



# *Zeiss*

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# ZEISS MAGAZINE

*Devoted to Zeiss Ikon Photography*

The ZEISS MAGAZINE, devoted to Zeiss Ikon photography, is published monthly by Carl Zeiss, Inc., 485 Fifth Avenue, New York. It will have 16 pages or more. Subscription rates in the United States, one dollar (\$1.00) for twelve issues. Single or sample copies are ten cents. The editor will welcome original manuscripts pertaining to photography with current models of Zeiss Ikon cameras. Accepted contributions will be remunerated at the rates usually paid by photographic magazines—Herbert C. McKay, Editor.

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## ZEISS MONTHLY COMPETITION

•  
SECOND PRIZE

"A Summer Day"

Paul W. Wall  
•

**FIRST PRIZE:** The cover picture, "Power" made by A. G. Noehren, M.D., with a Super Ikomat B, the F:2.8—8 cm. Tessar Lens set at F:6.3 with light yellow filter, exposure 1/100th second. A very striking picture showing the much photographed Niagara Falls from a new viewpoint. Through the use of a filter Dr. Noehren has retained a full range of tones throughout despite the fact that the picture was taken against the light; by the use of a comparatively slow shutter speed he has obtained an agreeable illusion of motion.

**SECOND PRIZE:** Awarded to Paul W. Wall for the picture "A Summer Day" shown on this page. Made with a Super Ikomat A, the F:3.5—7 cm. Tessar was set between F:5.6 and F:8 with an exposure of 1/300th second. An excellent conception showing how forethought and planning will contribute materially to our photographs. More sky and less foreground with a consequent dropping of the figure and horizon line to about one-third of the way from the top would improve this picture materially.

**THIRD PRIZE:** Won by A. Merrell Powers on his picture "Hallowe'en" (picture shown on page 19) made with a Model II Contax with the F:2.8—5 cm. Tessar used wide open at a speed of 1/25th second. Mr. Powers tells us that the only light used in addition to the ordinary room lighting was a 25 watt light inside the pumpkin and a bridge lamp with 60 watt light four feet away. Thought and ingenuity plus the high speed Tessar Lens has, in this instance, made the use of high powered expensive lighting equipment unnecessary.

(Continued on Page 19)



# Contax Photography:

## The Value And Use Of Additional Lenses

H. R. CHAMPLIN

THE Contax with its complete series of Zeiss lenses and numerous accessories is the most highly perfected form of universal camera available today. Complete in itself for general photographic work without requiring the purchase of additional equipment, the Contax can easily and inexpensively be adapted for any photographic purpose by the addition of a few of the numerous accessories.

As standard equipment, the Contax is generally used with a lens of 5 cm. (2 inches) focal length and a speed ranging from the rapid F/3.5 Tessar to the ultra rapid F/1.5 Sonnar, the choice depending on the requirements of the user. The field covered by these lenses is excellent for all general photographic use except scenes embracing an extremely wide angle. They are superior for candid camera photography, average views, pictures in and around the home, and most other photographic work. Why, then, should anyone want more than one lens for his Contax?

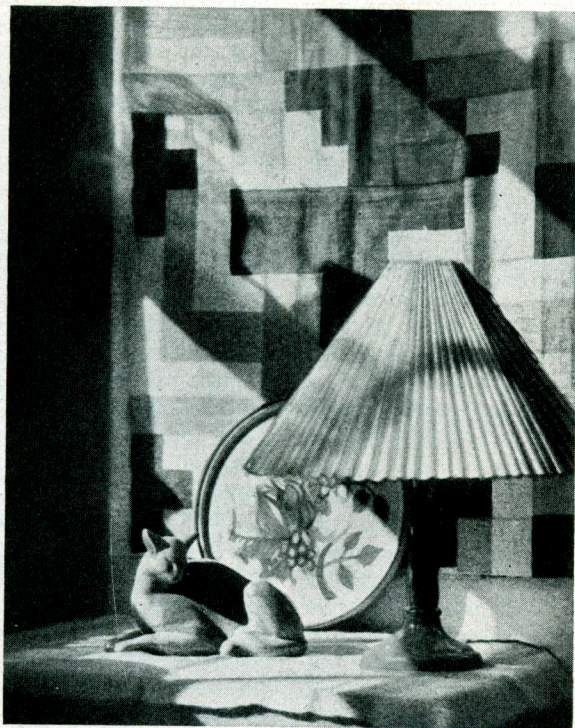
The size of the picture taken by the Contax is fixed, namely, 24 x 36 mm. or slightly less than 1 x 1½ inches. While these tiny negatives may be enlarged to many times their original size, it is a distinct advantage

to have the subject matter appear as large as possible on the film. There is, of course, a limit to which any negative can be enlarged, although the superior qualities of the lenses used in the Contax and the fine grain motion picture film obtainable today, permit of enlargement to a higher magnification than

is possible with other cameras and films.

With any camera, to secure a large image on the film we must photograph the subject from fairly close range with the standard lens or from a distance with a lens which magnifies the image. The latter lens is generally referred to as a telephoto lens. A good rule to remember in the selection of lenses of various focal lengths for the Contax is that the size of the image at a given distance from the object

photographed will vary directly as the focal length of the lens. For instance, the 8.5 cm. lenses will at the same distance give an image  $\frac{8.5}{5}$  or 1.7 times larger than that given by a 5 cm. lens. Of further interest, is the fact that if we are satisfied with the size of the image, we can, with the 8.5 cm. lens, stand 1.7 times farther away from the object and secure an image of the same size. The same rule will hold true with all the other Contax lenses.



"Morning Sunlight"

H. R. Champlin

Contax, F/4—8.5 cm. Triotar Lens



Photography from too close a viewpoint will in many instances cause distortion; objects near the camera are too large for their surroundings and the perspective in the photograph is bad. Perspective is actually a matter of viewpoint and has nothing to do with the focal length of the lens used on the camera. With the camera at the same distance from the object the perspective in the picture will be the same whether we use the 2.8 cm. wide angle Tessar or the 18 cm. Tele-Tessar. Only the angle of view covered and the size of the image will vary.

Suppose, for example, we wanted to photograph a landscape, with a magnificent tree in the foreground and a majestic range of mountains in the far distance. We want to capture as much of the exquisite detail of the tree, its branches and leaves, as possible. This means that the tree must occupy as much of the film area as possible. A shot from close range with the standard 5 cm. lens will give us all the desired detail of the tree but the mountains will suffer. They will appear too small, too insignificant; will seem too far away. The perspective has suffered because the viewpoint distorted the relative sizes of the objects we wished to portray. The focal length of the lens was responsible for the distortion only in that it allowed too close a viewpoint. Too close a viewpoint has the effect of increasing the apparent distance between the object in the foreground and all things behind it.

Another shot made with the same lens, but twice the distance from the tree will correct this fault. The tree will be just half the size while the height of the mountains in the distance will remain unchanged. The space between the two will seem to have been lessened and everything will be more in its correct relative size. Thus we see that perspec-

tive is not a function of the focal length of a lens; it is merely a matter of viewpoint. By moving farther back we have gained more nearly correct perspective, but our actual picture now occupies just one-half the film area. The final enlargement will require a much greater degree of magnification and some of the details and tonal gradations of the tree will, of course, be lost.

It is here that the lens of longer focal length is invaluable. We can now select the correct viewpoint and a lens which magnifies the image until it occupies the entire film area.

Lenses longer than the standard 5 cm. focal length are also useful in photographing street characters, if naturalness of expression and pose are to be retained. These lenses are invaluable in picking out choice bits of composition—perhaps a vine hanging down over a white wall, with long shadows; an interesting group of flower pots setting in a sunlit corner; a bowl of flowers on the window sill; icicles hanging from a projecting eave or a snow laden branch. In many such cases the photographer cannot come close enough to secure a good sized image with the standard lens or else the choice of some interesting angle of view prevents a close-up shot. Then with the 13.5 cm. Sonnar or 18 cm. Tele-Tessar we can bring our Contax close, and in doing so open up an entirely new world of picture possibilities.

