Exakta

The Magazine For Exakta Photographers

Ben Rose

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Exakta

The Magazine for Exakta Photographers

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By Bert Leidmann-Warlies

FLIES

The wings of the ordinary housefly in flight move with the incredible speed of 180 beats per second! As a photographic subject, therefore, the fly in flight is one of the most difficult you can find and few successful pictures of it exist. The technical problem in such a picture, of course, is to "freeze" the wing activity so that it does not blur undistinguishably. It is not as easy as one might think.

Strangely enough, the photographic equipment required for such a picture is not complicated. An Exakta VX, extension tubes to increase the scale of the image and electronic flash to freeze the motion are all that we needed to take the pictures illustrating this article. The difficult part came in the many days spent in testing and experimenting to make certain that we had the right set-up and timing. We quickly discovered that both are extremely critical.

We set up our equipment in a room from which all daylight had been excluded. On a table we placed a bottle containing about 100 hungry flies. Food had been withheld from them for three days. A piece of cork with a pin in it was placed on the table about 20 inches from the bottle. On top of the pin we put a tiny piece of bread covered with butter and marmalade. This was the bait.

A small pilot light was directed onto the top of the pin and we focused the lens on the bread. The light was just bright enough so we could get a sharp focus and it was a narrow beam so it would not light up the area surrounding the pin. Only the target was lit, therefore.

Then we opened the bottle, which had a neck so narrow that only one fly could get through at a time. The hungry flies passed through the narrow opening one after another, every moment another one, and headed straight for the shiny target. They moved so fast that we were compelled to release the shutter the instant a fly appeared out of the bottle in order to catch it landing on the bread.

We experimented a number of times without film to get the necessary technical experience. We found that the distance between the bottle and the pin is the most critical factor of all since it must match the time lapse

(Continued on page 4)

A rare picture, this is one of the few successful photos ever taken of a fly in flight. Such pictures are hard to get because the fly is tiny and cannot be controlled like other subjects. Photographic methods must be determined by experiment and must be adhered to precisely. The fly's wings move with such great speed that even electronic flash cannot "freeze" them in action. In this shot, taken a split-second before the fly landed, its body is frozen sharp, but its wings are egg-shaped blurs. Note how the center legs fold toward the body to facilitate landing.

between the release of the shutter and the firing of the bulb. You may think that this should be an easy figure to determine, but we discovered that the slightest difference in timing and distance resulted in failure. It was necessary to develop intuition and luck also played a great part in our success.

When we felt that we had obtained the necessary experience, we loaded the camera with film and went to work. The set-up was triangular, the points consisting of bottle, bread and camera. We discovered that photographing a fly landing, feeding and cleaning itself was a problem that solved itself, but getting a shot of a fly leaving the bread is not so easy.

We solved it by not waiting for the fly to decide to leave the bread. We chased it away. To do so, we coupled two flashguns timed to go off one after the other. When the first bulb went off, the fly naturally took off. The second bulb, going off a fraction of a second later, caught the fly as it started to move.

The housefly is a fascinating subject for picture taking, but there are many other equally interesting subjects in the insect world. The grasshopper, the spider, the beetle, or the lady bug — they all make wonderful pictures. All that you require, in addition to your Exakta, extension tubes and flash, is an infinite amount of patience to keep you trying when you fail the first few hundred times.

● Top: The fly makes a four-point landing atop a bread crumb. The two hind legs, not shown, are in the air back of the body and probably serve as balancers during this operation. In flight, all six legs are completely extended.
Center: The fly feeds like an elephant, grasping food with its trunk-like appendage. After eating, it cleans the trunk with its front legs, as this photo shows.
Bottom, The fly's back legs are also used as pushers in taking off, similar to the way a human's legs are used in jumping from a diving board or similar object. In this picture, the left hind leg is being used to get momentum for the take-off. The shot was obtained by firing two electronic flashes, one right after another. The first frightened the fly into leaving, the second took the picture.

THE 1952 EXAKTA VX

Ihagee Camera Works recently introduced a new 35-mm. Exakta model, the VX. Naturally, a new model is of major importance to the entire Exakta family—to you, to us and to Ihagee. As an Exakta owner, you undoubtedly want to know how the VX differs from your camera. You also may be interested in the background activities that bring about a new model.

The process of refining the Exakta's design has been going on since the first (vest-pocket) model was introduced in 1933. Ihagee has been on the alert, watching new developments, testing new ideas, sifting technical material in a vigilant effort to find and develop anything new that could help the Exakta owner take better pictures more easily. Skilled designers and extensive laboratories have been maintained for this purpose.

Year after year, Ihagee has brought to photographers the latest technical advances from the drafting boards and laboratories, improvements that have made revolutionary changes in picture-taking methods. A change in a model has been made only when Ihagee felt that something radically different, something not offered by an existing model could be incorporated in a new one.

The single-lens, reflex design of the Exakta, however, has remained the same from model to model. This ingenious approach to picture taking, which was the basis of the design of the first Exakta, has not been altered through the years, even in the VX. Only refinements and unique features to improve and simplify the operation of the camera have been incorporated in new models. Therefore, no previous Exakta model has been made obsolete by a new one.

The most significant innovation in the VX is the long and eagerly awaited pre-set diaphragm lens, an important

The pre-set diaphragm lens, long awaited by Exakta owners, is the most important innovation of the new Exakta VX. This mechanism permits you to pre-select the correct aperture for your exposures, then open and close the lens at will without taking your eye from the viewfinder. Every time you close the lens it stops at the pre-selected aperture, a tremendous timesaver.

1

1. The Exakta's back has been redesigned so that the lock cannot open accidentally.
2. Cartridge-to-cartridge film feed is possible because of the redesigned body. This decreases the possibility of scratches and speeds operation.
3. The VX is hinged. A removable pin permits the back to be removed.

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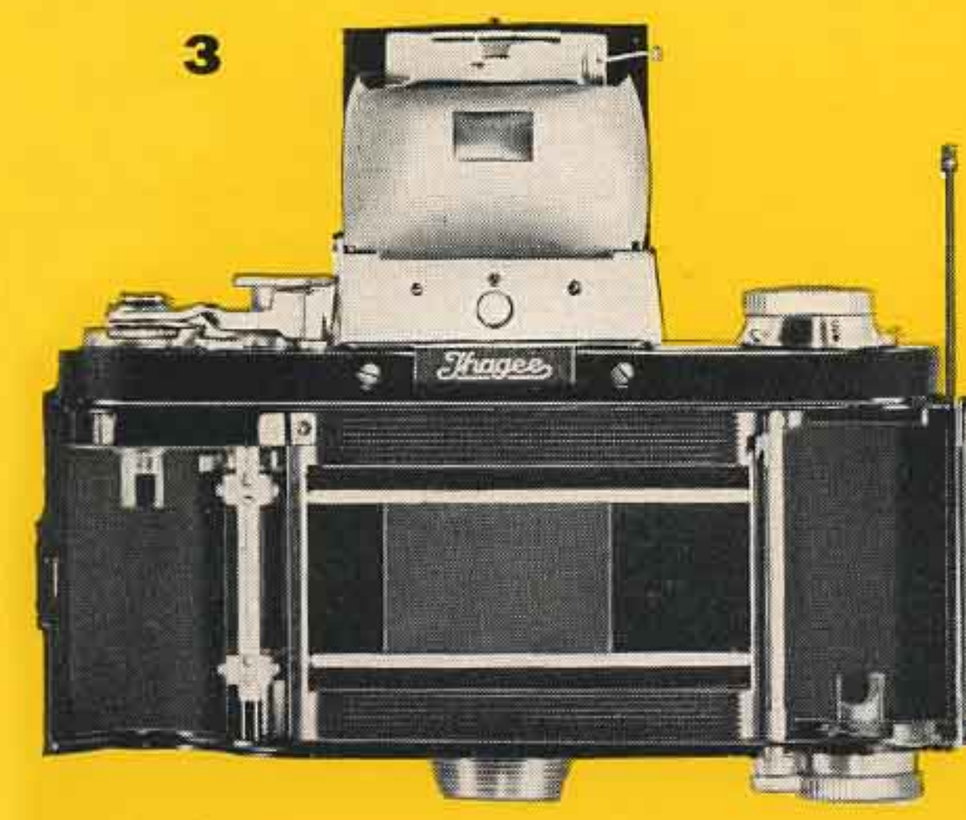

asset to the Exakta photographer. The pre-set diaphragm acts like a brake, stopping the iris diaphragm at a pre-selected aperture when the lens is closed. The mechanism can be activated or ignored, as you wish.

Pre-setting the aperture speeds picture taking immeasurably when you are working under lighting conditions that are constant. You can pre-select the correct aperture for your exposures, then close and open the lens as many times as you wish without taking your eye away from the viewfinder to look at the aperture scale. The iris diaphragm will always stop at the pre-selected aperture.

Although an entire series of pre-set lenses eventually will be offered, for the time being the VX is available only with either of two original Carl Zeiss Jena coated objectives with the pre-set mechanism—the redesigned 50-mm., f/2.8 Tessar and the 58-mm., f/2 Biotar. With the Tessar, the VX lists at $269.50; with the Biotar, $343 (both tax included).

The new f/2.8 Tessar is of special interest to Exakta owners. This lens, whose high quality has been a byword with photographers for many years, has been redesigned and its definition has been vastly improved. The new f/2.8 is now the equal of the f/3.5 Tessar, which has been the standard all-around lens for many years. (See page 24.)

The Tessar and Biotar mounts are newly designed, too, featuring a knurled focusing ring with a non-slip grip. In addition, the mount extends much further in front of the first lens element than previous lenses of the same type, providing a built-in sunshade. Naturally, the new lenses have the standard Exakta mount and can be interchanged. All of your lenses can be used on the VX, of course, because the mount is the same as those on previous 35-mm. models.

A second major innovation of the VX is cartridge-to-cartridge film feed, which also speeds picture taking. For years, Exakta owners who must shoot a great many pictures rapidly and reload hurriedly have asked for some way of eliminating or decreasing film rewind time. Ihagee redesigned the inside of the Exakta so that with the VX you can eliminate rewinding, if you wish. In other words, you now have a choice of two methods, rewinding or not rewinding.

If you prefer to rewind, you use the standard take-up spool, just as in other models. If you prefer to eliminate rewinding, you replace the take-up spool with a regulation daylight loading cartridge. Then, as you take pictures, you wind the film directly into the take-up cartridge, not only eliminating the need for rewinding but decreasing the possibility of scratches. (It is also possible to use special cassettes which open inside the camera to avoid scratches, but not as take-up spools.)

Roll changing is speeded with this method because the cartridge containing the exposed film can be removed immediately after the last picture is taken. The built-in knife, a unique

Exakta feature, takes on added significance because it is used to cut the film loose from the original cartridge.

If you wish to remove a few frames before the entire roll has been exposed, the use of the take-up cartridge makes it possible to do so in daylight. The knife severs the exposed portion of the roll, which is already encased in the daylight loading take-up cartridge. Thus, the need for darkroom removal of the exposed film is eliminated.

A third VX innovation is the built-in film transport indicator, located on the right side of the slow-speed knob (camera lens facing away from you). The indicator, which looks something like the revolving disk in a taxi meter, turns when the film is being transported. It gives you perfect assurance that the camera has been properly loaded, that your film is moving and that you are getting the pictures you are taking.

The left side of the VX slow-speed knob also has a new feature. Ihagee has engraved both Weston and A.S.A. film speed rating scales there so that you can keep a record of the kind of film in the camera. An ingenious control ring, built into the slow-speed knob, can be turned counter-clockwise so one of its three prongs point to the appropriate film speed. Each prong designates a specific type of film by means of a code. Three different kinds of film are identified by code letters: BW for black-and-white; black C for daylight color; and red C for tungsten type color.

The back of the Exakta has been redesigned in two ways. The locking mechanism has been changed so that the back cannot be opened by accident. In order to open the VX back, the knob opposite the take-up spool must be pulled out and given a quarter-turn either clockwise or counter-clockwise. At the same time the back must be pulled backward. Once it is open the back cannot be closed unless you press it down and at the same time give the aforementioned knob a quarter-turn until it clicks into place.

The back of the VX also is hinged so you can handle the opened camera conveniently. Both hands thus are freed for film changing. The hinge has a removable pin so that the back can be removed if you wish.

Minor changes have been made in the take-up and rewind knobs and the tripod socket on the bottom of the camera body. The take-up and rewind knobs now are much larger than before and easy to grasp.

The rewind knob has been redesigned so it operates on a spring and can be pushed back into place after the film is loaded and even after the back has been closed. For rewinding the center of the knob is pushed in until it catches the spool of the film cartridge. The rewind lever is no longer required.

The tripod socket is much larger so the camera can balance on it when placed on a level rest. It will fit both European and American tripods (the latter with a bushing adapter).

The neckstrap eyelets have been moved around on the VX so they are on the front of the camera. In this position, there is less chance of their interfering with camera operation.

None of the changes that have been made in any way alter the adaptability of any accessories you own to the VX. The various 35-mm. Exakta models are standard in size and any changes that have been introduced have been made without making any accessories obsolete.

These changes not only improve Exakta photography, but make the VX the most versatile 35-mm. camera on the market and put it way ahead of any other camera in many other respects. You will find the VX in the honor spot at your local dealer. We invite you to inspect it there.

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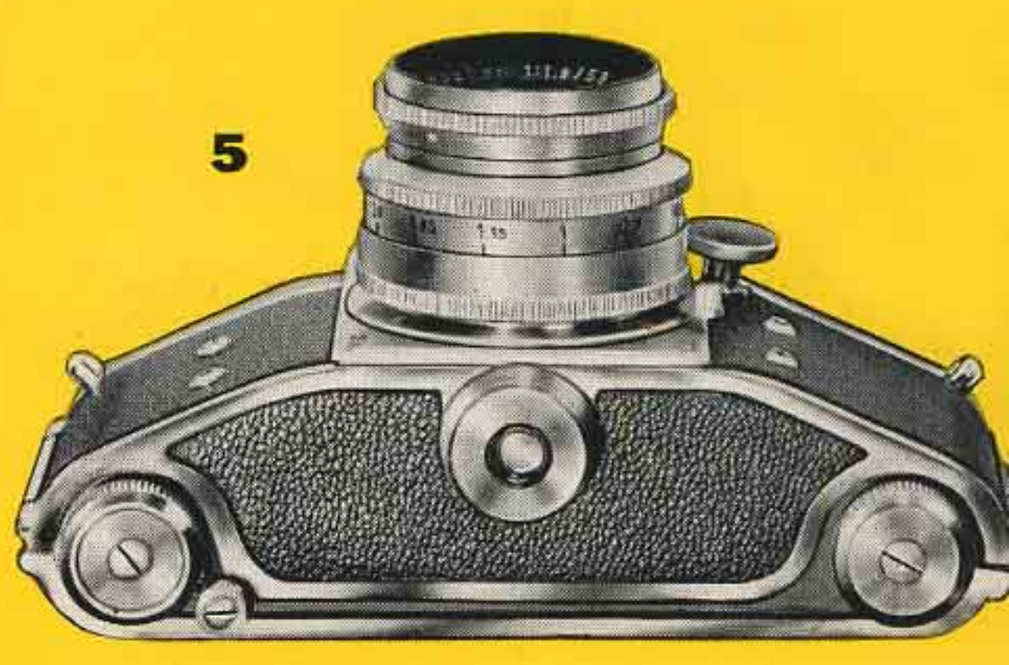
4. Film speed guide (left arrow) tells you what kind of film you have in the camera. Prongs point to Weston and A.S.A. ratings of film. Indicator (right arrow) tells you if film is loaded properly and is being transported.
5. Rewind and take-up knobs are larger, easier to handle. Rewind lever is no longer needed. Rewind knob can be inserted after back is closed. Tripod socket is larger, serves as camera rest.

