doubling the exposure as compared to the best-light test.

Here we have a subject which contains almost pure white and deep shadows (the dark foliage). Since, however, the foreground is open and the building is, of course, more than 25 feet from the lens, no variation from the standard of half the full time for the best light needs to be made. It might be advisable to use ¼ time if it were not for the dark foliage; if, for instance, there were no trees around the building and the foreground was almost white. A building really counts as part of the landscape if it is far enough from the lens. The terms "buildings and street scenes" refer only to dark buildings near the lens or to narrow city streets.



U. S. S. VIRGINIA F. L. BEY

In using a meter, one finds, with a good modern shutter, that the tendency is to get heavy, slow-printing negatives unless one takes care to apply some correction. It is really simpler to adopt some such classification as already explained, with the Watkins P number as given on the speed card, than to change the P number.

Another question asked by our reader concerns the allowance to make for telephoto subjects, such as distant mountains. Here we should use the factor of ¼ full time, as the subject is really a panorama, with nothing but middle distance to form the foreground of the picture. To counteract overexposure, full sunlight should be tested. For a large magnification picture of a distant peak, we should time as for sea and sky, that is, use 1-10 the time. This result would, of course, have to be multiplied by the factor of the ray-screen used.

For a figure study in the shade, distance 8 feet from lens to subject, we should take the light in the shade, letting the paper face the sky, and give full meter time.

U. S. S. VIRGINIA

However much the newspapers may dispute over the question whether Secretary Daniels has destroyed the morale of our navy, it is certain that the ships are still in being, as the large number of pictures of them which have reached us testifies. This print of a battleship displays it fairly well, though, as the maker says, it does not stand out very clearly from the somewhat confused background of the Jersey shore. The print is, however, true to the value of the war paint. A little more space both fore and aft would give the vessel a more imposing appearance. Close inspection reveals uneven definition, which is due to the curvature of the field of the R. R. lens. Data: 5 x 7 camera with 8½-inch R. R. lens; 1-100 second at *f*: 8 in May at 10 a. m. in bright sunlight; 4 x 5 Cramer Medium Iso plate; M.-Q.; print on Soft Glossy Azo.

A PINHOLE STOP IN THE LENS

A pinhole itself does not give a perfectly sharp picture, although sharp enough for many purposes; but if a stop no larger than a pinhole is used in a lens, then the picture will be critically sharp all over, and at the same time the exposure required will be as long as if the pinhole were being used by itself. Ordinarily the photographer wishes to make his exposures as short as possible, but there are occasions when he requires just the opposite. For instance, if he has to photograph a shop front in a busy street, he will find the traffic very troublesome. If he goes in the early summer morning all the other shops in the view will be shut and the place will look dead. But if he uses a pinhole stop and a slow plate he may easily prolong the exposure to half an hour or more, and in that time all the moving traffic will have become quite invisible. A similar result can be got by using a color screen with a plate that is not orthochromatic; a "five times" screen may then prolong the exposure two or three thousand times, and so give what is required.

THE POPULARITY OF THE HAND CAMERA AND WHY

Whatever the photographer of the old school may say in defense of camera craft practiced before the era of the hand camera, there is no doubt that this type of instrument has revolutionized photographic methods, has proved an educative factor of no small importance and is of universal popularity.

The statement that photography opens the eyes of the photographer to the beauties of nature, and teaches him to see where previously he was blind, has become a platitude. We would go further than this and say that, in addition to giving him vision, the hand camera has been the means of teaching thousands to think, and, moreover, in conjunction with a health-giving and pleasurable occupation.

Photography for the million was impossible so long as the amateur was tied to a large and heavy camera and a tripod. The advances in plate and film manufacture, and the lightening of field apparatus, were steps in the right direction, but it was not until the hand camera in a portable form was fully established that the real benefits of amateur photography became definite and universal.

During the past decade hand camerás of all sizes, shapes and capabilities and at prices to suit all pockets have been made and sold in thousands, and it is not going beyond the mark to say that ninety per cent of the thousands of hand cameras have introduced a new interest in life to their possessors, broadened the view of their users and largely added to the pleasure of their friends.

The modern hand camera, even of the cheapest form, can produce results with a minimum of trouble and a certainty of result that would stagger the workers of the old school referred to above. It has been argued that the pains and penalties attached to the production of a photograph in the old days rendered the result more approximately a work of art, in addition to being one of considerable skill, than the snapshot produced by the modern hand-camera user in thousands every year.

We are inclined to think, however, that the attention devoted to the production of photographs in those times was less a matter of inclination than of necessity; whereas nowadays the attractiveness of amateur photography, and the ease with which pictorial records can be secured, create amateur photographers among those who would not have troubled about photography at all if the conditions had remained so strenuous. The remunerative side of photography is also one not to be overlooked.

When these points are considered it can well be understood that the popularity of the hand camera is no ephemeral matter, but that this form of photography grips and retains the interest of those who take it up. Here is a hobby of hobbies — one that leads to other things, yet keeps its own individual charm even when practiced merely as a means to an end.

The Hand Camera for Picture Making

This brings us to another point, and one deserving of every attention — namely, the value of the hand camera for pictorial photography. Certain superior beings are apt to sneer at the hand camera as being incapable of producing well-considered and well-composed pictorial results, the argument being that it is only when a camera is firmly adjusted on a tripod and the view peered at upside down on a focusing screen that a pictorial result is likely to be achieved. These workers are apt to overlook the fact that the artist, and everyone with artistic vision (vision that the focusing screen will never engender), see their effects in nature by looking straight at them, and then recording the compositions they see with such tools as they are able to use efficiently. The artist will use his brush, paints, pencil; the photographer will use a camera.

Modern invention has placed beautifully and ingeniously constructed cameras, and rapid lenses, plates and films at the disposal of the photographer, so that practically any effect in daylight can be recorded in a minimum of time; and there is no doubt that a very great proportion of the best camera pictures produced to-day are made from snapshot negatives taken with a hand camera.

With the possible exception of studio portraiture and certain architectural and night work, it is difficult to name any type of picture subject that cannot be successfully portrayed with a camera held in the hand, and the only difference that can be reasonably made in defining "snapshots" or "pictures" is that the first is the product of the beginner, and the other that of the more advanced worker who has profited by the educational advantages of a course in photography, and instinctively sees good compositions when they occur, ignoring the incidental and trivial. His work, however, still remains snapshot photography, but of a

better class, and demonstrates that the hand camera is capable of producing all that the most critical-minded can demand. In other words, the hand camera can be accepted to-day as the universal instrument for practically every photographic purpose.

THE SISTERS

Although the idea of this picture is good, technical and pictorial defects mar it greatly. The worst faults are the unpleasant distribution of sunlight and shadow on the nearer head and the poor quality of the definition. The focus was placed too far back. The composition is bad because the figures are too near the margin toward which they are looking. Trimming liberally from the right side would help correct this fault. There are also too many scattered highlights in the leaves above and behind the children's heads. The print is a sepia bromide enlargement by a firm of finishers. The negative was made on film with a 1A F. P. K.

MIXING A DEVELOPER

A reader asks for a description of the correct way to mix a developer containing metabisulphite. Let us take for illustration the Modified Thermo M.-Q. formula.

A.	Water to make	20 ounces
	Potassium metabisulphite	60 grains
When dissolved add		
	Metol	30 grains
	Hydrochinon	90 grains
B.	Water to make	20 ounces
	Sodium sulphite, anhydrous	440 grains
	Sodium carbonate, anhydrous	660 grains

First measure out about 18 ounces of water at the temperature of the room, not hot, for hot water decomposes metabisulphite. Weigh out the metabisulphite, crush it in a mortar, and dissolve it in the water. It should entirely dissolve in about a minute, if the water is well stirred with a glass rod. As soon as it is quite taken up by the water, weigh out the metol and the hydrochinon and add them separately or together, as seems more convenient. Stir well. If the metabisulphite was not spoiled by age, the developing agents will dissolve almost at once. Finally add water to make the total volume 20 ounces, filter, and bottle.

The B solution can be made up with hot water, if desired. Again measure out about 18 ounces. Place the sodas on a piece of paper creased down the middle and pour them in a fine stream, while stirring vigorously, into the water. When all are dissolved, make up to 20 ounces, filter, and bottle.

THE SISTERS MAE M. SIEBERT

These two stock solutions should be perfectly clear and remain in good condition for use for a long time. The A will keep for at least a year, if the metabisulphite was in good condition. The B will throw down a fine sediment of lime and manganese salts, if hard water was used; but this precipitate can be removed by filtering through absorbent cotton. Sometimes a scale forms in the B bottle. This is due to the alkali's attacking the glass. It should be filtered out, or else the mixed developer should be filtered just before use. The B stock does not keep so well as the A, for the sodium sulphite is affected by air and turns to sulphate, which has a bad effect on the developer. The acid metabisulphite in the A is the best preservative of developing agents of which we have any knowledge; but it does not keep in perfect condition indefinitely and when stale may cause trouble.

A USE FOR GROUND GLASS

Instead of matte varnish, which I find difficult to apply easily without spilling, I have a number of pieces of ground glass, made by

BUSY F. W. MALLETT

grinding old negatives together with fine emery and a little water. One of these is laid with its glass side next the film side of the negative, and held in place with a couple of bulldog clips while the necessary work is done on the ground side. When this is finished, I put the ground glass with its ground side in contact with the glass side of the negative, adjust it into register, and bind the two together with lanternslide strips. Gum water painted on the ground side makes the parts more transparent when dry, while much more pencil and stump work can be done than matte varnish itself will stand. If the work is only temporarily required, the ground glass can be cleaned with soap and a nail brush and used again; but sometimes the last traces of the black lead cannot be got off. It is very easy to make a dozen pieces of ground glass of perfectly even and fine texture. I prefer to grind the two glass sides before cleaning off the film, as the gelatine gives the fingers a good grip, and seems also to be of service in reducing the chance of breakage during grinding.— F. CARTWRIGHT.

