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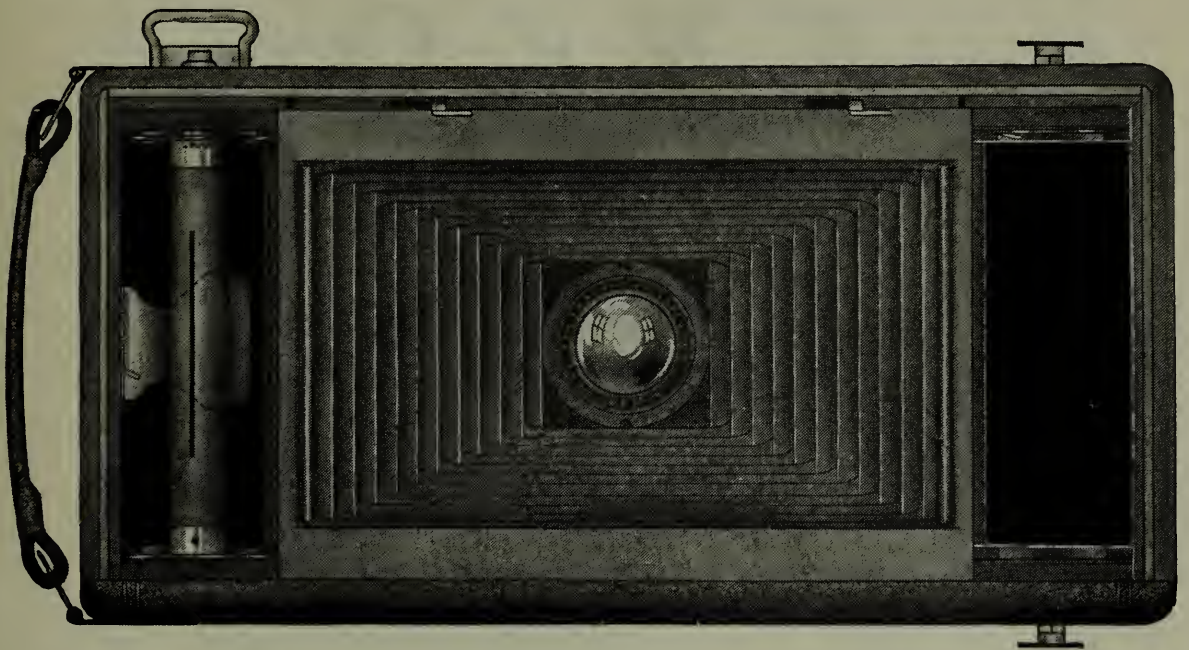
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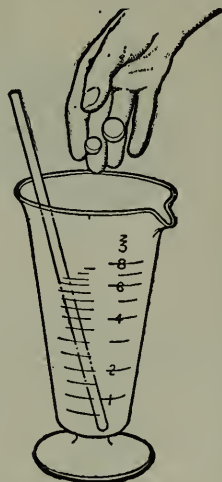
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The rear of the hose wagon is rather lost in the darkness but that is due to the fact that Mr. Dietz did not know until five minutes before the exhibition run that the apparatus was to

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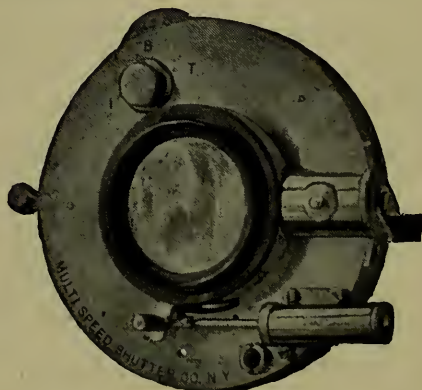
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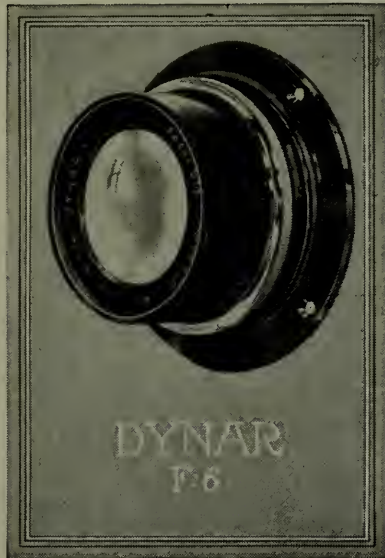
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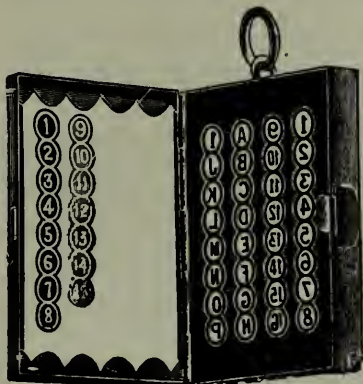
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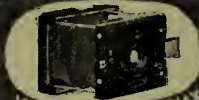
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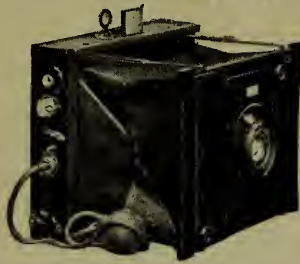
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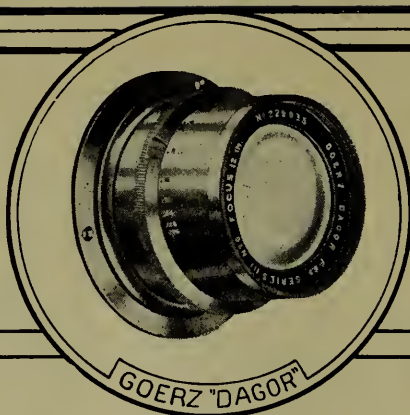
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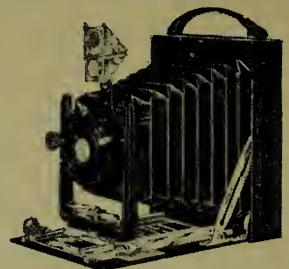
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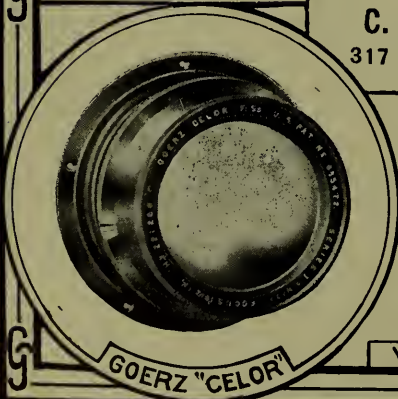
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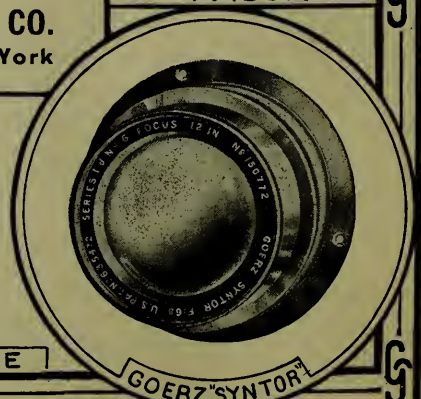
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The American Annual of Photography 1912

VOLUME XXVI
Edited by Percy Y. Howe




NEW YORK
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Sincere thanks are given to all those who so generously helped in making this book. We wish to extend our special thanks to those whose contributions, pictorial or literary, are not included through lack of space.

PERCY Y. HOWE.

NEW YORK, November, 1911.

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PORTRAIT.

B. J. Falk.

The American Annual of Photography · · 1912

THE AMERICAN SALON

By C. C. TAYLOR

BY the time this book is ready for distribution, the Eighth American Salon will have been viewed by many thousands, and the place it will hold in the history of pictorial exhibitions determined.

Perhaps greater efforts were never put forth by the managers of previous exhibitions than were put forth for the Eighth Salon, in the attempt to overcome the prejudice and hesitancy our pictorialists may have against an organized effort to collect in one exhibition the best of the year's pictorial work, and to so arrange that the public in many different sections of our country may view that work. On first thought one would naturally think that, having something good, something far beyond conventionalities, the maker would be very glad to exhibit it so the good and pleasure in it could be given to others. The experience of the past has shown that very many have a hesitancy, yea, a shyness, of permitting their work to be handled by an organization who do all the work without compensation and only for the love of the game, that the most people will get the most good and pleasure out of the work exhibited. Glory there is, and plenty of it, but it is not the managers of the Salon who receive the glory, for the public do not know them, neither do they care as long as they see results, and results always overshadow the details, so the

glory goes where it belongs; to the makers of the exhibition. They, and they alone, get the praise.

The good will and support of our museums of art and our museum directors have been won by the efforts of previous managers, to the end that the two past Salons have been unable to accommodate all the museums of art that wished to hang the Salon. While this assured plenty of wall space in places given over to works of art, it also helped to overcome the prejudice of many workers, as they were assured that the Salon was popular with the knowing ones, and that it was recognized as an institution of national importance. It has done even more than that. It has been the means of placing pictorial photography on a plane with painting, etching and kindred finer arts, and that influence has extended beyond the confines of our own country.

This is gratifying, yet just as the efforts merit. It demonstrates the progress of determined endeavor; it emphasizes the good and the need of organized collection of the work. It shows very conclusively that the Federation, as an organization, is doing a work that cannot be done in any other way.

In the prospectus for the Eighth Salon attention was called to the unique place held by the American Salon as compared with other large exhibitions of like nature, and every word written there is true, but few of our pictorialists thoroughly appreciating their significance. If our American pictorialists would give to the American Salon but a portion of the zeal and enthusiasm shown by the Englishman for his London Salon, and which Salon gets out of London only as fragments; if they were alive to the importance of the Salon in our national artistic life, how it is pioneering the way for greater things artistic and educational, with its influence extending far beyond the pale of mere photography, then they surely would hold up the hands of the management, would contribute the best of their work and cause others to do likewise. They would sustain the Salon in such a way that the mere announcement would be sufficient to have the work pour in from everyone who has work to offer.

It would be hard to say how much influence the Salon has exerted on our artistic life. We have evidence that its influence is felt in quarters where one would not expect even to



THE MAUMEE.

C. C. TAYLOR.

hear the name. Several museums of art, art societies, as well as educational organizations, have sprung into existence, or are in a fair way to exist, through the known influence of the American Salon.

In several places the public schools have been influenced to decorate their walls with pictorial photography. Public libraries in several small towns are forming art societies, with the children of the public schools saving their pennies to purchase works of art. By close observation, it seems that to the average layman a photograph will awaken more than mere wonder and admiration. That it is a scene taken by the camera, he can grasp. That he can do the same, he can hope, and that it is within reach of his intelligence, he believes. But a great painting? It inspires awe, and he can only hold up his hands in admiration and he never gets any farther. It has been my privilege on many occasions to mingle with the school children when they were viewing the various exhibitions in the Toledo Museum of Art. Each month they go and they see all on the walls for the year. Of the paintings they are in awe. They whisper in low tones; they are attentive, yet they act as if there was a gulf between them and what they see.

But when they view the American Salon their action is different. They are just as attentive, yet they seem to be on familiar terms with what they see and they are not afraid. If you pictorialists who do not believe that your work has an influence just try the experiment of visiting a photographic exhibition with some children, and if you have their confidence or can hear their criticism; hear why such and such frames are good or bad, you will get a shock that will open your eyes to the fact that there is something in pictorial photography that makes all the world akin. Our school authorities are becoming more and more each year cognizant of the influence for good that lies in a beautiful print. The present management have had several calls for a collection of prints to hang on public school walls. Others have, or will, purchase frames just for the influence for good they exert.

That the American Salon is just as popular with the public is attested by the attendance to see the Seventh Salon, which was considerably greater than any previous Salon.



REFLECTIONS.

C. C. TAYLOR.



SUNRISE AT CHAGUARAMAS BAY, TRINIDAD

GEORGE ADHAR.

SIMPLE TELEPHOTO LENSES

By A. LOCKETT



○ every photographer there come occasions when the object or place to be photographed is too distant for a satisfactory picture to be obtained with the ordinary lens, and when it is also impossible to bring the camera nearer to it. It is in such circumstances that the telephoto lens makes good its claim to appreciation. The telephoto lens is even yet not valued as it deserves. If it were really understood how largely it widens the scope of the camera and the number of otherwise forbidden subjects that are rendered practicable by its use, very few photographers would care to be without it. There is a very general impression that telephotography is difficult and full of pitfalls, and that long exposures are required. The first idea has but a partial degree of truth

in it, while in reply to the second it is merely necessary to recall the fact that under favorable conditions, and with suitable subjects, hand camera "snapshot" exposures are quite feasible with a telephoto lens.

Many photographers who would not care to purchase an expensive telephotographic objective, on the ground that they have only an occasional use for it, may yet be glad to carry a simple home-made accessory that will serve their purpose at a very trivial cost. It consists merely of a concave or negative "spectacle" lens, mounted in a blackened cardboard tube made to slip over the back of the camera lens, which usually projects slightly inside the camera. A convenient focal length for the negative lens is about half that of the camera lens; thus, with an objective of six inches focus a negative lens of about three inches focus might be procured, though there is no hard and fast rule. Almost any optician or spectacle dealer will supply these glasses at a moderate charge. They are obtainable either with rough edges or accurately ground to a circle. The finished kind is best for insertion inside a tube, but the rough-edged variety, which are a trifle cheaper, are suitable for gluing outside at the end of the tube, as may sometimes be more convenient when the camera lens is of small diameter.

A short cardboard tube, from two to three inches long, is required to fit the end of the lens that comes inside the camera. Sometimes a postal tube, as used for despatching drawings, etc., may be obtained of the right diameter; or the cylindrical boxes in which incandescent gas mantles are sold may prove suitable. When these are a trifle too large they may be made to fit by pasting a narrow strip of paper round inside, rubbing it down with a pencil and continuing the pasting until the tube goes closely, though not tightly, on the lens. To cut the tube to the right length a pencil line should be drawn round it until the ends meet, taking care to keep the line at right angles with the sides of the tube. The line is then scored round by degrees with the point of a sharp penknife until the tube is severed. The latter is next blackened inside with ordinary writing ink applied by a brush and is set aside to dry. Tubes of tin or of thin sheet brass may be made if the worker is used to

handling and soldering metal. These require to be coated inside and out with dead black varnish.

To fix the spectacle lens in the tube, cut two strips of cork linoleum $\frac{1}{4}$ inch wide, and sufficiently long to form rings



Fig. 1.

that will go inside the tube without overlapping ends, as shown by Fig. 1. Glue in one of these rings at one end of the tube, insert the spectacle lens, and push in the second ring behind it, having first applied a liberal coating of glue. The glass is thus secured in the tube between two rings, as shown in section by Fig. 2.



Fig. 2.

This completes the telephoto attachment. To use it, the focusing screen of the camera is removed and the free end of the attachment slipped over the back of the camera lens, which it should fit without shake or looseness. Care should be taken that the tube is in proper alignment with the lens. The focusing screen is then replaced and the photograph may be taken in the ordinary manner.

The degree of magnification obtainable depends on the focal length of the negative lens and its distance from the "positive" or camera lens. Other things being equal, the shorter the focus of the negative lens the greater the magnification, but it is not usually advisable to go too far in this direction. The magnification may also be increased by bringing the negative lens closer to the positive lens, or decreased by placing them farther apart. As the magnification increases a greater camera extension becomes necessary.

It is obvious that only one degree of magnification is possible with a fixed tube, so that the amount of magnification likely to be of most general use should be chosen. This is

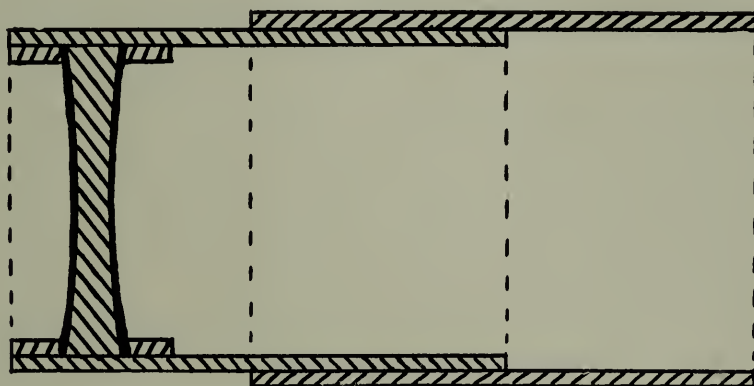


Fig. 3.

soon obtained by a few experiments. If, on focusing the image with the telephoto attachment, the magnification is not considered sufficient, the tube may be cut shorter, provided more bellows extension is in reserve; while if it is greater than required, or if the camera bellows will not extend far enough to get the image in focus, a longer tube is called for. A moderate degree of magnification of only a few diameters is most useful for average work, and is best suited to the capacity of the simple spectacle lens.

To obtain different degrees of magnification at will, tubes with negative lenses of various focal lengths may be used, or tubes of different lengths may be employed but with negative lenses of the same focus. A more satisfactory way, however, is to have two tubes, one sliding inside the other, as shown by Fig. 3 (or outside if preferred), so that the separation between the negative lens and camera lens is adjustable.

An advantage of having the movable tube to slide inside the fixed one is that it may be reversed if desired to permit closer approach of the two lenses.

When the spectacle lens is too large to go inside the tube, the latter may be well glued at the end and the warmed lens pressed down on it, as shown by Fig. 4, getting it as central as possible. For this method of attachment, which is not recommended if it can be avoided, untrimmed glasses may be economically used, as already explained. The edges are not usually sharp enough to cut the fingers, except with great carelessness.

Many workers have been greatly puzzled how to find the focal length of a negative lens. The following method is easy and is believed to be new: Fit the lens in, or glue it on, a cardboard tube to go over the back of the camera lens, focus sharply on any distant building or object, and carefully measure the height or width of any part of the image, measuring also the distance between the back of the negative lens and the ground glass screen, i. e., the back focus. Then remove the negative lens and focus the same object with the camera lens only, without shifting the position of the camera, carefully measuring as before the width or height, as the case may be, of the same object on the screen. The size of the image as rendered by the positive lens alone divided into that obtained by the aid of the telephoto attachment gives the magnification; while the magnification *minus* 1 divided into the back focus or extension gives the focal length of the negative lens. Thus, if any part of the image given by the telephoto combination measures four times as high or as broad as with the camera lens alone, the magnification is 4. Suppose the back focus or extension is found to be 18 inches, then $18 \div (4 - 1) = 6$ inches, the focal length of the negative lens.

As a guide to the selection of a suitable negative lens, the following formulæ may be quoted:

(1) To find the greatest magnification obtainable with a given negative lens, divide the bellows extension available by the focal length of the negative lens and add 1. It must be understood that the extension used for the calculation is measured from the negative lens; the real extension will, therefore, have to be a little longer than this to allow for the length of

the tube. Thus, if the camera has a bellows extension of 18 inches, it should be reckoned as, say 16 inches, to allow for a tube about 2 inches long. Then with a negative lens of 4 inches focus the magnification will be $(16 \div 4) + 1 = 5$ diameters. To get this particular magnification it will, of course, be necessary to experiment with the cardboard tube until it is of the right length to give the proper separation from the positive lens.

(2) To find the extension required for a given magnification multiply the focal length of the negative lens by the desired magnification *minus* 1. Here, again, it must be remem-



Fig. 4.

bered that a slight additional allowance is needed for the length of the tube.

These two formulæ will enable the effect of any given negative lens to be calculated, bearing in mind that it will commonly be inadvisable to use one of less than half the focal length of the positive lens.

Very good work may be done with a simple telephoto accessory made as described. Occasionally some stopping-down is necessary, and the results are always improved if a hood of some kind is used over the camera lens. It is important that no vibration or shakiness shall be present in the apparatus. It may sometimes happen that the negative is not sharp, although the image on the screen was properly focused. Should this occur, it shows that the uncorrected spectacle lens has introduced chromatic aberration, and to rectify this it will

be necessary to rack in the camera very slightly after focusing and before exposure to an extent readily found by experiment.

The exposure with a telephoto lens is ascertained by multiplying that which would be needed with the positive lens alone by the square of the magnification. Thus, suppose the exposure without the telephoto attachment would be $1/80$ of a second, and the magnification with the attachment is four diameters. The exposure will then be $1/80 \times 4 \times 4 = 16/80 = 1/5$ second. But when the portion of the subject that is enlarged consists mainly of distance a shorter time may be given, following the usual rule that distant objects require less exposure.



INTERESTED.

SAMUEL DORAN.




GIRL WITH FAN.

ELIAS GOLDENSKY.

PHOTOGRAPHING AGAINST THE LIGHT

By HORACE SYKES

LTHOUGH there have been a great many articles written of late, on the various phases of photography, and published in the journals, magazines, etc., it is surprising how little has been said about the topic, "Photographing Against the Light," either to support or discourage it.

Whether under the old iron-clad rules it is proper to photograph a subject or scene directly, or nearly against the source of light, it is hard to say. Under present day methods, however, it certainly is not only proper, but one of the most prolific fields, considered from the standpoint of art; and without a doubt art expression is the highest attainment in photography.

Presenting a subject against the source of light, gives it three characteristics that distinguish it from the ordinary side or other lighting—first, it subordinates the detail; second, it broadens and deepens the shadows, and third, it intensifies and rarifies the high lights. It has the general effect of presenting things in form, rather than in detail, and of greatly simplifying the composition.

How often one is solemnly advised to always have the source of light to the side, or above, and occasionally the cut and dried photographer of ten or twenty years ago comes back to life with the warning that nothing is permissible but a forty-five degrees lighting, and then only a north slant sky light, and a lot more of that old photographic superstition. The day of superstition is passing, in photography as well as in other things, and to-day many of the best productions are made by amateurs, using dwelling house windows, or even the open sky, for the source of light, with no regard for old rules or formulæ.



THE HEADLAND.

HORACE SYKES.

Viewed against the light, a scene while not unnatural or freakish often presents an unusual appearance. It is the unusual that attracts the attention and commands interest. It is the unusual flower by the roadside that causes one to stop and admire its beauty and fragrance, or the seldom heard song that causes one to listen with wonderment and then try to discover the feathered songster. It is the unusual lighting of the commonplace scene that transforms it, as by magic, into a thing of beauty, causing one to stop and admire, and stirring within the desire to photographically record its charms. There is always this characteristic about a scene bathed in the last rays of a glorious sunset, or a scene that includes within itself the source of the light.

The ocean in all its grandeur has ever increasing charms, and there is nothing more enjoyable than, camera in hand, to wander along its ever changing beaches or scale its rocky cliffs, hunting for new and enchanting scenes. And amid its endless variety there is always something new to be found, but the rarest scene of all, the pearl of greatest price, is to be found when the sun is sinking low and when Nature's great artist, light, is painting sea and sky with light and shade, with hues and colors, that can be only suggested by the best productions of lens or brush.

At first glance, photographing against the light might appear to be easy. One might think so on account of the intensity of the light and the general simplicity of forms. There are, however, to offset these advantages, a thousand and one difficulties not encountered in other classes of photography that have to be contended with.

It would be impossible to write an article or a complete book that would fulfill all the needs of the person starting out to do this class of work. Every scene and every exposure has its own peculiar pitfalls and stumbling blocks, no two are exactly alike. The following few observations will, however, be useful and may help to avoid some of the most common of them.

It is best never to go on a trip, or for pleasure, without the camera if circumstances will permit it to be taken. (The author missed getting the grandest sunset on the ocean he has ever seen on account of so doing.) The most mag-



CHILD PORTRAIT.

Mrs. W. W. Pearce.

nificent sunset comes often when least expected. Without a moment's notice the sun will break through heavy clouds, sometimes for only a minute, transforming the lifeless scene into a wonderland of beauty.

One should be in readiness to make an exposure on short notice, and, needless to say, spend all spare time studying the forms of passing objects, and composing pictures in mind. There is always a few critical moments when everything is at its best, and a person does not want to be hunting a pretty scene or some object of interest for the foreground when that time comes.

It is usually best to make the exposure when the sun is glinting through the lower edge of a cloud. This allows the full light to fall on the water if there be any, making a wake and at the same time keeps the strong rays from striking the lens.

Another thing that must be studied closely on account of the great difference in the color of the light is its actinic properties. Any form of exposure meter that measures the light by the use of sensitive paper will be found very serviceable. It is also well to study closely the color and character of the clouds. Blue sky with white clouds, of gray or very heavy clouds, if they be light in color, are best rendered by the use of the ray filter. Other times the light itself will be of a sufficient reddish or yellow color that the filter will be altogether unnecessary. A great amount of care and good judgment must be used in this respect.

The best results are only secured by the use of orthochromatic plates, which should always be nonhalation. Films always possess the latter quality. Plates or films with exposures against the light should be developed in very weak or soft working developer. The tank method is well adapted to this class of work. (The author uses the tank exclusively, and mixes the solution for never less than thirty minute development.)

In conclusion, a hint or two as to the finished print will not be amiss. Very realistic and beautiful effects can be produced by combining more than one color. A print in blue, green or black, stained reddish or orange, gives beautiful sunset or fire light effects. The carbon process adapts itself

well to this class of work, as the colors can be controlled absolutely in the tissue and the final support. Such pictures as moonlight effects on snow, or snow scenes against the light, can be well rendered by blue tissue mounted on a silvered support, and some sunsets and firelight effects by black or brown tissue mounted on a gilt support.



SPLASHING SURF.

HORACE SYKES.



THE OPEN SEA.

HORACE SYKES.

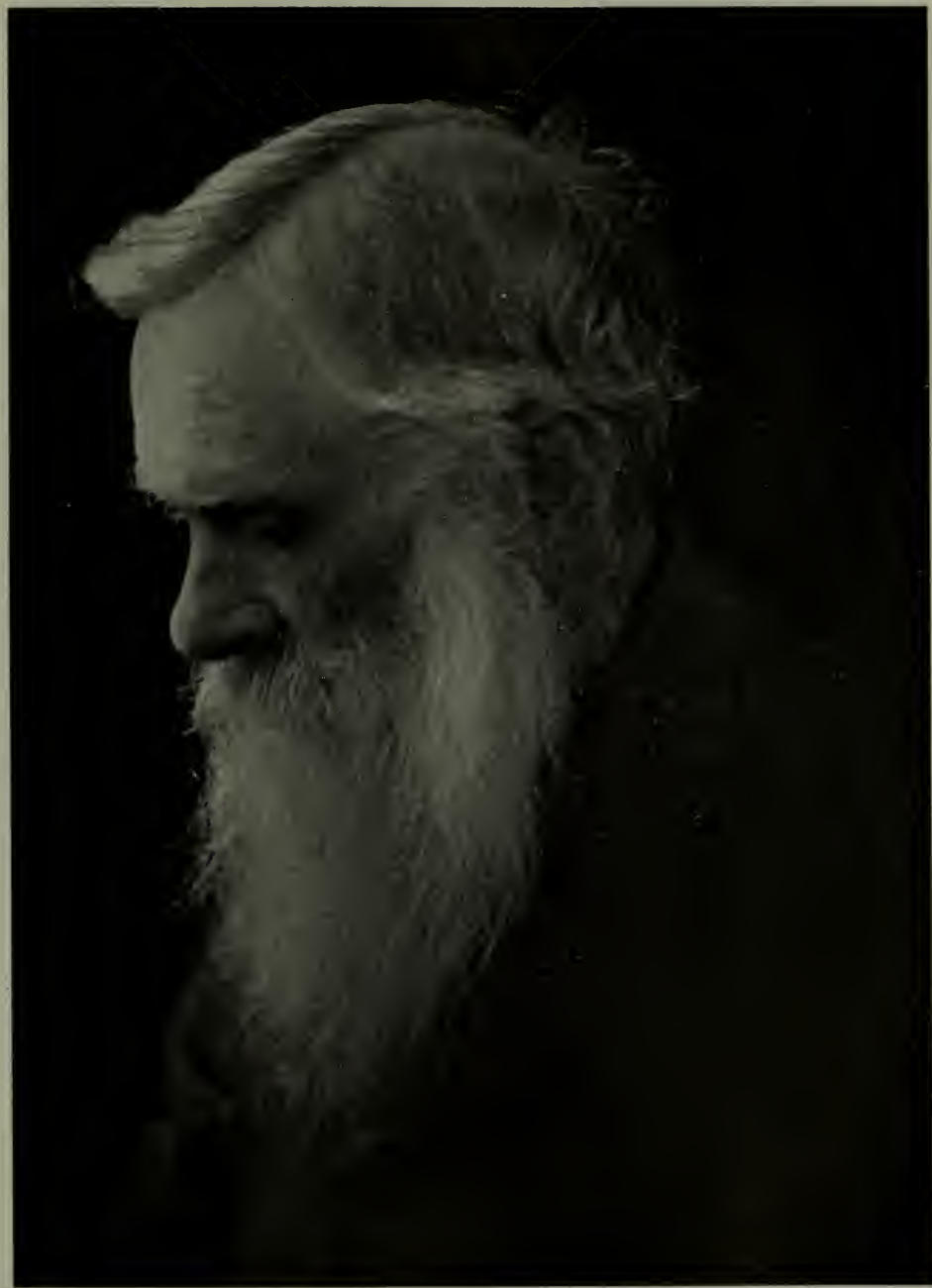
COLOR PHOTOGRAPHY

By WILLIAM H. KUNZ

EVER since the days of the first photographs it has been the dream of men to make the pictures in natural colors. Every once in a while it was noticed that the Daguerreotypes would show a certain amount of colors, and it was then discovered that silver sub-chloride had the remarkable property of changing to the color of any light that struck it. The hope was immediately raised that the days of color photographs was not far off. Numerous experimenters worked on the problem and some results were secured. Of course, the colors were not perfect, and they could not be fixed, but that problem looked simple.

In 1868 Professor Zenker experimented with sub-chloride of silver, and advanced the theory that the colors were stationary light waves. Professor Lippman, in his experiments in 1891, proved Zenker's theory to be correct. Professor Lippman's results were very beautiful and created immense interest in the scientific world, although it was later found that the method was not commercial on account of the great length of time necessary for an exposure, and the difficulty of securing perfect results.

Another method of direct color photography that may have a great future is the bleach-out process. In this method a paper is coated with a mixture of red, yellow and blue dyes and sensitized by immersing in some chemical which makes them very fugitive in light. The sensitive dyes only fade in light of a color different than that which it reflects, therefore the mixture of red, yellow and blue, which forms black, will fade to the color of any light that strikes it. Where red light strikes it the blue and yellow fade, and the same with the other colors. The difficulty with this process is the rendering of the prints permanent by neutralizing the sensitizer, and also the fact that it is very difficult to get the three dyes to fade evenly.



A PORTRAIT.

GERALD E. JONES.

Improvements are being made in this process every little while, and we may yet hear of this as the ideal color process. Up to date there have been only two methods that have been really commercial. The first is the three-color process that is used by engravers all over the world. The other is the screen-plate method, such as the Autochrome, Dufay, etc.

Both are based on the fact that the human eye is sensitive to only three colors, viz., spectrum red, green and violet. In the three-color method, roughly speaking, one negative is made by red, one by green and one by violet light. These plates are then printed in their complimentary or minus colors, red light negative in blue-green, green plate in red of a bluish cast, and the violet plate in yellow. The reason for printing the plates in the colors mentioned is that through the red filter all objects that are minus red, or as we call it, blue, photograph black. Therefore, wherever there is any blue in the subject it is automatically printed there in this negative. The same is true of the other plates, and the mixtures of the three colors give, or rather recombine the colors of nature. In order to secure perfect results it is necessary that each plate receive just the exact amount of exposure necessary and that the gradation in each negative and print be exactly the same. That means that very careful work must be done, and this usually is a very difficult thing, for the reason that under some conditions the ratio of exposures may be possibly six times normal exposure for the violet, twelve for the green and fifteen for the red. Other times the ratio may be quite different. This complicates the problem to such an extent that very little really successful three-color work is done from nature.

The other and much simpler method is based on the same three-color principle, but the color filters, red, green and violet, are printed on the plate itself in very minute particles, the idea of the fine particles being to get them invisible to the eye. This is accomplished in the Lumiere autochrome plate by dyeing potato starch grains in each of the three colors and then mixing them until they form a neutral gray. They are then dusted on a glass plate that has been coated with a tacky varnish, to which they adhere, thus forming a composite filter that to the eye looks gray. The emulsion is then coated over this composite filter, and the exposure is made through the



A CUP OF TEA.

J. WILL PALMER

glass side, so as to have the light pass through the color particles before reaching the emulsion. These minute filters act just the same as the large filters in regular three-color work. The great difference in the two methods is that prints on paper are made in red, yellow and blue, whereas those by the screen-plate method use red, green and violet. There are no yellows or blues, but the mixture of red and green produces yellow, and the mixture of green and violet makes blue.

This method, to my mind, is the process that is the most promising, for the reason that all the pictures being on one plate the gradation must be the same. The ratio of exposures is

obtained by using a filter at the lens that dampens down those colors that act too rapidly so that all three act at exactly the same speed. On the autochrome plate the starch grains are not perfectly transparent, and also the spaces between the grains are filled in with black. All together so much light is absorbed by the various things that only 10 per cent. of it gets through the plate at all. This means that the pictures are not so brilliant as we would like and that for lantern use it is very difficult to get sufficient light through to make a pleasing picture. With a very powerful arc light some satisfactory pictures have been shown, but any improvement that would tend to make the plate more transparent would be an advantage.

A number of inventors have been working on the problem, and as a result several other color plates are now on the market, all of them having for a talking point that they pass more light than the starch grain plate. I have tried several kinds of these plates and find that the Dufay dioptichrome plate has a very transparent screen and is very uniform and regular. Some of the examples I have seen on this plate are very fine indeed, having perfect color rendering. My personal observation of the plates shows that it has a thicker emulsion than the autochrome and consequently a greater latitude. The exposure is about the same and the manipulations present no difficulties.

As I said before the problem of color photography is one that is advancing a little at a time and the Dufay dioptichrome is certainly a step in advance. To my mind the ideal color process will be one that will permit of a single exposure being made in any camera with any lens, and that can be made with a snapshot. The picture also must be capable of being printed on paper in colors. So far this has only been done practically by the three-color process, but if the screen plate is made for it a set of three-color negatives can be made from it by contact in a printing frame through suitable filters same size as the plate. Some day I expect to see such a plate on the market, and we can then say they have made another step in advance same as we now say about the Dufay dioptichrome.



CHILD PORTRAIT.

O. C. CONKLING.

PHOTOMICROGRAPHY WITH SIMPLE APPARATUS

By WILLIAM C. BARBOUR



THIS is intended to be a description of the methods by which clear photomicrographs can be made by the use of a microscope and a camera with bellows front, without the costly apparatus used by institutions with plenty of money at their command. The camera used in making the illustrations for this article was an old-style Premo, from the front of which the lens-board was removed for this purpose. This leaves an opening about two inches square for the admission of the upper end of the microscope tube. The microscope used was a late type by the Bausch & Lomb Optical Co., with 4-mm. and 16-mm. objectives, 10X ocular, iris diaphragm, and Abbé condenser.

For purposes of stability a wooden base was constructed, with means for holding both camera and microscope rigid. This is a simple matter. The measurements given must be varied to suit the camera used and the variation in microscope stands. The one I use (Fig. 1) is 36 inches long, 15 inches wide, with a raised table $2\frac{5}{8}$ inches high at one end for the camera. This height must be adjusted so that the center of the microscope tube will be on a line with the center of the ground-glass. This platform is 12 inches square, and bears two cleats placed parallel to the length of the base, just far enough apart to admit the camera base. Toward the other end of the base are two more parallel cleats to hold the microscope base firmly. The base is placed upon a table that is free from jarring or vibration, and the camera body placed upon it. It is necessary that the table be placed where the microscope will receive bright light, but not direct sunlight.

A north window is very good for this purpose. Then the microscope, with the tube horizontal, is placed upon the base and the tube thrust through the opening made by the removal of the lens-board. The joint between the microscope and the

camera must be made absolutely light-tight by careful wrapping with black cloth. The microscope slide is placed in the microscope and the mirror adjusted properly for the light, using the plane side only. Now the operator gives his attention to the ground-glass, using the focusing cloth, the same as in other camera work.

The size of the circular field showing upon the ground-glass is regulated by the distance the microscope tube enters the camera body. The focusing is done by means of the regular coarse and fine adjustments of the microscope. The rough focusing is done with the iris diaphragm wide open,

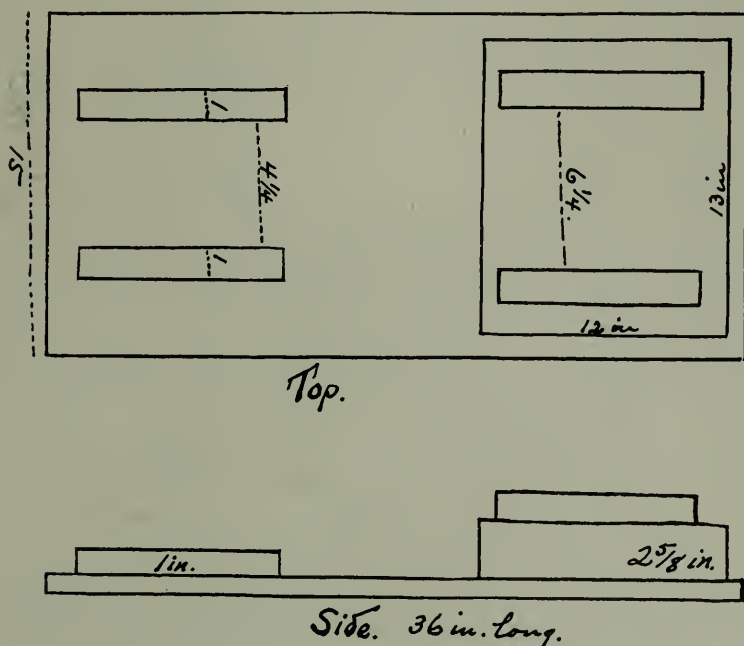


FIG. I.

and is continued while it is gradually closed, the object on the ground-glass becoming dark and rather indistinct. When the focus is sharpest a cover of black paper is slipped over the objective, a plate holder inserted in the camera, and the slide withdrawn.

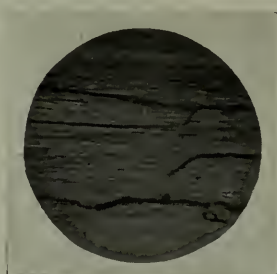
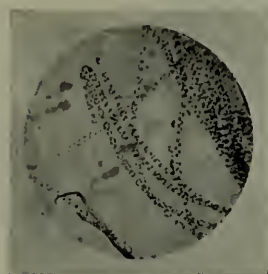
Exposure is made by withdrawing the slip of black paper from the objective and returning it at the end of the time. For an object of medium density, with the 16-mm. objective, 30 or 40 seconds' exposure will give a good negative. For a denser object, of course, a longer exposure is necessary. For the 4-mm. objective the exposure should be from 1 to 2 minutes.



NATURE'S MIRROR.

HARRY D. WILLIAR.

Development is best done in a tank, with any kind of developer calculated to give contrast and density. Pyro and Glycin have given the best results in my experience. When entirely successful the negative should show as a clearly defined circle on a sheet of clear glass. In printing it is



SPIROGYRA IN CONJUGATION.

16mm. Objective and 10x Ocular, 20 Sec. Exposure. Unstained Material Temporary Mount in Water.

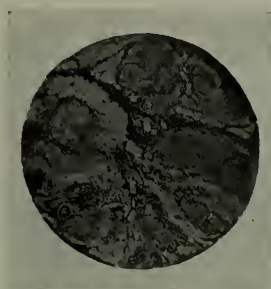
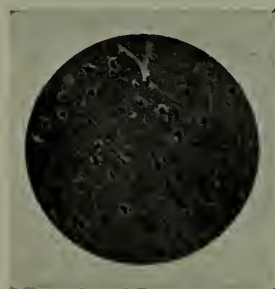
SEBACEOUS GLAND OF HUMAN SCALP.

16mm. Objective and 10x Ocular. Exposure 20 Sec. Slide Stained With Hæmatoxylin and Eosin.

VOLUNTARY MUSCLE—HUMAN.

4mm. Objective and 10x Ocular. Exposure 150 Sec. Slide Stained with Hæmatoxylin and Eosin.

usually advisable to work again for contrast, using a contrasty developing paper or a printing-out paper giving plenty of detail. It is wise not to attempt too great magnification, but to work for a clear-cut negative and depend upon enlarging



STELLATE NERVE CELLS — SPINAL CORD OF CAT.

16mm. Objective and 10x OCULAR. Exposure 40 Sec. Slide Stained with Van Gieson's Combination.

SWEAT GLAND OF HUMAN SKIN.

16mm. Objective and 10x Ocular. Exposure 30 Sec. Slide stained With Hæmatoxylin and Eosin.

TRICHINA — IN HUMAN TONGUE.

Exposure 30 Sec. 16 mm. Objective and 10x Ocular. Slide Stained With Hæmatoxylin and Eosin.

later if a print of greater size is desired. In practice most of my negatives show a circle $2\frac{3}{4}$ or 3 inches in diameter, on a 4 x 5 plate.

The negative of Trichina, of which a reproduction is shown herewith, has given a sharp, clear image in an enlargement

14 inches in diameter. If the microscope slide is prepared especially for photographing, the work can be greatly facilitated by using a stain of suitable color. Some stains of general use giving very satisfactory results are Mayer's Carmine, Bismarckbraun. Kernschwarz (made especially for this purpose), and Haidenhain's Iron-alum Haematoxylin.

In general, stains which give the colors which are photographically dark are the easiest to use, and those in blue and purple the hardest to use. In case the slides are already mounted much help can be secured by the judicious use of screens in various shades of yellow, orange and green. These may be prepared by an undeveloped plate until all the silver has been dissolved out, washing thoroughly, then immersing in a solution of picric acid for yellow, methyl orange for orange, Bismarckbraun for a darker shade of orange, and methyl green for green.

The screen thus prepared can be placed upon the stage of the microscope under the slide.

In this work, as in everything else photographic, success depends upon experience, adaptability, and patience; but, with a fair supply of these, results will be sure to come.



A RISING WIND OFF JURA.

C. E. WANLESS.



PORTRAIT.

J. C. STRAUSS.

TRANSPARENCIES BY THE CARBON PROCESS

By A. C. BRAHAM, F. R. P. S.



D EAN SWIFT wrote a "Dissertation on a Broomstick" in which, with his mordant humor, he compares the base usage to which, that which was once the branch of a forest tree is put, with the fate befalling man, but I am not aware that any essayist has attempted to deal with the morals to be drawn from the use of dry plates for making transparencies.

However, there seems to be some perversity in their nature which makes them fittest for base purposes—a really bad negative is most readily and with more success reproduced by a dry plate, but the negative of good quality yields the finest results only when reproduced as a carbon transparency. Its excellencies of gradation are then done full justice to and no coarse grain or texture is produced in the resulting enlargement.

Few photographers, if any, would be candid enough to admit that they made bad negatives; therefore, the number of negatives that demand reproduction by dry plates is very limited and the carbon process should be employed by those seeking the finest results, for it is peculiarly suitable for making transparencies intended either for the purpose of window decoration, for projection in the optical lantern, or for the production of enlarged negatives.

In the last instance they have the special advantages of giving a grainless film; Indian ink in the finest possible state of division, being the color used in the manufacture of "Transparency" tissue; and of giving a correct rendering of the complete range of gradation existing in the negative, as there is no halation or reversal of the image possible, which may occur in making transparencies on plates containing silver salts.

For lantern slides varied colors may be employed according to the subject represented and the effect desired; dark blue,



EVENING'S GOLDEN GLOW.

HARRY D. WILLIAR.

bright blue and sea green are most effective colors, but Italian green is disappointing in the lantern, losing its distinctive green tone. Ruby brown, standard brown, and terra cotta are all pleasing warm colors, but the distinction between them is less when viewed on the screen than when they are used for paper prints, the effect of color being diluted by the amount and nature of the light passing through the lantern.

When transparencies are used for window decoration they must be backed with ground glass to diffuse the light and may frequently be usefully and decoratively employed to block out unsightly views from a staircase or other window.

In the coin room of the British Museum a series of transparencies produced by The Autotype Company, and printed from enlarged negatives of ancient coins are exhibited to illustrate the degree of perfection obtained in coins two thousand years ago, and serve the secondary purpose of hiding the expanse of flat copper roofing.

To obtain deep luminous shadows and brilliant high lights, due consideration must be given to the fact that the tissues are made primarily for making paper prints, and that the sensitizing when it is intended to use them for making transparencies should be modified.

The best results will be obtained by using a sensitizing bath made of 1 to 1½ per cent solution of bichromate of potash, giving two minutes' immersion and using the tissue freshly sensitized while it is in its most soluble condition.

Printing must be deep, at least three times that required for an ordinary paper print, and owing to the weakness of the sensitizing bath it must be borne in mind that the action of the light in printing will be less per tint than when the tissue has been sensitized on a 3 or 4 per cent bath.

The glass on which the slides are to be developed must have a preliminary coating of insoluble gelatine to hold the lighter half tones which would otherwise have a tendency to wash away. The glasses may be bought ready for use or be prepared as follows:

Soak ½ oz. of Nelson's No. 1 gelatine in 20 ozs. of cold water for a quarter of an hour, warm till melted, and add 10 grains of bichromate of potash; filter this solution through fine muslin, flow over the glass plates, which must have



PORTRAIT STUDY.

J. F. WILDE.

previously been carefully cleaned, allow to drain and dry in a rack. Expose to light for a couple of days that the coating may become thoroughly insoluble.

Take care to avoid dust at all stages and any particles of dirt in the mounting water. When mounting the tissue on the glass it is advisable to cover the back of the tissue with a piece of wetted temporary support placed glazed side uppermost and squeegee upon that, as if this precaution be omitted craze like markings may be produced in the transparency by the pressure of the squeegee direct on the back of the tissue.

Development should be begun in water comfortable to the hand and increased afterwards to a temperature as high as the hand will bear, and should take about five minutes to complete, or more, when printing has been deep to secure full contrast. Hotter water from a tap or kettle may be poured on the transparency for the same purpose without injury.

When development is complete, rinse in clean cold water and place in 5 per cent alum solution for a few minutes. Rinse and dry.

Protect with cover glasses and binding strips in the usual manner; in putting in the lantern the slides must be introduced the reverse way to that used with slides made by contact.

Examined in the hand, the slide will show considerable relief due to the gelatine, and an apparent lack of sharpness, but when projected on the screen the picture will leave nothing to be desired on the score of definition. Some granularity may also be noticed in the dark blue tissue due to the varying size of the color grains, but this is not apparent on the screen.



PORTRAIT.

Rudolf Dührkoop.



BABY WANTS IT.

EDITH L. WILLIS.

SENSITIZING PLATINUM PAPER

By PAUL L. ANDERSON

IF paper be coated with a mixture of ferric oxalate and potassium chloro-platinate, dried and exposed to light under a negative, the ferric oxalate is reduced to a ferrous salt in proportion to the amount of light action. On immersion in a bath of potassium oxalate, metallic platinum is deposited in proportion to the amount of the ferrous salt, the final result being an absolute permanent print in one of the most stable substances known. Many commercial platinum papers are on the market, and are excellent for general use, but their limitations are such that the pictorial worker will often prefer to sensitize his own paper, the operation being exceedingly simple and much easier than coating gum-bichromate paper. The advantages of home-made paper are as follows:

(1) Any degree of contrast may be secured by slight changes in the sensitizing mixture.

(2) Any texture or color of paper may be used.

(3) Any range of tones may be had, either by varying the sensitizing mixture or by multiple coating and printing.

(4) A platinum print may be finished and then resensitized in parts, so that the relation of tones in the negative may be varied.

The disadvantages are:

(1) Home-sensitized paper is more expensive than the commercial.

(2) A little more time is required to prepare the paper than to take a sheet from a can.

We will now take up the method of working.

CHOICE OF STOCK.

Any well-sized paper may be used. The writer has a predilection for Whatman drawing papers, the Strathmore charcoal paper (which has a beautiful texture), the various styles of Japan vellum sold by the Japan Paper Co., of New York City (especially the thinnest), and a moderately rough yellow paper sold by Eugene Dietzgen (New York), known as "Grifon Detail Paper." Many of the linen writing papers are of beautiful quality also, and each worker will undoubtedly be able to find papers that will give him more satisfaction than the commercial stocks. In choosing a paper, moisten the finger slightly and touch the paper. If the moisture is absorbed rapidly the paper may need a coat of size. If, on the contrary, the moisture remains on the surface for several seconds sensitizing may take place without any preliminaries.

SIZING.

If clear high-lights are desired some papers may need sizing (none of those mentioned above will require any), but interesting results may be got by coating a soft paper, allowing the solution to sink into the pores. If multiple printing is to be used the paper should be sized before each of the secondary sensitizings. To size, make up a medium thin paste of laundry starch (boiled) and, pinning the paper on a flat board, apply the paste with a damp sponge, rubbing it well



ROSE.

NATHAN R. GRAVES.

into the paper. Be liberal with the paste, but be sure that it is free from lumps.

FORMULÆ.

The formulæ for coating are based on those given by Miss Katherine Stanbery, in Photo Miniature No. 96, but have been varied a trifle, as it was found difficult to get a full scale of tones and rich blacks in working by her method. The variation is very slight, however, and the writer takes this opportunity of thanking Miss Stanbery for placing in his

hands one of the most valuable photographic processes that he has ever encountered.

Stock solutions:

- (I) Oxalic acid 16 gr.
 Ferric oxalate 240 gr.
 Distilled water—hot 16 dr.
 Oxalic acid 16 gr.
- (II) Ferric oxalate 240 gr.
 Potassium chlorate 4 gr.
 Distilled water—hot 16 dr.
- (III) Potassium Chloroplatinite 219 gr. (=1/2 oz.)
 Distilled water 19 dr.

Sensitizing solutions:

(1) For very soft prints—

- I 22 mm.
- III 28 mm.

(2)

- I 18 mm.
- II 4 mm.
- III 28 mm.

(3) About same degree of contrast as a silver print.

- I 14 mm.
- II 8 mm.
- III 28 mm.

(4)

- I 10 mm.
- II 12 mm.
- III 28 mm.

(5) For extreme contrast.

- II 22 mm.
- III 28 mm.

It will be observed that these formulæ are arranged in the order of resultant contrast. The quantities given are about right for a 9 x 11-inch sheet of ordinary paper, the very smooth vellums and linen papers requiring slightly less, the rough Whatman and charcoal papers from 10 per cent. to 25 per cent. more. The quantity used is, of course, directly proportional to the area of the paper.



A MANX LANE.

CHAS. E. WANLESS.

SENSITIZING.

Cut the paper about one inch larger each way than the finished print is to be, pin it firmly on a smooth board with a sheet of paper under that which is to be sensitized, measure out the required quantity (the writer pours from each bottle into a minim graduate and mixes the solutions by pouring back and forth between two graduates), then pour in a pool on the paper and spread thoroughly, using a flat *rubber-set* camel-hair, fitch or sable brush. Work the solution back and forth until the paper is well covered, and the solution has begun to go into the pores, then lay aside until surface-dry and complete the drying over a stove or gas-jet. When the paper is bone-dry put it into an empty platinum tin, with preservative, until ready for use. All of these operations may be conducted by the light of an ordinary window, avoiding direct sunlight. It is advised to wet the brush and shake it out thoroughly before beginning to coat, as it will then absorb less of the sensitizing mixture. After coating several sheets of paper it will usually be found that the brush contains enough of the mixture to coat another, without taking any more of the stock solutions.

POINTS TO BE NOTED.

No metallic substance may touch the sensitizing or stock solutions without damage.

The paper should be bone-dry within ten minutes after sensitizing.

Graduates and brush should be washed clean before putting away.

If several pieces of paper are to be coated for different degrees of contrast the brush should be washed before applying a different formula.

The addition of potassium chlorate in the sensitizer increases contrast.

Brush marks can result only from extreme carelessness.

It is easier and more economical to coat large sheets and cut to size than to coat small pieces of paper.

Rough papers are slightly easier to coat than smooth.

Save clippings, waste prints, and all paper, etc., that has any of the sensitizing solution on it, as it can be sold, thus tending to diminish the cost of the work.



O. VON ROSENBERG, ARTIST.

LOUIS FLECKENSTEIN.

The ferric oxalate must be fresh, and in this condition should consist of clear, bright green scales. If it is brownish, or if the scales stick together in the bottle, it is unfit for use.

Keep all solutions in amber glass bottles, in the dark.

PRINTING.

Printing is conducted exactly as with commercial papers, being very slightly slower than is the case with the ready-made article. In printing on very thin transparent papers it is advisable to print by time, using test slips, as the image is only slightly apparent before development.

In making multiple prints a note should be kept of the time required for printing, as it will be almost impossible to judge of the secondary printings by inspection.

DEVELOPMENT.

This also is the same as with the commercial papers, a hot or concentrated developer giving soft prints of a warm tone, a weak or cold developer producing greater contrast and cold tones. The addition of bichloride of mercury to the developer also increases the warmth of the tone.

CLEARING.

The purpose of clearing is to remove the iron salts from the paper. Contrary to the usual idea, an immersion of three minutes in a 1 to 300 bath of C. P. hydrochloric acid is sufficient to do this, *if the bath be clean, i. e.*, not already loaded with iron. Longer immersion or a stronger bath will injure the tone of a mercury-developed print.

COST.

Assuming the chloroplatinite to cost \$10.00 per $\frac{1}{2}$ oz. and Strathmore charcoal paper to be 2c. per sheet, the cost of a dozen 8/10 prints will be about \$3.25 or slightly less, on account of the sale of the clippings. From this it will be seen that from a financial standpoint it will not pay to coat platinum paper at home, but the advantages enumerated above will for many more than counterbalance the increased cost. The platinum salt, however, which is the main expense, varies greatly in price and at times the cost of the operation may be reduced 25 per cent or more on this account.



ADELAIDE.

Alice Lillian Becht.



WAITING FOR PAPA.

E. G. DUNNING.

AIMS

By NELSON J. JEWETT



THE subject of this preachment is believed to be, in importance, so far ahead of any other consideration for the amateur photographer that "there is no second." Such questions as plates or films, size of camera, lens, printing medium—all of the thousand and one questions debated pro and con by photographic publications are insignificant in comparison with the question of the amateur's aim or object. This is the very first thing the embryonic photographer should get clearly in mind before he attempts to decide any of the minor details.

Photography does not differ from any other line of endeavor in this respect. It is true of every human activity that the great majority merely "fool." If this succeeds in calling the attention of only one to the importance of a definite object, it will be justified. If you want evidence of the need of missionary work along this line, inspect the piles of stuff printed for amateurs by the professional finishers. The sinful waste of good paper to make prints that mean absolutely nothing shows plainly that the button pressers had no definite object in view. The curious attracts them unfailingly. An especial joy is to perpetuate the appearance of their friends at their worst. The artistic possibilities—the capabilities of the photographic process for the making of pictures are an unworked vein of precious metals lying all about them. The rules of composition, tones, placing of masses, atmosphere are entirely neglected tools for the mining of all this wealth.

There are numerous aims which may be chosen by the amateur, any one of which is better than none. As we are considering the amateur we presuppose that the pleasure derived from the hobby is the ruling motive—hence money-making may be left out of the question. If this be taken as an object, the hobby is converted into work. The recording of facts is an aim that may be adopted, and one which has a



NOVEMBER.

N. J. JEWETT.

great deal to recommend it, especially if the growth of a child is the subject. Recording places and objects seen while traveling would be included in the work of such an amateur. He would want the best optical outfit to be had, plates of a generous size, and would probably print on glossy paper. His work would be of moderate—not engrossing—interest, and his prints would be looked at only casually. Usually his camera will be idle 50 weeks out of 52, and after a few years, stored in the attic or sold.