5

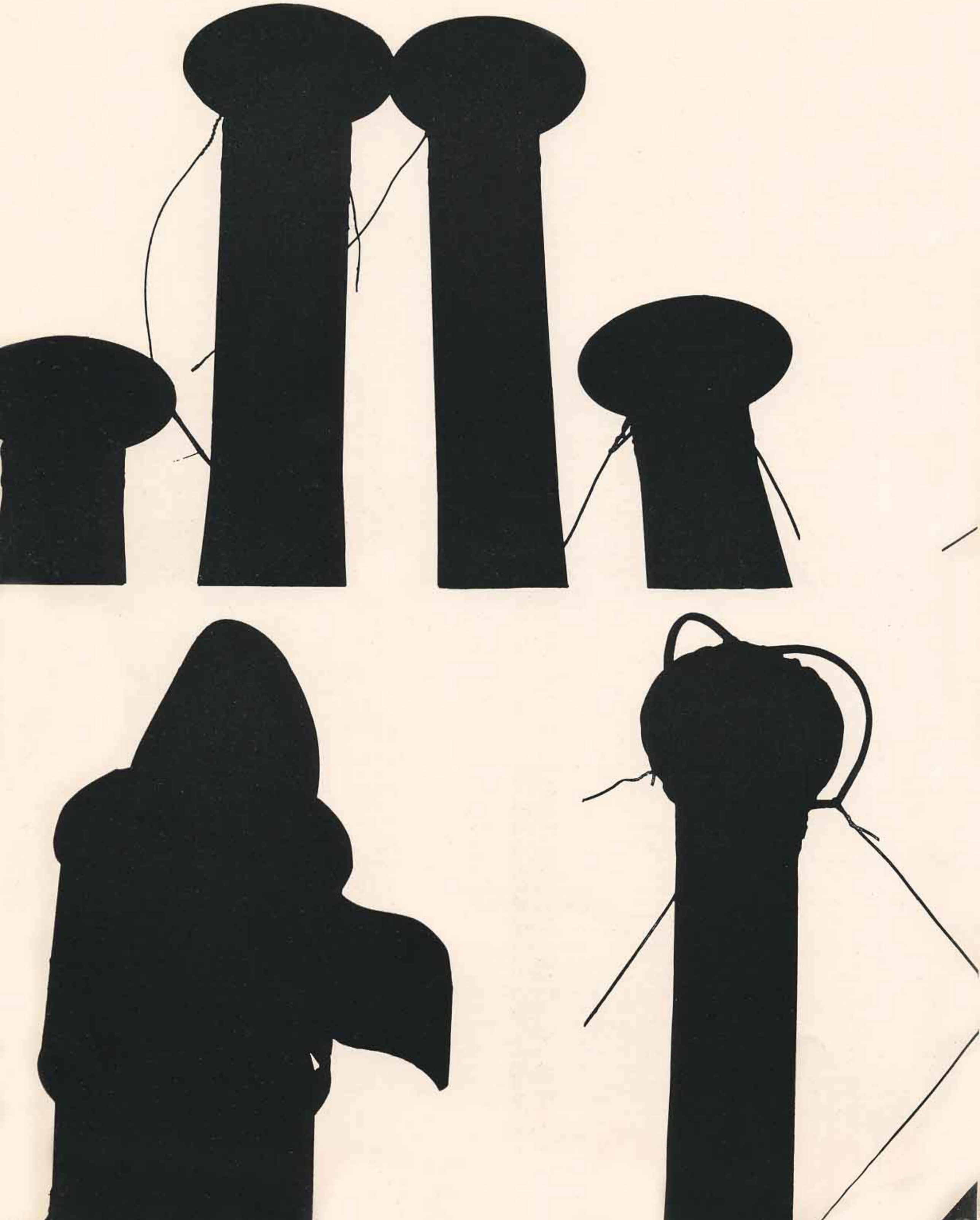


In preparation

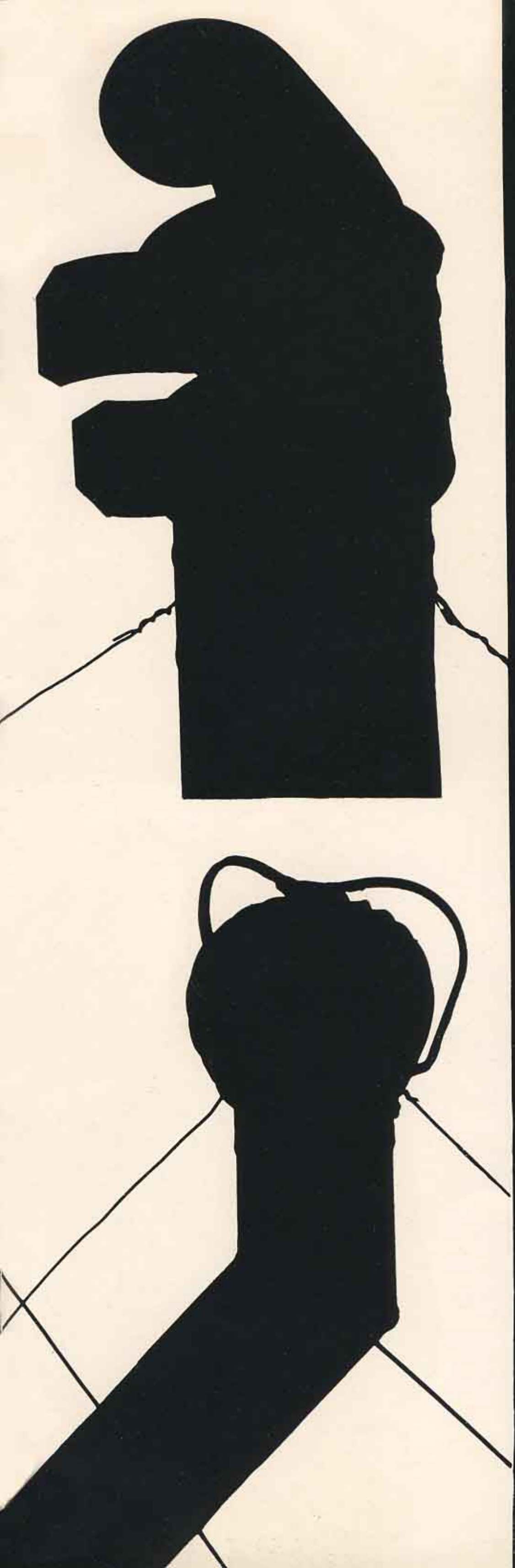
V AND VX,
THE EXAKTA GUIDE

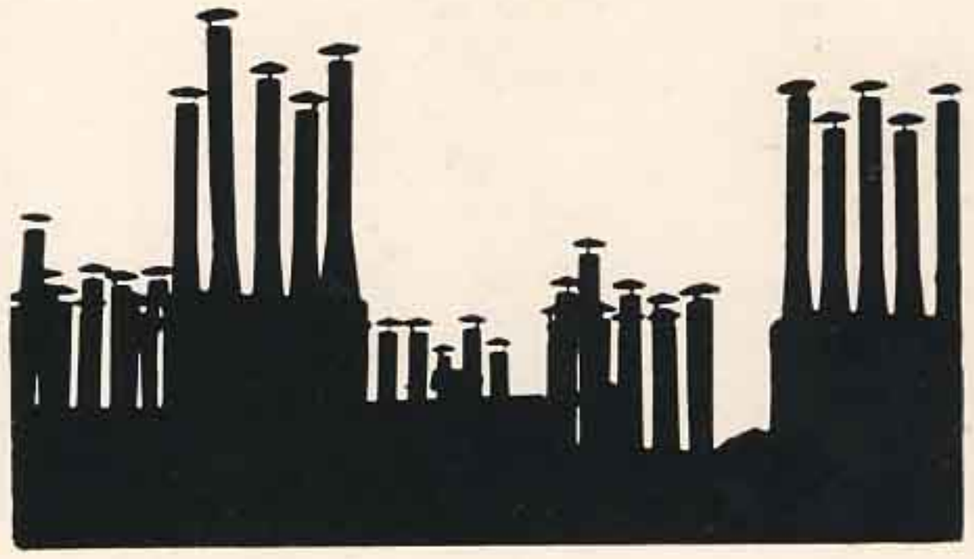
By George J. Berkowitz

● This book is indispensable to every Exakta owner and to anyone considering buying a camera. The author, who was formerly Associate Editor of *Popular Photography* and Eastern Editor of *Minicam Photography* and *Modern Photography*, now is Editor of *Exakta*. *V and VX* will contain complete information on both Exakta models, including information on operation, lenses, lighting, regular and electronic flash, filters, black-and-white and color photography, close-up photography, photomicrography, accessories and depth-of-field and close-up tables. This is a completely revised and redesigned edition of *A Complete Guide to the Exakta V*.



By Diane and Ray Witlin





CHIMNEYS OF THE CITY

We have long been fond of looking at rooftops. Living in New York's Greenwich Village, we have found that they are full of individuality and suggest new photographic ideas. From looking at rooftops we graduated to looking at chimneys in particular. They are very amusing and there are many different types.

It became a game to us when we went for walks. We looked for different shapes, different groupings, then discussed what they suggested to us. One chimney might look like a clown, another like a cow. A group of four chimneys of the same design but of different heights looked to us like parents out for a stroll with their two small children. After looking for some time, we wondered if we could convey our imaginative feelings in photographs, and decided to try.

We soon found that it is much easier to look at chimneys from the street than to get on the roofs to photograph them. At first we went to the superintendent of a building where we had noticed some provocative chimney shapes and asked permission to go to the roof. This seemingly innocent (to us) request met with some fantastic reactions.

For one thing, no one believed that anyone could possibly want to take a picture of a chimney; therefore, there must be a hidden motive.

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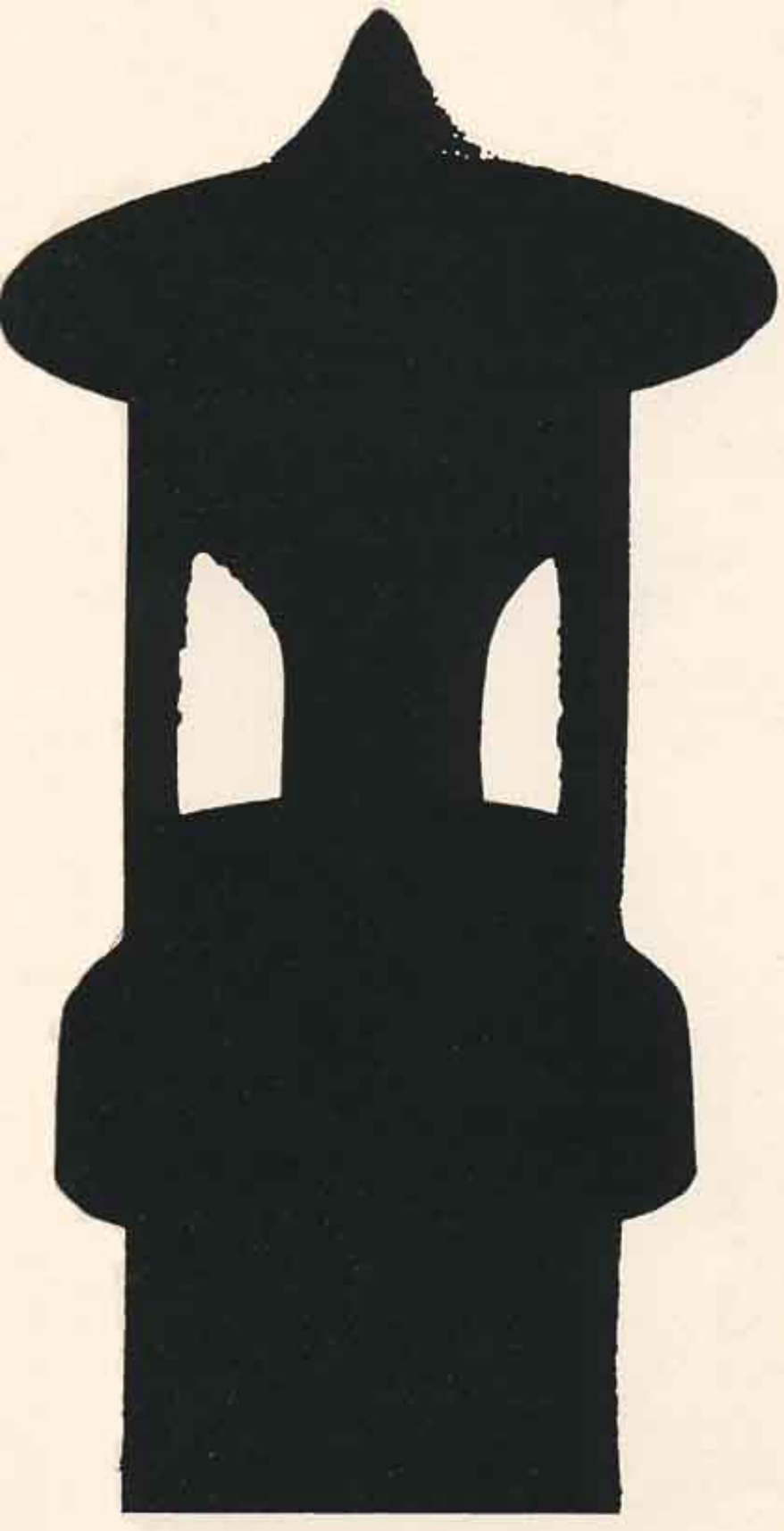