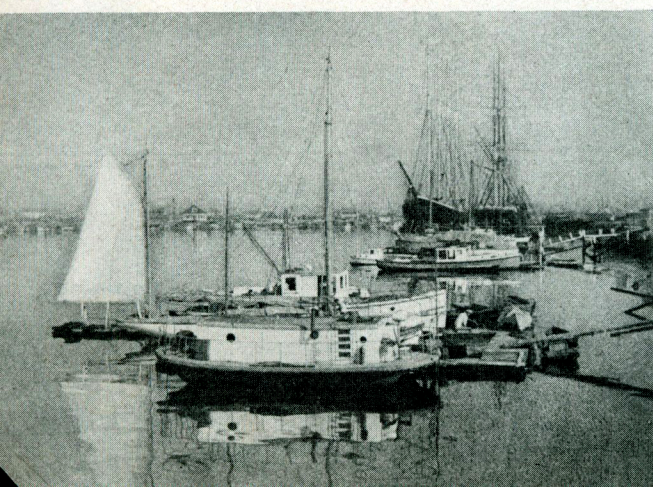
The Contax user should not, however, acquire from these comments the erroneous belief that a telephoto lens should be used at all times and that the standard 5 cm. lens has no place in the equipment of the more ambitious worker. The standard lens is the most nearly universal of the entire range of lenses available for the Contax. The wide angle F/2—4 cm. Biotar and the extreme wide angle F/8—2.8 cm. Tessar also have a definite place in Contax photography. The short focal length lenses will be necessary whenever the angle of view is greater than that covered by the standard lens. Either we cannot get far enough away from the object to include the whole field we want or else we wish to emphasize some particular feature in the picture and minimize the background.

We are, for instance, in the operating room of a hospital, the doctors and nurses are grouped around the still, white-wrapped

"Harbor Scene"

H. R. Champlin

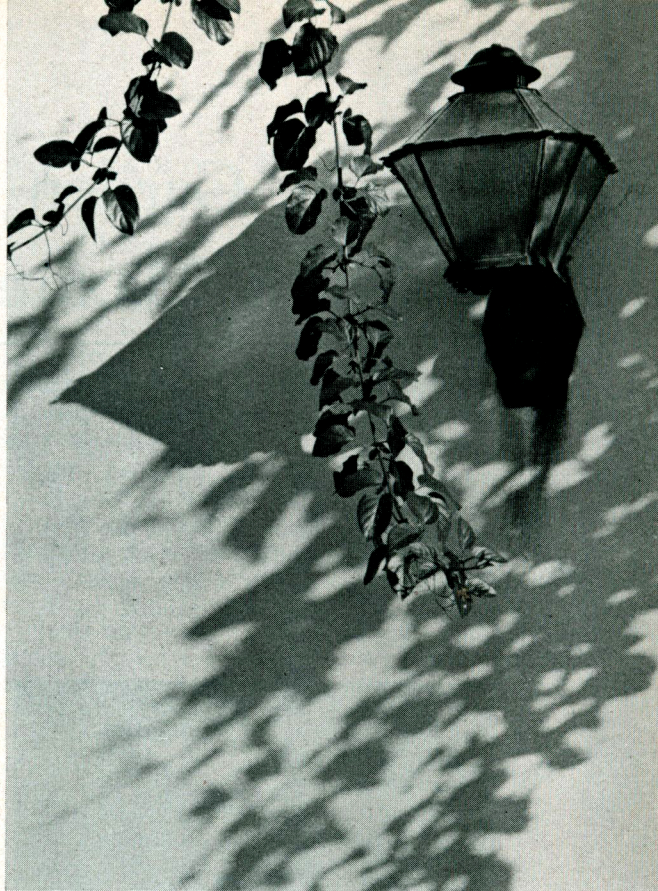
Made with Contax, F/2—4 cm. Biotar Lens





form. We are in white cap and gown like the rest and cannot get various lenses in and out of our pockets. Here is a dramatic opportunity, one which the compact precision Contax equipped with the ultra-rapid F/2—4 cm. Biotar lens will not miss. With this lens we are sure to be able to include enough of the view and, if necessary, will be occasionally allowed close enough so as to include only the hands of the surgeons and the field of the operation. Or perhaps we have just a simple gathering around the dinner table. Our standard 5 cm. lens will get in everyone but Uncle Willie. The picture taken with the Biotar will include not only Uncle Willie but also the family cat. Again, we may want to emphasize some object in a picture, make it stand out as the central theme. A basket or two of fish, a few nets draped carelessly about; a short distance behind we see fishermen, the end of the old pier, the prow of a fishing schooner. The Biotar will permit a shot from a viewpoint so close to the baskets that they loom large, the fishermen, the pier and the schooner are dwarfed by comparison. The short focal length of this lens furnishes a tremendous depth of focus and we find everything sharp with a medium stop.

The extreme wide angle F/8—2.8 cm. Tessar is absolutely necessary when photographing buildings and all scenes embracing an extreme angle of view. Remember, though, you should not tilt a wide angle lens when photographing buildings or, for that matter, anything else, especially where vertical lines are involved, unless you want distortion of perspective in the picture. If the camera is tilted so that the top of a building is included, the vertical lines in the picture will come together rapidly and the building will look somewhat like a pyramid. This can be corrected to some extent when enlarging by tilting the paper carrier, but the amount of correction that can be secured this way is limited. An excellent rule to follow is to try and make the shot from a height which will make tilting the camera unnecessary. Suppose the building is one hundred feet high. A shot from the street means that the camera will be held at a height of about five feet. If the camera is held level one half of the resulting picture will show a portion of the building and the balance a record of the pavement. A shot from another building at a height of approximately fifty feet will



H. R. Champlin  
Contax, F/6.3—18 cm. Tele-Tessar Lens

show the building in its entirety and without distortion.

Those who are interested in securing interesting effects by means of deliberate distortion of perspective will find that they can secure very striking pictures by shooting down at the tops of buildings from some other considerably higher building or from an airplane with the extreme wide angle 2.8 cm. Tessar. Or set the camera on one side of a billiard table with the balls arranged in an interesting composition and a friend on the other side making a shot with the cue pointing at the camera. Keep the camera position low and you will see another interesting possibility in deliberate distortion with a wide angle lens.

Very fine portraits can be made with the standard 5 cm. lenses and any of the four speeds available will, within their speed limitations, give equally high quality. The faster lenses, naturally, will be better because they will permit shorter exposures with lower light intensity and thus give more natural expressions. The camera should be at least

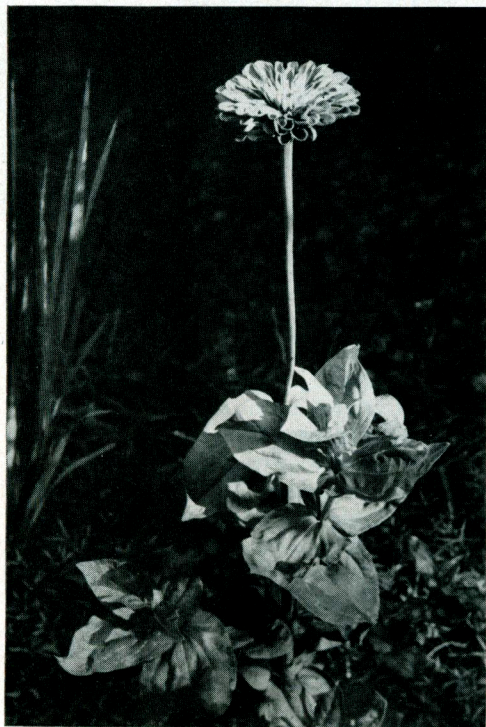
(Continued on Page 18)



# In The Garden With A Maximar

SIDNEY W. WILLISTON

A FEW years ago I turned to flower gardening as a recreational activity and the results of my efforts the first season were more than gratifying. However, the arrival of Jack Frost brought a sudden and unwanted divorce from a hobby that had afforded much pleasure during the summer. I sought some means of continuing my hobby through the winter months.