The aim which the writer believes will render photography the most educative, the most intensely interesting, the richest in results both as to prints and as to culture, is the pictorial. Let us persuade a hitherto thoughtless snapshotter to seriously, consciously, definitely adopt the pictorial as his aim. He is hereafter to make no exposure unless he sees that which he thinks will make a picture. The variation of light and shade, the lines and masses, are to be so arranged as to beautifully decorate a surface when reproduced or modified in some way possible to the process.

The mere fact of being conscious of such an object begins the education of our convert, for at the very threshold of his experience he meets the question, "What makes a picture?" He discovers that he must be governed by the same principles as the etcher, the worker in charcoal, India ink or any other monochrome. Aside from the question of color, he must apply the same rules as does the painter, with the added difficulty of making his tones suggest color. The whole field of art is opened to him and he has need for all the knowledge of the subject which he can acquire. Every added refinement of the sensibilities will show in his results.

The pictorial photographer, to do his best work, must study the best pictures produced by every process and in every age, whenever he has access to them. He must read the best books obtainable on painting, composition, landscape engineering or gardening, art subjects of every kind, as well as those on photography *per se*. From each of these he will cull much that will better his product. The photographic magazines and exhibitions will have a new interest for him, for he will begin to exercise his artistic judgment—to become a critic. He will find that the pursuit of pictorial photography will really tend



SPRINGTIME.

Kate Mathews.

to a broad education of the whole artistic side of his nature, for, in the last analysis, all art is one. Foundation principles will be found to underlie pictorial art, sculpture, music, literature and the drama. A careful study of pictorial art will lead to the whole field. Moreover, enrichment of the æsthetic nature will result in a keener appreciation of the beauties of each of the divisions of the field. This culture is the richest experience of the pictorialist.

The question of equipment is of much less importance to the pictorialist than to the record-of-fact man. A camera costing from one to three dollars may produce much finer results in the hands of an artist than an expensive outfit in the hands of a bungler. An enlargement of fair size from a 1 by 2-inch negative may contain everything desirable from the pictorial standpoint. Added outlay is for conveniences, not for necessities. The writer has had much satisfaction from a 4½ by 6 c.m. (1¾ by 2¾-inch) plate and film-pack camera which carries readily in a vest pocket. The accompanying prints were produced by this outfit. Satisfactory enlargements up to 11 by 14 may be had. Of course, the record-of-fact man who wishes to count hairs would be dissatisfied, but to record an impression or reproduce the feeling of a landscape, the enlargements leave nothing to be desired. These prints are submitted to show that a large outfit is not required—not as examples of pictorial excellence. Indeed, the writer, while aiming at the pictorial, must plead guilty to a lack of success.

In conclusion, let me urge the reader, if he has not already done so, to decide to be a pictorialist. Photography for the amateur should be a hobby, and as such should be made to yield a maximum of pleasure. What can yield more pleasure than the cultivation and exercise of an appreciation of the beautiful? When anyone tells you “photography is not art”—smile! A photographer may be an artist, and when you are one you will *compel* recognition as such. Do not be discouraged if you cannot at first see a picture until it is on paper. This is the most difficult matter in all picture making by any process.



JOHN C. CALHOUN.
From a Daguerreotype.

J. A. ANDERSON.

DAGUERREOTYPE COPYING

By J. A. ANDERSON

IN many a family is found a little hoard of the old time Daguerreotypes, in which are depicted, on polished silver, the form and features of friends of long ago; the child now to man or woman grown; the quaint costume of grandmother in her youth; and many other interesting things of the past; with, perhaps, the face of one who holds an abiding place in historic lore.

While the "dry plate" of the present day affords the means of indefinitely multiplying the impression which the light has



A RAY OF SUNLIGHT.

ERNEST CLAYPOLE.



MARTHA WASHINGTON.

J. A. ANDERSON.

From Daguerreotype of Miniature.

made on it, the Daguerreotype is unique, in that each represents a separate "sitting."

The amateur may well spend an occasional hour in making negatives from these beautiful productions of early photographic art, for the better preservation of what they portray and for the pleasure of sharing with friends, the product of his skill.

The Daguerreotype to be copied must be taken from its case and the glass cover removed. Otherwise the result would be marred by reflections from and refraction by the glass and by fog and specks sometimes found on its under side, which are often taken for defects in the plate.



GENERAL WASHINGTON.

J. A. ANDERSON.

From Daguerreotype of Painting.

On the plate spots and other defects are often found which have arisen from atmospheric influences or from carelessness in production or in subsequent handling. Some of these defects may be removed by experts but, as a rule, the remedy must be found in corrections on the negative or print of the copy.

To remove the picture from the case, in which it is simply held by pressure, take the case in the right hand and tap it smartly, face down, in the hollow of the left hand. Two or three taps will usually bring it out.

Handle the plate with extreme care. Nothing whatever must be allowed to touch the delicate surface. A touch of

the finger, or a drop of water from the mouth, in attempting to blow off dust, or the least scratch, will make a mark which the unskilled operator cannot remove.

Sometimes the adhesive paper, by which the plate was bound to mat and cover, is found to have separated from the metal, in which case care must be used to prevent injury to the plate by its falling unexpectedly. If the paper adheres, cut it around the edge. Remove the plate from mat and glass and fasten it, by thumb tacks, to a board which can be set upright in front of the camera.

To prevent reflections, from the polished surface, reaching the lens, hang a black cardboard, of sufficient size, to the lens hood, by a hole cut in the card and just fitting the hood. Divert reflection of the lens itself by a slight inclination of the plate to right or left. Such inclination is also sometimes needed to do away with reflections of side light from slight irregularities in the surface of the plate.

After exposure, remount the picture, with the same precautions against injury as before observed. Place the mat in the position indicated by the marks usually made by it on the plate; clean and dry the cover glass; and fasten all together with adhesive paper extending well over the back of the plate and trimmed off evenly at the front edge of the glass. Replace the ornamental casing of light brass, which is sometimes used, and press the whole into the case.

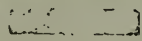
Daguerreotype plates vary in size, from the $6\frac{1}{2}$ by $8\frac{1}{2}$ "whole plate" to the half and quarter plate and on down to very small sizes. The size most commonly seen is the sixth, $3\frac{1}{4}$ by $2\frac{3}{4}$, of which the part not covered by the mat, when enlarged about $2\frac{1}{2}$ times (lineal), gives a picture of suitable size for a $6\frac{1}{2}$ by $8\frac{1}{2}$ dry plate.

The copy may be of the same size as the original or smaller or larger, according to taste or convenience. Some enlargement is usually preferable, the amount of which must depend upon the extension of which the camera is capable. Most cameras do not give enough extension for even a full-sized image, with the lenses commonly used with them. Some give enough for full size or a little more, while others are made especially with long extension.

The amateur may increase the capacity of his camera, in



CHILD STUDY.



WILLIAM GILL.

this respect, by adapting to it a lens of shorter focus than that for which the camera is intended. In the absence of a lens board fitting the camera with the smaller lens, the plan adopted by the writer is as follows: Take off the lens ring from the lens board of a $6\frac{1}{2}$ by $8\frac{1}{2}$ camera and secure to this board the smaller board of a short focus lens, with a ring of cloth between them to exclude light. To effect this tack three little strips of light brass or tin to the back of the larger board, around the opening and extending slightly over its edge.

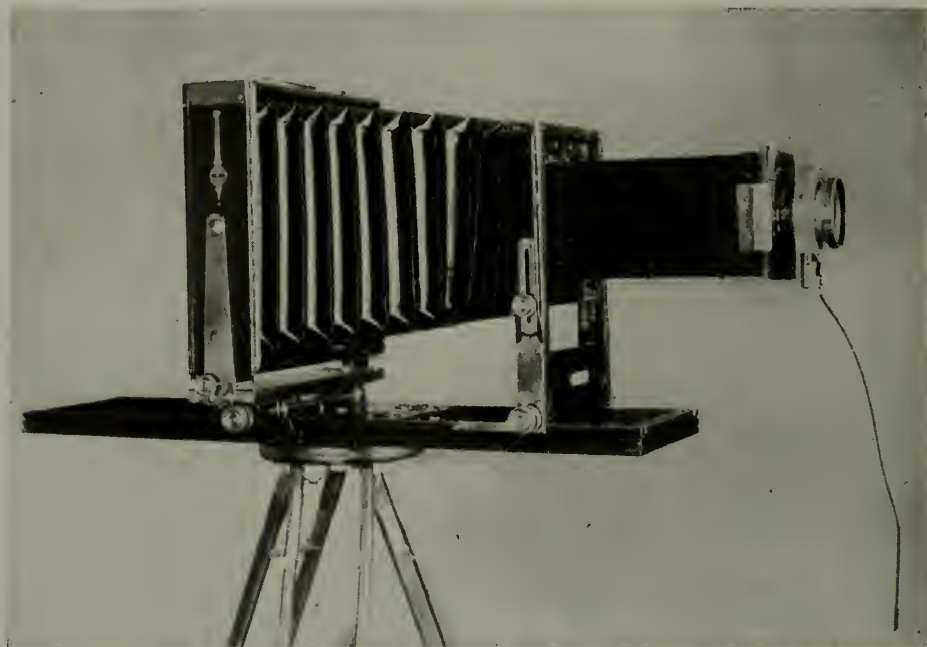


Fig. II.

EXTENSION TUBE ON CAMERA.

J. A. ANDERSON.

Through a hole in the end of each strip pass a light screw into the smaller board, which is thus held in place.

Another plan is the use of an "extension tube," of suitable size and convenient length, with means at one end of connecting it with the camera, after the manner of the lens board, and, on the other end, brass clips to hold the lens board, on a surface of cloth or velvet.

The tube may be of wood or metal, according to the ingenuity or facilities of the operator. That used by the writer is a square tube of wood, as illustrated by the accompanying drawing and photograph (Figs. I and II). The inside is blackened and the joints are covered, within, by black paper

For those who are not accustomed to this kind of near-by work, some points may be given respecting the method of determining the distances each way from the lens and the time of exposure, for any given size.

The relative size is termed the "ratio." Thus, if the copy is half the size of the original, the ratio is $\frac{1}{2}$; if of the same size, the ratio is 1; if double size, the ratio is 2, and so on.

For the distance from lens to ground glass (the extension), multiply the lens focus by the ratio and add the focus to

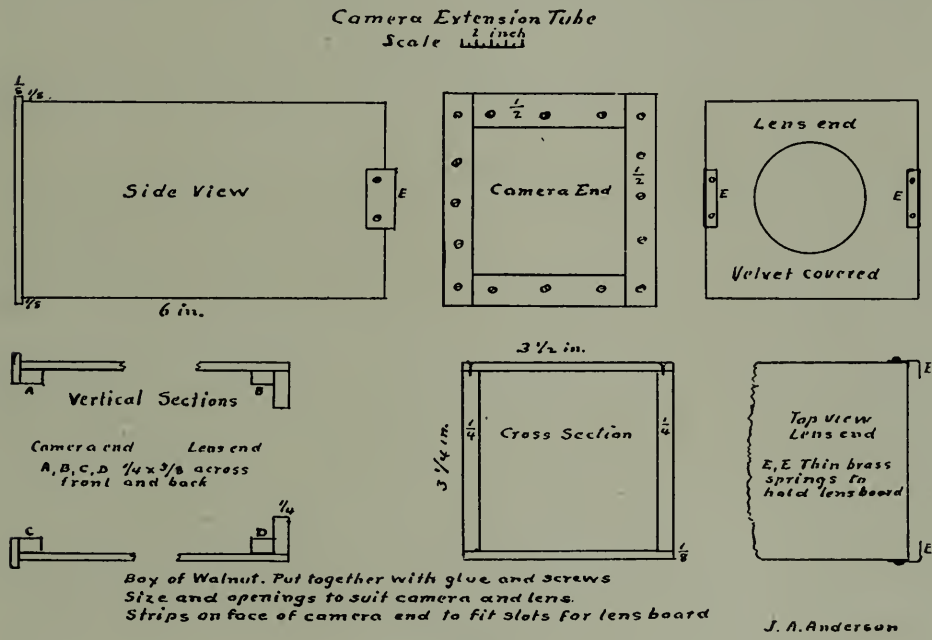


Fig. I.

the result. For the corresponding distance from lens to object, divide the extension by the ratio. For example, if the ratio is 2 and the focus 8 inches, 8 multiplied by 2 gives 16, which, with 8 added, gives 24 inches for the extension. This divided by the ratio, 2, gives 12 inches for the distance from lens to object. Measuring these distances from the shutter is sufficiently accurate, with subsequent fine focusing.

For the time of exposure, first ascertain by meter, what it would be, with the given aperture, if the extension were equal to the focus (for long distance). Then multiply the time so ascertained by the square of the sum found by adding 1 to the ratio. In the case just stated, this sum would be 3 and its square 9, and, if the time ascertained for long distance is 2 minutes, this, multiplied by 9, would give 18 minutes for the exposure.

For one not using a meter and not accustomed to estimating the strength of the light, some trials may be needed. These, for economy, may be made with small plates and a "kit."

With a good lens there is seldom need for severe "stopping down," as the subject has no depth, but, when using a short focus lens and long extension, it is safer to use a fairly small aperture, even at the cost of prolonged exposure.

Few persons observe that in the Daguerreotype the figure is reversed, as in a negative viewed from the film side. To reverse this, if desired, expose the plate with the film side away from the lens, or, from the negative made in the usual way, make a reversed positive by transmitted light and a negative from this.

From Daguerreotypes, made by himself and others, the writer has made many copies and has found the work of much interest. For prints there is, of course, the usual wide choice in papers, but, for these enlargements, he has found rough sepia platinum quite satisfactory.

The portraits used as illustrations are copies made by the writer from Daguerreotypes. Those of General and Lady Washington are from paintings, and are somewhat enlarged in copying. The original picture of Lady Washington was described by Mr. G. W. P. Custis, in 1848, as a most exquisite miniature. The full-sized portrait of General Washington, from which the Daguerreotype was taken, was declared by Mr. Custis, to be a very fine likeness.



EDGE OF THE LAKE.

THEODORE EITEL.



Illustrating "Making Picture Postal Cards."

JOHN BOYD.

MAKING PICTURE POSTAL CARDS

By JOHN BOYD



HE picture post card has grown into such lasting favor with the people of the world that no one needs to be told it is here to stay, and gaining ground every day.

Many eccentricities have been brought out to supplement or supplant the original popular view postal, but their short life shows the evanescent hold they had with the buying public.

The best sellers, and the ones most eagerly sought by particular buyers, are those of genuine photographic origin, or which by imitation most nearly represent the photo processes.

A postal card by the blue print, printing out, or developing paper methods is easy of accomplishment, though strange to state we find very few makers departing from the stereotyped

cut out masks usually furnished by the manufacturers of the cards, or the still easier solid print covering the entire postal.

There is no reason why this should be so, as many beautiful results can be produced by double printing, and it will be my aim in this article to explain in the simplest language how a few variations may be accomplished without much trouble.

Let me state in starting that as I have to do all my work in the evenings it was necessary to plan a method whereby the printing could be done on Velox or other similar cards, thus making it most essential that every part be laid out



Illustrating "Making Picture Postal Cards."

JOHN BOYD.

accurately so that when they came to be "imposed" each to the other that they register absolutely. The slightest difference in the size or position of the two masks or "cut outs" would spoil the effect aimed at, and ruin the beauty of the resulting card.

With this in mind the measurements were very accurately and carefully made, and for this purpose I used a metric rule, which is more easily read, and contains finer divisions than one of ordinary English inches.

The figures given will, therefore, be expressed in metric form in case any reader should wish to copy the designs I am submitting in illustration of the explanations.

The standard size of a Velox postal card is 87 by 137

millimeters, and this I believe is the size used by most makers of sensitized postals.

First procure some pieces of black mat paper (the kind that comes around Velox or dry plates) not less than 5 x 7 inches. Take two of these and set them apart for the first pair of masks, and write on the top of them, "Set No. 1." This will tell you at all times in the future that one is to be worked only in connection with the other—it will also show you which is the face and the top of the masks.

Next take a postal, one that has been used, if you do not wish to spoil an unexposed one. Lay it in the centre of the black paper, and with a very sharp pencil trace its outlines on the two sheets. Take one of these sheets, lay it on a piece of zinc or glass, and with a flat ruler or straight edge and a sharp knife cut along the four lines so marked when the center will fall out. Save this piece for future use. The postal will now lie inside the cut out, and you will need to see that it does so.

The next thing to do is to take a piece of clean glass, 5 x 7" or whatever larger size you prefer, and which fits your printing frame, and paste this form on it, taking care to see that you do so without distorting its shape or stretching it unduly. Were it not for the trouble in cleaning the glass afterward I would prefer to recommend pasting the whole piece of black paper to the glass, and let it dry before attempting to cut out the center. This gives a truer shape, but one will have trouble getting rid of the paste on the glass when he comes to polish it for printing.

We now take up the second piece of black paper, and prepare to cut out a section that shall represent the size of the picture that is to adorn the center.

In the card before us this is 67 by 117 millimeters, which leaves a margin of 10 millimeters on all sides of the print.

These 10 millimeters must be marked off inside the lines ascertained from the pattern card from which they were outlined, and cut out with the knife, using caution in getting the mask straight and the corners without any overcutting, or with broken lines. The piece taken out from this is also saved for further use.

We have now a glass plate with a shape cut out the



NAPPING.

LOUIS FLECKENSTEIN.

size of our postal, and a mask from another piece of paper the shape of our picture. Our next task will be to adjust a center for the former that will insure the latter getting into correct position, and protect the picture while printing the further embellishments.

It looks easy, but it is not so simple if you do not use care and judgment in placing them.

My plan is to take the center that was cut out from the part that determined the shape of the picture, and reduce its length and breadth by cutting off one centimeter from two of its four edges; or, in other words, making it 66 by 116 centimeters. The reason for this will appear later on.

In order to get it into its proper place on the glass, to which it is affixed by paste that will not stretch it, I lay the glass on a table, and place the piece of paper the size of the postal inside the shape; which is really putting it back in its proper place, and inside this again is set the section cut out of the piece that determined the size of the picture.

If the work has been done properly all three pieces will fit together with hardly any space between them, unless it be in the inside one, and this is necessary to give a narrow dark line around the view.

When you have got them all snugly in place paste down the inner one, lift the next out from where it lies, and you ought to have ready for use a set of masks that will make postal printing an easy matter.

This will, of course, only give a plain tinted border around the center picture, but in order to make it more effective, lines of varying thickness and distance apart can be ruled on the glass with a fine pen and India ink, all of which I think gives the card a more finished appearance.

To use the set we place the mask over the negative in the usual way, and adjust the sensitive card exactly on the lines ruled there when we commenced, and which one more easily finds if we paste two small pieces of thick white paper along the upper and left-hand sides. This allows us to slip the postal along until it stops at these markers, thus making it possible to adjust the cards exactly in the darkened room.

After printing the picture the negative is taken out of the frame, and the glass with the masks on put in its place. The



HEMPSTEAD BROOK.

Joseph Laurier.



WOTAN.

JOHN E. BOULTENHOUSE.

postal is set with its edges close to the outer cut out, and given a short or long exposure according to how dark the margin is wanted, after which the card is developed in the usual way.

To make a stippled effect on the border, mix up a solution of India ink, place it in a saucer, and take up a small quantity with the point of a stiff paint brush. Grip the brush well down on the bristles with the left hand, and run the fingers of the right across its points. This will spray the ink for a considerable distance, and with a little practice one can make a nice even stipple over the plain glass that borders the inside mask.

Innumerable variations in double and treble printing are possible, the limit being only bounded by the ingenuity of the progressive photographer.

A "built up" card is a dainty conceit if managed in an

artistic manner. Unfortunately there is little art in my make-up so the crude efforts that are shown here must not be taken as a standard to work to, but merely as starting points or finger-posts to higher results.

These are made up on large mounts of a suitable tint, say 8 x 10 inches, and then reduced by copying to postal size. Dried leaves, grasses, ferns, grains, with prints from suitable subject will all combine to form the basis of some greeting. Do not aim to crowd in too much material in making the design, as that will destroy much of the effect when it is reduced to the size of a post card. The simpler these cards of greetings are the better they will be liked, and a sincere effort to make them convey a message will often result in a harmonious conception.

I have been in the habit of sending out each year to friends and relatives some new combination on cards like these, and that they are appreciated more than those purchased in the stores is evidenced by the remarks that greet the arrival of one of these inexpensive missives of one's affection.

Just try it once and see for yourself.



Illustrating "Making Picture Postal Cards."

JOHN BOYD.



BUILT BY ISAAC HOPPER, PARAMUS, N. J., ABOUT 1725. USED AS RENDEZVOUS DURING REVOLUTION BY AMERICAN OFFICERS.

BURTON H. ALLBEE.

INTERESTING PHOTOGRAPHIC RECORDS

By BURTON H. ALLBEE



AM not a pictorialist. I make that confession at the outside, thus acknowledging my own limitations. Sometimes I make a picture that looks like those which the critics describe with so much attention to the partially invisible portions, as they dilate upon the feeling expressed by the artist; but as a rule I can't make that class of work.

Perhaps I was unfortunate in my beginnings. Not long after some one who little realized what he was doing put the first kodak into my hands, I showed some of my prints to a publisher. He said that was just the kind he wanted for his magazine. Those will reproduce, he declared, so the reader can tell what they are. So I was early initiated into the method of making prints that would reproduce, and I have

followed that scheme more or less ever since. In fact, I do it now; consequently, what I am about to say is a bit of personal experience based upon this fact.

Probably in the vicinity where each amateur photographer lives there is something different from anything anywhere else. Perhaps this assertion requires modification; but generally speaking this is true. I live in New Jersey, that northern section bordering on the Hudson River originally settled by the Dutch. Scattered through that section are many old



BUILT BY ABRAM ZABRISKIE, NEW BRIDGE,
N. J., 1735. CONFISCATED AND GIVEN TO
BARON STEUBEN BY STATE OF NEW JERSEY.

BURTON H. ALLBEE.

stone houses constructed from one hundred and fifty to two hundred years ago. Early in my photographic career their picturesque appearance attracted me and I began to photograph them. I have now something like one hundred and fifty negatives of these structures, with more or less extensive histories regarding each one, who lived in them, where their children went and all the data I can gather. I have been something like six years getting these negatives and information together, nor is the work done yet, because almost every day someone supplies something further about some of them. In other words, I have tried to master these houses, both



AN AUTUMN DAY.

N. J. Jewett.

photographically and historically, with the result that I have achieved considerable repute as a historian and some fame as a photographer.

Every historical society in the State and some of the patriotic organizations have collections of these prints, the State society, for instance, treasuring them as invaluable additions to its store of information of the early settlers. I have in hand now a request from the Metropolitan Museum of Art that I prepare enlargements for them of the best



BUILT BY NATHANIEL KINGSLAND AT KINGSLAND, N. J., ABOUT 1730. ALL BRICK AND INTERIOR FINISH IMPORTED FROM BARBADOES.

BURTON H. ALBEE.

examples to be placed on exhibition in their architectural department.

Further than this, at the suggestion of a friend, I prepared a series of lantern slides and a lecture. I have probably given this lecture more than one hundred times and always have engagements ahead for it. As this is written I have four engagements booked, with others under discussion.

Scores of other photographers had passed these houses very many times, but for some unexplained reason they did not consider them worth while picturing and investigating. Yet since I began to exploit them they have been made the subject

of innumerable articles in magazines and newspapers, and hundreds of people visit them each year.

This was what came of record work. That is all it is, but coupled with that should go the statement that the Dutchmen who settled New Jersey evolved a type of architecture in house building which has no counterpart on the globe, and as architects have made this discovery they have begun to investigate their essential characteristics, viz., first, the invention of what is known as the gambrel roof. It had been supposed that this originated in France, but investigations shows that it was unknown in France prior to its use here in New Jersey. Second, the artistic use of field stones in the construction of a stone wall. These two achievements in architecture are sufficient to explain how unique these buildings are. Of course many of them are interesting historically, and as the Revolution was fought largely in New Jersey, some of these buildings have a Revolutionary history that is as interesting as any that can be told of buildings in New England or the South.

How I did it needs not to be told. In photographing each house I endeavored to emphasize its characteristics as much as possible, even at expense of perspective in some instances. To show its shape and the way the stones were laid has been my aim rather than what might be termed an artistic presentation of the subject, based upon the laws which govern such subjects. Probably I have been wrong, but the pictures have been many times praised and wherever they are exhibited they attract much attention.

This story is not told in a spirit of egotism. It is plain fact which can be verified. I relate it here as a suggestion for the amateur who may wonder what is worth while photographing near him. Perhaps he has no Dutch houses, but he may live in a region where Indians once roamed, for example, and their remains or traditional camping places may be matters of local knowledge. If so, here is an opportunity to do some work worth while.

It may be he lives in a region of waterfalls, or some similar wonder of nature. If so, then he has an opportunity to depict some of the most marvelous beauties in all nature. And so one might go through the list. There is something



AFTER THE RAIN.

RUDOLPF EICKEMEYER.

everywhere that is different from what it is somewhere else. There lies the amateur's opportunity.

Of course I have done a great deal besides this. I have more than one thousand negatives made on all sizes of films and plates. I have now four different sized cameras and Kodaks, all of which I use in one way or another. And I have an enlarging outfit to make my small pictures the size I want if they prove worth while.

I am not going to tell you about the technical methods I follow. They are not essentially different from anyone else, excepting I use tanks almost exclusively for developing. Probably most of my negatives are 5 x 7, or No 3A Kodak. These I find most reliable and the shape of the pictures are satisfactory.

One more thing I want to mention; I have made what may be termed a photographic record of the industries of my county. In one way or another I have made negatives illustrating the principal operations in all the industries within reach. I could, upon a few hours' notice, illustrate any industry in my county. And of course this subject is endless. There are always new negatives to be added, old ones to be improved, or changes made which will make the subject plainer.

Of course this is a sordid way to look at photography. But I have had my recreation out of it and others have received information. In no sense is any of my work pictorial. It is records and nothing but records; but I imagine that in years to come there will be those who will look at these records and be quite as interested as they will be gazing into the mist of some artist's conception in a vain endeavor to determine what it all means.



THE PLOWMAN.

T. W. KILMER.

THE LENS HOOD

By T. K. KILMER

SOME sort of lens hood is an absolute necessity to the photographer, be he amateur or professional, whether he goes afield to photograph, or whether he keeps to the quietude of his studio. After experimenting for the past year with and without a lens hood, I am firmly convinced in my own mind that I can make better negatives no matter when or where, when I have some kind of hood on my lens. This is no theory, it is a *fact*.

Having thus established a fact, what are we going to do about it? Why, the answer is simple; get a lens hood! What

kind of lens hood? Ah! that is the question over which I have greatly pondered. There are all kinds of home-made lens hoods, and there are also those which are ready made and purchasable. There is one of British make, similar to the bellows of a camera, which is an excellent article. It collapses when not in use and may be carried in the pocket. At first I used a cardboard tube blackened inside, which projected about three inches from the end of my 10 inch Zeiss Tessar lens. After crushing a half dozen of these hoods, by carrying them in my pocket, I tried making them of black paper, and



LENS HOOD CLOSED.

Fig. 1.

folding them: this I found to be an objection on account of their not opening readily nor keeping their shape.

I finally hit upon the collapsible hood which is herein illustrated. I had this hood made of four aluminum rings, each ring measuring one inch in length. These rings fit one within the other. They are dull black on the inside and slight ridges break up any rays of reflected light. When this hood is extended, it measures about $3\frac{1}{2}$ inches. One may

extend it from one inch to its entire length. It fits on lenses of various diameter by means of spring clamps. When through with this hood it is simply collapsed, and remains *in situ* on the lens. It is no bother to carry as it fits any lens and remains on it. One may extend it any distance up to its full length. It weighs practically nothing. *It is always with you and always a necessity.*




LENS HOOD EXTENDED.

Fig. 2.

GIANT VISION

By W. C. MARLEY

HE experiment of viewing a series of objects placed at gradually increased distances, first with one eye and then with the other (keeping position of the head unchanged) will show that all "parallax" or relief effect ceases at about 250 feet away. The ordinary stereoscopic camera, to produce results simulating normal vision, has its two lenses separated about 3 inches—approximating the average separation of the human eyes. Hence a view made with such a camera and containing no objects within 250 feet distance might just as well be made up of two identical prints from a single negative—it will lack all "relief." Far-off landscapes, when stereophotographed through or over nearby rocks or foliage, give impressions of distance and height of standpoint, but there is generally something lacking. The foreground is under-exposed, or the distance is over-exposed, and a perfect result is seldom obtained—the slide is soon examined and quickly laid aside.

There is a method, however, to give actual stereo effects in far-away objects, and to so render distant scenery in a stereogram, that it seems to be an exquisitely made relief map, with every hill, valley, ravine, tree-clump, etc., accurately modeled. This does not resemble nature, but is very pleasing nevertheless, and one will often examine such a slide again and again, finding new and interesting details each time.

The principle is simply that of increasing the separation between our two lenses, when we take our view; either by simultaneous exposure of two matched-lens cameras set up at a properly determined separation, or by two exposures of one single-lens camera, which has been rapidly moved a proper distance after the first exposure.

The two-camera method, with two operations, is the only *theoretically* correct one, but almost as good effects can be



RUTH.

Charles H. Davis.

produced by one operator with one camera, if a few rules be followed—we will assume such to be the case.

Our first requisite is an elevated standpoint, such as a cliff or mountain ridge—there must be some lateral space, for the two exposures must be made at same level and at the same distance from the field. We want a cloudless day, or at least no clouds over the scene, for their shadows may change place on the landscape while the camera is being moved to the second position, and this mars the finished effect in the stereoscope.



ELLENVILLE, N. W. FROM MT. MONGOLA.

W. C. MARLEY.

(In two separate exposures 85 feet apart.)

The inclusion of moving objects; smoke from trains, chimneys or bush fires; teams on roads; and the like, must be avoided. Some prominent point should be noted as a center for each exposure to be focused upon, and the two standpoints should then be determined and marked—this before beginning exposures, that the shortest possible time may elapse between the two.

The separation between the two standpoints, if made to equal about $1/80$ of the distance to “middle-ground” part of the landscape, will result in extending “relief” throughout most of the scene.

Exactness in estimating the distance is hardly essential—

under-separation will give *some* "relief," and over-separation simply enforces the trimming off of more foreground at base of prints, but extends "relief" further into the distance.

Long-focus lenses are best; with them distant objects give larger images; ray filters improve results and help to render detail clear to the skyline. A four- or six- time screen is recommended.

Printing-out paper is to be preferred for its ability to record everything in the negative. Trimming should be narrower than usual with stereograms. Carefully eliminate all objects at bases which are so near as to produce confusion when viewed in the stereoscope.

The method outlined above is not particularly new and has been utilized with good success by many workers—notably Victor Selb of Brussels, Theodore Brown of Salisbury, England, and Sanford Robinson of Los Angeles.

Ideal localities are abundant in this country, such as the Grand Canyon, various summits in the Rockies, White Mountains, Green Mountains, eastern crests of the Catskills and Helderbergs, Lookout Mountain, etc.

Someone has said that a landscape might appear to a giant like one of these "long-distance" stereograms, hence the title "Giant Vision."



WINTER SCENE, VALLEY JUST SOUTH
OF ELLENVILLE, N. W.

W. C. MARLEY.

(Taken in two separate exposures over 200 feet apart.)



PORTRAIT.

O. C. CONKLING.



THEO. ANDERSON.

GUIDES TO CORRECT EXPOSURE

By FRANK A. RUGG

THE belief in the possibilities of modification in tray development is fast passing away. To-day the most experienced workers will tell you to obtain, first of all, a correct exposure, and the development will largely take care of itself. Admitting that correct exposure is a thing very much to be desired, the question comes as to how to attain this ideal.

Different workers certainly have quite different methods of determining the proper exposure for a given subject. The painstaking amateur is almost sure to go forth armed with an exposure-meter which is to tell him just what to do under all conditions. He is too apt to depend entirely upon his meter for arriving at the correct exposure without giving enough chance for his reason to exercise itself.

On the other hand, there are many professional workers successful with all kinds of subjects, under the most difficult conditions, who never use a meter of any sort. Such a worker relies upon his judgment, based on a wide experience, together with his memory of previous exposures. Now and then we



THE SHORTENING DAY.

John M. Whitehead.



FRANK A. RUGG.

Standard Orthonon—September 8th—6 P.M. (Sunset).
F-16—4 seconds exposure.

find a photographer who confidently asserts that he decides upon the proper time to give by judging the intensity of the light on the ground-glass. A friend of mine, who does a great deal of difficult copying under varying light conditions, always uses two plates on the given subject, giving one four times as long an exposure as the other.

In my opinion, the exposure meter ought to be of great assistance at those times when it is very difficult, if not impossible, to determine the actinic value of the light. I have used, for some years, a set of exposure tables (by F. Dundas Todd) with great satisfaction. The tables are very helpful,



FRANK A. RUGG.

Cramer Isonon—September 8—5:40 P.M. (Sunset)
F-16—4 seconds exposure.

giving, as they do, the comparative exposures for different times of the day, and for the different months in the year. As to which section of the tables to use for the given subject I must depend upon my past experience, and there is absolutely nothing else to help me. When it comes to deciding whether the light is "brightest sun, no haze," "bright sun," "sun obscured," "dull," or "very dull," the task is not so easy. An exposure meter is just as useful and just as sensible at this stage in the game as is one's watch to measure the flight of time.

A good set of tables, then a reliable exposure meter and careful judgment, to be gained only by varied experience, should give us very nearly perfect negatives.



SUNLIGHT AND SHADOW.

C. F. CLARKE.

A CONVENIENT ENLARGING AND DEVELOPING LAMP

By HOWARD HEIMERDINGER



WHEN a person who lives in a small flat or in a "furnished room" desires to enlarge his own pictures, he is generally up against a hard problem, but I have here a solution that should prove an excellent arrangement for camera workers.

It was designed and made by a friend of mine whose home is a "furnished room" and he uses it continually, turning out excellent enlargements. Being handy with tools, he made a stand 36 inches high (see drawing), with a hole in the top (C) large enough to let the bellows of the camera project through below. There is a false top (A) to go over the one with the hole (B)—this is kept on when not enlarging, thus making the stand suitable to hold a lamp, or books, etc. The false top is used under the stand when enlarging to pin the bromide paper on to, and is supported by two rods or sticks laid on pegs or nails that are placed $\frac{3}{4}$ of an inch apart on the legs of stand (E).

For the light, a box is made 8 inches square by 14 inches high, without a bottom. On one side is a door; on the opposite side a piece of orange glass (3) is set in. A hole is made in the top large enough to hold tight the socket of a 60-watt frosted globe Tungsten lamp. On the lamp is a "B" Hyloplane reflector, which is supported by strips of wood, one of which, running in front of the door, is removable.

Remove the back from the camera, make a small frame with a rabbeted edge that will hold the negative to fit on the camera when enlarging. Have a piece of ground glass the size of the negative; place this on the negative, ground side to the negative. Put the lamphouse over the camera, being careful to have the light over the center of the negative. When using a negative that is denser at one end move the lamp so as to be over the dense end—this will make a better enlarge-

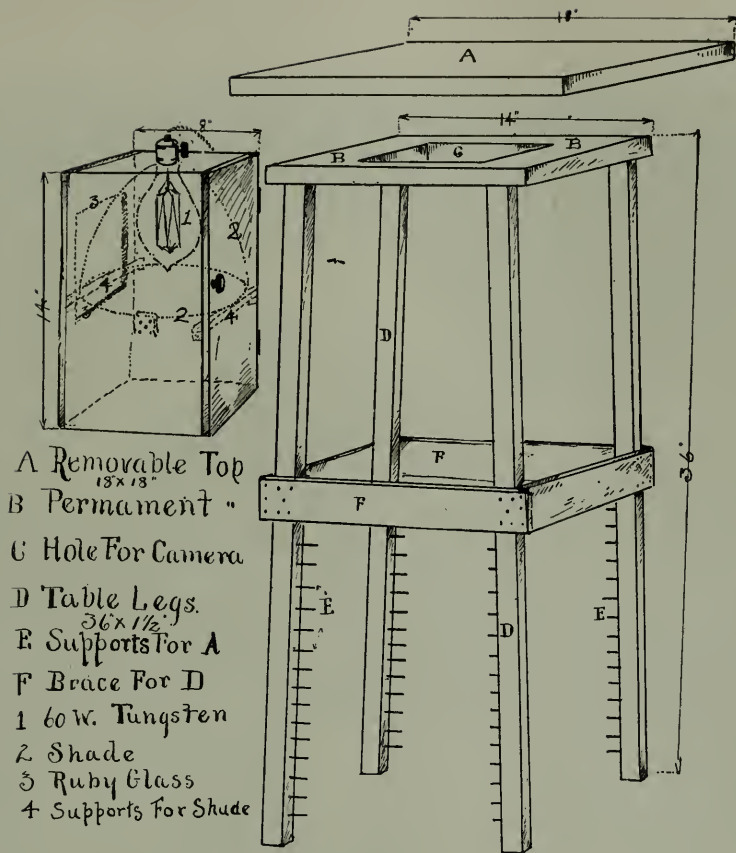


Fig. 1.

ment. The lens can be reached easily from under the stand for focusing with rack and pinion and the board moved up or down to get the proper size of enlargement. The paper is then pinned to the board, exposed, and developed by the orange light in the lamphouse. The negative is removed and replaced through the door in the lamphouse. This stand is being used for 4 x 5 negatives and with this arrangement of the lamphouse no condensers are needed. The frosted globe on the lamp reflector and ground glass diffuse the light so that the illumination is perfectly even.

To use the lamphouse for D.O.P. printing, remove the stick supporting the reflector, then remove the reflector (handle the lamp carefully or you will break the filament). Set the lamphouse on a table in front of your developing tray and you have as handy a printing light as one could wish for. The door being opened and printing frame held in position for the required length of time and the print then developed without it being necessary for you to rise from your chair.



*"Oh! Mammie oo' Cries,
But Wait Till My Ship Comes In."*

HOWARD HEIMERDINGER.

NOTES ON PICTORIAL LANDSCAPE PHOTOGRAPHY

By MALCOLM DEAN MILLER, M. D.



F late years more and more attention is being paid to the pictorial side of the photographic art. Photographers have realized that all the graphic arts are based on much the same general rules or principles and are turning to the study of these fundamentals. Good workers everywhere recognize that in photography, just as in other fields, it is the artist (working in a given medium) who counts, not the medium itself; hence photography, *per se*, cannot be art or non-art, because the art lies in the personality of the artist shining through his selected medium. It follows then that many people of artistic tastes, but lacking training in drawing and painting, are attracted to photography as a convenient means of expression. My thesis is that their work will be artistic just so far as it expresses their ideas of nature without violating the qualities of the photographic medium.

As one of those persons whose time did not allow him to follow up landscape painting in oils as a hobby, the writer, some ten years ago, took to the camera as a makeshift means of making pictures of landscapes. During the course of many seasons of successes and failures considerable costly experience was accumulated, and some of the lessons thus brought home are here condensed for readers of the "Annual."

The first point for the would-be pictorialist to consider is the selection of apparatus. I can see no reason why almost any camera provided with ground-glass focusing, vertical and horizontal swings, and a very liberal amount of rising and falling front may not be successfully used. Even the reflex is available if it allows double extension and is like some of the English models fitted with swing-fronts. Film-cameras are so limited in adjustments as to be of relatively small value. My own preference is for a good solid view-camera and $6\frac{1}{2} \times 8\frac{1}{2}$ plates, which I consider the smallest size capable of furnishing direct prints large enough to exhibit; 5×7 , how-

ever, will suit more on account of the lighter weight, and may perhaps be taken as the standard size if the results are always enlarged.

Even here, however, the view-cameras will be found superior to the box or folding types, with rare exceptions. For pictorial effects the choice of the focal-length of the lens is most important. As a rough guide I should say the shortest foci which ought commonly to be used should be equal to the sum of both sides of the plate, e. g.:

$3\frac{1}{4} \times 4\frac{1}{4}$	.....	$7\frac{1}{2}$	inches
4×5	.....	9	inches
5×7	.....	12	inches
$6\frac{1}{2} \times 8\frac{1}{2}$	.....	15	inches

For many subjects foci at least 50 per cent. greater are an advantage, as 18 inches for a 5×7 plate. Since focal-length is usually the last thing thought of by camera makers, and lenses of long focus in the modern types are expensive, it is perhaps well to note that the old-time single landscape-lens is still a very fine instrument. One of these can often be picked up second-hand and opened up to work at F. 8, thus introducing a desirable amount of spherical aberration. At least one American optical firm lists single lenses and will furnish any desired focus and aperture within reason. The half of an R.R. lens makes a good landscape-objective, though an extra long focus doublet should be chosen in order to get sufficient covering power. Of special lenses, there are the "Smith" (Pinkham & Smith Semi-Achromatic) and the "Portland" (Spencer Lens Co.), both of which are specifically designed to give a soft vibrating image full of spherical aberration. Among the anastigmats, the Cooke is peculiar in that the extension-lenses allow one to introduce some spherical error by opening the iris to its greatest diameter. Thus a 16-inch extension intended to work at F. 16 gives a beautiful quality when opened to F. 11. More error can be introduced by unscrewing the front lens a trifle after focusing.

Regarding the choice of a shutter, any type will do if it can be conveniently fitted. Probably the old reliable behind the lens roller-blind type is one of the best, particularly as all one's lenses may be fitted to extra front-panels and the ray-screen mounted on the lens-hood.



LATE AFTERNOON.

WILLIAM H. KUNZ AND
MALCOLM DEAN MILLER, M. D.

(May 14, 4:30 P.M., faint sun, F.11, 1/5 sec., Def. D. C. Ortho., 16" "Smith" Lens.)

There is undoubtedly a special advantage in the "Sky-shade" shutter, a type which solves the problem of securing clouds and foregrounds in one exposure, even on plain plates. Unfortunately, it is made only in small sizes at present. The high efficiency of the focal-plane shutter, of course, makes it very useful on windy days to stop movement in trees. The plate to use depends largely on the season. In spring, iso. or ortho. plates are necessary to record the light tones of the yellow-green foliage. In the summer when the leaves are blue-green, the plain bromide plate, fully exposed, will often give better rendering, because it records all the ultra-violet and blue-violet reflected from the landscape, thus compensating for its deficient sensitiveness to blue-green. The iso. plate, particularly if used with a filter, often requires double or triple normal exposure to receive any impression in the shadows. Even the panchromatic (red-sensitive) brands are deficient as regards this particular region of the spectrum, but wonderful results can be got on such plates as Cramer's "Spectrum," Lumiere's "Panchromatic C" and Wratten & Wainwright's "Panchromatic." The best screens to use with them are Filter-Yellow K screens with factors of from 2 to 4 to avoid over-correction. Often, however, they give splendid results without a filter, particularly if the sky is shaded during exposure. Double-coated plates are particularly desirable. So much for apparatus.

The next great essential is the possession of the pictorial sense. The worker who has this gift or can develop it by study and training will never lack subjects. Choose simple, large masses, foreground studies, single motives, turn the long-focus lens on them and compose the elements of the picture on the ground-glass until they balance correctly. Distracting details which refuse to be suppressed may be worked out of the negatives afterwards. The exposure in pictorial work need not always be normal; in fact, as A. J. Anderson says in "The Artistic Side of Photography"—quite the best book which has yet appeared—one should "expose for the tones which are most desired." It all depends on what the landscape says to you and how you expect to render the impression in your print. Without this personal touch your result will be a record and not a picture.



THE EDGE OF THE POND—MAY AFTERNOON

WILLIAM H. KUNZ AND
MALCOLM DEAN MILLER, M. D.

(May 14, 4:30 P.M., faint sun, F.11, 1/5 sec., Def. D. C. Ortho., 16" "Smith" Lens.)

The negative should be treated with a view to subsequent enlargement, that is, it should be kept thin and harmonious. Then direct bromide enlargement may be made for bromoil if desired, or one can make either a contact positive or an enlarged positive in the camera, and on this do any working up or alterations which may seem necessary. I believe it is always a help to have the positive on glass to study, because from it one can tell just what modifications will help express the sentiment of the picture. If all the work is done on the positive, the final enlarged negative will yield straight prints in any desired medium.

Platinotype is unquestionably one of the finest printing processes yet discovered. There is a certain charm in the texture and quality of a good platinum print which is unapproached by any other positive on paper, and if the negative is not too hard, platinum reproduces the delicate variations of tonal quality most exquisitely. Carbon is almost as good, but unless rendered matt by the use of ground-glass in transferring, has an objectionable gloss. Gum, it seems to me, is too limited in its power to carry values for many subjects. It tends to block up the shadows into masses out of all harmony with nature or to render the lights without full gradation. Of course, there are many subjects in which simplification of the masses is necessary, but gum should be reserved for these special cases. The photographer, notwithstanding, should have the same liberty as the painter to simplify details, and since the lens gives him everything he should exercise a wise discrimination. He is not a commercial view-man, but is trying to make his print convey a message. If there is too much in it—detail which overrides the mass—it is perfectly legitimate to remove the detail. The caution needed is to preserve the values of the passage, for the eyes is offended by masses palpably blacker than could exist in nature.

To sum up my convictions, I believe that straight prints from negatives made on double-coated or backed ortho plates, with a soft focus lens, if these prints preserve the relative values of the landscape, are just as pictorial and just as much art as any other monochromatic pictures produced with pencil or brush.



MOTHER'S HOUR.

HELEN W. COOKE.

STEREOSCOPIC NIGHT SCENES

By HENRY C. DELERY

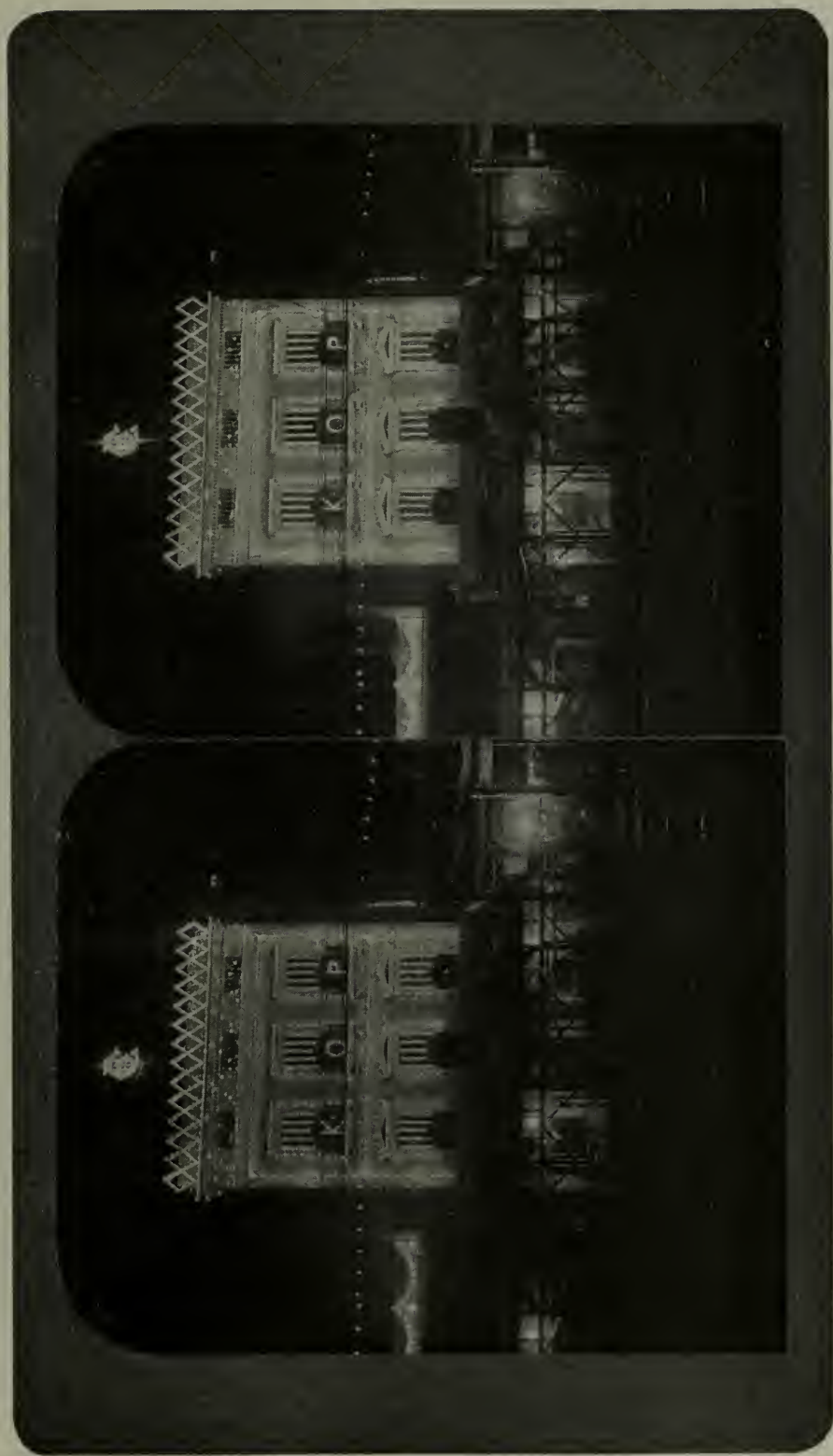


THE much heralded and long hoped for revival of stereoscopic photography begins now to crystallize itself into an accomplished fact. The many advantages derived from this most interesting branch of photography, the superior results obtained, and withal the ease and simplicity of our modern methods of operating, should enhance its popularity, and it requires only a fair trial to convince one that the realistic visual effects of the stereoscopic picture undoubtedly is the process by which photography is shown at its best, and which affords the greatest amount of pleasure and recreation.

As we all know, the most commonplace subjects, which in a single picture barely pass notice, become at once attractive and fascinating in the stereoscope; hence how much more interesting would be such subjects which of themselves possess beauty and merit?

Photographs of night scenes have been considered as subjects of an unusual nature, a sort of "tour de force" of photography. Yet we have here a range of views specially suited for the stereoscope. The pictures which produce the best results in this instrument are those of a rather dark tone, whose technique would be classed as dull or lacking in contrast. But when we examine these pictures in the stereoscope, we notice that much detail in the shadows and dark portions which would not be observed in the single picture, stands out with remarkable clearness, and here lies the special adaptability of stereoscopic photography for the portrayal of night scenes.

One of the greatest difficulties in this class of photography is the long exposure required, necessitating the use of fast plates; but here our choice is rather limited. To obtain the best results the plates must be of a special grade designed for this character of work. In this instance the double-coated plate practically fills all requirements, and it is best to employ



CARNIVAL ILLUMINATIONS, NEW ORLEANS.

Illustrating Article "Stereoscopic Night Scenes," by Henry C. Deley.

one which is also orthochromatic. The exposure with this kind is about the same as the plain double-coated plate, but the effects are superior.

When selecting a point of sight to take the picture, there are several items of vital importance to be observed. In the first place, all strong lights, such as arc lamps should not intrude into the foreground. These will cause a halo and often spoil the picture. It would be advisable to have some obstruction such as a tree or other object to shield the direct rays of the light from the lens, and it would be better still if these illuminations were not included in the view at all.

Another trouble is reflections caused by certain lamps, giving rise to small "ghosts" in the photograph. These may effect the two views in a different manner, one having the defect more pronounced than the other, and it is a rather difficult matter to detect them in the camera, and they are often only observed when the plate is developed.

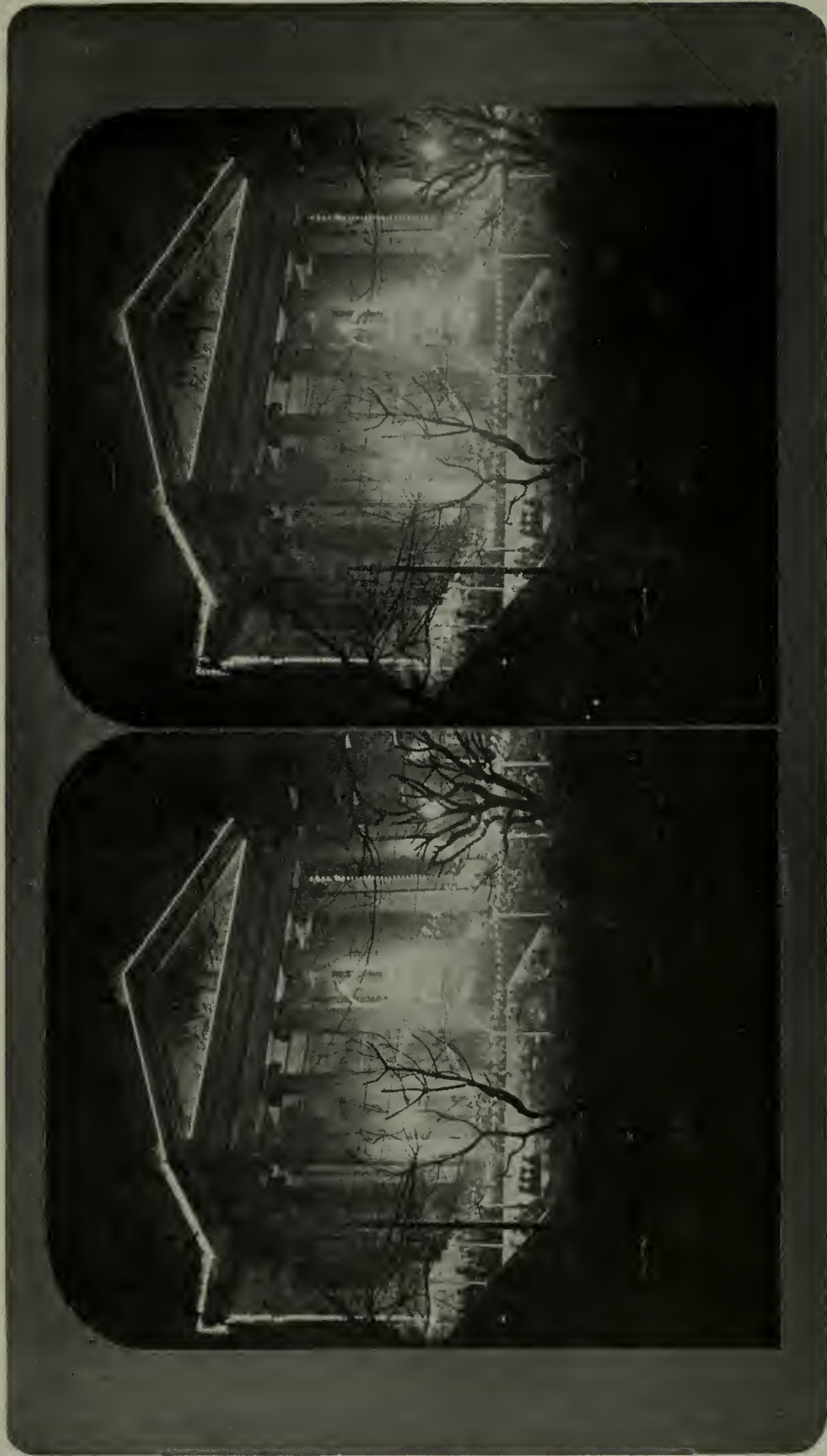
It has been my custom to employ the full working aperture of the lens—with my lens F.8—and although it is quite rapid the views require an exposure of from eight to twenty minutes, depending upon the amount of light and the character and tone of the object being photographed.

Some will wonder, with this prolonged exposure, if a blurred effect is not produced by objects passing in front of the camera. There is no danger of this provided that the objects do not remain stationary for too long a time; in fact the pictures here shown were taken at a time when the streets were filled with people and cars and other vehicles were constantly passing to and fro. One point to be guarded against, however, is when any light appears, as automobile lamps or electric cars, etc. The lens must be temporarily shielded until they have passed and disappeared from the field of the lens. The view of the City Hall illustrating this article was taken on a very windy night, the branches of the trees continually swaying during a very long exposure, but a glance at the picture reveals not the slightest blur. Of course if the lamps move, it will be impossible to make a good exposure. Yet perhaps the greatest danger is not with the objects themselves, but with curious or careless persons who are liable to move the camera.