BUSY

This small picture is all that the maker has left of a 4 x 5 horizontal, another print of which was inclosed, proving his judgment on the trimming to be sound, as he eliminated another desk and a typewriter. The arrangement, as it now stands, is good, though a softer print, yielding more of a tone in the whites, would be an improvement. The maker thinks perhaps he should have employed reflected light to secure more detail in the side of the table; but would not this have detracted from the unity of the composition by calling attention to detail in an unimportant part? We feel that it would. A more serious blemish, in our eyes, is the texture of the window shade behind the figure. The exposure was made with a combination of daylight filtered through the shades and electric light. A No. 4 Folding Kodak with R. R. lens was used. The time was 35 seconds at *f*: 16 at 2 p. m. in February, with bright sunlight outside. The film was developed in M.-Q. and printed on Velox.

A CORRECTION

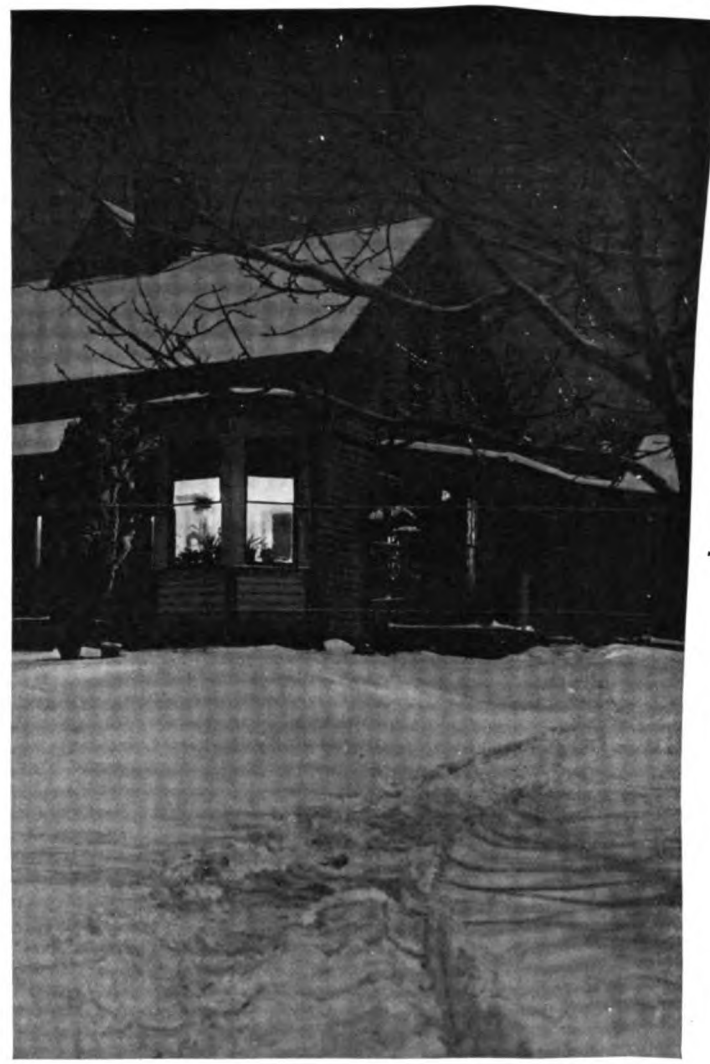
On page 372 of the June, 1915, issue a mistake occurred in giving the formula of the acid hypo bath. It should read:

Hypo..... 1 pound
Water..... 4 pints
Dissolve and add
Liquid sodium bisulphite..... 4 ounces
(Or dry granular, 2 ounces)
Water to make..... 1 pint
(and if greater hardening action is desired)
Chrome alum..... 1 ounce

The ingredients of the hardening solution should be perfectly dissolved in the fifth pint of water and then added, a little at a time, while stirring well, to the hypo solution.

SIMPLE DRAPERY FOR FIGURE WORK

The following hints for a simple form of drapery for figure work were given by Mr. Partridge in an address to the Photographic Society of Philadelphia some years ago. The distance from the shoulder to the floor should be the width of the material; the length should be twice the distance between the extended finger tips. If the seams are vertical they should be hidden in the folds. The length is folded and a button is sewed on each side of the center, so as to leave an opening, the width across the shoulders, for the model's head. Along the upper edge buttons are sewed at intervals of about two inches, with corresponding buttonholes. The garment is put on over the head, the closed side being on the left. With the two buttons fastened it forms a sleeveless garment; fastening some and leaving others undone, it can be slipped from the shoulder. By using a girdle at the waist, it can be held more closely to the figure, or by pulling it up through the girdle and allowing



WINTER MOONLIGHT CLARENCE BUNDY

it to hang, another series of effects can be secured. By the use of a girdle crossed at the shoulders, it takes another form, developing the outlines of the figure. Other variations will suggest themselves in the course of its use.

WINTER MOONLIGHT

A genuine moonlight picture, this print has not only the charm of novelty, but also a strength of composition which places it high in merit. The lighted window is the touch of human interest which makes the picture more than a mere record. Data: 5 x 7 Century camera fitted with 7-inch Wollensak Velostigmat *f*: 6.3; 8 minutes' exposure at *f*: 8 at 7.30 p. m.; pyro; print on Cyko postcard.

BROWN FIXING BATH

A reader asks why his plain hypo fixing bath turns black after use only a few times.

Plain hypo had better never be used a second time. If developer is carried over into it, it oxidizes; and the product of oxidization is yellow, brown or black. It is far better to add to the plain hypo enough metabisulphite to get an acid bath. The exact proportions do not matter; but a good, average formula is a pound of hypo dissolved in 4 pints of water, to which add 2 ounces of metabisulphite dissolved in a pint of water, while stirring well. This bath keeps clear until exhausted and will not stain plates or papers.

PEACE AND SOLITUDE R. F. HUMPHREY

PEACE AND SOLITUDE

The following defects are seen in this print by the maker: A smaller stop should have been used to get better definition near the edges; the patches of white paper for sky should have been toned down; a tripod would have allowed a longer exposure with a smaller stop, thus sharpening the foreground; and the values are false, because though the scene was rather dark, detail has been lost in printing. Our chief criticism is that the negative was over-developed. The exposure as calculated by our Tables is 4 seconds, which is what was given; but, on account of the very strong contrasts of the scene, development should not have been carried so far. The remedy is to reduce with acid permanganate, which will cut down the excessive density of the multitudinous scattered highlights so that they will print as halftones. The composition is fairly good. A station-point farther to the right, with more trees included on that side, might have been better. Data: 4 x 5 Korona VII camera with 6½-inch R. R. lens; 4 seconds at *f*: 16 in August at 4 p. m. in bright light; Hammer Extra Fast plate; M.-Q.; print on Normal Cyko. We should recommend making this picture over with an ortho plate and a filter, as the false values are due to the insensitiveness to green of the ordinary plate.

CHEMICAL IRRITANTS

Some of the chemicals which are used in photography are poisonous, as is well known; indeed, there is none — not excepting common salt itself — which, taken in any quantity, is not actively injurious to the human system. But the adoption of a few quite simple precautions will be sufficient to prevent any real danger from taking such quantities into the system by means of the mouth. It is not the same with some of the chemicals which affect the skin when it is wetted with a solution of them. We cannot guarantee never to let a drop fall upon the cuticle; we must guard ourselves from the consequences in some other way.

Prominent among chemicals which act upon the skin are nitric, sulphuric and hydrochloric acids. In a very dilute form they are harmless enough in the short time that one would be in contact with them, but when strong they are very corrosive, and should not be allowed to touch the skin at all. Then there are the alkalies, caustic potash and caustic soda, and in a milder form carbonate of potash, carbonate of soda and ammonia. These all attack the skin, make it harsh and rough, and irritate any scratches or cuts one may have. But with these also, if the solutions are washed off as soon as possible, nothing that can be called poisoning will result.

DIVING — MADE WITH 4 x 5 AUTO GRAFLEX M. V. BACON

Metol, it has long been known, affects the skin of some people in a very unpleasant manner. Within a few hours of using it, itching and irritation arise. Ultimately little blisters, which may break, make their appearance, and the outer skin may peel off. The effects may last for a week or two. One result of this seems to be, not immunity from trouble afterward, but the reverse. It is a curious but well-ascertained fact that one may handle metol freely for years without the slightest inconvenience; then, one day, it may have the effect just mentioned, and thereafter the slightest trace of metol getting to the skin will give rise to the trouble.

It does not seem to be dangerous; but it must be admitted it is decidedly unpleasant. We speak from experience. We should not advise anyone who has been using metol in the past, with no ill effects, to abandon its use in the future; but at the first sign of any such irritation, its use must be discontinued. Our recent calls for information as to victims of metol poisoning have led us to believe that this is far rarer than has generally been supposed. We have been able to discover only forty cases in three months' search.

Another salt which may have an actively injurious effect upon the skin is potassium bichromate, or any other soluble chromate salt for that matter. In this case, however, it is not likely that the amateur photographer will suffer any ill effects from using bichromate in the ordinary way. It is only those who are constantly dabbling about in its solutions, who may get the salt drying on their skin and remaining there for some time, or may get it into a cut or scratch, who run any serious chance of bichromate poisoning. With ordinary care and cleanliness, with a liberal wash-

A DOUBLE A. A. PATTERSON

ing of the hands with a nail brush, whenever bichromate solutions have been used, one may handle them quite freely.

Salts of platinum are said to act upon the skin in much the same way; but the use of platinum paper for printing, or chloroplatinite for toning, need not come into question. We never heard of any amateur suffering in consequence; though we have known of cases of platinum poisoning among those who have had to deal with the salts in a large way in the course of manufacture.