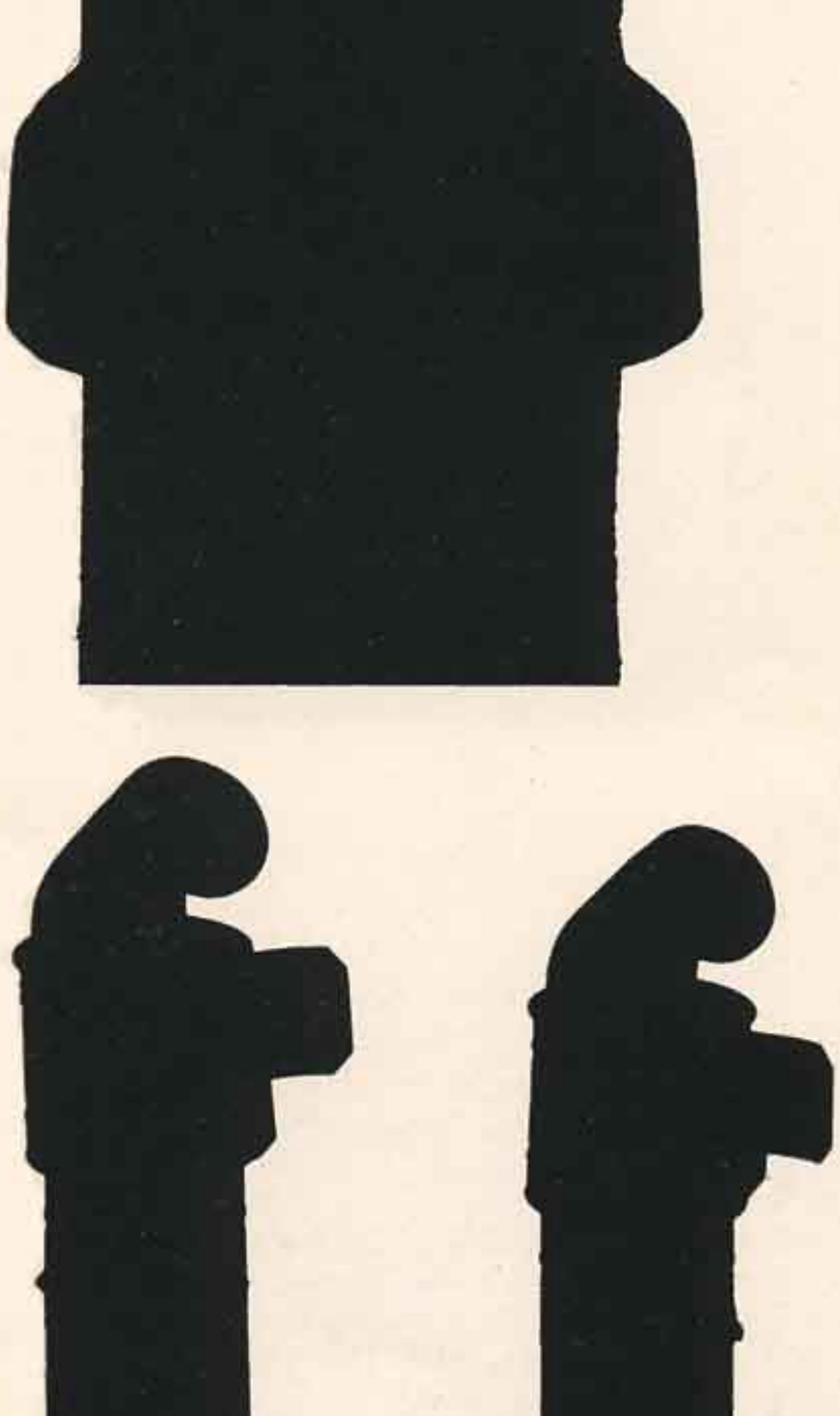

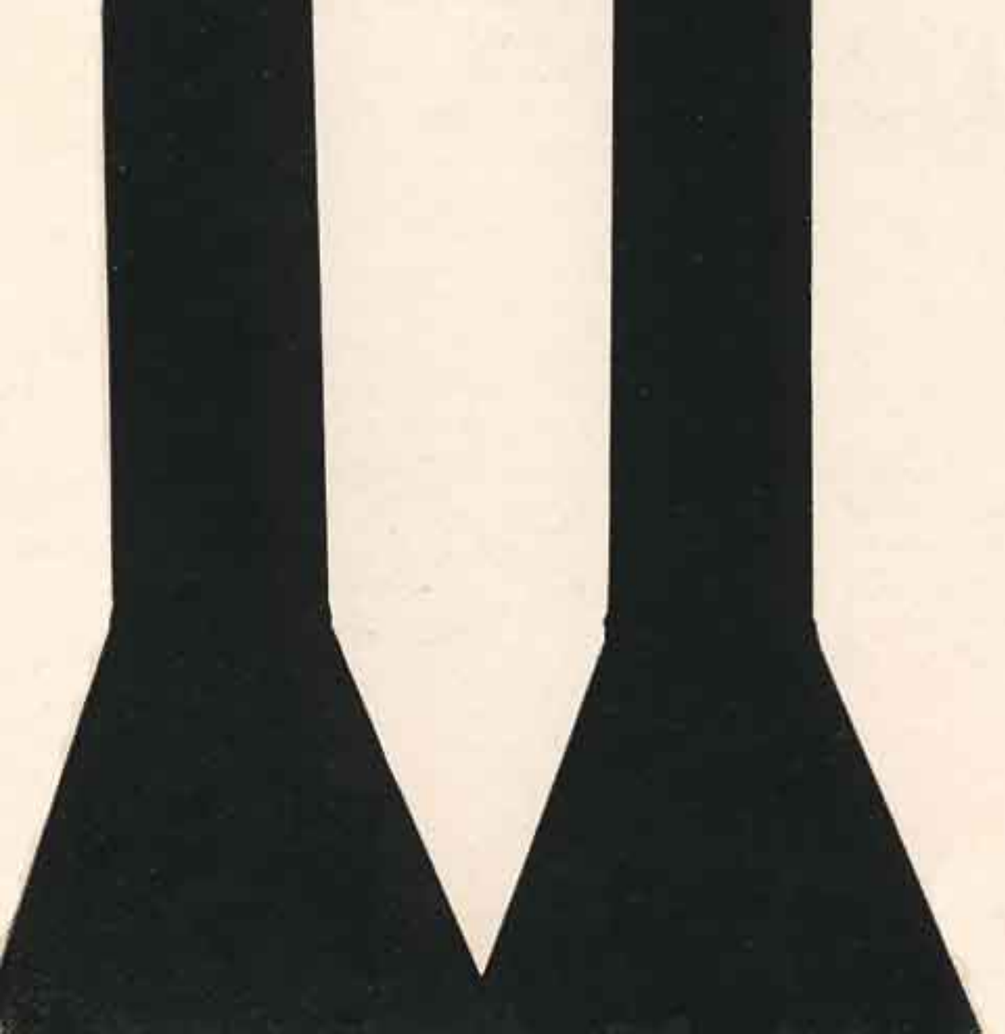

BRING FAR SUBJECTS NEAR WITH A MEYER GOERLITZ 400 TELE-MEGOR

Meyer's telephoto lenses range in focal length from 100 to 400 mm. The giant of them all is the magnificent 400 mm., f/5.5 Tele-Megor. With the 400 on your Exakta, you can "see" and photograph a subject across a park, an arena from a grandstand, a bird's nest from the ground, a mountain from miles away or a parade over the heads of crowds.
The 400 gives you the famous Meyer quality, the product of outstanding scientists who have labored for years in the world-renowned Goerlitz laboratories to develop special lenses for the Exakta, lenses that would record any subject with the accuracy and sharpness this great camera deserves. Meyer is proud of its lenses and proud to have them on the Exakta. Meyer also is proud to offer this exceptional 400 mm. lens, available at your dealer, at $199.50.

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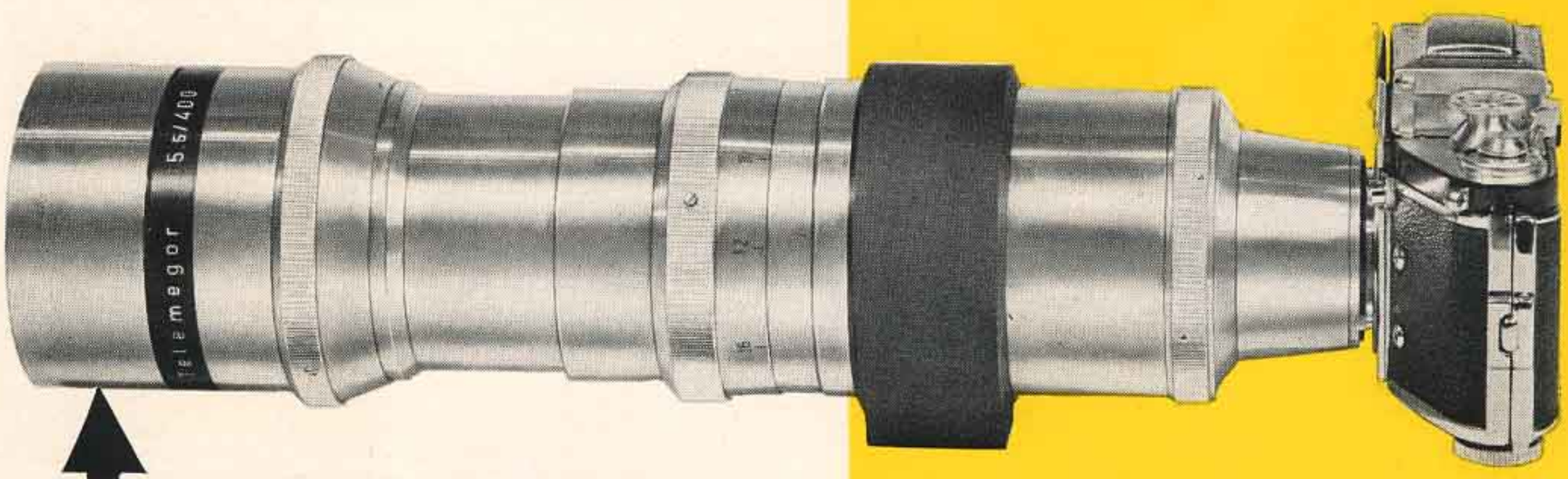

YOU GET THIS WITH A

400-mm. lens

50-mm. lens

By Margaret Markham

LIGHTING SCIENTIFIC PICTURES

Scientific photographers are required to illuminate and record an amazing array of objects, ranging from black to white, dense tissues to transparent lucite, living embryos to lifeless machinery. There is no rigid formula for lighting a scientific subject. Each one calls for an individual combination of common sense and experience. Nevertheless, certain fundamental lighting principles can serve as a starting point and save the photographer wasted effort and poor negatives.

Lighting varies basically in two ways—quantity and quality. Although every lamp has a fixed intensity (wattage) which is determined by the manufacturer, the amount used for a picture varies according to the position and distance of the lamp from your subject. The closer the lamp and more directly the light falls upon the subject, the more intense the illumination. Of course, the number of lamps used also controls the intensity.

The first problem confronting a scientific photographer is how much light and what quality are needed to get the desired result. To get this information, three questions must be answered: Does the subject move? Is it flat or irregular? Is it large or microscopic?

It is obvious immediately that if the subject moves at all, a speed of at least 1/50 of a second must be used to avoid blurring of the image by motion. Enough light to permit such a short exposure and still provide a negative of good quality, therefore, is required.

If the subject is so irregular that depth of field must be taken into account, a small lens aperture is preferable to furnish a maximum area of sharpness. More light than with a flat object thus will be required.

Light can be concentrated on a small object much more easily than upon a large one. A less-intense light

source may be adequate if your subject is tiny. In some cases, it may be preferable to place a condensing lens in front of the light or to use a reflector with a shallow curve to photograph small objects. With such a reflector, the light does not spread as much as with a large, broadly curved one, and there is less light loss.

Ideal illumination exists when the minimum amount of light is used with maximum efficiency. To achieve this, the qualities of various lamps must be considered.

Ordinary floodlamps in reflectors, or reflector floodlamps which have built-in mirror reflectors (see *Exakta*, Spring, 1951, issue, page 10), do a good job. They cost relatively little and cover large areas.

Spotlights, including those of the "mushroom" type with the inner surface mirrored, are efficient for lighting small objects in close-up photography. However, floods and spots get very hot. For lengthy periods of photography, therefore, baby spots may come in handy. They are relatively inexpensive and are equipped with projection bulbs. They are designed so they release heat at the top and back rather than in the direction of the patient or delicate organisms being photographed. For photography of the mouth and throat, such spots are preferable to broad, diffusing floodlights.

Fluorescent tubes provide a colder light than floods or spots. They have great virtue, however, in that they throw less heat, provide even illumination, use less electricity and last much longer. They are relatively less expensive to use.

For photography of extremely fine details, often not even visible to the naked eye, the smaller and more concentrated the light source, the better the definition in the picture. The carbon arc and Western Electric zirconium arc lamps and electronic flash are used for such exacting work.

Once you have decided which and how many lamps to use, then the set-up must be determined. All lighting set-ups are variations of a few standard positions. The same amount of light will bring out different characteristics of a subject, depending upon the position of the bulb. You must adapt the set-up to your subject.

For large areas, such as surgical rooms, X-ray equipment or groups of patients, flat (or front) lighting is preferable. Front lighting also is used in the photography of dental and nasal plastic patients, where a minimum of shadow is desirable. It is achieved when all the lamps are set in a direct line in front of and equally distant from the subject. Flat lighting usually gives a two-dimensional rather than a three-dimensional effect. It should be used only when necessary.

Side lighting, which brings out texture, is used extensively in scientific photography. Rough surfaces on crystals, raised growths of the skin, texture of instruments—these are only a few of the many subjects that require some shadow to provide depth and pattern.

A lamp placed at the side of the subject will give it roundness and bring out its texture. It will also create shadows on the other side. The further away or smaller the light, the longer and darker the shadows. If the lamp is placed above the subject, it will bring out more details on the top than the bottom; if it is placed below, vice versa.

A light placed low or far at the side so that its beam spreads across the subject will outline fine details. Wrinkles on the skin or veins on the back of a leaf will

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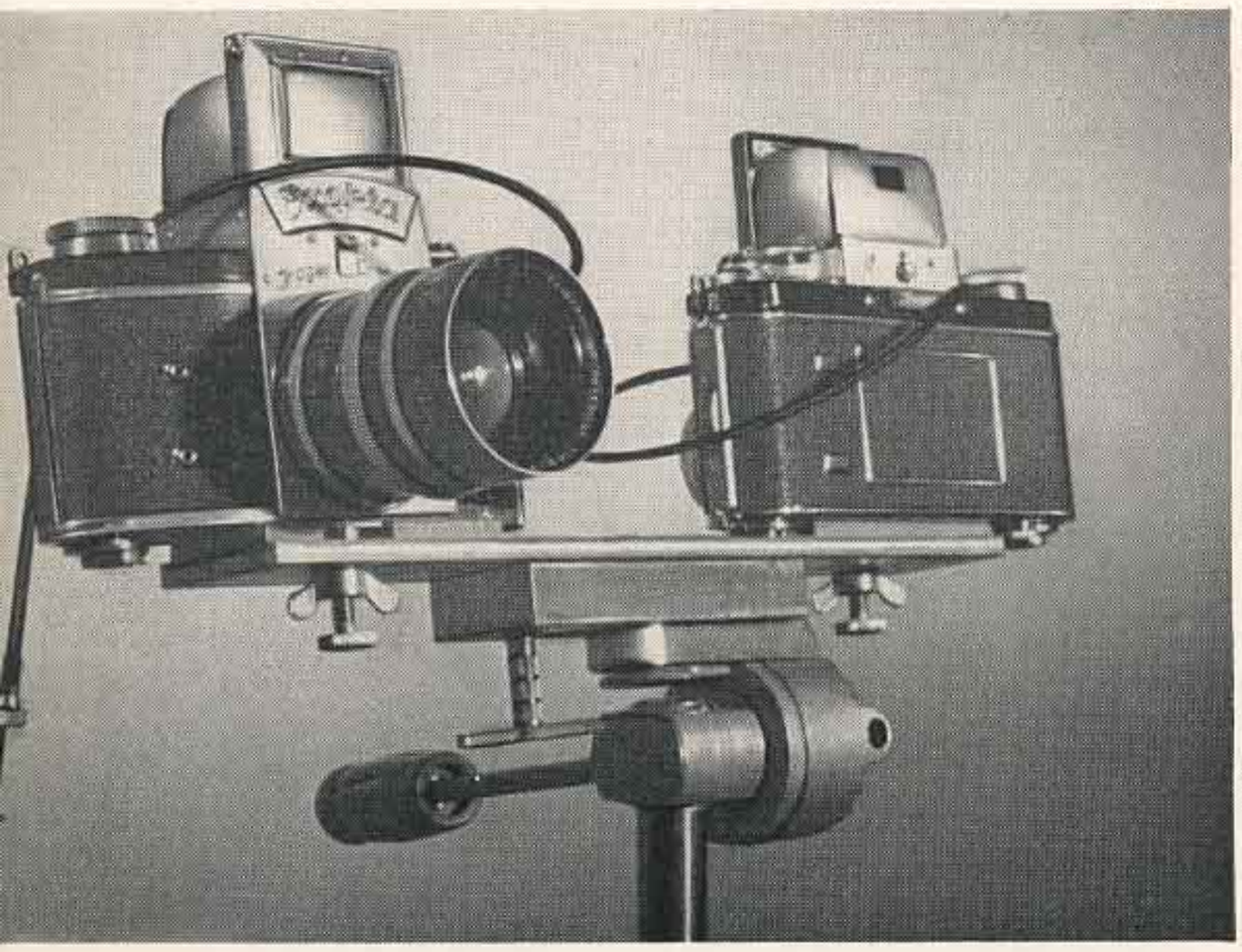


Two-camera mount designed by the author for taking identical black-and-white and color photos of architectural models. Locater pin permits cameras to be pivoted and locked in identical positions for making duplicates.

SHOOTING BUILDING MODELS

By Robert W. Mitchell

Before a new building is constructed, the architect or engineer may need a scale model of it so the buyer can see what he will get. We have been employed by such designers for years to translate their thoughts into three-dimensional form. Photos of these models also are required constantly for publicity and other purposes. Therefore, we decided some time ago to set up an extensive photo department to supply them. Many of the problems common to all photographers have come up in our work. Our experiences may be helpful to other Exakta owners.

Our first problem was finding a suitable camera. Because we were interested almost entirely in color slides at the beginning and cost was a factor, it had to be a 35-mm. camera. Our search lasted only until we got our hands on an Exakta and discovered its many unusual features. Low cost of materials and ease of working were big reasons for choosing the Exakta. Since our pictures were to be taken moderately close, the single-lens reflex system was important. The handy bayonet lens mount which allows quick changing of lenses looked good. The wide range of shutter speeds clinched the deal.

Not until we were back in the studio did we discover such features as the rapid-winding lever and the magnifying lens in the viewfinder. Since then, we have taken literally thousands of pictures without finding anything to dislike about the Exakta. We have found that a 35-mm. negative can be blown up to a good 8x10 print, the size usually required by publications, and we often make satisfactory 16x20 enlargements.