HOME PORTRAIT.

E. G. Dunning.



CITY HALL, NEW ORLEANS.

Illustrating Article "Stereoscopic Night Scenes," by Henry C. Delery.

Tank development is preferable to other methods for this class of work. To obtain the best results with double-coated plates, the developer must be weak so as to penetrate through the first film and act upon the second or slow emulsion, developing each coating with equal intensity. If one has no tank, a substitute may be improvised by using a large tray which admits of being covered so as to protect the plates from any light which might fog them during the prolonged development. The tray is set perfectly level and the plates with the developer are left stationary, and not rocked as is customary with our present way of operating. It is claimed that this method of horizontal undisturbed development is far superior to the vertical methods. As the solution is left undisturbed, the bromide created by chemical reactions settles upon the high lights and holds them in check, allowing the half-tones and shadows to come to their proper density without over-developing the high lights.

It is generally conceded that the best medium on which to print stereoscopic views is glossy paper; and to produce a more realistic effect, the prints may be stained or tinted slightly with red or yellow color. But this should be done with great discretion, otherwise it might become more of a detriment than an advantage.



THE PYRAMID AT GIZEH, CAIRO.

GUSTAV EISEN.



ONIONS.

FRANCIS A. TINKER.

BOTANICAL PHOTOGRAPHY

By G. T. HARRIS, F. R. P. S.

AT the present time, when nature study is a distinct cult, when even boarding school children have it crammed into them by teachers whose knowledge is mainly derived from nature study manuals, a great impetus has been given to natural history photography, and it goes almost without saying that a photograph of an object of nature is very much more convincing than an artist's presentment, even when the drawing is made by an artist who is himself a naturalist, and scientifically acquainted with his object. At the same time it does not follow that because a photograph has been taken from nature it is always to be preferred to a careful drawing made by a draughtsman conversant with his

subject. One has only to compare many photographs of plants, especially when taken in a state of nature, and which one finds *ad nauseam* in papers devoted to nature study, with, say, Sowerby's drawings of the same plant, to realize how hopelessly misleading a photograph can be made. To be a good nature photographer it is not enough to know how to expose and develop a plate, one must have considerably more than a rudimentary knowledge of the branch of nature photography it is proposed to work in; otherwise, however technically excellent the photograph may be, its value to the naturalist may be absolutely *nil*. In the present paper I propose to give the methods of working I have found to answer most satisfactorily in my own excursions into the fascinating province of flower photography; and it may be desirable to admit that my interest in flower photography is essentially botanical and scientific, so that any inquirer with "art" or even "arty" aspirations will find absolutely no help herein.

Two methods of work are open to the botanical photographer: He may work in the field or he may bring home his plant and photograph it indoors, using suitable backgrounds and lighting arrangements. Or, again, he may adopt the method most suited to his subject; for instance, the great stitchwort is a particularly difficult plant to make a satisfactory photograph of in its natural surroundings, owing to its vegetative system resembling so closely surrounding growth. The cuckoo-pint, on the other hand, is such a striking object that no difficulty need be experienced in isolating it from its surroundings. In many cases it is desirable to supplement outdoor photographs showing natural conditions with detailed photographs of parts, which work is essentially laboratory work.

BOTANICAL PHOTOGRAPHY IN THE FIELD.

The great drawback to successful work in the field, at least in England, is unfavorable weather. Perfectly still intervals of sufficient duration to enable an exposure of, say, one minute to be made, seldom occur; how seldom only those accustomed to this kind of work know. As a rule, exposures have to be made by additive methods, capping the lens carefully on the first appearance of wind. The day par excellence for suc-



PORTRAIT.

Mary Carnell.

cessful outdoor plant photography is a very dull day with slight drizzle. The "drizzle" is by no means essential to successful plant photography; it is merely the almost invariable accompaniment of the ideal day, and as such accepted; in fact, a meteorological "commensal." Next to the dull, drizzling day, the late summer evening offers most opportunities for prolonged exposures, and some of my most successful negatives have been taken quite late in the evening when the light was photographically very poor. It may be observed here that color values are very often quite well rendered at such times, even without a filter. Probably the ideal conditions for outdoor work is a fine, still evening, with the sun well towards the horizon, and yellow light illuminating the object; certainly, with such conditions I have been able to get negatives that impressed me as being of finer quality than those taken when the light was better photographically.

The choice of camera may very well be left with the individual. As Dana Gibson is reported to have said when his advice was asked as to the precise pen and paper to be used for drawing, "Any pen so long as it is a good one, and any paper with a suitable surface." I, myself, use a square half-plate, with reversing and double-swing back, rising, falling and cross-front, long extension. I usually carry six double backs, but I fitted to the reversing back, just inside the camera, a shutter covering exactly half of the half-plate, and which slides to and fro and is, of course, altogether removable. This shutter enables me to expose the two halves of the half-plate on different subjects, making two negatives, $3\frac{1}{4}$ by $4\frac{3}{4}$. The lens is a 6-inch, which with a camera extension of 12 inches, gives me a negative X.I. of the object. Whenever possible the photograph should be made to a certain scale; natural size when the plant permits, half or quarter life size if too large for a negative of the natural dimensions. There is, of course, no scientific need for taking negatives to scale, as individual plants of one species vary so much in this respect, but it is a matter of great convenience to know the proportion the negative bears to the original. So I include a spring tape in my outfit. With the greatest hesitation, and some shamefacedness, I write that—I use a cap when exposing. The tripod is a very firm stand with sliding legs, so that the top

can be brought within a few inches of the ground. Plates should be rapid, at least 250 H & D, preferably backed (though this is not an absolute necessity) and, of course, orthochromatic. The filter when in position is at the back of the lens, inside the camera. Having given these particulars, I would like to add: "Any camera, so long as it is a good one; and any plate, so long as it is suitable."

The bulk of the labor in the field consists of so isolating the object that it stands out prominently from its surroundings. The growth around it must be sufficiently cleared away to leave it isolated, to which end it may occasionally be necessary to place in position a background of some description. The focusing cloth can be used, but it is better to carry a piece of fairly dark brown, soft material. Occasionally the entire plant is better removed with a fern trowel and replanted in some spot with a better background. Color translation will always be a difficult question with the plant photographer, however skilfully he uses his filters and times his exposures.

Take, as an instance, the common English bluebell; make an attempt to photograph a bed of the flowers in some woodland glade, and the result is, without a color filter, a bed of fairly white flowers; with a filter giving correct color translation, a bed in which the flowers cannot, or with great difficulty, be distinguished from the leaves and background generally. As a matter of fact, the botanist will often have to effect a compromise, sacrificing some color truth for the sake of securing a better rendering of form. One of the most useful adjuncts in the field is a discarded umbrella with the greater part of the handle removed. When opened and held by the projecting foot with one hand, it makes an admirable wind screen or sun blind. The reason for removing the handle is that the umbrella may be approached quite close to the object without the handle appearing in the field of view. With regard to exposure, little can be said that will be of any assistance. I have never yet met with the exposure meter that would be of the least assistance in this class of photography. The only road to success is the time-honored one of experience, but a most useful plan is to keep records of all exposures, with full particulars of light, time of day, magnification, etc. It then becomes easy to find an exposure recorded that will be helpful



ALLIUM URSINUM—OUT OF DOORS.

Illustrating Article "Botanical Photography," by G. T. Harris, F. R. P. S.

on some subsequent occasion. I have previously stated my use of the old-fashioned lens cap for exposing, and it will soon be found that the majority of shutters are quite useless when an exposure has to be got by repeatedly opening and closing the lens, owing to the risk of movement in resetting the shutter. If there is a prospect of having to make an exposure by instalments, particular attention should be paid to the secure foothold of the tripod before commencing to expose. Nothing is easier than to lose a negative through one or more of the tripod legs gradually sinking in soft earth or in a bed of leaves.

With regard to the development of the plate little can be said that would prove helpful. The whole tendency of modern photography is towards automaticity, and development has had to fall into line with the other operations that have been harnessed. If every care is taken to secure as correct an exposure as possible, the method of development does not very much matter. The character of the negative does, however, matter a good deal. A "nice-looking" negative, crisp, with clear shadows, is quite useless in botanical photography. What has to be constantly kept in mind is the correctness of the color values, and no true color translation can be expected from a negative with crisp, high lights and clear shadows. My own preference is for a pyro-soda developer, used without bromide if the plate will stand it. The result is usually a somewhat flat-looking negative, unless the object has a dark background. Metol-hydroquinone is a very suitable developer for this class of work. The test of the negative is the print, and the operations of exposure and development must be adjusted so as to make it as much as possible a transcript of nature.

LABORATORY BOTANICAL PHOTOGRAPHY.

Plant photography indoors, while it covers a very much wider field, is altogether easier and less trying than field work; no dense growth has to be cut and pulled away, no wind springing up at critical moments, no capping and uncapping of the lens, with its accompanying risk of movement. In the laboratory matters are more or less under the photographer's control, and little difficulty occurs that cannot be overcome by patience and ingenuity. As a rule the laboratory work



WILD MIMULUS—IN-DOORS.

G. T. HARRIS, F.R.P.S.

Illustrating Article, "Botanical Photography."

consists of photographing the entire plant and making enlarged photographs of the various organs, etc. Dealing first with photographs of the entire plant: This has to be supported in such a manner that it displays the plant in a natural manner and without the support being obtrusively prominent. To do this, simple as it may at first seem, will lay a heavy tax on the skill and ingenuity of the operator, for it does seem that every plant requires a special piece of apparatus, designed to hold

it in a firm and suitable manner. First of all, movement from evaporation has to be guarded against by seeing that it has access to a water supply sufficient to replace the loss by transpiration; and when it is remembered that this process is so rapid that a plant like the sunflower will give off about a quart of fluid in 24 hours, it is conceivable that even in a comparatively short exposure movement from this cause may ensue. If the object is merely a portion of the plant, the cut stems may be passed through holes punched in a strip of cardboard supported on a vessel filled with water, the base of the negative just clearing the cardboard support. Where this cannot be used, tufts of cotton wool saturated with water may be wrapped around the severed ends of the stems. At the same time much inconvenience may be obviated by seeing that the atmosphere of the laboratory itself is humid. As the exposures indoors with a filter are, even under the best conditions, rather protracted, it is best to wait a short time after the plant has been arranged, so as to allow any strain that may be present to pass away.

Where the plant is of moderate size and it is desired to show the whole of it, I find it may best be accomplished by fastening the plant to a stout wire held by a test-tube holder, if the wire is fastened to the plant at some place covered by a leaf or stipule the horizontal portion connecting with the holder shows against the background as a thin, dark line, which may easily be penciled out in the negative. The background is best supported on an individual stand, so that it may be manipulated independently of the flower support. I employ rather a large stand on castors. It is what in a portrait studio would be called a "cloud effect" background, and I am able by pushing the background to and fro to pick out some portion of the background that will be an effective contrast to the plant before it. One great advantage to be gained by photographing plants at home is the possibility of arranging them so that the principal parts come in the same plane; this permits of a larger stop being used, and less risk of movement.

For detailed work of parts of plants, such as seed vessels, single flowers and similar things that cannot be regarded as photo-micrography, I use a camera and baseboard similar to those used in photo-micrography. At the opposite end of



HOME.

W. SMEDLEY ASTON.

the baseboard is a small frame sliding in the same grooves as the camera, which carries such sheets of "art" paper as I may decide to use for background. The object carrier is usually a test-tube holder, but may be any temporary contrivance that happens to hold it best. Using a short-focus anastigmat lens, magnifications of three diameters can be readily got with moderate bellows extension. It should be borne in mind, however, that the detail-giving power of a lens is proportional to its numerical aperture and that the N.A. of a photographic lens is very small, hence it is always necessary to employ lenses other than purely photographic when much enlargement of parts is needed.

If work among such plants as the gramineæ is contemplated, it may be better accomplished by employing the camera vertically and arranging the plant on a sheet of glass, below which, at some distance, is the background. This method necessitates a stand made for the purpose, but it may be quite a simple piece of apparatus, and is quite worth the trouble.

In conclusion, I may offer my apology to the reader for what appears to me to be a lack of practical information. Many pages of this ANNUAL might be filled with devices used for one purpose and another, which would each need illustrations to make them readily comprehensible, and even then they might not apply to the exact want of the inquirer. Each worker has to find for himself the methods that are most useful to the particular work in hand. The methods and apparatus that would do admirably for, say, a series of photographs of carices would be almost useless for one of mosses. So I would ask the reader to take these hints for what they are worth, and if by chance they inspire anyone to attempt the absorbing pastime of plant photography I am amply repaid for the trouble of penning them.



CHILD PORTRAIT.

Harold Cazneaux.



CATHEDRAL ROCKS, BERMUDA.

L. P. GRATACAP.

THE CAMERA IN BERMUDA

By L. P. GRATACAP

FEW places offer to the scene-hunter more delicious little bits of sunlight, water and land than these entrancing islands. The whole dreamy and delightful archipelago covers hardly more than twenty-four square miles, but every yard of its diversified and fruitful surface tempts a snapshot. And then the sunlight—such downright blistering illumination will give you *something*, though a little carelessness may be punished by flat pictures. You can wheel around from shore to ocean, from villa, or bungalow, or cottage, to break-



SOUTH COAST, BERMUDA.

L. P. GRATACAP.

ing crests of sea-green waves plunging in from turquoise depths; a palm waves over your head, and directly opposite you the life-plant makes a fringe along the gray summit of a wall; here is a picturesque and scrambling crust of huts, and within a stone's throw is the ocean, calm, unruffled, flooring the rounded earth to the girdling horizon with the deepest sapphire; now the darkening shadows and the flashing highlights on some poinciana tree tempts your skill, and anon the pavement of waters where the light is reflected, paling in places its oriental blueness, while lapping the coves, bays and indentations of the shore under cavernous ledges of cellular pitted limestone, it covers the marble bottom with a chrysalitic sheen.



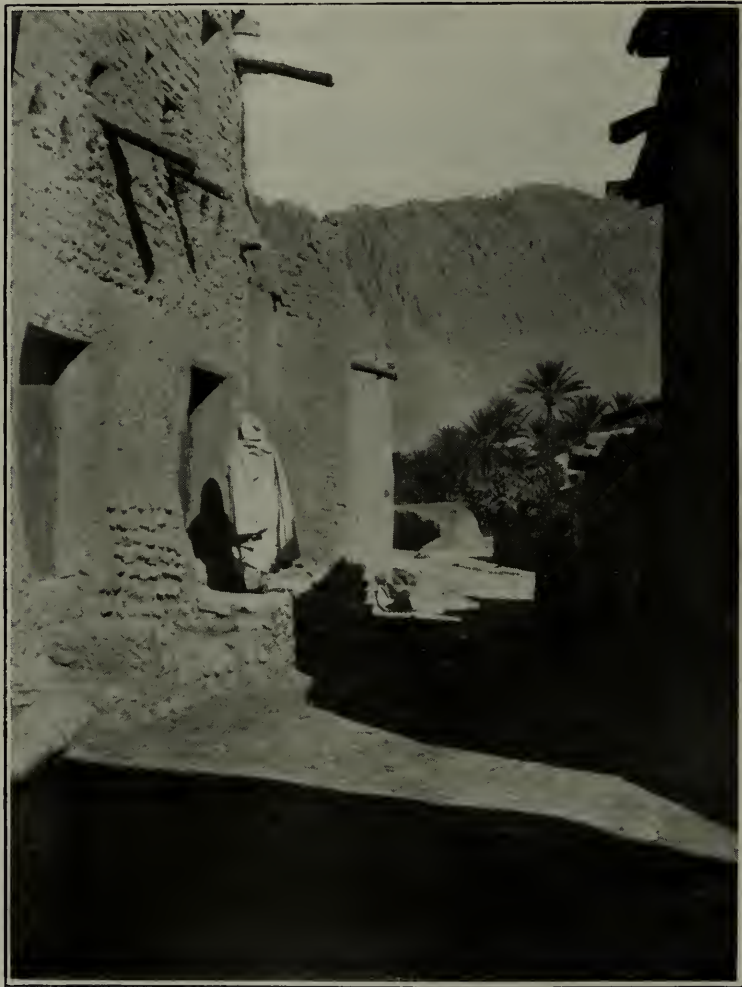
HAMILTON HARBOR, SUNSET.

L. P. GRATACAP.

Here windbreaks of oleanders make admirable pictures, while a stiff papaw column with its pouch-shaped fruit below its crown, a palmetto, a cocoanut palm and the luxuriant banana plantations furnish a retinue of quickly succeeding impressions that the camera-artist in dismay struggles to retain on his vanishing films. It is impossible in Bermuda to withhold admiration of the illimitable detail in its roads, shores and fields—a detail always delicate and alluring

At an angle of Harrington Sound, a stone wall, pale and mossy, overhangs the water just above a button bush that has grown stout or deformed and hangs its lower bower of leaves above the nacreous nipple. Perhaps by no art can the photographer quite catch these subtle effects, and yet I

would not call them subtle either—there can be no mysteries in such revealing sunlight—it is their brilliant surface that he misses. But he can easily make good pictures there; his indispensable coadjutor the sun is seldom lachrymose or retiring for a long time. It will dazzle him with light, and when, as often happens, the saturated air gathers its moisture into cloudscapes he will have a chance to bring home the most glorious sky pictures. A warning—let him unfailingly put his film rolls in good tin cylinder boxes, sealed with hospital tape, and let him note carefully the date on his film covers, getting them as fresh as possible.



TOWARD THE SAHARA.

H. M. LOMAS, F.R.P.S.



IN THE BERKSHIRE HILLS.

Rudolf Eickemeyer.

PICTURES FROM AUTOCHROMES

By H. F. PERKINS



THE superb color-photographs obtainable by the Lumiere "Autochrome" process have won a notable fame in every part of the world in the very short time since their invention. Their wide use by portrait makers, designers, naturalists, has made them familiar to a multitude of people. It may not be amiss to call attention to the opportunities for carrying the usefulness of the Autochrome beyond the single color transparency, the result of the original exposure

I. AUTOCHROMES FROM AUTOCHROMES.

Many autochromists have paid little attention to the duplicating of successful color-plate positives by copying—a thing very well worth doing in case the exposure, for any reason, cannot be repeated. The best subjects are positives with good depth and vigor, but not of extreme contrasts, evenly lighted and fully exposed. Delicate tints of blue and yellow are the most difficult to reproduce. The original picture is placed in an opening in the dark room window, or in the back of an improvised copying camera, lighted by strong daylight, or full sunshine reflected upon the plate by means of a white card. Dull cloudy days should be turned to some other good use than this. In the majority of cases, such methods can, with a little practice, be made to yield results which will be nearly, if not quite, equal to the original.

2. BLACK AND WHITE FROM AUTOCHROME.

It is certain that Autochromes show the colors of nature not only with vividness and beauty, but correctly as well, when they are handled with reasonable care. This fact may be used to give a new interest to this most fascinating branch of the art, for besides the single original picture in color, the

photographer has in his hands the basis for the finest imaginable studies in monochrom. The Autochrome is copied, enlarged or reduced, just like an ordinary transparency. The plate used should be slow, and by selecting the plate and developer for contrast or softness, the range or key of the Autochrome may even be improved in the process. Certain it is that the illusory something we call "atmosphere" is preserved in a striking degree, and yet clouds and foliage come out as if the ray screen and color sensitive plate had been brought into requisition.

In spite of the oft-repeated charges of narrow range of exposure for Autochromes, the writer has again and again succeeded in retaining filmy clouds in a blue sky, and in bringing out in the same plate detail in heavy shadows of rocks and trees.

With a good Autochrome in your hands, the limitations of time and distance are overcome. You may, at your leisure, and in your own laboratory, experiment with plates, exposures and developers, until you are satisfied and your results are likely to be finer than if you had started out by making a regular, plain negative, or a dozen of them for that matter, from the scene itself.



THE LONE FISHERMAN.

E. L. CRANDALL.



SOME PUNKINS.
(Copied from Autochrome Positive.)

Illustrating Article "Pictures from Autochromes," by H. F. Perkins.

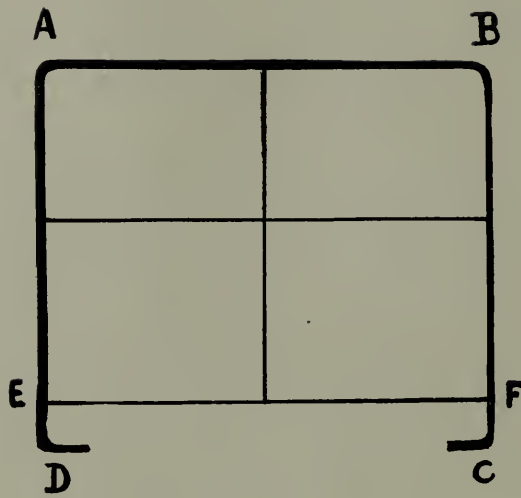


Fig. 1.

THE DIRECT VISION VIEW FINDER

By FRANK E. HUSON

IT seems surprising what little we hear of the very useful and at the same time absurdly simple contrivance known as the direct vision view finder. It can be fitted to the camera to give the actual view with whatever lens we use, providing it is not a telephoto combination. We can see our image right way up and full size. We can make the finder with a few pieces of wire in a few minutes.

We require a light framework of stout wire in which very thin crosspieces are fitted so that the crossing point will indicate the center. This is fitted to the front portion of the camera while a sighting piece, from which one may always take a central view through the apparatus, is fitted to the back.

To go into the construction in detail, Fig. 1 shows the finder, the outer frame A B C D being one piece of stout wire say 1/16 inch thick. E F is a similar piece fastened to complete the shape. The crosspieces I make with very thin hair-pins (begged or borrowed) or with steel banjo strings. The

pieces of the outer frame are bent inwards in order to form hinges so that the frame may fold flat to whatever it is fitted. I find it advisable to raise the actual finder above the level of the camera a little distance, as shown, that it may clear any screws or projections there may be fitted thereto. The



Fig. 2.

finder is fitted to the camera by narrow strips of tin bent over the projecting pieces and screwed down, thus completing what is practically a hinge (Fig. 2).

The back sighting piece can either be a piece of metal about one-half inch wide or a piece of wire bent to shape as shown in Fig. 3. This is fitted to the back of the camera so that it may turn out of the way when not in use. The

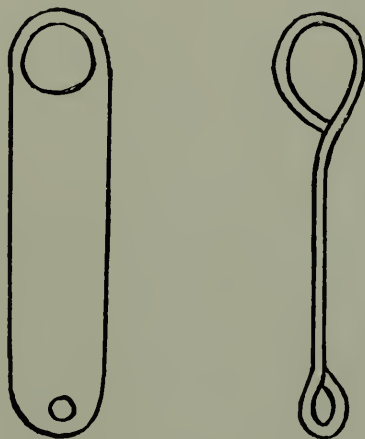


Fig. 3.

whole should now have a coat of black enamel or, perhaps better still, dead black.

In fitting to a camera of the box type (Fig. 4) the reader should be careful to note that as the back sight is fitted on the back of the camera, the finder, if full size, should not be fitted on the extreme front, but at the focal length of the lens in front of the back sight. In fixing to a bellows camera it is convenient to screw it to the lens board when it will be available for lenses of any focal length. In this case the

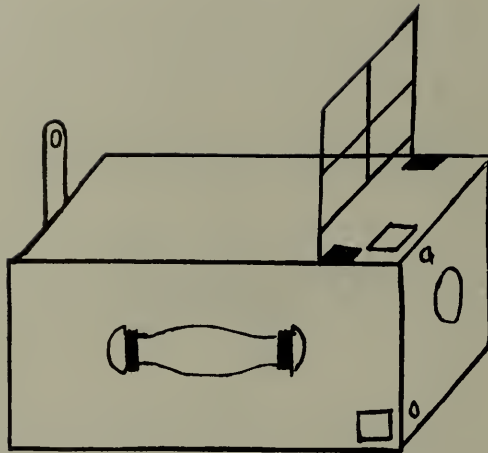


Fig. 4.

finder should be made to fold down over the camera front when the lens is removed.

I have used home-made finders of this type for some years on many cameras and have found them of great value, and I feel sure if the reader will prepare one of these finders and fit it to his camera (even if it is supplied with other finders) he will not regret the half hour or so spent in the making.



CHATEAU DE FRONTENAC,
DUFFERIN TERRACE, QUEBEC.

HARRY GORDON WILSON.



OVER THE HILLS—SUSSEX.

FRANK E. HUSON.

A HANDY WAY TO USE MAGNESIUM RIBBON

By WM. H. ZERBE



SERS of magnesium ribbon well know the good use to which it can be put in photographing interiors, portraits and still-life subjects, on account of being able to handle the amount as well as the direction or arrangement of the light. Those who use this method of lighting also know how awkward it is to handle if a piece of ribbon more than 12 inches long is required to light the subject, how it swings about, goes out before the end is reached, and how the ashes are generally scattered over the floor.

Some time ago the photographic magazines gave a method that was an improvement over the long strip. This was to weave a number of short pieces like the weave of a basket. I have used this method, but did not find it entirely satisfactory, and have hit upon a way I believe to be an improvement. I take the required length of ribbon necessary to properly light my subject, and wind it around a piece of straight wire about $\frac{1}{8}$ inch in diameter in the form of a spiral spring; wound in this fashion, the 2 feet of wire is no longer than 6 inches, and can be ignited and held in the usual way.

I have been using a very simple and efficient holder made from a can that held platinum paper. The photograph (Fig. 1) will show how it is made, also show a piece of the spiral ribbon hanging ready to be ignited. The can is slitted on both sides of the seam or lock joint to about $\frac{3}{8}$ inch from the bottom, cutting off the seam at this point. It is then cut in on both sides of the slit at top and bottom so that the tin can be spread out as shown, thus forming a reflector; the bottom serves as a receptacle for the burnt ribbon. For the top, the cover of the can is fastened to the holder; from this top hangs a spring clip such as is used for holding price cards or small articles on a line. This clip holds the spiral wire.



Fig. 1.

The seam or lock joint can be used as a handle for the holder. It is bent to fit the four fingers, and two holes punched through the back of the holder and the ends of the handle inserted, then fastened by bending the ends over on the inside.

With this holder the light from the spiral ribbon can be directed wherever desired so long as it is kept out of range of the lens, and can be carried to any part of the room during exposure, thus giving one part more or less exposure, as desired.



THE OPEN BROOK IN WINTER.

WM. H. ZERBE.

SOME HINTS ON PHOTOGRAPHING TABLES

By A. B. STEBBINS

IN hopes of helping some photographer who working alone has no chance to consult an expert, or is in despair over the meager literature on the subject, I contribute these notes, which are the result of experience under the above conditions.

I wish to say that I have met with quite a measure of success in that most important point—of suiting my customers—who, like all furniture men, are very particular, and will scarcely believe that any photo does justice to their work. One reason for this is that their traveling men blame the photo for any slackness of sales from it, and vice versa, give the picture credit of a good seller, although neither may be correct.

Find out by all means in your power just what your house wants, and then do your best to fill the bill. It is not unusual to make negatives to suit some one drummer. One of the best selling tables made by the firm I photographed after consulting with their New York agent. The firm thought, and I also, that the result was not so good, but the pleased salesman made a big success of it. Endeavor to have their most expert man help pose the tables, and keep in mind he carries a large line of photos from many different houses and he has the opportunity to compare your work. The comparisons will be odious for either you or the other fellow.

Let us now proceed to pose a table, say a pedestal extension dining table. The first point is the height of the camera, which will depend on the focal length of your lens, the longer the focus the farther away and higher you will have to place the camera. Your furniture man will want the table top to look rounder than the natural perspective taken from the usual height. Some accomplish this by tilting the table, but one is apt to overdo that. It also cuts off light somewhat from the pedestal. If you raise the top alone it distorts the table. If

you block up the back legs that will distort them, making them look too high up in the air, and cut off too much of the pedestal, also foreshorten the whole lower parts.

We make all sized tables to fill the photo, a 40- to a 55-inch top being the same size, so you realize the proportion of the pedestal to the top is a very large problem to consider, and has caused much discussion in my studio. Often all the members of the firm and what salesmen were at hand are needed to settle the question. It is obvious that too large a top will make the pedestal look small and the whole table too low and flat, while too small a top makes a tall, spindling table with too large a pedestal. The more sensible way would be to take each size in its proper proportion all the same distance from the camera, but as this won't go the happy medium must be found in each case.

How shall we set the pedestal is the next question. In a cheap table, with legs of say three thicknesses of seven-eighths stuff, do not set the front leg edgewise to the lens, for it will make them look too thin, although doing so would give a spread to legs that some salesmen like, and insist upon. He will be apt to be disappointed, for he likes to make out that his cheap tables have a lot of lumber in them. In elaborate and carved bases the most important point is what position will show the carving best. Even here do not forget the relation of the pedestal to the top. (See illustration No. 1). Had one of the "graven images" been straight front, the carving would have looked more elaborate, but the whole pedestal would hardly have been covered by the top and the photo been absurd, although it is a large top. Ordinarily I try to make the whole look symmetrical—see illustrations No. 2 and No. 3, which are posed to show equally the four legs. The proprietor's taste is the final law, nevertheless the above considerations of proportion and symmetry produce that indefinable something which makes the picture a success.

Now let us put on the top. The top and apron are sawed in two parts for extension. Do not place the top with this cut endwise to the lens so that it will show. They will reject it every time if it does. Notwithstanding, you can get finer effects in the grain by placing the wood endwise to the camera, see that the top is level. By the way, no tops are fastened on.

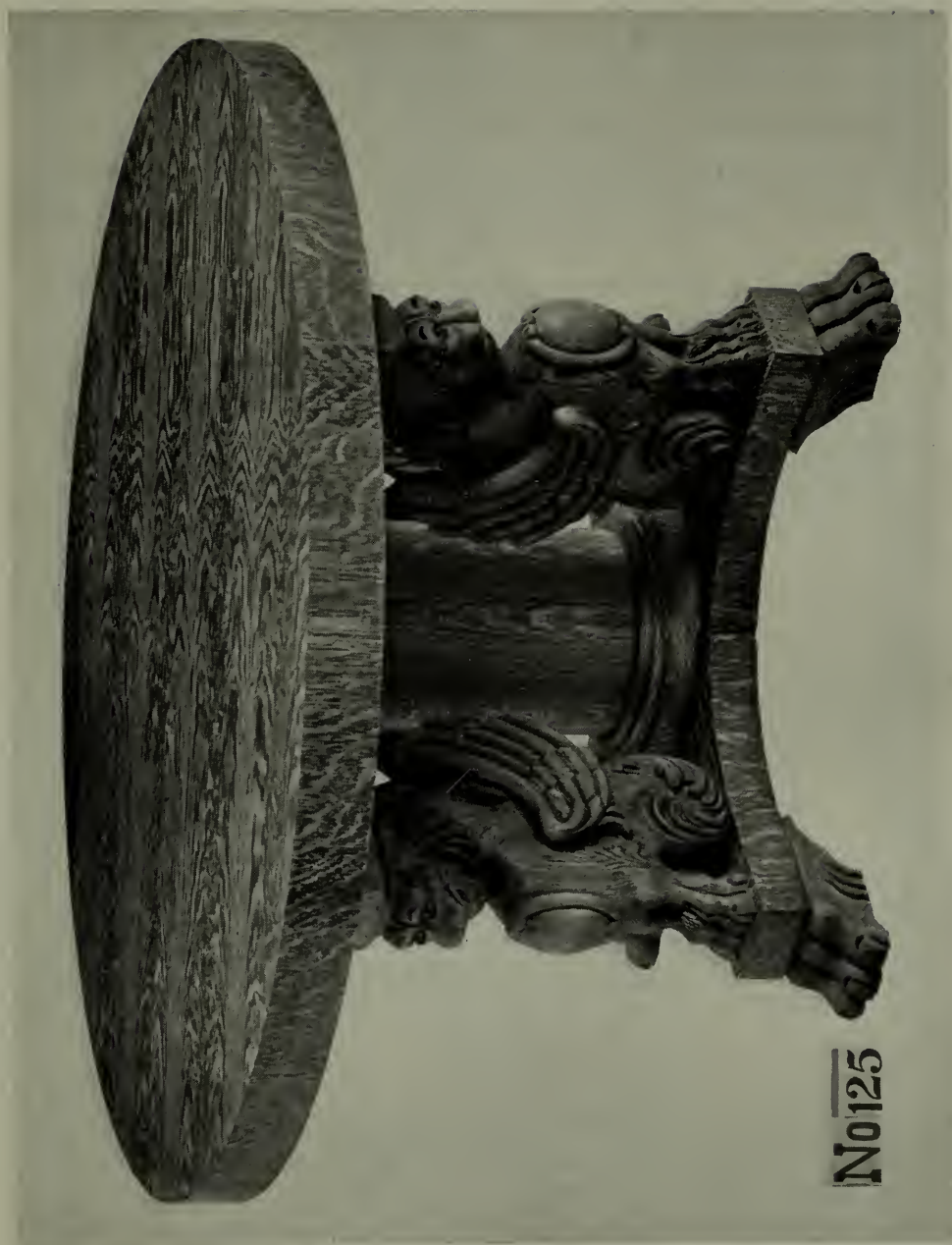


Fig. 1.
Illustrating Article "Some Hints On Photographing Tables," by A. B. Stebbins.

Measure the top on each side from the pedestal. The eye will not be correct enough. A quarter of an inch will show it one-sided. Have your furniture man run his hand up the pedestal to where he wants the top to cut it off, then while you look through the camera have him shove the top front till it cuts off right. This and height of the camera will give that low, massive appearance so loved by salesmen. I get the lens of my camera 5 feet from the floor, and it is 26-inch focus.

Lighting. Have a large white muslin cloth to cover the floor



Fig. 2.

and run up the background 4 or 5 feet. After placing the table take a strip of black calico and pin it on the background just low enough to come within an inch or so of the top when looking through the camera. This is to cut off any reflected light from the background on the table top; an important point: hang a large white cloth 6 to 7 feet high and as wide on the wall opposite the light. I also have a cheesecloth head-screen 6 feet wide, which runs on wires just high enough to clear the head, extending clear over the table to the side screen and to within 4 feet of the light, where it drops down to the

floor. I will further explain that I work in a room 15 feet wide with a single slant light 9 x 12 feet.

The most important thing in lighting is to unlearn all that you have been taught about portrait lighting, to work and learn to see when you have an absolute flat or diffused light. I have two small side screens which I use to correct as near as I can any lack of light on the front of the table, often working as near into the range of the lens as I can. Even with these you will see that I get shadows in the front. Now get



Fig. 3.

in front of the lens, shut one eye and if you can see any light spots or reflected light do all you can to correct them by your skylight curtains. I usually cut off the lower half of the light, even with the cheesecloth intervening, and often hang up an opaque curtain between to balance up the light on both sides of the table.

Before exposure a few words on faking. I do as little as I can; some try to fake up the whole thing, but generally make a failure. If you think that some dark piece of wood or some part in the shadows needs the grain or flakes lightened up, put

on a little whiting with a large paper stump very carefully and delicately, and with a camel-hair brush blend it off, examine the effect from some distance and continue to blend off till the whole is harmonious, being sure that the part worked up will not take lighter than the rest of the table. Remember that you are using white and that there is no white in the table. In carvings and ornamental work with a stump and a little crayon sauce, work in the lines that will not show up strong enough, especially in the shadows, and so bring the work out in bold relief.

I forgot to say that one of the best things to do is to wipe off the table with a rag, wet with turpentine, or better, a mixture of half kerosene, half benzine (the latter will cause the varnishes to kick) ; this will brighten the grain a lot. Better than all faking is to have the wood stained and filled right, and carefully selected to harmonize in color and grain. I could say much about staining and filling, but that belongs to the furniture manufacturer; kick on all pieces such as carvings, table legs, etc., where the end of the wood is filled a dozen times darker than the rest, for it can be avoided by putting on the filler to the end of the grain and dipping the end into a very dilute stain. This can be done so neatly that the piece will be the same color all over. Lay a piece of white paper on your table, consider how much lower in value are the yellow flakes that are to be your high lights, the narrow scale between them and the brown of the filler, which are to be your blacks, the flatness of the lighting, the necessity of detail in the shadows and high lights, the possibility of any part being too strongly lighted, a stray gleam of reflected light, the top cutting off the light from the base. All these factors make the margin of correct exposure very short. Expose for detail in the shadows and develop for brilliancy, using the minimum of carbonate of soda with a dose of bromide. Develop fully; if need be, reduce. Under-exposure or under-developing I never could correct by intensifying. I sometimes do some local reducing, as there is no background to be careful of. It can be done with a small sponge wet with a weak solution of Cramer's reducer.

I varnish with an alcohol shellac varnish and block out with Gihon's opaque. I know that this is old-fashioned, but if I overrun a line I wipe it off, and taking a clean damp brush



THE EDGE OF THE POND—EARLY MORNING.

Malcolm Dean Miller, M.D.

wipe out little irregularities or soften a line that needs it. Use a ruling pen for all straight lines, cut off ends and wipe out corners with the damp brush, block out about half an inch from the image, have some pieces of tissue and black paper that the D.O.P. came rolled in, cut the size of the negatives, daub a little paste on the corners of tissue and stick on glass side of negative; put in retouching frame, trace image and while the paste is still wet stick on black paper; trim out with shears and paste black paper on negative. This is a quick way to block out a series of negatives. I also have a very thin varnish that I flow over to hold the opaque, which is made by putting a few drams of white hard varnish into an 8-ounce bottle and filling with benzine. Faking on the back of negative is very limited, occasionally the lower part can be covered with tissue but not often, as it is too strong. More often you can varnish and grind with pumice stone over the parts that need it, adding a little black lead rubbed on with the finger.

For prints I use D.O.P. entirely for blocked-out work where you must have clean whites. Expose fully and do not force the development. I use as little iodides as I can get along with, and put it in only as I need it, as it gives bluish tones, and I think that the developer fogs quicker with it. I find Argo soda a necessity when prints are running a little flat or have a tendency to fog, putting in 15 to 20 grains to 20 ounces of developer; it has saved me lots of prints. Do not overwork your developer. The above quantity will run twenty to twenty-five 8 x 10 prints. In using roll paper it curls badly, lay the print face down, put both hands on the middle and slide them out to diagonal corners, catch hold with thumb and fingers, roll the hands inward, curling the paper backwards, slide face down into developer, patting down, keeping it under till the curl is out enough to turn over; take a look for bubbles, turn back till nearly done. By this method you can use a good light and save prints from fogging.

I consider Ortho plates and a ray screen a necessity, and use Cramer's medium, Ortho and Isos III screen. Some workers claim to work successfully with slow plates, but I have always got too much contrast; they may be all right for furniture that can be lighted evenly, but a table is the most difficult piece of furniture to photograph.

TONE VALUES IN PORTRAIT PHOTOGRAPHY

By HAROLD CAZNEAUX



ONE of the greatest triumphs of photographic art at present is the correct rendering of flesh tones, etc., in portraiture.

The photographer who exhibits prints with pose and expression reflecting the sitter's personality and temperament, and at the same time suggesting real flesh tonal values, not only does justice to himself and his sitter, but also advances the art of portraiture by photography. The old school of white faces and hard range of tone on draperies and backgrounds is surely passing away.

However, it seems a pity that many photographers who have advanced their work by portraying excellent character studies, fail as yet when their tonal qualities are questioned. The subject is worth careful study, many will say, but how? My advice to those is the word "observation." Cultivate it and take its meaning to heart. Make a start by examining paintings by such a maker of tone as was Rembrandt; one will probably have recourse to the reproductions. Those in black and white will teach the photographer many lessons. Notice the subtle range of tone in most of the portraits, the beautiful rendering of flesh tones; there is an absence of hard whites and blacks.

The luminosity of the backgrounds can come in for comment. They are *not* black, mind you, but dark and full of light; our photographic background is as dead as dead can be. If our flesh tones are to be good, well, our grounds must also be luminous.

A study of the best modern portrait painters would be an advantage, even if in reproductions, as very little is lost now-a-days in the etcher's art. One of the Photo Miniature Series, No. 95, deals effectively with tone principles. Add it to your library, if you have not got it there. "Let the high lights fall on the face." This is a tip that many photographers



THE SISTERS.

Illustrating Article "Tone Values In Portrait Photography," by Harold Cazneau.

have followed carefully, and have accordingly come some croppers as regards tone. Suppose the sitter wears a white collar or fur. Would it be correct to place a higher light value on the face than that reflected by the white collar or fur? Certainly not; that collar or fur would be out of tone.

If the photographer observes whilst being shaved some morning the effect of the white lather against his face, he may be surprised to learn how much darker is his flesh in tone as compared to white. White has the property of making a gray look darker by contrast. Now, if black is added, such as drapery, the white seems intensified. This also applies to the black. If the white collar is removed, the black seems less intense, but the flesh tones now appear lighter but far from white, as has been proved.

How many of us have seen portraits of people arranged in dark dresses with white faces? A knowledge of the tone values would have prevented the photographer passing such work.

The so-called "Rembrandt" light in the studio is generally at its best a streak of light outlining the profile in relief; the rest of the face in shadow with a black ground to back it up. The hair in many cases is rendered as white as the light on the profile. I've seen many a hideous libel on Rembrandt's light by people who did not know the meaning of the relative value of tone. Rembrandt used the pencil of light, but there was a reserve and holding in of the power that such a light could give.

This is where the photographer fails. The undiffused strong top light becomes fatal, the high lights get clogged up in development and the shadows take on too deep a tone; some of them are not far from clear glass.

One of the most subtle effects is the combination of tone in dark drapery and flesh. If the lighting is correctly and sympathetically done there should be a very beautiful contrast in light and dark grays.

To raise or lower the range of tone in portrait work one need only manipulate the area of studio light that is available. I don't mean alteration of the blinds that have been arranged to let in the light, but rather by the use of diffusing screens, drawn over or away from the light area. Thus a brilliantly



THROUGH THE ROYAL GORGE,
COLORADO.

George L. Beam.



PORTRAIT OF MRS. D—.

HAROLD CAZNEAUX.

lit portrait would show a long range of tone from black to white, and is seldom satisfactory from an artistic standpoint, whilst the very diffused light in portraiture would have a short range of tone, the white objects would be distinctly softer or grayer, and the blacks less intense and more luminous.

It is this scheme of lighting adopted by the advanced photographers of artistic feeling that has done much to lift portrait work to a higher plane. They know the value of tones and the light to get them. In outdoor work in portraiture the two schemes of lighting hold with the studio alike, with the exception that the brightly lit work is done during the bright part of the day, and the soft lit or tone work is done during the fading light after sundown. Most of my portrait work is made during this interval out of doors.

During cloudy weather it is possible to work before sundown, and if observant one can get beautiful lighting.

What about high-keyed effects? one may ask. The principles still hold good as regard tone in high-keyed or sketch effects of good quality. Contrast is avoided. A flat light is generally made use of in conjunction with light drapery and grounds; a good exposure is given, which secures, as a rule, a short range of tone in a high key. An accent note can be made by the introduction of dark objects such as a tie, belt or child's toy, etc. This will be found to be the very reverse of the use of the light object in the dark picture, but the law of contrast holds them equally important.

Let one open up the keyboard of a piano and consider what a range of tone, light and shade and accent notes is represented there. A musician will select a key, around which he weaves his composition and tone values. Then let it be so with us photographers to see that our notes and tones are correct and in keeping with the chosen key.



A RESTFUL HOUR.

KATHARINE BINGHAM.



THE LITTLE CHURCH ON THE CORNER.
Exp. 20 Min. Stop 4, Stanley Plate, Symmetrical Lens.

CHAS. M. SMYTH.

NIGHT PHOTOGRAPHY

By CHAS. M. SMYTH.

IT has not been so very many years since the first instantaneous photographs were taken. Previous to that time it was necessary for the photographer to give his plate a time exposure even in broad daylight. The dry plate of to-day has been perfected to such a degree that in even a subdued daylight one may take what may be termed an instantaneous photograph. Such a condition causes a photographer to wonder how long it will be before he can take views he is familiar with after the day is gone and the gaily dressed people come forth for their evening's pleasure and recreation. A street scene that may look cold and uninviting in the day time when



THE CLOSED SEASON FOR
THE THEATER.

CHAS. M. SMYTH.

Exp. 14 Min., Stop 16, Eastman Film, Rectilinear Lens.

lighted by the brilliant artificial lights at night will have a warmth and picturesqueness unsuspected. The obtrusive objects disappear by night and the unlighted corners and dark recesses take on a grotesque appearance almost fascinating. But even in the most brilliantly lighted places the light is so inferior to that of daylight that it is not an easy matter to take a photograph.

Even now night photography is not an uncommon thing. But the photographs that are taken at night, as a general rule, are of brilliantly lighted buildings or streets and the principal detail consists of the attractive array of lights, with here and

there a glint from a protruding cornice. Such photographs are usually taken by long exposure and are void of the moving objects that give them life. Ordinary movement has no effect upon the plate unless there be some conveyance with a light pass before the lens. In such instances it is necessary to cover the lens with the slide from the plate holder or, with an automatic shutter, to close it until the light has passed. Otherwise the moving light would cause an annoying streak across the plate.



THE BROWN PALACE HOTEL.

CHAS. M. SMYTH.

Exp. 20 Min., Stop 8, Eastman Film, Rectilinear Lens.

It is not necessary that one be a professional, nor must he be equipped with the very latest and most perfect appliances possible to produce. Any ordinary dry plate will produce a good night view—the difference in the speed of the plate regulating the difference in the length of exposure. It is true some lenses are better adapted for the taking of photographs at night where bright arc lights shine directly into the camera, and in such cases non-halation plates will also produce the better results. But where it is possible to get objects such as limbs of trees or telephone poles between the lights and the



THE REFUGE.

LOUIS J. STEELE.

camera any lens will answer the purpose admirably. With a little manipulation one can usually obscure arc lights except where there are too many. Incandescent lights do not usually cause blurs by halation unless over-exposed. A little halation around the brighter lights, if it is not too sharply defined, is not altogether objectionable, as a little haze gives a truer appearance of what is really seen with the eye.

It is utterly impossible to give a definite time of exposure for a night photograph any more so than for a daylight picture. Night photographs are shown that were taken where conditions were the very best; where many brilliant lights threw their bright rays upon the scene to be taken and when the night was a wet and rainy one so that the wet pavements caught and reflected every particle of light. It is said such photographs had exposures of close to a second. Those photographs were an achievement and were produced with the most rapid plates and lenses. Such photographs as the novice may attempt might need exposures ranging anywhere from 3 to 30 minutes, but should be of scenes where the absence of life and moving objects would not be a serious objection. Sometimes the help of a few assistants who are willing to stand quietly for a few moments will greatly improve a scene.

The accompanying photographs were taken on low-priced plates of an ordinary speed and with cheap lenses, and are presented only with the purpose of showing what an amateur, with a little patience and perseverance, can do with an ordinary outfit.

But after all, who among us can now tell how far distant the time may be when we can sally forth with our camera and take the fantastic scenes that we all are familiar with about the streets of our larger cities after dark?




PORTRAIT.

Miss Reineke.

COLORING PHOTOGRAPHS

By EDGAR A. COHEN

HEN some dozen years ago I began selling my photographs, the demand was almost entirely for monochromes, viz., one color. This was true as to art dealers in cities, stores at resorts and private customers.

Visitors at resorts and tourists were in the habit of buying views of local interest, both to send away and for themselves. Most anything with merit sold well. The coming of the colored postal enabled them to supply their wants much more cheaply, and they now expend on photographs only half the former amount; besides which both subject and technique must be exceptional to tempt them.

During the past couple of years the colored photograph has become so popular as to still further decrease the sale of the uncolored. Many of the wealthy, while willing to hang on their walls a fine uncolored photograph, refuse space to it colored, because they claim it is neither a painting nor a photograph; but the majority will purchase if it is artistic and the colors true.

I am finding that sales of my colored and uncolored work net me about the same amount. I get three and a half times more for it colored, and while many might prefer it that way the condition of their pockets is a factor to be considered.

Will the colored photograph retain its hold on the American public? I believe not; because crude coloring and cheap imitations will weaken it.

There are several good lines being shown here, but most of the others are an offence to art ethics, and advertise lack of knowledge of proper composition and color in their promoters. In many the colors are raw and inharmonious.

Air brush work is all right in knowing hands, but the sale under the name of hand colored photographs, of lithographs printed in colors and touched up by hand with water colors,

is not only dishonest, but their buyers having been burnt are chary about purchasing the real thing.

This is a cheap age, in which the aim of the dealer seems rather to have something with which to undersell his competitor than to attract custom by the excellence of his wares. The individual private buyer is the sufferer, in having to purchase inferior goods or go without.

As a trite example, I quote from a letter just received from a picture jobber in Italy, whose traveling men cover Italy, the Balkans, Austria, Greece, Asia Minor and Northern Africa, who says in part as follows:

“We desire to deal in oleographs, but especially of the cheapest quality. The subject of the picture is not of great importance. It may be religious, landscape, figures, or faces of women, but the prices must be of the lowest. Our customers are of the poorest classes, who have little money, and less artistic taste. The main point is that all the pictures must be in colors and vivid colors at that.”

Coloring photographs is too large a subject to be treated at length in this paper, so shall give attention only to a few points that may help the amateur desiring to do such work.

Premising that he does not wish to do a great deal, it will be well to keep down the cost of his outfit, so shall make suggestions on that basis.

Brushes should be of the kind mounted in tin. Get following sable brushes: No. 1, No. 2, No. 5, No. 7, No. 9; flat camel's hair brushes, No. 3 and No. 5.

Paints had better be purchased in half pans, as the tubes are apt to dry up if kept too long after opening. Those made by Winsor & Newton are very satisfactory. I have also used with good results the German colors prepared by H. Schimcke & Co., of Dusseldorf, which cost only about half as much as the first named.

The trouble in using paints by different makers is that while under the same names, they may be of different shades.

It is not necessary to have a lot of colors on the start, as more can be added if needed. If you want to color portraits, would recommend your reading No. 44, Vol. 4 of the Photo-Miniature; but if your work is to be on landscapes, you will need the following: Orange; pink madder; permanent violet;



ACROSS CRESCENTA VALLEY.

(The Kind to Color: Plenty of Snap and Harmonious Contrasts.)

Illustrating Article "Coloring Photographs," by Edgar A. Cohen.

blue—cobalt (tube), permanent, Prussian; Chinese white (tube); gray—Payne's, charcoal; brown—raw umber, burnt umber; red—vermilion, Indian; yellow—raw sienna, burnt sienna, Indian; green—Hooker's No. 1, Hooker's No. 2, sap, English, gamboge, olive, lake.

There is a multiplicity of other colors, some being opaque when transparency is necessary, others such as mauve and crimson lake, which are beautiful while they last, but are to be shunned because they will fade away in a year or so;



A HILLSIDE HAYFIELD (A MAP).

EDGAR A. COHEN.

and still others which are all right in every way, provided you have the money to spare for them.

Whatever other things are necessary, every photographer already has. A plate will be found a good substitute for palette, and a number of butter plates for the mixing of such colors as you are continually using. If you have a lot of the tops of the china jars in which Imperial cheese used to be packed, they will be the best thing you can get. You can transfer to them color from the pan or tube, writing name of the color with waterproof India ink on the reverse side. What color is left in them can be used next time to avoid waste.



"OH YOU MELON."

BELLE JOHNSON.

It is not every print that is improved by color. Artistic outlines often make a pleasing photograph, whereas a painter would pass the subject, owing to lack either of harmonious colors or sufficient contrasts. Do likewise in selecting from your prints.

Remember that prints lacking in detail will be the same when colored. This can be remedied by working it into high lights and halftones with an H pencil, but in masses of deep shadow it is insurmountable.

Do not be misled by common advice into making a light print. It is a fallacy, except, perhaps, in case of a large head. Your colors are transparent, and your colored result would be weak. You need just such a snappy print as would please you best as a straight photograph—one with plenty of contrast, but rich in detail through shadows, halftone and high lights.

Select subjects that will honestly permit of complementary colors, which means harmonious contrasts, such as red and green. If you do not understand the subject, get a book on the question from your public library. If the contrasts are inharmonious, the print will get up and slap you in the face.

If the result lacks sufficient contrast in colors, it will be flat by daylight and much more so by artificial light.

Rough surface papers coated on heavy stock are most desirable. The moisture of the paints will warp a thin print, making difficulty in getting it to lie flat; and the moisture of the mounting agent may work through to the surface. Unless you use some such sizing as ox-gall it is hard to make paint take hold evenly on a matte or glossy surface.

Buff Argo makes a nice surface for portraits and interior landscapes with no sky, giving a warmth not obtainable on a white surface. If a little sky shows through the branches, touch it out with a pencil before coloring. You could never get a natural blue on a buff surface, as the combination makes green, for which reason a white surface is essential for most subjects.

Fix your prints in plain hypo, as the hardening of an acid bath has a tendency to prevent even absorption of paints. As soon as fixed, transfer to tray of water till ready to wash to avoid danger of toning. Clean prints with tuft of cotton

dampened with water. Do not use alcohol, as it hardens the film. Do not trim prints before coloring. Use two pins in each corner to fasten print to piece of corrugated cardboard, such as framer uses to back a picture.

You are now ready to color, and at a north window is the best place. On a level with the eye the brush goes most truly to the desired spot, for which reason an easel is a good thing, but a good substitute can be made from pieces of a wooden box, and set upon the table before you. If you must work



DOWN THE MONTEREY COAST.
(Not Suitable for Coloring.)

EDGAR A. COHEN.

with print flat on table to prevent soiling, cover with a sheet of letter paper that portion of print on which hand would rest.

You must have two glasses of water: one to moisten brush and the other to rinse it.

If you get your colors wrong, a wet brush or a wet tuft of cotton, with a blotter to take up the moisture will remove color from the portion from which you wish it eliminated. If you want it all off, lay print on a piece of glass and hold under faucet, scrubbing gently with a nail brush till it is clean.

The sky is the most difficult thing to handle, and it is well

before pinning prints to cardboard to put it into all you intend coloring within a given time.

Put about an ounce of water in a cup and into it squeeze about a quarter of a tube of cobalt blue. After putting it into thorough solution, add enough permanent blue to darken it perceptibly. Cobalt alone is rather pale.

Many people give the whole print a blue wash, but this is not advisable where, for instance, you have to portray hay or dead grass, of which the predominant color is yellow, as that part of the print must be freed from the blue before using the yellow, or else the result will be green.

Soak prints and lay on a tilted drying frame so that they may drain and partially dry; have piece of glass same size as print, on which lay it; taking either your No. 3 camel's hair brush or No. 9 sable, according to surface to be covered, stir up solution thoroughly so as to avoid sediment; hold print on slant and begin to flow from top with a very wet brush, taking surplus with brush as you work down; drain bottom thoroughly before laying away face up to dry; also before print is put to dry pick off with a needle such foreign substances as you can.

Another way is to swab surface with wet cotton or sponge just before flowing.

If there are only small spaces of sky, use smaller brush, with only enough paint to cover each space.

If you want effect of broken clouds, let print be drier before putting in sky.

If sky is unsatisfactory when dry, you can wash it off and try again.

When print is dry and pinned on cardboard, take scraper and with gentle motion remove specks. On those that will not come away, place with a No. 1 brush enough Chinese white to eliminate without making a white speck, which in turn would necessitate a touch of blue.

If the blue has run over into places where it does not belong, it can be removed by washing down with a small brush wet with clean water and moisture taken away by pressing blotter against spot washed.

If there were no clouds in negative, very fair ones can be made by a gentle semi-circular motion with a tuft of damp



A BUTTERFLY.

Kate Smith.

cotton. Another way is to work extra blue into sky after it dries.

If there are a few clouds in sky, flow it; dry and then remove blue from them with wet brush and blotter. If sky is full of clouds do not flow, but work blue between them while print is damp.

If there is solution left in cup save it for next time. If it dries up, add water and dissolve thoroughly before using. Keep it covered to keep out dust.