The great thing to remember in all work which brings the fingers into contact with irritant chemicals is to be very careful not to carry it on when there are cuts or scratches on the hands through which they make their way, and, after having got the skin once wetted with such solutions, to lose as little time as possible before washing thoroughly.

Finger-stalls and rubber gloves have been used as preventives; and, when new, they are effective enough, if costly. But they are open to the objection that they are either so thin as soon to become useless or thick enough to make it difficult to handle things easily with them; while they are soon cut through by the edges of glass plates, etc., which must be handled with them, and if they are not used much the rubber will soon be found to perish.

It is curious to note the difference between workers in the appearance of their hands. One will hardly ever be free from stains and roughness of the fingers due to chemicals, while another, who may do more work with the same or even more actively harmful substances, will have an epidermis which shows no signs of it. The difference is not merely that of a strong skin vs. a delicate one, we believe, but of the care which may have been taken to give as little time as possible for the reagents to make their attack.

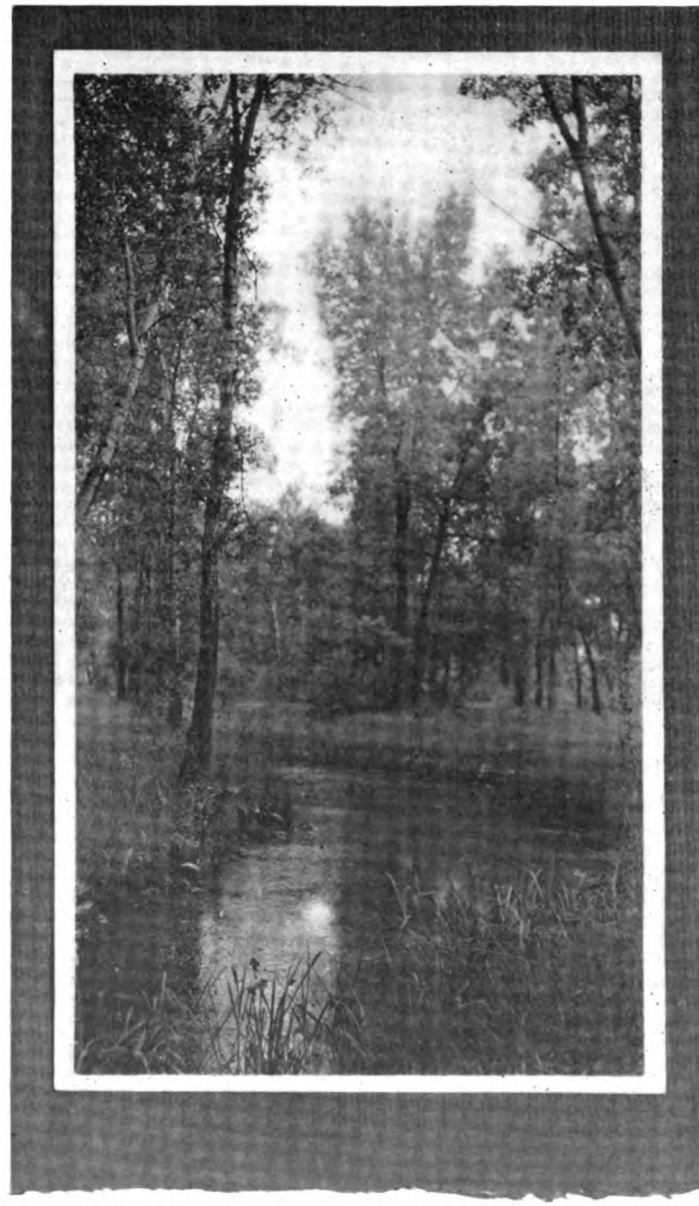
A DOUBLE

The maker of this print should be able to sell a glossy enlargement for a cover picture for one of the sporting magazines, for it is an unusually good thing from the sportsman's point of view, as well as being a good photograph technically. The reader will observe that a good effect of motion is secured, even at the slow speed of 1-100 second, as the dead birds are somewhat blurred. Furthermore, the ejected shell is distinguishable in the print a little to the right of the gun — an automatic. If the maker had had available an actual speed of 1-250 or 1-300 second, as furnished in the more expensive shutters, these details would have been more clearly brought out, yet perfect sharpness would not have suggested motion so forcibly as does the unsharpness of the present rendering. Smokeless powder is not so good, for pictorial purposes, as the ancient "soft coal." The exposure was full, and the print, though on a hard-working paper, is soft and harmonious. The negative was made on a Standard Orthonon plate in 1-100 second at *f*: 8 in November in bright light at 2 p. m. with a postcard Conley camera. It was tray developed in M.-Q. and printed on an Argo Hard Glossy postcard.

RELATIVE SPEEDS OF "ENLARGING" PAPERS

A reader draws attention to what he thinks is an error in our determination of the speed of Enlarging Rexo. He states that he finds it exactly the same as Enlarging Cyko, namely sixteen times as fast as Normal Cyko, so he cannot understand why we stated that it was 1-40 to 1-60 the speed of a bromide paper.

The answer is, of course, that the printer set up the fractions 1-4 and 1-6 as 1-40 and 1-60. So far as we can tell, Enlarging Rexo is about four or five times as slow as an average bromide paper.

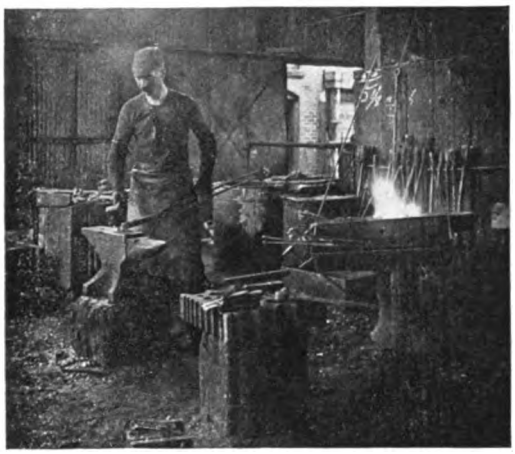


VALVERDE
C. S. BOOTH
Third Prize, July Competition
(See page 472)

THE IMPORTANCE OF THE SUBJECT

BAYARD BREESE SNOWDEN

Some philosopher is responsible for the saying that a new baby is the most tremendous object man can ever behold. He is right. But second place easily belongs to the new camera. As you take it out of its case and turn it over, as you fondly let down the front and pull out



THE ANVIL SOLO B. B. SNOWDEN

the lens board, what a wonderful thing it seems — how full of possibilities, how capable of yielding endless gratification! To think that with this compact little instrument you can make a faithful record of all the scenes that please you! What an amazing fact! What an astonishing, what a mysterious power is thus put into your hands!

I suppose this feeling of unlimited and delightful privilege is common to all amateurs. And I suppose that another feeling as commonly follows it — the feeling that with so unlimited an opportunity there is need for wisdom in choosing what to photograph.

This feeling — this mental query, "What shall I take?" — is, it seems to me, the biggest question for the amateur. Technical proficiency is reasonably sure to come; though taking time and thought and consistent effort, it is largely a matter of mechanics. But the picture is the thing. What shall it be? That is the eternal question.

Looking back over a good many years of active effort as an amateur photographer, I can see how I have wasted a good many plates and films on subjects that were not worth my attention; and I can also see how, lured away by such subjects, I have missed a great many others on which my efforts might profitably have been spent. The hope that others may be helped to avoid the same errors is the occasion of the present article.

It seems to me that my greatest mistake as a beginning amateur was in getting the notion that I must hunt for something big — some grand climactic picture that would be so unusual as to at once attract attention. To use the parlance of the newspaper office, I went around looking for some great pictorial "scoop." It was fun, but it was a wild-goose chase. Any newspaperman will tell you that the reporter who starts out every morning with ears for nothing but that which promises a scoop is likely to be fired before the week is up. Moreover, he will miss the scoop. And the man who gets it will be the man who neglects no item of news, however small. Scoops are rare; they come to him whose net is spread for everything.

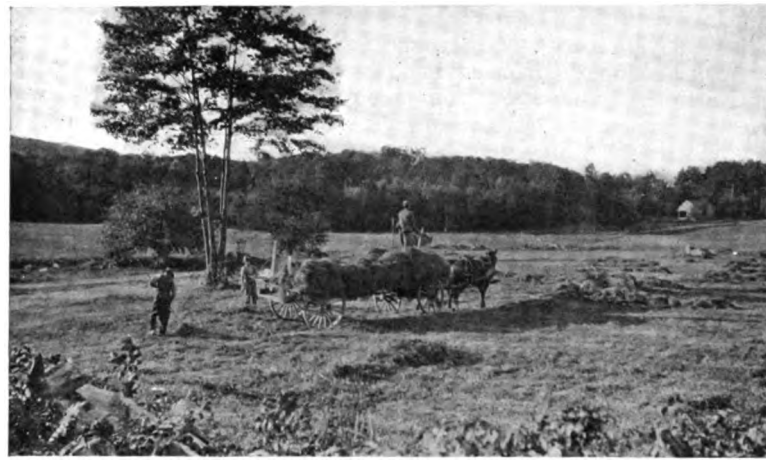
So with pictures. I do not mean that to get your great picture you must snap at everything in sight, trusting by your all-inclusiveness to round up a masterpiece in the end. Far from it. That would indeed be foolish. The reporter does not make a "story" out of everything he sees and hears; certainly not. But he considers the possibilities of every item, and more often than not it is around some apparently trivial incident that he builds his biggest story.

It is a fine thing to have high aims; the beginning amateur with artistic aspirations is

HOW THE RUMOR STARTED B. B. SNOWDEN

well started on a pleasant road. But the law of gravitation presents certain difficulties for him who would walk among the clouds. Hitch your wagon to a star — but be sure the traces are long enough to save you from the bumps.