Zinnia

Sidney W. Williston

Maximar "A", F/4.5—10.5 cm. Tessar

Photography seemed to be the answer. However, with only a meager knowledge of photography at my command and with equipment of doubtful efficiency, the first results were far from satisfactory due, principally, to the difficulty in focusing on near objects.

When a birthday rolled around, in mid-summer, friend wife responded to subtle (not too subtle) hints and I found myself the possessor of a Zeiss Ikon Maximar Camera.

I had selected this camera, the  $2\frac{1}{4} \times 3\frac{1}{4}$  inch size, for several reasons. The small size was decided on principally because of the increased depth of focus possible with the lens of shorter focal length. This was of great importance in the work before me, especially when working at short range. Film economy and the lower initial cost of the instrument, too, were taken into consideration.

The Maximar has many features which are not only desirable but necessary for flower photography.

In the first place, negatives in pack form, cut film, and glass plates may be used making a wide choice of film emulsions available for every purpose.

When using film pack a single negative can be removed and developed before exposing the remainder of the pack, and if the results are not up to expectations for any reason the negative can be made over immediately. Flowers have a habit of fading, even in the garden, and prompt action is sometimes necessary in order to catch a record of a prize bloom.

Most of my negatives are made on film of the "chrome" (orthochromatic) type which is sensitive to all colors except red. This film when used with light and medium yellow filters will give a very satisfactory color rendering of most flowers.

If full color correction is necessary, particularly if red predominates in the subject, panchromatic film with a K-2 filter, or super-pan with a light green filter, such as the X-1, will give the necessary correction.

Of particular importance in flower photography is the ground glass focusing back. As an aid to composition, the exact placement of the image within the negative area is reduced to the utmost simplicity. Sharp focusing is made simple and, most impor-





Rose of Sharon Sidney W. Williston  
Maximar "A", F/4.5—10.5 cm. Tessar

tant is the ability to determine in advance the exact depth of focus at any given aperture. This is an especially valuable feature when working at distances of only a few inches from the subject where the depth of focus is greatly reduced.

Utilizing the full double extension of the camera bellows an image approximately life size can be obtained, and by slipping an inexpensive Proxar supplementary lens over the regular camera lens an image of even greater size results.

It is important to remember, however, that as the bellows draw is extended the F value of the lens decreases, and at full double extension the stop indicated on the scale as F:4.5 becomes approximately F:9, and requires a corresponding increase in exposure. Experiment, however, enabled me to determine a set of exposure factors.

A good rigid tripod or other firm camera support is a necessity. In order to secure the desired depth of focus when making extreme close-ups a small aperture, usually F:22 or F:32, is required. This, of course, calls for a longer exposure, at least one-half second in brilliant light and longer when the light conditions are less favorable.

With such prolonged exposure it is necessary that outdoor flower photography be indulged in on days when the air is still

as any movement of the subject such as would be caused by a gentle breeze will result in a blurred image on the negative.

Several summers have since been devoted to negative making, during which time I have photographed nearly two hundred varieties of flowers and flowering shrubs. I never expect to run out of subjects. New varieties of plants are grown each season, and superior blooms of the older varieties are constantly making their appearance in my garden.

I do very little printing during the summer months and that is where my camera has enabled me to carry the pleasure and satisfaction found in flower culture throughout the winter months.

Aside from garden photography the possession of such a fine and versatile camera as the Maximar or the Ideal awakens a new interest in photography. I find myself constantly in search of new subjects, both at home and afield.

The accompanying illustrations were made with the Zeiss Ikon "Maximar." All of my prints are made by projection, using the same camera coupled with a Mirax enlarger. The efficiency of this outfit is marvelous, and I often use less than a quarter of the available negative area in making 8 x 10 prints. That is just one more point of combined efficiency and economy in favor of Zeiss equipment.

Summer Daisies. Sidney W. Williston  
Maximar "A" with F/4.5—10.5 cm. Tessar Lens





# The Contax In Museum Work

M. S. DIMAND\*

THE miniature camera, not so long ago regarded even by amateur photographers as a toy, is now generally recognized as a precision instrument, well adapted to all branches of scientific photography. The compactness and portability of the Contax while of great advantage to the museum workers is particularly useful on expeditions and in connection with record work to be done outside the museum or scientific institution. Since the closest distance on which the standard Contax lens can be focused is about 3 feet, the scope of Contax photography is greatly increased with the addition of several accessories permitting the use of the camera at closer distance. The whole outfit including film sufficient for several negatives requires very little storage space, and can be carried in a small bag.

More important among these accessories, besides the Proxar lenses which are well known to users of Zeiss Tessar lenses, are the Contameter, an optical near-focusing device,

Detail of a Persian Vase.

M. S. Dimand

Made with Contax and Contameter at eight inches



Contax and Contameter

and the reproduction stand for making copies of flat originals and photographs of small objects on a scale of 1:4, 1:3, 1:2, 1:1½ and 1:1. With the addition of the Contax Photo-Micrographic Equipment the camera can be used for making speedy and inexpensive photomicrographs. By these means micro- and macrophotography with the Contax are greatly simplified and less expensive than with larger cameras. With the Contax the research worker is always ready to record important material quickly without great loss of time.

In an art museum macrophotography is of great importance in a study of the various technical processes and methods employed by artists of different countries and periods. The Contameter, described in the first issue of the Zeiss Magazine†, is ideal for photography at the short distances of twenty, thirteen and eight inches. In combination with the Contameter, the Contax is a highly satisfactory apparatus for making photographs of metalwork, pottery and sculpture. Using fine grain film and reasonable care in focusing, the sharpness and definition of enlarged photographs taken with this accessory are for all practical purposes equal to that of photographs made with larger and more compli-

\*Curator at The Metropolitan Museum of Art, New York City.

†cf. November, 1935, Page 9.



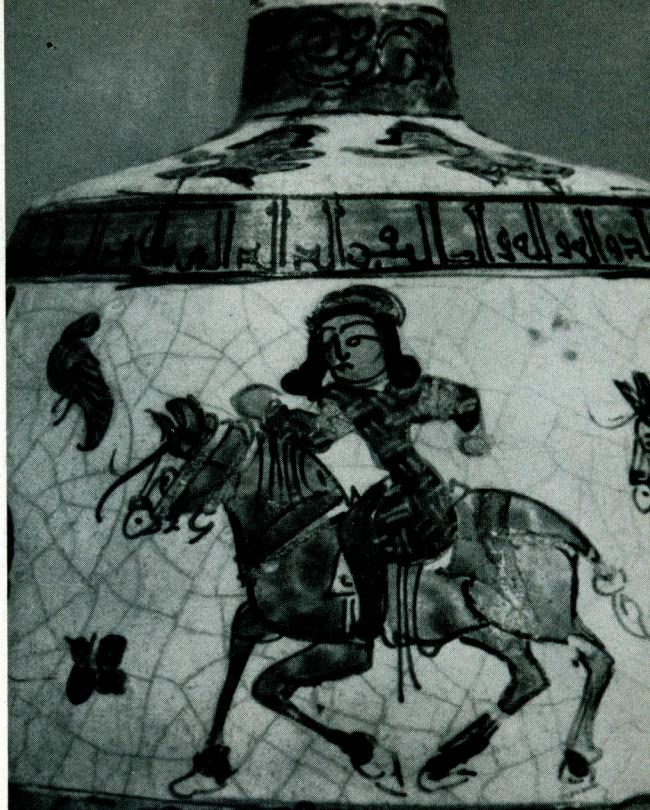


cated cameras. The first two illustrations accompanying this article illustrate the results obtained by the author with the Contameter. The detail of a Persian thirteenth century vase, decorated with painted figure subjects in polychrome, is an excellent example of a close-up photograph of a round object at a distance of eight inches. In spite of the roundness of the object, there is a remarkable sharpness over the whole area of the negative, due not only to the fact that the lens can be stopped to F/22 but also to the excellent qualities of the Zeiss Tessar lens. A portion of the negative has been enlarged to three times the actual size of the original without any loss of definition. The texture and each detail of the design are faithfully recorded in the enlargement.