For convenience we can divide out-of-door pictures into two classes, which we may call maps and artistic bits.

The map is the open landscape, in which distance gradually softens away. This is perspective, and is taken care of by the good photographer, but the colorist has to use correct pigments, else it is destroyed. It is retained by putting the brightest colors into the foreground and darkening to the distance by even degrees. This can be done by adding increasing quantities of blue and violet, preferably the latter, and decreasing the thickness of the color applied. As an instance, take trees and the greens I have suggested purchasing and make the following color scheme: On the nearest Hooker's No. 1, then sap, Hooker's No. 2 and a little raw sienna, Hooker's No. 2, Hooker's No. 2 and increasing quantities of violet.

The artistic bit is where everything is near enough to you to recognize its variety, so that you are compelled to give double the attention to the correct color of the species that you do to its perspective.

The photograph gives about the correct nature color of roads, rocks and trunks of trees. Sometimes it helps out your color scheme to give, as you legitimately may, a coat of gamboge to trunks of such as willows, alders, etc., and a blend of cobalt and violet, with a touch of pink where the sun strikes, to trunks of such as oaks, pines and cypress.

If you do nothing to roads and rocks, they have an unfinished look. If your rocks lack detail, put it in with a pencil before applying color, which may be violet and raw umber, pink, violet and cobalt, etc. You cannot give same color in same picture to rocks and road without destroying contrast, so you can use on road violet, raw umber, raw umber

and raw sienna, or any other combination that will give both harmony and contrast.

Shadows are intensified by use of violet and are lightened by orange, pink, yellow, etc. You cannot make a cast iron rule for application of colors, for the same negative, printed with different developers and papers, will so vary in tones as to give different results with the same paints.

Bear in mind that all detail in a print is violet, and any color put over it blends with it, and on the same principle each color put over another blends with it.

Charcoal gray is used for spotting and for darkening blends; Payne's gray mostly for working in between green and blue.

Until he learns not to smear over the edges of what he is coloring, a beginner is safest with a No. 2 brush in his hand.

When a first application of color is not dry, it may be intensified by a second, but further strokes of the brush will remove it.

You will find out as you go along that there is much more to be said than there is space for here. You can yourself work out your problems or else take them to some artist friend.



SUNSET ON THE POTOMAC.

E. L. CRANDALL.



AMY.

W. G. CORTHELL.

SHADOWS

By H. H. BROOK

SHADOWS may be very beautiful, especially so when cast by a person possessing a good figure. The picturing of shadows in connection with portraiture is little practised, still, with the help of the illustrations, this note may be acceptable to those who wish to get away from the beaten track, and to discover beauties not anticipated before.

This work can either be done by day or artificial light, but as daylight has to be controlled, and the amateur does not possess the convenience of a studio, artificial illumination will be found more convenient.

For our purpose magnesium ribbon is hard to beat, but as it tends to give harsh results on account of the light being

of small area, it is necessary to give the plate a full exposure. The result then will not be disagreeable.

The length of ribbon required varies according to the speed of the plate, and stop of lens used, also the distance of the model and the color of the dress, but as the strength of the light is according to the length of the ribbon used, the exposure can be calculated to a nicety, and repeated under like conditions with the same results. Given a plate of 400 Watkins, lens aperture F-8, model in black dress and 12 feet away from light, 18 inches of ribbon will be required.

As the exposure must be kept as short as possible, the ribbon should be cut into four lengths, then each length bent double. To hold the ribbon and to shield the lens from the light, a tin box 8 inches long by 6 x 4 deep should be used. Stand the box on end, and 2 inches from top and in the center of the two sides pierce holes; through these holes, stretch and fix a piece of wire, from which the bent ribbon can be supported. The four pieces of which should be placed close together so that they will all light at the same time. To ignite ribbon, use a piece of cotton wool saturated with methylated spirit and held by a length of steel wire. With this it is possible to keep close to the camera and light the magnesium some distance off. A lens cap is awkward, so use a bulb and tube or antinuous release. Fast plates are best and backed by the makers; home-made or applied backing is oft times not very effective.

Development is largely automatic. Use developers which tend to bring out detail without making the lights too dense, and it is well to use a weak solution and without bromide. Do not develop longer than necessary; a denser negative means more contrast, and in portraiture contrast should be avoided. Metol, pyro-metol, or rodinal will be found suitable.

Figured backgrounds seem peculiarly out of place here, nothing is better than plain canvas stretched on a frame. For single figures the dimensions of the frame can be 7 ft. 6 in. high by 5 to 6 ft. wide. The model should not stand close to the ground, three feet or more away if possible and focus on the model.

To observe the shadow cast by the model a portable electric light is handy and, of course, the greater the candle power



ENQUIRING.

F. 8; Barnet Extra Rapid Ortho; Rodinal; 18 in. Ribbon; 10 ft. away.

Illustrating Article "Shadows," by H. H. Brook.

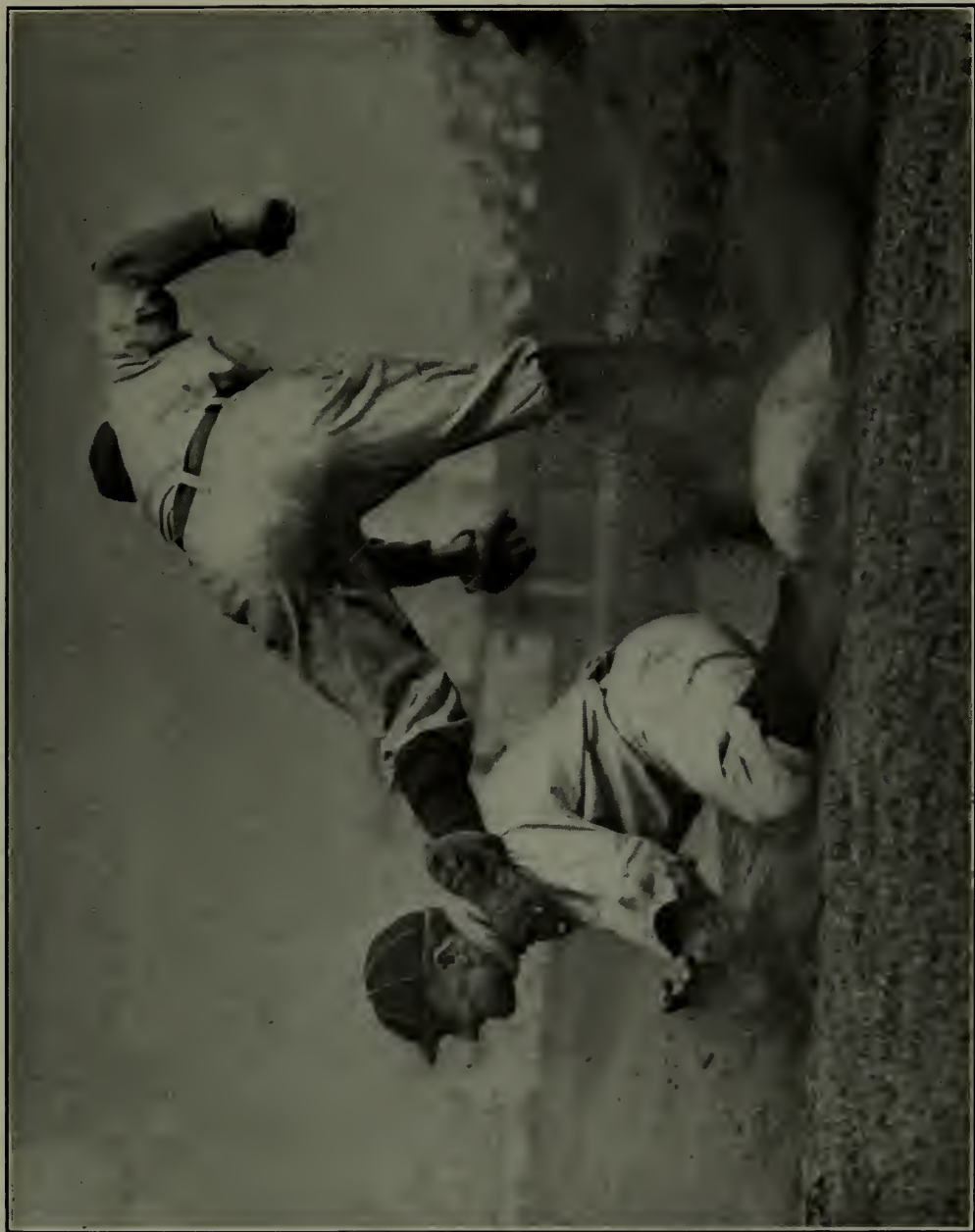
the easier it is to focus. Try to avoid sharp angles or awkward curves in the shadow. Take note of the shadows from earrings, glasses, or the nose. They are often detrimental to the effect, and might completely spoil the picture. Children making rabbits, etc., on the wall form telling pictures, but children are very camera-conscious, therefore repeated exposures may be necessary before they will concentrate their mind on the little animal or caricature they are forming on the wall.



THE WHITE DRESS.

Lens F. 8; Barnet Super Speed Ortho; Pyro Soda; $13\frac{1}{2}$ in.
Ribbon; 12 ft. away.

Illustrating Article "Shadows," by H. H. Brook.



TY COBB (DETROIT CLUB) STEALING THIRD BASE.

CHARLES M. CONLON.

THE HANDS IN PORTRAITURE

By ARTHUR HAMMOND



ONE of the most difficult problems the ambitious portrait photographer has to contend with is the treatment of the hands in a picture. The most obvious way to overcome this difficulty is to leave them out, and include in the picture only the head and shoulders, but by so doing a lot of individuality and character are often sacrificed, for the hands show almost as much character as the face, and the attitude of the sitter can be more varied and more characteristic when the arms and hands are included.

The lighting and posing of the hands and the selection of a satisfactory point of view offers technical difficulties and, considered merely as lines and accents in the composition, the proper placing in the picture space of the hands and arms must be taken into consideration. Many people complain that their hands in a portrait come out too large, and, it is true, they do appear large unless special precautions are taken to keep them well back, as far as possible in the same plane as the face.

It is important also to select the point of view from which the hand looks small and looks like a hand. A side view of the hand, showing the edge, will usually present a more pleasing aspect than a broadside view, showing the full width, and often just a very slight turn of the wrist will make a lot of difference.

The use of a long-focus lens will greatly help in securing good drawing and perspective so that the relative size of objects, even when they are not in the same plane, will be more truthfully rendered. If such a lens be not available, it is better to make the picture small, and enlarge it if necessary, than to get it larger on the plate by placing the camera too close to the sitter, for, after all, the focal length of a lens is merely relative, and a lens that is too short when used for a



SHADY BROOK.

Harry D. Williar.



FIG. 1.

At-home Portrait, taken in an ordinary room; 16 in. Smith Lens.

large plate becomes a long-focus lens when used for a smaller plate, or when the picture occupies only a small portion of a large plate. I have a lens of 11 inches focal length which will cover an 8 by 10 plate, but when used for a plate this size it is far too short for figure work and gives very violent perspective; but the same lens used for a 4 by 5 plate is a long-focus lens and gives quite pleasing drawing.

Those who possess a symmetrical R.R. lens or a convertible anastigmat might well try the experiment of using only one combination of the lens instead of the complete lens, provided the camera is furnished with sufficient bellows extension to permit of its use.

With regard to the lighting of the hands, it is well to know that a hand in shadow will generally appear smaller than a hand in full light, and in this respect a good deal can often be done to improve the picture by dodging in printing so that the hands are rendered a little darker in tone than the face.

Considered from the artistic point of view, the disposition

of the hands and arms and their value as accents and lines in the composition is an important point. In a portrait or figure study the face is usually the chief point of interest, and everything else in the picture should be subordinated and should not—either by its contrast in lighting or by its position in the picture space—compete with the face as an attraction to the eye. In a picture with a dark background the hands, unless carefully placed, are apt to form competing points of interest by reason of their standing out boldly against the dark ground, but when they are so arranged that they give a suggestion of good lines, the very fact of their standing out boldly may be a decided advantage.

As regards their position in the picture space, it must be remembered that the eye will instinctively connect prominent objects in the picture and so form leading lines, therefore it will be seen that by placing the hands so that they form with the face a pleasing arrangement of line, the composition of the picture may often be greatly improved.

As the two hands and the face make three spots, the line arrangement very often takes the form of a triangle, and such an arrangement of line is generally very satisfactory and pleasing. The triangular arrangement gives a suggestion of stability and firmness, it is easy to secure and is capable of almost endless variety.

This triangular arrangement (Fig. 1) is very common and can be observed in many portraits in which both hands are shown, but by reason of its possibility of variation it need never become monotonous. It is, however, by no means the only possible arrangement. In the picture of the two boys reading the paper (Fig. 2) it will be seen that a line connecting the hands and arms takes a circular form. This is another shape that is often satisfying as a line composition. Like the triangle, it forms a design that is complete in itself and one that fits well into the picture space.

Another very common and often satisfactory arrangement is to have one hand supporting the head (Fig. 3). This serves a useful purpose in helping to steady the sitter so that there will be less risk of movement when a long exposure has to be given. In arranging the hands and arms the utmost tact and care must be used.



Fig. 2.

Illustrating Article "The Hands in Portraiture," by Arthur Hammond.

With many sitters it is impossible to avoid self-consciousness and the stiffness and woodenness that will be the inevitable result if any posing be attempted. It is best, as a rule, never to touch the sitter; just make suggestions and let him pose himself or, better still, leave the sitter entirely alone and be on the watch for a pleasing and characteristic attitude.

Many people when engaged in conversation and when they have forgotten all about the camera, will often assume a photographable pose which, being assumed quite unconsciously, is bound to be natural and characteristic, and the more natural and characteristic the pose, the more will the resulting picture be likely to be regarded as a speaking likeness.



HILLSIDE PASTURE.

THEODORE EITEL.



Fig. 3.

Illustrating Article "The Hands in Portraiture," by Arthur Hammond.

WHAT MAKES A PICTURE?

By J. WILL PALMER



FTTIMES we hear a person exclaim, when standing before some grand piece of scenery, like the White Mountains, across a picturesque valley, for instance, where the noble peaks loom up before us, their alpine summits mingling with the clouds, "Oh! if I only had a camera!" And I often wonder if those same persons in an unguided moment should become possessed of a camera and again visiting some similar scene should indulge their craving instinct by exposing a plate on the broad expanse of nature before them, how they would feel when they came to see the resulting print. If there's anything that will make one feel like the proverbial "Thirty cents," I believe this will. When that grand awe-inspiring range of mountain peaks which has so enthralled us is reduced to postcard dimensions, and the diameter of a lead pencil will cover the highest and loftiest of them all, there is apt to come over one a feeling of "littleness" not realized before.

Perhaps this is why so many people purchase a photographic outfit and fail to follow up its use. For what amateur has not passed through this experience? And how few really "advanced amateurs"—those who make pictures—ever essay a subject of this nature in maturer years. They have been through the fire. They know the camera's limitations.

To the newly wedded "camerad," therefore, I would say: Do not attempt to see how much of "God's green earth" you can get on one four by five plate. It is better to go to the other extreme and strive to see how little can be made to cover the plate, decoratively. In other words, strive to tell your story with as few words as possible. Study the small things. Study the units which make up all compositions. Try to make compositions of a single unit that shall be pleasing to the eye and tell a story.



A WINDING BROOK.

J. WILL PALMER.

In the instance above cited the would-be artist was filled with the grandeur of the mountains. But the camera made the mountain range a very small fraction of the plate area. Simply a line across the center. The upper half being a pure ungraded mass, which in the resultant print appears as so much white paper. The lower half probably a jumble of materials mixed together in such a manner as to make a single dark mass of no particular interest. At the same time, in that immediate foreground—probably within “a stone’s throw” of where we were standing, possibly the tripod need not be moved from its position—there is among that heterogeneous mass a unit that is capable of forming the keynote for a whole dozen compositions, which can be made to cover the picture space in such a manner as to satisfy the most exacting.

Therefore I say, Study the units, their lines, their masses. See that single clump of mullein stalks, the broad acres beyond, even the mountain range, but see the mullein first.



FRIENDS.

S. DORAN.



FIG. 2.

GEO. D. JOPSON.

THE LINE LIGHT

By GEO. D. JOPSON

LINE lighting is one of the most difficult lightings to make, yet one of the most fascinating and, with a good profile, one of the most beautiful. Line lighting is so called on account of the fine line of light running around the face. It is of a contrasty nature, therefore it is difficult to obtain full detail in all parts of the draperies. I will call your attention to Fig. 1; while full detail is saved in the shadows the high light is not "burnt" out in the face. The left shoulder being out of focus naturally no detail would show. I claim my use of curtains, explained later on, and tank development assists materially as well as using a high grade lens, Goerz Celor No. 6.

The view of the light room, Fig. 2, is self-explanatory. Now examine diagram of light room, Fig. 3. Distance between side light and end wall, A, is five feet; B is the background which is extended out under the skylight, close to and in line with the side light, four feet; C is the side screen seen in light room view, Fig. 2. The curtains are drawn one side to show position of subject. D is the sitter in the position occupied under the skylight. E is position of camera when picture, Fig. 1, was made two feet from end wall. Note that sitter was directly under top light—fully six feet from the end wall. Do not attempt this kind of lighting without

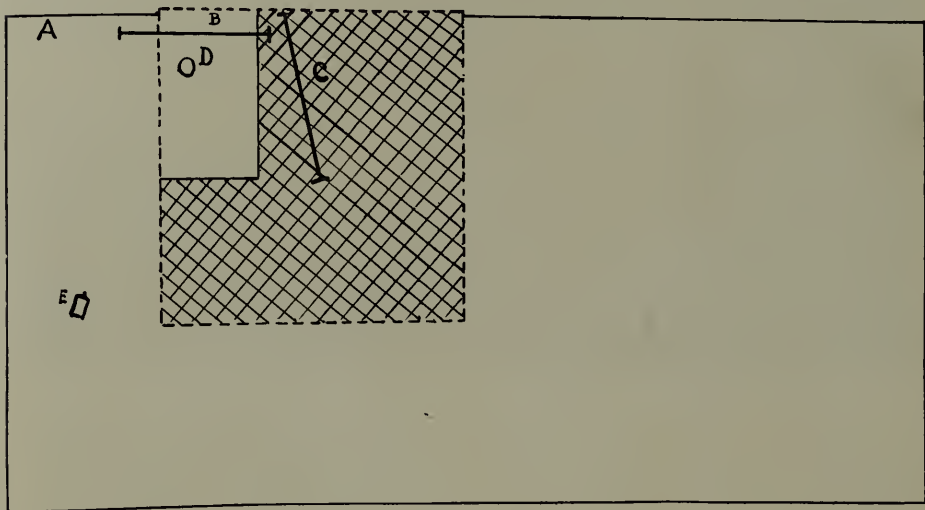


FIG. 3.

a shade over the lens. The lens shade is removed from camera in Fig. 2 to better show the position and angle of camera.

I control the side light exclusively with the side screen hung with three rows of black calico curtains. I also cut the top light out with black calico curtains, with the exception of a space over the sitter's head running up the light six feet and three to four feet in breadth. I have been criticised for using black calico curtains on account of the light filtering through. If you notice in Fig. 2 there is no reflector. If absolute opaque curtains were used, then a reflector would have been a necessity to force the detail on the shadow side. As I curtain my light detail is saved in the shadows and not lost in the high lights. The dotted lines in Fig. 3 represent



AN OLD ENGLISH PRINT.

Chas. C. Kough.



Fig. 1.

Illustrating Article "The Line Light," by Geo. D. Jopson.

the top light. The fine "criss-cross" lines represent the black calico shades. The blank space is the opening over sitter in top light. I call your attention to "A Study in Line Lighting" which was also made under these same conditions and illustrates my idea of a perfect line lighting on an absolute profile.

Line lighting can be made by an ordinary side window but that is another subject and should be treated separately.



CALLA LILLIES.

NATHAN R. GRAVES.



A STUDY IN LINE LIGHTING.

GEO. D. JOPSON.

Illustrating Article "The Line Light," by Geo. D. Jopson.

ONE PHASE OF SPEED PHOTOGRAPHY

By HARRY S. HOOD

IN looking over the photographic illustrations in books and magazines, particularly those printed in America, it is seldom that one sees snapshots or action pictures in which both the chief object of interest and the background are equally sharp and distinct. In a large number of cases it is neither possible nor desirable to have everything in the field covered by the lens, critically sharp; but there are occasions when such sharpness adds considerably to the value of the picture, as for instance, in one of the accompanying photographs, where the crowd and the race which they are viewing are equally sharp. In cases where the objects, which are in this instance boats, move slowly, the picture can be made with a camera of the reflecting type, with the lens stopped down, if a slight elevation is at hand to make the photographs from, but where there is very rapid motion this is impossible as the lens must be used at full aperture or nearly so in order to permit the use of a very short exposure.

Where the operator wishes to photograph a boat, horse, automobile or foot race, showing both the chief event of interest and the crowd and surroundings, a kind of picture which is looked upon with great favor by the newspapers and magazines, the best outfit to use is a view camera fitted with a fast lens and a multi-speed shutter. A multi-speed is preferable to a focal plane shutter on account of its greater speed and lesser bulk. The object in using a view camera and tripod is to take advantage of the swing-back feature which is missing in reflecting cameras. If the operator uses a high tripod or a stepladder, or secures some other elevation to work from, an elevation of about twenty feet being nearly ideal, he can then point his lens downward at about an angle of 15 degrees and by using the swing-back, keep the plate perpendicular. With a little experimenting a position will



SWEETHEART DAYS.

Copyright, 1911, Knaffl & Bro.



THE BOAT RACE.

Illustrating Article "One Phase of Speed Photography," by Harry S. Hood.

be secured which will give a perfectly sharp image with the lens wide open, thus making it possible to use a very fast exposure.

The chief objection which most workers have to using a view outfit for work of this nature is its weight and general cumbersomeness. It is, however, not necessary to use an 8 x 10 camera or even a 5 x 7, as a 4 x 5 will do the work equally well, and will give a negative that will be so sharp that a 16 x 20 enlargement can be made therefrom with but slight loss of detail. There are many newspaper and magazine photographers that use a 5 x 7 view outfit exclusively, using a graduated scale to focus by and making the exposure with a multi-speed shutter, the camera being held in the hand all the while. With a little practice in estimating distances, focusing can be made very accurate, and if the operator has a small focusing cloth along he can make use of the swing-back whenever it becomes necessary. This swing-back feature is extremely useful in photographing birds' nests, as it makes it possible to get a picture of the nest containing eggs or young birds with the mother bird just alighting on the edge of the nest or in the act of feeding the young. The camera would, of course, have to be fastened to the tree in a favorable position near, a trifle above the nest, and the exposure made with the aid of a long rubber tube and bulb.

The possibilities of the swing-back were long ago realized by the men who make a specialty of natural history photographs; but there seem to be many amateurs and not a few professionals who often overlook some of its most useful qualities.




BOATING.

Illustrating Article "One Phase of Speed Photography," by Harry S. Hood.

WHY NOT KALLITYPE ?

By GEORGE P. SWAIN

URING the six years that I have used kallitype as my almost exclusive printing medium, it has frequently occurred to me that one of the seven wonders of the photographic world is the general indifference of the amateur to the wonderful possibilities of this versatile process. In the present day, more especially, when there is such a tremendous expenditure of time and much agony in the evolution of abortions in the name of "gum" and "oil," when right at hand is kallitype, a process that gives all the freedom possible for the expression of individuality and assures prints that *are* prints, artistic to the last word. Surely it is a matter to marvel at.

It is not to be said that kallitype is the alpha and omega of the photographic print, but I wish to here appeal for a more general consideration of the process. It has served me well, and would others. The first and prime factor to consider is its marvelous latitude of quality—a slight variation in the manipulation giving a wonderfully soft print or an abnormally hard and snappy one. To one unfamiliar with the process this extreme latitude is almost unbelievable. It is simply a matter of exposure and the absence of any or varying quantities of a potassium bichromate solution in the developer. Prints can be obtained that are really not possible by any other printing method. The copy of the red chalk sketch is a good example. The artist that made this had never previously had any satisfactory photographic copies made of her work. Kallitype prints solved the problem and gave just the effect and quality desired.

The original sketch is in red chalk on a yellowish-brown paper. A "silver" print or any of the usual commercial mediums have a flat and dead effect, but the kallitype gives all the brilliancy and snappiness desired from a very ordinary negative, a Stanley plate being used, and no color screen.



SKETCH OF GEO. P. SWAIN BY CHARLOTTE SCHETTER.
(Kallitype copy of Red Chalk Sketch.)

Illustrating Article "Why Not Kallitype?" by George P. Swain.

Again a negative so harsh that it is impossible to get a passably soft print by the usual methods will yield satisfactory results in kallitype.

Next, in the choice of papers for coating, the kallitype admits of a very wide range indeed. Photographic papers are not necessary, and any paper supply house has a hundred makes, grades and surfaces, each giving a variation in color or effect in the finished print. The only warning is to use rag stock for the sake of permanency, though prints can just as readily be made on papers full of wood pulp. I have used most everything from onion-skin to rough cardboard. Ledgers are reliable, but give prints with a purplish tendency in their tones, as do all hard-calendered papers. Papers with "antique" finish are easier to coat smoothly, and give warmer tones. The antique finish is simply paper not calendered, so the surface is slightly rough.

A good paper is wedding kid finish, which comes in size 21 x 33 inches, and is not watermarked. Most ledger papers are watermarked, and the mark sometimes comes in a very objectionable spot on the print. When developing prints for brown tones, better effects can be obtained by using papers of cream or yellowish shades. I have gotten some very satisfactory prints on such a toned paper called Beaufort antique laid. As to sizing, I have never yet used a paper that it was necessary to size, about all the papers on the market being sufficiently sized.

Sensitizing kallitype is a really simple process, and when the chemicals are pure the ultimate prints will be absolutely successful. Of the great number of sensitizing formulas published from time to time, I have found that used by Mr. Henry Hull the most reliable. I have always used Merck's chemicals.

The following chemicals comprise the really necessary ones, and the quantities named are what I have found the most economical to purchase.

Iron oxalate, ferric, scales.....	4 oz.
Iron and potassium oxalate, crystals.....	1 oz.
Silver nitrate	1 oz.
Oxalic acid, crystals.....	1 lb.



THOMAS WATERS.

Harry Hendrickson.

Potassium bichromate	4 oz.
Ammonia, 26°	1 lb.
Carbonate soda, dry	1 lb.
Rochelle salts	1 lb.
Borax	1 lb.
Sodium acetate	1 lb.
Tartaric acid.....	4 oz.
Phosphoric acid, 50%	4 oz.

The two iron salts first mentioned should be absolutely pure and fresh. The first step is to make up the sensitizing stock solutions, which are four in number. Use distilled water in each case.

No. 1—Water	20 oz.
Iron oxalate	4 oz.
Gum Arabic	¼ oz.

Pour the water in a deep orange-colored bottle or stone jug, add the iron salt. Shake occasionally during the course of ten minutes and set away for 24 hours. The salt should then be perfectly dissolved and the liquid clear and of a deep amber color. Then add the gum arabic, and shake occasionally to dissolve.

No. 2—Water	16 oz.
Iron and potassium oxalate	1 oz.

Keep in a deep orange bottle. Add the salt to the water and shake occasionally till dissolved.

No. 3—Water	4 oz.
Oxalic acid	½ oz.
Ammonia, 26°	¼ oz.

Have the water of a temperature of about 90 degrees, dissolve the acid and add the ammonia slowly, stirring during the operation. This solution needs no protection from light.

No. 4—Water	8 oz.
Potassium bichromate	½ oz.

Keep in a deep orange bottle with the cork slit for dropping.

When ready to sensitize mix the following:

No. 1	1 oz.
No. 2	½ oz.
No. 3	½ dr.
No. 4	4 drops

Then while stirring rapidly with a glass rod, add 40 grains

silver nitrate and stir till thoroughly dissolved. The solution should remain clear. When coating the paper I prefer the use of a rubber-bound camel's hair brush $2\frac{1}{2}$ -inch size. I have a large sheet of glass on which I clamp the paper at three corners by the wooden clips that I use to hang it up by to dry. Next, see that the paper is right side up. By close examination one side of the paper will be seen to show the mark of the web of the paper machine, a screen of diagonal lines. That is the wrong side. Of course, just as good a print may be made on the wrong side of the sheet, but the web-mark generally has an objectionable appearance on the finished print. On watermarked papers, in nearly every case, the right side is that when the design reads reversed.

Measure out sufficient sensitizing solution to cover the sheet being coated—about $1\frac{1}{4}$ drams for a size 11 x 17 inches—pour on the center of the paper and spread with the brush, which is first rinsed in water and squeezed as dry as possible. Go over the sheet lengthwise and crosswise several times and then hang up by the clips on a line to dry.

The sensitizing may be done safely by ordinary gas light, and the room should be warm and dry, so that the sheets will be perfectly dry in 15 to 20 minutes. If any of the sensitizing solution gets on the glass when coating the paper, wipe the glass dry with a piece of tissue before coating the next sheet. After sensitizing three or four sheets, wash the brush out thoroughly and wring it dry, and so on till all the sheets are finished.

The dried kallitype paper is as sensitive to moisture as platinum, and should not be unduly exposed to dampness. In fairly dry weather it will keep without special care several weeks but on humid summer days it is well to use it up within a few hours.

Kallitype prints very much the same as platinum, a faint purplish image on a lemon-yellow ground, but is considerably quicker. In sunlight a fairly strong negative prints in about two minutes. When over-printed the shadows print out in a brown tone. In making a number of prints from one negative they should be timed all exactly alike instead of judged, to insure uniform results when developing.



KALLITYPE PRINT ON ROUGH "LAID"
PAPER; SOFT DEVELOPMENT.

Illustrating Article "Why Not Kallitype?" by George P. Swain.

For developing, make up the following stock solutions (distilled water not being necessary) :

- No. 1—Water32 oz.
- Rochelle salts 2½ oz.
- No. 2—Boiling hot water.....32 oz.
- Borax 1¼ oz.

When cool add

- Rochelle salts 2½ oz.
- No. 3—Water32 oz.
- Sodium acetate 4 oz.

Ready for use in 48 hours.

Brown tones are obtained by mixing No. 1 and 2. The more of No. 1 the warmer the tone. I prefer a developer of 8 ounces, of No. 1 with 1 ounce of No. 2. No. 3 gives a purplish-black tone and should be modified as follows:

- No. 3—Solution 8 oz.
- Tartaric acid20 gr.
- Phosphoric acid, 50%.....½ dr.

Next comes the remarkable variation in the quality of the developed prints obtained by the use of the potassium bichromate solution (the same as used in the sensitizer). For the softest possible prints use the developers without the additions of any bichromate. Increasing contrast is then secured by the gradual addition of the bichromate drop by drop. Its effect is much stronger in the developer for brown tones and should be added with caution. In no other printing process can such control be obtained simply in the developer. Thus, hard negatives may be made to yield soft prints, and flat negatives brilliant ones.

Slide the prints face up in the developer, breaking quickly any bubbles that form with a camel's hair brush or tuft of cotton. Care needs to be taken in this respect or the finished print will show marks. Allow the prints to remain in the developer two or three minutes at least, for if properly exposed they cannot over-develop. Then transfer to a tray of water ready for the clearing bath, which is necessary to dissolve the yellow iron salts. I find the following the most vigorous:

- Water½ gal.
- Carbonate soda, dry 1 oz.
- Oxalic acid 1 oz.



KALLITYPE PRINT ON SMOOTH WRITING
PAPER; DEVELOPED FOR BRILLIANCY.

Illustrating Article "Why Not Kallitype?" by George P. Swain.

Brown prints clear in 10 minutes; black ones or those developed with acetate from 20 minutes to half an hour. After clearing, wash 20 minutes, then fix for ten minutes in:

Water $\frac{1}{2}$ gal.
Hypo 5 oz.
Ammonia, 26° $\frac{1}{2}$ oz.

Wash one hour.

If the black prints have too objectionable a purplish tone, they may be given a cold bluish shade by toning in a gold bath, an acetate bath preferred. Prints will reduce slightly in this bath. Tone after fixing and drying.

The acetate developer can be used but once, the Rochelle salts-borax several times if allowed to stand and decanted. The clearing and fixing baths should be used only two or three times. Use the developer deep in the tray, cover the prints quickly and keep moving a moment or two in all the baths. And now I hear someone say kallitype is not permanent. Personally I am satisfied that it *is*, provided pure chemicals are used, good paper, and the prints thoroughly cleared, fixed and washed. It is as permanent as any photographic print whose image is a silver base. When I first began to make kallitype prints by Mr. Hall's formula I placed one of my prints in a south window, where the sun could shine on it all day—provided it wasn't cloudy. That print remained so exposed for fourteen months. It was considerably weather-beaten at the end of that experience, and had lost very slightly, but I am sure was not nearly as much faded as any other silver paper so tested. I would doubt the resistance of a platinum under the conditions.

And now a last word for kallitype. It is certainly a convenience not to be dependent on the photo-supply house for various sizes and qualities of papers, and the possibility of their just being out of what you want in a rush. You can always make up what you need in very short notice. And perhaps you would like to save a few dollars on your paper expense. For example, sufficient paper to cut a gross 5 x 7 size can be sensitized at the cost of an hour's time, the paper 15 or 20 cents, and for the chemicals about 25 cents.

What more need be said?



TWIN FALLS, NEAR TWIN FALLS CITY, IDAHO. Copyright by C. E. Bisbee.

IMPROVEMENTS IN OZOBROME

By THOMAS MANLY, F. R. P. S.



BETTER understanding of the scientific principles involved in the process of the tanning of gelatine by the metallic silver deposited in the development of a photographic plate or paper, has led to a considerable improvement and simplification in the method of working ozobrome.

An entirely new process unfortunately hangs fire on its introduction due to a want of the requisite knowledge to detect the cause of failure. An insignificant difficulty may be met with, and from lack of experience the error cannot be located and the work is given up. It is the same in every new photographic process. When bromide paper printing was first introduced the pitfalls were many until step by step the manufacturers by effecting slight improvements at long intervals of time arrived at the present standard of perfection.

One would have thought that the fact of being able to make a carbon picture from an enlarged bromide print, or to reproduce a permanent picture in any monochrome from a questionable lasting bromide print, would have induced many workers in America to endeavor to overcome inevitable initial difficulties. But not since bromide printing has become a thoroughly practical method has any new printing process been introduced, except ozotype and ozobrome, and it is without doubt the newness of the process and the inability to turn to a friend for advice when in difficulty that has limited its adoption in America. In England there are many very enthusiastic ozobrome workers who find the work much more simple and convenient than carbon printing.

The principle and method of working are simple. A sheet of pigment plaster or paper coated with pigmented gelatine is first soaked in the diluted ozobrome pigmenting solution and then immersed for a few seconds in an acid bath. The plaster after this treatment is then squeezed to a bromide



A WINTER MORNING.

CHAS. K. ARCHER.

print and the act of bleaching, in the presence of the acid, causes the gelatine in contact with the silver image to become more or less insoluble in exact proportion to the deposit of silver. Now the quantity of acid present determines the degree of insolubility. It is a case of oxidation of the product of bleaching. A small quantity of acid will tan the gelatine only moderately, and then we get strong color and swollen gelatine in the shadows and possibly insufficiently tanned gelatine in the high lights, causing the picture to present harsh contrasts. It may seem strange that a heavier picture is obtained by a limited degree of tanning and this requires explanation. The ozobrome solution simply bleaches the image and the acid reoxidizes the product resulting from the bleaching action, and thus the tanning effect is produced.

If a small quantity of acid is present the insolubilizing action being weak will proceed a comparatively long way through the gelatine film especially in the shadows and will consequently engage more coloring matter. In the high lights, however, the gelatine will probably be too weakly tanned to withstand much development and may possibly wash away in the process.

When, however, we add the correct amount of acid the oxidation of the product of bleaching will allow the tanning action to proceed to a definite distance into the film, because the tanning action itself prevents its own progress through the film. If too much acid is used the progress of the insolubilizing action will be arrested on the surface of the film and a thin, poorly colored, strongly tanned, image will result.

The whole process, therefore, depends upon the degree of oxidation, and the best pictures are produced by a certain prearranged quantity of acid which will allow the tanning action to proceed at a definite rate through the pigmented gelatine film. The simplest method of adding the acid is to first soak the plaster in the diluted ozobrome solution and then to immerse it in the acid solution of a definite strength for a definite time, say 15 seconds for a good correctly exposed and developed bromide print from a good negative. Six to ten seconds immersion would probably be sufficient if a gray or weak bromide print is required to give a more contrasty ozobrome, and in dealing with a bromide print presenting



BEAVER BOY, SIOUX.

Copyright 1908 by J. A. Johnson.

strong shadows and harsh contrasts 20 to 25 seconds immersion in the acid bath may be given to reduce contrasts. A very convenient way of using the acid bath is to dilute it with an equal volume of water, thus halving its strength and to give it double the time of immersion. This is particularly recommended in manipulating large prints, and it is advisable for beginners to adopt the half strength bath for the simple reason that it is found the inexperienced worker generally oversteps the mark with regard to time.

The acid bath which has been found to work efficiently and uniformly is:

Water	1000 c.c.
Chrome alum (pure)	15 grammes
Bisulphate of potash	5 “
Citric acid	2 “

The bisulphate of potash should not be confounded with the bisulphite of potash, which will not do at all.

Oxidizing acids alone, such as sulphuric, hydrochloric and nitric, are apt to produce free bromine, and if used at all should be used fresh for every two prints. The proportion is about 1 part of acid to 300 parts of water.

Certain neutral salts and boric acid may be added to the ozobrome solution to modify the physical condition of the gelatine, thus, boric acid or nitrate of soda will render the development easier and give clean high lights. Sulphate of magnesium (Epsom salts) and sulphate of soda (Glauber salts) will raise the melting point of the gelatine and is a useful addition in hot weather. The proportion of these salts may be 2 per cent. of the diluted or working ozobrome bath.



DRYBURGH FARM, MALVERN, PA.

RICHARD TROTTER JEFFCOTT.

THE PRACTICAL SIDE OF A HOBBY

By RICHARD TROTTER JEFFCOTT

IT was Emerson who wrote, "If a man can write a better book, preach a better sermon, or make a better mouse trap than his neighbor, though he build his house in the woods, the world will make a beaten path to his door." I have no doubt when he wrote the above he had in mind that no matter what man's profession or trade may be, behind him must stand a workshop or training to enable him to compete with or outdistance his competitor.

The above quotation often passes through my mind and brings constantly before me the fact that to compete with others equipment must be at hand to further the effort and make the best work show for itself.

The "Annual" readers will better understand my theme if they have read in previous issues "From a Hobby to a Business," and my last year's contribution, "System."

About the first of the present year my plans had so matured as to cause me to give up my old quarters and move into a new building, the change made necessary by the increase of business and the necessity of having behind me an up-to-date plant ready to care for the business which would in my line come to me.

The floor plan illustrated herewith (Fig. 1) shows a space 20 x 65 feet, with skylight (top light), heated and lighted from a private plant. From the first article mentioned it will be gathered that my maiden effort showed many little contrivances applicable to the business, and these of necessity were not dispensed with, but rather improved and extended.

Generally speaking no limited space is large enough, and the planning of how to allot sufficient space to each division of the work, and then to install necessary partitions, lights, water, gas and fixtures had my attention previous to moving in. The best material was used, due care being taken that the underwriters would pass on all features, for insurance applied to the photographic business is by many thought to be a lost art, or you would think so from the papers when you read, "Smith's studio total loss—not insured."

All partitions were of three-inch yellow pine tongued and grooved, set on sills and headers, and all joints carefully calked so as to make perfectly light-proof. The electric wiring and lighting was of the best, for to-day the sun does not count when compared with Tungsten and arc lamps. Now to consider the plan, the entrance door leads to an attractive reception room, through which one passes to the private office. Furnished in simple taste, with examples of work, one must be impressed with the fact that "personal service" counts. The studio, 16 x 20, with top north light, is of good size for small articles to be photographed for catalogues, illustrations, copying, etc.

On one side is the record desk and the "clearing house" for all finished orders readily obtained through a wellnigh "fool-proof" system. On the west side are shelves for the storage of negatives arranged under number and name system.

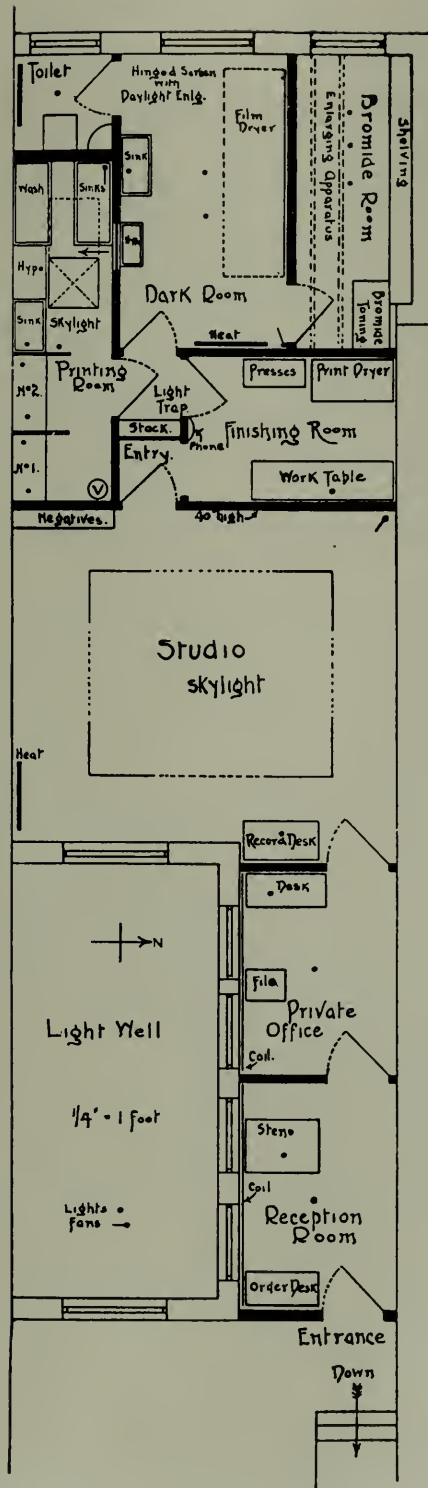


Fig. 1.

Illustrating Article "The Practical Side of a Hobby," by Richard Trotter Jeffcott.

The room contains a large work table, copying stand, portrait camera and various items of screens, backgrounds, etc. When necessary the open entrance to the finishing room may be used for the camera stand, giving an additional range of eight feet. The partition dividing the finishing room from the studio is but 40 inches high, of sufficient height to keep the work table and necessary appliances in place.

The finishing room has a work table 30 inches wide and seven feet six inches long, with drawers and necessary bin space to accommodate the work. Shelving for small tools, etc., is on the west wall over the three presses used in flattening and caring for the prints. Just beyond the presses are the print dryers, fitted with a fan and also gas heater for quick drying. Lighting the work table was carefully planned, using Tungsten lamps with green shades, lamps of sufficient candle-power to light evenly and yet be out of the way.

From the finishing room one may pass to any other division, without interfering with the work, or cause damage from extraneous light, for it must be remembered there is not a partition between the skylight and the "trap" we are about to enter. For safety, and as an indication that one is coming through to another room, a signal system of push buttons with bells were arranged, and these were rigidly observed with good results. For instance, one going from the finishing room pressed the button once; from the dark room twice, and from the printing room three times. The rule follows: "Always keep the three doors closed, and then close your door after entering." Probably if the space were larger I would plan a maze, but then the carrying of various apparatus from division to division would not be so easily accomplished as now. Entrance to the printing room shows two printing cabinets, planned a little with the idea that to obtain the best results the workers and their work should be divided, and each furnished with individual apparatus, and, further, the space occupied and the operation of the lights did not interfere with either's work. The cabinets (marked on the plan No. 1 and No. 2) were each furnished with a printing light and a safe light; so as to better convey the idea a special photo (Fig. 2) has been made of the large or "printing" lamp, as it was not practical to make a negative of the entire cabinet as I should wish.



A STUDY.

Baker Art Gallery.

Each cabinet measures 3' 3" x 5'. A work shelf or bench 20 inches wide is 40 inches from the floor, the operator standing or sitting at his pleasure. Midway between the workbench and floor is a shelf for holding the workboxes, "finished" and "new work." Each workbag contains a work ticket numerically stated, dated and explicit instructions regarding paper, matting, etc., with spaces for the operator's date, number of prints produced and initials.

Just below the line of the workshelf and on the left-hand side is a double throw switch for operating the lights, arranged so that the printing light, about eight inches (to bottom of cone), is on the left side. On the right side about two feet above the bench is the smaller or safe light. To operate the switch is thrown in (white light), negative examined and adjusted in mask, switch thrown out (red light), paper adjusted and numbered with self-inking machine to coincide with work ticket, and also stamped on workbag to avoid error. Time on second clock noted—switch reversed—time necessary for exposure given, and in less time than it takes to write, the finished product is placed in the developing print box. From this it will be gathered the operator by using this system cuts down the the expense of a constantly burning high candle-power lamp together with a safe light, for he cannot burn both together, and if careless in operation his loss to paper, etc., is instantly noted. Inasmuch as work of this character requires a safe light, a ceiling ventilator and fan were installed, operated from the further end of the printing room. The balance of the printing room was fitted with developing sink, hypo tray and two enameled iron wash sinks, 24 x 50, operated with siphon.

This room is lighted from the roof by skylight 30 x 30 inches. About a foot below the ceiling I arranged a light tight sliding sash, fitted with orange, ruby and green glass, absolutely safe for working any and all papers, including bromides. A metal track carried the sash back and forth as required.

The rear of the box which held the sash was arranged with ventilator, and as the skylight was always open, fresh air was constant. This is important in the printing room. On the left side a safe light over the developing sink of

same pattern as the illustration (Fig. 2) was installed and likewise operated with switch. This idea was twofold—the skylight illuminated the room and when closed was “safe,” and when open permitted the operator to judge his “color” and print without disturbing others.

So as to check up the necessary washing of prints, a clock hanging over the sink gave the time of start. “In and out” dials were placed over each sink and further written on a slate in the finishing room. Double checking important operations must be commended for “guess work” in my plant is unknown.

From the printing room we proceed to the dark room through the “trap.” To-day roll films outnumber plates a hundred to one, so the film idea was expanded, although the necessary arrangements for plate developing were cared for as described in my previous article. Large trays 4 x 6 ft. laid on horses or trestles formed the foundation for film developing. On the large tray were placed the necessary three-tray system for developing each roll separately and caring for it only at that time. I have always contended the start of good work is in the dark room, and the care I have taken in producing the best negatives speaks for itself. On the large tray is the “rinse tank;” next on a separate stand is the hardener—used winter and summer—no chances taken at any time is the rule. Next the acid hypo fixing bath. So as to save time and effort the hardening, fixing and rinsing were arranged in “runs,” and at the proper time a window, indicated on the plans, shows how the films were placed in the wash tanks, and from that back to the “film dryer,” which needs passing mention. In my old plant each night lines of wire were strung to carry the films whether there were one or 500. This was a “time loser” of the worst kind, so in my new venture I tried out with success the following:

Hinged to the north wall of the dark room about six inches below the ceiling, and when not in use lying flat against the wall, was a frame 30 inches wide and 10 feet long, twice cross-braced and corners reinforced. The whole was covered from the top with two-inch mesh chicken wire. When ready for use the frame was pulled up to its proper place against the ceiling, as the films taken after being cleaned from the

wash tank were clipped. The hook in the clip was slipped over the wire mesh and hung in its proper position without touching its neighbor. Care must be taken, however, to shut off the ventilating fan and arrange against strong draught for its working success.

The large frame or screen in the window was redesigned to take all the ruby, green and orange glass it would accommodate. This enabled one to develop by daylight. (West light softened by large buildings 100 feet distant.) The constant and insistent demand for enlargements on Cyko and

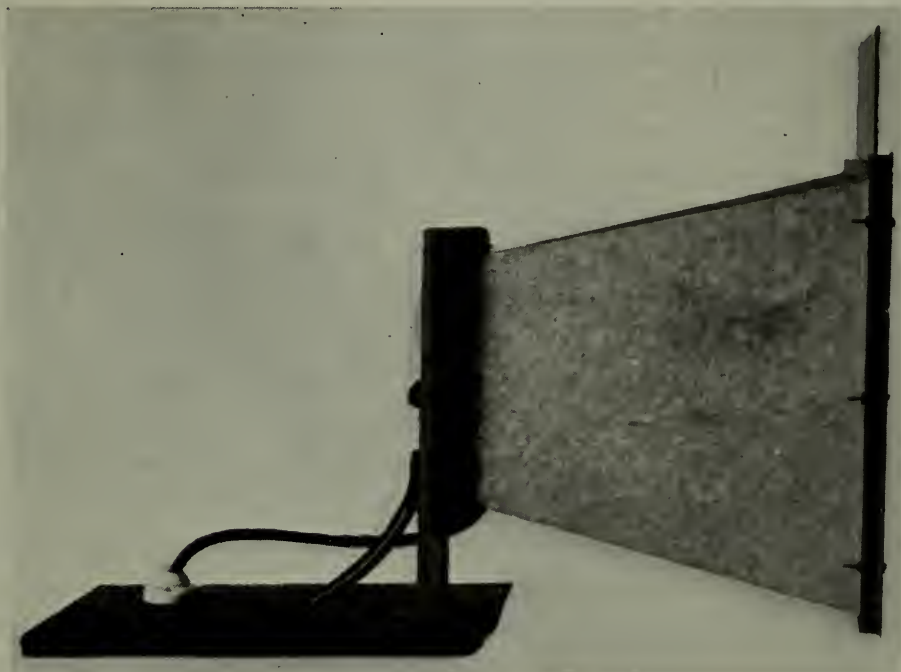


FIG. 2.

Showing Type of Lamp Box Used in Printing and Dark Rooms.

Artura, which shows no grain, and the beautiful effects produced in sepia on Cyko buff was sufficient to cause me to put in a daylight enlarging apparatus in this room. To the ceiling was arranged a grooved carrier, made by Richardson Wilcox Company, used ordinarily for sliding doors. I utilized the idea given me by a friend and arranged a movable screen or easel, which when not in use can be readily stored. Having a rule affecting the size of enlargements I make, not over 20 x 24. The cost and arrangement need not be expensive, but is entirely practical and successful. Perhaps at a leisure

time I will transfer this to my bromide room, which up to this has been reserved for the making of bromides, lantern slides and transparencies, and which owing to the apparatus installed did not permit the new idea to yet become a permanent fixture.

From the previous description given, the present enlarging apparatus did not differ to any great extent from the old one, except the whole apparatus was fitted in grooved tracks so as to operate easily—that is, carrying the lamp box and easel on one track and when not in use condensing to the smallest space. The condenser idea was given up. A new glass of foreign make was substituted, evenly illuminating the negative. The 100-watt lamp was replaced by one of 500 watts, the box being lined with three-way prism glass so as to catch and distribute every ray of light and shorten exposure. One new feature, and that I am glad to say a successful one, was installed early last winter—a hot bath sepia toning apparatus. When I figured out the cost and the gain in accuracy, color and beauty of the sepias produced I felt it was a good investment all around. Gas was connected to a three burner plate warmer or stove. This was fitted to a table which was covered with heavy sheet iron for protection. A “pipe stand” was made and framed with due regard for the weight it was to carry. The top of the stand was about six inches above the top of the “warmer.” On the stand was placed a metal pan 25 inches by 34 inches, and 4 inches deep, and filled about two-thirds with clean building sand. The pan had a cover of the same material fitting closely.

For use the gas was lighted, and at the end of 50 minutes the sand had reached a temperature of probably 125° F.; resting on the sand, and in a central position was an enameled tray 22 by 28, into which at this time was poured the sepia bath. A wait of about 20 minutes brought the solution to 110°-120° F. and ready for work. The bromides or prints were now placed in the hot bath and carefully moved with a paddle to secure proper and even emersion. At this point the gas on the end burners was shut off, and the center burner reduced one-half for about 20 minutes longer, and finally shut off entirely. The cost of this operation—gas at Philadelphia price was not more than 3½ cents per hour. Inasmuch as



BY MY STUDIO WINDOW.

Charles H. Davis.

the sand retained its heat for at least 7 or 8 hours, the temperature held normal, and produced good sepia prints. On this same stand another stove was installed for the heating of water for all chemicals requiring hot water, but this is about to be replaced by a special hot-water heater, installed specially for the purpose. Now, in closing, I would advise that the short description given of how many little necessary operations in the commercial line may be handled, I have no hesitancy when I say every man's plant must be fitted and installed to suit his special requirements, and these in a measure are controlled by his location, space and natural advantages.



BRINGING HOME THE WANDERERS.

JOHN W. SCHULER.



AN OLD FIREPLACE.

RICHARD TROTTER JEFFCOTT.

PINACHROME FOR COLOR VALUES

By J. EDWARD B. GREENE



THE photographer who wishes occasionally to use color-sensitive plates, will find pinachrome of decided value. Ordinary dry plates or films may be bathed in a solution of pinachrome to render them panchromatic. Plates so sensitized are superior to the orthochrome bathed plates in possessing greater red sensitiveness.

In employing pinachrome a stock solution is prepared as follows:

Pinachrome	3 grains
Alcohol	5 drachms

Heat gently and when dissolved add

Alcohol	4 ounces
Water (distilled).....	2 ounces

The above solution will keep indefinitely, but should be placed in amber-colored bottles and kept in dark.

When ready to bathe plates prepare the following:

Stock solution.....	60 minims
Ammonia C.P.....	30 minims
Water (distilled).....	7 ounces

As the pinachrome bathed plate is sensitive to red light, it is well to use the Lumiere Virida papers. With 16-c.p. incandescent lamp use three of the yellow and two of the green papers, placing the yellow papers next to the light.

The plates selected for bathing should not be ultra-rapid. I have found the 26X Seed plates entirely satisfactory and plates of this speed will remain free from fog and keep better than the more rapid brands after bathing in pinachrome.

The plates are bathed preferably one or two at a time in the pinachrome solution for three minutes, using plenty of the solution to cover the plates well, and rocking the tray. Fresh solution should be used on each set of plates. A piece of stiff cardboard is convenient for covering the tray to

prevent unnecessary exposure to the light. After the three-minute bath the plate is washed in water for two minutes and should then be placed to dry in a perfectly dark, cool drying box, or in the ventilated dark cupboard of the darkroom.

A drying box may be easily constructed. It should have double top and bottom with air spaces and perforations arranged to allow circulation of air without admitting light. It is well to thoroughly line such a box with black paper. When the rack of plates is set in the box in the darkroom and the cover bolted in place, it may be brought out and placed near a window, or wherever is best for the air to circulate through the box.

If the plates are sensitized in the evening they will be ready for use the following morning. They may be carefully stored in plate boxes if not desired for immediate use, and will keep several months.

In using the pinachrome bathed plates best results are obtained by stopping the ultra-violet rays with a ray filter. The exposure should be prolonged sufficiently to compensate.

Development should be conducted by the illumination through the Virida papers, using preferably Amidol.



PORPOISES.

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A DAUGHTER OF THE PYRAMIDS.

CLEO S. BOURGEOIS.

NEGLECTED POSSIBILITIES

By HENRY EILE COOPER

IT has always appeared to me that the hibernating habit of the average photographer who works for pleasure is a mistake. At this time of the year he is to be found by the fireside dreaming of the coming springtime and planning his photographic work for the new year. His camera is packed away on the shelf, alongside of which are his negative boxes holding the proceeds of his past season's work. In a large number of cases the plates are finished with, a print or two has been struck, their author's interest is satisfied, and

they are put aside without thought. I would suggest, however, that now, while the long winter evenings hold their sway an excellent opportunity occurs to go through these plates, the result of the last year's work, and examining each plate decide if the best that can be produced from it has yet been obtained, before it is finally packed away. Every negative should be examined with this query before one: "Has the utmost been got out of this plate? Is it not possible to get a special print worth keeping from this negative?" Having decided that the plate contains in it artistic possibilities, has pleasing composition, or is of an interesting subject, it should be placed aside for the further consideration of how best to treat it.

