ENTOMOLOGY NOTES

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Drawing Insects Directly from a Stereo Microscope

Everyone interested in insects has, at one time or another, felt the need for some method of making an accurate drawing of what he observed through the microscope. Here is a simple method of "projecting" and "copying" accurate insect figures directly from a stereo microscope without the aid of a lucida or other specialized equipment. The optical principle involved is based on the binocular overlap of the normal vision.

Entire insect specimens, 5 mm or less, may be drawn in this manner, using a 30X objective lens. Lower power lenses will be needed for large specimens. With a bit of patience, the following procedure should produce excellent results even if you have never drawn an insect before.

Assuming you already have a stereo microscope, let us begin by swinging the body of the scope approximately 120 degrees on its axis to the right of the stage. Because the work area falls nearly on top of the stage area, the body would only be a hindrance in its normal position. Place the specimen on the right hand edge of a glass slide, which in turn is positioned on the right hand edge of a white sheet of paper. Now, peering through the right hand objective with the left eye, focus on and orient the specimen until either the entire specimen or the desired portion appears in the extreme right of the field (Fig. 1a). Make sure the specimen is on a plane parallel to the lens. A slight tilt or angle will result in a distorted, untrue image. Then take another sheet of white drawing paper and place it immediately to the right of the positioned specimen. The entire arrangement should appear as in Figure 1b.

Now, peer through the right hand objective with the left eye and at the white paper with the right. A perfect image of the specimen, enlarged to the size of the objective power, can now be seen on the paper. If a 30X objective is used, for example, the resulting figure will be enlarged 30 times on the paper.

A steady and fixed gaze should now be held on both specimen and paper while tracing the image as exactly as possible with a sharp pencil. After the basic sketch is made, it will be necessary to "tighten up" the drawing, i.e., correct and smooth out lines, fill in details, etc. This can be done best by making several progressively better tracings of the original sketch, all the while referring to the microscope for accuracy. The tracings, if made on good, transparent tracing paper, may be further enlarged for more detail if desired. Tracings may be enlarged with either an opaque projector or a photographic enlarger.

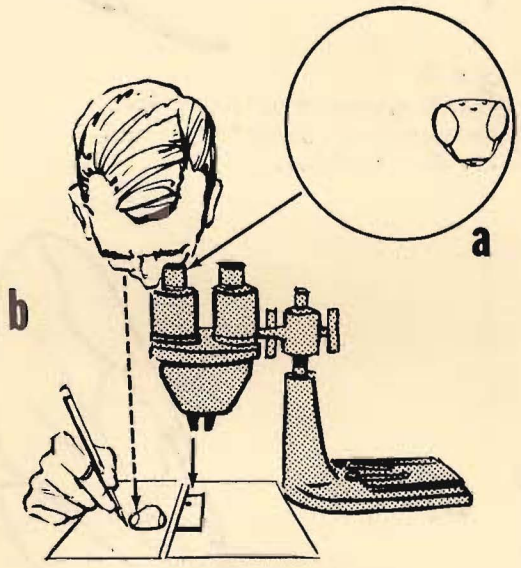

Figure 1. Set up used for drawing insects through the microscope. For explanation, see text.

Final renderings can be made in several ways, but a No. 1 Rapidograph pen, or a similar instrument, with India ink is good for most work. Figure 3 was rendered using this pen and is reduced from nearly twice the size shown. These items can be purchased at most art or drafting supply shops.

Figures 2 and 3 were reproduced using the eye projection method. Figure 2 is definitely too detailed for good identification of species; however, it may well be used as a representative of a genus or family. A more functional drawing appears in Figure 3. Here, economy of line and of visible details makes

it a better drawing scientificly and, for that reason, is most often used.

The "eye projection" method can also, with a little ingenuity, be used to make drawings from transparent slides. Light, transparent larvae can be made to stand out beautifully by placing the slide on black paper instead of white.

Regardless of one's ability to draw, with some patience and a simple line and stipple technique, combined with a steady hand, the entomological devotee can turn out some fine figures using the above method of projection.