The perfect definition of Contax photographs with the Contameter is also apparent in the third illustration, reproducing a section of another Persian thirteenth century vase with open work decoration. This photograph taken with the Contameter at a distance of eight inches has been enlarged to five times the original size of the piece, which is eight inches in height. Many of the details of the design are even clearer in the reproduction than in the original, thus enabling the student of pottery to acquire a perfect picture of various ceramic methods employed by Persian potters. Such a collection of enlargements could be made accessible to research workers who are not permitted to handle the objects themselves because of their fragile condition.

The reproduction stand is an excellent apparatus for recording of manuscripts, paintings and prints, as well as for photographing of small solid objects. Exact focus

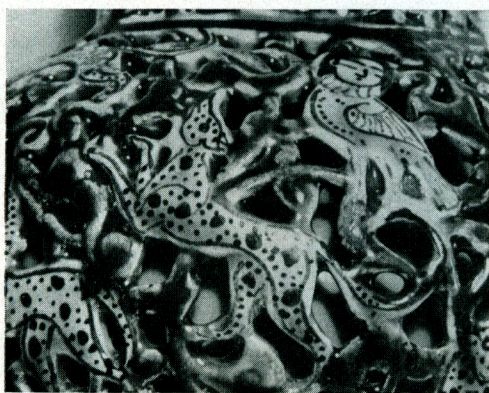
Contameter in leather case



Detail of a Persian Vase. M. S. Dimand  
Made with Contax and Contameter at eight inches.  
From photograph three times size of original object.

of thick solid objects may be obtained with the aid of a ground-glass adapter which is attached in place of the camera. With the reproduction stand, which requires neither additional nor supplementary lenses, one can make reproductions either of the same size as the original or reduced on a scale of 1:1½, 1:2, 1:3 and 1:4. The adjustments are so easily made that they may be regarded as automatic. The area of the subjects to be photographed is determined by masks. Once the scale of the reproduction is decided upon, exposures can be made in quick succession without the difficulty and waste of time encountered with larger cameras. The use of artificial light rather than daylight is recommended, since it is more constant and uniform and will give a more even illumination over the whole surface. A 60 Watt bulb gives sufficient light and permits, on a fine grain panchromatic film, relatively short exposures of from four to eight seconds using stop F/16. It is advisable to use small stops, such as F/16 or even F/22, especially in photographing surfaces which are not in the same plane such as bound manuscripts where the pages are not entirely flat or small thick objects.

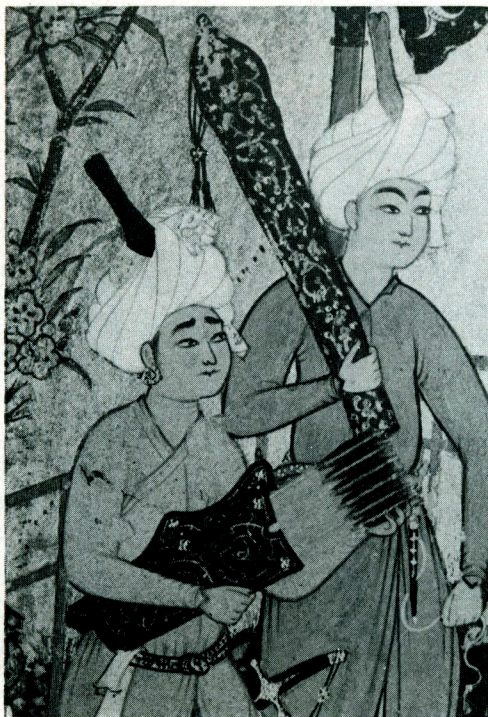




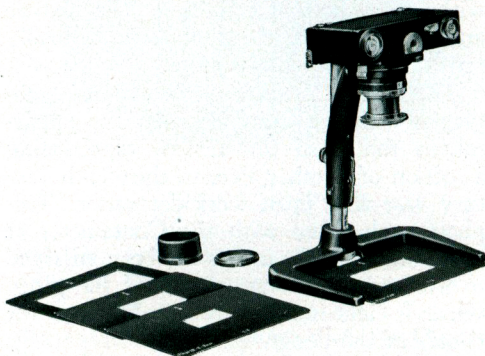
XIII Century Persian Vase. M. S. Dimand  
Made with Contax and Contameter at eight inches.  
From photograph five times size of original object.

In the hands of a museum man or librarian this reproduction stand is very useful not only for making records but also for the study of technical characteristics of artists. The illustration reproducing a detail from a miniature painting in a Persian manuscript dated 1525 is a typical example of the work which can be accomplished with the

Detail of a Persian Painting. M. S. Dimand  
Made with Contax and Reproduction Stand.  
From photograph 12 times size of original object.



Contax and the reproduction stand. The illustration shows a small section of the miniature photographed in the same size as the original and then enlarged twelve times. The result is quite surprising and opens new possibilities to research workers in the field of art. The enlargement not only preserves the perfect definition and sharpness of the original but reveals many features and details which escape the naked eye. In the case of Persian miniature paintings, the drawing of figures and the background are often so fine that one has to use a magnifying glass to be able to study the artist's brushwork. The Contax enlargements mag-

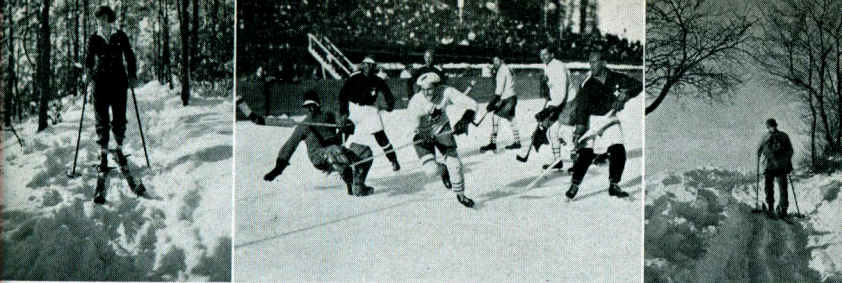


Reproduction Stand with Contax attached.

nify the original design, thus permitting the student to make a permanent record of all the technical characteristics otherwise not visible. Enlargements of this kind furnish the research worker with invaluable photographic material for comparative study of styles of various art centers and individual painters. As most museums and libraries here and abroad do not permit the students to handle precious manuscripts, enlargements such as these can be used instead of the originals.

In many cases black and white photographs are sufficient in the study of style. Unfortunately the color which is an important factor in most paintings, cannot as yet be successfully recorded with the miniature camera. The processes used at present are sufficient for many other fields of photography but for much of this work in the museum we find the color range is still limited. This branch of photography is undergoing considerable experimentation and there is no question but that the future will probably bring improvements in color photography further extending the range of Contax in museum work.





# Snow and Ice

FENWICK G. SMALL

ARE you a winter sports enthusiast? Do you prefer skating or following some ski trail in freezing weather, to a nice comfortable seat by the fire? Have you tried photographing your favorite sport, be it on snow or ice? And obtained some of the finest examples of soot and whitewash to be had in all photography? If so, do not give up in disgust, or be satisfied with inferior pictures; get a couple of filters, observe a few simple precautions, and you will be surprised at the immediate improvement.

In making photographs of snow and ice we are faced with two problems; first, the extreme range of contrast between the snow and ice, and the darker objects such as trees, people, etc., and, second, the fact that the snow itself is not white throughout but shows a delicate range of shades that will form the most beautiful part of such pictures if they can be captured and reproduced in the print. The places where the sun strikes directly on the snow are dazzling white. The shadow portions seem to be white but if observed closely will be seen to have a bluish white tinge. This, despite the lower intensity of the shadow portions, will tend to have almost as much effect on the film as the portions on which the sun strikes directly.

If the correct filter is used the bluish white light from the shadows will be held back sufficiently so that the texture of the snow will be correctly reproduced. For orthochromatic film of the so-called "chrome type" the Zeiss Ikon "G-2" medium yellow

filter requiring a three times increase in exposure is recommended. Where speed is required the use of the Zeiss Ikon "G-1" filter causing an increase in exposure of two times will serve, although the result will not be as satisfactory.