Our next problem was the right lens. The many lenses available for the Exakta made it necessary to be certain we got the proper one. Fortunately, the subject practically dictated the answer.

Our architectural models are about three to four feet square. Because of their height, they usually fit into a horizontal picture composition and can be shot readily with the standard 50 or 58-mm. lens. We bought a 58-mm. Biotar with the camera and later acquired another Exakta and 58-mm. lens. We soon found that the lenses of the Exakta could be interchanged so easily that it was unnecessary to have two 58-mm. lenses. Therefore, we traded one for a 35-mm Retrofocus wide-angle so we could work extremely close to the model and make it appear large and lifelike.

A wide-angle lens characteristically makes objects near to it look huge and background objects small in comparison. This occurs because of the short distance between lens and subject and the greater-than-ordinary angle of view. This characteristic makes our models look real by exaggerating the perspective.

One of our first serious picture-taking sessions after getting both lenses was to test them at all stops for definition. The results would have made Carl Zeiss and Pierre Angenieux jump up and down for joy. Although most of our work is done at the smaller apertures, we value highly the knowledge that our lenses can be used with fine results at all openings.

We soon found it necessary to take identical black-and-white and color shots of our models. The problem of how to avoid set-ups for the two different kinds of films then presented itself. Since photographing a model takes anywhere from 5 to 10 hours, we are constantly seeking ways to simplify the technical end of the job. We found an answer with a new tripod head.

We designed and built this novel camera head for our studio tripod. Both cameras are fixed to a rotating bar which is held in position by a locater pin underneath. One camera faces the subject, the other the photographer. After exposures have been made with the camera containing the black-and-white film, the locater pin is released and the entire unit rotated so the camera containing color film faces the subject. Then the color pictures are taken before the lighting arrangement is changed, eliminating a second set-up.

Depth of field, always a problem with close-ups, is of major importance in the photography of architectural models. Naturally, we would like to have everything sharp in our pictures but this is not always possible because of the extremely narrow zone of sharpness when a lens is focused on an object that is very close. The ground glass focusing system of the Exakta is a great help in controlling this area of sharpness. Using it, we can determine that the interesting portion of the subject at least is well defined. In some cases, we deliberately throw a part of a picture out of focus in order to bring a center of interest into prominence.

As in all pictures, our backgrounds are extremely important. They must fit the picture. Preparing a background of clouds or distant landscape and buildings

for each model would take too much time so we use different shades of plain materials such as paper.

Our favorite is a large roll of display paper which comes in 9-foot widths. We prefer a blue-gray paper which gives a fine sky effect for color photography and a suitable gray for black-and-white. By keeping most of the light off the same paper we can get an almost black background.

We usually try to light models with a single light source to simulate the sun. Additional lights should not cast a second or third set of shadows because the resulting photograph can be confusing. Shadow sides of a building should be lighted with diffused floodlamps or by reflectors such as white cards. We prefer the reflectors for filling in shadows because of the softness of the resulting light.

Our lighting equipment includes two 750-watt studio spotlights, a 1,000-watt flood, a baby spot and a number of standard reflector floodlamps. Such accessories as barn doors and snoots for the spots and spun glass diffusers for the floods come in handy.

Shooting still lifes only, we naturally take advantage of the film with the finest grain. We have been using Panatomic-X and developing in FR X-33.

However, Panatomic-X is not available at present so it is necessary to use Plus-X. (*Fine grain results as good as those obtained with Panatomic-X can be obtained with Plus-X if the film is developed in Microdol to which has been added benzotriazole or Kodak Anti-Fog No. 1. In the latter case, use two tablets or one ounce of 0.2 per cent stock solution per quart of developer. The effective film speed is reduced somewhat so exposures should be increased about two times or one stop greater than when developing in regular Microdol.—Ed.*)

Kodachrome Type A is our standard for color. We use a Wratten 85B filter on the lens when shooting outdoors and get reliable pictures every time.

The manufacturer's recommended film speeds are fine as a start but we always make our own tests and rate the film according to the way we use our exposure meter and for our lenses and shutters. In our opinion, an exposure meter is almost as important a piece of equipment as a camera.

We check and double check our exposures very slowly to make certain everything is as it should be. If we have a lot of white in a picture, we use a neutral gray card from which to take the reading.

When detail in an entire side of a model is to be in shadows we may take more than one reading—one for the light side and one for the shadow—and make more than one exposure on a single frame. Here the Exakta's double-exposure mechanism comes in handy.

By dodging the bright side while exposure is building up on the shadow side, we can balance the picture to avoid great contrast. This step is the same as dodging under the enlarger. We use the neutral gray card and wiggle it in front of the main light source so that the nearest side of the model, which reads brightest on the meter, is shaded. This cuts down the contrast range and gives much better balance.

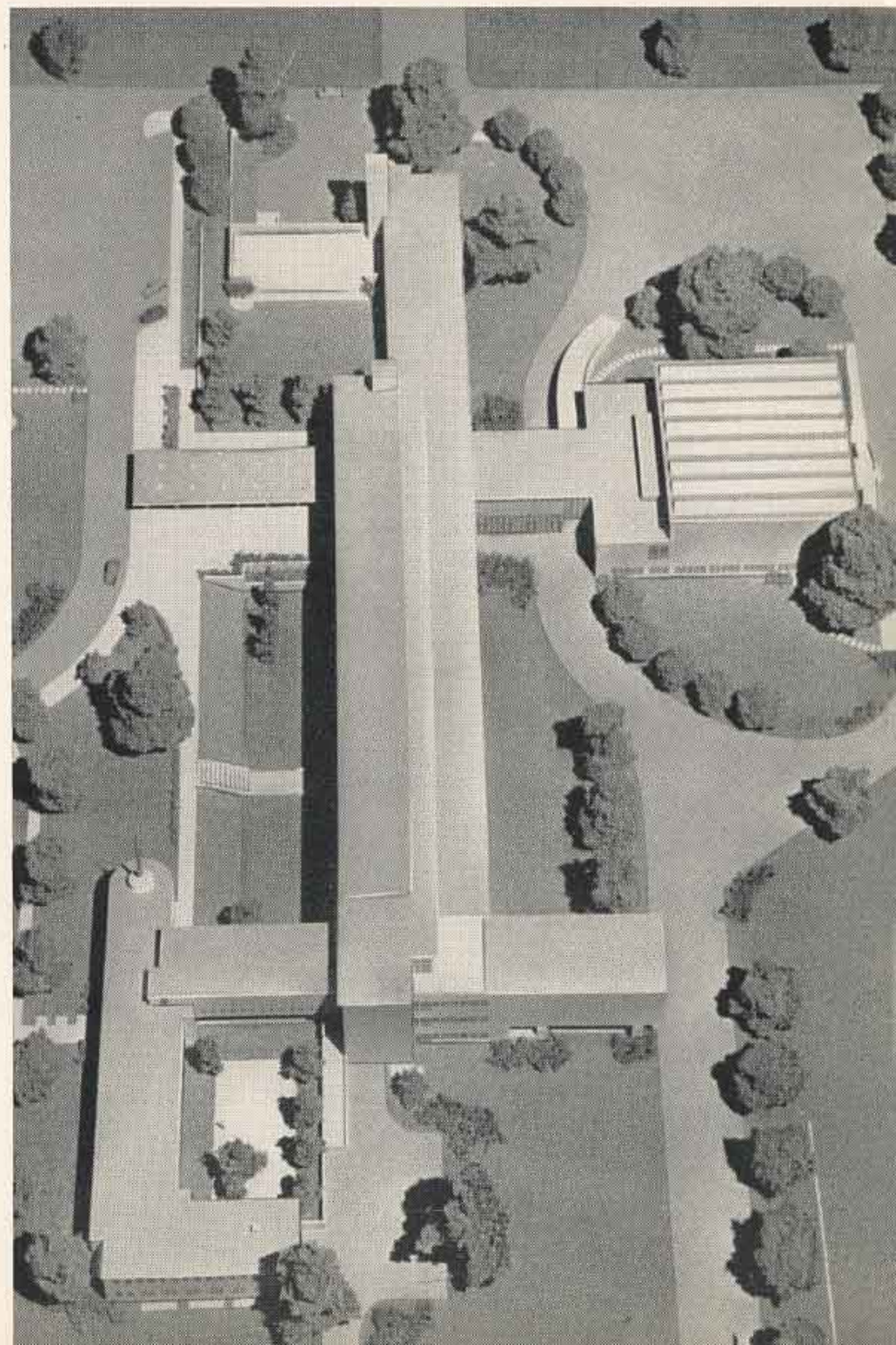
We even find the Exakta helpful in the darkroom. We have made an adapter for our enlarger so it takes the 58-mm. Biotar. We find it to be an excellent enlarging lens for our purposes.

Since there is no provision on a 35-mm. camera for correcting vertical distortion which causes the sides of buildings to look like they are slanting out from the base, we correct this in printing. The easel is tilted until all the lines are parallel and the lens is stopped down well to assure adequate sharpness.

Verticals can be corrected even in color transparencies. The transparency is placed in the space where the negative carrier goes and your Exakta is placed below it on its back and without the lens. You tilt the transparency and at the same time focus on the viewfinder ground glass. When the lines of the picture appear parallel to the sides of the ground glass, you release the shutter.

Architectural models in themselves are cold. Sometimes this coldness can be relieved by silhouette forms or cut-outs of trees, people or cars of cardboard that are used to frame the subject or by projected backgrounds either in black-and-white or color. It is advisable, however, to use these effects sparingly so they do not detract from the subject.

This looks like an aerial shot of a real building but it's actually only a model of a St. Louis high school. It indicates how realistic pictures of models can be when the proper technique is used. Taken with a 135-mm. Zeiss Triotar on an Exakta, exposed for 3 seconds at f/22.

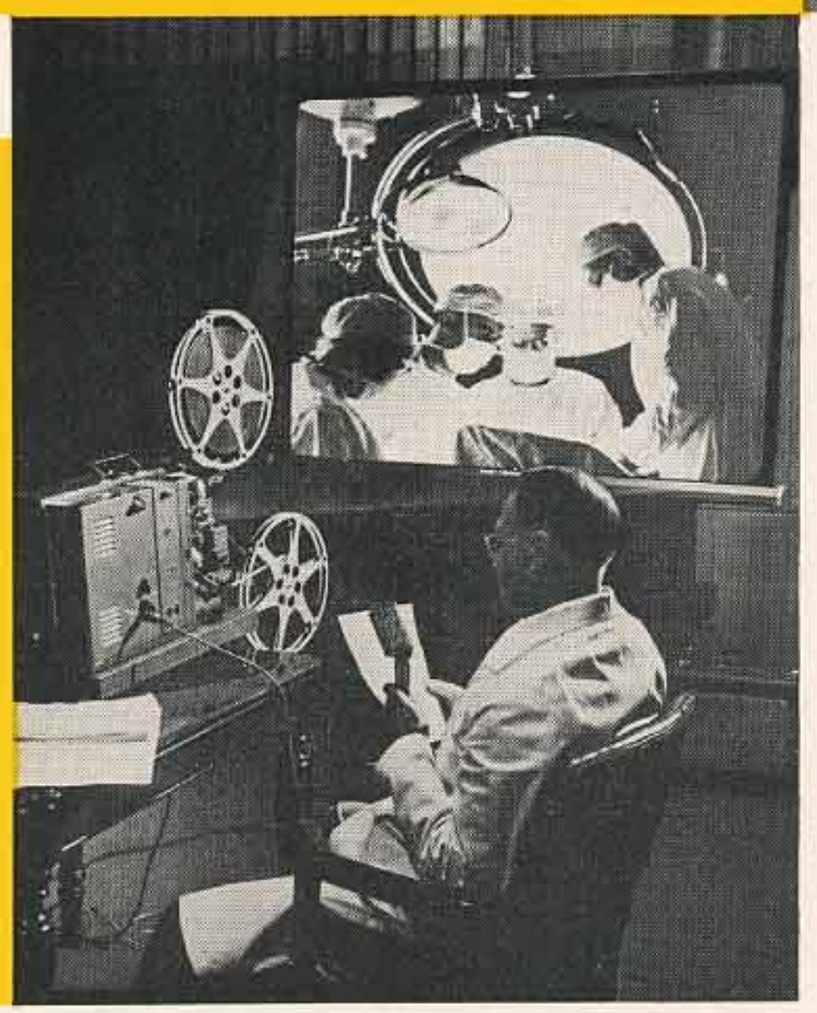


STRATOJET TAKING OFF

Part of the fun of photography lies in the possibility of applying imagination to a good picture after it has been taken and coming up with something that has terrific impact. The picture of a Boeing B-47 Stratojet in a rocket-assist takeoff, reproduced here, is a good case in point. Actually, of course, it is obvious that this is not just a single shot. The chances of a photographer getting five planes to take off one right after the other in parallel lines of flight against a dark sky are infinitesimal. The picture reproduced here is a composite or montage of five pictures taken by Glenn Jones, Chief of Boeing's Engineering Photographic Unit. Shot at a speed of about 1/500 of a second, the series of shots is striking. The difference between strong and stunning impact resulted when the montage was made and then reversed for printing in this magazine. White sky became dark and dark planes became white, resulting in a dramatic and stirring picture.

MAGNETIC SOUND

By George J. Berkowitz



The invention and recent introduction of equipment to put magnetic sound on film, like color film, brings a new dimension and pleasure to the amateur movie maker. It puts the making of sound movies within the reach of everyone. It would not be optimistic to predict that once the home movie maker has combined sound and pictures he will reject with great stubborness any attempt to interest him again in silent film photography.

The principle of magnetic sound films derives from the tape recorder. The sound is recorded on a narrow strip of magnetic iron oxide that can be coated onto the film either before or after processing. The recording is done by means of a special magnetic projector or adapter device which also plays back the sound and projects the film during screening. The projector plays a key role.

The remarkable part of the achievement of magnetic sound films is that the stripe furnishes sound quality that is superior in all technical respects to the best theater sound obtainable from 35-mm. prints with optical sound tracks. Magnetic sound does not deteriorate and become noisy with wear and mishandling. The entire magnetic sound track or any part of it can be recorded after the picture has been taken, then erased if desired and re-recorded as often as needed. Tape or wire recordings can be made on location and dubbed in later.

Another advantage is that the magnetic stripe can be coated on any film, black-and-white or color, after processing, or on positive stock before exposure and processing. It also can be coated on film of any emulsion position and of any size, 35-mm., 16-mm. or 8-mm.

It can be applied to positive raw stock before exposure or to developed and edited prints. Processing does not affect a pre-recorded sound track. The stripe is made of inert materials that are not affected by and have no effect upon developing chemicals. The unique iron oxide is a chemical end-product that is so resistant to change that the heat of a blast furnace would be required to alter it. The binder materials are more inert and passive than the film base itself.

Striping is now being done by Reeves Soundcraft Corporation, first on the market with the service, and Bell & Howell at a cost of 3½ cents a foot. It is likely that several other firms will soon offer the service. Reeves, which offers a wider range of striping services than B&H, also sells rolls of positive 16-mm. film (perforated on one or both sides) that already have been striped.

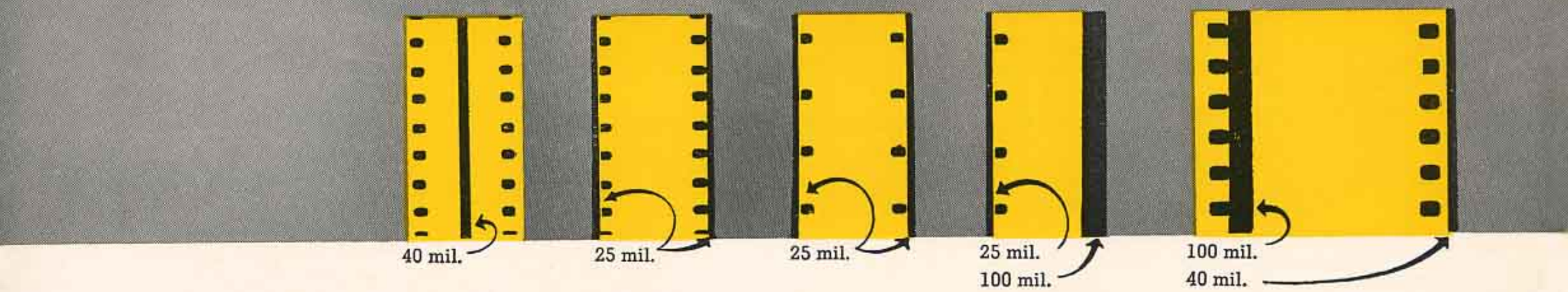
The process of making a sound movie breaks down in this manner. First, you shoot a movie on single or double-perforated movie film. After the film has been exposed, you have it processed and edit it. After editing, you send it to Reeves or Bell & Howell for striping.

