## AN INEXPENSIVE APPARATUS FOR PHOTOGRAPHING MOUNTED SPECIMENS

## JOHN M. KOLYER

## 55 Chimney Ridge Drive, Convent, New Jersey, U.S.A.

A considerable investment is required for a new, high-quality camera of small film size (e.g., 16 mm) with close-up lens attachment, or, alternatively, for a large, supported view camera with integral height adjustment and focusing devices. Photoflood lamps or, especially, an electronic flashgun, normally add to the expense. Therefore, the following procedure, which utilizes an inexpensive camera, requires no special lighting facilities, and gives excellent photographs, may be of interest to those who are not inclined to make a multihundred-dollar investment in photographic equipment.

The basis of the inexpensive arrangement to be described is the fact that a sharp image is obtained without a *very* expensive lens because the film size is large and the lens is stopped far down (aperture minimized). Brilliant illumination is unnecessary because the subject is motionless and the time exposure may be as long as needed.

The most expensive item in the apparatus shown in Fig. 1 was the camera, an old Watson Speed Press using  $4 - \times 5$ -inch cut film and equipped with a f/3.5 (range: f/3.5-f/32), 4 cm lens made by the Jos. Schneider Co., Germany. (The f-number represents the relation of the aperture to the focal length, i.e., f/32 means that the aperture is 1/32 of the focal length, which for this particular lens is about 14 cm.) This camera was purchased for \$35 in one of the many photographic shops in New York City, the main criteria for selection being that the shutter functioned for time exposures (all that is needed) and that the bellows was in good condition. The camera was mounted vertically, using a wooden frame as shown, so that the distance from the lens to the specimen could be adjusted from 9 inches, making the field of view  $3 \times 2\%$  inches and the magnification about 1.7 (a feature of this procedure is that contact prints are often suitable without necessity of enlargement), to 14 inches, making the field  $7 \times 5^{\frac{3}{4}}$  inches and the magnification about 0.7. The photo (*Papilio glaucus*, male, Aug. 23, 1964, Convent, New Jersey) shown in Fig. 2 was taken at a lens-subject distance of 11 inches.

The procedure is as follows. The subject, suitably in a Riker mount on cotton or black velvet as desired (the specimen shown was on cotton), is placed on the adjustable platform (a laboratory jack in this case but other arrangements may be designed). The glass over the specimen presses it



An inexpensive apparatus for photographing insect specimens.

flat and keeps it in the same focal plane; reflection of light from the glass did not constitute a problem, but the glass may be omitted, of course, if desired. Next, the two ordinary lamps (with 100 watt bulbs) are turned on (a certain amount of heat is produced, so the lamps are kept off between exposures), and the diaphragm is opened fully to make



Photograph of specimen in Riker Mount, taken by a method described in the text.

a bright image on the ground glass. After focusing by adjusting the height of the subject, the diaphragm is closed to f/32, a cut-film holder with Kodak Plus-X Pan sheet film ( $4 \times 5$  inches) is inserted, and a 30-second time exposure is made.

If one desires the film is easily developed at home (providing that a place of total darkness is available) by following the Kodak Company's instructions, with continuous, vigorous agitation during the development step. For printing, a contact print box with a 7.5 watt bulb is satisfactory; a contact (illumination) time of 25 seconds with Kodak Velox F-3 paper (which gives better contrast than the F-2 grade) was used for the picture shown, the Kodak instructions being followed. The prints are rolled onto a ferrotype plate and when they have been released (1.5–3 hours) are pressed flat on a blotter for further drying. Of course, the developing and printing may be assigned to a professional photographic service, but one may find that best results are achieved by doing the work, especially the printing, personally.