I have found superpan film to be best for snow and ice photography. Although the fine grain "pan" films, if properly developed, will serve as well, superpan gives me the speed required for skiing and skating pictures, its tendency to give a softer negative to some extent nullifies the extreme contrast in most snow and ice scenes, and its full range of color sensitivity allows the use of all the Zeiss Ikon filters. The latter is advantageous, for in many instances, the red filters will aid in making very striking pictures.

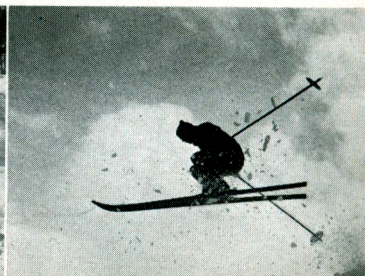
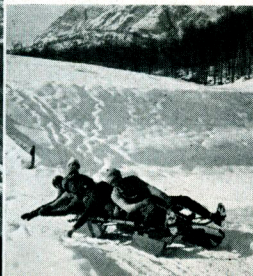
But, with either "pan" film, a filter should always be used. Generally, I use the Zeiss Ikon "GR-5" yellow-green filter requiring a two times increase in exposure with Agfa Superpan Film.\* When, because of speed requirements, I cannot increase the exposure this much, I use either the

\*cf. Page 6, December, 1935, ZEISS MAGAZINE, for complete filter factor table for all the Zeiss and Zeiss-Ikon filters and the more popular films.

(Continued on Page 13)

JANUARY, 1936

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# Photographic Lenses and How they are Made

C. E. BECK

(Continued from December)

As we have already seen, the glass of which the lenses are made is not an arbitrary matter. On the contrary, this glass must have very definite qualities. Foremost among these qualities are the *refractive index and the colour dispersion*. A pencil of light passing through a prism is deflected from its original course. The degree of the deflection depends upon the refractive power of the glass of which the prism is made. The refracted pencil spreads out as it passes through the prism, so that when it reaches a white screen it does not form an exact image of the narrow slit from which it proceeded, but will be seen to have been drawn out into a coloured band. The prism does not refract *uniformly* all the coloured rays of which the white light is made up. It deflects the violet and blue rays to a greater extent than the green rays and these again to a greater extent than the yellow and red rays. In consequence, the coloured rays of the illuminated slit do not meet in one place, where their mixture would have furnished white light, but are ranged side by side, thereby forming the *spectrum*, of which we have a familiar example in the rainbow. The colour dispersion varies widely for different kinds of glass. Many glasses produce long bands, others yield much shorter bands; in some the blue end is more distended, in others this happens at the red end. We thus see why simple lenses are bound to have the defect of chromatic aberration.

Formerly it was believed that colour dispersion and refractive power were mutually dependent. They are so, as a matter of fact, more or less, but not to anything like the extent as was supposed at a time when crown and flint glasses only were known. The crown glasses have a comparatively low refractive power and at the same time are only able to form a short spectrum band, whereas in the case of the flint glasses a high refractive power is as-

sociated with a considerable amount of dispersion. The manufacture of modern optical glasses, however, has rendered largely fictitious the old distinction between crown and flint glasses, in that now there are glasses which have a comparatively low refractive power and nevertheless furnish spectrum bands of great length and vice versa. With two kinds of glass, that is to say, old crown glass and flint glass, it is not possible to unite more than two colours, say *yellow and blue*, at a single point. The remaining rays continue to give rise to a more or less noticeable blurred fringe, which is known as the "secondary spectrum." Photographic lenses with a secondary spectrum are nevertheless well adapted for the ordinary purposes of photography, and it is not till we come to face the problems of three-colour photography that it becomes necessary to bring to a common focus other colours of the spectrum, e.g., red. Objectives of this order of correction are called "*apochromatic lenses*." They are now used almost exclusively in photographic process work.

The two classes of the old *crown and flint* glasses were for a long time the only means which were available for the construction of lenses. Fraunhofer, at the beginning of the last century, realized that these two kinds did not suffice for the realization of his newly computed telescope objectives. It is not saying too much that Fraunhofer inaugurated by his achievements the era of modern applied optics. It was he who first associated systematic knowledge and a scientific system with the art of lens making, which until then had been a mere matter of handicraft. He was also first to describe exact methods for making strictly spherical surfaces.

Wonderful as were the achievements of Fraunhofer, there still remained a tremendous stride to be taken before the technical methods now in use could be developed. The uncertain element of personal skill has



now been superseded in a large degree by a highly organized system of mass production utilizing every available scientific and mechanical refinement. This is apparent in the construction of a lens combination. In the old days the optician, guided by experience and a more or less trustworthy intuition, would grind lenses by way of a trial, combine them, and then proceed to vary the curvatures of the lenses and their combination until the desired result was more or less completely attained.

This procedure by trial and error was a tedious and uncertain business. Fraunhofer was the first to replace it, at least to a considerable extent, by preliminary computation. This method was further developed by Steinheil. It was, however, left to *Professor Abbe*, then Director of the University Observatory at Jena and subsequently head of the Carl Zeiss Works, to evolve a complete system of predetermination of *all the data* for the construction of microscopic objectives made by Carl Zeiss. Despite all these achievements there would have been little tangible advance in applied optics, if a want of suitable glasses had been allowed to stand persistently in the way of the improvement of optical instruments. It was Abbe who time and again showed how enormous improvements might be effected if only the requisite glass were at the disposal of the producers of lenses. Inspired by his reiterated utterances, Dr. Otto Schott, who had graduated in the school of the Westphalian glass industry, conceived the idea of varying the optical properties of glass by introducing new materials into their formulas. He became associated with Prof. Abbe, who had at once realized the full significance of these experiments. It is to their systematic combined working that we owe the unexampled development of modern practical optics. As Abbe had done in the making of lenses, so Schott proceeded along strictly scientific lines in his experimental glass smelting operations, in that he systematically investigated the correlations between the optical constants of the glasses and their composition and the effect of the introduction of new constituents. He succeeded in the course of his experiments in producing glasses the properties of which had formerly been but a dream, the fulfilment of which had never been looked upon as a realizable thing.

(To Be Continued)

## SNOW AND ICE

(Continued from Page 11)

Zeiss Ikon medium yellow filter requiring an exposure increase of one-half, or the Zeiss Ikon "G-O" ultra-violet filter requiring no increase. The correction will not be as good but the picture will be better than if no filter had been used. Over-correction of snow and ice pictures will generally cause harshness, but in the case of a ski jumper silhouetted against the sky, the over-correction caused by the use of the Zeiss Ikon "R-10" light red filter will make a striking picture and enhance the effect. The increase in exposure for this filter with Agfa Superpan is six times. Under-correction in snow and ice photography will result in a lack of texture in the snow.

The Zeiss Ikon filters are colored in the mass and, consequently, will not be affected by temperature, humidity, or light. The surfaces are optically finished and the use of these filters will not detrimentally affect the fine definition of the Zeiss lenses. Although the yellow-green "GR-5" and light red "R-10" are now obtainable only in 42 mm. mounts, an intermediate ring can be secured so they may be fitted to 37 mm. lens mounts. They can also be had in the screw-in mount to fit the Super Nettel. Zeiss light and dark yellow filters are obtainable in all standard sizes for most Zeiss lenses.

The direction of the light should be watched carefully. Front lighting should be avoided unless absolutely necessary; it will flatten the picture and cause the loss of most of the snow texture. Pictures taken against the light will be harsh and contrasty. The best lighting for snow and ice pictures is from the side with the sun low in the sky, as it is early in the morning and late in the afternoon. A sunshade should be used at all times because of the strong light reflections from the snow.

An exposure meter should always be used, for the light is tricky and deceptive. Exposures made while the sun is shining should be full, with a slight decrease in the time of development of the film. Exposures made without the sun should be reduced very slightly below normal and the time of development increased slightly. The prints made from snow and ice negatives should show a full range of tones with a very slight darkening of the snow rather than showing it as clear white.





# A Newspaper Man's Camera

JIM DAY

I HAVE photographed bubbling champagne, murderers and murderesses on trial in court, army planes dropping bombs, racing planes, swimmers, divers, football players, politicians and panhandlers, kidnapers, parades, cactus, deserts, Joshua trees, statutes, good looking blondes, plain mugs and fancy gorillas. For all of these and many other photographic assignments, I have found my Contax eminently satisfactory.