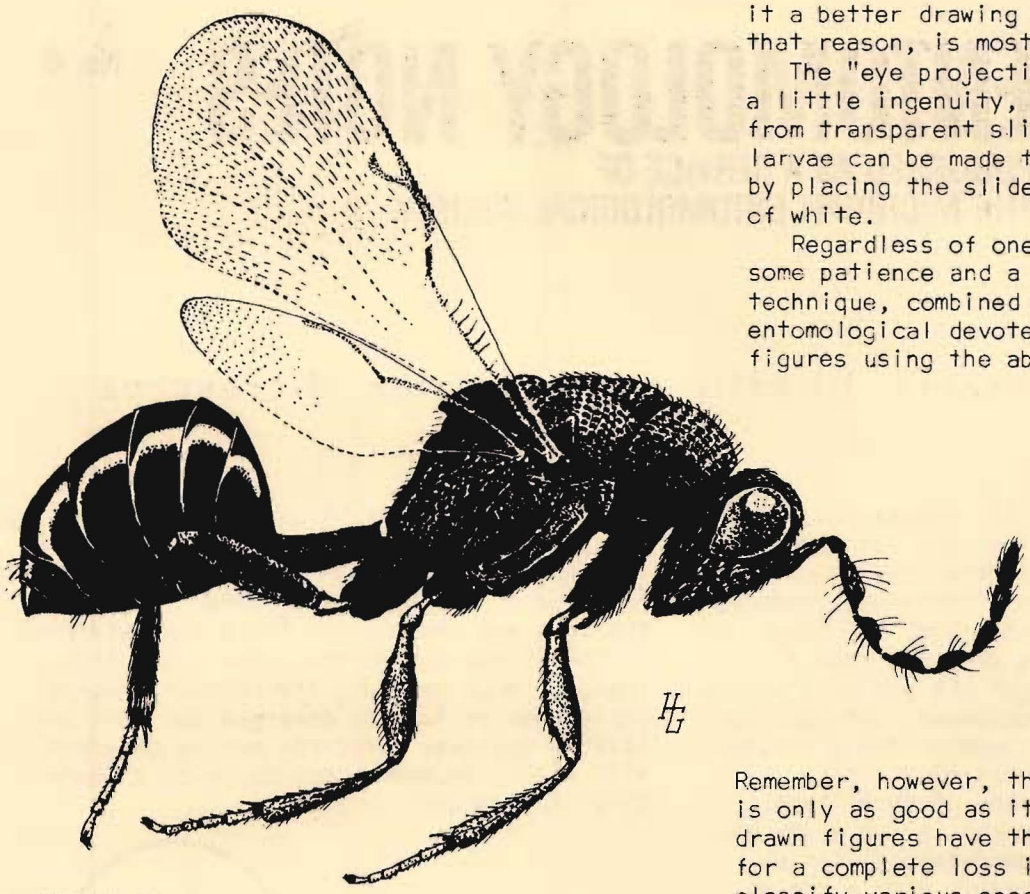

Figure 2.
A male *Eurytoma diastrophi* Walsh; a Hymenopterous parasite of the family Eurytomidae.

Remember, however, that a scientific drawing is only as good as it is accurate. Poorly drawn figures have thrown many an entomologist for a complete loss in attempting to name and classify various specimens. A figure must be rendered carefully and with a certain amount of pride in the knowledge that it is a permanent record of an elusive reality, being depended upon as a matter of fact by others in the same field of endeavor.

Confucius said, "One picture is worth a thousand words"--it is certain he would have considered a scientific drawing worth even more.

H. C. Gordinier, Jr.

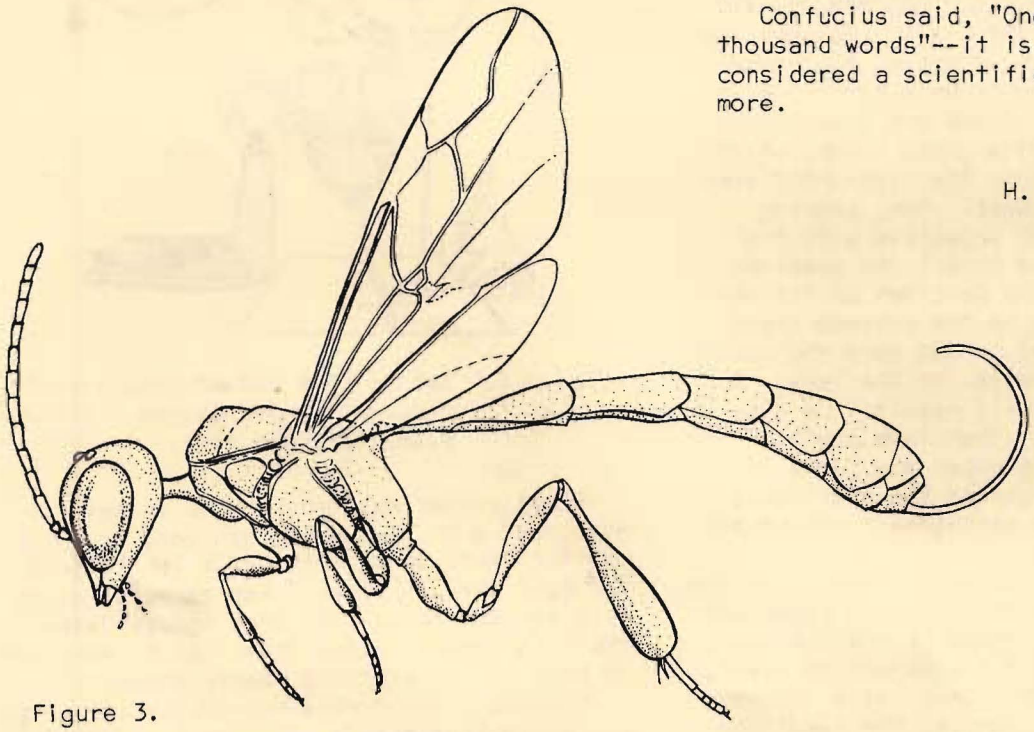

Figure 3.
A female hymenopterous parasite of the family Gasteruptiidae.