All of which, simmered down, means this: When you ask yourself that pointed question,



SEPTEMBER HAYING B. B. SNOWDEN

"What shall it be? What shall I photograph?" do not expect too big an answer. Be content, at least for the time, with simple subjects, letting the big things come as study and practice open your eyes. Do not expect to be an artist without some preliminary training.

If you want to get the most fun as well as the most profit out of your hobby, start with a definite purpose. Start, first of all, with the resolution to make pictures that will be interesting, pictures that will commend themselves as having a reason for their being. Instead of piking out of town with your camera every Saturday afternoon, take a Saturday now and then to ramble *around* town and photograph some of the common scenes with which you are familiar. For one gleam of interest that your album will excite by an underexposed sunset or a picture of a clump of trees, there will be a hundred eager questions over prints that portray the common scenes of life. Forget the three-baggers, and be content with a modest single. If you acquire the habit of knocking good clean singles you will much sooner find yourself hammering out a home run when occasion offers.

Every town has features of interest. Pause to see them. Do not hurry by the street groups in your wild rush for the open. Stop in at the blacksmith shop and get acquainted. The smith will pose for you at his anvil, gladly. Later, as you pass the horse fountain, have a sympathetic glance for the thirsty team that is being watered. It will yield you, perhaps, only a simple record, yet a simple record with something interesting to tell is more enjoyable than a mediocre landscape that pretends high art.

Why should we amateurs be so scornful of the record photograph? Perhaps because so many wretched records have been perpetrated in the name of art. Yet a record photograph, well composed, is a thing of real value. Did it ever occur to you how much we Americans owe to the record photographs of scenes in foreign lands? What a lot we have got from the newspaper photographs of the war, yet few of these are anything but records, and most of them are poorly composed records at that. To what extent should we be able to visualize the life and environment of the Turk, or the Arab, or the Chinese, were it not for the numerous record photographs reproduced in books and magazines? Think of other countries, other regions — regions of our own land. Suppose that photographers in these regions had one and all been obsessed with the prejudice against the record photograph. Suppose they had passed up every subject that offered no hope of a pictorial triumph. How much more poorly furnished our minds would be. How much less we should know of the way things look in other parts of the world.

Let us have more purpose in our photographing. Not more "pictorial" purpose; we shall have that, willy-nilly. Let us think less of making photography or art an end in itself, and more of using it to show something that is worth seeing. Let us first cultivate an interest in the world about us, then use the camera as a means of setting forth our observations. The camera is a servant. It is an automatic pencil for those who can see but cannot sketch. It is a self-acting brush for those who can compose with eye but not with

hand. Give it a chance and it will do its work well. But give it a chance at something that is worth looking at. If your mind is not receptive to the scenes about you, how can you give the camera the chance it needs? Study your matter, get interested in your subjects, then turn to the camera for your means of expression.

TESTING A LENS

"PRACTICUS"

There are two distinct things which have to be ascertained about a lens before taking it into use — its capabilities and its qualities. Under the heading of capabilities are three principal points: The intensity, or, as some call it, the speed at full aperture, the relation of the circle of illumination to focal length or "angle of view," and whether the image is sufficiently rectilinear for the work the lens is to be used for. Want of rectilinearity is not a defect for some work; it may even be an advantage, so that I place this point under capabilities instead of quality.

To arrive at the intensity, or as it is often called, "angular aperture," we must first ascertain with some degree of accuracy the actual or "equivalent" focal length of the lens. There are many ways of doing this, perhaps the simplest being to focus a distant object, to mark the camera extension on the baseboard, and then to focus any object, such as a printed card, so that the image on the ground glass is exactly the size of the original. The difference between the original extension as marked and the extension required for a full-sized image is the equivalent focal length of the lens.

The intensity is got by dividing the diameter of largest aperture of the diaphragm into the focal length. This, however, although not difficult of accomplishment, is not quite as easy as it sounds. As in obtaining the focal length, it is not enough to measure the distance between the lens and plate with a rule, so, in measuring the aperture, it is not correct to measure the diaphragm opening with a pair of dividers. In many lenses there is a considerable convergence of the rays before they reach the diaphragm, so that it is quite possible for a lens having an actual aperture of f: 6.3 to seem to have one no larger than f: 7. To ascertain the amount of this convergence, we must focus a distant object upon the screen, and after replacing the ground glass by a card which has had a fairly large pinhole perforated in the center, take the camera into a darkened room and hold a candle flame close to the pinhole. If a piece of ground glass be placed in contact with the front cell or hood of the lens, we shall see an illuminated circle, and this circle is the true working aperture of whatever diaphragm aperture happens to be in position. In a general way we should start with the largest aperture; we may then proceed to check all the others. As it is somewhat difficult to measure the disc of light while holding the ground glass in position, it is a good plan to rule a pencil line upon it, and mark off upon that the various apertures.

It is not quite so easy to determine the size of the circle of illumination with a lens unless one has access to a very large camera; with a ¼-plate lens, a 10 x 12 camera will answer, but for lenses of over 8 or 9 inches' focal length, some special device will be necessary. An optician's "horse," or testing bench, is, of course, the most convenient thing for the purpose, but is hardly likely to be available. The easiest way is to fasten the lens to a fairly large front board and to fix this in a window which can be covered with a dark curtain. A child's hoop of about 30 inches in diameter, covered with tracing paper, will serve as a focusing screen, and if a scale of inches, starting with zero, in the center, is marked on the paper, it will at once show the limits of the field. To ascertain the covering power for any size of the plate, it is a good plan to draw a circle the size of the field of the lens, and to lay an actual plate upon it. It is then easy to see how much rise and fall is possible without any further measurement or calculation.

The test for rectilinearity should be made on the class of subject it is desired to take, as it is a fact that lenses which are rectilinear at some distances may not be so at others. I once possessed a lens which was absolutely correct on a test chart at a few feet, but which gave a perceptible curvature of the lines in a church interior. The test should also be made on the size of the plate to be used, as some single lenses give practically no distortion over a moderate angle. The test should take the form of an actual exposure, as it is much easier to examine a negative than an image upon the ground glass.

Before attempting to make any tests as to the quality of a lens, the camera upon which it is to be fixed should be carefully examined, and the larger the aperture and the more highly corrected the lens is supposed to be, the more necessity exists for this. Most present-day cameras are very lightly built, and a slight bending of the struts or straining of the hinges will cause a lack of parallelism between

the front and back which will seriously impair the accuracy of the result.

The principal defects which have to be looked for are spherical and chromatic aberrations, astigmatism, curvature of field and flare. Besides these, the quality of the glass must be examined for specks and bubbles. Faults in mounting, such as bad centering and strain through too tightly fitting the glasses into the cells, may also be present.

Spherical aberration means incapacity to give sharp definition at a large aperture. It arises from the fact that, unless properly corrected, the rays passing through the margin of a lens have a slightly different focal length from those passing through the center. This causes a softness of outline which is most noticeable around the highest lights of the subject, such as the white color in a portrait or a patch of white wall in a view. It may be recognized by focusing a printed page from a good magazine, on which the ink is black and the paper smooth. If it is impossible to secure a sharp image in the center of the field without stopping down the lens, spherical aberration is present. Except in very bad cases, a sharp image can be secured when the aperture is reduced to *f*: 16. A more delicate test is to use the light of a small lamp reflected upon a mercury bulb (an ordinary thermometer will do, as the test object), in a darkened room, as the blurring is shown more clearly. Another way which also demonstrates the cause as well as proving the existence of this aberration is to make two stops of black paper. One is a disc about two thirds the diameter of the full aperture of the lens, the other a disc which will fit inside the lens hood, and having a diameter a little larger than the solid disc. The perforated disc is placed in the hood, and any object sharply focused, the exact position of the screen being marked. This disc is then removed, and the other disc fixed on the center of the front lens with a touch of gum or rubber solution. If spherical aberration be present, the image will no longer be sharp, but it can be made so by refocusing. If poor definition is due to other causes, such as bad centering or badly annealed glass, there will be little difference in the definition when the discs are changed. It should be remembered that for some classes of work spherical aberration is advantageous, and special means for introducing and regulating it are provided in the "Patent" portrait lenses of Dallmeyer, and more recently in the Cooke Anastigmat Portrait Objectives. In either of these, by simply turning one of the lens cells a range from absolute sharpness to decided fuzziness may be obtained.

Astigmatism is a defect of the marginal rays. It differs from spherical aberration inasmuch as it cannot be removed by any amount of stopping down. It is usually present to a large extent in portrait lenses of the Petzval type, and to a lesser one in a Rapid Rectilinear. The handiest test for it is a cross made of two strips of black paper about three inches long and a quarter of an inch wide, pasted upon a white card. If this be focused upon the center of the ground glass, the vertical and horizontal lines will appear equally sharp, but upon rotating the camera so as to bring the image near the edge of the plate, it may appear unsharp. This may be due to curvature of the field, in which a sharp image can be obtained by refocusing. If astigmatism be present, it will be found that only one of the lines can be focused at a time; when the vertical one is sharp, the horizontal one is fuzzy, and vice versa. If the mercury bulb or "artificial star" be used for this test, the bright dot focused in the center of the field is drawn out into a short line, which takes a horizontal or vertical position as the camera back is racked out or in.