Reeves stripes all film at the Springdale, Conn., plant. Bell & Howell stripes film at the Chicago plant and limits the service to standard single-perforated or single optical track film in half-track or full-track widths.

When the film is returned, you thread it into a magnetic sound projector, grab the microphone and start recording. You can record music, voices and any other sounds, and utilize previously recorded tape and wire recordings.

The limiting factor in the entire set-up at the moment is the magnetic sound projector situation. Because very few are on the market and these are very expensive, the amateur with limited means cannot jump into sound overnight. For the time being, only two projectors and a converter are available. Both RCA and Bell & Howell have put out magnetic projectors during the last few months and Ampro will soon have one out. Victor has produced an adapter for its own projectors that converts them to magnetic sound, but it sells for one-fourth the price of the RCA and B&H projectors. All these are for 16-mm.

There are no 8-mm. magnetic sound projectors on the market yet, but two companies are working on such



equipment. (Before they appear, however, the entire picture may change because of a new development. Revere has just announced a magnetic sound system using a silent projector, either 8-mm. or 16-mm., a tape recorder with a speed of 3¾ inches per second, and a new magnetic recording tape called Synchro-Tape.)

If you want to make magnetic sound movies, you must decide whether to use your present equipment, convert or replace it before doing anything. You must also decide whether you want to use tape or striped film. If you decide on film, in the case of 16-mm., you must choose between single and double-perforated film. Single-perforated film is preferable. The difficulty with double-perforated film magnetically striped is that the film base is weaker around the perforations and the film does not lie absolutely flat when passing over the sound drum.

If you use double 8-mm film (16-mm. film that is split into two lengths after processing), the stripe can be coated down the center 40 mil. wide (a mil. is one-thousandth of an inch) or next to the perforations 25 mil. wide on both sides. It is likely that the stripe outside the sprocket holes will become standard for 8-mm. Magnetic sound projectors for 8-mm. film, which will appear soon, are designed to record the stripe in this position.

Double-perforated 16-mm. film is coated with a 25-mil. stripe in the same manner as 8-mm. film, on both sides outside the sprocket perforations. Single-perforated 16-mm. film is coated with a 100 mil. stripe on the unperforated side and a 25-mil. stripe on the opposite edge. The latter is added to balance the film so it will wind evenly on reels and to prevent uneven shrinkage.

Reeves also stripes film with a 50-mil. magnetic track, permitting the retention of a 50-mil. optical track. The two tracks are useful in many ways. For instance, it is possible to record the sound in two different languages with two tracks on the same film.

A track 100 mil. wide provides the best magnetic sound quality. It is completely free of the noise problems associated with wear on optical tracks, since scratches and abrasions have no audible effect on the magnetic track.

Many movie makers already own cameras that use sound film so no conversion will be necessary. Others, who own cameras that use silent film, may find it an inexpensive matter to convert to sound film. Otherwise, it will be necessary to obtain a camera that uses single-perforated film in order to make sound movies.

Even if you don't want to go to the expense of making sound movies now, you can and should prepare for the future by converting your present camera or by using one that takes single-perforated stock. By so doing, now, you can save an intermediate duplicating process should you decide later on to have your film striped for sound.

Single-perforated, raw, unstriped 16-mm. film is made by several companies. Ansco offers 100-foot rolls on special order. DuPont suggests using its No. 930-A panchromatic reversal film, which is available in lengths of 100 and 200 feet and on core windings in lengths of 1,000, 1,200 and 2,000 feet. All Kodak 16-mm. cine films are available on order, including Daylight and Type A Kodachrome, Plus-X and Super-XX, in lengths of 50, 100, 200 and 400 feet. Kin-O-Lux is offering both TV and Gold Seal black-and-white emulsions in 100 and 200-foot lengths and longer rolls on core windings.

Not only should you shoot all films on single-perforated stock, but you should operate your camera at the sound speed—24 frames per second—instead of the silent speed of 16 frames per second. Although magnetic sound projectors will record and play back at 16 fps, better quality is achieved with the sound speed.

If your camera does not provide a speed of 24 fps, you can shoot between a half and a third more footage than at 16 fps to compensate. Then, when projected at the sound speed rate, your scene will have normal duration.

At sound speed, your lens aperture must be a half-stop more than normal. You can make this adjustment either by opening your lens diaphragm or by decreasing the film rating on your meter. For example, cut Daylight Kodachrome from 8 to 6 Weston and 10 to 7.5 A.S.A.

One of the advantages of magnetic sound is that you can make talkies of the silent movies you have already shot. In order to do so, however, you will need to make a duplicate print of the silent film on sound film and then have the duplicate striped.

Magnetic sound movies will have far wider application than home movies, of course. They will be of great use to business and industry for sales and demonstration aids, for annual reports, public relations, labor relations and training. Government, schools, armed forces and other groups will make use of the films for training and education. There are so many ways in which such films can be used that the movie maker who wants to utilize his hobby for more than the usual purposes can let his imagination extend itself. This is one invention that will change photography considerably.

EUMIG 88

the 8-mm. movie camera that thinks for you

The Eumig 88 for the first time simplifies movie camera operation to the point where it is as easy as pushing a button. This has been made possible by the revolutionary Automatic Aperture Control, a new mechanism that assures you correct exposure. You no longer need worry about exposure or carry an exposure meter when you own a Eumig. An Electric Eye (photoelectric cell) measures the available light at all times and shows you whether the lens aperture (f/stop) being used is the right one. The Electric Brain (coupled aperture-viewfinder pointer mechanism), directed by a touch of your fingertip, corrects the aperture when necessary. The Eumig 88, made in Austria by Europe's best craftsmen, is the finest, most advanced personal movie camera available today. An f/1.9, 12.5-mm. anastigmat, coated, color-corrected lens in universal focus assures sharp images with both black-and-white and color film. A precision clockwork motor permits you to run more than the average length of film at one winding. Ask your dealer for our attractive explanatory booklet. Have him show you the Eumig 88. You'll know it's your camera when you handle it, sight through it and hear the smooth purr of the motor. In construction, finish, appearance and price, it is, feature for feature, the best buy.

EUMIG 88 with f/1.9 lens.....$139.50

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EUMIG PRECISION WORKS

Austria

Exclusive factory representative in U.S.A.

CAMERA SPECIALTY CO., INC.

New York

LIGHTING SCIENTIFIC PICTURES (Continued from page 13)

appear almost as if they were raised in the photograph.

Some subjects require only one lamp, which provides a dramatic, textural effect. Others require more. Start with one lamp and build your lighting by adding and subtracting lamps and shifting their positions until you can see by inspection of the ground glass image in the viewfinder that the lighting is as you want it. This applies to all lighting set-ups, by the way.

Glass and metallic objects that reflect considerable light and give you "hot spots" require reflected lighting. Such an effect is obtained when the lights are not directed at the subject but rather at a white ceiling, wall, card or other light-colored surface that can be positioned alongside the subject to reflect the light.

This type of lighting, sometimes called "bounce light," furnishes soft, uniform and usually shadowless illumination. Another method of eliminating glare is to construct a "tent" of tracing paper, cheesecloth or thin, white, loosely woven cloth around the subject.

The lamps, which should be outside the tent, can be placed in any position required to illuminate different parts of the subject. They can even be in back of it without glaring directly into the camera lens. The minor disadvantage of this type of lighting is that some of the light is lost because of diffusion, consequently forcing the photographer to use a slower exposure, larger aperture or more lamps.

Another alternative, of course, is to use polaroid filters or diffusers over a direct light source to eliminate glare. These can be purchased or made quite simply but are an added expense.

To copy X-rays, photograph objects that are transparent or create an impression of depth and solidness, use transmitted light. Not frequently employed by the average amateur, such light answers an important need of the scientific photographer.

It is achieved by placing a lamp in a box, one side of which is covered by opal glass, thereby creating a "shadow box." An object placed on the glass is lighted from below. If the box is set up on end and the object placed in front of it, back lighting is achieved. Adding this to top lighting, it is possible to outline the subject contours far better than with top lighting alone.

An indirect way of getting an added dividend of light is to use light contrasting paper. If an object is dark, placing it on or next to a white paper will contrast it. The white paper also will reflect considerable light back onto the sides of the subject that are nearest. A dark paper, on the other hand, will soak up light but will separate a light-colored object visually from the paper.

It is impossible to discuss exposure for scientific photography here, because it varies considerably with the light intensity, quality, position and other factors. The best guide is an excellent exposure meter, which will furnish a basic setting. The trial-and-error method will provide you with the best setting. It is helpful to keep accurate records of each set-up (position and distance of each lamp, type of lamp, etc.) and in time you will build up an extensive file of technical information that will provide you with the right settings when the conditions are duplicated.

Regardless of how difficult your subject is to photograph, it is always wise to aim at the simplest, least complicated set-up. Vary the standard set-up to fit the conditions and you will be able to handle almost any scientific subject.

ANGENIEUX
lenses for the Exakta

1. Just introduced. Coated 135-mm., f/3.5 Y2 telephoto $75.50
2. Just introduced. Coated 90-mm., f/2.5 Y1 telephoto $84.50
3. Recently introduced. Coated 90-mm., f/1.8 P1 telephoto $149.50
4. Recently introduced. Coated, 35-mm., f/2.5 R1 wide-angle (Retrofocus) $99.50

A year ago we produced two lenses that startled the photographic world. Since then Exakta owners have shown us again and again that these lenses are their favorites for pictures of rare quality. The remarkably short focal length of the 35-mm., f/2.5 Retrofocus, its great speed, 64° angle of view and excellent definition make it a lens unequaled. The great speed of the 90-mm., f/1.8 P1 and its fine definition make it a fit companion for the Retrofocus. Now, two more Angenieux lenses take their place in the battery of essential lenses for Exakta owners. The 90-mm., f/2.5 Type Y1 telephoto is an inexpensive lens of medium focal length with fine definition. The 135-mm., f/3.5 Type Y2 is a fast telephoto for all-around work. All the postwar advances in lens design and construction have been put into these lenses with amazing results. All are coated and in handsome, lightweight black-and-white mounts with duplicate scales. We invite you to inspect them at your dealer.

Manufactured by
PIERRE ANGENIEUX, Paris, France

Exclusive representative in U. S. A.
EXAKTA CAMERA CO., New York, N. Y.

CHIMNEYS (Continued from page 9)

After being refused several times, we decided to alter our approach. From then on, we picked buildings where the downstairs door was open. We would walk quietly to the roof, shoot what we wanted and go. While on each roof, we surveyed the surrounding buildings to see if there were any chimneys of interest that we had missed from the street. When we couldn't get into a building, we usually managed to shoot the chimneys on its roof from a neighboring building with or without a telephoto.

Even this casual method had its hazards. While we were on one roof, we were suddenly interrupted in the middle of shooting by two people who demanded to know what we were doing there. After we made our weak explanation, they ordered us off that instant. Naturally, we went and downstairs found out from the janitor that thieves had entered the building that week from the roof.

And since it was summer, many people were sunbathing on the roofs. It required some delicacy to avoid becoming involved in the situations that can arise from the presence of cameras and semi-dressed sunbathers.

To get our pictures, we climbed innumerable flights of stairs and roasted on countless roofs. In order to get the contrast we needed for the silhouette effect, we underexposed the film. We increased the film rating (Plus-X) to 500 Weston, shot against the light when possible, developed in Dektol. We printed on Varigam T paper using a No. 10 filter.

It was a story we were glad to finish. Nevertheless, it had its compensations. Aside from the pleasure of the pictures themselves, we have sold them to several publications, including *Life*.

BOOKS

100 STUDIES OF THE FIGURE, John Rawlings, Studio-Crowell, New York, 96 pages, $5.50.

The well-known fashion photographer says in this book: "The nude is a universal subject; every camera artist who undertakes it should be able to make it say something new." Rawlings says many new things and some old things with his camera, but always in an interesting way. In many ways, this is a fascinating book.

U. S. CAMERA ANNUAL 1952, U. S. Camera Pub. Corp., New York, 400 pp., $6.95.

This is the 17th Edition of the Annual with special sections featuring the work of Philippe Halsman, Eliot Elisofon, W. Eugene Smith and photographers of the Audubon Society. A color section presents eight pages of photos of the midnight sun.

THE ART OF THE ARTIST, compiled by Arthur Zaidenberg, Crown Publishers, Inc., New York, 176 pp., $4.

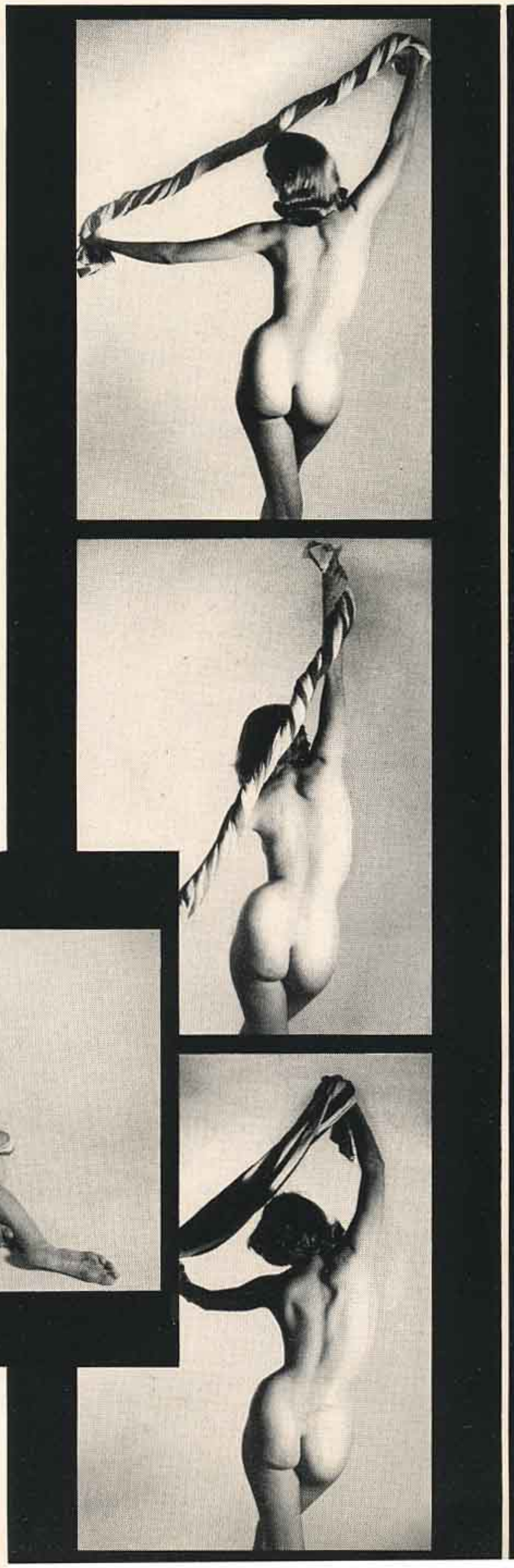
This book contains the theories and techniques of such distinguished contemporary artists as Yasuo Kuniyoshi, Nahum Tschacbasov, and Doris Lee. There is much for the photographer to learn from other artists and books like these can free him from the boredom of humdrum photography.