As a newspaper man I want a camera that will "work" at 40 below zero, if necessary, and at 122 above, and I object to carrying cumbersome apparatus . . . my Contax is the solution. It has flown over Mount Whitney with me, clicking off pictures at an elevation of 15,600 feet. The crystal clarity of its interchangeable lenses recorded the bombing operations of the First Wing of the Army aviation force over the Muroc Lake area, California, with 200 planes in action, ranging from Martin bombers to the Boeing pursuit groups. Its metal focal plane shutter has clicked with effective precision on the Mojave desert, on the Pacific, along the coast, on mountain tops, in court rooms, in the fading light of football gridirons, under lamp light, on race tracks, aviation fields, at swimming meets and scores of other places.

I have made good, usable news shots with no more light than that given by a 60 watt bridge lamp. I have made shots of motion picture actors when the Hollywood cameramen stopped their motion picture cameras and quit work in the dusk. I have "stopped" racing airplanes rounding pylons at 200 miles an hour. In fact, I have shot about every imaginable subject—animate and inanimate.

There are other cameras and good ones in my photographic battery but the Contax has spoiled me for the others. After using it for several years I now find myself looking upon a 9 x 12 centimeter camera as a "big berth."

I hold no brief for myself as an expert cameraman. Taking pictures is incidental to my work. I am a sports editor and an Associated Press correspondent; but the attribute of being able to snatch up the Contax, about the size of a cake of soap, and go out and get good, usable, contrasty newspaper prints, when I want them, is a practical one.

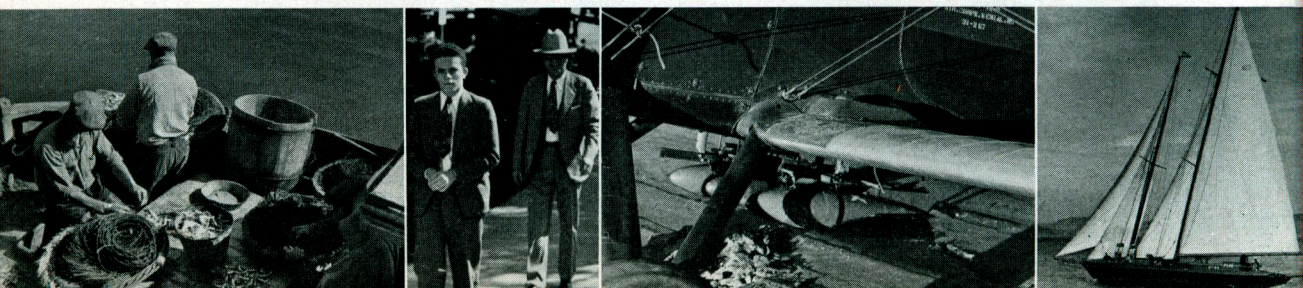
Two lenses have sufficed for me. I make frequent use of the 85 millimeter F/2 Sonnar. Without sticking one's head under a man's chin this long focus lens brings faces up close and fills the picture frame in good style. It is a marvelous portrait lens and for shots in poor light it is excellent. I like it as much as the F/2.8 - 50 millimeter Tessar which I use for general work.

My prints are blown up to 6 x 8 inches. This I have found to be a good, practical size for news work. Fine-grain film permits me to use only a small section of the Contax negative and have it projected to this size.

For my work I have found the Albada sports view finder adapted for use with both the 50 and the 85 millimeter lenses, very useful.

A modified metol - hydroquinone - borax type of developing formula has proved satisfactory to me, as I need nothing larger than a 6 x 8 print of good contrast. As I am not a photographer I have not attempted the special development processes which

(Continued on Page 18)



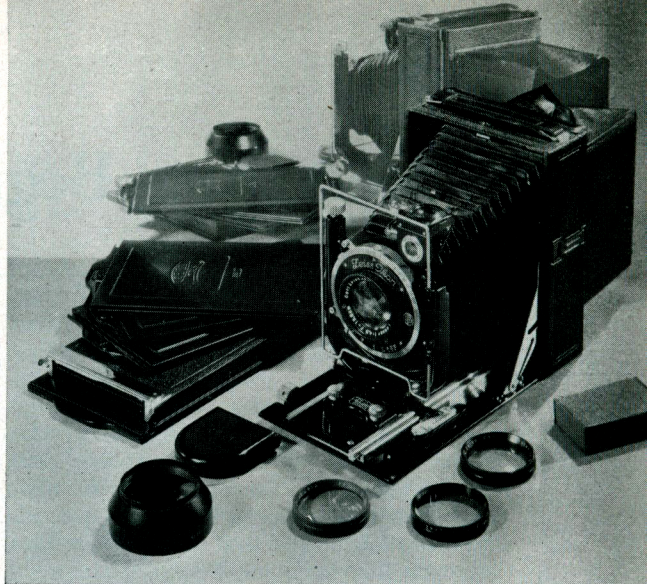
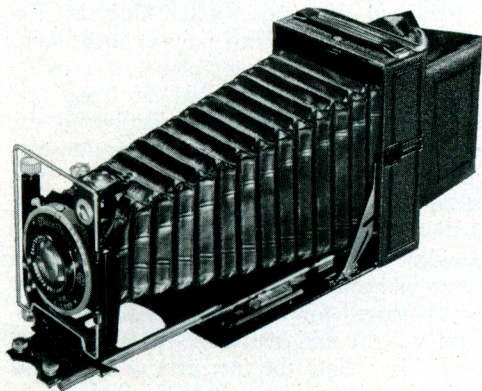


# Zeiss Ikon Maximar

LONG the favorite of many experienced photographers throughout the world, the Zeiss Maximar Cameras provide at a moderate price many of the features of the more expensive folding plate and film pack cameras. They will be the choice of those who desire an inexpensive camera of great versatility that will be capable of handling almost any photographic job. The Model A, coming within the requirements of most competitions and exhibitions for miniature camera users, will be of interest to the "Minicam" who wishes to add a light, small folding plate and film pack camera to his equipment.

The Model B, illustrated herewith, uses plates and film packs in the familiar 9 x 12 cm. size, kits for the plate and film pack holders being provided so that  $3\frac{1}{4}$ " x  $4\frac{1}{4}$ " cut film and film packs may be used. Closed, the camera measures  $4\frac{3}{8}$ " wide,  $6\frac{1}{4}$ " long and  $2\frac{1}{4}$ " thick and weighs 40 ounces, the body being of a rigid and strong light metal covered with grained black leather. The drop bed front is rigidly supported by nickel plated struts eliminating the possibility of vibration between the lens mount and camera body; metal guides on the back of the camera hold securely and accurately in the focal plane the fully hooded ground glass back and plate and film pack holders. Tripod screw bushes are set in the bottom of the front bed and side of the camera body so as to provide for attaching the camera to a tripod for either vertical or horizontal pictures.

Lens equipment is the world famous Zeiss F:4.5 Tessar of 13.5 cm. ( $5\frac{1}{4}$ ") focal length set in the new style 12 second delayed action compur shutter speeded from 1 to 1/200 second with time and bulb. Lens and shutter are rigidly supported in a light strong "U" mount provided with micrometer screw action for vertical rise and fall and horizontal motion. This mount slides in a wide track on the front bed provided with automatic lock at infinity



position, focusing being by scale with micrometer rack and screw which advances the double extension the whole length and will lock in any position. The double extension together with the fact that the lens mount will grip the track at any position permits pictures being taken the same size as the object photographed and allows the use of Distar and Proxar Supplementary Lenses in order to change the focal length of the Tessar Lens and provide for telephoto, wide angle and macro-photographs. Automatic catches on the bellows prevent sagging when the lens mount is not fully extended.