Chromatic aberration is a serious defect for ordinary work. A lens afflicted with it will give a sharp image upon the ground glass, but upon taking a negative the image of the object appears unsharp, while other objects at a greater or less distance appear sharper than they did upon the screen. This is due to the fact that the yellow rays which are the most luminous are those which are mainly used in focusing and produce what is known as the visual image, while the blue and violet rays which are more chemically active come to focus in another plane. The simplest test for a lack of achromatism is to fix up a long strip of sharply defined printed matter at an angle with the axis of the lens, the center of the strip being opposite the lens; in a strip of two feet of length the inclination should make the nearest end of the strip about eight inches closer to the camera than the farther one. It is convenient to place a couple of pins to mark the center of the print. A column of newspaper answers well for the purpose. Then focus the line lying between the pins, and make a negative. If the line focused is the sharpest in the negative, the lens is free from chromatic error; if it be undercorrected, a more distant line will be in the best focus; if overcorrected, a nearer one. A properly achromatized lens brings both blue and yellow rays to the same

focal plane, while an apochromatic one makes practically all the rays of the spectrum coincident. It is obvious that for this test the surfaces of the ground glass and the sensitive plate must fall into exactly the same plane, and for this reason it is recommended to focus upon a piece of ground glass placed on the actual dark slide which is to be used. A trained observer can form a good estimate of the chromatic correction by a visual inspection with a telescope eyepiece, but the novice will do well to trust nothing but a photographic test.

Curvature of field is easily discovered by examination of the image of a flat wall on which, if possible, some printed bills should be fixed. Test charts are not good for this purpose, as, being usually small, they require a longer camera extension, and this naturally increases the covering power of the lens. Consequently, a better performance can be obtained from a chart at two feet than from a wall forty feet away. If a flat object be not available, any distant one, such as a weathercock or chimney, will serve. This should first be focused upon the center of the screen, and the camera rotated upon the tripod until the image falls near the margin of the screen. The amount of racking-in which is necessary is a measure of the curvature of the field. In the case of some anastigmats, it is not safe merely to compare the image formed at the center of the field with that formed at the margin, as the field frequently has a dip extending in a circular form, after which it recovers its original flatness. I have used an expensive modern lens, which, at the same aperture, gave better definition at the corners of a whole plate than it did upon the 5 x 4 size. It is very necessary to see that the front and back of the camera are absolutely parallel, as any swing or inclination will vitiate this test.

Flare spot occurs in two forms, one being a decided disc which appears at a distance from the center of the plate corresponding to that of any bright object, such as a gas flame or window, which may be in the field, while the other, which usually occurs in single lenses, takes the form of an ill-defined central patch of fog. The former is easily discovered by focusing a gas flame placed in front of a dark background, when, upon rotating the camera, the image of the flame and the disc will be seen to approach and recede from each other. Many useful lenses suffer more or less from this defect, which only appears under trying conditions. The other form is more difficult to detect upon the ground glass, but may be found by taking a bright sky against a dark mass of foliage. If a patch more or less circular in form is visible in the center of the subject, it is probably due to flare.

It is now rare to find lenses suffering from mechanical defects, except those due to accident. If a lens is badly centered — that is to say, that if all the axes of all its components are not in the same line, the definition will be affected. This may be due to careless workmanship or to the position of the lenses having been altered by a fall. It may be detected by focusing a candle flame at a little distance from the center of the field, and then gently rotating the lens in its flange. If the lenses are perfectly centered, the image will remain stationary; if not, it will move in a circular direction. If the cells are separately rotated in the same way, it will be seen in which the fault is present. Another test can be made without a camera by holding the lens between the eye and a gas flame, so that a number of small images of the flame are seen inside the lens. In a properly centered lens these can be brought into a straight line, but if one or more cannot be made to do so, it shows that one, at least, of the glasses is displaced.

Defective glass sometimes gives rise to poor definition, and so does too tight a cell. These can only be detected with the aid of polarized light, which shows any strain, as in badly annealed or compressed glass, as dark patches. Veins in the glass may be seen by holding the lens up to a small gas or candle flame, so that the surface is uniformly luminous. The streaks will then show quite plainly. Care must be taken not to confuse them with any streaks which may have their origin in the eye of the observer. If the lens is turned, a genuine vein will turn with it, but a spectral one remains stationary.—*British Journal of Photography.*

WATCHING THE DEVELOPMENT OF A CORRECTLY EXPOSED PLATE

There are photographers who declare that they derive so much pleasure from watching the gradual development of the image in the negative that they would throw up photography altogether rather than abandon the observation method for time development, in which the process takes place unobserved and in complete darkness. Whether they are right or not, it must be admitted that, even if the operation is to be done in the dark in the ordinary course of things, the amateur should at least know what it is that takes place; in other words, he should have seen a plate develop,

or have looked at it at intervals during the course of the operation.

We will suppose that a plate has been duly exposed, taken into the darkroom and laid, film upward, in a dish. Unless everything is quite ready, a card or cover of some kind should be put over the dish to protect the plate even from the red light as much as possible. No darkroom light is absolutely safe; some are very far from being even reasonably safe; and we must make it a rule all through never to expose the plate to it any more than is absolutely necessary. The developer is mixed up in a measure or cup — it should never be left standing long, as a scum forms on it which might mark the plate — and then, the card being removed at the last moment, the liquid is poured on.

There is a knack in pouring on the developer. It is not merely emptied over the plate, but it is sent across with an even sweep, by holding the dish slightly tilted at first, and running the edge of the developing cup along the dish as the liquid is poured in. In this way the whole surface of the plate will be wetted almost at once, a thing which is very important. If any part is left uncovered, it may be only for a few seconds, that part will show distinctly in the finished negative and spoil it. For this reason, it is most unwise to stint developer, at least while one is a beginner; as it is, of course, much easier to cover the plate smoothly and quickly, if there is plenty of liquid with which to do it.

As soon as the developer has been poured on, and a glance, very obliquely, at its surface shows that it has been wetted all over, the cover is slipped on to the dish again at once, and the dish being put flat on the table, it is gently rocked from time to time. This does not mean that the solution is sent surging backward and forward over the plate, getting airbells or froth, and perhaps being spilt; but simply that every few seconds one end or other of the dish is lifted a little and then put down again.

Rocking the dish is important. If it is neglected, the negatives suffer from a defect known as mottling, a series of uneven patches appearing, especially in the denser parts, such as the sky, instead of a uniform deposit. When it has occurred the negative is quite spoiled; there is no remedy short of almost impossibly elaborate handwork. Hence the necessity for care not to let the dish remain unmoved too long.

The actual rate at which development takes place depends upon the make of the plate, the nature of the developer and the extent to which it is diluted, and the temperature. It is not advisable, usually, to have the developer any stronger than the formula states; but there is no reason why, within limits, it should not be weaker. Provided it is not carried too far, dilution only makes development slower; if carried on long enough, the negative obtained from the weak developer will be identical with that obtained from the strong. There is then no reason why we should be short of solution on economical grounds; if we cannot get the plate covered nicely with two ounces of developer, we may add an ounce or two ounces of water. All the difference will be that the operation will take half as long again or twice as long, or a little more.

Before actually describing the appearance of the plate while it is being developed, a word may be said about a very bad practice which is sometimes followed, that of using the same solution more than once. The action of development does not merely weaken the developing solution; it alters its composition very materially. Fresh chemical substances are formed in the liquid which would affect injuriously the next plate put into it. For this reason, therefore, the developer should be poured into the sink as soon as it has done its work, and fresh solution taken for the next plate. By using dilute developer this is quite removed from any possibility of wastefulness.

After the plate has been in the solution for half a minute or so, the card may be removed, and the negative glanced at. It is possible that signs of a picture will be seen, the creamy white surface darkening here and there in those parts which represent the highest lights of the original subject. The card should be at once replaced, since it is in these early stages that any possible injury from light will be most harmful. After a lapse of about the same interval we may give another look, and we shall find in all probability that a great deal more of the picture is visible. Possibly the whole of it will be seen, looking strange to unaccustomed eyes, by reason of the reversal of light and dark.

When most of the image is apparent, the plate may be picked up from the dish, taking great care not to touch its front surface at all; and, being held up in front of the lamp but not too near it, we look through it. Although while it is in the dish, the image may have seemed vigorous enough, it is probable that on looking at it in this way, it appears quite feeble. The contrast between light and dark parts is slight and the whole appearance is fairly translucent. Just how translucent it is

will depend not only on the extent to which development has gone but also on the strength of the light.

Before putting it back in the dish, we may give just one hurried glance down upon the glass side, when it will be noted that so far no alteration has been made in that aspect of the negative; it still has an even, light, creamy look.

For the moment, I am assuming that the plate has been correctly exposed. It is put back into the developer, covered with the card, and the dish rocked. It may be glanced at a third time, after about the same interval, when it should appear to be darkening more or less all over, except just along the edges, or those parts of the edges by which it was held in position in the camera. No light at all having reached these parts during exposure, they should be quite light, almost white, right through to the end. But everywhere else the picture should darken over gradually, until at last, although one should still be able to see the main outlines while looking down upon it, they should seem buried and heavy.

Over- and Under-exposure

If there are parts of the picture which do not darken in the way described, even after prolonged action of the developer, we may be quite sure that the plate has been underexposed. Overexposure is not so easily recognized, as there are other faults which may present much the same appearance.

Returning to the development of the correctly exposed plate, we may once more hold it up to the light and look through it, after the image has acquired the buried appearance just referred to. A great change should now be manifest. The whole plate is more opaque; so much so that with a thickly coated plate and a not very strong light, it may be difficult to see anything at all on looking through it. Usually, one can make out the principal parts of the subject though, and it will be seen that they have increased considerably in density, as well as in opacity. That is to say, not only is it more difficult to see through the plate generally, but the difference between the lighter and the darker parts is also much greater. It may still not be sufficient to give a good print, and the plate may have to be put back for further action; but it will be much more than before.

Glancing at the glass side once more, we may notice here and there patches, corresponding to the lightest parts of the subject, which are beginning to darken. The extent to which the image shows through on the glass side varies very much with the make of plate and with the exposure. It is a help toward deciding how far to develop when one has had some experience with the particular make of plates being used; but it may easily be misleading.