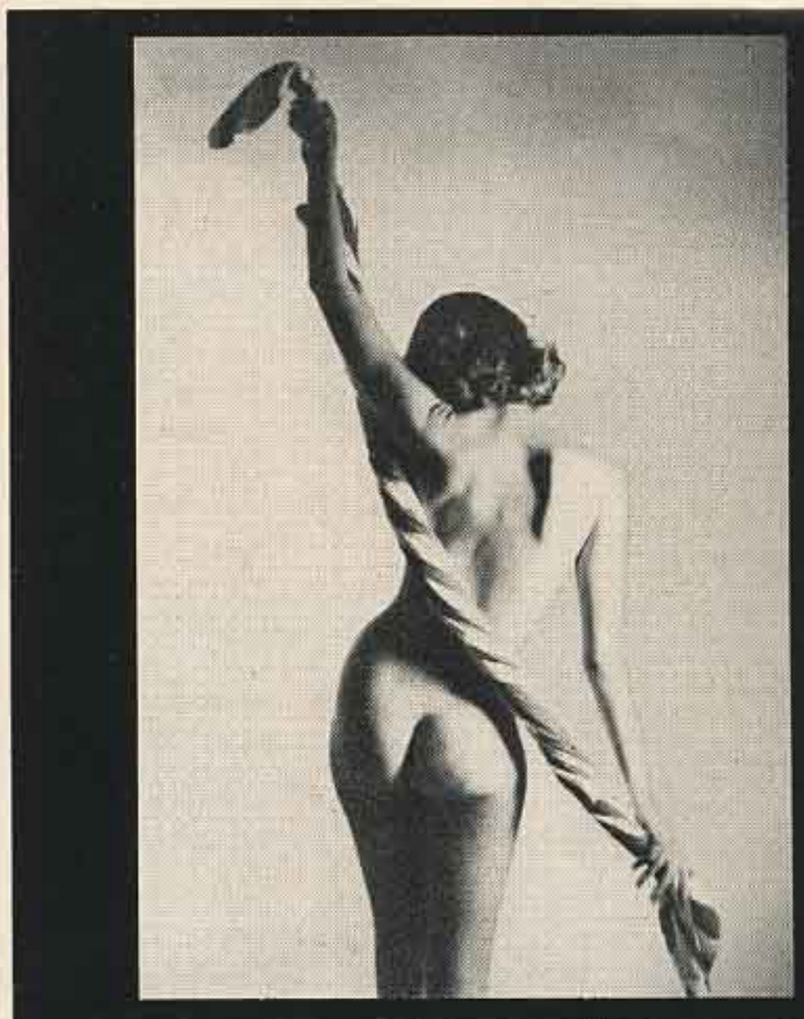
EUROPA-CAMERA, Rayelle Foreign Trade Service, Philadelphia, 206 pp., $7.50.

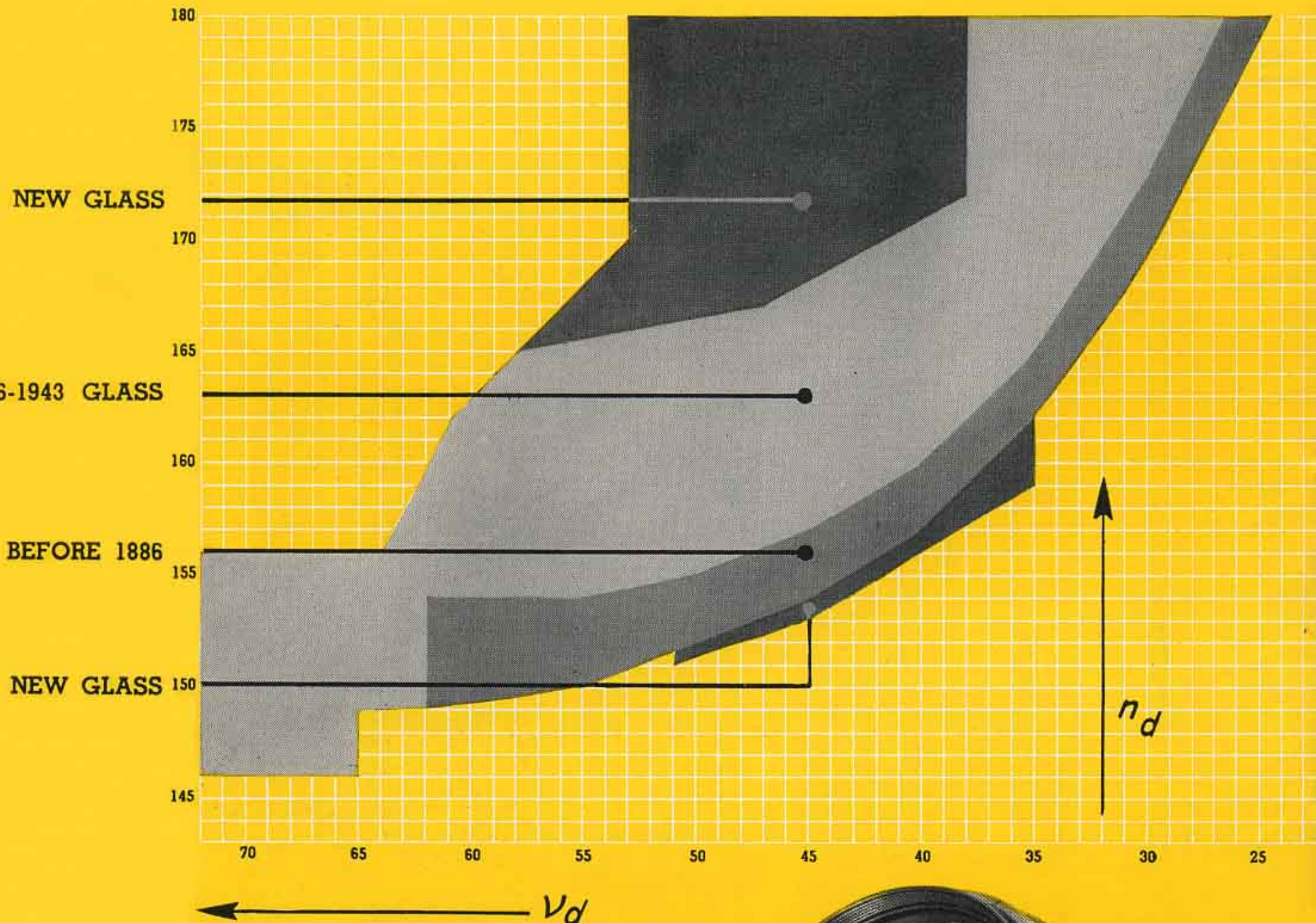
It is obvious to see from this volume that European photographers still can give their American rivals something to think about. True, there are still the time-honored skiing and pictorial shots, but there are some other documentaries and journalistic pictures that are fine examples of the new dimensions of photography.

VARIATIONS ON A THEME

Variety, so the old adage goes, is the spice of life. Of photography, too. By shooting variations of your subject and making the law of averages work for you, you can increase your chances of getting good results. You are far more likely to get several good pictures if you take many different shots than if you take few. Any subject can be photographed an infinite number of ways. Each time you vary the composition, perspective, lighting, exposure or depth of field, you get a different picture. One variation leads to another, one idea to another and, if you persevere, you may wind up with imaginative and creative ideas that otherwise probably never would have occurred to you. In any case, you will have many pictures from which to select, instead of only one or two. It's better to have too many good ones than none. Lillian Bassman's figure variations, reproduced here, are excellent examples of how you can produce a different photo by a turn of the head, a twist of the arm or some other slight change in the pose. The next time you use your Exakta, try shooting a lot of variations and see how your picture average soars. Remember that film is the cheapest item in your camera case. You get as many as 36 exposures to the roll, and if you load your own cartridges, the film costs only about a penny a frame. You can well afford the investment of a few cents to get back a huge dividend of good pictures.







CARL ZEISS JENA'S

NEW f/2.8 TESSAR

Carl Zeiss Jena, the world's most famous lens manufacturer, announces an unusual achievement. The Zeiss works in Jena has completely redesigned the 50-mm., f/2.8 Tessar and created a significant new eagle eye for your camera. Despite the larger aperture, the definition of the f/2.8 Tessar now equals that of the well-known f/3.5 Tessar, which has been the standard, all-around lens for photographers for many years. The addition of two new optical glasses, *Tief-Flint* and *Schwer-Kron*, has made it possible to correct the aberrations (optical faults) of the f/2.8 to a much greater degree than the f/3.5 Tessar, especially the chromatic (color) aberrations that occur in every lens. Definition and color rendition of both black-and-white and color pictures are improved with the new f/2.8 Tessar, making it the preferred standard lens for miniature photography. It also incorporates the revolutionary pre-set diaphragm mechanism, which permits the photographer to pre-select the required aperture for his pictures and then to obtain it instantly when he closes the lens without taking his eye from the viewfinder. The f/2.8 Tessar is interchangeable with other Exakta lenses and can be used on all 35-mm Exakta models. Your dealer will be happy to show it to you.

CARL ZEISS JENA

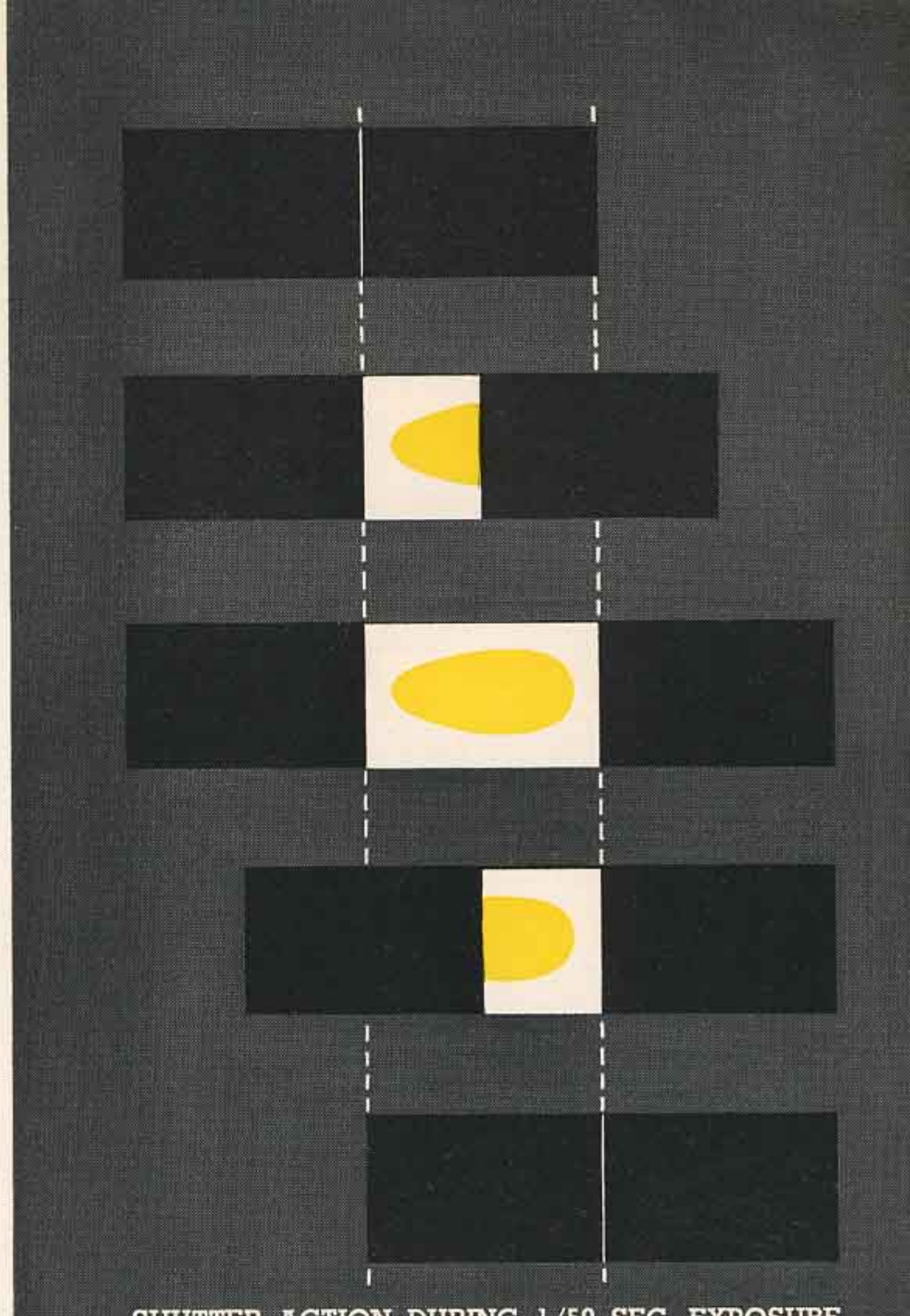
HOW THE EXAKTA SHUTTER WORKS

The shutter of your Exakta is its heart. Like a human heart, it is the key factor in the whole mechanism. The success of your picture depends upon its proper functioning.

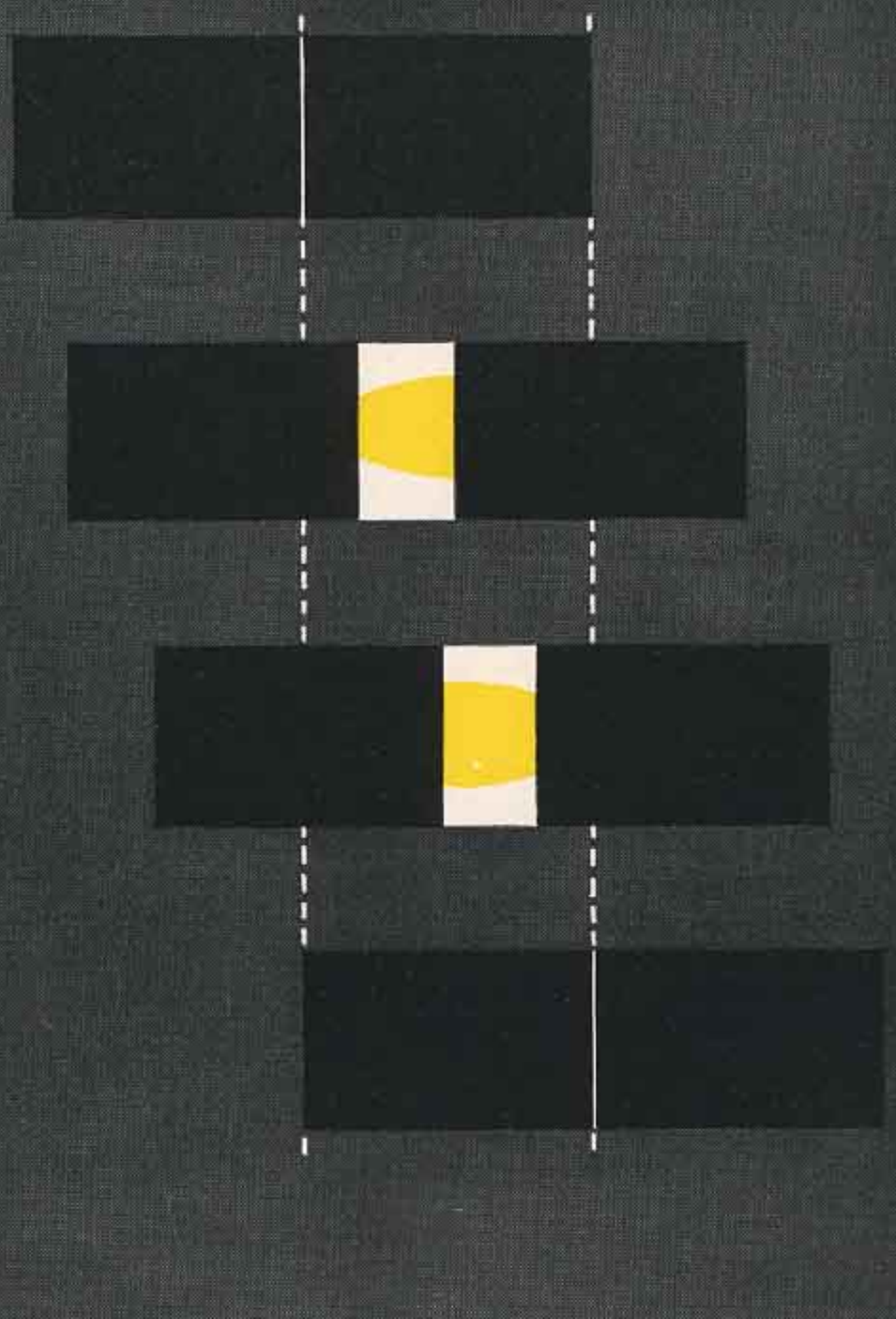
Photographers rarely are interested in the shutter or its operation. They simply accept it as being there. Yet the way it works often determines how your picture looks. Therefore, it is important to know something about it. Some strange pictures occasionally result because of lack of such knowledge.