One of the principal mistakes made is in regarding the size of the plate used as the fixed and final limit of the finished print. Because plate makers issue their wares in stock size 4 x 5 or 5 x 7 that is no reason why the final print should be limited to these sizes. The plate is only a beginning or a means to an end, and its size should in no way limit or control the final result. It follows, therefore, that enlargement must often be resorted to if the best is to be made from one's negatives; particularly is this so in this age of small hand cameras, but with the large variety of enlarging apparatus and paper at one's service to-day, this question should present no difficulties. Another point to consider is that there are very few subjects where the original proportion of the plate is the one best suited to the composition of the subject. Careful and judicious trimming will often improve a weak composition: an inch or two off a poor sky, a piece off of an uninteresting foreground, or a distracting object trimmed off the side will often redeem and save a print.

I need hardly impress upon my readers the necessity of suitable skies. By this I do not mean strong clouds in every subject; that fault is usually committed by the enthusiast on first commencing to insert clouds; often a plain tinted or shaded sky is the most appropriate, but in every case the subject must be studied and a cloud or sky to suit the scene inserted; that is, if no clouds exist in the original plate. If there is the faintest trace of clouds it is far better to bring



TOIL; OR, A WOMAN'S WORK.

HENRY E. COOPER.

them out by reducing the plate locally with ferricyanide, or printing them up by shading the print during exposure, than to insert fresh ones that are foreign to the scene. This is especially so if enlarging is used where the difficulty of putting clouds in is considerable. Next will come the question of what paper to use, and here a wide latitude exists for individual fancy. Surface and color are the two points to consider, bearing in mind the effect required and its suitability to the subject.

Regarding the vexed question of how far hand work, local treatment and the many other methods of obtaining effects are justified, I will not venture to advise. Each must be a law unto himself; much must, of course, depend on the skill of the photographer, for it will be evident that whatever method is used, the means that are adopted must not be apparent in the result. If the critic in viewing the finished result is conscious of how the effect was obtained, then the work stands self-condemned. The greatest skill is required to obtain in a print an effect that is not in the original, and any attempt to force such an effect will generally end in disaster. Nevertheless, the portrayal of many of nature's varying moods may legitimately be attempted. The morning mist, the noon-tide heat, the shades of evening, sunshine, storms and rain, and the various seasons, with many other similar subjects are suitable for camera work, and will give the ambitious photographer opportunity to test his skill, and in many a negative where only a hint of these effects is evident it can, by careful manipulation, be strengthened.

In the foregoing remarks I have endeavored to show that the photographer who packs his plates after having taken off a few plain prints has often not obtained from them one-half the artistic possibilities they contain, and that in the negative box on the shelf is to be found many of these neglected opportunities of picture making.



PORTRAIT.

WILLIAM SHEWELL ELLIS.

THE LIFE STORY OF A SCANTLING

Transcribed and Illustrated by WILLIAM FINDLAY



WHEN I first peeped above ground I found that my neighbors were small bushy shrubs; and very kindly ones they were, for they shielded me from chilling winds and biting frosts. Their leaves did not, like mine, wither and decay, when

“The cold winds of Autumn wailed mournfully here.”

On the contrary, they kept green the whole year through, and besides sheltering me from wintry tempests they must have been a pleasant feature on the landscape during the season when “surly blasts make fields and forests bare.” But my neighbors did not remain shrubs long. They grew amazingly—much faster than the beech family—to which I belong, but then many of us can boast of great girth, can we not?

They soon overshadowed me, but through their waving branches I caught glimpses of the blue sky, and my whole life was, like that of many a human being, a strenuous endeavor to rise above my fellows. This I eventually did, but the fight was a long and arduous one, and did not tend to the development of my physical proportions. This you will readily understand from my photograph, which is here reproduced. But once I did get a clear outlook to the glorious heavens, what a pleasure there was in existence, and what a lovely prospect I gazed upon! To the east I believe I could have caught a glimpse of the ocean and a noble city situated on its shores, but a wooded hill intereved, and, of course, I could not see through that. When the wind blew from the sea there was a chill in the air, and sometimes a thick mist was carried up with it which fell upon my leaves and through them I eagerly drank the moisture. But it was not like the sweet rain that came with the western breezes; it was sometimes saline to the taste, and though it was not palatable I believe I gathered strength from it. To the north I looked



Illustrating Article "The Life Story of a Scantling," by William Findlay.

across a noble river threading its way to the sea. A village nestled on its banks. In it was a factory, and the smoke and vapor which were sometimes wafted across had the effect of tarnishing my dress somewhat. The outlook to the south was also somewhat circumscribed, but I understand it is somewhat bare and uninteresting. But what of the prospect looking westward? A valley lay smiling before me, in which I caught occasional glimpses of the river already mentioned and a winding road leading along its banks. I saw on a clear day many miles along this valley, and would have seen much further had it not been for the fact that lofty mountains obscured the vision.

So much for my surroundings. Now you will be interested to hear of how my companions and I came to be in the rather lonely position depicted in the photographs. It happened thus: The trees which surrounded us were firs and spruce of great commercial value. These trees had come to maturity, so the owner thought he might as well reap his harvest. Woodmen came 'round one day and made a notch on each of my companions. I wondered what this was for, but was glad that they did not use the axe upon me—I might have fallen under the blow and these lines might never have been written. It was not long ere my curiosity on this point was satisfied. A sawmill was erected in an adjacent field and after its appearance on the scene my fellows one by one were sawn down, their branches lopped off, while the trunk was drawn by horses to this mill.

Soon most of my companions were laid low, and I believe I would have shared the same fate, but the woodmen did not think it would pay them to disturb me. At least this was what I gathered from a conversation two of them had regarding me.

“We winna' min' this ane, will we, Geordie?”

“Na, na; lat it stan'; its jist a scantlin', an' the win' 'll seen blaw it doon.”

So I was left with some others, “scantlin's” like myself; and cold and dismal it was to one so accustomed to shelter and society. The wintry winds did make war against me, and though some of my companions shared the fate predicted by Geordie, I with a supreme effort managed to weather the storms.



*"O'er Me Like a Regal Jewel, Cloudy
Ribbed the Sunset Bent."*

WILLIAM FINDLAY.

When spring came I felt stronger than ever I did before, and my dress was of a richer hue and of more ample proportions than I had ever known it.

In the leafy month of June picnic parties made merry in the clearing which the woodmen had made, but none admired my beauty till a gentleman with a camera came along one day with one of these companies.

"Ah ha!" said he, "here is something out of the ordinary; I must have a picture of this."

Accordingly he photographed my companions and I. The result must not have been to his taste, or else the photograph had revealed to him new beauties in us, for not long after-

wards he came back alone and stayed quite a long time, almost until it was dark. And again he came, and yet again, and thus it is that I am telling you my story through him. Some of my companions fell during a storm in autumn, and when my friend came after this blast to see how we had fared I could see by the look on his face that he was sorry for us, and this was verified when I heard him remark regarding myself, of whom I think he was rather fond:

“Poor chap, I doubt you’ll be the next to go, but I hope the fates will be kind to you.”

The winter was not a very severe one, and when March came I still survived. This month gets the credit of being a windy one, but this season it belied its name. So mild was the weather during a part of it that I began to shape my summer dress, and so much progress had been made in this direction when April came that I expected to have had it ready, richer and more ample than ever, to welcome May. But a northwesterly wind, fiercer than I had ever felt before, swept down the fair valley I have spoken of, during the latter part of this month, when balmy breezes and gentle rains would have been more seasonable. I did my utmost to withstand the tempest, but it was so long-continued and so boisterous that my strength gave way, and, like my companions, I was laid low.

Sorry indeed was my friend when he paid a visit to the clearing after the storm had passed, and as he viewed my prostrate but still animated form he remarked:

“Poor fellow, you, too, have gone at last. I had hopes of cementing our friendship still further this summer, but it is not to be. Your picture in this lowly position would not be a pleasant reminder, and I prefer to think of you in all your airy lightness and the picturesque figure you made against the distant landscape.”

And doubtless those who gaze on the reproductions of his pictures may think with him that, though the woodmen were scornful of my presence in this fair world, for a brief time at least I justified my existence and brought not a little pleasure into the life of at least one human being.




THE RISING SUN.

WILLIAM FINDLAY.

A UNIT METHOD IN PHOTOGRAPHY

By F. M. STEADMAN

HE unit method of photographic practice and light study which I have been perfecting for the last ten or more years and which I hope to have published in another six months, is based on the *convergence* of light rays. It is true that each point on every surface and light source is radiating rays outward into a hemisphere of space, but it is also true that each point of all surfaces is the center or focus of a hemisphere of rays which converge upon it. It is on this latter truth that my system is based.

In photography we photograph surfaces which are of greater or less actinicity. If we can know the actinicity in simple units we will solve the problem of exposure and, what is of more importance, we will be able to teach the truths of light in the schools from the standpoint of simple compound numbers and also subject the lens manufacturers to a governmental standard in marking diaphragm scales and in designating the extreme speed of lenses. The writer once purchased a lens advertised as F-7.7 and on account of the way it was mounted it proved on investigation to have only a speed of F-9 or 73 per cent. of the advertised speed. A quart cup brings only a few cents in the market, but let a manufacturer cut one of these measures to only 73 per cent, of its legal volume and imagine what would happen.

The fixing of two units suffices for working the system. One is a cone unit, which may be compared to our degrees for the measurement of circles, except that it deals with volume as represented by a sphere instead of with surface only. For good reasons I have chosen the small cone F-64 as the unit cone. As applied to lens stops this scale is simply the unit values of the cones of light which the stop allows to pass the lens in this scale. Stop 4, for example, will do a



WATERFALL, DINGMAN FERRY, PA.

JOSEPH LAURIER.

certain work in a quarter the time required by stop 1, just as 4 men would do a certain job of work in a quarter the time that one would do it.

The following table will show the unit scale as compared with both the Uniform and the F systems of stops:

U. system.	.256	128	64	32	16	8	4	2	1
F system...	64	45	32	22	16	11	8	5.6	4
Unit system	1	2	4	8	16	32	64	128	256

The other unit is that of the actinicity of surfaces. In making this measurement the light from a surface is impinged upon a strip of ordinary film through an opening having the value of F-1 or 4096 cone units, in such a way as to tint the outline of a small hole on the emulsion when it is exposed to a surface. A surface has one unit of actinicity when one minute (or 64 seconds) is required to create a "least visible tint" on the surface of the film, the strip being removed from contact with the instrument while examining it. It is clear then that if 32 seconds sufficed to get the faintest tint, 16 seconds not creating one, then the surface would be seen to have two units of actinicity. Should two seconds disclose the tint then there would be 32 units of actinicity, etc.

By this method the sky when the sun is high measures 512 "actinos." Objects in the shade out of door from 256 down to 32 actinos, according to the high or low actinic character of their color. A head lighted by a home window would measure from 4 to 16 actinos, etc.

The speed of any emulsion is simply its required exposure with unit stop in the lens and a surface of unit actinicity. By this method Cramer's crown plate, for example, has a speed of 4 minutes or 256 seconds. (One minute and 64 seconds are considered as interchangeable in the system in order to preserve the geometric scale with base 2, which scale is used almost exclusively throughout the system.) Should a surface measure, for example, 32 actinos, the exposure with stop 1 would be $1/32$ of four minutes, or $1/8$ of one minute or eight seconds, and this is divided again by the number of the stop used to get the exposure with that stop. Should one use the 16-unit stop the exposure would be $1/16$ of eight seconds or $1/2$ second, etc.

The method is thus seen to work at all points from cause

to effect in the natural way. The system has the approval of a number of well-known scientists and has been studied from the MS. in the department of physics of the University of Pennsylvania for the last two years. The writer hopes to interest the various photographic societies of the world in the matter of selecting a standard tinting medium for taking the measurement of the actinicity of surfaces.



CHILD STUDY.

BELLE JOHNSON



THE NIGHT COMETH.

H. OLIVER BODINE.

A SHUTTER FOR PICTORIAL WORK

By H. OLIVER BODINE

FOR the pictorial worker no piece of apparatus is more important than an efficient shutter. The ordinary shutters, however, have one grave fault—they give as much exposure to the sky as to the foreground. Now, the sky is, as a general thing, 10 to 12 times as luminous as the foreground; hence this equal exposure overtakes the sky and gives pictures having a blank white or “bald-headed” sky—quite untrue to nature. The earlier landscape workers, recognizing this limitation of photography, either printed in clouds from a separate negative or chose subjects in which most of the interest lay in the foreground. Later the introduction of isochromatic plates and ray filters allowed the artist to get clouds and foreground on one plate at the expense of a greatly increased exposure; but even this method has been found defective, as



EVENING.

H. OLIVER BODINE.

shown by the recent introduction of "foreground" and "graduated" filters, made necessary because a filter of uniform tint does not sufficiently correct the *luminosity* of the sky, the contrast between sky and foreground being too great for any photographic plate to render. These screens will do the work, but their limitation, the increase of exposure needed, makes them inapplicable when there is much wind.

The sky-shade shutter is free from the defects referred to and has several great advantages over other devices. In the first place, it can be used with plain plates (many pictorial workers prefer the non-orthochromatic effect), and will give the sky in its correct luminosity, as the foreground receives about five times as much exposure as the sky portion. In the second place, those who prefer iso plates can use the sky-shade shutter without a screen for rapid exposures, or in addition to the screen when more time can be given, in the latter case getting the benefit of full correction for color and luminosity at one and the same time. And since the ray filter is not needed for color correction with several of the so-called "non-filter" or "anti-screen" plates now on the market, the user of these goods can accomplish the luminosity correction with the shutter alone and make exposures rapid enough to stop all motion in the trees, unless it is blowing a gale.

Another interesting point about this shutter is that, although it vignettes the sky, it does not perceptibly under-expose near dark objects in the foreground. Comparative tests made to determine the difference between the sky-shade and ordinary shutters show that even a tree extending the full height of the picture is almost as well exposed at the top as at the bottom, and at the same time the sky is held back, remains thin in development, and is capable of printing its clouds without dodging.

The pictorial landscape photographer, then, will find in the sky-shade shutter just the instrument he needs for most of his work. It clamps readily to the front cell of the lens without interfering with between-lens or focal-plane shutters, and may be instantly detached when it is not wanted. In a word, it produces by direct and simple means a single negative in which the relative brightness of earth and of sky is correctly reproduced.



CONFIDENCES.

T. LEE SYMS

WHY NOT MAKE COLOR PHOTOGRAPHS?

By WILLIAM IRELAND STARR



HERE is nothing easier or simpler in all the branches of photography than the manipulation of the color process of the Lumiere Company (autochrome) and the Dufay Company (diophtochrome), despite the popular notions to the contrary.

It is, of course, to be expected that the would-be colorist is equipped with some knowledge of the fundamental principles underlying the process, and also some knowledge of the relative value of diaphragms and the quality of the light in which he works. If he lack these simple rudiments of photographic information, my advice is to learn them as speedily as possible, for success in color work depends more upon exactness of exposure than nicety of manipulation, though no careless manipulator will even produce other than ordinary results.

Color plates are so wonderful, so startling, so beautiful and, on the whole, so worth while, considering that no special equipment except a ray filter is required, that I cannot conceive of any excuse for amateurs generally not making them.

In the hope that I may induce others to try their hand I shall attempt to set forth how I have worked and made satisfactory color plates (with no other equipment than a little knowledge, a camera box, a lens, a screen, a clock, some plates and chemicals, and a room that was made dark at night).

My dark room is my bedroom, in which I am fortunate enough to have a stationary washstand with running water, but a bath room is excellent if you have a couple of boards to lay across the top of the tub for a table. My white light is a cap-mantle Welsbach of about 100 candle-power, and my dark-room lantern is a cigar box containing a 3-candle-power electric lamp, connected through a switch on the top



PORTRAIT.

William Crooke.

of the box by a flexible cord to a battery box containing seven Columbia dry cells. The cigar box has a hole cut in the front, and pasted over it with passepartout binding strips are two sheets of glass, between which is the necessary Virida or Excelsior papers. In my dark room I believe in having plenty of table surface, and so I employ two sewing tables, one for developing and the other for extra trays, chemicals, graduates, etc. This is only so solutions may be mixed up in advance in trays, in order that plates may be put through with the least delay, as it is not good to keep plates in or out of solutions longer than absolutely necessary. After the final washing the plate should be dried as quickly as possible.

All of these essentials being provided for, take your camera into the sunlight, remove the ground glass, extend the bellows full length, and with shutter closed and focusing cloth over head and just the back edge of camera, take a careful look for pin holes in the bellows, or white light that may penetrate anywhere.

If you do not find any you are in luck, but if you do, you must remedy the trouble before you can make color plates, for the little white light that only produces a slight veil in ordinary plates will ruin the color plates.

As it is next to impossible to make an ordinary room dark in the daytime, it is a good plan to anticipate your needs by loading your holders the night before you intend using them.

The keeping quality of the color plate is greatly below that of ordinary plates, particularly after they have once been opened and placed in the holders.

Experience has taught me that the best results cannot be expected of plates that have been in the holders a week, and one worker tells me that *four days* is about the limit.

Do not use an ordinary red light under any consideration, and the less light you have at any time prior to reversal the safer you will be.

There is no sense in taking chances; be on the safe side always. Owing to the comparatively long exposures required you will be somewhat limited in your choice of pictures, moving objects for the present being barred, but almost any stationary subject will do, provided you avoid as much as possible the more violent contrasts of light and shade. In

landscape work it is very difficult to get a blue sky and a properly timed foreground, so it is advisable to avoid the sky as much as possible.

I prefer the afternoon light to work by, or better yet, a bright, gray day, as usually the colors in a subject are sufficient to give the necessary contrast. Until you understand the workings of the plate and its limitations it is well to see that your subjects are as evenly and uniformly lighted as possible.

Now about exposure: This is the greatest difficulty and where experience counts more than anything else. There are no absolute rules that I can give, and it seems that every worker has a different standard to go by. I would, therefore, suggest following the textbook, but your judgment must be brought into play when the quality of light differs from the "midday bright summer sunlight" usually given as standard. I make all my pictures outdoors with diaphragm F. 16 (U. S., 16), and recommend users to adopt a similar standard and stick to it.

Whether you have had any experience or not, it is a good thing to provide yourself with a photometer; they are made for color plates now, and use it to check up by. The autumn and winter sunlight is very apt to fool you, as, while appearing bright, may be extremely yellow and non-actinic, requiring twice or three times the exposure you might think.

In outdoor work my exposures have run from 8 seconds to 2½ minutes with stop F. 16, while interiors have exceeded 3 hours with the same stop. I have found that the Dufay dioptichrome is considerably faster than the Lumiere autochrome, which, of course, is a great advantage in many cases.

My method of developing is not one I would recommend to the novice, because instead of following the text-book rules strictly I depend upon my judgment in the appearance of the plate after it has been in the developer one minute, as to how long it should be carried. In this way, of course, one does not have to be so careful about the temperature of the developer except to keep it at 65° F. or below.

In autochrome work I use the old formula of pyro and ammonia, with dianol as a second developer, not because I believe it is any better than the metoquinone, but because I



PORTRAIT.

HOWARD D. BEACH

commenced with it and am more familiar with it. One should not mind the little extra trouble of handling one more solution, provided you can get results. I believe it is a good plan to stick to one developer, or one system of manipulation, in preference to changing about. It is the constant handling of one thing that brings perfection, and the nearer one can keep to the A, B, C the surer the results are going to be.

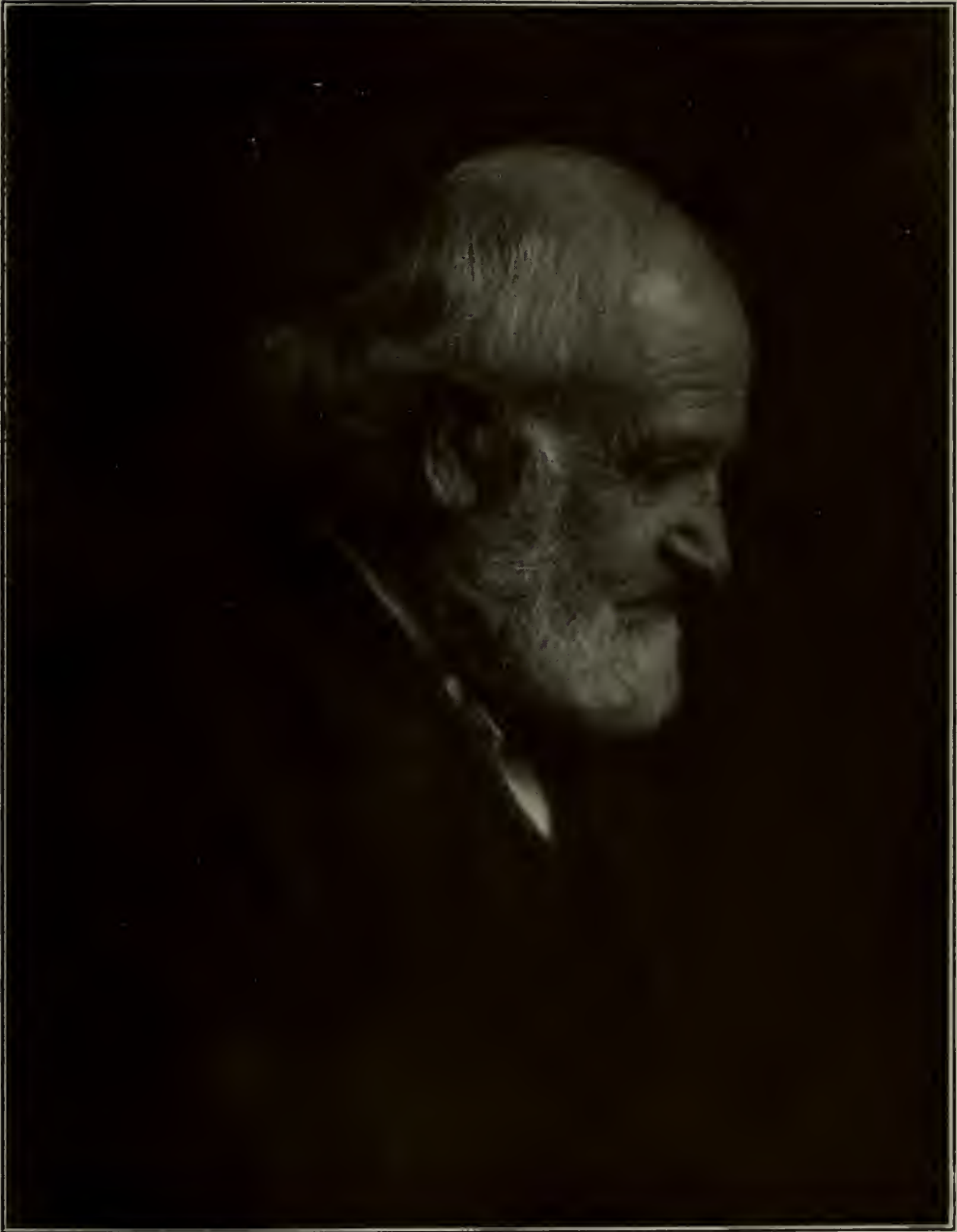
In the dioptichrome work I use the metol hydro developer of the formula, and otherwise having followed the book strictly, my results have been uniformly good. In arranging my developing table I place the tray of reversing solution at my left, with the lantern between it and the developing tray, the lantern facing away from me, with the light from it shining on the face of the clock.

In this way the plate is always in the dark, yet there is sufficient general light to give a sense of locality.

At about 20 seconds before the clock hand is upright on the dial, draw the holder slide and get the plate in the developing tray, and as the hand reaches the upright position pour on the developer, being careful to cover the plate with one sweep. The developer period is so short that it is essential to get the plate completely covered with the developer immediately, otherwise you get streaks and "things." Rock the tray continuously for the required time, then rinse plate thoroughly, front and back, and place in reversing solution. Rock a few seconds, then turn off your battery switch (if you do not your batteries will be run out), and turn on your white light. If you use electric light or Welsbach, such as I have, take your tray of reversing solution with the plate in it, and hold it a couple of feet from the source of light and keep it there until reversal is complete.

One cause of failure in color plates is due to the fact that the plates are not subjected to sufficient white light before the second development, or that the second development is not prolonged sufficiently.

There is a point about this that requires a little study. In the first exposure you obtain a negative in which the true colors are masked, since they are the only ones that make an impression on the sensitive emulsion, and consequently are the only parts affected by the first developer; but by the action



BISHOP WRIGHT.

Jane Reece.

of the reversing solution, which is only a reducing agent, you dissolve away all of the metallic silver (blackened portions), so that these portions become transparent and the true colors appear.

The balance of the plate which appears white must now be masked or blackened so as to concentrate the transmitted light on the true colors, thus making them more brilliant.

This white portion not having been previously acted upon by the light, was not affected by the first developer, so to blacken it, it is necessary to expose it to white light and then develop it with the second developer. If you expose this white portion to too strong a light you are apt to solarize it, so it is difficult to obtain a good deposit in second developer, in which case intensification will have to be resorted to. The same applies if the plate has not been exposed long enough. Prolong the second development in preference to shortening it, particularly if intensification is necessary with the following fixing. If you do not carry this well along, the plate will thin out when you fix it after intensification.

I prefer to overtime and intensify if necessary than to take any chances on the other side, but if you do overtime considerably you will have to see that your first development is somewhat shortened.

The appearance of the plate when out of the reversing solution is described in the failures and remedy column of the text book. If your plate is overtimed, too much light has reached it and there is a general action of the first developer all over. As a consequence, when you put it in the reversing solution it is reversed all over, the resulting image is thin and the true colors, after the second development, have a washed out appearance. Unless this is too extreme, intensification will improve it wonderfully. If you over-develop you obtain very much the same effect, but generally worse, since the colors are usually all gone in the high lights, and there is no hope of bringing them back. With over-exposure, therefore, you must shorten your first development. In under-exposure your shadows and half-tones lack color because the exposure has not been long enough to transmit the color rays to the sensitive film. These parts, of course, are not developed by the first developer, and consequently are not acted upon by

the reversing solution to any extent; therefore in the second development the true colors are partially masked and the resulting image is black and muddy. If you under-develop, the action of the first developer is not sufficient to allow perfect reversal and the resulting image is dull and lacks brilliancy, as though it had a screen over it. In some respects the appearance is similar to the under-exposure, only there will be detail throughout.

In general, use distilled water in making up solution and filter it before using. Reversing should be carried about 4 minutes, chrome alum bath 2 to 3 minutes (it is a good plan to use the alum, although not absolutely necessary); second development from 4 to 6 minutes, preferably 6 minutes. Intensification is a matter of taste. Of the artificial lights I find that next to electric arc a Welsbach is best for judging colors in the color plate, but the mantle should be highly incandescent, with no noticeable tinge of yellow or green. To obtain this quality of light, I procure the long, slender, fine-weave mantle and use the Lindsay type clear-glass chimney, which I am particular to keep scrupulously clean. Perhaps it is needless to add that everything else you handle should be kept in the same condition.

Color photography is no longer a dream, nor purely a laboratory experiment. It is a splendid reality, come to stay, and moreover, is gaining greater recognition daily as a gigantic field for art of the highest order and merit. Thousands are now making the most beautiful and artistic color plates, and if you are not among these workers you are missing one of the greatest charms that photography has yet offered.



A COUNTRY LANE, ISLE-OF-WIGHT.

JESSIE B. DIXON.

GETTING BACK ON THE TRACK

By P. S. HUNT



PECULIAR title, yes, and would apply to so many different tracks. The particular track to which I refer is an imaginary one, one which many of us get off of many times in the course of our work.

If you have experimented to any extent in photography, and more particularly the printing part of it, you have at times been so far off of the track that it seemed to be next to impossible to get back to the point where you could get strictly first-class prints with any certainty. Did you ever have a stated plan of doing so? Did you ever think that there was a certain way in which you could do so? If not, it

is my purpose to set you thinking along certain lines with that point in view.

The most common cause of difficulty is from negatives that are under-exposed and under-developed as well. These negatives are thin, have scarcely any trace of an image and decidedly hard to print from. They must have value for some reason or we would throw them away. We mix our developer according to the makers' directions for the paper to be used, which is the very thing we should do at all times, and with chemicals that we have reason to believe to be pure and of standard strength. The first print is made, and we find that it is perfectly flat and, if of the proper color, practically black. Then we add a little bromide of potassium, result looks better, but still there is no sign of a high light, so we add a little more bromide; result, a patch of perfect soot in which a little whitewash has been sprinkled. No, we do not like that at all, so try putting in a little more water so that it will develop a little slower. We now find we have got rid of most of the soot look, but the color is anything but right, so we go back to the full strength developer as we should for the contrast paper used, and put in more bromide than we had before, with the result that we have a dirty greenish print. We next change the portions of sulphite and of carbonate and soon are so far off the track that it would seem that there was no such thing as getting right again.

The same thing will happen time and time again, even with our good negatives. We have changed carbonate, sulphite and bromide, but have not improved matters any by these changes.

Now, we will admit that the makers of the paper are in a position to know the developing formula best suited to their make of papers, so it will be best to take their directions as a base to work from. As no two grades of paper work exactly alike it is impossible to prescribe a set formula; but there is a way in which we can proceed with all of them, no matter whether our negatives are too flat and thin or too contrasty.

The first thing to do is to see that you are working in a room that is of proper temperature—about 70 to 75 degrees. At this temperature our solutions are in their best working



RETURN FROM LABOR.

A. R. F. EVERSLED.

condition, and the air does not chill the prints while they are being transferred from one bath to another. 80 degrees will be found a little too warm and incline to fog. Next, be sure that your solutions are mixed exactly according to the formula that comes with the paper. Now you are on the right track and must avoid getting off by using a little bromide, then a little water, then a little more or less of carbonate, but change only one thing at a time, leaving the bromide alone until you get an idea of the effect of the one change, and then using bromide as though it was the most expensive chemical you have. Every experiment should be started right from the one base, the prescribed formula and your experiments tried one at a time, using barely enough bromide to keep the whites clear. You should remember that a print exposed to a light twice as strong as the one in use will not give the same results in half of the time. It seems that it requires a certain percentage of time for the light to act. In other words, we will take the hardest of hard negatives to print, the thin flat one referred to. I have taken such many times in my amateur finishing work and secured prints that the customer was more pleased with than some from his good negatives, because of the failures he had met with when trying to make prints from this negative. Now, if we expose this negative to the usual strength light it will not give us a sign of an image, but if we take it further from the light so that it will require considerable more time to print, we will have a much better image, and of fairly good color, but it will not show the details as we wish; consequently we will have to sacrifice color in order to get the details. It will be found that if we use a good contrast paper of high grade, using barely enough bromide to make the whites clear with a good negative, then reduce the developer with water—not too much—and make the exposure to a slow light, we will have a print of a gray color, but will be clear and clean and give a print, not a smudge.

Should this not suit, make a series of experiments; take the standard formula and for experiment sake try adding a trifle more metol or hydroquinone, and if that does not do, try either a little more or less of carbonate or sulphite, but only one at a time, and each time starting with the maker's formula. and always remembering to be as stingy of bromide as pos-



A SUNLIT GIRL.

CARLE SEMON.

sible. In short, get back to the track by using the maker's formula, having the room just comfortable or about 75 degrees, using barely enough bromide to make the whites clear, and water according to the paper, that is, more for soft or special paper and less for the regular or contrast grades. Start all experiments from the maker's formula, trying one change at a time, making two or more changes only as a last resort.

You will find that if you are careful to have the conditions as suggested, and expose just long enough so that with contrast paper it will come to a point in developing where it seems to lag or stop, in 30 to 40 seconds, and with special or soft papers in from 50 to 60 seconds, exposing negatives that are flat (either thin or dense) to a slow light, and those that are contrasty (either thin or dense) to a strong light, you will find you have the best prints that the negative is capable of giving. Do not try to make a picture with bromide. It is only suitable to prevent chemical fog, and beyond that it is a detriment. Some developers require more bromide than others, and some papers require more than others, but in all cases remember it is only used for the one purpose. giving. Do not try to make a picture with bromide. It is you are assured that the trouble is not with yourself, by reason of having the room too hot, too cold, too strong or too weak a light, or the developer too strong or too weak, or your exposure too long or too short. Get on the track by adopting the manufacturer's formula first, then look to the above conditions before experimenting with chemical changes.



PHANTASY.

HERMAN ALBRECHT.

PERMANENCE OF PHOTOGRAPHS

By GEORGE ADHAR

TO the ambitious photographer the subject of permanence, whether it be in connection with negatives or positives should be of supreme importance. What does it matter how many expensive and elaborate apparatuses he may possess, and however exceedingly fine in appearance the work he turns out, yet if they are not permanent they will not count for much. The photographer's pride should consist in the issuing of work which he knows and conscientiously believes to be of lasting character—the best his brains could devise. He should not rest day or night until he has thoroughly investigated the causes which conspire to the fugitiveness of photographs, and applies himself assiduously to root out what-

ever fault may be on his own part conducing to that result—such, for instance, as inattention to the thorough elimination of the fixing salts. Experiments in every department of activity are always interesting, and this branch, so little attended to, should be replete with pleasure to the enthusiastic worker, who should aim at all times at making not only “Things of beauty, but joys forever.”

I will readily admit that there is nothing absolutely permanent; that things die, crumble and fade, but surely these should not serve as apologies for carelessness and inattention on the part of the worker. Conscientiousness should form a large phrenological bump, and the golden rule, “Whatsoever ye would that men should do unto you, do ye even so unto them,” should form part of his daily musings, especially when he is tempted to “palm off” that which he inwardly fears may sooner or later show up to his discomfiture.

The perpetuating of fame, glory, honor, ambition and renown as seen in the memorials left unto this generation by the Eternal Wisdom, through the instrumentality of the ancients in the traces of their arts exemplified in the embalmed bodies and in the oracles of those days written in fadeless inks, commands our imitation for the careful and thorough manner in which they did their work. While we of the present generation can justly claim that we have made progress in every department of life, and thanks to the men of our calling—those carbon and other conscientious workers, whose works are done in pigments rare, beautiful and fadeless—through whom photography is enthroned in high reputation, yet we must admit the humiliating fact that there is being added daily to the list of devotees of photography many whose chief ambition is merely to “press the button” and let some other person do the rest. It is when some such take into their heads the making of prints that anxiety arises to have the work done by quick process; and though the prints may come out beautiful in appearance, yet who can tell what dangerous chemicals are still under the gloss.

It goes without saying that when a sitter visits the studio he feels he wants the value of his money and surely it must be disappointing to him to find—some days later—his pictures changing tints and the image fleeing like a day dream.




CAVE AT GASPAREE, TRINIDAD.

GEORGE ADHAR.

THE ILLUMINATION OF THE DARK ROOM

By MARCUS G. LOVELACE

HE matter of the illumination of the dark room is of so much importance to the photographer, that, although the subject has been taken up so many times that it seems futile to try to write anything new, yet in view of the experience of the writer, it seems that the word which is needful on the subject has yet to be spoken.

The whole problem has been studiously avoided by the very people who should have made it their business to put on the market safe lights that were really safe. The writer has seen safe lights of all sorts and kinds—everything from the single sheet of ruby fabric to the expensive patented safe lights which are obtainable in Europe, and the majority of the men who were using them were simply working in a sort of dim obscurity, trusting to the absence of light of any sort—that is in reasonable quantity—to prevent fog. There is only one safe light that is a real safe light made in this country. It is a screen which passes deep red rays to which no plate, save a panchromatic, or a color plate is sensitive. It, however, is not cheap, the light is rather dim for ordinary plates, *i. e.*, green-yellow sensitive plates, and does not pass the maximum light usable with ortho-plates.

The problem has gone beyond the red glass and orange glass of former years, and the modern dry plate will not stand any such treatment, unless a very weak illuminant is used. Tank development has done away with a great deal of the work in the dark room, but lantern plates, bromide paper, and factorial development need light to do successfully, and I must confess that I favor factorial development rather than tank. There seems to be no way to work very slow plates with a very strong developer in order to arrive at results of extreme contrast, by using the tank, and a great deal of



CHILD PORTRAIT.

KATHARINE BINGHAM.

my work must perforce be done under these conditions. For the amateur the tray system offers more pleasure than any of the "No dark room" plans that have ever been proposed, and I confess that I have never gotten over the fascination that there is in seeing a good clean image appear on the surface of the plate.

Ruby light to most men means a dark red light. Orange means anything from a deep yellow to a red-brown. The average ruby glass sold for photographic purposes is not

suitable and unless used with a very weak illuminant for a very short time, will surely give a fog strip if it is tested. Ruby and orange as usually sold are unsafe, for the simple reason that they are not tested. There is only one way to find the value of a light for this purpose, and that is to make a spectroscopic examination of it, and find exactly what rays it passes, and what it absorbs. The ruby glass as usually sold if combined with orange will sometimes prove safe—often the contrary. In the second case the usual practise is to screen the light with orange fabric, postoffice paper, or use a weaker light. I know a man here who has two ruby glasses, a ground glass and four thicknesses of orange paper in the wall of his darkroom, and who has a sixteen candle-power light outside for a source of light. He tells me that a thirty-two candle-power lamp used for this purpose means fog. The bulk of his work is developing and printing for amateurs using tray development. I have pursued these medieval methods for some years until I decided that there must be some way to have more light and safe light at that. I bought all types and kinds of glass and tried all sorts of combinations but could find nothing that was satisfactory on the market.

After some time spent in correspondence with some of the makers of aniline products, and a certain amount of spectroscopic work, I hit upon a combination that has proven itself absolutely safe, convenient, and comparatively cheap.

Three dyes are to be bought and the minimum quantity sold will be found sufficient to make any number of safe lights of good size so that this method is really cheaper than buying ruby glass, and ruining the sight. These three dyes are, flavazine T, fast red and methyl violet. They are sold in ten gram bottles, which is enough to make several large lights. They should be made up into stock solutions of 10 per cent strength, with distilled or boiled and filtered water. The glasses to be coated must be thoroughly cleaned with hot water and washing soda, or lye. They must then be cleaned again with Bon Ami, or some similar cleaning and polishing preparation. On the cleanliness of the glass depends the success of the light—if not properly cleaned, the coating will crack as it dries, and will pull away from the glass. After the glass is clean, it must be allowed to dry, and then be

carefully leveled and firmly placed so that there is no chance for vibration or tilting.

The solution for coating is made by swelling some good hard gelatine in water and then warming until the whole is in solution. This solution should be about 10 per cent strength in summer and 8 per cent in winter. The dye solution is then added and the mixture is then heated to 57 degrees Cent. or about 135 degrees Fahr., and the *coating done at this temperature*. If the coating is done above this point, there is a possibility of the formation of meta-gelatine which will not harden, and if the coating is done too cold, the film will dry with a partially translucent, and very streaky surface. If the gelatine is at the right temperature and the plates are absolutely clean there will be no difficulty in producing plates of absolute transparency and entirely free from bubbles. Three screens are to be made, a red, a yellow and a violet after the following formulæ:

For the yellow screen, use for each 100 square centimetres of glass surface to be coated, 1 cc. of the stock solution of flavazine T and 6 or 7 cc. of the gelatine solution. This is to be at a temperature of 135 degrees Fahrenheit, or 57 degrees Centigrade when it is flowed over the plate. Each square centimetre of surface will then contain 1 milligramme of dye. More dye will not hurt, but is useless—less is not safe. The plate must be allowed to dry naturally without heat, which will take about twenty-four hours, during which time it must not be disturbed or jarred. If it is not absolutely level do not expect your coating to be even. The plate when dry is ready for use. It passes a bright yellow light which is safe for bromide papers, wet plates, and with a little care, for lantern plates, and the amount of light it passes is remarkable, while at the same time, it is safer than the ordinary orange glass.

The red screen is made by coating a sheet of glass with the following, allowing for each 100 square centimetres $\frac{1}{2}$ cc. of the solution of fast red and 6 cc. of the gelatine solution. This coating is to be done at the same temperature and with the same precautions as the yellow screen.

The violet screen is made by using for each 100 square centimetres, 1 cc. of the solution of methyl violet, and 6 cc.

of the gelatine solution, the coating done in the same way as the other dyes.

When these plates are dry they are ready for use. The red and yellow screens used face to face are safe for any plate, except an orthochromatic, and my experience has been that it is safe for this if a little care is used, while it gives the most brilliant red light. This red, however, is of such a shade that the ordinary green-yellow sensitive plate is not readily fogged by it, while it is impossible to fog the ordinary non-ortho plate with it. By using the three screens, red, yellow and violet in combination, we get a screen which is safe for all ortho plates except the Wratten Panchromatic, or similar plates whose red sensitiveness extends well toward the infra red. It may be used with ordinary red sensitive plates with perfect safety as the red that is passed is the extreme red, to which ordinary bathed plates are insensitive. The light is quite strong and may be used even with direct daylight as an illuminant, as the dyes are absolutely correct—spectroscopically that is.

The red screen when combined with the yellow transmits light from the end of the visible red to about 5900 y in the yellow—that is, from about 7000 y to about 5900 y. The ordinary ortho plate is only sensitive up to 5900 y and as the unorthochromatic plate does not reach this far in sensitivity, it follows that the light is absolutely safe for any plate except orthochromatics, at the same time transmitting a large volume of light. The methyl violet screen absorbs all the light from 6500 y to 5000 y so that there is a good overlap at about 5000 to 5900 and the combined screens, red, yellow and violet, therefore, only transmit light from 7000 y to 6500 y, which none but panchromatic, or deep red sensitive plates are affected by, and this light is therefore safe for any plates made orthochromatic or otherwise even of the highest speed, while it transmits the maximum amount of light.

With these three screens then, we have a yellow light, safe for bromide paper, slow plates, or lantern slides; a red yellow screen, safe for ordinary plates, and a red, yellow, violet screen, which is safe for any plates except panchromatic or autochrome plates. This last screen has been used by the writer for the last-mentioned plates and, while eminently

satisfactory, requires a little care, so that the light cannot be said to be safe in the sense that it is for ordinary ortho or red sensitive plates.

All these screens transmit a maximum of light as they are absolutely transparent; they are perfectly permanent; they can be made for a cost of a few cents each, as the quantity of dye mentioned will suffice for a dozen or so 8 x 10 lights; they are absolutely safe even if the sun is shining directly on them, and are far more adaptable and convenient than any of the lights sold commercially.



TEA PARTY.

JEAN M. HUTCHINSON.

PICTURES NEAR HOME

By K. T. KRANTZ



AFTER a number of years' experience I have come to the conclusion that it is not necessary to wander afar in search of the pictorial, as plenty of subjects may be found within walking distance of one's home.

Speaking primarily of landscape photography it might appear that the good compositions within such a comparatively short radius would soon be exhausted; but I have not found such to be the case, although my photographic efforts in the present vicinity have covered the space of eleven years, and I have traveled over the same ground time and again, always finding something new worthy of being recorded.

Eminent writers on pictorial photography claim that a composition should be studied under all possible conditions of light, atmosphere and change of seasons, in order to obtain the true picture. Where, may I ask, are the opportunities for such study presented to the average photographer unless within a comparatively short distance of his home?

Let us consider the various conditions which may develop to alter a landscape so that a study which has been passed by as worthless may become a valued addition to one's collection:

First the seasons. Spring with its misty days and gentle rain will efface many an ugly background leaving a harmonious foreground study ready for the camera. Again, many a tiny brooklet becomes enlarged at this season, changing its course and introducing new leading lines frequently proving of pictorial value.

Especially in April, the month of showers, when the sun bursts forth after a rain, many a commonplace street shows beautiful reflections in the puddles, and harmonious curves in the muddy wheel tracks filled with water, lighted by the sun.

A little later the fruit trees are in bloom, creating a complete change in the view and adding many pictorial possibilities to the picture seeker's list.



THE CABBY.

FRANK M. INGALLS.

Soon after this the trees are in full leaf, giving masses where previously lines existed, and the field flowers such as daisies, etc., soon begin to bloom in such profusion that it is seldom difficult to select a view point where the flowers will mass properly for a pictorial gem.

The summer season follows when the foliage of the trees has lost the brightness of spring and takes on a darker shade. The field crops ripening show changes in hue, and stacks of oats, wheat and hay may be found which present subjects for the picture lover.

The changing foliage and storms of autumn give us further opportunities. At this time also the clouds are unusually fine, completing and adding effect to many simple compositions, which would be of small interest without the cloud effect.

Probably the greatest change of all is caused by winter's snow. At this time the key of the landscape is completely changed, much that is unsightly is hidden from view by the white mantle.

Winter landscapes are also very flexible; one may add lines by beating a path wherever desired, or add masses by merely sticking a few bushes in the proper location.

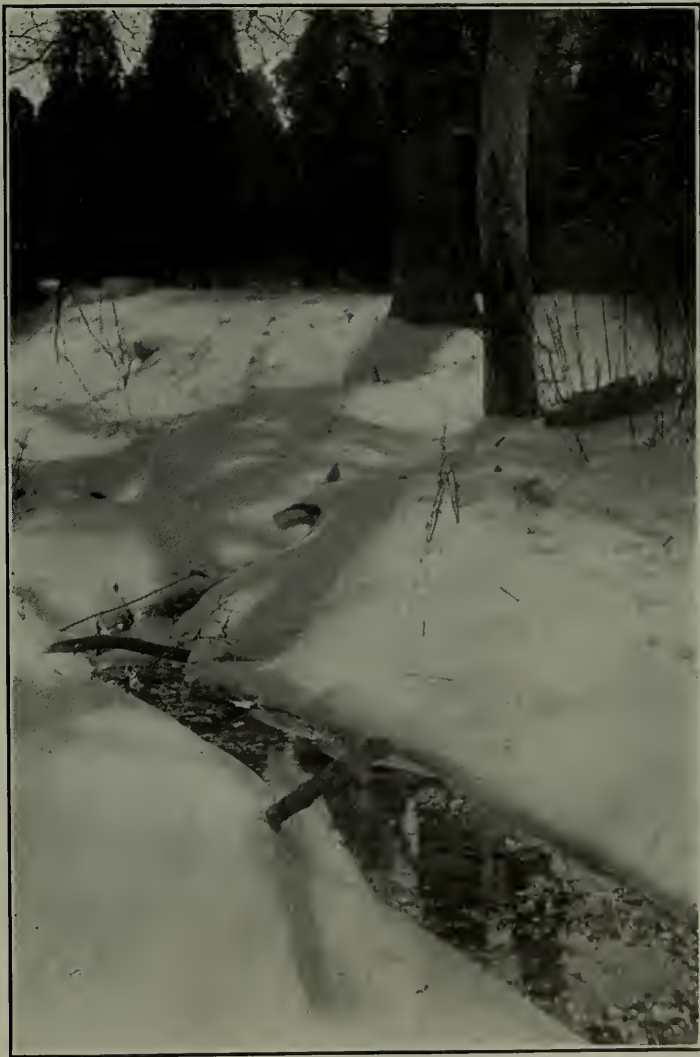
This is the time of the year for the study of tones, the shadows in the snow presenting possibilities hitherto undreamed of. The drifting snow forms many fantastic figures, and for true atmospheric effects I doubt whether conditions can surpass or even approach that in the scenes taken when the snow is falling.

After considering the foregoing it is not surprising that the pictures near home are not readily exhausted. Occasionally one will discover a fine picture in a scene passed by many times.

I recall a certain lane where I pass by daily on my trips to and from my office, which as a rule appears decidedly commonplace. One evening, however, in the spring I happened to pass just before sunset and was surprised to find a beautiful picture before me. A few muddy ruts, lighted by the setting sun, formed beautiful leading lines, the houses massed together by the weakening light and balanced by a group of trees, just breaking into leaf, formed the picture which was completed

by a few fleecy sunset clouds. Unfortunately by the time I had procured my camera the sun had set and a record of the scene was lost. However, I have hopes of obtaining a picture at this place when spring comes round again. I have studied this scene many times since, but only at the time mentioned above was the pictorial possibility visible.

The same thing may be discovered many times in one's wanderings in search of the beautiful, and I could mention many other such pictures which I have discovered and fortunately recorded from time to time.



THE BROOK IN WINTER.

K. T. KRANTZ.

A NOVEL SHUTTER RELEASE

By B. J. FALK



ON the opposite page we reproduce a picture made by Mr. B. J. Falk, the well known New York photographer. There was no spare hand to press the bulb, so a small trap arrangement was devised which was released by a rifle shot fired by a member of the group. The occasion was a rehearsal of a fancy dress revel in one of the mountain resorts. The following is Mr. Falk's description of the method used:

"The camera was placed on a ladder facing the group on the porch at a distance of 30 feet. To the lens-shutter was attached the usual rubber tube and bulb, which latter hung about 12 inches below the camera. The compression of the bulb was accomplished in the following way:

"The camera was so placed that the back of the bulb rested against one of the rungs of the ladder. From the end of a strip nailed to the top of the ladder, and projecting from it about 10 inches, was horizontally suspended by a thin string an ordinary kitchen funnel—its wide opening facing the group—and in such a way that the end of the stem of the funnel just rested against the front of the bulb. All that was now necessary to make the exposure was to impart a sudden motion to the funnel of ample force to compress the bulb.

This was done by the rifle bullet. To insure sufficient resistance the stem of the funnel was solidly plugged with a piece of wood to the near end of which a penny was glued. At a signal the gun was fired by Jack Johnstone, the son of the hostess, and with so true an aim that the bullet struck the penny without touching the sides of the funnel. The scheme worked perfectly, but to me the strangest part of the experiment was that the bullet after doing the work it was meant to do, had just enough force left to enter the bulb, but not enough to go through. It is still there."



Illustrating Article, "A Novel Shutter Release," by B. J. Falk.

PHOTOGRAPHIC LIMITATIONS

By CHARLES E. FAIRMAN



MUCH has been written about the universal application of photography. Many have claimed its possibilities as closely crowding upon the art of the painter. Others have classed it among the purely utilitarian mechanical arts. Others have failed to consider it seriously, regarding it as a pastime and money spender, and from these different view points it may be possible to arrive at a reasonable estimate of its proper field by carefully considering its limitations.

In discussing whether photography can be properly classified among the fine arts, it will be well to determine whether by its aid we can secure all of the results secured by the artist who uses oils or water colors as a medium. We find that in the process of elimination of undesirable material, whether the portrait, the landscape or the marine is the subject of the work, that the painter is free to paint what he will, as much of it as he will, and in such manner as best suits his determination of the needs of the case. No one will claim for a moment that all of these results can be obtained by any photographic process.

It is true, and it should, however, be borne in mind that for the faithful copying of a bit of nature, landscape or marine, that the camera is a faithful servant, a good copyist, an able statistician, but in such a copy the personal interpretative element is wholly lacking.

It is also true that some moods of nature, such as a fine cloud effect, a coming storm, a marine view with the so-called night effect, is oftentimes rendered in such a manner as to invite the admiration of the ablest painter. Such results, however, are but the truthful realism of the copyist, and while the painter may not hope to equal them, it is for the reason that the conditions are so rare and often so transitory that the easel could hardly be located before the condition has passed away.



MADELEINE.

ALCIDE PINARD.

In portraiture the product of the camera is many times a severe disappointment. Of its truth it is hardly proper to question, but the feeling remains that the sitter has been photographed with an expression or pose that seems wholly unnatural. The results are therefore lacking in that pleasing quality, that interpretative analysis obtained by the skilled portrait painter who has learned the moods of his model, and in his selection has portrayed the sitter at his best.

The difficulty with much of the photography of the present when compared with other arts is that the photograph includes

too much, the interest is therefore divided, and often there is great difficulty in determining the dominant point of interest or the motive of the picture.

Inasmuch as the faculty of elimination is denied to most of the users of the camera, for the reason that elimination means skilful after manipulation of the negative after development, it is important that more care should be given to selection, and that the subjects of the photographic compositions should be made as simple as possible. If by any means a composition can be selected which would include only as much as would be included on the canvas of a painter, then in such a case the photographer has an opportunity for real rivalry with the painter's art.

It requires but little to form an interesting composition and for this reason the photographer who loves his work from the painter point of view should study constantly the simpler forms of composition, and then add to this simplicity all of his training in the attempt to express such a condition of nature as will lend an additional charm to the simple subject selected.

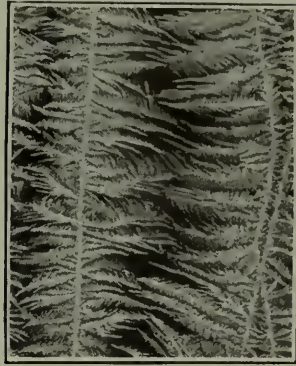
Clouds in landscape studies, a proper separation of the different planes, the proper emphasis of what is important, all of these add greatly to the attraction of the most ordinary landscape, and yet with an attempt to include too much in the composition these fail to atone for the neglect of selection.

The space permissible for such an article will not permit of an extensive showing of all the limitations of photography, and the most which can be hoped is that the subject will be the source of serious thought by the many readers of the "Annual." It has not been the purpose of the writer to discourage, but rather to encourage sincere workers in the right direction.

It is wiser to take photography for what it is, rather than to lament for what it is not, and recognizing what may be attained by the use of the camera, try and develop along the lines of the possibilities of this art-science the interpretation of such subjects as are within the limitations of this interesting process, remembering that within the scope of the camera there is no better medium for accomplishing those things which from its nature is was intended to accomplish.



WINDOW FROST.



WILSON A. BENTLEY.

THE MANY USES OF A LOW POWER LENS

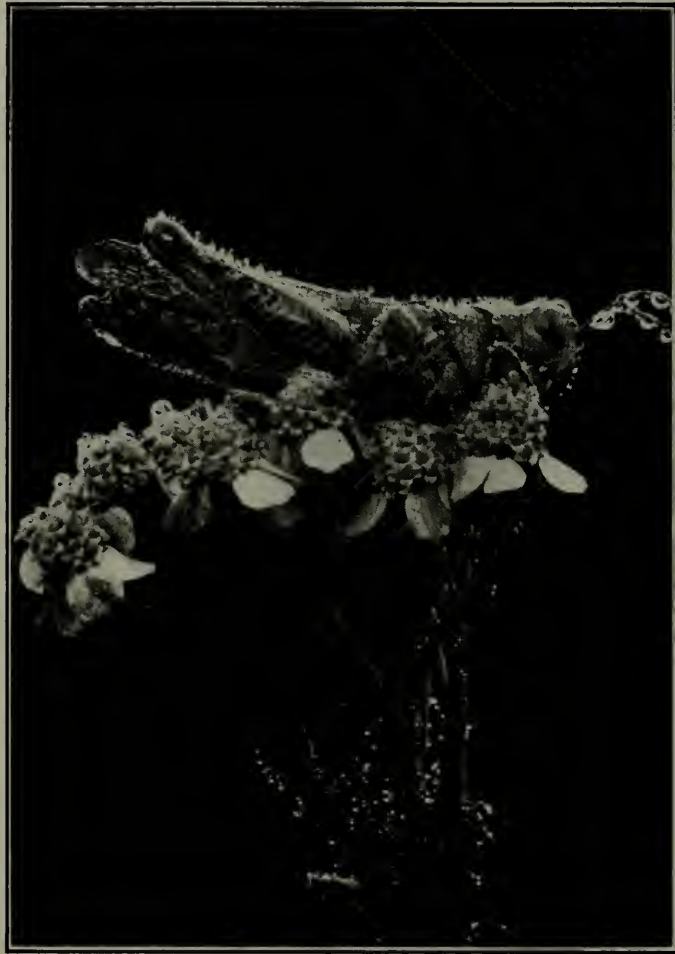
By WILSON A. BENTLEY

IT is perhaps too often thought that all photomicroscopic work of any kind requires an expensive apparatus, both microscope and extension camera, and is difficult of accomplishment. This may be to a degree true, as regards photographing the snow crystals, but not as regards the "forms of water" in general, and of many quite tiny natural objects.