The Maximar A Camera, accommodating 6.5 x 9 cm. plates and cut film and  $2\frac{1}{4}$ " x  $3\frac{1}{4}$ " film packs, is, in general construction and fittings, similar to the model B camera. Closed, it measures  $3\frac{1}{4}$ " wide, 5" long and  $1\frac{7}{8}$ " thick, weighs 25 ounces and is an excellent pocket camera for the miniature camera user who wants a film pack and plate camera as supplemental equipment. Lens equipment is the well known Zeiss F:4.5 Tessar, 10.5 cm. ( $4\frac{1}{8}$ ") focal length, set in the new style delayed action Compur shutter speeded from 1 to 1/250 second with time and bulb. Both cameras are provided with a large brilliant view finder, Ikonometer wire finder and spirit level. Either model is supplied with ground glass back, wire cable release, three plate holders, film pack adapter and, in addition, kits for  $3\frac{1}{4}$ " x  $4\frac{1}{4}$ " cut films and film packs are provided with the Model B. The price of \$56.00 for the Model A and \$65.00 for the Model B is low considering the excellence of construction, fittings and lens equipment.

Accessories available for either camera include large metal sunshade, light and dark yellow Jena glass filters colored in the mass, color plate holders, Ducar lenses for Agfa Color plates, tripod and leather carrying case. Of special interest are the Proxar and Distar Supplementary lenses. When attached to the Zeiss Tessar Lens the Proxar will decrease and the Distar increase the focal length of the lens thus allowing the same camera and lens to be used for wide angle and telephoto shots. They give to the owner of the Maximar Camera the same advantage that a set of convertible lenses or several lenses of various focal lengths would give.

(Continued on Page 19)



# Among the Beginners

CHARLES C. MUNRO

THE beginner with the miniature camera usually feels that the development of the film is going to present many difficulties. Those who have used a larger camera and finished their own pictures are generally familiar with the development process; their main fear is grain. But the novice who has had no previous experience with the development of film feels that he is faced with a mystery.

There are no real difficulties in the development of miniature camera film. No knowledge of chemistry or physics is required. And fine grain is no longer a bugaboo. *Provided* we are willing to adopt an orderly procedure and be careful and clean. The use of a fine grain film and the best chemicals will be an aid but what we do and how we do it are more important than what we use.

Miniature camera film should be developed by the "time and temperature" method. This is not as technical as it sounds. It merely means that we keep the developer at a certain temperature during the developing process and keep the film in it for a given length of time. This is not difficult and there is no reason why it should be made a sacred rite, neither should it be done in a sloppy and slipshod manner.

Just a word of caution regarding darkroom procedure. Cleanliness in the darkroom is an absolute necessity; something one must never forget. And by cleanliness is meant not only the ordinary dirt and dust we usually associate with the word but also chemical cleanliness. Keep all chemicals and solutions in properly labeled and stoppered bottles. If the label becomes detached from a bottle throw the contents away rather than take a chance. Do not place or mix solutions in bottles or dishes which have not been washed clean. Wash tanks, thermometers and other equipment as soon as you have finished using them. As soon as you empty a bottle, wash it or else throw it away. If you always follow this procedure you will know that your solutions cannot be contaminated by the chemicals from another solution or from any

other source. That is what is meant by chemical cleanliness.

For development by the time and temperature method a light-tight tank is used. If you do not have a tank, take the question up with your dealer. He can show you all the different models and tell you what the experienced miniature workers think of each. After you have the tank, practice loading it with old film—first in the light and then in the dark. Continue this practice until all your actions become automatic.

After you have once groped around a darkroom for the cover or some other part of the tank with an unrolled spool of film on the reel you will adopt a regular loading procedure. Spread a clean newspaper on the table and on it lay the various parts—*always* in the same position. Before turning the light out, check up and make sure all the parts are there and in the right position. With a little practice and the right procedure, loading a tank is easy.

It is recommended that the beginner with a miniature camera use prepared developing and fixing solutions for a while before undertaking to compound his own. In fact many experienced workers use prepared solutions all the time, it saves time and trouble and many excellent prepared solutions are available. Here, again, friend dealer will be a great help for he is continually receiving reports from users of the various prepared solutions as to the success they are having.

Prepared chemicals for finishing the film can be obtained in both powder and liquid form. The latter is simpler but possibly more expensive. Prepared chemicals in powder form are ready to dissolve in the required amount of water to make the solutions. It will be necessary to buy a prepared developer and prepared Acid Fixing Bath. Whether you get the solution or powder form will depend on your own fancy or pocketbook. Both are inexpensive but, perhaps, for the first time the solution form will be easier to use. In either case, implicitly follow the instructions that come with the chemicals and you will have no



trouble. At the same time buy some 28% Acetic Acid. Mix 1½ ounces with 32 ounces of water so as to prepare what is called an Acid Short Stop Bath.

Now with your film loaded in the tank and the three solutions—Developer, Acid Short Stop, and Acid Fixing Bath—laid out before you, you are ready to proceed. The first step is to bring your three solutions to the required temperature. The developer, acid short stop, and acid fixing bath are placed in a large tray full of water at the desired temperature. For this purpose, buy an accurate photo thermometer and use it. *This is important.* For this article let us use 68°F. which is the temperature I personally use. In your case the temperature specified for the developer should be used. The three properly labelled bottles in which I keep my solutions are placed in an 11 x 14 tray. This is placed in the bath tub and a stream of water at 68°F. is circulated thru the tray by means of a short section of shower bath hose.

All the solutions having been brought to the proper temperature as indicated by the thermometer, the tank is filled with developer and gently rocked, the time being noted. Keep on rocking or agitating the tank at one or two minute intervals while the film is in the developing solution. Keep the tank in the tray while not being agitated as this will keep the temperature constant. The time of development should include the time taken to fill and empty the tank. In filling the tank do so with an even continuous flow of solution as otherwise you may get a line across all the negatives or air bells may form on the film. An excellent way to break up any possible air bells that may have formed on the film is to tap the tank gently on the table three or four times after all the developer has been poured in. After the film has been developed pour out the developer and pour in the short stop. Leave the short stop in for one minute agitating continuously and then pour it out. Next pour in the acid fixing bath, agitating intermittently for about six minutes and then remove the cover from the tank and see if the milky appearance of the film has disappeared. If it has, leave the film in the fixing bath six minutes longer, raising and lowering the reel from time to time.

While the film is fixing, it is a good thing

to prepare a quantity of water (about three quarts or enough to fill the tank six times) at the proper temperature. After the film has fixed for twice the length of time it has taken to clear, the acid fixing bath is poured out. The tank is filled with the water you have prepared and then emptied, and this is repeated five more times, or for a total of six rinses. After this, the film is washed for ten or fifteen minutes in a stream of water which is regulated to the proper temperature and hung up to dry.

In drying film let me say a word about the use of fans. They speed up the drying of the film but, unless you are a better housekeeper than I am, they will also stir up a lot of dust and part of this will settle on your nice wet film. So I hang my film on a line in the bath room about three feet from a steam riser where it is out of a direct draft. The film must not be hung too close to the pipe as the air currents around the pipe will carry dust and too high a temperature will affect the film.

After I have hung up the film I use a damp viscose sponge or damp chamois to remove the surplus water and prevent "drying spots" caused by the chemicals carried in solution in city water. The viscose sponge or chamois is soaked in water and thoroughly wrung out. Then, with gentle, even pressure it is slowly passed over each side of the film. Using this process with a developer solution requiring about fifteen minutes time I have completely processed a film from the start of development to the completion of drying in an hour and a half.

Some of the above sounds complicated but it isn't really. The only operation which has to be performed in the dark is loading the tank, all the others are done in the normal light available. If no darkroom facilities are to be had a "changing bag" can be used to load the tank. This requires considerable practice but is frequently better than being cooped in a small, stuffy closet. Secure from your dealer a 5 x 7 changing bag and practice the operation many times on an old piece of film before you try to load the tank with those cute shots of the baby with his first rattle. Of course, the changing bag should be kept clean and free of dust.