PHOTOGRAPHING WOODLAND SCENES: ORTHOCHROMATIC WORK

At this time of year the summer foliage makes the country more than ever alluring, and there must be very few who own cameras who are not tempted to take them out amid the woodland scenery which is readily accessible in almost every part of the country, and try to make pictures of the beauties that nature spreads so lavishly before them.

Although the trees may provide a constant succession of pictures to the eyes, the amateur soon finds that it is not quite so easy as it looks to make pictures of his photographs of them. He has first of all to remember that in his photographs all the charm of color, which is the greatest beauty of all, will have vanished. In most cases it will have done more than have vanished; for unless he is a skillful worker using particular materials, he will find that his photographs are not even truthful renderings in light and shade of what his eyes see.

We may take a very simple case as an example. Just now almost any group of miscellaneous trees will present two very distinct classes of foliage. There are the dark green old leaves of the evergreens, while beside them is the light green foliage which has been produced this year. If we look at such a group, and try to imagine all the color taken out of it, so that nothing is left but the light and shade, we must admit that the new leaves are very, very much lighter than the old. If we exclude sky, we may find that this new foliage is in parts the very lightest tone in all the picture. Yet if we photograph such a scene on an ordinary plate, not only do the old leaves appear in the print distinctly darker than they are in nature, but

the new leaves also are darkened down, and that to such an extent as often to be quite indistinguishable from the old.

It is to remedy this state of things that what are called "orthochromatic" or "isochromatic" plates and films are made. The two terms "orthochromatic" and "isochromatic" are now used indiscriminately for the same thing.

These plates, if used in just the same way as ordinary plates, do not give a result that is perceptibly better in this respect than that which the ordinary or nonchromatic plates give; but when, in addition to the choice of such materials, we use what is called a color screen or light filter, then it will be found, if the combination is properly employed, that the rendering of the light and dark green is no longer so noticeably incorrect. The dark greens appear lighter than before; in fact, they seem to be about correct in tone, while the light green leaves are rendered very much lighter than before, and the contrast between the two which was visible enough to the eye is preserved in the photograph.

This color screen or light filter is usually a film of gelatine stained to a particular shade of yellow and mounted between two pieces of glass. It is placed somewhere between the subject and the plate, the best position for it being close to the lens, either behind or before it.

When a color screen is used, it necessitates an increase in the exposure, and the screen is usually described by this increase. Thus when people talk of a "five-times screen," they mean a screen of such depth that when it is used the exposure must be five times as long as it would be were the screen taken away.

This method of describing a color screen is, at best, only a rough-and-ready one. The same screen may be a "three-times screen" with plates of one make, and a "six-times" or "eight-times" screen with plates of another make. The actual increase required for plates or films of any make must be found by trial unless the screen has been specially made for that particular brand and the increase it entails is stated authoritatively. Even then, more advanced workers find it advisable to check the accuracy of the maker's statement.

I am often asked why a color screen should not be used with plates that are not orthochromatic. The answer is that there is no reason except that it prolongs the exposure out of all reason. Nonorthochromatic plates are so feebly sensitive to yellow light that a color which may only require an increase of five times with orthochromatic plates would perhaps require an increase of three or four thousand times with plates that are not orthochromatic.

If we can give such a prolonged exposure, and if we know how much it should be prolonged, there is no reason why we should not use the color screen with such plates. It is at least an interesting experiment; and published examples of work done in this way have shown that it may be made to give a very fairly correct rendering even with the screens which are made for orthochromatic plates, while if the screens had been specially worked out for the purpose, still better results might have been got. But the long exposures needed are prohibitive, and for special purposes the color screen or light filter is only used with plates that are orthochromatic.

It has been pointed out already that the color screen may be placed anywhere between the subject and the plate; it may even, when this is practicable, as it sometimes is when working by artificial light, be placed between the source of light itself and the subject. The one thing is that somewhere or other in its course to the sensitive emulsion the light shall be "filtered" through a suitable yellow medium.

Some years ago it was found that, instead of having a separate "light-filter" it was possible to obtain the same result by dyeing the emulsion itself with a yellow coloring matter. There are now several makes of such plates on the market, known as "nonscreen," "self-screen," or by some similar term, which indicates that they are orthochromatic plates that do not require any separate screen to be used with them; although at times it may be found that an extra screen may be advantageous. As such plates, quite apart from their screened and orthochromatic properties, are very good plates, they are now largely used by amateurs for all-round work.

Of course, the screen is there, just the same, but it is in the body of the film itself. As every color screen must, of necessity, cause the exposure to be longer with it than without it, it follows that no "nonscreen" plate can ever be made as rapid as plates that have no screen, but by taking care not to have the screen too deep in tint, they can be made fast enough for all ordinary purposes, and any photographer who is undecided what type of plate to select, will find that there is much to be said in favor of one of the "nonscreen" kind. Any of the standard makes will be found to be quite satisfactory.

The question arises, are such plates any more difficult to handle than others, and the reply to this can soon be given. Being specially designed to be sensitive to green and yellow light, to which nonorthochromatic plates are comparatively nonsensitive, it follows that all orthochromatic plates are, of necessity, more easily fogged by the light of the darkroom lamp. But as they are not sensitive to pure red light, they can still be handled quite safely in any ordinary darkroom with reasonable care. The dish must be covered during development, except just when the plate may have to be glanced at; and when the camera is being filled or emptied, the lamp should be placed behind the photographer so that he works in the shadow of his body. But these are precautions which one takes in the ordinary course of things, even with plates that are not orthochromatic.

It may be mentioned here that plates sensitive to red light are also made. These plates are orthochromatic, of course; but in order to distinguish them from those that have just been described they are generally called "panchromatic." It is usual to deal with them in complete darkness, as any light that is strong enough to see by will soon fog them.

For woodland subjects of all kinds orthochromatic plates should be used, and a screen used with them, either separately, or else combined with the emulsion as described. It is only by doing this that we can hope to do justice, not to the color, of course, but even to the mere light and shade of the subject we select. If our picture includes any sky and clouds, we shall find that such a course will give us negatives in which the clouds will appear of such density that they will show in the print, whereas with plates that are not orthochromatic we shall not get the clouds to print out unless the landscape part is grossly under-exposed, and even then not properly.—*Photography.*

SPOTTING OUT PINHOLES

Just as accidents happen in the best-regulated families, so pinholes come in the negatives of the most careful workers. They may be reduced to the minimum, in the point of numbers, by careful attention to the dusting out of the camera and slides. They do not trouble the expert much, for they are touched out with comparative ease with a fine sable pencil and a little India ink or lampblack water-color. But the novice usually makes matters worse at the first attempt. There are three causes for this failure. (1) The tiny blob of color is not put exactly on the spot. This is due to lack of practice, and to the fact that when working against the light, as one must when spotting a negative, it is difficult to see the point of the brush, and so difficult to guide it accurately to the pinhole. The thicker the negative the greater is this difficulty. Thus when spotting (in contradistinction to retouching proper) it is well to have a little light from behind, so that one is not entirely dependent upon the light the negative transmits. (2) The tiny blob of color is too large for the spot it is meant to obliterate. The disadvantage of this is that the white spot on the print is a large one, and so requires a lot of spotting again for its obliteration. The reason for this is much the same as for the failure to hit the spot exactly, but in addition may be due to having too much color on the brush. (3) The color does not fill up the pinhole, but simply makes a ring around it. This is due to the pinhole being an actual hole in the gelatine, and not merely a transparent spot. Further, the color is used too wet, and so is sucked up by the absorbent gelatine, and none remains in the hole. The remedy is to use the color nearly dry — that is, just to moisten the brush in the mouth, and take up dry color from the palette — rather than to wet the brush in water, and get the color in too fluid a condition. With practice it is possible to put on enough color to match exactly the surrounding tone, the spot not showing at all when the negative is printed, but this degree of skill takes a good deal of acquiring.

SEPIAS BY HYPO ONLY ON P.O.P.

A reader asks why it is not feasible to make sepia prints on a regular P.O.P., such as Solio, by treating the prints in a plain hypo bath, and asks for complete working directions.

Prints made in this manner, without gold, would be permanent, but the colors would be unpleasant. There is, however, a sort of P.O.P. which allows the production of good sepias, namely Aristo Platino. Although this paper is chiefly intended for black tones by toning first in gold and then in platinum, it is possible to get very fine sepias on it by toning with gold only. The simple fixing process would give a good color only with the self-toning papers, which are made with gold in the coating. We can see no reason for departing from the latter class of goods, as the manipulation is simplicity itself and the results are very charming as well as reasonably permanent. Such papers are Aristo Gold, Seltona, and Wellington P.O.P. Self-Toning.

EDITORIAL

AN OPPORTUNITY FOR AMERICAN TRADE

It has long been a matter of surprise to us that first-class manufacturers of postcards did not see the opportunity lying before them to extend their trade by advertising in the photographic magazines. Photographers must make the negatives which lie at the basis of all postcards, and the demand for postcards, though smaller than a few years ago, is still continuous and large. The proper kind of advertising on the part of first-class firms should lead many photographers to have postcards made from their prize negatives, which would have a ready sale. Before the war a very large proportion of the commercial postcards of the United States, as well as of the rest of the world, were produced in Germany, and while the taste of the United States in recent years has demanded colored postcards, the black and white, or brown and white, collotype card has been a great favorite in other countries. This sort of card, as far as we know, is made only in Germany, for no American firm seems to produce them in large quantities, and the English market was supplied from Germany. This source of supply is now cut off entirely, and there is a lively inquiry all over the world as to where postcards can be made which will replace those furnished by the Germans. A single mail recently brought us inquiries from the Republic of Panama and from Ireland, enclosing samples of German collotype and colored cards, and asking for information as to the addresses of reputable manufacturers in the United States who could make these goods. American postcard manufacturers should get busy, and take the chance to get some of this trade while the opportunity offers.