Much of our photomicrographic work among the frost and ice crystals, the dew, etc., has been accomplished by using an ordinary low-power (one-quarter size) photographic lens and a home-made extension camera.

It is of the many uses of such a lens and combination which I wish to emphasize in this article. A low-power lens of this kind, well stopped down, in combination with a purchased or home-made extension camera, serves admirably as a low-power photomicroscope for photographing a vast number of tiny natural objects. It is a comparatively easy task, as pointed out in my last article,* to fit a lens to one end of a box, blackened inside and made light-tight, and one's camera, of whatever size, to the other (open) end of the box, with

*Page 110, Annual 1911.



DEW ON GRASSHOPPER.

WILSON A. BENTLEY.

light-tight connections, fastening and adjusting all, box and camera, to a baseboard of the proper size and length. The total length of box and camera for most kinds of work should be about 30 inches.

The methods employed and the charming nature of the work, as well as some of the exquisite pictures secured thereby among the windows and hoarfrost effects, dew-laden objects, etc., have been pointed out in previous ANNUALS. But such an apparatus is equally adapted for photographing tiny insects, flowers, mosses and lichens, hailstones, sections of ice and ice crystals, plants, seeds, tiny mineral crystals, etc., etc.

Photographing should be accomplished, when possible, outdoors under the open sky (but, of course, not in direct sunlight), as the objects are thereby well lighted up so that all details are brought out.

Many objects show best against a dense background, and all such should be arranged before a blackened pail, the latter being placed in a horizontal position and blackened inside. Objects which flutter in the wind may be mounted and photographed within a glass enclosure, as directed in the 1911 ANNUAL.

This field of endeavor is inexhaustible, as each State and county and clime have in part vegetal and other objects peculiarly their own and which make most exquisite and interesting pictures in the photo-micrograph.

The illustrations accompanying our article may perhaps serve to still further convey an idea of the utility and many uses of a lens and apparatus of this kind, and of the charm and clearness of detail in the photomicrographs of insects, frost, dew, etc., secured thereby.



SISTERS.

WILLIAM GILL.



HATS.

E. T. HOLDING.

SOME NOTES ON LANDSCAPE PHOTOGRAPHY

By J. W. LITTLE

FOCUS sharply on what is intended to be the principal object in the composition; then observe for a moment the principal object with the naked eye. Then endeavor by refocusing to produce on the ground glass the impression made on the mind when viewing the principal subject directly by the eye, with an equal amount of detail, by altering focus, using horizontal and vertical swings and different stops, generally using the largest stop that can be used to produce the desired result. Do not focus so that it can be determined where sharp focus ends and diffusion of focus begins. The



OLD FARM HOUSE.

WM. T. KNOX.

view must be in no part so out of focus as to destroy structure, but should be graduated gently, built up, so to speak, around the principal object.

On misty days the principal object may be focused quite sharply if close at hand. Otherwise, the whole view may be slightly out of focus to assist in carrying out the theme that it is a misty day. Greater care must be taken in preserving the different planes on a bright day.

The landscape photographer will do well to select scenes in which the principal lights are toward the center to get a

satisfactory composition, or he may modify it in printing as illustrated in The Photo Miniature No. 61.

Use orthochromatic plates and screen, with dilute developer, for scenes with bright sky and large masses of shade or trees. Dark, heavy, nearby trees do not harmonize well with open landscapes and should usually be subdued.

In working against the sun or strong light, give generous exposure for shady side and use lens hood to shut out unnecessary light. Backed orthochromatic plates are the best for this kind of work. For a good atmosphere effect, use stop not smaller than F.8 or F.11, and if necessary additional definition by use of the swing back.

When the subject abounds in detail it should be defined, if a mere record of the place is wanted. More or less suppression of detail is usually necessary where some sentiment is to be conveyed.

Late in the evening or on very cloudy days when no shadows are cast, it is better to rather under-expose in order to produce contrast and avoid flatness.

Always finish focusing with the stop it is desired to use, and use largest stop that can be used.

Leafless trees should be exposed long enough to avoid silhouette effect of branches and trunk against sky. Backed orthochromatic plates should be used; otherwise the smaller branches and twigs will be lost through halation.

If grandeur is to be represented in a landscape, as in a rocky district, select masses few but bold, lines straight and their junctions rectangular. Gentle curves, as of grassy slopes, should not go prominently into the picture. Do not introduce the human figure, but if life is needed make use of some indigenous animal placed insignificantly, but not in the foreground. The rocks and crags should be few and occupy a large portion of the picture. Gloom is better than daylight, lowering sky than dappled clouds. The distance should be shrouded in haze to produce mystery. Shadows in the foreground should be heavy masses, but full of detail and may perhaps be emphasized better with ordinary than with orthochromatic plates.

The camera should be very much elevated when taking a nearby view of a tree, or the tree should be taken at a distance



PORTRAIT.

J. Ellsworth Gross.

and enlarged, so as to avoid the effect of looking upward. A little movement in the foliage may be an advantage sometimes as showing motion. A little halation may also be an advantage for the same reason.

The principal object should if possible be supplemented by one of lesser importance as a secondary object. As, if a large tree is near the camera there may be a smaller one in the distance. If a group of people are in the foreground there may be a smaller group in the distance.

In photographing distant views, which consist principally of light tones, introduce dark object in foreground to give force and consistency.

If a group is included in landscape, the group must usually dominate the landscape, and one of the figures must dominate the group. If a group of trees, one tree must dominate the others.

In the introduction of figures in landscapes, when it is desired that there be a feeling of openness to the landscape, the figures should be placed near the principal masses, or if placed on the opposite side they must be small and distant so as not to block the distance or divide the interest.

One of the causes of the difficulty of placing figures in landscapes is the reason that it secures a prominence which may be detrimental to the landscape itself.

With figures in landscapes, the sky should not contain too much white if it is the background to the figures.

Short exposures give brilliancy and are characteristic of sunlight. Prolonged exposure gives restful effect of evening.

When near houses, etc., exposures must be increased for the reason that the light reflected from one side of the sky is shut off and getting but half the reflected light the actinometer time is increased accordingly.

While photographing under trees requires full exposure, especially against light, yet too long exposure tends to reduce contrasts and produce flatness, particularly when ground is covered with Autumn leaves and is flat.

In evening effects the contrasts of light and shade should not be great. Strive to get the exact effect produced by the light under which you are working.

The introduction of a shadow in the foreground or middle

distance over which the vision travels to the light beyond gives a feeling of depth to the picture.

Vista pictures are seldom satisfactory, the framework contending with the point of interest beyond.

Sky space should not be divided by trees, etc., into two or more equal parts. Fences, shadows, etc., should also be watched that they do not divide the pictures.

Branches of trees should not be included which are detached and have no support. They may be often taken out by retouching. Too little sky space tends to give a cramped impression to a picture.

The forms of wind-driven clouds should harmonize with the direction of the wind as indicated by the bending of weeds, trees, etc., in the landscape itself.

When a road or stream or a line comes up to the margins it should be kept well subdued at the margin to keep the eye within the picture. This is particularly necessary if it runs towards the corner of the picture.

Where there are two or more objects, as a tree, a bridge and water, any one of which might be the principal motive, principality must be given to one, which may be done by judicious placing of a figure or by the arrangement of the principal light, etc.

If the foreground is the main point of interest, do not have too much background. If background is of most interest, no prominent objects should be in foreground.

The lines of the background, if possible, should emphasize and repeat those of the figures, trees and buildings in the foreground. If not actually repeated, the foreground and background should be related to one another either by likeness or effective contrasts, as with cattle large and prominent in the foreground there should be a wide and spacious view in one part of the landscape to give proper sense of space and absence of restraint.

The shadow masses in landscapes may be utilized in the composition by determining the best direction of the lighting, *i. e.*, best time of day. They are often useful in filling up an uninteresting foreground.

Apart from the effects of atmosphere, distance has a very small influence on time of exposure. At a distance of 100



IN THE NORTH COUNTRY.

LIONEL DICKINSON.

times focal length of the ordinary landscape lens the exposure required to produce same the density in a white object as in the sky is about the same. Nearer than that distance, say at ten times the focal length of the lens, the exposure required for a white object is a very little more than that required to produce the same density as the sky.

The effect of great distance on exposure, as compared with the same objects near at hand, is about as ten to one. Objects nearer than fifty yards, unless very close to the camera, require about the same exposure, as there is very little intervening atmosphere.

The influence of the weather upon exposure at a given hour of the day is not great, being but about four to five, as between a very bright and very dull day. The greatest influences are, the height of the sun, season of the year and the amount of dust in the atmosphere, as at sunset when the light is of a red color.

The appearance of the image on the ground glass is not always a safe guide in judging exposures, owing to the difference between the chemical and visual luminosity under various circumstances and different actinic power of light at various hours of the day and year and under various atmospheric conditions.

Unless there are green or dark objects in the subject which are against the light, ordinary plates are best for seashore photography, as otherwise the sky may be over-corrected. Medium plates are best and they should be backed.

In high and breaking wave photography (not merely seashore photographs) the shutter speed should not be greater than $1/75$ to $1/100$ seconds. For running water the speed should be about $1/5$ to $1/10$ seconds in order to secure the effect of motion.

A hand camera is better for photographing sea waves and the lens should be kept covered up to the moment of exposure to prevent its being clouded with mist. A rectangular view finder is best. The camera should be held in both hands and the bulb may often be held in the teeth. If a tripod is used, a thin piece of glass may be fastened over the lens with rubber bands to keep the spray off while composing the picture on the ground glass, and it may be removed long



FOUR SENTINELS.

Harry D. Williar.



SHADOWS.

ERNEST CLAYPOLE.

enough to focus and also at the actual time of making the exposure.

The duplication of an image by reflection in water is more often a source of weakness than of strength in the composition.

Fountains are best taken when there is a slight wind blowing. It is better to have some dark object as a background to the water and spray. The shutter should not work too rapidly in order to preserve an effect of motion.

In all water pictures, care should be exercised that reflections should not be lighter than the sky itself.

In snowscapes, where the snow shows good detail, the sky may be made slightly darker than the snow to produce greater brilliancy.

A dry, crisp snow should have a bright clear atmospheric effect, as light clouds and sunshine. Wet snow and slush

should be duller in treatment, with misty atmosphere and heavier, softly defined clouds. Wind-swept snow should have a bolder treatment of the sky, with large rolling clouds suggesting storm and movement.

When it is desired to take views rather than pictures in hazy atmosphere, use screen with full exposure to clear the distance, also to avoid flat lighting.

For panoramic pictures which it is desired to join together, the screw on which camera revolves should be directly under the lens.

Long focus lenses should always be used for panoramic work where negatives are to be joined together. Otherwise straight lines will not join properly. A shorter focus may be used for landscapes, but the lens should be rectilinear.

In panoramic work the joinings of the negative should be at places where angles will be produced in place of straight lines. Cross lines should be at the center of plate and joinings at the center of buildings, if possible.

Panoramic pictures taken with separate exposures are often better mounted only in close proximity, leaving a narrow space between each section.

An eminent authority says that the use of large apertures and throwing distance out of focus gives better perspective and truer tonality and atmosphere, as small stops give equal brightness to all planes; that lenses with spherical aberration should not be used for landscapes, as they affect the tonality by lowering the tone throughout, while throwing the distance out of focus with a corrected lens lowers the tone principally in the distance. He maintains that the best results are obtained by using a lens corrected for all aberrations, but that no part of the image should be absolutely sharp; that the back combination of a rapid rectilinear used at open aperture gives the truest tonality in landscape.

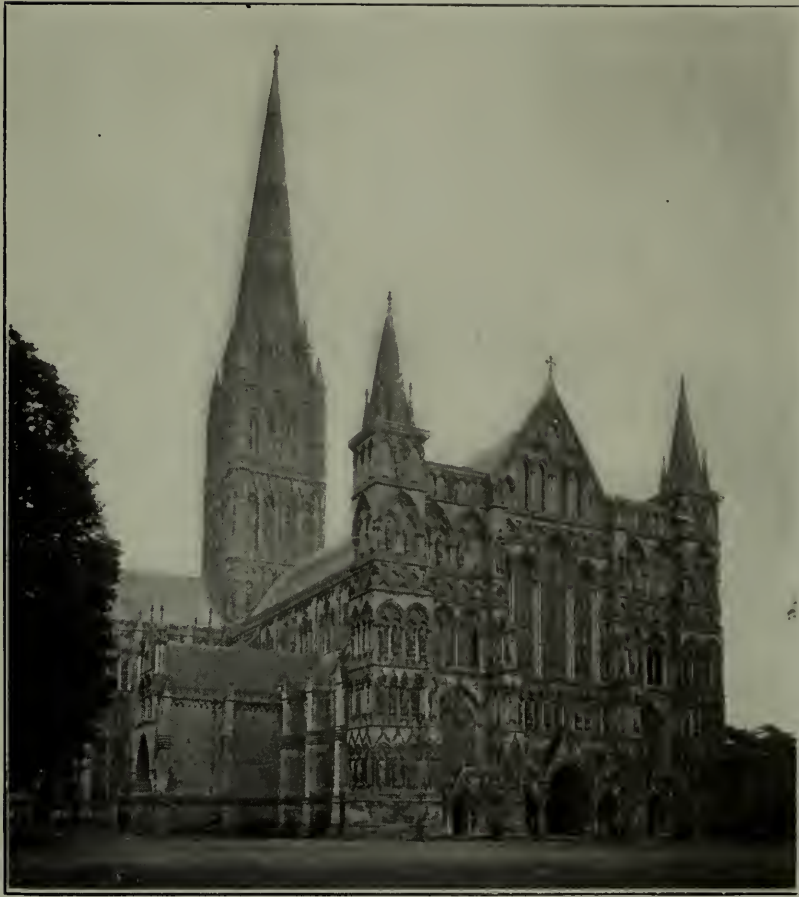


Fig. 6.

EARLY ENGLISH (SALISBURY).

G. W. ALLYN, M.D.

THE ENGLISH CATHEDRALS

By G. W. ALLYN, M.D.

THE summer tourist to England misses much of pleasure and profit by lack of preparation for his visit. Sights are so new and strange, and the time for inspection so brief that unless our preparation has been ample full enjoyment on the spot will be impossible, and, on our return, our memory of most of our visit will be a perfect jumble. Guide books are useful to those not fully prepared, for they furnish a modi-

cum of information, and if annotated serve for future recall. In this whirl of sight-seeing a hand-camera will be very useful and its records, on our return, give much pleasure if not always satisfaction; but the serious photographer who wishes to secure creditable views of the great national monuments of England must use a tripod with time exposure and usually wide angle lenses. Not second to this photographic outfit there must be a clear notion of what you want to study and where it can be found; information just as useful to the tripper.



Fig. 2.

THE NEWPORT ARCH (ROMAN), LINCOLN.

G. W. ALLYN, M.D.

Now, to understand and appreciate the historical development of England's great cathedrals and abbeys, a special study of the subject must be made before the journey. This need not be so extensive as exact and definite. The work extends through five hundred years and is easily divided in structure into about four periods. If the few dominant characteristics of each of these four periods are carefully mastered, every arch, window or door will offer an intense historical interest on every turn.

The oldest monument in England is the Stonehenge, a remnant of a great people so ancient as to have no history, no name.



Fig. 4.

EARLY NORMAN (WINCHESTER).

G. W. ALLYN, M.D.

The Newport Arch at Lincoln (Fig. 2) harkens back to Roman times, but English architecture only began when William the Norman, came as conqueror in 1066. The Anglo-Saxons had never been builders. Under the Conqueror the monks who followed him started some ninety churches, some of which are as perfect to-day as when built eight hundred years ago.

A cathedral has as ground plan a Latin cross and includes

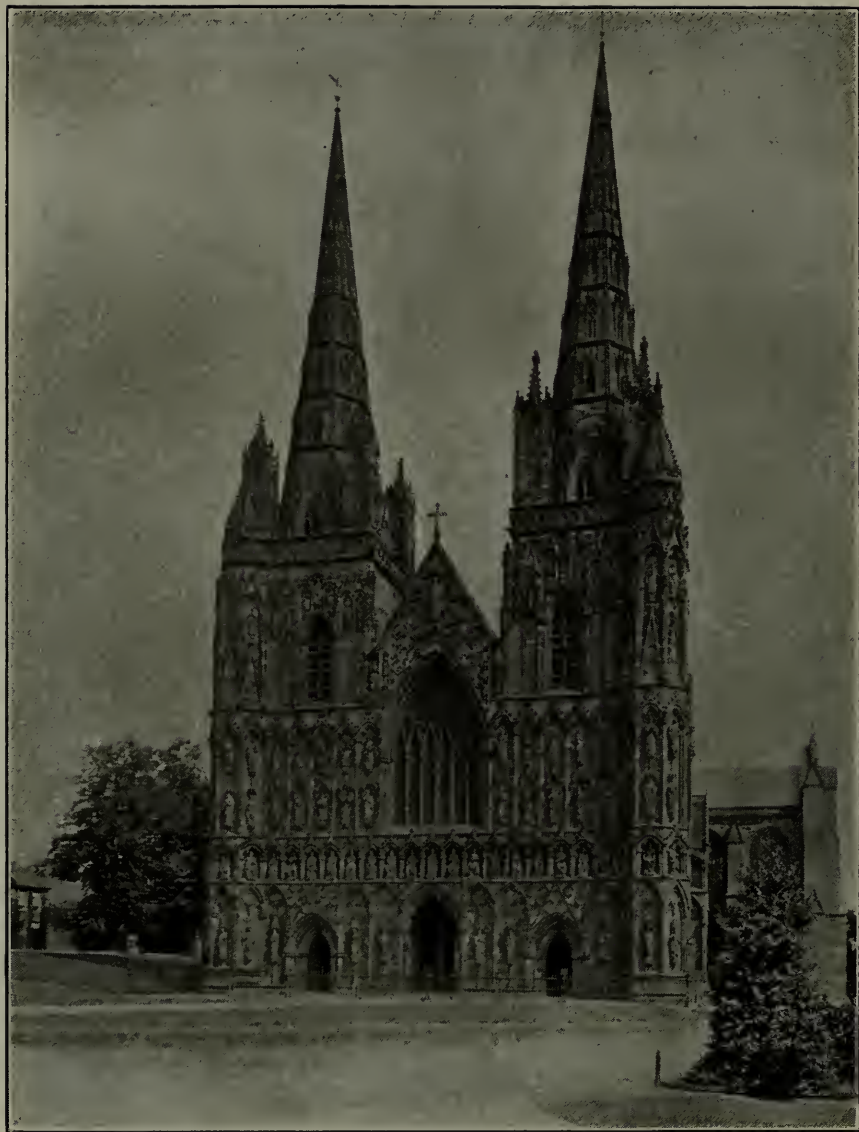


Fig. 1.

LITCHFIELD CATHEDRAL.

G. W. ALLYN, M.D.

a choir, transepts, nave and aisles. The elevation shows three distinct stories (Fig. 3).

I. THE NORMAN STYLE

introduced by the monks who followed the Conqueror was Romanesque. The early work was extremely rude, massive and devoid of ornament. As seen in the Cathedral of Winchester (Fig. 4), erected thirteen years after the landing of William, we observe the round heads of the arches, the columns are round and with a characteristic capital called



Fig. 3.

NORMAN INTERIOR (PETERBOROUGH).

Illustrating Article "The English Cathedrals," by G. W. Allyn, M.D.

“cushioned,” the piers were massive and with square edges, the roof was barrel-shaped, the doors and windows were deeply splayed or recessed and round-headed.

An excellent specimen of Early Norman and one easily visited is the St. John’s Chapel in the White Tower, London. Later Norman while preserving the early essential of structure became very beautiful with zig-zag and other ornaments, used to-day even; the doors in the front of Lincoln Cathedral (Fig. 5) furnish excellent examples.

THE GOTHIC.

About the year 1200, not to be exact, a great wave of new architectural ideas spread over all northern Europe. This held sway and underwent many modifications in different countries for four hundred years, finally yielding to an ornate and beautiful restoration of the classical style called the Renaissance. A dominant feature of this Gothic style was a pointed arch instead of a round one. To trace its development from the old style, or to discover its origin is too long a story for this article; yet the “pointed” notion took possession of every northern nation, and in a few years it had unfolded and developed into a manner of buildings which has never been surpassed. In 1225 Amiens was founded by its architect who had thus early digested fully all details. This movement was not unlike the wonderful unfolding of a new scientific idea, in our own times, the wireless telegraph or telephony. We have mentioned Amiens in France; Salisbury was building at the same time in England.

II. THE EARLY ENGLISH.

Except the four-hundred-foot tower, Salisbury Cathedral (Fig. 6) was entirely built in this style, and there are many examples of repairs or new work done in this age to be found in several cathedrals.

Almost at a glance you may identify Early English architecture (Fig. 7). The tops of the doors and windows are pointed. These “pointed” elements as doors or windows, or as blind arcades for decorating wall surfaces are very beautiful. They are sometimes clustered as groups of even fives or more. The columns are no longer heavy and massive, but light and airy and at times clustered. The moldings are elaborate and



THE LAST LOAD.

A. M. Bryson.

deeply undercut and frequently embellished with "dog-toothed" ornaments. The tympanum or space in the top of a window may be cusped or perforated by cusped circles two or three in each window head. Foliage with straight stems called "stiff-leafed" foliage is common in the caps of columns where they are not round or smooth. These characters can be detected in the illustration (Fig. 7) and should be mastered for future use.

III. THE DECORATED.

This name given to the highest development of true Gothic in England needs a little explanation to make it clear. The



Fig. 7.

EARLY ENGLISH (YORK).

G. W. ALLYN, M.D.

area in the top of a window or door was called the tympanum (drum). In the Early Norman it was a flat dead surface (Fig. 3). This was perforated first by round holes. In the Early English these perforations became more ornamental, the circles were cusped in the inside, yet the pattern was not lost: the stone dominated the glass. In the Decorated work this subdivision became more intricate from the insertion of series of circles (geometrical) to intricate patterns of tracery (curvilinear). (Fig. 8.) In France it became flamboyant. The

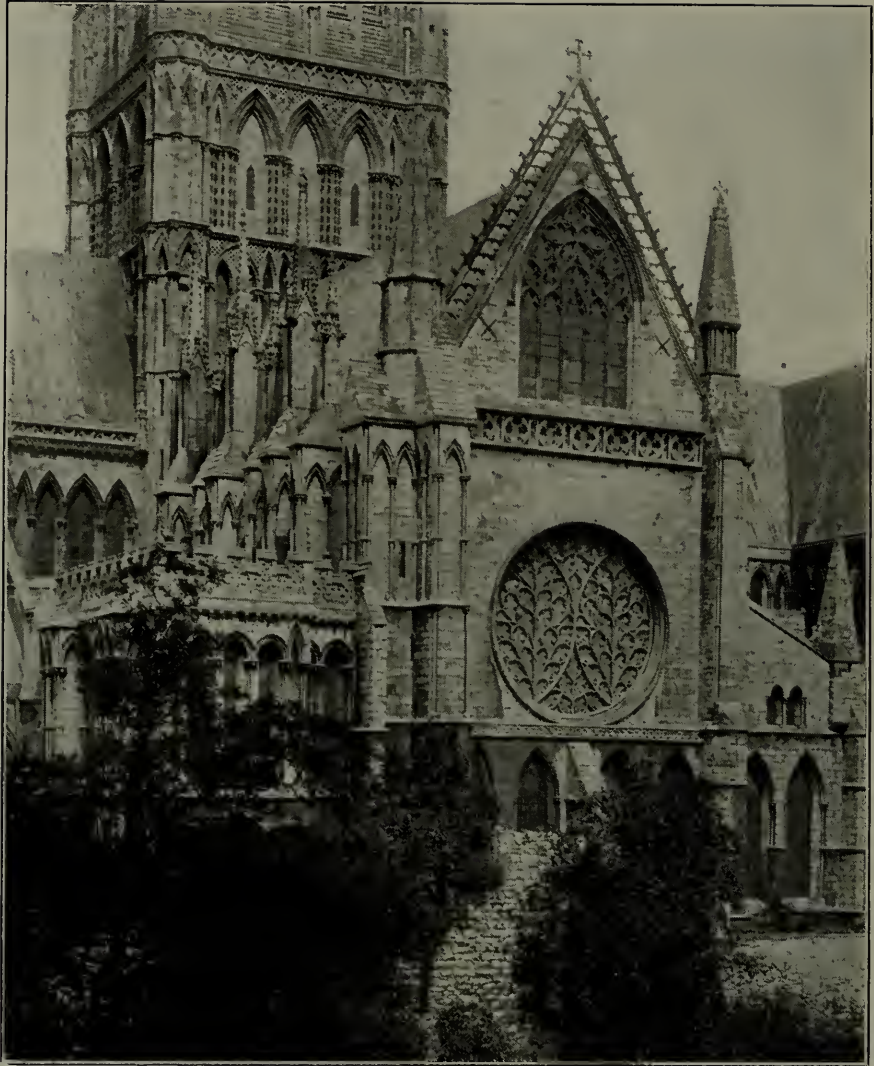


Fig. 8.

DECORATED WINDOWS (LINCOLN).

G. W. ALLYN, M.D.

stone work became the mere skeleton on which to support the wealth of stained glass. This was known as *decorated*. The windows were not quite so pointed and the carvings not quite so deep. A ball-ornament when used is characteristic. The foliage is no longer "stiff-leaved," but beautifully curved and entwined.

IV. THE PERPENDICULAR.

This manner of building is purely English and is limited to England. It is easily identified when seen. The mullions of the windows run in vertical lines the entire length. All constructive or ornamental lines run perpendicularly (Fig. 9)

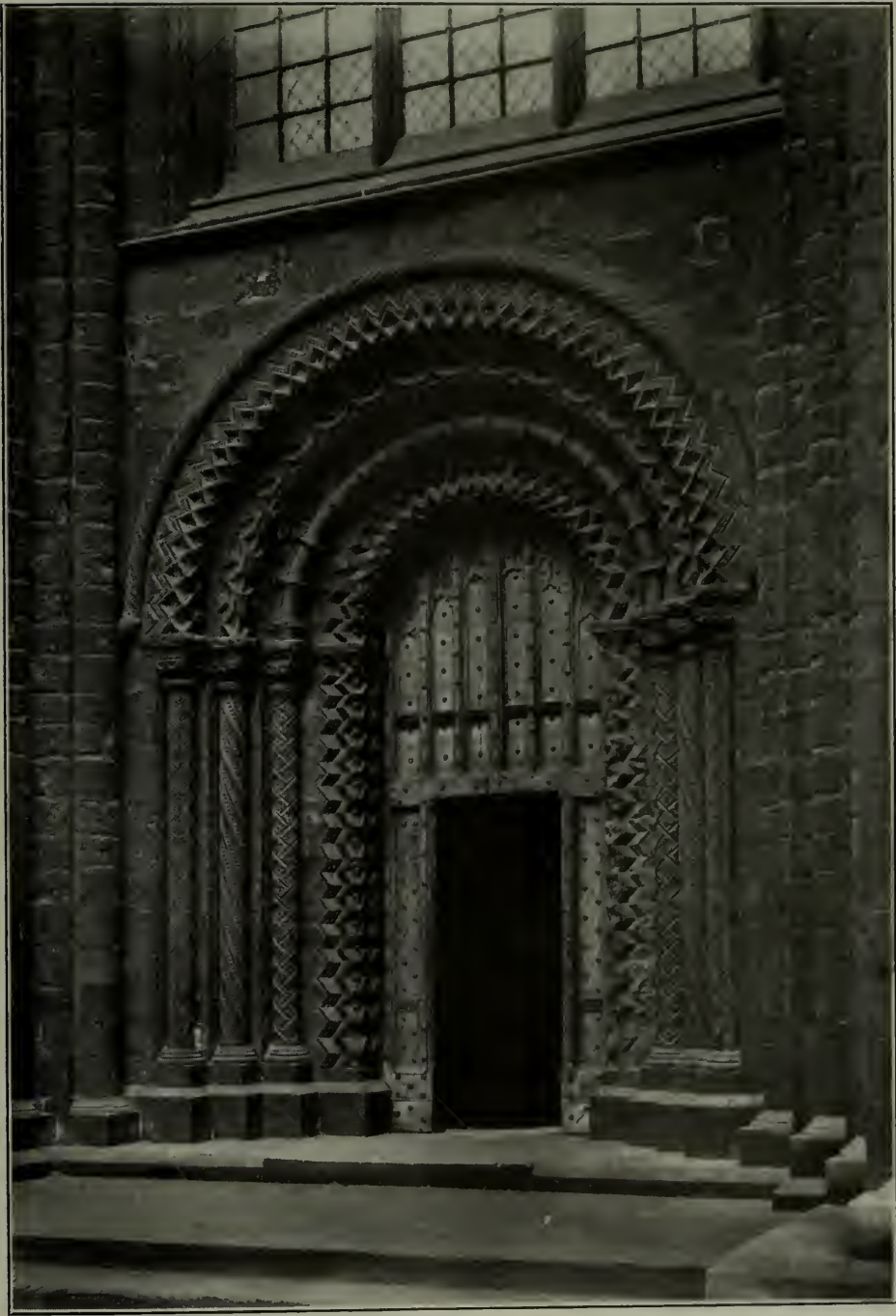


Fig. 5.

LATE NORMAN (LINCOLN).

Illustrating Article "The English Cathedrals," by G. W. Allyn, M.D.

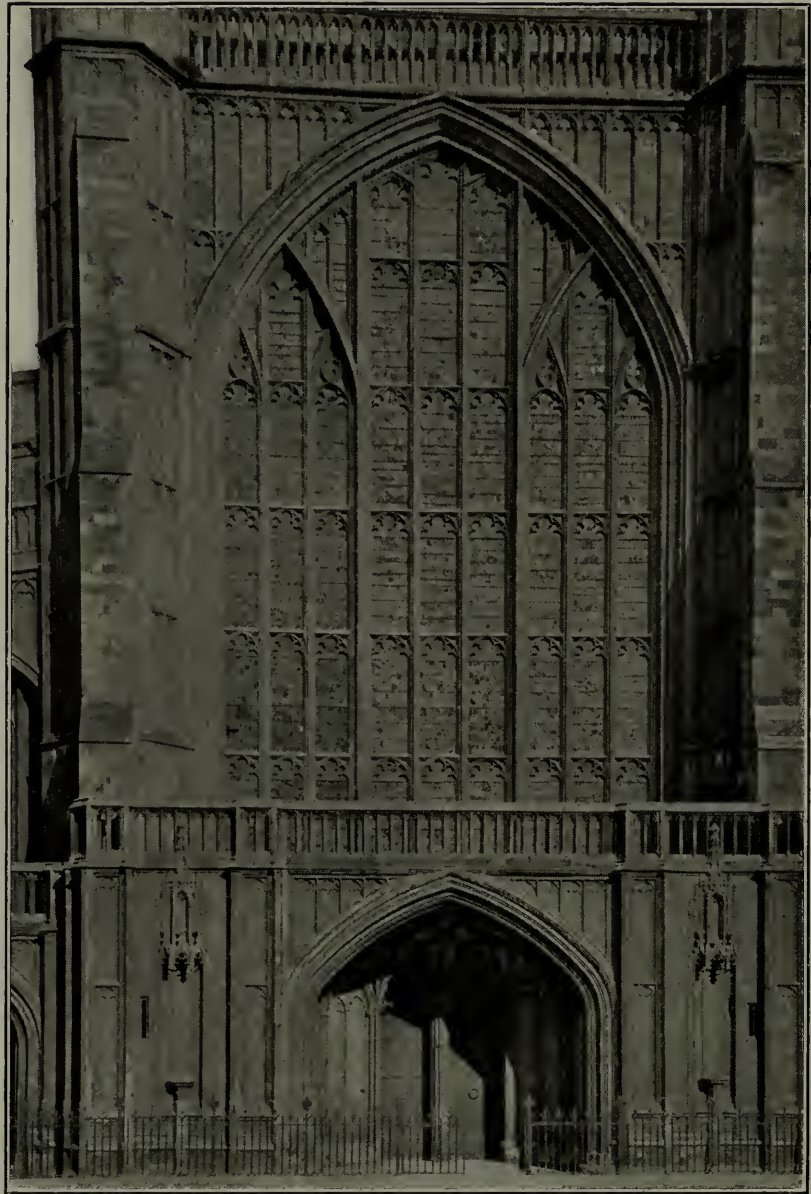


Fig. 9.

PERPENDICULAR (WINCHESTER).

G. W. ALLYN, M.D.

as far as possible. The arches are quite flat; the moldings are quite low.

The Houses of Parliament are in this style, and the beautiful roof of Henry VII. Chapel, in Westminster, was worked out by a French architect.

A list of places where these four styles may be found is at once complicated by the fact that several cathedrals show them all. That is, you may stand as on the northeast side of

Winchester and see all the styles since 1079. The same for the east end of Ely. The following is a partial list giving the most prominent examples of each style:

THE EARLIEST NORMAN:

Transepts of Winchester; St. John's Chapel, London Tower; crypts of many cathedrals, as York, etc.; parts of Ely.

MIDDLE NORMAN:

Front walls of Lincoln; main portions of Durham, Ely, Peterborough; St. Bartholomew, London.

LATE NORMAN:

Church of St. Cross, near Winchester; front doors of Lincoln; Lady Chapel, Durham.

EARLY ENGLISH:

Choir of Lincoln, 1202; the whole Cathedral, Salisbury; transepts of Lincoln; screen of Peterborough; porch of Ely.

THE DECORATED:

The whole Cathedral, Litchfield; the Angel Choir, Lincoln; The Nine Altars, Durham; Fountain's Abbey, Church; the Lady Chapel, Ely; windows in south end of Lincoln.

THE PERPENDICULAR:

The eastern portion of York; the nave of Winchester, from alterations; the Houses of Parliament; the western front of Winchester; Gloucester.

Every cathedral town has its small local guide, and we would suggest the following as practical books on the subject:

ENGLISH CATHEDRALS. By Mrs. Van Rensselear. For winter evenings.

A, B, C OF GOTHIC ARCHITECTURE. By J. H. Parker. Simple and to the point.

ENGLISH CATHEDRALS. Illustrated. By Francis Bond. An excellent hand guide to all of the English cathedrals.

LEAVES FROM MY NOTE BOOK

By HENRY O. KLEIN, F. R. P. S.



THE following chiefly deals with collodion emulsion, which is likely to become of much greater importance than could have been anticipated in face of the advance made by panchromatic process dry plates.

At present the spheres of both processes are within well-defined limits. Some firms in England expected of dry plates more than collodion emulsion could offer, and now, somewhat disappointed, return to the old process, which they knew to be cheaper, though more delicate. Moreover, there was sufficient evidence to anticipate the coming of a color-sensitive collodion emulsion dry plate and of a collodion emulsion manufactured on entirely new lines, to be sold at a price which would make it possible to successfully compete with the wet collodion process for black and white work. Although not on the market, both are accomplished facts. Whether they become monopolies to be worked by one large photo-engraving concern, or whether an enterprising manufacturing firm, which is not looking forward to immediate gain, will secure and work them, will probably be settled in the very near future.

NEW SCREEN FOR COLLODION EMULSION.

It is well known that collodion emulsion requires shorter screen distances than wet collodion, which is due to "irradiation effects." How to make use of this somewhat troublesome property has been ably discussed by Mr. Howard Farmer, of the Polytechnic Institution, London, in his "Irradiation Process" lecture some years ago. To avoid sweating of screen, small diaphragms were requisite and the exposures were unduly prolonged. A series of troubles were directly traceable to long exposures and subsequent drying of the emulsion film. The new screen introduced by Max Levy,



BROOKFIELD MEADOWS.

GEO. R. BOSWORTH.

of Philadelphia, has a very thin cover glass, and allows of very close screen distances and large apertures. If we bear in mind that intensity of illumination cannot be compensated for by prolonged exposure the great value of the new screen becomes self-evident, and cannot be exaggerated. The tendency of the high lights closing, due to spreading of light, is successfully overcome by increasing the width of the black lines.

A USEFUL COLOR PRESERVATIVE.

Collodion emulsion, when sensitized with iso-cyanine derivatives, is liable to be affected by atmospheric impurities. Sulphuretted hydrogen, carbon dioxide, sulphur dioxide and nitrous oxides in the dark room or studio have caused trouble. A simple remedy has been found which we can strongly recommend.

After washing the plate, flow three times with the following solutions before exposure:

Distilled water	50	oz.
Gum Arabic	1 $\frac{1}{4}$	oz.
Glycerine	3 $\frac{1}{2}$	oz.

or 10 lumps of ordinary white sugar dissolved in one quart of distilled water may serve as a substitute.

The plates will be found to work perfectly clean and to retain their color sensitiveness, even if worked under the most unfavorable conditions.

ETHYL VIOLET VERSUS PINACYANOL.

The question has been raised whether the very delicate pinacyanol has proven the ideal red sensitizer for collodion emulsion. We feel inclined to answer in the negative. Pinacyanol sensitized emulsions are liable to completely lose color sensitiveness within a few days and serious disturbance to business routine has been caused by this undesirable property. Ethyl violet sensitized emulsions will keep indefinitely, actually improving with age. The red sensitiveness of the latter is, of course, not as great as that of the former and a deeper filter must be used. However, this increased exposure may be compensated for by larger lens apertures which pinacyanol does not permit.



CHILD PORTRAIT.

C. F. Townsend.

Moreover ethyl violet 6B, or ethyl purple, as it is commonly called, is a very cheap dye, pinacyanol very expensive. The reason why pinacyanol is unreliable we believe to have traced to minute quantities of viugl-alcohol $C_2H_4O_2$ present in the solvents used in the preparation of collodion emulsion. A similar difficulty is met with when panchromatizing dry plates with pinachrome. The distilled water shows in most cases acid reaction and completely discolors the dye bath after a few minutes. The addition of ammonia restores the color, but seriously impairs the keeping qualities of the plate.

TEST FOR PURE SOLVENTS.

Operators are often called upon to dissolve emulsion pellicle and it will be necessary for them to test their alcohol and ether.

The alcohol must be 95 per cent., specific gravity 0.790 and stand the following test:

Prepare a 10 per cent. aqueous solution of nitrate of silver, a few drops of which are added to the alcohol in the test tube. Now add ammonia in excess and expose to strong light for some time. If the alcohol remains colorless—provided the specific gravity is satisfactory—the alcohol is suitable for collodion emulsion making.

The ether is tested by adding a few drops of iodide of potassium solution. No coloration due to liberated iodine must be noticeable.

We generally found that the absolute alcohol of commerce contains too much water, although called "absolute."

It may be of interest to note that perfectly anhydrous alcohol is very difficult to prepare, but if required can be obtained by treating with the usual dehydrating agents, removing the last traces of water with metallic calcium. Such anhydrous alcohol would be, of course, quite useless for our purpose, the 95 per cent. alcohol being most suitable.

WASTEFULNESS

By FEDORA E. D. BROWN



THE disregard with which many amateurs pass by the various publications prepared so carefully for their benefit is to be regretted, since, with all the journals, magazines and articles written in the interest of photographic work, it seems as if the beginner might find help enough to learn at least the rudiments of the mysterious process, to them, of exposure, developing and printing, and to a certain extent eliminate the greater part of that bugbear "expense," which is, after all, principally waste.

If the amateur will learn to intelligently operate the new camera he must study it well, before it is loaded, and know all its parts, what they are for and what should happen when the bulb or lever is pressed. If they fail to work properly, it will then be at once detected and waste avoided of spoiled plates or films. Read carefully the booklet which comes with the camera, and ask questions of the dealer, who will always be willing to explain.

Keep reading camera literature until it really means something. At first the amateur takes too much for granted, and thereby causes more loss by waste than the real expense, as from the purchase of a camera to the finished picture there are numerous steps to consider in the matter of economy and avoidance of wastefulness.

In the preparation of solutions for developing and printing and carefully observing directions when using, the saving, though small as regards cost of chemicals, means waste in big letters when used unintelligently as regards plates or films and time. Many an otherwise good negative has been utterly spoiled in careless developing.

In printing or making enlargements be sure your solutions are right before exposing full sheets of paper. Test the solution, test the paper, and get the time of exposure on a bit of paper first.



EMBERS.

FEDORA E. D. BROWN.

Often an amateur will show the results of an entire afternoon's or evening's work and say, "What is the matter with these prints?" Stain from under-exposure and prolonged development, or examined in white light before thoroughly fixing; blisters from too strong hypo bath, or covered with white spots from careless handling in developer. Not only is this waste of paper, solutions and time, but it is also so discouraging that the amateur often loses interest and says "it's too expensive," when the trouble is so much has been wasted by lack of study and a heedless rushing at the work before knowing how to properly set about it.

Association with a camera club, if possible, or one of the postal-print criticism clubs, will prove the greatest help and inspiration, giving the opportunity of comparing work and also the benefit of others' experience and their helpful criticism. In fact, it is most essential that some connection of this kind should be formed as soon as the first steps in exposure, developing and printing are learned, for the small pictures will soon cease to satisfy one if the work has been taken up with the feeling that only the best and highest in photography is worth while. Then will come the desire for the enlargement on bromide paper from small negative, or the making of a large negative and contact prints by any one of the more satisfying processes, platinum, carbon or gum-bichromate, and nothing is so fascinating in all the work as the "gum" process.

In summing up: To avoid wastefulness and reduced expense, learn to operate and understand the camera before it is loaded, study directions and formulas, read all the good photographic literature possible and study it well until it is understood, join a club of camera workers and, above all, do not get discouraged if there are a few failures. Experience will be gained through them, expenses reduced and results more satisfactory will be obtained.

STEREOSCOPY

By W. I. CHADWICK



EARS and years ago, it was said "The most perfect transcript of nature photography is capable of rendering is by a stereoscopic transparency correctly presented to the observer," and notwithstanding all the advancements that have been made in photography up to date, the above averment holds good to-day. I don't know any branch of photography more fascinating to the amateur when once a few technical points and observances have been mastered.

For many years past the stereoscope has not been popular amongst photographers and there are many reasons. I have already hinted at one. Then the thousands of very common and intensely vulgar subjects put on the market and the very cheap inferior and incorrectly mounted paper slides, with stereoscopes to match, which have been offered to the public, have all helped to bring about the disfavor and decline.

If the reader be prejudiced against stereoscopy, what I am about to say may not interest him, but if he be, as most amateur photographers are, pleased to exhibit their work and to receive the commendations of their friends, read on.

The object and glory of the stereoscope is that it enables us to see and appreciate photographs of solid objects as we see and appreciate them in nature. Nature has provided us with two eyes, and these at a certain fixed distance apart; obviously then when viewing solid objects in nature the retinal images of the two eyes are not alike. The axis of each eye converge to one and the same spot, and it is only this spot or point of an object that is seen distinctly at a time, because the image of it falls upon *corresponding* sensitive portions of each retina (the central spot—*macula centralis*) and by the optic nerve is communicated to the brain, the mind accepts it, and then we say we see, but do not see anything *in* the eye,

or on the retina. The mind refers the image back upon the line by which it came; therefore to its right place in space. All other points surrounding that upon which our attention is directed, whether they be on the same plane or nearer or more remote are indistinct and double, and before we can see them distinctly we must concentrate our attention upon them. An adjustment of the optic axis and a focal adjustment then takes place by which the mind distinguishes the near and more distinct objects, or as we say "The natural relief and solidity."

A single picture may be described as a one-eye picture, there being only one plane; and to see and to appreciate distance, middle distance and foreground (or solidity), there is only mechanical perspective and light and shade to guide us. The alterable convergence of the optic axis and focal adjustment are quiescent, and it is well known how unreliable perspective in a photograph may be. If a certain size single picture be made by one lens, and other similar size picture be made with another lens of longer or shorter focus, and both results were viewed from the same distance, the mechanical perspective would be very misleading.

In a stereoscopic slide the dual pictures should be made to include that which would be presented in nature to each eye used separately, as by parallel vision, and when the results are properly presented by the stereoscope, we combine the two retinal images by the variable convergence and adjustment as when viewing the objects in nature. The lenses of the stereoscope should be the same focus as those used in the camera, then we see the picture at the same angle under which it was taken, and the apparent natural size with the correct mechanical perspective. If photography could give us the true aerial perspective—light and shade and color—the correct distance apart for the twin lenses on our camera would be the interocular distance, which is approximately $2\frac{5}{8}$ inches; but as photography has not yet arrived at that degree of perfection we may increase the centers of our lenses to 3 inches for general landscape work. There are cameras on the market with adjustments for increasing and reducing the centers of the lenses. These are wrong in principle and lead to confusion and mistakes in practice; then there are advo-



SUNLIGHT IN THE CRYPT.

W. W. LAKIN.

cates for "long-distance base-lines;" i. e., taking the dual pictures from points of sight yards and yards apart so as to increase the binocular perspective to an unnatural degree. Who ever saw Niagara Falls under such conditions as by one eye at the American end of the suspension bridge and the other eye at the Canadian end? Nature has not provided us with any adjustment for the interocular distance, and our faculty for judging distance by binocular perspective is limited. This is the reason why successful stereoscopists pay attention to the arrangement of the foreground subjects. For stereoscopic work alone there is no advantage in using larger plates than $3\frac{1}{4} \times 6\frac{3}{4}$ inches, though personally I prefer "double quarter" ($4\frac{1}{4} \times 6\frac{1}{2}$) which give the advantage of the larger size for single pictures, and considerable latitude in selection of foreground when printing from the stereoscopic negatives.

There is no technical limit to the vertical dimensions of a stereoscopic picture, but the width is limited by the distance they are apart, a 3-inch picture taken by, say, a $4\frac{1}{2}$ -inch focus lens and viewed—as it should be—by a $4\frac{1}{2}$ -inch lens will contain the same amount of subject and convey exactly the same impression of size as a 4-inch picture taken and viewed by a 6-inch lens.

As the lenses on the camera work independently, each inverting its own image, and as the picture taken by the right-hand lens is to be seen by the right eye, the print from the complete negative must be cut through the central division and transposed. If the lenses on the camera are 3 inches apart, and their axis parallel, identical objects in the distance as shown in the negative will be 3 inches apart, but nearer objects, say in the foreground, will be wider apart, perhaps $3\frac{1}{8}$ inches from point to point, but when the prints are transposed their differences will be reversed, the foreground objects being nearer together. Now we already know that when viewing distant objects in nature we do so by practically parallel vision and for near objects in nature the optic axes converge, therefore the finished stereoscopic picture must be presented to the observer so that the distant objects are seen by practically parallel vision and the foreground objects by the natural convergence. If then the transposed prints are mounted at 3 inches for the distant objects the near fore-



PORTRAIT.

Rudolf Dührkoop.

ground objects will be probably $2\frac{7}{8}$ -inch centers and if the stereoscope be provided with lenses of the same focus as the camera lenses with an adjustment for their separation, they not only bring the picture within the range of vision, but they enable us to use them as prisms, and thus to see the distant objects by parallel vision (though it has been said they are 3 inches apart on the slide) and, of course, we see the foreground objects by convergence.

Now, this is a point I wish to emphasize. However, perfect the negative may be technically or pictorially, if the print is not correctly presented to the observer the whole thing is generally a failure. When paper slides are made, the prints should be trimmed to show a little more subject on the left-hand side of the right-hand picture than is shown on the corresponding left-hand side of the left-hand picture, but as this may seem a little confusing and perhaps not easy to remember, we will put it in another way: Let the two inside edges of the two pictures contain a little more subject than is shown in the corresponding outside edges, or more subject on the nose sides than on the temple sides. The mounts should be of dark color (say a dark chocolate), not light buff or pale green as is so generally used.

By the stereoscope we don't want to see the mount at all, conveying the impression of a little print stuck on a piece of cardboard. But why bother with *paper prints* at all? Transparencies on glass are so very much superior, and quite as easily made when suitable appliances are employed. For contact printing, a specially constructed frame is required by which the pictures are transposed, each end of the negative being printed from separately (and here is where mistakes and disappointments are usually to be traced). The slide should be bound up with a cover glass in front and a ground glass backing with a black paper mask in between; thus we have three glasses in the finished slide. But by far the best method of printing transparencies is by a specially made though inexpensive copying camera provided with a very simple adjustable lens front in which the ordinary stereoscopic lenses may be used, and if a paper mask, such as is to be used when binding up the slide, be attached to the focusing screen of the copying camera, we are able to see and

adjust the centers before making the exposure, and if the negative be copied through its own glass, the cover glass in front is dispensed with, for the transparency is viewed through its own glass and all that is necessary is a ground-glass backing, thus only two glasses are employed instead of three as in contact printing.

Amongst my collection of photographs—mostly holiday reminiscences—I have several albums and folios of paper



Fig. 1.

prints, some of which are made from one side of my stereoscopic negative—these latter I hand to a friend. They are looked over for a short time, quickly turned over with a few casual and complimentary remarks, "Yes, very nice; pretty little picture this, etc.," and perhaps fifty prints are finished within practically a few minutes. After a little time

I show the same friend a few stereoscopic transparencies, by a properly constructed stereoscope, which is of box form—no light only from the back—rack and pinion focusing and lateral adjustment to the lenses, the whole mounted on a stand at a convenient height. In the evening the stereoscope is placed on a smooth papier maché tray, with a lamp and opal globe, as illustrated (Fig. 1.). After seeing that the illumination, focusing and adjustment is all right for the first slide, the tray carrying the stereoscope and lamp may now be slid over the table cover backwards and forwards to several observers, with the assurance that all the slides shown are properly presented, the slides being all made to one uniform center—no further adjustment is necessary. Now, my friends begin to talk, they are soon in ecstasy and cannot say too much in expressing their admiration. "It's like looking at the real thing!" Five or six minutes devoted to one slide is not unusual, and when told that the prints in the album they had previously seen were from the same negatives, it seems to them incredible, and they usually say something more, all, however, in favor of the stereoscope.



A GLIMPSE OF NEW YORK.

HENRY BOWE.

SIMPLICITY IN LANDSCAPE WORK

By ROY J. SAWYER



IMPLICITY is the keynote to successful landscape photography. The majority of pictures of this character by well-known pictorialists, exhibited in the various photographic magazines, depend largely for their effectiveness upon the few simple elements they contain. A print of any pleasing transcript of nature requires but few elements to suggest the motive of the maker, and the introduction of any unnecessary components only serves to destroy the unity and suggestiveness, for, after all, our pictures please solely on account of their power to suggest to the observer the ideas intended.

As we are compelled, at present, to render our productions in monochrome, the task is to present our conception of nature's varied moods, with prints containing a range of gradation in monotone, and containing only the vital elements necessary for the complete and satisfying whole. For example, if the effectiveness of an early morning scene depends almost entirely upon the atmospheric affect and the suppression of insistent detail, the aim should be a rendition of these qualities, subordinating or excluding any distracting elements. Or, again, if an evening effect is the impression intended, the quietude is best suggested by those elements that suggest tranquillity.

I have seen prints which a single tree with harmonious foreground and sky gave the desired impression, leaving no suggestion that the simplicity was too severe. A striking example of this can be seen in "Wind-swept," by Ernest Claypole, reproduced in the "Annual" for 1910, page 255.

There is a prevailing idea among a great many amateurs that their own particular locality is devoid of the pictorial, and that the worker who wins honors is favored with a more



GRETCHEN.

L. F. Brehmer.

picturesque location. This is erroneous. Except in some few instances, we all have a small "bit" of woods, or meadow, or creek nearby and we can find material a-plenty if we but *seek*. Success will not crown our efforts if we casually traverse the territory without thought or attempt to separate the pictorial from the commonplace.

If one endeavors to make every effort *suggest* some phase of nature, even should the results not be entirely successful, the satisfaction of having a fixed purpose more than compensates one for the time and labor involved, and the interest in photography increases instead of diminishing, as is often the case with those amateurs who never accomplish any lasting results, solely on account of their inability to understand and appreciate the beautiful and picturesque in nature.

Note the subtle changes light and shade play in any selected landscape, and study nature under various moods, for only by so doing can we learn the fundamental principles of "tonal qualities" as well as the power of "suggestion" embodied in every phase of nature.

Avoid the conventional. Interpret nature according to your own ideas, bearing in mind, of course, the laws of composition, and the originality of your productions will be the incentive for higher ideals in photography.

If a multiplicity of detail in your prints destroys the effect you are striving for, remember that F. 64, while ideal for reproducing the grain in furniture for trade purposes, when used in connection with landscape work, this small aperture only serves the purpose of giving prominence to the very elements that need softness to convey the desired impression.



DADDY'S RETURN.

J. T. ROBERTS.

A SIMPLE DEVICE FOR THE RAPID EXCHANGE OF LENSES

By E. H. WASHBURN

THE home-portrait photographer of to-day usually carries along with his outfit at least two lenses of different focal lengths, using one or the other as the occasion demands; being governed by the amount of working space available, or the size of picture wanted.

It is frequently desirable, and very essential, to exchange lenses while working and to do so very quickly and without disturbing the sitter. This is especially the case when photographing children. After making a group or figure with the shorter focus lens, the photographer may be asked to make a larger single head, or bust. The caprices and pranks of little folks will not admit of much delay, and the necessity



HOME PORTRAIT.

F. A. FRIZELL.

for rapid working becomes very apparent. With the larger lens near at hand, to quickly substitute for the other, the head is focused with very little change of tripod arrangement; sometimes without moving it at all.

The reverse operation of making a figure after making a head is at times equally desirable. The usual way of having

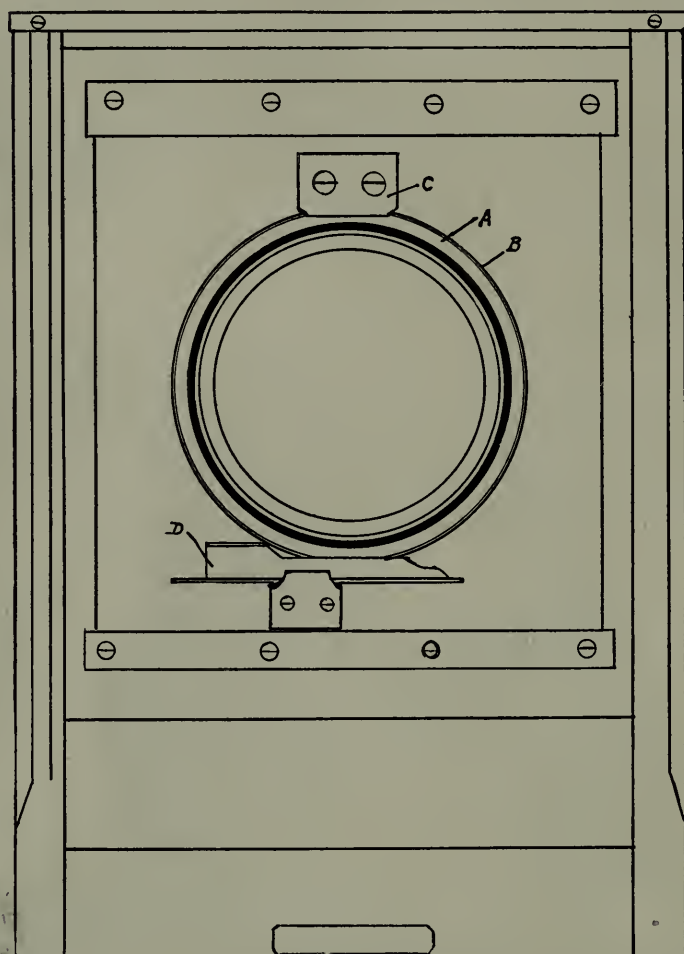


Fig 1.

the lenses fitted up is on separate lens-boards. These are at best awkward, and being beveled at the top, this side must always be uppermost, or they do not fit into the camera-front.

The problem has, in the writer's opinion, been much more satisfactorily worked out by Mr. F. A. Frizell, of Boston, whose home portraits are much appreciated by a large following of select patrons. He has devised a very simple means of making a rapid change of lenses, and with his permission, I will describe it for the benefit of the readers of the ANNUAL.