Some developers can be used over again, and, in fact, improve with use, so when

(Continued on Page 18)



## CONTAX PHOTOGRAPHY

(Continued from Page 5)

nine or ten feet from the sitter in order to secure proper perspective and prevent the nose and mouth from appearing enormous in comparison with the ears. Because of this distance limitation the 8.5 cm. lenses will be found more advantageous for head and shoulder portraits. With them the image will just fill the negative frame and lesser magnification will be required in the enlargements. I have found the F/2—8.5 cm. Sonnar to be the finest miniature camera lens obtainable for portraiture. It is fast, the focal length gives a good sized image with excellent perspective and it has that quality which, while giving a sharply defined image, imparts an almost stereoscopic quality to the picture. The 8.5 cm. lenses will also be a valuable aid to the owner of a 5 cm. lens in candid street photography. The F/4—8.5 cm. Triotar is light and easily carried in the pocket and will be found valuable where a small angle of view is to be included or the photographer cannot approach the subject closely. The speed will be found adequate for most work of this type.

The Contax owner who adds one or two additional lenses to his equipment will be able to secure many pictures which he would otherwise have missed. In addition, he will find that the proper use of lenses of different focal lengths will contribute materially to the quality of his pictures. Generally he will use the standard 5 cm. lens. Where he wishes to show objects at different distances from the camera in about the same comparative size in the picture or to minimize the distance between them he will use a telephoto lens and increase the distance between the camera and the principal object. The wide angle lens will be used for the reverse effect or where the camera position is such that the angle of view of the standard lens will not be great enough to cover the entire subject.

## A NEWSPAPER MAN'S CAMERA

(Continued from Page 14)

permit almost unlimited enlargement. Prints larger than 8 x 10 are interesting, but the processing demands more attention than I can give, so I am willing to let others do this work.

The Bakersfield Californian which employs me, used a series of my Contax enlargements. Depicting the process of a newspaper story with its inception in the courtroom murder trial, they took the viewer through all the steps of making a newspaper—editorial room, copy editing, composing room, stereotyping press room, and finally to the "reader." The series was rephotographed on motion picture film at Hollywood and projected on the screens of local theaters. The screen pictures were the largest Contax shots I have ever seen "puffed up."

If newspapermen are called upon to cast a ballot I shall cast it in favor of the Zeiss Ikon Contax, the most versatile and compact camera.

## AMONG THE BEGINNERS

(Continued from Page 17)

getting one find out about this point. Personally, I use one which will develop about ten or twelve rolls to the liter (about one quart). The acid fixing bath can also be used again but not for more than about six to eight rolls to the liter. The short stop should not be used a second time but should be thrown out.

Having once started to use a developer learn what it will do before trying another one. If your negatives are too contrasty cut down on the development time, provided, of course, your exposure and subject are not at fault. If the negatives do not have enough contrast, increase the development time a few minutes. Thus, by trial and error, you will soon obtain the type of negative you can make the best prints from. One thing which will help a lot is to systematize your development procedure. Have a notebook in which to keep a record of the development time, developer and temperature for each roll. Then, when you print from that roll keep a record of the type of paper, soft, normal or contrast, required to give a satisfactory print. And if you have trouble or are not satisfied with the result, do not be discouraged. We all have trouble at times. Ask some other worker or your dealer for advice. Better still, join some camera club and you will find your photographic pleasure has really commenced.



## THE ZEISS EXHIBITIONS

OUR exhibitions of photographs made with the Contax and other Zeiss Ikon Cameras will be repeated this year from February to May, the same months as last year. Full details will be given in our February issue.

We originated this kind of travelling show in February, 1935, in New York City and subsequently exhibited in some of the large Eastern centers such as Boston, Chicago, Detroit, Cleveland, Pittsburgh and Philadelphia.

These exhibitions are brought together so as to show the amateur photographer the great variety of pictures which he himself can make with the various Zeiss Ikon Cameras and Zeiss Lenses.

This feature was appreciated by the many thousands of visitors who praised the great variety and excellent quality of the American photographs shown. Our exhibitions this year will be arranged along the same lines. Watch for the announcement next month and be sure to see the exhibition when it is shown in your locality.

## ZEISS MONTHLY COMPETITION

(Continued from Page 2)

Any photograph made by the entrant with a current model Zeiss Ikon Camera and Zeiss Lens as shown in our advertising



"Hallowe'en"

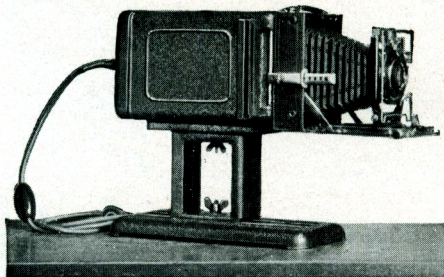
A. Merrell Power

literature is eligible for entry in the Zeiss Monthly Competition. The rules are simple and may be obtained from any Zeiss Dealer

## ZEISS IKON MAXIMAR

(Continued from Page 15)

The Mirax Universal Enlarging Attachment, also illustrated, is provided for the photographer who finishes his own pictures. This is a light-tight housing fastened by means of a sliding attachment to a strong metal base. The high power electric bulb, opal diffusing plate and reflecting properties of the silvered interior of the housing give a high intensity and even distribution of illumination.



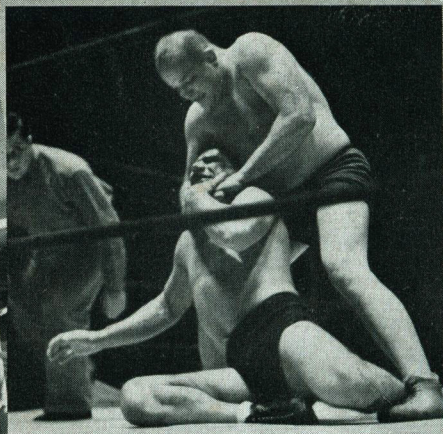
Either model Maximar Camera can be attached to the housing and thus the camera becomes the projection unit of this ingenious enlarging attachment, saving the expense of an additional lens for the enlarger. The owner of a Maximar Camera can provide himself with a high grade enlarger at the total cost of \$17.50 for the Mirax. For those who wish an automatic focus enlarger with separate lens there is the Miraphot obtainable with either the F:6.3 Novar lens or F:4.5 Tessar and providing enlargements of pictures from either model camera of 1.3 to 3.5 diameters.

or ourselves on request or will be found on the last page of the November and December issue of the ZEISS MAGAZINE.

There are three monthly awards of \$40, \$20 and \$10 worth of Zeiss Ikon cameras or accessories to be secured by the winning entrants from any recognized Zeiss Dealer. In addition, there is a Grand Prize awarded every six months to that prizewinner during the preceding six months whose picture is considered best by the judges. The awards, naturally, will be made on the basis of pictorial quality and technical perfection and it is expected that the pictures will demonstrate the superior performance of Zeiss Ikon Cameras and equipment.

Be sure to send us some pictures for the next competition. Extra photographic equipment is always useful and, in addition, there is the fun of having done better than the rest in an open competition. If your prints do not win an award they will be returned, postage prepaid, so your only loss will have been the trouble and postage involved in mailing them to us.





# 6x6 cm

For photographers preferring an auto-focussing "miniature camera" making a somewhat larger size negative

**THE SUPER IKOMAT "B" 2 1/4"x2 1/4"**  
**IS IDEAL**

It combines features found heretofore only in the finest miniature cameras, with a simplicity and ease of operation that will astonish you.

Fitted with the famed Zeiss Tessar F/2.8—8 cm. lens and the new rapid Compur shutter speeded from 1 to 1/400th of a second, it provides a range of lens and shutter speeds that will meet any photographic problem.

The built-in distance meter automatically coupled with the lens focussing as-

ures absolutely sharp focus at all times and permits working with the lens diaphragm wide open.

Ingenious automatic lock prevents accidental double exposure. Automatic film advance by milled knob on top of camera. No need to refer to red window or film counter after starting film in camera.

Accessories include Light and Dark Yellow and Green Filters, two supplementary Proxar Lenses, Sunshade, Waist-level Brilliant View Finder, Soft leather and Eveready Carrying Cases; shortly available will be the Albada Finder, Contameter, etc.

See this marvelous camera at your dealers. Ask for descriptive folder on

## THE NEW SUPER IKOMAT "B"