PRACTICAL PHOTOGRAPHY

The reception accorded to the first two issues of *Practical Photography*, "The Secret of Exposure" and "Beginners' Troubles," which have been published during the last month, has been unexpectedly gratifying. Not only have we received many kind words of approbation from individual customers, but the reception of the book by the photographic trade has been unexpectedly generous. Although many dealers gave us large initial orders for the books, so large in fact that predictions were made that we were oversupplying the market, barely a week had elapsed, after the mailing of the book, before reorders began to come in, from dealers in widely separated sections of the country. Our readers who may desire to obtain these books will probably have little difficulty in finding a progressive dealer in their own town who sells them, but if not, we shall be glad to supply them by mail, or to see that the dealer is induced to carry them for the benefit of his customers, if his address is sent to us.

Especially flattering comment is made upon the fact that the *Practical Photography* series is issued in cloth binding of a beautiful dark red shade as well as in paper covers. A large collection of paper-bound books is a very awkward thing to store properly in the library, whereas a cloth-bound book might be found an ornament to any book-shelf. We already have no doubt that the enthusiastic photographer who desires to get a working library will welcome the fifty-cent edition of *Practical Photography*, and even buy this for his den, while the cheap paper-covered edition may be used in the workroom, where it will run the risk of stain and soil.

The third number of *Practical Photography* will be titled "How to Choose and Use a Lens" and will contain more practical information on the lens question than has ever been put together in the same number of pages. This will be issued in September and will be followed in October by "How to Make Prints in Color," a book whose scope is quite new to photographic literature. It will give tried and tested formulas for making prints in all

colors except black and white. Sepias, reds, greens, blues, all the manifold shades in which single prints can be made, will be fully considered, and in addition information will be given as to the processes of color-photography which are at present practically on the market. Any reader who has not yet received it may obtain a copy of the special subscription offer made to readers of *American Photography*, and POPULAR PHOTOGRAPHY by writing to us and asking for it.

OUR COMPETITION

The first prize this month was awarded to Mr. P. B. Bacheller for his picture "Lunch Time," an extremely amusing and story-telling genre. The second prize goes to Mr. Milton M. Bitter for his charming and graceful "Portrait Study." Mr. C. S. Booth won the third prize with his picture "Valverde," a landscape of pleasing composition and delicate detail.

The following pictures received honorable mention in our July competition: "Florence," Ed. Herzog; "Cracks in the Snow," F. L. Weaver; "The Mother Goose Book," Harriet E. Williams; "Making Up," Harry E. Peak; "The Broken Leg," Fred L. Snavely; "Toby Gets a New Ball," Margaret Hitchcock; "A Lesson in Patience," Clarence Bundy; "The Shady Glen," H. N. Nation; "Scrappers," Charles Heiser; "Sweet Peas," W. R. Bradford; "Autumn Desolation," Wm. R. Jost; "Watching for the Bird," Clifford G. Franklin; "From the Water Front," John Baptista; "A Morning Catch," F. L. Kimrey; "The 5.15," A. R. Brown; "The Twins' Seashore," J. O. Angstadt; "The Lake," John A. Becker; "Caught Napping," F. W. Houghton; "Where the River Turns," Louis Benedict; "Wrestling Match," M. O. Wing; "Country Road," Alfrieda Madsen; "A Country Home," Edwin A. Roberts; "Gossips," Elizabeth B. Wotkyns; "Portrait," D. M. Reeves; "Between Meals," B. Harrison; "Kakabeka Falls," W. G. Whale; "The Peristyle," G. L. Lutterloh; "Ready for the Torch," Oscar G. Whiting; "Monday," Claude Mindorff; "Indoor Portrait," Mrs. Wm. Percy; "In the Zoo," F. G. Harlington; "In the Library," Garnet E. Jacques; "Study," Charles D. Meservey; "Easter Rabbits," W. E. Whitaker; "Nature Lovers," H. E. Bohlken; "Deer," Edwin Fries; "Cold Creek," Ray M. Robinson; "Clear Brook," Eva L. Eden; "Befo' de War," Edna Blackwood; "The Passing Clouds," Ralph Lumley; "Rio Pecos Cañon," G. E. Rudolph; "Haying," H. H. Kimball.

DO IT AGAIN

Every month we criticize a very large number of photographic prints for the benefit of the readers of *American Photography* and POPULAR PHOTOGRAPHY, and one of the commonest criticisms which we make is that the viewpoint is not the best which could have been selected, the arrangement not the most perfect with the model used, or some similar criticism, indicating that the opportunity of doing the work again and better might well be grasped. It seldom happens, however, that a reader for whose benefit such a criticism has been made sends us another print showing that he has profited by it and has made a more satisfactory picture. This is not as it should be. Every teacher knows that one of the best pedagogical methods is that of repetition. The pianist plays the same music over and over again until perfect; the draughtsman practices lining and lettering with the most tedious iteration until accuracy is achieved; the designer draws units over and over again, to acquire deftness of touch; the painter makes sketch after sketch, only to throw them away; but the photographer seems to feel that a single snap of a scene is enough, and that once recorded, a subject is done with, be the result perfect, mediocre, or indifferent. The great impressionist painter, Monet, painted a haystack over and over again, at all times of day, at all seasons, and under different lights, until he had succeeded in showing all of the aspects of the subject which appealed to him. Let the photographer do likewise: select some simple subject, not too far from home, and photograph it over and over again, until he is sure that he has mastered the subject, seen it under the most manifold lights, and recorded it in all possible variations. Thus, and thus only, will he learn the mastery of lens and plate in the making of a picture; for thus only can he recognize the causes of failure and be sure that he has achieved all that is possible from his subject.

READERS' FORUM

EDITOR POPULAR PHOTOGRAPHY:

On account of the excessive amount of contrast produced by the Modified Thermo M.-Q. developer, used for the times given in POPULAR PHOTOGRAPHY for June, 1914, I have compiled a new list of times and temperatures which may be of interest to such of your readers as use this formula. This table does away with the necessity of using the developer one or more classes more dilute than the Watkins Speed Card in most instances, although I have been obliged to use the V.-Q. dilution on one batch of Wratten Panchromatics, even at the reduced times, in order to get negatives suitable for Normal D.O.P. or enlargements. The table follows:

Degrees F.	80	78	76	74	72	70	68	66	64	62	60	58	56	54	52	50	48	46	44	42	40
Min. Tray	2.40	2.50	3	3¼	3½	3¾	4	4.20	4.40	5	5.20	5.40	6	6.30	7	7.30	8	8.40	9.25	10.05	10.45
Min. Tank	10	10½	11	12	13	14	15	16	17	18½	20	21½	22½	24	26	28	39	32.30	35	37.30	40

W. S. PULSFORD.

A NOTE ON THERMO METOQUINONE

Although many of the developers have advanced greatly in price, users should not complain, for they can buy Lumière's metoquinone for 75 cents for a single ounce, and that is no more than metol cost until the patent expired. Metoquinone is a chemical union between metol and hydrochinon. It is formed by mixing saturated solutions of metol and hydrochinon in the proportion of their molecular weights, viz., 344 to 110, and precipitating by adding a solution of sodium sulphite. As this is a French product, made in Lyons, it is reasonably certain to continue to reach this country in spite of the war.

We have made experiments with metoquinone in the Modified Thermo M.-Q. formula, and, although we would not, without further tests, guarantee its exact equivalence, believe that readers will find that the following works perfectly with the tables given on the Thermo Card. A number of experiments in the ordinary course of vacation photography have given perfect negatives with the 1.9 tables. The formula used is:

A. Hot water ..... 18 ounces
Metoquinone ..... 120 grains

When completely dissolved add

Sodium sulphite, anhydrous ..... 440 grains
Water to make ..... 20 ounces

B. Sodium carbonate, dry granular (monohydrated) ..... 660 grains
Water to make ..... 20 ounces

This formula, with bromide, also gave fine results on papers.

DISTANT RELEASE

P. H., Crugers, N. Y., asks whether there is any device by means of which a picture may be snapped at a set time so that the maker can be in the picture. The device is wanted for a No. 3 Brownie camera. *Ans.* The Imp Flashlight Gun, recently advertised in these columns, is arranged so that it will release any shutter provided with bulb and tube or antinous release, and the operator can lead a string from the gun to any desired point. It is not necessary to use a flash. We know of no device suitable for the camera you mention. There is an expensive imported distant release which can be set to operate after a given time, but we doubt if it is now obtainable, on account of the war.

WINTER TIME

This negative picture is an interesting experiment which one of our subscribers sent in. It was taken under the following circumstances. He happened to be out of plates when the snowstorm came, so he put a Velox postcard into his camera and gave an exposure of 25 seconds. The result was, of course, a negative instead of a positive; and no difficulty should be experienced in securing a printable negative from this by copying same size on an ordinary plate. There has been a negative paper of the bromide variety on the market for the use of those who wish to make their large negatives cheaply, and of course such a paper could be waxed to print from direct, whereas a postcard cannot. The present picture is interesting chiefly as a curiosity.

WINTER TIME E. POESCHEL

EXPOSURE-TABLES FOR SEPTEMBER

DIRECTIONS: Find in the tables printed below the NUMBERS for SUBJECT, STOP, LIGHT, HOUR, and PLATE. Add them, find the sum in the last table, and give the exposure indicated. When the exposure fails to correspond with the speed-marking on shutter, use the nearest shutter-speed, preferably the lower. If sunlight falls over one shoulder, add **0**; if straight across subject, add **1**; if sun is ahead, add **2**. When using back combination only of lens, add **2**.

EXAMPLE

Average landscape	3	July, 11 A. M.	0
Stop U. S. No. 8	6	N-C film	1½
Intense light	0		

Adding these numbers, we get **10½**, and on referring to the last table, under **10½**, we find **1-40** second, which is the exposure to give. In this case you would use the speed marked **1-50** and open the lens a little, if possible; say, half-way to U. S. No. 4.