As everyone knows, the purpose of any shutter is to regulate the amount of exposure to light the film receives. This is true for any of the several different kinds that are available. The manner in which the amount of exposure is controlled varies according to the type of shutter and occasionally introduces technical problems. These problems can be overcome quite easily if you know how the shutter operates.

The most important requirement of any shutter is accuracy. Technical experts have long agreed that the most efficient and accurate kind available, especially for extremely high speeds, is the focal plane shutter. Your Exakta is equipped with such a mechanism.



SHUTTER ACTION DURING 1/50 SEC. EXPOSURE



SHUTTER ACTION DURING 1/250 SEC. EXPOSURE

The focal plane shutter gets its name from its location in the camera; that is, it is right next to the film (along the focal plane). Besides its efficiency and accuracy, it has additional merit in that it is part of the camera body rather than part of the lens. Consequently, it is not affected by the interchange of lenses.

It's much easier to understand the action of the shutter if you see it, so it would be a good idea to open the back of your Exakta right now and look at the cloth curtain across the picture area. This curtain actually is only one-half the shutter. Your shutter is made up of two cloth curtains, which move from left to right on rollers during the exposure. One curtain uncovers the picture area, the other covers it.

Assuming that your shutter is not cocked at this moment, the curtain that you see covering the picture area is the second one. The first one is rolled up on a roller to the right of the picture area.

Now wind the film-transport lever. As you know, winding the lever simultaneously cocks the shutter. If you watch the shutter curtains

WHEN YOUR SUBJECT IS A PORTRAIT USE A STEINHEIL TELEPHOTO

The 35-mm. camera is the most versatile photographic instrument invented. The telephoto lens illustrates this fact perfectly. Most photographers use the telephoto for distant subjects only. Yet it is essential for portraits. With a standard 2-inch lens on your Exakta, you would be forced to work much too close to your subject to fill the film frame with a head and you would get distortion. Your subject's nose, being nearest the camera, would appear abnormally large in comparison with the rest of the head. With a telephoto, however, you can back up, fill the film frame with the subject's head and still get the right perspective. And since you work quite a ways from the subject, you avoid making him uncomfortable and self-conscious. You'll find a telephoto—not just any telephoto, of course, but a Steinheil Culminar—the right way to increase the usefulness of your Exakta.

The Culminar, choice of discriminating Exakta owners, meets the highest standards for color correction, sharpness and performance. Available in two lengths, an unusually fast f/2.8, 85-mm. at $68 and an exceptional f/4.5, 135-mm. at $60. Both Culminars are coated.

C. A. STEINHEIL SONS
Munich, Germany

Factory representative in U. S. A.
EXAKTA CAMERA COMPANY
New York

during this action you will see that the second curtain is pulled to the left of the picture area where it winds up on a roller and the first curtain is pulled in the same direction and comes to a stop covering the picture area. Note that the picture area is never uncovered during the shutter-cocking action.

When you press the shutter release of your Exakta, the first curtain begins to travel to the right, uncovering the picture area so that light strikes the film. At a specific instant later, the second curtain starts traveling to the right and covers the picture area.

The first shutter curtain travels at a rapid speed. The second shutter curtain travels at a speed about 25 per cent that of the first. These speeds are constant. The exposure is made by the light that is admitted through the gap or space between the back end of the first curtain and the front end of the second.

Different exposure times are achieved by variations in the size of the slit between the two curtains. The width of the space between the two curtains determines the amount of light admitted to the film, so it controls exposure.

The significance of this is that the entire film frame is not exposed simultaneously. When slow speeds are used, the first shutter curtain moves across the entire picture area gradually uncovering it. The picture area stays open fully for a specific time; then the second shutter curtain gradually covers it. The top, right diagram on page 25 shows the action of the two curtains when the exposure is made at 1/50 of a second.

The first line of the diagram shows the position of the two curtains when the shutter is cocked. The curtain on the left is actually rolled up on a roller. The second curtain is across the picture area of the camera (shown in the diagram by two white dotted lines).

The other lines of the diagram show the operation of the curtains after the shutter has been released. The yellow oval represents the image of the subject. Note that one shutter curtain travels to the right, the picture area stays open fully, and then the other curtain covers the area. Of course, all this occurs so quickly that it is impossible for the eye to see it, except at a speed much slower than 1/50 of a second.

The amount of time the first curtain stays open fully depends, naturally, on the exposure setting. It would stay open much longer for a 12-second exposure, of course, than it would for one of 1/50 of a second.

When speeds of 1/100 of a second or faster are used, however, the picture area never is fully uncovered. As you can see in the bottom, left diagram on page 25, the first curtain begins to cover the picture area long before the second curtain has reached the right side of the picture area. The two curtains have the effect of a band of light being played along the film frame from left to right. This band varies in width with the speed.

It is apparent, therefore, that at any given instant during the exposure only an area of film as wide as the slit between the two curtains is being exposed to light. For example, if the slit were only 2 mm. wide, then only 2 mm. of the total width of the film frame (36 mm.) would be exposed at any given time. The entire 36-mm. width would be exposed in 2-mm. sections, one right after the other. (This is true not only for the Exakta's shutter, but for all focal plane shutters.)

This is an important factor in Exakta Photography. It often determines whether your pictures will be successful. Its application will be discussed in Part II of this article, which will appear in the next issue of *Exakta*.

EXAKTA

PICTURES

Readers are invited to submit photographs for this page. We will pay $5 for each published picture. Photographs are acceptable in any size, whether your own printing or that of a photo-finisher, but must be accompanied by complete technical information and return postage. If any persons can be identified in your photos, include a release signed by each individual, authorizing the use of the picture in advertising. Send pictures to George J. Berkowitz, Editor, Exakta, 46 West 29th St., New York 1, N. Y. This issue's contributors: Top, Harold Schenke, The Bronx, N. Y., taken with an Exakta and f/3.5, 50-mm. Tessar and an extension, Plus-X exposed at 1/100 of a second at f/22, one No. 6 flash-bulb at 3 feet. Center, Ray Tuttle, Salt Lake City, Utah, self-portrait taken with an Exakta and f/2, 50-mm. Xenon lens on Plus-X exposed at 1/250 of a second at f/16 by delayed action with one No. 6 flashbulb (camera on tripod, flashgun hanging on bathroom door). Bottom, Cpl. Leonard Overturf, Fort Knox, Ky., taken with an Exakta and 50-mm extension tube on Panatomic-X exposed at 1/100 of a second at f/4 (toad is 1½ inches long).

TECHNIQUE

By Wolf Wirgin

Exakta Camera Company maintains a Technical Division that answers queries about the use of the camera and helps solve photographic problems. The Technical Division from time to time receives from Exakta owners information that is not readily available in photographic literature. This material can be of great help to other Exakta owners, if not immediately, then for some future photographic work. Regardless of whether the information is utilized fully, many valuable ideas can be obtained from it to enhance results. Exakta Camera Company would like to extend the services of the Technical Division to all Exakta owners and publish their contributions. Therefore, this page has been established as a regular feature of the magazine and we invite all readers to contribute. If the material merits it and is published, contributors will be paid. Please address your letters to Wolf Wirgin, Technical Division, Exakta Camera Company, 46 West 29th Street, New York 1, N. Y.

Copying Color Transparencies

Exakta owners seem to be greatly interested in copying transparencies. An Air Force major recently sent us a brief description of how he copies Kodachrome transparencies on black-and-white film: "I place the slide in an enlarger and adjust the latter until the portion of the transparency I want to copy fills a double-frame, 35-mm. area. Then I place my Exakta, with the lens removed, on its back under the enlarger. I focus the enlarger and at the same time check for sharpness on the ground glass of the (waist-level) viewfinder. When my focus is sharp, I snap the shutter and the slide is copied. A few experiments provide the proper exposure. I have found that 1/25 of a second with Plus-X and the enlarger lens at f/8 is a good start."

A Mt. Sterling, Ill., photographer asks how 2¼x2¼ transparencies can be copied and reduced to 35-mm. size. This is not a simple process, as one might suspect, since it involves masking the transparency. The general photographic procedure to be followed, as recommended by Robert Kafka, former chief of *Life* Magazine's color lab, is to use a light box.

The box should be shaped approximately like a square or rectangle and be constructed so that one side will take two pieces of clear (ordinary) glass. The transparency is placed between the two pieces of glass to hold it flat. The light source should be two 3200° Kelvin lamps, one at each side, mounted so they throw their light backward instead of at the transparency. The inside back of the box should be covered with a white blotter which will diffuse the light and reflect it at the transparency in an even glow. This indirect method of lighting is much better for copying. The blotter should be about 12 or 14 inches from the transparency.

Kodachrome Type A film should be used, and the lens should be covered with a CC4 (or 82A) filter to compensate for the use of 3200° Kelvin lamps. The latter are recommended for such copying because their light is more constant over a long period of time than floodlamps, for which Type A film is balanced: If No. 2 floodlamps are used, however, shoot without a filter.

The masking technique is much too complicated to go into here. Full information is contained in Eastman Kodak's Data Book, called *Color Separation and Masking*, available at photo supply stores or direct from Kodak in Rochester, N. Y.

Exposure should be determined with the aid of a good meter held close to the transparency. This will give you a starting basis, then trial and error will provide you with the best exposure setting for the particular transparency you are copying.

Microfilming with an Exakta

From Exakta owners in Alice, Tex., St. Louis, Mo., and Holliston, Mass., come queries concerning the possibility of using an Exakta for microfilm copying. The 35-mm. Exakta can be used for such work with several types of film. Kodak Micro-File film is an extremely high-contrast panchromatic film especially suited to line copy work, colored or black-and-white. It has the finest grain and highest resolving power of all Kodak films for 35-mm. cameras and is, therefore, suitable for copying originals having very fine detail.

Kodak Direct Positive film yields positive transparencies and is particularly well suited to making slides from illustrations. The reversal processing is done easily by the photographer. Kodak Fine Grain Positive (Safety Base) film is non-color-sensitive and suited for continuous-tone black-and-white copying and linework. Kodak High Contrast Positive (Safety Base) film is non-color-sensitive and is well-suited for black-and-white line copying.

Since there are several methods of microfilming, Exakta owners interested in the subject should refer to the following publications for detailed information: *Copying*, Kodak Data Book; *Microfilming* by Ralph De Sola, Essential Books, New York; *Copying Technique* by Frank R. Fraprie and Robert H. Morris, American Photographic Pub. Co., New York.

Close-up Extension Ring

The uses of the 2-in-1 Adapter for covering "blind" spots (extremely short distances not covered by the regular set of extension tubes when taking close-ups) were mentioned on this page in the last issue of *Exakta*. Since then, Ihagee has notified us that the Adapter will cover these areas only when used with a 50-mm. lens or the new 58-mm. Biotar with the pre-set diaphragm.

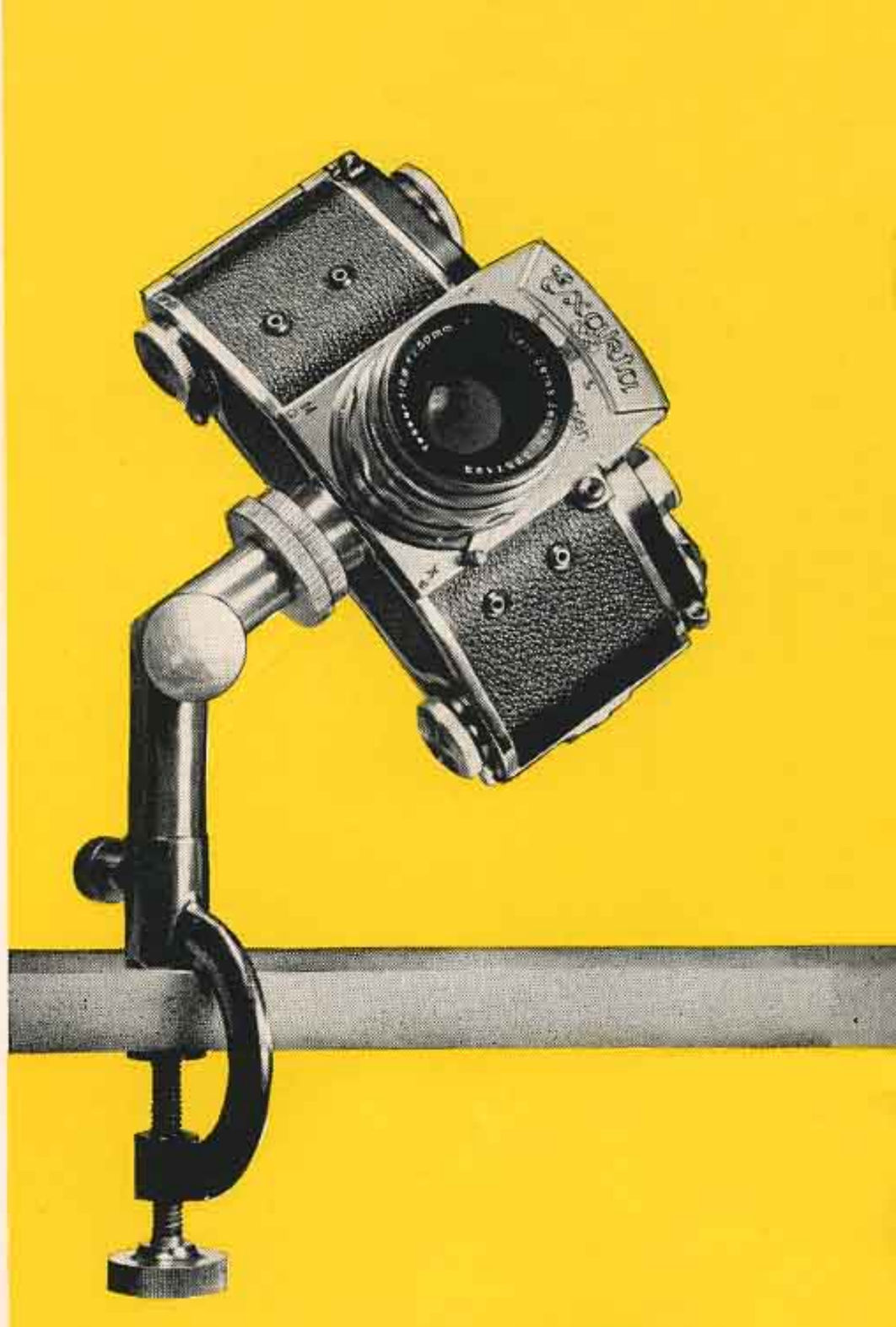
If the ring is used with the old 58-mm. Biotar (without the pre-set mechanism), it will not cover the following distances: 88-76 cm., 47-45cm., 35-34 cm. and 30-29.5 cm. Unfortunately, the Adapter cannot be made shorter to cover these areas. However, Zeiss has taken care of this problem in the new Biotar by redesigning the mount so that it can be focused closer than the old Biotar.

Top: A new camera clamp, particularly applicable to close-up and table-top photography, has just been made available. The clamp has a universal head and separate controls for vertical and horizontal positioning. Vertically, the head moves in a 180° arc; horizontally, it permits a complete 360° camera movement (full circle). Separate locks permit fixed positioning at any angle and view. A viselike construction on the bottom permits fastening to any round or flat object up to 1⅜ inches in thickness. A removable knob on the head makes it suitable for both American and European tripod socket threads. The clamp is of die cast and machined aluminum and weighs 7 ounces. Its over-all length is 7½ inches. Price, $3.95.

Center: Steinheil has made available an exceptional, low-priced wide-angle lens for Exakta owners. The new Cassaron has the usual Steinheil quality and is designed to fill the needs of the budget-minded Exakta owner. It combines the relatively fast speed of f/3.5 with a 57° angle of view (40-mm. focal length) and fine definition at the low price of $49.50.