First, in the lens-board of the camera is cut a circular opening, just large enough to permit the rear tube and thread of the largest lens to pass through freely, the shoulder on the barrel overlapping the opening. A rabbet (B, Fig. 1) $\frac{1}{8}$ inch deep, is now made around the opening, just large enough for the shoulder (A, Fig. 1) to rest in.

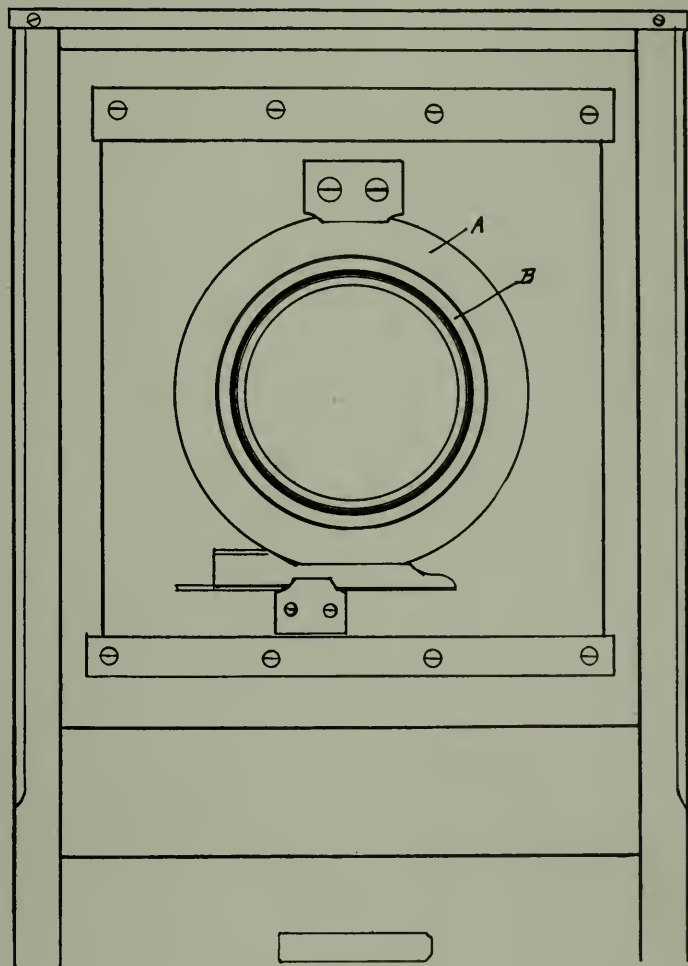


Fig. 2.

The lens is held in position by a small brass plate at the top (C, Fig. 1) and a sliding catch at the bottom (D, Fig. 1). For the smaller lens, a plate of aluminum (A, Fig. 2) $\frac{1}{8}$ inch thick, is cut to fit the circular rabbet in the lens-board. In the center of this aluminum disc, an opening is cut to receive the smaller lens. This opening may either be threaded to screw onto the lens-mount like the regular flange, or the hole may be made just large enough to let the threads on the lens pass through freely and the shoulder (B Fig. 2) rest

on the disc, the regular flange being screwed on at the back, to clamp the lens on tightly.

The disc and lens are now fitted on camera, as described for large lens and Fig. 2 shows the appearance. Any number of these aluminum discs may be provided to fit different lenses, all fitting the large rabbet on camera lens-board.

The discs being thin and light are much easier to carry than as many boards, as they may be readily slipped into a pocket without inconvenience. When working the extra lens is placed ready mounted on its disc, on a convenient mantle, or table, near the camera.

If a change of lens is necessary, the one on the camera is quickly removed and the other as quickly put on. The discs being circular, no attention need be paid to right side up, as with square lens-boards.

A trial of this method will quickly convince the user of its advantages over the usual way, as it will be found in practice that the change can be effected with much less loss of time and patience, leaving the photographer free to devote more attention to the sitter.



REFLECTIONS.

GEO. R. BOSWORTH.



ON A STORMY SUNDAY.

E. H. WASHBURN.

WASHING PRINTS

By J. C. HEGARTY



THE tendency of prints made on developing papers to become yellow, lose their brilliancy or fade away is one of the unfortunate things that the photographer has to contend with. Many prints that are highly prized because they cannot be replaced, as well as those of less value, but which represent considerable work, are found to be in a bad condition in a few months after they have been finished.

The cause of this fading or turning yellow can be traced very often to lack of care in fixing and washing the prints, thus allowing a portion of the hypo to remain in the print. Careful fixing and the thorough elimination of hypo from the print is absolutely necessary if we wish to prevent our photographs from fading or losing their brilliancy.

The instruction books say, fix thoroughly and wash; it should be fix carefully and wash without delay. My observation of the methods of the average amateur leads me to believe that they do not use a logical method in washing their prints. They are prone to err, either by washing too short a time or too long a time. If too short a time the hypo is not eliminated from the print; if on the contrary the prints are allowed to soak too long in water, the brilliancy of the prints suffer. In fixing prints only a limited number should be placed in the fixing bath at one time. They should be turned over several times and not allowed to lay in a mass, as the solution must have access to the face of the print. Ten or fifteen minutes in the fixing bath should be sufficient. In washing the prints the method that I have found most satisfactory requires two vessels, each capable of holding four or five gallons and four home-made trays.

When a batch of prints are fixed they are taken from the hypo bath one at a time and dipped in one of the larger vessels of water, then placed in the first tray, where the print

is allowed to remain a minute or two, then to the second, third and fourth trays in a like manner, only allowing the print to remain a short time in each tray. Lastly it is placed in the second large vessel there to remain until all the photographs are printed and ready for the final washing. It is supposed that the amateur has everything so arranged that he can make his prints rapidly, the idea being to complete the work as soon as possible, as it is advisable not to allow the prints to remain in the wash water too long. After the printing is completed and all the prints have been passed through the first waters they should be given a final washing. For this use two trays and change from one to the other, allowing the prints to remain a few minutes in each water. Six changes in this final washing should be sufficient to eliminate all the chemicals from the print. Should any doubt exist the permanganate of potash test may be employed to determine if any hypo remains in the print.

Those who desire to produce prints that will be permanent will not hesitate to use some extra care in washing, as the results will amply repay for the extra effort.



JOE SEYMOUR IN THE CLOUDS.

Copyright, 1910, J. H. Hare.



A GLEAM OF SUNLIGHT.

CLEO. S. BOURGEOIS.

A CLOSET FOR DRYING PRINTS

By HENRY F. RAESS

THE demand on the pictorial^o side of modern journalism for quick service in photographs taxes the ingenuity of those who furnish them. The competition between rival concerns intensifies this haste, which begins from the time the photographer leaves on his way to the scene of action, and continues until the prints are delivered at the newspaper's art department, put in the mails, or are otherwise transmitted. Any device which will expedite the making of the photograph will, of course mean a shortening of the total time. It may be in development by using a strong and warm

developer, a peculiar composition of the fixing bath to hasten the fixing, a method for washing and drying, if negatives are printed dry, which is not always necessary if only a few prints are required. If many prints are wanted from one negative, some form of printing machine, either automatic or semi-automatic, will save time.

On account of the brilliancy and general beauty of pictures on glossy paper, this variety is mostly used. The prints after

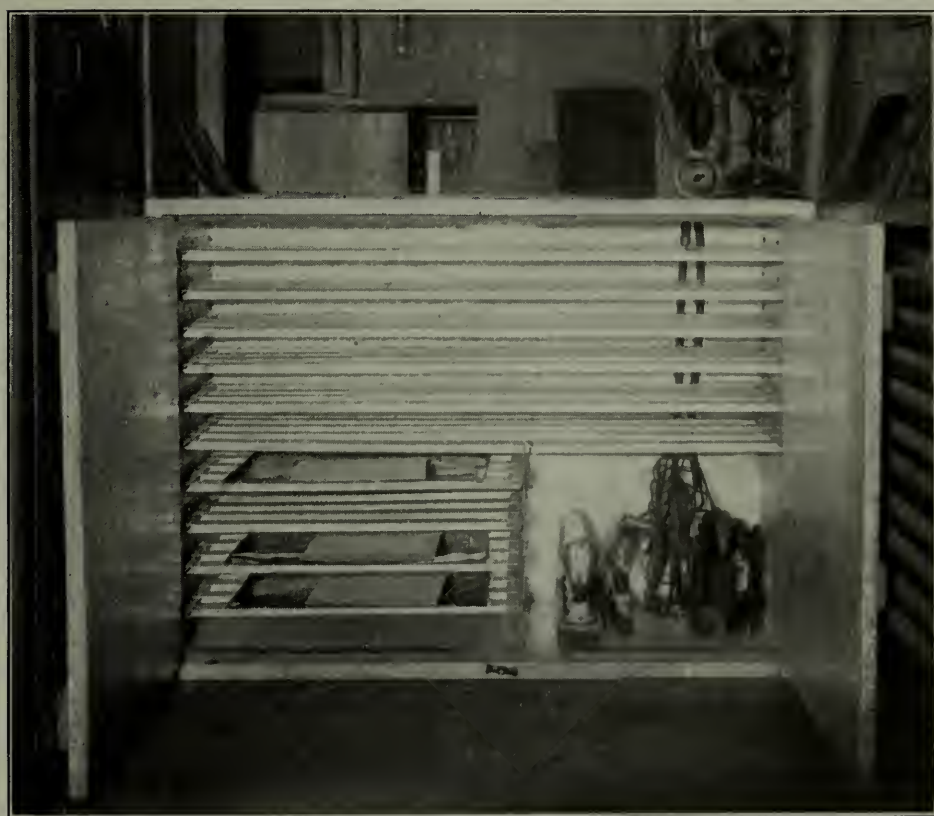


Fig. 1.

HENRY F. RAESS.

washing, and very often only a short washing, which is not harmful if the prints are properly fixed, are squeegeed on enameled and highly polished iron sheets known as ferrotype plates, a special kind being made for this purpose. The prints after washing are placed on the ferrotype plates and run through a suitable wringer, such as is used for laundry work, for removing the surplus wash water, and at the same time bringing the prints in intimate contact with the polished surface. The problem of drying a large number of prints in a

short time was solved by the New York *Herald* photographic syndicate in the following manner :

A closet was constructed which measured 14 inches deep, 48 wide and 34 high. It was lined with galvanized sheet iron. The illustration (Fig. 1) will give a better idea how it was made than pages of explanation. The racks and shelves were also made of this material. In the rear of the closet will be noticed a bank of incandescent electric lamps. These lamps are to warm the air which is caused to circulate by the fan motor. The scheme is to blow warm air over the prints, causing them to dry rapidly if the doors are kept closed.



FOUNTAINS ABBEY.

FREDERIC G. P. BENSON



AN OLD ENGLISH PRINT.

Chas. C. Kough.

American Annual Formulary

In the following section we have gathered together a typical collection of Formulæ and Tables, which will assist the photographer in his every-day work. It will be noticed that makers' formulæ are omitted. These can best be obtained by direct application to the makers. The appended formulæ are selected from the working methods of practical photographers.—Editor.

TRAY DEVELOPERS FOR NEGATIVES

Adurol. No. 1.—Water, 10 ounces; sodium sulphite, $1\frac{3}{4}$ ounces; adurol, 85 grains.

No. 2.—Water, 10 ounces; potassium carbonate, $1\frac{1}{4}$ grains. For average outdoor exposures use equal quantities Nos. 1 and 2; for fully timed exposures take 1 ounce each of No. 1, No. 2, and water.

Amidol. A concentrated developer.—Water, 13 ounces; sodium sulphite (crystals), $2\frac{1}{2}$ ounces; when dissolved add amidol, $\frac{1}{4}$ ounce. The solution keeps fairly well in bottles completely full and well corked. For use take 1 ounce of the concentrated solution and dilute with 3 or 4 ounces of water.

Edinol-Hydro for Panchromatic Plates.—Water, 30 ounces; edinol, 120 grains; hydroquinone, 120 grains; sodium sulphite (dry), 768 grains; carbonate potassium, 1344 grains; 10 per cent. bromide potassium solution, 1 dram; 10 per cent. oxalic acid solution, 1 dram. For tank use 1 ounce of above to 15 ounces water; temperature, 65 degrees; time, 15 minutes. For tray use 1 ounce above to 4 ounces water.

Hydroquinone (Shoemaker). No. 1.—Hydroquinone, 123 grains; sodium sulphite (crystals), 1,000 grains; bromide of potassium, 3 grains; water, 16 ounces. Dissolve the hydroquinone in 6 ounces of the water; in the remaining 10 ounces dissolve the sulphite and bromide; combine the two solutions in one bottle and label "stock solution."

No. 2.—Water, 10 ounces; caustic soda, 180 grains. For correct exposure use 3 ounces of No. 1, $\frac{1}{2}$ ounce of No. 2, and add 1 ounce of water. For over-exposure dilute this solution with 2 ounces of water.

Metol (Wenzel). No. 1.—Metol, 30 grains; potassium metabisulphite, 10 grains; potassium bromide, 5 grains; water, 5 ounces.

No. 2.—Sodium sulphite, 240 grains; sodium carbonate, 240 grains; water, 5 ounces. 1 and 2 combined form a one-solution developer for normal exposures. For use as a two-solution developer, for normal exposures take of No. 1, 1 part; No. 2, 1 part; and water, 1 to 2 parts, according to the assumed degree of under-exposure. For over-expos-

ures take of No. 1, 2 parts; No. 2, 1 part; and add 10 per cent. solution of potassium bromide as required.

METOL-HYDRO-EIKENOGEN (HOOD).

Water	150	oz.
Metol	$\frac{1}{2}$	oz.
Hydroquinone.....	$\frac{1}{2}$	oz.
Sodium Sulphite (dry).....	$5\frac{1}{2}$	oz.
Sodium Carbonate (dry)	6	oz.

This can be kept in a hard rubber tank for five days before exhausted by oxidation.

Metol-Hydroquinone for Orthochromatic Plates.—Water, 20 ounces; metol, 14 grains; potassium metabisulphite, 18 grains; hydroquinone, 56 grains; sodium sulphite, 1 ounce; sodium carbonate, $1\frac{3}{4}$ ounces. Use 1 drop of a 10 per cent. potassium bromide solution to each ounce only if necessary.

Ortol (Pentlarge). No. 1.—Water, 1 ounce; metabisulphite of potash, 4 grains; ortol, 8 grains.

No. 2.—Water, 1 ounce; sodium sulphite, 48 grains; carbonate of potassium, 16 grains; carbonate of soda, 32 grains. Add a drop or two of a 10 per cent. solution of bromide of potassium. For correct exposure mix No. 1 and No. 2 and dilute with an equal bulk of water. For under or over-exposure, add less or more water than equal bulk of Nos. 1 and 2 combined.

Pyro, Dry (Fairman). A developer for those who develop at irregular intervals.

1.—Dissolve 1 ounce of sodium sulphite in 3 ounces of distilled water heated to boiling point, and when the salt is dissolved add water to make up solution to 4 ounces. Keep in a well-corked 4-ounce bottle, labeled sodium sulphite 1:4.

2.—Dissolve 1 ounce of sodium carbonate in 3 ounces of hot water, make up to 4 ounces of solution and label carbonate of soda 1:4.

3.—Dissolve 1 ounce of potassium bromide in 9 ounces of cold water, add water to make up the solution to 10 ounces and label potassium bromide 1:10. Keep on hand an ounce of dry pyro. When ready to develop, take a 6-ounce graduate with measures marked in drams and ounces. Pour into this $\frac{1}{2}$ ounce of the sulphite solution; dissolve in it 5 grains of pyro; add 3 drams of carbonate solution and 5 drops of potassium bromide 1:10. Add water to make the developing solution up to 5 ounces in winter time, or 6 ounces in summer time.

Pyro Soda (Mellen). No. 1.—Water, 20 ounces; sodium sulphite (crystals), 4 ounces; carbonate of soda, 2 ounces. Dissolve the sulphite first and then add the carbonate.

No. 2.—Water, 6 ounces; pyro, 1 ounce. For correct exposures take 1 dram of No. 2; 1 ounce of No. 1, and add 2 ounces of water. For snapshots, or plates thought to be under-exposed, use 1 dram of No. 2; $1\frac{1}{2}$ drams of No. 1, and 6 ounces of water. For over-exposure take 2 drams of No. 2, 1 ounce of No. 1 and 6 ounces of water. Or, instead of the 2 drams of No. 2 in this solution use 1 dram of No. 2 and 10 drops of a 10 per cent. solution of potassium bromide.

Rodinal. A single solution developer.—For normal exposures dilute 1 part of rodinal with 20 parts of water; for over-exposure rodinal, 1 part; water, 10 to 20 parts; and a liberal dose of a 10 per cent. solution of potassium bromide; under-exposure, rodinal, 1 part; water, 20 to 40 parts. For uncertain exposures begin with rodinal, 1 part; water, 25, and when the character of the exposure is indicated transfer the plate to rodinal solution of the strength required.

TANK DEVELOPERS FOR NEGATIVES

Adurol (Montgomery). Water, 20 ounces; sulphite soda (anhydrous), 220 grains; carbonate of soda (anhydrous), 220 grains; adurol, 45 grains. For use take 1 ounce of above to 4 ounces water; add 2 drops 10 per cent. bromide solution; temperature, 65 degrees; time, 25 minutes.

Glycin (Montgomery). Water (hot), 8 ounces; sulphite of soda (anhydrous), 50 grains; carbonate of soda (anhydrous), 240 grains; glycin, 45 grains. For use take 3 ounces of above to 37 ounces water; temperature, 65 degrees; time, 25 minutes.

Metol Hydro (Frew). Water, 12 ounces; metol, $7\frac{1}{2}$ grains; sulphite of soda (anhydrous), 274 grains; hydrochinone, 30 grains; carbonate of soda (anhydrous), 150 grains; bromide of potassium, 2 grains. For use to each ounce of above add 4 ounces of water; temperature, 65 degrees; time, 12 minutes.

Ortol (Smith). Water, 60 ounces; metabisulphite of Potassium, 15 grains; sulphite of soda (anhydrous), 100 grains; carbonate of soda (anhydrous), 100 grains; ortol, 30 grains; temperature, 65 degrees; time, 20 minutes.

Rodinal (Agfa). Water, 60 ounces; rodinal, 1 ounce; temperature, 65 degrees; time, 25 minutes.

FIXING BATHS AND HARDENERS

Acid Fixing Bath (Carbutt).—Sulphuric acid, 1 dram; sodium hyposulphite, 16 ounces; sodium sulphite, 2 ounces; chrome alum, 1 ounce; warm water, 64 ounces. To prepare the bath, dissolve the hypo in 48 ounces of water; the sodium sulphite in 6 ounces; mix the sulphuric acid with 2 ounces of the water and pour slowly into the sulphite solution, and then add to the hypo solution. Dissolve the chrome alum in 8 ounces of water; add to the bulk of the solution and the bath is ready for use.

Plain Fixing Bath.—Dissolve 1 pound of sodium hyposulphite in 2 quarts of water or 4 ounces of the hypo in a pint of water, according to the bulk of the solution required.

Hardener for Fixing Bath (Beach). Water, 40 ounces; sulphite soda (crystals), 6 ounces; powdered alum, 16 ounces; acetic acid, 40 ounces. Add in the order given and shake well until dissolved. Of the above add 16 ounces to each gallon of hyposulphite of soda solution, testing 70 to 80 degrees.

Hardening Negatives.—Immerse them for a few minutes in formalin, 1 ounce; water, 30 ounces.

INTENSIFICATION

Mercuric Chloride Process. No. 1.—Mercuric chloride, 200 grains; bromide of potassium, 120 grains; water, $6\frac{1}{2}$ ounces.

No. 2.—Sodium sulphite, 1 ounce; water, 4 ounces. The well-washed negative, free from hypo, must be thoroughly bleached in No. 1; well washed; and then blackened in No. 2. After blackening it is well washed again.

REDUCTION

Ammonium Persulphate.—Prepare a solution in the following proportions: Ammonium persulphate, 15 grains; water, 1 ounce. The solution should be made just before use. The negative must be per-

fectly free from hypo or it will be stained by the persulphate. When the desired reduction has been reached, transfer the negative without washing to a 10 per cent. solution of anhydrous sodium sulphite. Wash finally for 15 or 20 minutes.

Farmer's Reducer.—Dissolve 1 ounce of potassium ferricyanide in 9 ounces of water and make up to 10 ounces, forming a 10 per cent. solution. Label this poison. Thoroughly wet the negative to be reduced. Take enough fresh plain hypo fixing bath for the purpose, and add to it enough of the ferricyanide solution to make it a light straw color. The negative to be reduced is immersed in this solution, when it will be seen to lose density. Rock the tray to insure evenness of action. This reducer can also be used for local treatment.

CLEARING STAINED NEGATIVES

Acid Alum.—Dissolve $\frac{1}{8}$ ounce of pulverized alum in 20 ounces of water and add 1 dram of sulphuric acid. Immerse the stained plate in this solution for a few minutes; remove plate, wash, and then set in the rack to dry.

PRINTING PROCESSES

Blue Prints.

Blue Printing Sensitizing Formulæ (Brown). A.—Dissolve 110 grains ferric ammonium citrate (green) in 1 ounce of water.

B.—Dissolve 40 grains of potassium ferricyanide in 1 ounce of water. These two solutions are made up separately in any desired quantity with the proportions given. They are then mixed together and kept in a stoneware bottle, but the single solution should always be filtered before use. The mixture will retain its good qualities for months if kept from the light.

(*Millen*).—Potassium ferricyanide, 1 ounce; ammonia-citrate of iron, $1\frac{1}{2}$ ounces; distilled water, 10 ounces. Mix thoroughly and filter. The solution should have a deep wine color and dry on the paper a lemon-yellow. If the solution is green and has a precipitate, the ammonio-citrate is old and spoiled, or you have been given plain citrate of iron. The mixture should be kept from the light by placing the bottle in a light-tight tin, or similar container.

(*Nicol*). A.—Ammonio-citrate of iron, 3 ounces; water, 4 ounces.

B.—Potassium ferricyanide, $2\frac{1}{4}$ ounces; water, 4 ounces. Just before using mix together one part each of A and B and add two parts of water.

Bromide Paper.

Bromide Paper Developers: Hydroquinone-metol. No. 1.—Water, 10 ounces; hydroquinone, 52 grains; potassium metabisulphite, 18 grains; sodium sulphite, 5 drams; sodium carbonate, $1\frac{1}{4}$ ounces.

No. 2.—Water, 10 ounces; metol, 30 grains; sodium carbonate, 5 drams; sodium sulphite, 5 drams. One or two drops of a potassium bromide 10 per cent. solution added to 1 ounce of the mixed developer will increase contrast and keep the whites pure. Equal parts of 1 and 2 give excellent prints from a normal negative; one part of 1 and two of 2 give gray prints with maximum half-tone and gradation; two parts of 1 and one of 2 give vigorous prints from soft delicate negatives.

Amidol for rich blacks (freshly prepared). Distilled (or boiled) water, 4 ounces; sodium sulphite (crystals), 90 drams; amidol, 10 to

15 grains. Add a drop of 10 per cent bromide solution to each ounce of developer.

Bromide Prints: Toning Formulæ for Sepia Tones: Hypo Alum.—Hyposulphite of soda, 5 ounces; ground alum, 1 ounce; boiling water, 70 ounces. Dissolve the hypo in the water, and then add the alum slowly. A milk-white solution results which should be decanted when clear. It is not used until cold (about 60 deg. Fahr.).

Sulphide of Sodium.—The fixed and washed print is treated with one of the following solutions: (1) Potassium ferricyanide, 10 grains; potassium bromide, 10 grains; water, 1 ounce; or (2) potassium ferricyanide, 20 grains; sodium chloride (common salt), 30 grains; water, 1 ounce. The image will be bleached by either of these solutions in a few minutes, the whitish appearance of the deposit being caused by its change into a salt of silver. After 5 minutes in running water apply the sulphuretting solution: Dissolve 3 ounces of sodium monosulphide in 15 ounces of water; boil the solution for about 10 minutes, filter off the black precipitate formed, and when cooled make up to 25 ounces with water. To tone, take 12 per cent. stock sodium sulphide solution, 1 ounce; water, 12 to 20 ounces.

Red Tones: Copper.—Dissolve 100 grains of ammonium carbonate in 2 ounces of water, and in this solution dissolve 10 grains of sulphate of copper. Then add 20 grains of potassium ferricyanide. A clear, dark green solution results which gives a red-chalk tone in about three minutes. Tone until the deepest shadow is converted, and then wash the print for ten minutes.

Green Tones: Vanadium.—Bleach print in the following: Potassium ferricyanide, 10 grains; ammonium carbonate, 100 grains; water, 1 ounce. Wash well and apply: Ferric chloride, 2 grains; vanadium chloride, 2 grains; ammonium chloride, 4 grains; hydrochloric acid, 5 minims; water, 1 ounce.

Blue Tones: Iron.—Bleach print in: Potassium ferricyanide, 10 grains; ammonium carbonate, 100 grains; water, 1 ounce; then tone in ferric chloride, 5 grains; hydrochloric acid, 5 minims; water, 1 ounce.

Carbon Tissue.

Carbon Tissue, Sensitizer for (Bennett).—Potassium bichromate, 4 drams; citric acid, 1 dram; strong ammonia water, about 3 drams; water, 25 ounces; dissolve the bichromate and citric acid in hot water, and add sufficient ammonia to change the orange color of the solution to lemon-yellow. Sensitize for 90 seconds; reducing the water softens the gradation in the print; increasing it to 30 ounces gives more vigor.

Carbon Lantern Slides. Prepare the glass by coating with the following preparation: 180 grains of Nelson's Gelatine No. 1, in 20 ounces water. Add 10 grains bichromate of potash. Dry and allow the plate to be exposed to light for a couple of days to make the coating thoroughly insoluble. Sensitizer for tissue: 1 per cent. to 1¼ per cent. solution of bichromate of potash. Immerse two minutes. Print deeply; expose twice as long as ordinary paper print. Develop in hot water as usual.

Gum Bichromate.

Gum Bichromate (Caspar Millar). A.—Gum arabic, 1¼ ounces; water, 3½ ounces; salicylic acid, 4 grains.

B.—Chrome alum, 45 grains; water, 3½ ounces. Grind A and B with water and pigment, brush over paper, dry and store.

Suggested formula.—A, 2 ounces; B, 1½ drams; carbon black, 10 grains; sensitize for 2 minutes in 5 per cent. bichromate solution.

Kallitype.

Kallitype Sensitizer for Black Tones (Thomson).—Distilled water, 1 ounce; ferric oxalate (Merck's or Mallinckrodt's), 15 grains; citrate of iron and ammonia (brown scales), 25 grains; chloride of copper, 8 grains; oxalate of potassium, 35 grains; oxalic acid, 15 grains; silver nitrate, 15 grains; gum arabic, 10 grains.

Developer.—Distilled water, 1 ounce; silver nitrate, 40 grains; citric acid, 10 grains; oxalic acid, 10 grains.

Platinum Papers.

Platinum: Sensitizing Gold Bath and Sepia Papers. A.—Chloro-platinite of potassium, 15 grains; distilled water, 90 minims.

B.—Ferric oxalate, 21 grains; oxalic acid, 2 grains; distilled water, 183 minims. For cold bath paper, mix A and B, and add 15 minims of water. For sepia paper mix A and B and add 15 minims of a 5 per cent. solution of mercuric chloride. The addition of a few grains of potassium chlorate to any of the above gives increased contrast in the print. From 140 to 170 minims of solution are sufficient to coat a sheet of paper 20 x 26 inches.

Platinum Prints: to Intensify. A.—Sodium formate, 45 grains; water, 1 ounce.

B.—Platinum perchloride, 10 grains; water, 1 ounce.

C.—For use, take 15 minims each of A and B to 2 ounces of water. Immerse prints until sufficiently intensified, then remove and wash.

Gold Toning.—For blue-black tones, for slight strengthening, and for converting rusty black into pure black. Soak print in warm water, lay on warm glass, brush over glycerine and blot off. Pour on few minims of solution of gold chloride (1 grain per dram), and rapidly brush in all directions. When toned, rinse, and sponge back and front with: Metol, 50 grains; sodium sulphite, 1 ounce; potassium carbonate, ½ ounce; water, 20 ounces. Tone in daylight. Do not tone sepias or old prints in this solution.

Platinum Prints: to Distinguish from Bromide.—Soak the print in saturated solution of mercuric chloride: a platinum print will not change; a bromide print will bleach.

Salted Papers.

Salted Paper Prints: sensitize with the following:

Silver	480 gr. Troy.
Water	11 ounces.

Dissolve and pour off 2 ounces, and to the 9 ounces left add strong aqua ammonia to form a precipitate and redissolve the precipitate, then add the remaining 2 ounces which will form another precipitate, to this add 9 drops of nitric acid C. P. Apply this to the paper with a tuft of cotton.

Any good Toning Bath will give good results, such as:

Chloride Aluminum	80 grains.
Bi-Carbonate Soda	360 “
Water	48 ounces.

When mixed this will form a flocky hydrate which will settle to the bottom. It can be strained through clean washed muslin. To prepare a small bath for toning, take 12 ounces of the stock solution and add sufficient gold to tone in 8 to 10 minutes. The gold solution must be neutralized with bi-carbonate soda before adding to the above bath. When the prints reach the desired tone throw them into a bath of salt water, made of water, 1 gallon; table salt, 1 ounce.

MISCELLANEA.

Adhesive for Labels.—Soak 1 part of the best glue in water until thoroughly swollen, add a little sugar candy, 1 part of gum arabic and 6 parts of water. Boil with constant stirring over a spirit lamp until the whole gets thin. Coat sheets of paper with it; let dry and cut up into convenient sizes.

Backing Mixture.—Dissolve a 4-ounce stick of licorice in 8 ounces of water with the aid of gentle heat. When dissolved rub into the mixture 1 ounce of burnt sienna in powder, using the back of a spoon for this purpose. When cold, bottle for use.

Blackening Brass.—Make two solutions: Copper nitrate, 200 grains; water, 1 ounce. Silver nitrate, 200 grains; water, 1 ounce. Mix the solutions; clean the article well; dip it in the solution for a moment; withdraw it; dry it; and heat it strongly.

Black, Dead, for Wood.—Shellac, 40 parts; borax, 20 parts; glycerine, 20 parts; water, 500 parts. When dissolved, add 50 parts aniline black.

Cleaning Greasy Bottles. Wash with benzine, or permanganate of potassium, to which has been added some hydrochloric acid.

Bottles that have contained resinous substances, wash with potash or soda and rinse with alcohol. Bottles that have contained essences, wash with sulphuric acid, then with water.

Film: to Remove from Glass: Make two solutions. A.—Sodium fluoride, 6 grains; water, 4 ounces.

B.—Sulphuric acid, 6 drops; water, 1 ounce. Place the negative in solution A for two minutes and then place directly in solution B. After another two minutes lift the film with the finger from one corner of the plate. It will soon leave the glass.

Ground Glass Varnish: Sandarac, 90 grains; mastic, 20 grains; ether, 2 ounces. Dissolve the resins in the ether and add benzole $\frac{1}{2}$ to $1\frac{1}{2}$ ounces.

Substitutes for Ground Glass. 1.—Paraffin wax makes an excellent substitute for ground glass if the latter should get broken. Iron the paper onto a sheet of plain glass. It is more transparent than the focusing screen and the image will appear clearer; hence, in exposing allowance must be made for the difference in illumination.

2.—Resin dissolved in wood alcohol and blown over the glass; this must not be scratched; it gives a very fine-grained ground glass effect.

3.—White wax, 120 grains; ether, 1 ounce.

Lens: to Clean.—The lens should always be kept free from dust or other impurities. To clean it, spread upon a table a clean sheet of paper; take the lens apart, and with a camel-hair brush dust each of the combinations on both sides. If the surfaces of the lenses are very dirty and have lost their polish, make up the following: Nitric acid, 3 drops; alcohol, 1 ounce; distilled water, 2 ounces. Dip a tuft of filtering cotton in this solution, rub each side of the lens, then polish with an absolutely clean chamois. Clean the lens tube before replacing the lenses, each of which should be finally dusted with a camel-hair brush.

Poisons and Antidotes.—Administer the antidote as soon as possible. If a strong acid or alkali, or cyanide of potassium, has been swallowed, lukewarm water in large quantities should be swallowed at once. Where strong acids or alkalies have not been swallowed, rid the stomach of the poison by vomiting; for this purpose take 25 grains of zinc sulphate in warm water.

Polished surfaces: to Photograph.—Smear the surface with soft putty so as to deaden the reflections. Photograph the article against a black background, and stop off all reflections, allowing the light to come from one direction only. To photograph hollow cut glassware fill with ink or aniline black water dye. Before photographing machinery deaden the bright parts with putty.

Retouching Mediums. (1.)—Pure alcohol, 2 parts; sandarac, 1 part; benzine, 4 parts; acetone, 4 parts.

(2.)—A simpler medium is made by dissolving a little resin in turpentine.

Retouching Medium.—Gum dammar, 10 grains, and add it to oil of turpentine, 1 ounce; Canada balsam (about) 5 grains. Shake occasionally until all is dissolved.

Safe Light for Panchromatic Plates.—Take old dry plates and coat with the following: Water, 10 ounces; tartrazine, 75 grains; patent blue A, 75 grains; naphthol green, 75 grains; sulphuric acid, 30 minims. Stain the plates as deeply as possible. Use 2 plates.

Stained Fingers.—Stains arising from developing generally disappear if the fingers, before they have dried, be rubbed with a crystal of citric acid.

Stains: to Remove from the Hands.—Developer stains: solution of citric or oxalic acid. Silver nitrate stains: Water, 4 ounces; chloride of lime, 350 grains; sulphate of soda, 1 ounce. Apply with a brush.

Tarnished Daguerreotypes, to Restore.—Remove the silvered plate from the case and place it, image uppermost, under a box lid or other protector from dust, etc. Put a small piece of potassium cyanide into a graduate and pour over it one or two ounces of water. Hold the daguerreotype by the corner with a pair of pliers, rinse it in clear running water, then pour over it the weak cyanide solution (a 3 per cent. solution is usually employed), and return it to the graduate. Repeat this operation several times until the discoloration quite disappears. Wash well in running water, and then, before the surplus water has time to collect in tears upon the image, begin to dry the plate gradually over a spirit lamp, holding the plate in an inclined position so that it will dry from the uppermost corner. The secret of success is in the use of pure water for the final washings and the drying of the image without check or the formation of tears.

Test for Hypo: Potassium permanganate, 2 grains; potassium carbonate, 20 grains; distilled water, 40 ounces. Soak the plate or print to be treated in water for one hour, then remove and add to the water a few drops of the above solution, which will turn a greenish yellow or brown if the water is not free from hypo.

Varnish for Negatives and Lantern Slides.—Dissolve 1 part of gum sandarac in 25 parts of benzole. Apply cold.

Protective Varnish for Labels.—Use waterproof ink when writing on the paper. Dry, and coat with the following varnish: Cut into fine shreds an old celluloid negative film from which all traces of gelatine have been removed. Put the shreds in a small bottle; half fill with amyl acetate and then add wood alcohol or methylated spirit which will dissolve the celluloid.

Waxing Solution: Spirits of turpentine, 6 ounces; Japan drier (white), 4½ ounces. Sprinkle the fluid on the print and rub in with cheese cloth.

THE ELEMENTS

THEIR NAMES, SYMBOLS, AND ATOMIC WEIGHTS. OXYGEN STANDARD

Compiled by HENRY F. RAESS

Aluminum.....Al	27.1	HYDROGEN..H	1.008	Rubidium.....Rb	85.4
Antimony.....Sb	120.2	Indium.....In	114	Ruthenium....Ru	101.7
Argon.....A	39.9	Iodine.....I	126.85	Samarium.....Sm	150.
ARSENIC.....As	75.0	IRIDIUM....Ir	193.0	Scandium.....Sc	44.1
Barium.....Ba	137.4	Iron.....Fe	55.9	Selenium.....Se	79.2
Bismuth.....Bi	208.5	Krypton.....Kr	81.8	Silicon.....Si	28.4
Boron.....B	11	Lanthanum....La	138.9	SILVER.....Ag	107.93
BROMINE....Br	79.96	Lead.....Pb	206.9	SODIUM.....Na	23.05
Cadmium.....Cd	112.4	LITHIUM....Li	7.03	Strontium....Sr	87.6
Caesium.....Cs	132.9	Magnesium....Mg	24.36	SULPHUR....S	32.06
Calcium.....Ca	40.1	MANGANESE..Mn	55.0	Tantalum.....Ta	183
CARBON.....C	12.00	MERCURY...Hg	200.0	Tellurium....Te	127.6
Cerium.....Ce	140.25	MOLYBDENUM Mo	96.0	Terbium.....Tb	160
Chlorine.....Cl	35.45	Neodymium...Nd	143.6	Thallium....Tl	204.1
Chromium....Cr	52.1	Neon.....Ne	20	Thorium.....Th	232.5
COBALT.....Co	59.0	Nickel.....Ni	58.7	Thulium.....Tm	171
Columbium...Cb	94	Nitrogen.....N	14.04	TIN.....Sn	119.0
Copper.....Cu	63.6	Osmium.....Os	191	Titanium....Ti	48.1
Erbium.....Er	166	OXYGEN.....O	16	TUNGSTEN...W	184.0
Fluorine.....F	19	Palladium....Pd	106.5	Uranium.....U	238.5
Gadolinium...Gd	156	PHOSPHORUS.P	31.0	Vanadium....V	51.2
Gallium.....Ga	70	Platinum.....Pt	194.8	Xenon.....Xe	128
Germanium...Ge	72.5	Potassium....K	39.15	YTTERBIUM..Yb	173.0
Glucinum....G1	9.1	Praseodymium.Pr	140.5	YTTRIUM....Yt	89.0
Gold.....Au	197.2	Radium.....Rd	225	Zinc.....Zn	65.4
Helium.....He	4	RHODIUM....Rh	103.0	Zirconium....Zr	90.6

**TABLE OF COMPARATIVE PLATE SPEED
NUMBERS**

H & D	Watkins P No.	Wynne F No.	H & D	Watkins P No.	Wynne F No.
10	15	24	220	323	114
20	30	28	240	352	120
40	60	49	260	382	124
80	120	69	280	412	129
100	147	77	300	441	134
120	176	84	320	470	138
140	206	91	340	500	142
160	235	103	380	558	150
200	294	109	400	588	154

The above Watkins and Wynne numbers are equivalent to the H and D, only when the latter is determined in accordance with the directions of Hurter and Driffeld, that is with pyro-soda developer and using the straight portion only of the density curve.

To convert H and D into Watkins: Multiply H and D by 50 and divide by 34. For all practical purposes the Watkins P number is $1\frac{1}{2}$ times H and D.

To convert Watkins into Wynne F Nos.: Extract the square root and multiply by 6.4.

The above methods have been approved by the Watkins Meter Company and the Infallible Exposure Meter Company.

**TABLES OF DISTANCES AT AND BEYOND WHICH ALL OBJECTS
ARE IN FOCUS WHEN SHARP FOCUS IS SECURED ON
INFINITY**

Focal length of Lens in inches	Ratio marked on Stops													
	<i>f</i> /4	<i>f</i> /5.6	<i>f</i> /6	<i>f</i> /7	<i>f</i> /8	<i>f</i> /10	<i>f</i> /11	<i>f</i> /15	<i>f</i> /16	<i>f</i> /20	<i>f</i> /22	<i>f</i> /32	<i>f</i> /44	<i>f</i> /6
	Number of feet after which all is in focus													
4	33	24	22	19	17	13	12	9	8	7	6	4	3	2
4 1/4	38	27	25	21	19	15	14	10	10	7	7	5	3 1/2	2 1/2
4 1/2	42	30	28	24	21	17	15	11	11	8 1/2	7 1/2	5 1/2	4	3
4 3/4	47	34	31	27	24	19	17	12	12	9 1/2	8 1/2	6	5	3
5	52	36	35	30	26	21	19	14	13	10 1/2	9 1/2	6 1/2	5 1/2	3 1/2
5 1/4	57	40	38	33	28	23	21	15	14	11 1/2	10 1/2	7	5 1/2	3 1/2
5 1/2	63	45	43	36	31	25	23	17	15	12 1/2	11 1/2	7 1/2	6	4
5 3/4	68	50	46	38	34	27	25	18	17	13 1/2	13	8 1/2	6 1/2	4
6	75	54	50	42	38	30	28	20	19	15	14	9	7	4 1/2
6 1/4	81	58	54	46	40	32	29	22	20	16	15	10	7 1/2	5
6 1/2	87	62	58	50	44	35	32	23	22	17 1/2	16	11	8	5 1/2
6 3/4	94	67	63	54	47	38	34	25	24	19	17	12	8 1/2	6
7	101	72	68	58	51	40	37	27	25	20	18	12 1/2	9	6
7 1/4	109	78	73	62	54	44	39	29	27	22	20	13 1/2	10	6 1/2
7 1/2	117	83	78	64	58	47	42	31	29	24	21	14 1/2	10 1/2	7
7 3/4	124	90	83	71	62	50	45	33	31	25	22	15 1/2	11	7 1/2
8	132	96	88	76	68	52	48	36	32	28	24	16	12	8
8 1/4	141	100	94	80	71	56	51	37	35	29	25	17 1/2	12 1/2	8 1/2
8 1/2	150	104	100	84	76	60	56	40	38	30	27	19	13 1/2	9
8 3/4	156	111	104	89	78	63	57	42	39	32	29	20	14	10
9	168	120	112	96	84	67	61	45	42	34	31	21	15	10 1/2
9 1/4	180	127	116	101	90	71	65	47	45	35	32	22	16	11
9 1/2	190	133	125	107	95	75	68	50	47	37	34	24	17	12
9 3/4	197	141	131	113	99	79	72	52	50	39	36	25	18	12 1/2
10	208	148	140	120	104	83	75	55	52	42	38	26	19	13

If sharp focus is secured on any of the distances shown, then, with the stop indicated, all objects are in focus from half the distance focused on up to infinity.

LENGTH OF STUDIO

REQUIRED FOR LENSES OF DIFFERENT FOCAL LENGTHS.
FROM 6 TO 8 FEET IS ALLOWED FOR THE CAMERA
AND OPERATOR

From "Photographic Lenses" by BECK and ANDREWS

Focus of Lens	Size	Kind of Portrait	Length of Studio	Dist. of Lens from Object
Inches			In Feet	In Feet
6	Carte de Visite 3 1/4x4 1/4.....	Full Length	18 to 20	11 to 12
7 1/2	Carte de Visite.....	Full Length	22 to 25	14 to 15
8 1/2	Carte de Visite.....	Full Length	24 to 28	17 to 19
		Bust	10 to 15	5
9 1/2	Cabinet and smaller groups.....	Full Length	20 to 23	12 to 13
		Bust	12 to 17	7
11	Cabinet and 5x7 groups.....	Full Length	25 to 30	17 to 18
		Bust	13 to 20	8
14 1/2	Cabinets, panels and 6 1/2x8 1/2 groups.....	Full Length	32 to 40	23 to 24
		Bust	14 to 20	7
19	10x12 portraits or groups.....	Full Length	20 to 25	13
		Bust	14 to 20	7
24	16x20 portraits or groups.....	Full Length	25 to 30	14
		Bust	14 to 20	8

TABLE FOR CALCULATING DISTANCES IN ENLARGING OR REDUCING

From The British Journal Photographic Almanac

Focus of Lens Inches	Times of Enlargement and Reduction							
	1 Inch	2 Inch- es	3 Inch- es	4 Inch- es	5 Inch- es	6 Inch- es	7 Inch- es	8 Inch- es
2.....	4 4	6 3	8 $2\frac{2}{3}$	10 $2\frac{1}{2}$	12 $2\frac{2}{5}$	14 $2\frac{1}{3}$	16 $2\frac{2}{7}$	18 $2\frac{1}{4}$
$2\frac{1}{2}$	5 5	$7\frac{1}{2}$ $3\frac{3}{4}$	10 $3\frac{1}{3}$	$12\frac{1}{2}$ $3\frac{1}{8}$	15 3	$17\frac{1}{2}$ $2\frac{9}{10}$	20 $2\frac{6}{7}$	$22\frac{1}{2}$ $2\frac{3}{16}$
3.....	6 6	9 $4\frac{1}{2}$	12 4	15 $3\frac{3}{4}$	18 $3\frac{3}{5}$	21 $3\frac{1}{2}$	24 $3\frac{3}{7}$	27 $3\frac{3}{8}$
$3\frac{1}{2}$	7 7	$10\frac{1}{2}$ $5\frac{1}{4}$	14 $4\frac{2}{3}$	$17\frac{1}{2}$ $4\frac{3}{4}$	21 $4\frac{1}{5}$	$24\frac{1}{2}$ $4\frac{1}{12}$	28 4	$31\frac{1}{2}$ $3\frac{9}{10}$
4.....	8 8	12 6	16 $5\frac{1}{3}$	20 5	24 $4\frac{4}{5}$	28 $4\frac{2}{3}$	32 $4\frac{1}{7}$	36 $4\frac{1}{2}$
$4\frac{1}{2}$	9 9	$13\frac{1}{2}$ $6\frac{3}{4}$	18 6	$22\frac{1}{2}$ $5\frac{3}{5}$	27 $5\frac{2}{5}$	$31\frac{1}{2}$ $5\frac{1}{4}$	36 $5\frac{1}{7}$	$40\frac{1}{2}$ $5\frac{1}{16}$
5.....	10 10	15 $7\frac{1}{2}$	20 $6\frac{2}{3}$	25 $6\frac{1}{4}$	30 6	35 $5\frac{5}{6}$	40 $5\frac{5}{7}$	45 $5\frac{5}{8}$
$5\frac{1}{2}$	11 11	$16\frac{1}{2}$ $8\frac{1}{4}$	22 $7\frac{1}{3}$	$27\frac{1}{2}$ $6\frac{4}{5}$	33 $6\frac{1}{2}$	$38\frac{1}{2}$ $6\frac{5}{12}$	44 $6\frac{2}{7}$	$49\frac{1}{2}$ $6\frac{3}{16}$
6.....	12 12	18 9	24 8	30 $7\frac{1}{2}$	36 $7\frac{1}{5}$	42 7	48 $6\frac{6}{7}$	54 $6\frac{3}{4}$
7.....	14 14	21 $10\frac{1}{2}$	28 $9\frac{1}{3}$	35 $8\frac{3}{4}$	42 $8\frac{2}{5}$	49 $8\frac{1}{6}$	56 8	63 $7\frac{7}{8}$
8.....	16 16	24 12	32 $10\frac{2}{3}$	40 10	48 $9\frac{3}{5}$	56 $9\frac{1}{3}$	64 $9\frac{1}{7}$	72 9
9.....	18 18	27 $13\frac{1}{2}$	36 12	45 $11\frac{1}{4}$	54 $10\frac{4}{5}$	63 $10\frac{1}{2}$	72 $10\frac{2}{7}$	81 $10\frac{1}{8}$

The object of this table is to enable any manipulator who is about to enlarge (or reduce) a copy any given number of times to do so without troublesome calculation. It is assumed that the photographer knows exactly what the focus of his lens is, and that he is able to measure accurately from its optical center. The use of the table will be seen from the following illustration: A photographer has a *carte* to enlarge to four times its size, and the lens he intends employing is one of 6 inches equivalent focus. He must therefore look for 4 on the upper horizontal line and for 6 on the first vertical column and carry his eye to where these two join, which will be $30-7\frac{1}{2}$. The greater of these is the distance the sensitive plate must be from the center of the lens; and the lesser, the distance of the picture to be copied. To *reduce* a picture any given number of times, the same method must be followed; but in this case the greater number will represent the distance between the lens and the picture to be copied, the latter that between the lens and the sensitive plate. This explanation will be sufficient for every case of enlargement or reduction.

If the focus of the lens be 12 inches, as this number is not in the column of focal lengths, look out for 6 in this column and multiply by 2, and so on with any other numbers.

UNITED STATES WEIGHTS AND MEASURES
According to Existing Standards

LINEAL

	Inches	Feet	Yards	Rods	Fur's	Mi.
12 inches = 1 foot.	12 =	1				
3 feet = 1 yard	36 =	3 =	1			
5.5 yards = 1 rod.	198 =	16.5 =	5.5 =	1		
40 rods = 1 furlong.	7,920 =	660 =	220 =	40 =	1	
8 furlongs = 1 mile.	63,360 =	5,280 =	1,760 =	320 =	8 =	1

SURFACE—LAND

	Feet	Yards	Rods	Roods	Acres
144 sq. ins. = 1 sq. ft.					
9 sq. ft. = 1 sq. yard.	9 =	1			
30.25 sq. yds. = 1 sq. rod.	272.25 =	30.25 =	1		
40 sq. rods = 1 sq. rood.	10,890 =	1,210 =	40 =	1	
4 sq. roods = 1 acre.	43,560 =	4,840 =	160 =	4 =	1
640 acres = 1 sq. mile.	27,878,400 =	3,097,600 =	102,400 =	2,560 =	640

VOLUME—LIQUID

4 gills = 1 pint.	Gills.	Pints.	Gallon.	Cub.In
2 pints = 1 quart.	32 =	8 =	1 =	231
4 quarts = 1 gallon.				

FLUID

Gallon	Pints	Ounces	Drachms	Minims	Cubic Centimetres
1 =	8 =	128 =	1,024 =	61,440 =	3,785,435
• 1 =	16 =	128 =	7,680 =	473,179	
	1 =	8 =	480 =	29,574	
		1 =	60 =	3,697	

16 ounces, or a pint, is sometimes called a fluid pound.

TROY WEIGHT

Pound	Ounces	Pennyweights	Grains	Grams
1 =	12 =	240 =	5,760 =	373.24
	1 =	20 =	480 =	31.10
		1 =	24 =	1.56

APOTHECARIES' WEIGHT

lb.	3	3	9	gr.	Grams
Pound	Ounces	Drachms	Scruples	Grains	Grams
1 =	12 =	96 =	288 =	5,760 =	373.24
	1 =	8 =	24 =	480 =	31.10
		1 =	3 =	60 =	3.89
			1 =	20 =	1.30
				1 =	.06

The pound, ounce, and grain are the same as in Troy weight.

AVOIRDUPOIS WEIGHT

Pound	Ounces	Drachms	Grains (Troy)	Grams
1 =	16 =	256 =	7,000 =	453.60
	1 =	16 =	437.5 =	28.35
		1 =	27.34 =	1.77

ENGLISH WEIGHTS AND MEASURES

APOTHECARIES' WEIGHT

20 Grains	= 1 Scruple	= 20 Grains.
3 Scruples	= 1 Drachm	= 60 Grains.
8 Drachms	= 1 Ounce	= 480 Grains.
12 Ounces	= 1 Pound	= 5,760 Grains.

FLUID MEASURE

60 Minims	= 1 Fluid Drachm.
8 Drachms	= 1 Fluid Ounce.
20 Ounces	= 1 Pint.
8 Pints	= 1 Gallon.

The above weights are usually adopted in formulas.

All Chemicals are usually sold by

AVOIRDUPOIS WEIGHT

$27\frac{1}{2}$ Grains	= 1 Drachm	= $27\frac{1}{2}$ Grains.
16 Drachms	= 1 Ounce	= $437\frac{1}{2}$ Grains.
16 Ounces	= 1 Pound	= 7,000 Grains.

Precious Metals are usually sold by

TROY WEIGHT

24 Grains	= 1 Pennyweight	= 24 Grains.
20 Pennyweights	= 1 Ounce	= 480 Grains.
12 Ounces	= 1 Pound	= 5,760 Grains.

Note.—An ounce of metallic silver contains 480 grains, but an ounce of nitrate of silver contains only $437\frac{1}{2}$ grains.

UNITED STATES FLUID MEASURE

Gal.	Pints.	Ounces.	Drachms.	Mins.	Cub. In.	Grains.	Cub. C. M.
1	= 8	= 128	= 1,024	= 61,440	= 231.	= 58,328.886	= 3,785.44
	1	= 16	= 128	= 7,680	= 28.875	= 7,291.1107	= 473.18
		1	= 8	= 480	= 1.8047	= 455.6944	= 29.57
			1	= 60	= 0.2256	= 56.9618	= 3.70

IMPERIAL BRITISH FLUID MEASURE

Gal.	Pints.	Ounces.	Drachms.	Mins.	Cub. In.	Grains.	Cub. C. M.
1	= 8	= 160	= 1,280	= 76,800	= 277.27384	= 70,000	= 4,543.732
	1	= 20	= 160	= 9,600	= 34.65923	= 8,750	= 567.966
		1	= 8	= 480	= 1.73296	= 437.5	= 28.398
			1	= 60	= 0.21662	= 54.69	= 3.550

METRIC SYSTEM OF WEIGHTS AND MEASURES

MEASURES OF LENGTH

DENOMINATIONS AND VALUES		EQUIVALENTS IN USE	
Myriameter.....	10,000 meters.	6.2137	miles.
Kilometer.....	1,000 meters.	.62137	mile, or 3,280 ft. 10 ins.
Hectometer.....	100 meters.	328.	feet and 1 inch.
Dekameter.....	10 meters.	393.7	inches.
Meter.....	1 meter.	39.37	inches.
Decimeter.....	1-10th of a meter.	3.937	inches.
Centimeter.....	1-100th of a meter.	.3937	inch.
Millimeter.....	1-1000th of a meter.	.0394	inch.

MEASURES OF SURFACE

DENOMINATIONS AND VALUES		EQUIVALENTS IN USE	
Hectare.....	10,000 square meters.	2.471	acres.
Are.....	100 square meters.	119.6	square yards.
Centare.....	1 square meter.	1,550.	square inches.

MEASURES OF VOLUME

DENOMINATIONS AND VALUES			EQUIVALENTS IN USE		
NAMES	No. of Liters	CUBIC MEASURES	DRY MEASURE	WINE MEASURE	
Kiloliter or stere....	1,000	1 cubic meter.	1.308 cubic yards.	264.17	gallons.
Hectoliter..	100	1-10th cubic meter.	2 bu. and 3.35 pecks.	26.417	gallons.
Dekaliter..	10	10 cubic decimeters.	9.08 quarts.	2.6417	gallons.
Liter.....	1	1 cubic decimeter.	.908 quart.	1.0567	quarts.
Deciliter...	1-10	1-10th cubic decimeter.	6.1023 cubic inches	.845	gill.
Centiliter..	1-100	10 cubic centimeters.	.6102 cubic inch.	.338	fluid oz.
Milliliter...	1-1000	1 cubic centimeter.	.061 cubic inch.	.27	fl. drm.

WEIGHTS

DENOMINATIONS AND VALUES			EQUIVALENTS IN USE	
NAMES	Number of Grams	WEIGHT OF VOLUME OF WATER AT ITS MAXIMUM DENSITY	AVOIRDUPOIS WEIGHT	
Millier or Tonneau....	1,000,000	1 cubic meter.	2204.6	pounds.
Quintal.....	100,000	1 hectoliter.	220.46	pounds.
Myriagram.....	10,000	10 liters.	22.046	pounds.
Kilogram or Kilo.....	1,000	1 liter.	2.2046	pounds.
Hectogram.....	100	1 deciliter.	3.5274	ounces.
Dekagram.....	10	10 cubic centimeters.	.3527	ounce.
Gram.....	1	1 cubic centimeter.	15.432	grains.
Decigram.....	1-10	1-10th of a cubic centimeter.	1.5432	grain.
Centigram.....	1-100	10 cubic millimeters.	.1543	grain.
Milligram.....	1-1000	1 cubic millimeter.	.0154	grain.

For measuring surfaces, the square dekameter is used under the term of ARE; the hectare, or 100 ares, is equal to about 2½ acres. The unit of capacity is the cubic decimeter or LITER, and the series of measures is formed in the same way as in the case of the table of lengths. The cubic meter is the unit of measure for solid bodies, and is termed STERE. The unit of weight is the GRAM, which is the weight of one cubic centimeter of pure water weighed in a vacuum at the temperature of 4 deg. Cent. or 39.2 deg. Fahr., which is about its temperature of maximum density. In practice, the term cubic centimeter, abbreviated c.c., is generally used instead of milliliter, and cubic meter instead of kiloliter.