SUBJECT

Sea (only) and clouds	½	Street scenes, buildings, groups	5
Sea-views, snow-scenes, distant landscape	1	Portraits in shade	7
Open landscape, without foreground	2	Indoor portraits	8 to 10
Average landscape, with foreground	3	Interiors	16

STOP:—

f:2	*f*:2.3	*f*:2.8	*f*:3.3	*f*:4	*f*:4.7	*f*:5.6	*f*:6.7	*f*:8	*f*:11.3	*f*:16	*f*:22	*f*:32	*f*:45	*f*:64
				U.S. 1	U.S. 1.4	U.S. 2	U.S. 2.8	U.S. 4	U.S. 8	U.S. 16	U.S. 32	U.S. 64	U.S. 128	U.S. 256
1	1½	2	2½	3	3½	4	4½	5	6	7	8	9	10	11

LIGHT: Intense sunlight (inky-black shadows), **0**; Bright sunlight (strong shadows), ½; Faint shadow cast by sun, **1**; Dull (no shadows), 1½; Very Dull (whole sky very dark), **2**.

HOUR: 10 a.m. to 2 p.m., ½; 9 a.m. and 3 p.m., **1**; 8 a.m. and 4 p.m., **2**; 7 a.m. and 5 p.m., **4**.

PLATE: AMERICAN, 1½. ANSCO FILM, 1½; Speedex Film, **1**. BARNET — Film, 1½; Superspeed Ortho., **1**; Ortho. Ex. Rap., **2**; Red Seal, **1**; Red Diamond, 1½; Self-screen Ortho., **2**; 550, ½. BURKE & JAMES — Atlas Film, 1½. CENTRAL — Special XX and Sp. Home Portrait, ½; Special, **1**; Special Non-halation, Comet, Colornon and Pan-Ortho., 1½. CRAMER — Crown, **1**; Anchor, **2**; Banner, 1½; Inst. Iso., 1½; Med. Iso., **2**; Commercial Isonon, 2½; Portrait Isonon, **1**; Trichromatic, **2**; Slow Iso., **5**; Contrast, **9**; Spectrum, **2**. DEFENDER — Vulcan, **1**; Vulcan Film, 1½; Ortho., **2**; Non-hal. Ortho., **2**; Slow, **9**; Process, **9**. DUFAY DIOPTICHROME, **7**. EASTMAN — Motion Picture Film, **1**; Portrait Film, **1**; Speed Film, **1**; Hawk-eye Film, 1½; N. C. Film, 1½. ENSIGN FILM, 1½. FORBES — Challenge, 1½; Snapshot, 1½. HAMMER — Sp. Ex. Fast, **1**; Ex. Fast, 1½; Aurora Ex. Fast, 1½; Ortho. Ex. Fast, 1½; Ortho. Non-hal., **2**; Fast, **2**; Ortho. Slow, 2½; Slow, **4**. ILFORD — Monarch, **1**; Zenith, 1½; Sp. Rap., **2**; Chromatic, 2½; Rapid Chromatic, **2**; Ord., **3**; Process, **9**. IMPERIAL — Flash-light, **1**; Spec. Sensitive, **1**; Orthochrome S. S., **1**; Spec. Rap. 225, 1½; Duonon Plate, 1½; Spec. Rapid 200, **2**; Non-filter, **2**; Process, **9**. JOUGLA — Violet Label, 1½; Green Label, **2**; Omnicolore, **7**. KODAK — Speed Film, **1**; N. C. Film, 1½. KODOID PLATES, 1½. LUMIERE — Sigma, ½; Blue Label, 1½; Film, 1½; Ortho. A, **2**; Ortho. B, **2**; Panchro. C, **2**; Autochrome (outdoors), 7½; (indoors), 8½; Process, **9**. MARION — Record, ½; Brilliant, **1**; P. S., **1**. NEW RECORD — Extra Fast, **2**. PAGET — XXX, 2½; XXXXX, **2**; Swift, **1**; Ex. Spec. Rapid, **1**; Ortho. Ex. Spec. Rapid, 1½; Panchro. Ord., **2**; Panchro. Colour (no screen), 2½; Spec. Rapid, 1½; Hydra Panchro., 3½; Hydra Rapid, 3½. PREMO — Filmpack, 1½; Speed Pack, **1**. ROEBUCK — Blue Label, **1**; D. C. Ortho., **2**; Ortho., **2**. SEED — Graflex, ½; Gilt-edge 30, **1**; Color Value, **1**; Gilt-edge 27, 1½; L. Ortho., 1½; 26X, **2**; Non-hal., **2**; Non-hal. L. Ortho., **2**; Tropical, **2**; C. Ortho., 2½; Panchromatic, 2½; 23, **3**; Process, **9**. STANDARD — Extra, 1½; Imperial Portrait, 1½; Orthonon, 1½; Polychrome, 1½; Thermic, 1½. STANLEY — 50, 1½; Commercial, **4**. ROGERS — Regular, **1**; Orthochromatic, **2**; Orthochromatic N. H., **2**. WELLINGTON — Extreme, ½; 'Xtra Speedy, **1**; Film, 1½; Iso. Speedy, 1½; Portrait Speedy, 1½; Anti-screen, 1½; Speedy Spec. Rap., **2**; Ortho. Process, **9**. WRATTEN & WAINWRIGHT — Panchromatic, 1½; Process Panchromatic, **3**.

3½ S 1/500	4 S 1/1000	4½ S 1/2500	5 S 1/2000	5½ S 1/1250	6 S 1/1000	6½ S 1/700	7 S 1/500
7½ S 1/350	8 S 1/250	8½ S 1/175	9 S 1/100	9½ S 1/75	10 S 1/50	10½ S 1/40	11 S 1/25
11½ S 1/20	12 S 1/12	12½ S 1/10	13 S 1/8	13½ S 1/5	14 S 1/4	14½ S 2/5	15 S 1/2
15½ S 2/3	16 S 1	16½ S 1½	17 S 2	17½ S 3	18 S 4	18½ S 5½	19 S 7½
19½ S 11	20 S 15	20½ S 23	21 S 30	21½ S 45	22 M 1	22½ M 1½	23 M 2
23½ M 3	24 M 4	24½ M 6	25 M 8	25½ M 12	26 M 15	26½ M 24	27 M 30
27½ M 45	28 H 1	28½ H 1½	29 H 2	29½ H 3	30 H 4	30½ H 6	31 H 8

These tables are based on the 1914 edition of the "American Photography Exposure-Tables," a new and revised form of the "Photo Beacon Exposure Card." Owing to the great increase in the speed of lenses and plates since the original compilation of these tables, it has been necessary to completely change the system of numbers corresponding to stops, plates and exposures, so that exposure numbers from this table are 5 units higher than in the old tables. The complete tables, in pocket form, 3 x 5 inches, containing full directions for obtaining correct exposure under all conditions, may be obtained from our publishers at the price of 25 cents postpaid.

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DATA

Title.....

Maker's Name.....

Address.....

.....

Return?.....

Postage enclosed.....cents

Size and make of camera.....

Lens.....

Focus of Lens....inches Rayfilter....times....

Stop Used for Exposure, *f*:.....Exposure.....

Month.....Hour.....

Light.....Plate or film.....

Developer.....

Print on.....

Please answer the following questions on a separate sheet if you desire the most helpful sort of criticism, in case your picture is selected for reproduction.

(1) Why did you take the picture?
(2) Are you satisfied that it is the best you could do under the circumstances?
(3) What faults do you see in it?
(4) Could you improve on it if you tried again, and how?
(5) Is the point of view satisfactory to you?
(6) Do you think the exposure was correct?
(7) How do the development and the printing satisfy you?
(8) Did you use our Monthly Exposure-Tables? If so, please give factors used for subject, stop, light, month and hour, and plate.

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No one knows the Kodak more intimately than the Kodak amateur. The only way any of us can know a thing thoroughly is from experience and it is by actual experience, day in and day out, that the amateur knows his Kodak. He has learned the various features that distinguish it—its simplicity, its dependability, and he has discovered the many uses to which it may be successfully put. And so the advertising contest of the Eastman Kodak Company offering $3,000 for photographs illustrating Kodak advantages or picture-taking delights is of particular interest to the Kodak amateur—and Kodak amateur means *you*.

You would be perfectly willing to admit that the combination of your experience, brains, and Kodak had a very real value to you. It may be worth something to us—as much as five hundred dollars, perhaps. In any event, the time spent in preparation for the contest will be anything but wasted. You will find it interesting and a line of work with which any Kodaker can well afford to become better acquainted.

The contest this year is being conducted along unusually interesting and definite lines. Pictures are desired illustrating any of the five slogans: "Take a Kodak with you", "All outdoors invites your Kodak", "There are no game laws for those who hunt with a Kodak", "Let the children Kodak", and "Write it on the film at the time". For the picture best illustrating each slogan, three hundred dollars will be awarded, for the second best. two hundred dollars. In addition, there is a special cash prize of $500.00 for the best new slogan together with a picture illustrating it. Here is an opportunity for absolutely original work, interpretative and inventive as well.

It is quite probable that, besides the prize winning negatives, others of particular merit will be purchased. If this is the case, special arrangements will be made.

It is readily apparent that we do not intend to pay hundreds of dollars for simply good, or merely pretty, pictures. They must have merit pictorially, of course, but as they are to be used for advertising purposes they will be judged largely from an advertising view point. Will this picture help sell Kodaks? That is the real test. Kodak advantages or photography's pleasures must be so visualized that they connect up with the Kodak idea. Study the illustrations of the Kodak advertisements in the magazines and you will see what we mean. You will find that each of them, even apart from the text, has a real advertising value and that the idea is presented in such a big way that you can't escape it.

A circular giving all the details of the contest will be mailed on request.

The contest closes November 1st, 1915.