EXAKTA ACCESSORIES

Bottom: Exakta owners who do close-up and copying work will be greatly interested in the Novoflex Bellows Extension, now available with a mount that fits all 35-mm. Exaktas. The Novoflex is a precision-made, small bellows extension designed specifically for photographing subjects less than 2 feet away. It is a wonderful auxiliary for the extension tubes and the 2-in-1 Adapter and the three make an unbeatable combination for close-up work. The bellows is purposely designed small to minimize loss of light. The parallel-rod carriage assures stability and precision even with hardest usage. A turn of either knob (one on each side) instantly alters the distance between lens and film plane. Amount of magnification and exposure increase can be read conveniently on scales etched on the carriage rods. The Novoflex takes any lens with an Exakta mount, including the standard 50-mm. lens. In addition, two special lenses of 105 and 135-mm. focal length are available. Two Novoflex models, EBAL and EBIG, are offered. EBAL is the standard one, with single carriage, attaching directly to the tripod. List price, $44.50. EBIG is the de luxe extension with a double carriage, permitting additional focusing by means of tripod rack. Both carriages of EBIG can be locked into position by counterclockwise turn of knobs on left side and the mount swivels so pictures with vertical format can be taken. List price, $75. A special tripod rack, CASTEL, for use with EBAL also is available. List price, $25. Leather carrying case, $5.95. 105-mm., f/4.5 Steinheil Culminar lens in bayonet mount, with click stops, for use with either EBAL or EBIG, $34.50. 135-mm., f/4.5 Culminar for both models, $60.



THE MOON

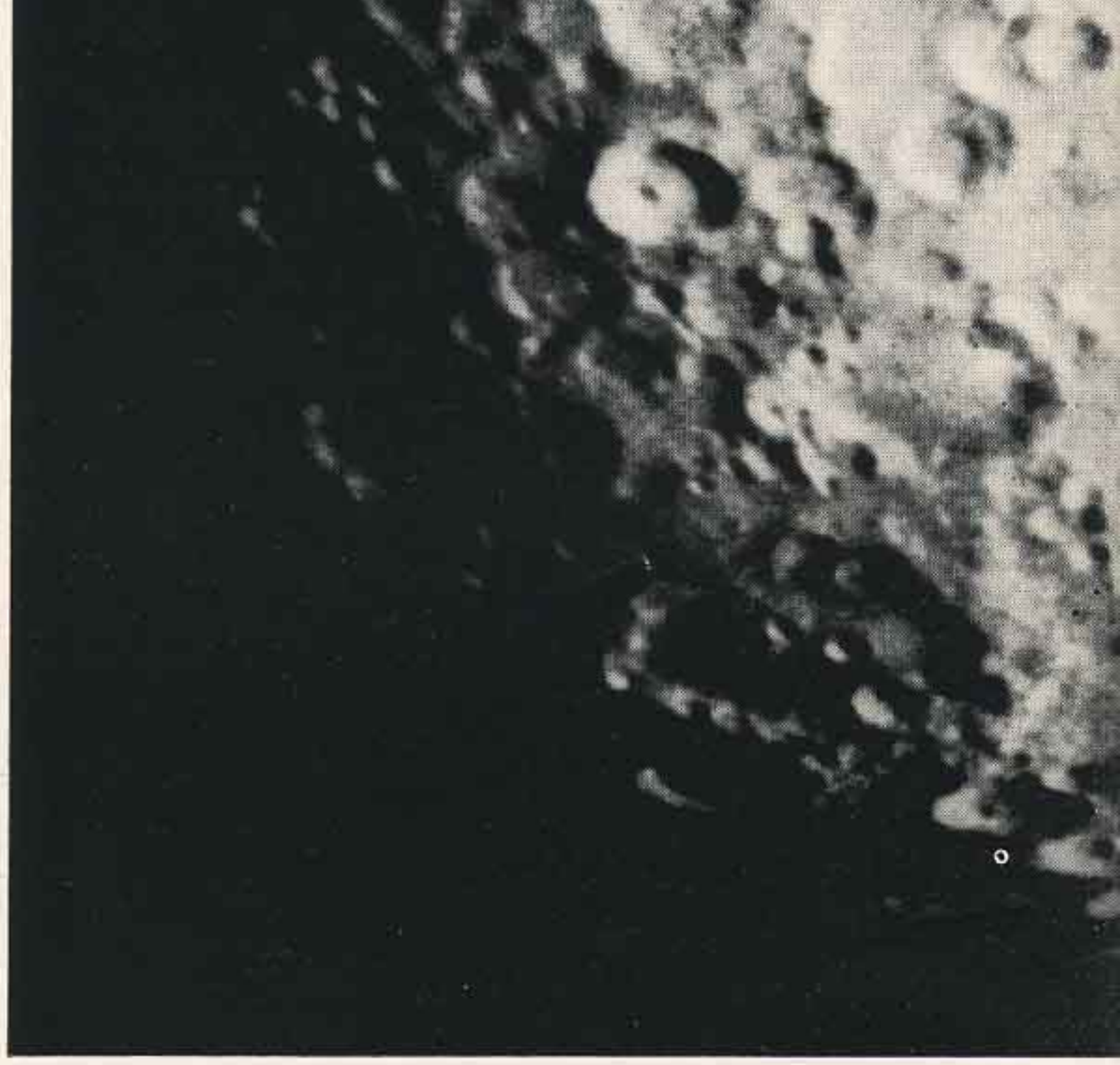
By Sidney Freidin

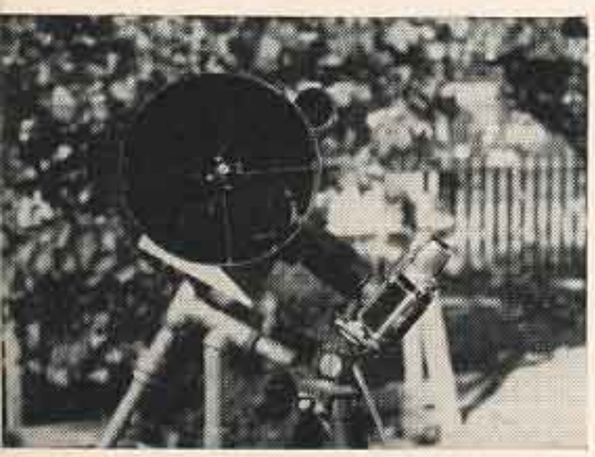
Unless you make a habit of testing the versatility of your Exakta, you probably are unaware of the range of your camera. So, it may come as a surprise to you to know that you can even photograph the moon with it and get some remarkable pictures.

All you need is a refracting or a reflecting telescope. You are probably most familiar with a refracting telescope. It has a lens at the front for gathering light (much like a camera lens does), a tube down which the light passes and an ocular (eyepiece) at the opposite end. The latter is nothing more than a compound magnifying lens, permitting you to examine the enlarged image. Ordinary opera glasses or binoculars and "spyglasses" are refracting telescopes.

A reflecting telescope is a variation of the other. One end of the tube is open. A parabolic mirror, ground, polished and aluminized on the front surface, is at the other end. It reflects the light back in a conical shape to a 90°, totally-reflecting prism (or sometimes a flat mirror) which diverts the light to a hole in the side of the tube. There it can be examined with an eyepiece or photographed, as desired.

I use a 6-inch reflecting telescope of my own construction, but similar results can be obtained with a refracting telescope of equal aperture. I prefer the reflecting telescope because the simplest and most efficient set-up is the one with the least optical elements.





Right: Photo of southern portion of the moon, taken on Super-XX film at 1/50 of a second with an Exakta. Prominent round crater with central mountain peak at left, center, is Tycho, diameter 54 miles. Magnification 40x.

Left, top: Set-up used to make photo of moon at right. Exakta abuts telescope at side.

Center: View of telescope looking directly into front. Light from moon enters this opening, travels to opposite end where a parabolic mirror reflects it forward again. There, a totally reflecting prism reflects light to an opening at the side where the Exacta is located.

Bottom: Close-up of parabolic mirror of reflecting telescope.

It is possible to use the lens of your camera focused upon infinity when photographing the moon, but, since the Exakta's lens can be removed easily because of the bayonet mount, I recommend doing so. The lens is unnecessary for this type of photography.

The brightest image is obtained at the prime focus of the telescope's parabolic mirror. The prime focus is the image reflected by the mirror alone, via the prism, with no further magnification by means of an eyepiece. For my telescope, it has a focal distance of 48 inches, or a focal ratio of F/8.

Carefully bring your Exakta, rigidly supported on a tripod, into line with the cone of light emerging from the side of the telescope. Some experimentation undoubtedly will be necessary at this point. Observe carefully the image on the ground glass to find the point of finest focus and definition.

It may be necessary to remove the eyepiece tube in order to bring the camera near the image for proper focusing. Because of the long focal length of the mirror (which, incidentally, acts as an extremely long focal

length telephoto), this point (of finest focus) is critical.

The single-lens reflex system of the Exakta permits you to view the image during the operation until the instant of exposure. When the image appears as clear and well-defined as possible, release the shutter. The negative will contain an image of the moon about ½-inch in size, representing a 24x magnification over the image of the normal lens.

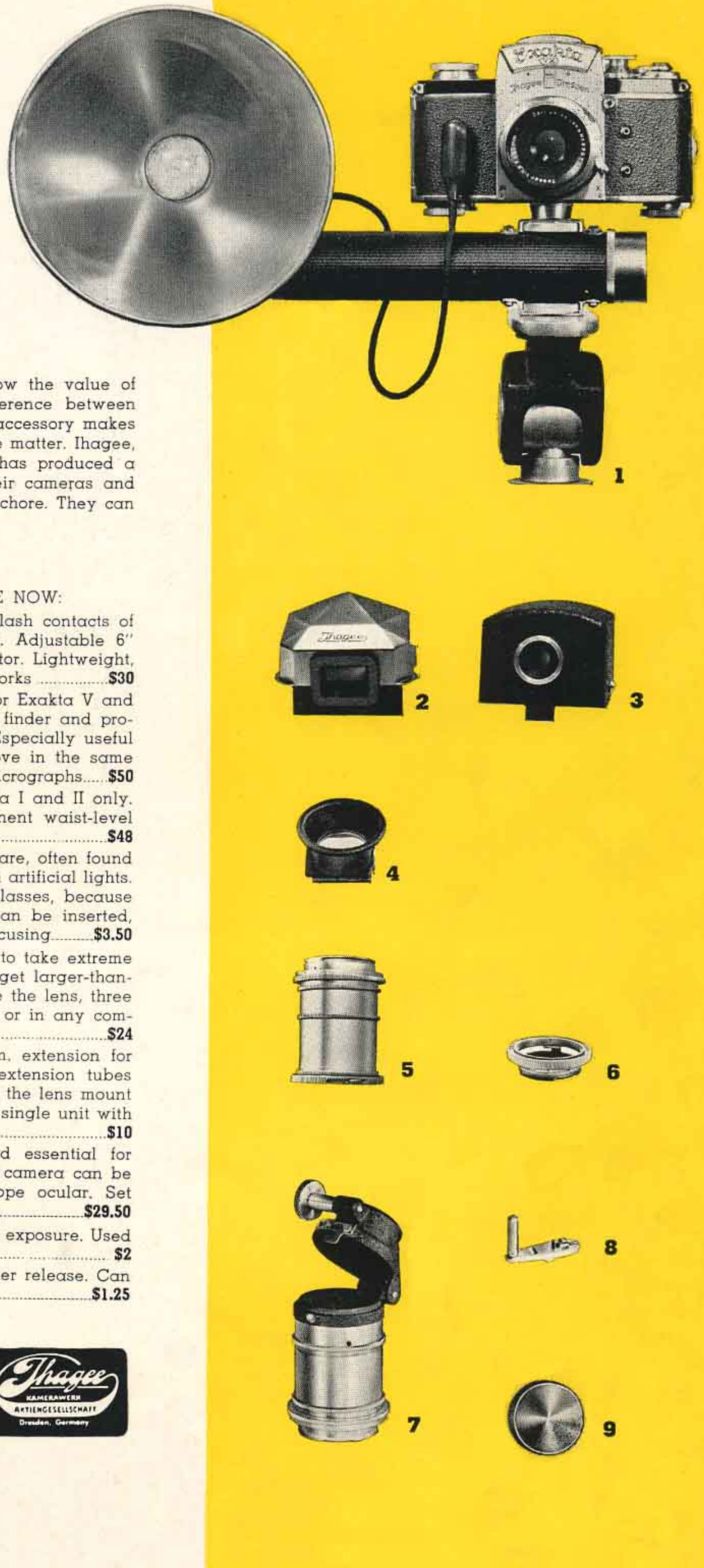
For great magnification, insert a low-power eyepiece into the eyepiece holder exactly as for visual use, but rack it out about an inch from the point of best visual focus. Then, again with no lens on the Exakta, explore the exit pupil of light emerging from the eyepiece by viewing the image through the camera's ground glass, using the built-in magnifier for critical focusing. You can locate the point of focus by moving the camera about. Then make the exposure in the usual manner. You have a choice of magnifications with this set-up, determined by how far out the eyepiece is racked, but limited partly by the inherent definition of the telescope and partly by the faintness of the image.

Exposure settings for pictures of the moon vary considerably, depending upon the type of film used. You should experiment freely with various kinds. I use both Super-XX and Kodachrome. A fast shutter speed is desirable. It is not advisable to shoot slower than ½-second because the motion of the object through the telescopic field, produced by the earth's rotation, will result in a blur. Speeds up to and sometimes exceeding 1/100 of a second can be used with fast panchromatic film. An exposure of the first quarter moon at 1/5 of a second with daylight type Kodachrome, at the prime focus, has produced good results.

Development of black-and-white film should be generous and a final print of somewhat greater than normal contrast should be sought. One of the speed-increasing developers (see *Poor Light, Fast Action*, page 2, *Exakta*, Winter 1950-51 issue) can be used successfully on pictures of fainter objects.

The moon is best photographed at or near one of the quarter stages, first or last. The full moon lacks the bold relief produced by the low sun on the moonscape. Nevertheless, it will produce a striking and unusual photograph, though not as rich in detail as when craters and mountain chains cast their long shadows across its desolate surface.

IHAGEE ACCESSORIES FOR EXAKTA



If you are a specialized photographer, you know the value of camera accessories. Often they mean the difference between success and failure in picture taking. The right accessory makes photography of the most difficult subject a simple matter. Ihagee, manufacturer of the Exakta and Exa cameras, has produced a series of accessories designed especially for their cameras and to make picture taking a pleasure rather than a chore. They can be examined at your local Exakta dealer.

THESE IHAGEE ACCESSORIES ARE AVAILABLE NOW:

1. Ihagee Flashgun. Plugs into built-in regular flash contacts of all 35-mm. Exaktas. Synchronizes at all speeds. Adjustable 6" reflector with mirror finish and built-in bulb ejector. Lightweight, extension outlet, takes all bulbs. Plug in and it works **$30**

2. Penta Prism eye-level, prismatic viewfinder. For Exakta V and VX only. Interchanges with camera's waist-level finder and provides an upright image with sides unreversed. Especially useful for sports photography, because camera can move in the same direction as action, and for close-ups and photomicrographs..... **$50**

3. Pentagon eye-level prismatic finder. For Exakta I and II only. Same as Penta Prism but attaches onto permanent waist-level finder of camera instead of replacing it..... **$48**

4. Eyepiece for Penta Prism. To eliminate side glare, often found in scientific photography and in photography with artificial lights. Especially useful for photographers who wear glasses, because a lens ground to camera owner's prescription can be inserted, eliminating the need for use of glasses during focusing..... **$3.50**

5. Extension tubes. For photographers who want to take extreme close-ups not possible with the lens alone and get larger-than-life-size pictures. Set includes an adapter to take the lens, three tubes of varying length that can be used singly or in any combination and an adapter to fit camera mount..... **$24**

6. 2-in-1 Adapter. Designed to provide the 5-mm. extension for close-ups that cannot be obtained with other extension tubes or adapter rings. The 2-in-1 Adapter incorporates the lens mount on one side and camera mount on the other as a single unit with a 5-mm. extension in between..... **$10**

7. Microscope Adapter. Especially designed and essential for photomicrography. Adapter is hinged so that the camera can be moved aside for critical focusing with microscope ocular. Set includes two extension tubes..... **$29.50**

8. Rewind Lever. For rapid rewinding of film after exposure. Used with Exakta I, II and V only..... **$2**

9. Giant Release Knob. For easy, non-shake shutter release. Can be used on all 35-mm. Exakta models..... **$1.25**

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