THE CONVERSION OF FRENCH (METRIC) INTO ENGLISH MEASURE

1 cubic centimeter	=	17 minims			
1 cubic centimeters	=	34	"		
3	"	=	51	"	
4	"	=	68	"	or 1 dram 8 minims.
5	"	=	85	"	" 1 " 25 "
6	"	=	101	"	" 1 " 41 "
7	"	=	118	"	" 1 " 58 "
8	"	=	135	"	" 2 drams 15 "
9	"	=	152	"	" 2 " 32 "
10	"	=	169	"	" 2 " 49 "
20	"	=	338	"	" 5 " 38 "
30	"	=	507	"	" 1 ounce 0 dram 27 minims
40	"	=	676	"	" 1 " 3drams 16 "
50	"	=	845	"	" 1 " 6 " 5 "
60	"	=	1014	"	" 2 ounces 0 " 54 "
70	"	=	1183	"	" 2 " 3 " 43 "
80	"	=	1352	"	" 2 " 6 " 32 "
90	"	=	1521	"	" 3 " 1 " 21 "
100	"	=	1690	"	" 3 " 4 " 10 "
1000	"	=	1 liter	=	34 fluid ounces nearly, or 2½ pints.

THE CONVERSION OF FRENCH (METRIC) INTO ENGLISH WEIGHT

The following table, which contains no error greater than one-tenth of a grain, will suffice for most practical purposes:

1 gram	=	15⅔ grains.			
2 grams	=	30⅔	"		
3	"	=	46⅓	"	
4	"	=	61⅔	"	.....or 1 dram 1⅔ grain.
5	"	=	77⅓	"	....." 1 " 17⅓ grains.
6	"	=	92⅔	"	....." 1 " 32⅔ "
7	"	=	108	"	....." 1 " 48 "
8	"	=	123⅔	"	....." 2 drams 3⅔ "
9	"	=	138⅔	"	....." 2 " 18⅔ "
10	"	=	154⅔	"	....." 2 " 34⅔ "
11	"	=	169⅔	"	....." 2 " 49⅔ "
12	"	=	185⅓	"	....." 3 " 5⅓ "
13	"	=	200⅔	"	....." 3 " 20⅔ "
14	"	=	216	"	....." 3 " 36 "
15	"	=	231⅔	"	....." 3 " 51⅔ "
16	"	=	247	"	....." 4 " 7 "
17	"	=	262⅔	"	....." 4 " 22⅔ "
18	"	=	277⅔	"	....." 4 " 37⅔ "
19	"	=	293⅓	"	....." 4 " 53⅓ "
20	"	=	308⅔	"	....." 5 " 8⅔ "
30	"	=	463	"	....." 7 " 43 "
40	"	=	617⅓	"	....." 10 " 17⅓ "
50	"	=	771⅔	"	....." 12 " 51⅔ "
60	"	=	926	"	....." 15 " 26 "
70	"	=	1080⅓	"	....." 18 " 0⅓ "
80	"	=	1234⅔	"	....." 20 " 34⅔ "
90	"	=	1389	"	....." 23 " 9 "
100	"	=	1543⅓	"	....." 25 " 43⅓ "
1000	"	=	1 kilogram	=	32 oz., 1 dr., 12⅔ gr

"UNIFORM SYSTEM" NUMBERS FOR STOPS FROM

$$\frac{f}{1} \text{ TO } \frac{f}{100}$$

In the following table Mr. S. A. Warburton calculated the exposure necessary with every stop from $\frac{f}{1}$ to $\frac{f}{100}$ compared with the unit stop of the "uniform system" of the Photographic Society of Great Britain. The figures which are underlined show in the first column what $\frac{f}{a}$ must be in order to increase the exposure in geometrical ratio from $\frac{f}{4}$, the intermediate numbers showing the uniform system number for any other aperture

f	U. S. No.	f	U. S. No.	f	U. S. No.
1	$\frac{1}{16}$	15	14.06	58	210.25
$1\frac{1}{4}$	.097	16	16	59	217.56
<u>1.414</u>	$\frac{1}{8}$	17	18.06	60	225.00
$1\frac{1}{2}$	.140	18	20.25	61	232.56
$1\frac{3}{4}$	.191	19	22.56	62	240.25
2	$\frac{1}{4}$	20	25.00	63	248.06
$2\frac{1}{4}$	.316	21	27.56	64	256
$2\frac{1}{2}$	.390	22	30.25	65	264.06
<u>2.828</u>	$\frac{1}{2}$	22.62	32	66	272.25
$2\frac{3}{4}$	.472	23	33.06	67	280.56
3	.562	24	36.00	68	289.00
$3\frac{1}{4}$	.660	25	39.06	69	297.56
$3\frac{1}{2}$	.765	26	42.25	70	306.25
$3\frac{3}{4}$	.878	27	45.56	71	15.06
4	1	28	49.00	72	324.00
$4\frac{1}{4}$	1.12	29	52.56	73	333.06
$4\frac{1}{2}$	1.26	30	56.25	74	342.25
$4\frac{3}{4}$	1.41	31	60.06	75	351.56
5	1.56	32	64	76	361.00
$5\frac{1}{4}$	1.72	33	68.06	77	370.56
$5\frac{1}{2}$	1.89	34	72.25	78	380.25
<u>5.656</u>	2	35	76.56	79	390.06
$5\frac{3}{4}$	2.06	36	81.00	80	400.00
6	2.25	37	85.56	81	410.06
$6\frac{1}{4}$	2.44	38	90.25	82	420.25
$6\frac{1}{2}$	2.64	39	95.06	83	430.56
$6\frac{3}{4}$	2.84	40	100.00	84	440.00
7	3.06	41	105.06	85	451.56
$7\frac{1}{4}$	3.28	42	110.25	86	462.25
$7\frac{1}{2}$	3.51	43	115.56	87	473.06
$7\frac{3}{4}$	3.75	44	121.00	88	484.00
8	4	45	126.56	89	495.06
$8\frac{1}{4}$	4.25	45.25	128	90.50	512
$8\frac{1}{2}$	4.51	46	132.25	91	517.56
$8\frac{3}{4}$	4.78	47	138.06	92	529.00
9	5.06	48	144.00	93	540.56
$9\frac{1}{4}$	5.34	49	150.06	94	552.25
$9\frac{1}{2}$	5.64	50	156.25	95	564.06
$9\frac{3}{4}$	5.94	51	162.56	96	576.00
10	6.25	52	169.00	97	588.06
11	7.56	53	175.56	98	600.25
<u>11.31</u>	8	54	182.25	99	612.56
12	9.00	55	189.06	100	625
13	10.56	56	196.00		
14	12.25	57	203.06		

American Photographic Societies

This list is compiled from information received from an inquiry form sent to over one hundred societies during the latter half of 1911. It includes many societies not given in the 1911 list, but falls short of completeness as a record of the photographic societies of America.—Secretaries of societies not here listed are urged to send us particulars of their organizations so that the list may be fully representative of society activities.—Editor.

AKRON CAMERA CLUB—Akron, Ohio. Headquarters, Y. M. C. A. Building. Established 1890. Membership, 50. Date of meetings, second and fourth Monday of each month from October to May, inclusive. *President*, William Spanton; *Secretary*, A. S. Hibbs, 358 Dean Street. Date of annual exhibition, February.

AMERICAN FEDERATION OF PHOTOGRAPHIC SOCIETIES—Headquarters, Toledo Museum of Art, Toledo, Ohio. *President*, John F. Jones, 723 Ash Street, Toledo, Ohio; *Vice-President*, August Smith, Toledo, Ohio; *Treasurer*, George W. Beatty; *Secretary*, C. C. Taylor, 3223 Cambridge Avenue; *Historian*, William A. Rheinheimer. For the advancement of pictorial photography, encouragement of pictorial workers and development of new talent. To hold an annual national Salon, of the highest class, to be exhibited in the principal American Art Museums and art centers.

AMERICAN INSTITUTE PHOTOGRAPHIC SECTION—New York City. Headquarters, 19-21 West 44th Street. Established March 26, 1859. Stated meetings, first and third Tuesdays of each month. No meetings during Summer months. *President*, Oscar G. Mason; *Vice-President*, Robert A. B. Dayton; *Treasurer*, James Y. Watkins; *Secretary*, John W. Bartlett, M.D., F.R.P.S., 149 West 94th Street.

AMERICAN LANTERN SLIDE INTERCHANGE—New York. Principal office, 361 Broadway. Organized 1885. *General Manager*, F. C. Beach. Membership, 20 clubs. *Board of Managers*, F. C. Beach, New York; Dr. Carlos E. Cummings, Buffalo, N. Y.; O. C. Reiter, Pittsburg, Pa.; H. R. Terhune, Orange, N. J.; W. H. Rau, Philadelphia, Pa. Annual meeting, January of each year.

BOSTON CAMERA CLUB—Boston, Mass. Headquarters, 50 Bromfield Street. Established 1881. Incorporated 1886. Membership, 100. Date of meetings, first Mondays. *President*, P. Hubbard; *Secretary*, John H. Thurston, 50 Bromfield Street. Date of annual exhibition, Spring.

BOSTON PHOTO-CLAN—Boston, Mass. Organized July, 1911. Headquarters, The Garo Studio, 747 Boylston Street. Membership, 9. *Secretary*, Dr. Malcolm Dean Miller, 156 Cypress Street, Brookline, Mass.

BOSTON YOUNG MEN'S CHRISTIAN UNION CAMERA CLUB—Boston, Mass. Headquarters, 48 Boylston Street, Boston. Organized 1908. *President*, F. W. Hill; *Vice-President*, H. A. Stanley; *Treasurer*, P. T. Cain; *Secretary*, H. E. Bump, 48 Boylston Street, Boston, Mass. Meetings held first Tuesday in each month.

BUFFALO CAMERA CLUB—Buffalo, N. Y. Headquarters, Block Building, corner Elmwood Avenue and Utica Street. Meets second and fourth Thursdays of each month. *President*, Charles R. Phipps; *Vice-President*, H. W. Schoenwolf; *Secretary*, Frank V. Lepper, 87 Livingston Street, Buffalo, N. Y.

CALIFORNIA CAMERA CLUB—San Francisco, Cal. Headquarters, 833 Market Street, San Francisco. Established March 18, 1890. Incorporated April 5, 1890. Membership, 382. Date of meeting, second Tuesday, monthly. Monthly slide exhibitions, every third Friday in the month. Print exhibitions, monthly. Date of annual exhibition, no set time. *President*, Edward H. Kemp; *Secretary*, F. G. Spencer, 833 Market Street, San Francisco care California Camera Club.

- CAMERA CLUB**—New York. Headquarters, 121 West 68th Street. Established by consolidation of Society of Amateur Photographers and New York Camera Club in April, 1896. Incorporated May 7, 1896. Membership, 200. Date of annual meeting, first Thursday after the first Monday in January. *Secretary*, Monroe W. Tingley.
- CAMERA CLUB OF THE TWENTY-THIRD STREET BRANCH, Y. M. C. A.**—New York. Headquarters, 23d Street Y. M. C. A. Established June 3, 1904. Membership, 65. Date of business meetings, first Monday in each month; third Monday in each month, socials, lantern slide lectures, etc. *President*, Albert K. Dawson; *Vice-President*, Ernest Adams; *Secretary*, J. O. Sprague, 215 West 23d Street; *Treasurer*, Charles d'Emery. Date of annual exhibition, usually in January. No fixed date.
- CAMERA WORKERS**—New York. Headquarters, 122 East 25th Street. Organized 1908. This club has no officers, but is managed by an executive committee of its members. The membership is divided into three classes, and limited to 100. *Secretary*, Paul Haviland.
- "CAMERADS"**—New Brunswick, N. J. Headquarters, corner Church and George Streets. Established April 24, 1890. *Secretary*, Harvey Iredell, D.D.S., Lock Box 34, New Brunswick.
- CAPITAL CAMERA CLUB**—Washington, D. C. Headquarters, 1010 F Street, N. W. Established April, 1891. Date of meetings, second Friday in each month. *President*, William M. Netherland; *Vice-President*, Francis C. Crow; *Treasurer*, Louis Lowe; *Secretary*, E. G. Sickler, 1010 F Street, N. W.; *Librarian*, J. T. Seabrook. Date of annual exhibition, May.
- CHICAGO CAMERA CLUB**—Chicago, Ill. Headquarters, Northwestern University Building, Dearborn and Lake Streets. Established February 14, 1904. Incorporated February 19, 1904. Date of meetings, every Thursday. *President*, George C. McKee; *Vice-President*, F. M. Tuckerman; *Secretary* and *Treasurer*, C. B. Hale, 31 West Lake Street. Annual exhibition, March (Salon).
- COLUMBIA PHOTOGRAPHIC SOCIETY**—Philadelphia, Pa. Headquarters, 2526 North Broad Street, Philadelphia. Established 1889. Incorporated July 3, 1894. Membership, 100. Date of meetings, first Monday of each month, business meeting; other Mondays, lectures or demonstrations. *President*, H. E. Cassel; *Secretary*, J. V. Altenecker, 2526 North Broad Street, Philadelphia. Date of annual exhibition, January, prints; November, lantern slide.
- COLUMBUS PHOTO-PICTORIALISTS**—Columbus, Ohio. Headquarters, 20 East Broad Street. Established May 10, 1910. Membership, 50. *President*, A. L. Kidd; *Vice-President*, J. W. Newton; *Secretary*, C. L. McKibben, 44 East Broad Street; *Treasurer*, J. W. Glick.
- DAGUERRE CAMERA CLUB**—Headquarters, Harbert, Mich. Established 1893. Membership, 20. Date of meetings, first Monday of each month. *President*, F. Blish; *Secretary*, Wells Sizer, Harbert.
- ELMIRA CAMERA CLUB**—Elmira, N. Y. Headquarters, 112 Baldwin Street, Elmira. Established 1902. Membership, 33. *President*, H. E. Snyder; *Secretary-Treasurer*, Seely Stage, 217 Sullivan St.
- ELYSIAN CAMERA CLUB**—Hoboken, N. J. Headquarters, 307 Washington Street. Established 1902. Date of meetings, second Tuesday of each month. *President*, Conrad R. Pederson; *Vice-President*, Richard Thiersen; *Treasurer*, Julius Nelson; *Secretary*, Charles Westerburg, 636 Park Avenue.
- ESSEX CAMERA CLUB**—Newark, N. J. Headquarters, 33 Court Street, Newark, N. J. Organized July, 1899. Membership, 75. Date of meetings, fourth Tuesday of every month. *President*, A. L. Hedden; *Secretary*, L. F. Gebhardt, 235 South Eleventh Street. Date of annual exhibition, February.
- HAMILTON SCIENTIFIC ASSOCIATION, CAMERA SECTION**—Hamilton, Can. Headquarters, 104 King Street, W. Established April, 1891. Membership, 80. Date of meetings, second and fourth Mondays. *President*, F. H. Wingham; *Secretary*, Sinclair G. Richardson, 401 Bank of Hamilton Bldg. Date of annual exhibition, last week of March.
- HARTFORD CAMERA CLUB**—Hartford, Conn. Membership, 100. *President*, Dr. Frederic S. Crossfield, 75 Pratt Street; *Vice-President*, Clayton P. Chamberlin; *Corresponding Secretary*, Eugene D. Field; *Treasurer*, A. L. Chase; *Secretary*, Mr. Charles R. Nason, 20 Madison Street.
- HAVERHILL CAMERA CLUB**—Haverhill, Mass. Headquarters, Exchange Block, Water Street. Established 1898. Membership, 37 active, 1 honorary. Date of meetings, third Tuesday, monthly. *President*, Joseph Osgood; *Secretary*, Geo. W. Nutter, Central Street; *Treasurer*, Vard B. Leavitt. Date of annual exhibition, no set date. Usually in March.
- INTERNATIONAL PHOTOGRAPHIC ASSOCIATION**—San Francisco, Cal. Founded 1908. *President*, F. B. Hinman, Room 4, Union Depot, Denver, Colo.; *Chief Album Director*, J. H. Winchell, R. F. D. No. 2, Painesville, Ohio; *General Secretary*, Fayette J. Clute, 413-415 Call Building, San Francisco; *Stereoscopic Album Director*, Harry Gordon Wilson, 4954 Washington Avenue, Chicago, Ill.; *Director Post Card Division*, Charles M.

Smythe, 1160 Detroit Street, Denver, Colo.; *Director Lantern Slide Division*, George E. Moulthroppe, Bristol, Conn.; *Secretary Lantern Slide Division*, Edward F. Cowles, 11 Oak Street, Bristol, Conn. **The State Secretaries:** Alabama—Richard Hines, Jr., 155 State Street, Mobile. Alaska—P. S. Hunt, Valdez. California—Sigismund Blumann, 3159 Davis Street, Fruitvale, Cal. Colorado—O. E. Aultman, 106 E. Main Street, Trinidad. Connecticut—George E. Moulthroppe, Bristol. Florida—Capt. E. S. Coutant, U. S. Life-Saving Service, Oak Hill. Idaho—Eugene Clifford, Weippe. Illinois—George A. Price, R. F. D. No. 1, Summit. Indiana—H. E. Bishop, 1704 College Avenue, Indianapolis. Iowa—C. E. Moore, Eddyville. Kansas—H. E. High, R. F. D. No. 1, Wilson. Maryland—E. G. Hopper, 218 East 20th Street, Baltimore. Massachusetts—John Mardon, 161 Summer Street, Boston. Michigan—W. E. Ziegenfuss, M. D., 327 West Hancock Avenue, Detroit. Minnesota—Leonard A. Williams, St. Cloud. Mississippi—Emory W. Ross, Institute Rural Station, Edwards. Missouri—Wharton Schooler, R. F. D. No. 2, Eolia. Montana—Mrs. Ludovica Butler, 932 W. Broadway, Butte. Nebraska—Miss Lou P. Tillotson, 1305 South 32nd Street, Omaha. New Hampshire—Mrs. A. Leonora Kellogg, 338 McGregor Street, Manchester. New York—Louis R. Murray, 266 Ford Street, Ogdensburg. New Jersey—Burton H. Albee, 103 Union Street, Hackensack. North Dakota—Jas. A. Van Kleeck, 619 Second Avenue, North Fargo. Ohio—J. H. Winchell, R. F. D. No. 2, Painesville. Oregon—Leonard S. Hopfield, Box 622 McMinnville. Pennsylvania—L. A. Sueary, 2822 Espy Avenue, Pittsburgh, Pa. South Dakota—C. B. Bolles, L. B. 351, Aberdeen. Tennessee—George Parke, 292 Madison Avenue, Memphis. Texas—Frank Reeves, Roby. *Utah—John C. Swenson, A. B., Provo. West Virginia—Wm. E. Monroe, Box 298, Point Pleasant. Wisconsin—H. Oliver Bodine, Racine.

JAMESTOWN CAMERA CLUB—Jamestown, N. Y. Established 1907. Headquarters, Arcade Building, Jamestown, N. Y. Membership, 25. Meetings, second Tuesday of month: *President*, R. H. Hooper; *Vice-President*, L. C. Ogren; *Treasurer*, E. H. Sample; *Secretary*, R. Sanctuary, 85 Falconer Street; *Assistant Secretary*, L. Miller.

LOS ANGELES CAMERA CLUB—Los Angeles, Cal. Headquarters, 3d floor, 321 South Hill Street, meet every Thursday at 8 p. m. Organized 1908. *President*, R. S. Crandall; *Secretary*, T. K. Adlard, 1104 West 42nd Street.

MISSOURI CAMERA CLUB—St. Louis, Mo. Club Rooms, Suite No. 26 and 27, Euclid Building. Organized November, 1903. Meetings, second and fourth Tuesday. Members American Federation of Photo Societies. *President*, W. E. Rolfe; *Vice-President*, C. F. Bartlett; *Secretary*, Francis K. Adams; *Treasurer*, Chas. Lindenschmit.

MONTREAL AMATEUR ATHLETIC ASSOCIATION CAMERA CLUB—Montreal, Canada. Headquarters, M. A. A. Building, 250 Peel Street. Organized May 1, 1906. Membership, 45. Meetings monthly. *President*, W. R. Allen; *Vice-President*, Gordon A. Melville; *Hon. Recording Secretary-Treasurer*, Charles Adkin, 48 St. James Street; *Hon. Corresponding Secretary*, P. S. Robinson, 402 Power Building.

NEWARK CAMERA CLUB—222 Market Street, Newark, N. J. Organized 1888. Incorporated 1910. F. Oscar Race, *President*; Alexander Berne, *Vice President*; L. Wright, Jr., *Treasurer*; W. S. Norris, *Secretary*, 85 Bleecker Street, Newark, N. J.

NEW BRITAIN CAMERA CLUB—Organized 1892. *President*, E. H. Start; *Secretary*, E. A. Sheldon; 53 Lenox Place, New Britain, Conn. Meets second and fourth Tuesdays, 173 Main Street.

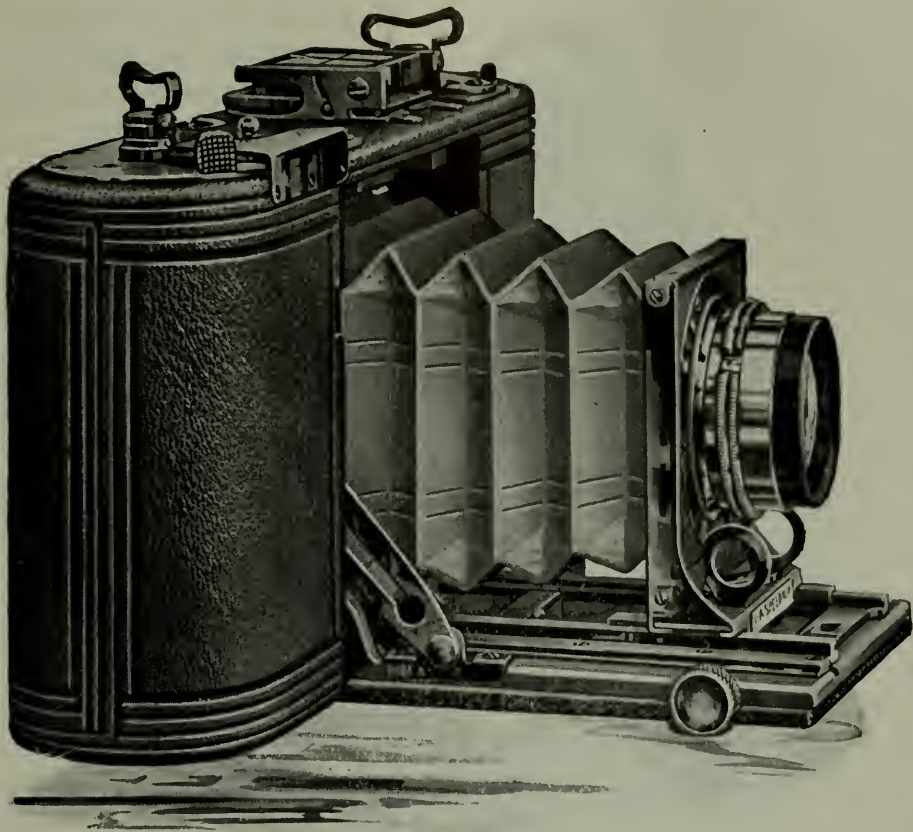
NEW ENGLAND PHOTOGRAPHIC EXCHANGE—Under management of New Britain Camera Club. *Exchange Secretary*, F. G. Patience, 181 Maple Street, New Britain, Conn.

ORANGE CAMERA CLUB—Orange, N. J. Headquarters, 222 Main Street. Established March 21, 1892. Incorporated May 19, 1893. Membership, 120. Date of meetings, first and third Saturday of each month, except July, August and September. *President*, H. R. Terhune; *Secretary*, W. A. Rudstad, 222 Main Street, Orange. Dates of annual exhibitions, Fall and Spring.

OREGON CAMERA CLUB—Portland, Ore. Established 1895. Incorporated 1903. Headquarters, 207 Park Street. Membership, 150. Date of meetings, second Tuesday in January. *President*, Henry Berger, Jr.; *Vice-President*, B. S. Durkee; *Secretary*, L. E. Anderson; *Treasurer*, F. W. Donnerberg. Date of annual exhibition, early Spring.

PHOTOGRAPHIC CLUB OF BALTIMORE—Baltimore, Md. Headquarters, Club House, 847 Hamilton Terrace. Established 1885. Incorporated 1890. Membership, active 52, associate 20, honorary 10, non-resident 3, total 85. Date of meetings, every Tuesday, 8:15 P. M. *President*, Percy M. Reese; *Secretary*, C. M. Kepner, 319 W. Mulberry Street. Date of annual exhibition, December.

- PHOTOGRAPHIC SOCIETY OF PHILADELPHIA—Philadelphia, Pa. Headquarters, 1722 Arch Street. Established November, 1862. Incorporated April 24, 1885. Membership, 134. Date of meetings, second and third Wednesday, 8 P. M. *President*, C. Yarnall Abbott; *Secretary*, Edward H. Smith, 1722 Arch Street. Date of annual exhibition, February.
- PHOTO-PICTORIALISTS OF BUFFALO—Buffalo, N. Y. Organized October, 1906. Membership, 8. Meeting, semi-monthly. *Correspondent*, W. H. Porterfield, 100 Lakeview Avenue.
- PHOTO-SECESSION—New York, N. Y. Headquarters and Galleries, 291 Fifth Avenue. Continuous exhibitions November-April. *Director*, Alfred Stieglitz.
- PITTSBURG ACADEMY OF SCIENCE AND ART (PHOTOGRAPHIC SECTION)—Pittsburg, Pa. Headquarters, Carnegie Institute, Schenley Park. Organized January 23, 1900. Membership, 100. Meetings, second Tuesday of each month at Club Room, 6004 Penn Avenue, and fourth Tuesday of each month at Carnegie Institute. *President*, O. C. Reiter, 2424 Penn Avenue; *Vice-President*, W. P. Clyde, Cheswick, Pa.; *Secretary-Treasurer*, F. L. Miller, 1113 Union station; *Lantern Slide Director*, F. C. Wilharm, 535 Winfield Street; *Print Director*, S. A. Martin.
- PITTSBURG CAMERA CLUB—Pittsburg, Pa. Established December, 1910. Membership, 75. Headquarters, 233 Fifth Avenue. *President*, R. L. Sleeth, Jr., 804 Home Trust Bldg.; *Treasurer*, Wm. McK. Ewart, 2524 Center Avenue; *Secretary*, George B. Parker, 426 Diamond Street.
- PITTSBURG PHOTO-PICTORIALISTS—Pittsburg, Pa. Headquarters, 406 6th Avenue. *Director*, Chas. K. Archer.
- PORTLAND CAMERA CLUB (PHOTOGRAPHIC SECTION) OF THE PORTLAND SOCIETY OF ART—Portland, Me. Headquarters, Spring corner High Street. Established 1899. Membership, 90. Date of meetings, every Friday evening. *President*, O. P. T. Wish; *Secretary*, E. Roy Monroe. Date of annual exhibition, in February.
- POSTAL PHOTOGRAPHIC CLUB—Headquarters, Washington, D. C. Established December, 1888. Membership, 40. Date of meetings, no regular meeting. *President*, Charles E. Fairman; *Secretary*, Gustavus A. Brandt, 631 Maryland Avenue, S. W., Washington, D. C. Albums circulate among members monthly, except August and September.
- PROVIDENCE CAMERA CLUB—Providence, R. I. Established 1883. Incorporated 1889. Headquarters, Commercial Bldg., 55 Eddy Street. Total membership, 100. Date of meetings, second Saturday of each month. *President*, C. W. Morrill; *Vice-President*, C. S. Wescott; *Secretary*, H. Ladd Walford, 55 Eddy Street; *Treasurer*, Homer Winslow.
- ROCHESTER CAMERA CLUB—Rochester, N. Y. Headquarters, Wilder Arcade, Rochester, N. Y. *President*, W. B. Cline; *Vice-President*, D. C. Ward; *Treasurer*, S. P. Hines; *Secretary*, Chas. C. Zoller, 100 Delevan Street.
- SALON CLUB—Thirty members. *Director*, W. H. Zerbe, 345 Spruce Street, Richmond Hill, L. I., N. Y.; *Secretaries*, W. and G. Parrish, 5607 Cobanne Avenue, St. Louis. Circulate monthly portfolios.
- ST. LAWRENCE CAMERA CLUB—Ogdensburg, N. Y. Headquarters, 26 Jay Street. Established 1900. Membership, 12. Date of meetings, at the call of the Secretary. *President*, Arthur L. Jameson; *Secretary*, John N. Brown, 26 Jay Street.
- SYRACUSE CAMERA CLUB—Syracuse, N. Y. Headquarters, Y. M. C. A. Building. Established 1886. Incorporated January 19, 1892. Membership, 101. Date of meetings Friday evening of each week. *President*, J. E. Bierhardt; *Secretary*, M. L. Trowbridge, 216 Ulster Street.
- TOLEDO CAMERA CLUB—Toledo, Ohio. Member of the American Federation. Headquarters, Museum of Art. Meets second Wednesday of month. *President*, August Smith; *Vice-President*, Percy Bridges; *Secretary*, Harry Webb, 1019 Prouty Avenue; *Treasurer*, M. W. Chapin.
- TORONTO CAMERA CLUB—Toronto, Canada. Established 1887. Incorporated 1893. Headquarters, 2 Gould Street. Membership, 202. Date of meetings, every Monday, from October to April, inclusive. *President*, A. S. Bowers; *Secretary-Treasurer*, Hugh Neilson, 295 Carlton Street. Date of annual exhibition, March or April.
- TOWN AND COUNTRY CAMERA CLUB—St. Paul, Minn. Established 1901. Date of meetings, every week, at which lectures and demonstrations are given pertaining to camera work. Outing excursions on May 30. *President*, George L. Nevins; *Secretary*, M. W. Wright, 905 Charles Street, St. Paul, Minn. Exhibitions annually.
- WILKES-BARRE CAMERA CLUB—Wilkes-Barre, Pa. Rooms, Coal Exchange Building. Meets every Tuesday, 8 o'clock. *President*, H. C. Shepherd; *Secretary*, E. Reisser, 847 Franklin Street. Exhibition annually, in the spring.



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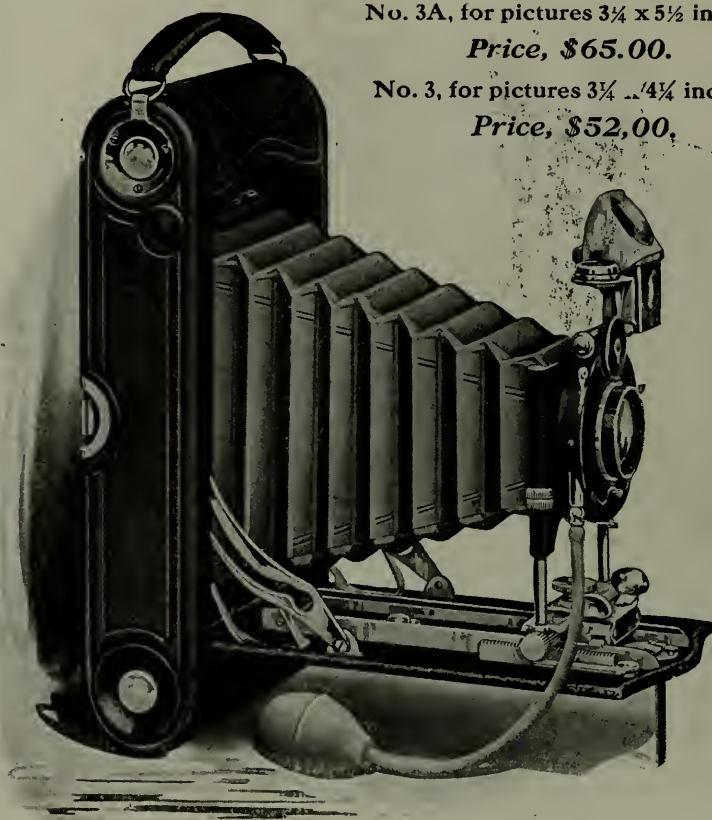
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For pictures $2\frac{1}{2} \times 4\frac{1}{4}$ inches. Size of camera $2\frac{1}{4} \times 4\frac{1}{4} \times 9\frac{3}{4}$ inches.

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A lens—the Zeiss-Kodak Anastigmat lens *f.* 6.3—with sufficient power to make slow snap-shots on cloudy days, with sufficient power to make exceptionally fast snap-shots of rapidly moving objects on bright days, a shutter—the Compound—with a flexibility of control which enables the operator to get the full value from the high power of his lens—these are the chief characteristics of these Special Kodaks.

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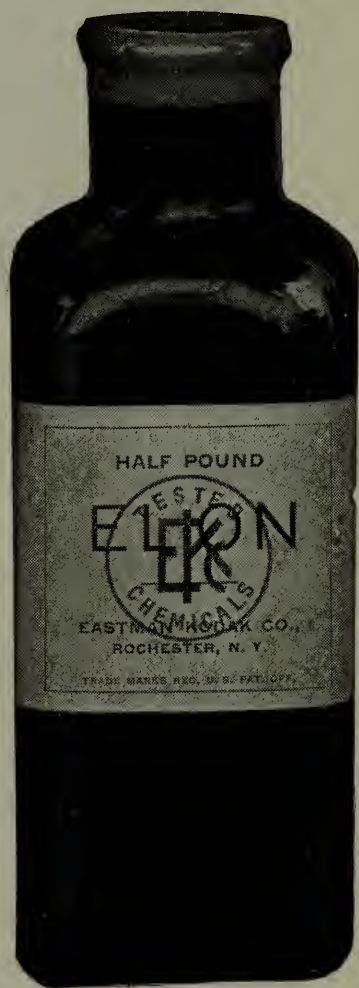
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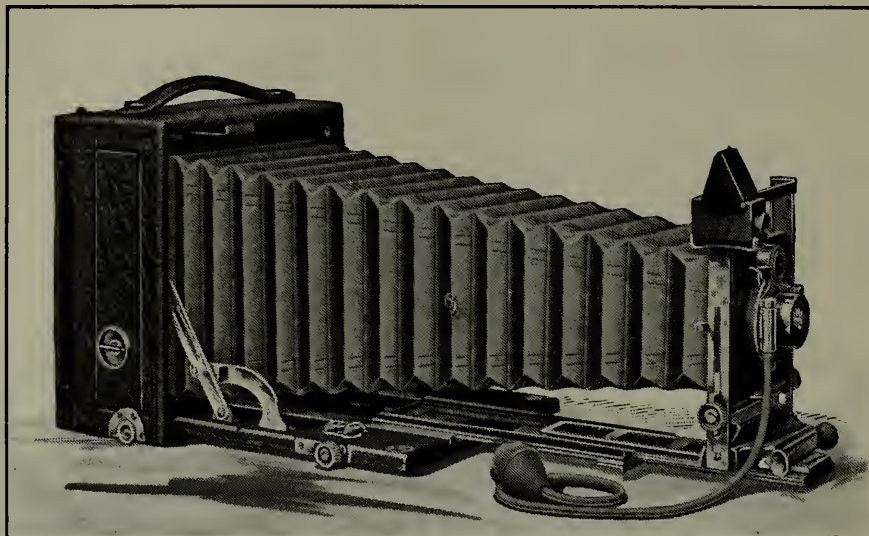
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Premo Film Pack Film is made from the same stock as the Eastman Non-curling—the best in the world.

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Premos are the smallest, the lightest, the easiest to load and operate of all cameras, and the nearest dealer will prove it to you.

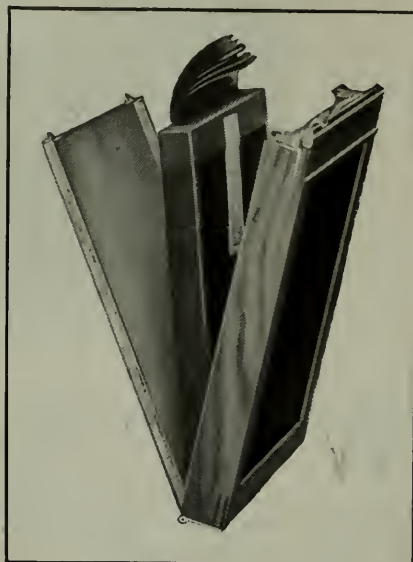
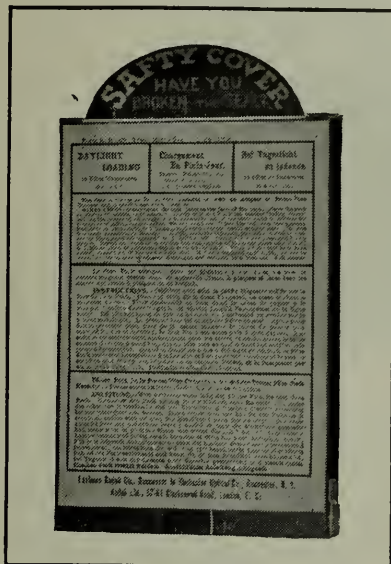
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The pack is merely dropped into the adapter, the back closed and adapter loaded in camera just as an ordinary plate holder is.

The adapter is provided with slide which can be removed or replaced at will, so that you may use the ground glass for focusing at any time.

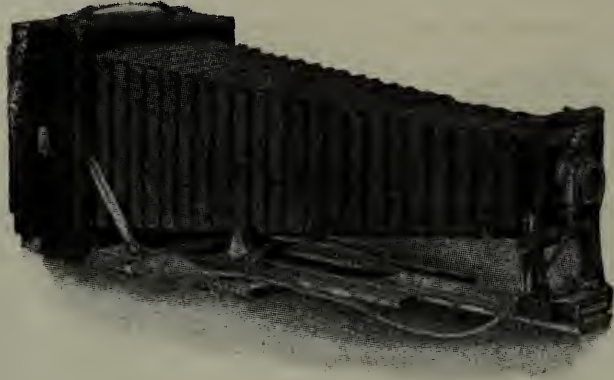
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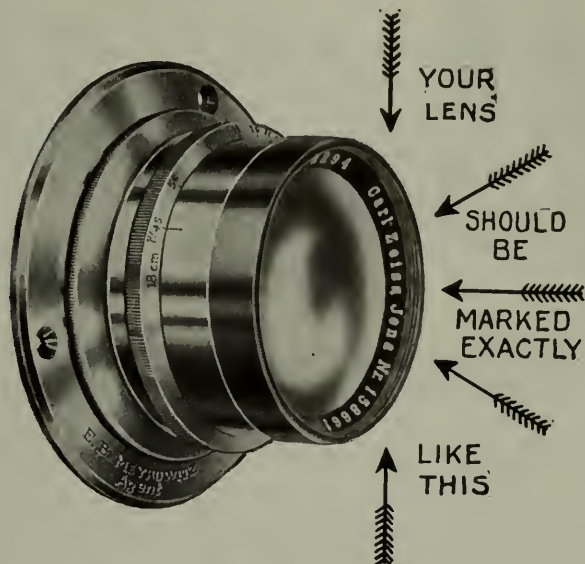
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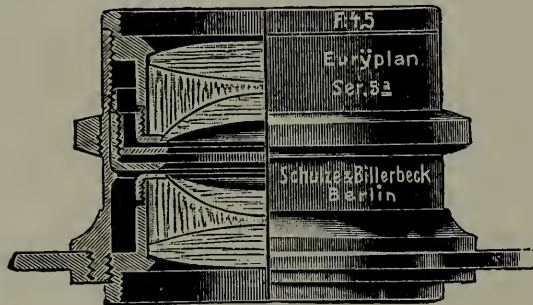
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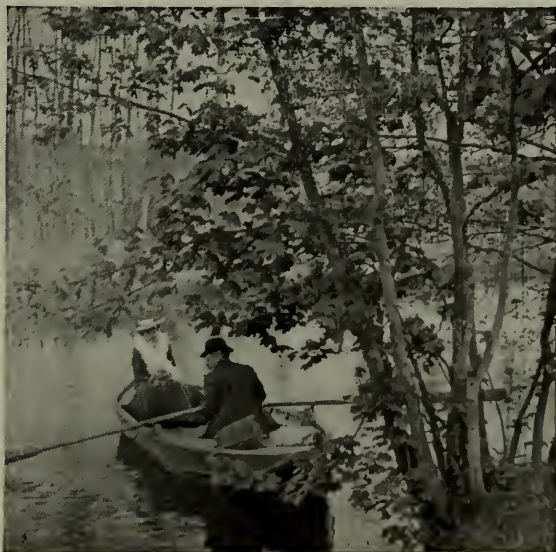
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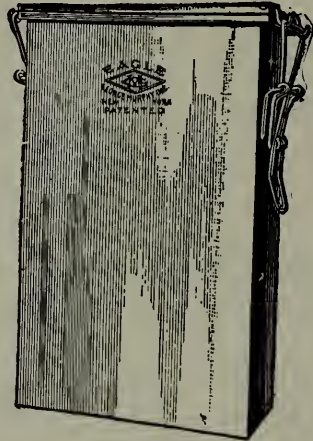
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Eagle Tank Developing Powders,	per package 6 powders each.....	.25

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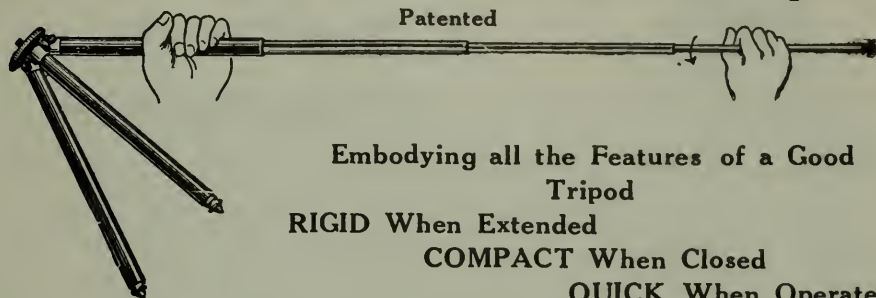
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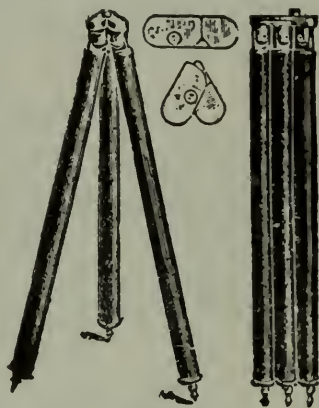
The Quick-Set eliminates all the defects found in other makes of tripods. It has no buttons or pins, and the legs cannot become loosened.

The Quick-Set Tripod, where fastened to the head, is reinforced by a pinion, making it absolutely unbreakable. However, in case of accident any section of the legs can readily be replaced at slight expense. Again, the Quick-Set does away with the objectionable buttons and springs used on other makes of metal tripods. It has no projecting parts, and the lock is so constructed that it is impossible to slip or unlock under pressure. Another feature of superiority over other metal tripods is the adjustable one; can be locked at any section, thereby shortening it, if needed.

Nos. 51 to 56, inclusive, are made with the legs fastened to a circular head $1\frac{3}{4}$ inches in diameter. No. 60 lies perfectly flat, the head being a flat piece of metal $\frac{3}{4}$ -inch wide, $2\frac{1}{2}$ inches long, it is so made as to fold over, when extended, and form a broad triangular-shaped head.



No. 75



No 60.

The No. 75 is constructed with a loose tripod screw, with a long shank, making it very easy to turn the camera in any desired direction, and then clamp firmly. The top is covered with green felt, to prevent marring the camera.

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52	3	45 "	16½ "	14½ "	2.35
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55	5	49½ "	12 "	20 "	4.25
56	5	57 "	13½ "	22 "	4.50
60	5	50 "	12 "	21 "	5.00
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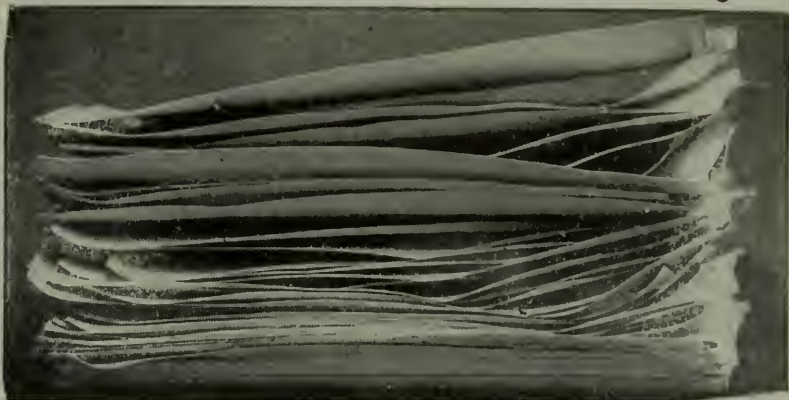
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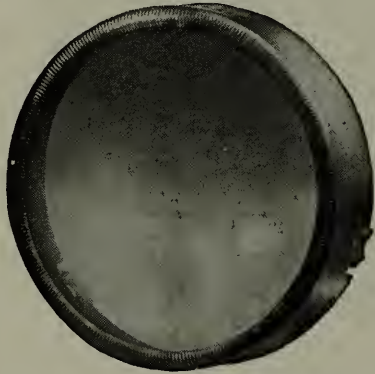
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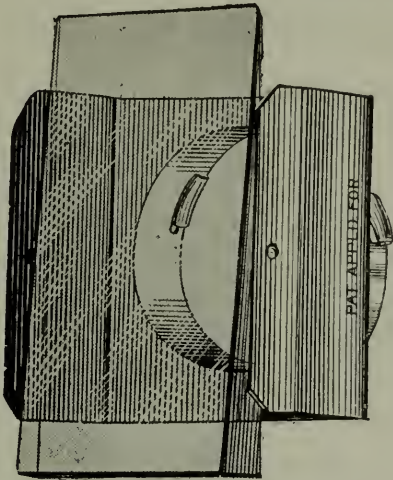
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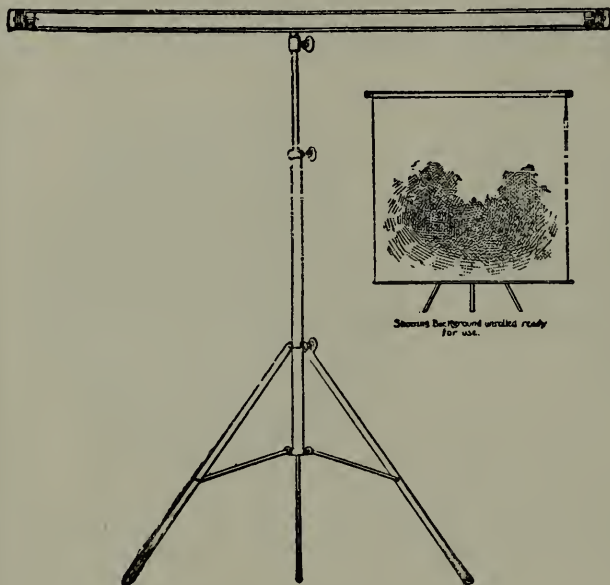
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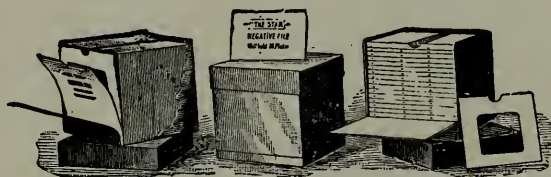
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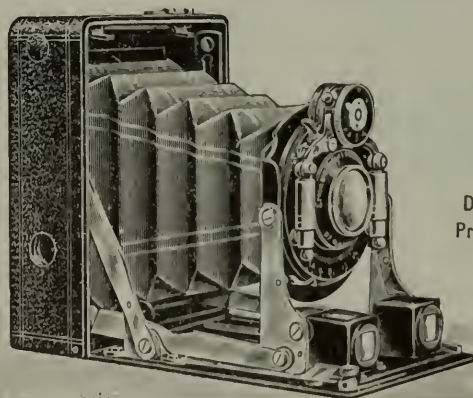
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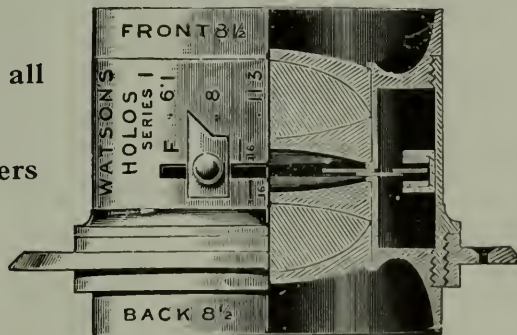
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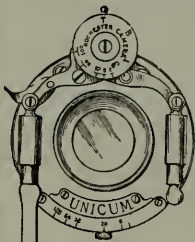
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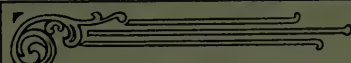
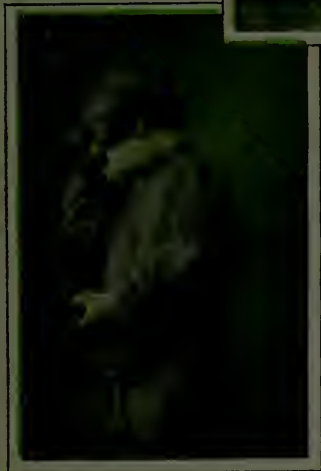
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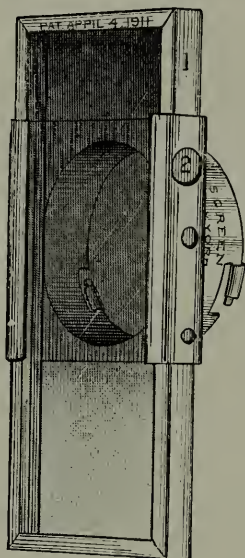
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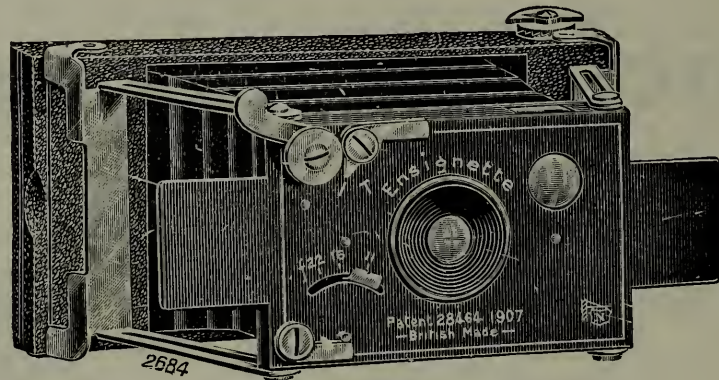
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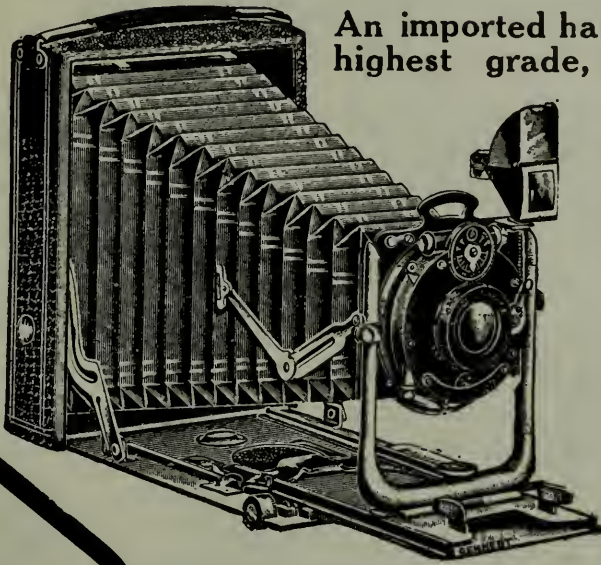
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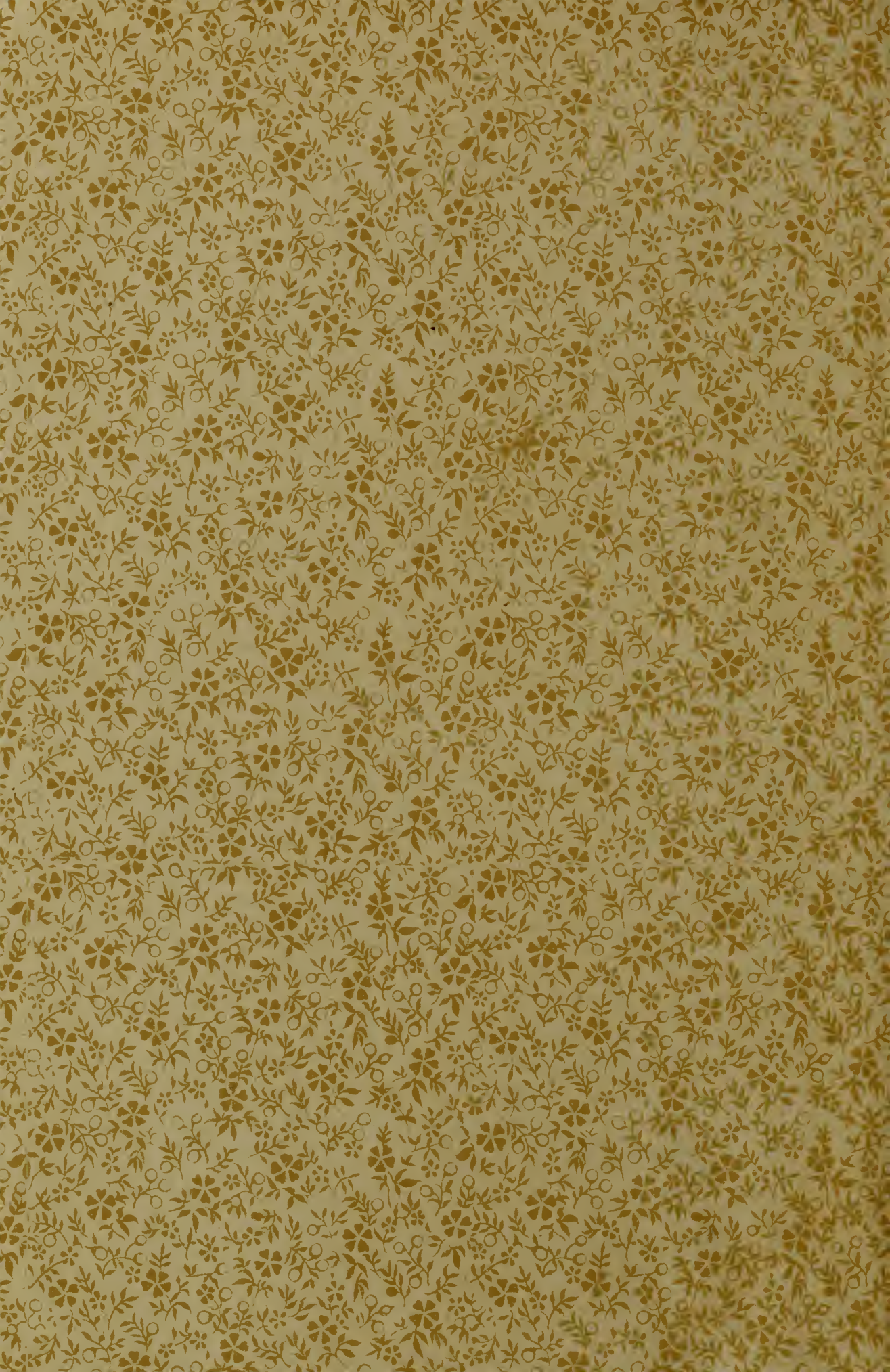
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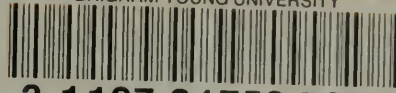
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