of his teachers, his parents, and the school administration.

Four of the students were interested in aquatic environmental biology. There were two aspects to this group's elective program:

1. The students functioned as "intern" executive directors of a large watershed association, the Green Valleys Association of Southeastern Pennsylvania. Halfred Wertz, Green Valleys' executive director, assisted the students in this capacity by allowing them to accompany him to pollution hearings, observe his work with school children in environmental studies, help him follow up pollution reports, and take part in other events that comprise an executive director's activities.

2. The students carried out a project of their own design, with technical assistance from their faculty adviser (the undersigned). This study was to relate occupational attitudes of people in a small, rural watershed to the way they use their land, and in turn to relate land-use to its effect on water quality. This was an original piece of work, and it has had a significant impact on the residents of the watershed.

The program designed by the four students was consistent with the intended goals of the Career Elective Program. In the true spirit of education, it allowed the students to discover, through direct participation, the realities of a career in aquatic ecology. Said Mrs. Marian D. Toth, Career Elective Program coordinator and the person responsible for initiating the program at Conestoga: "The students participating in the aquatic environmental biology program are pioneering an exciting, new educational concept. The merger of the school and the community expands the classroom into the world of reality. This project is an excellent example of the educational strategy we wish to encourage."

For more information on Conestoga's Career Elective Program write to Mrs. Toth at the address given below.

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MICROSCOPE SLIDE PREPARATIONS

S. I. Frommer (1972: "Time-saving Slide Mounts for Insect Wings," *Turtox News* 49 [3] :12) gives a nine-step procedure, using Diaphane, to mount insect wings. We believe there is an easier procedure, and it also has applications in other biologic studies. It uses water-soluble mountants. Permanently preserved and protected slides are obtained without the use of cover slips. The procedure is as follows:

Wash fixative from the insect with water; or use a freshly killed insect. Remove a wing from the insect. If it is a washed wing, simply place it on a microscope slide; if it is a freshly killed insect's wing, place in a drop of water on a slide. Blot excess water around the wing, but do not dry completely. Apply Slidemount or Stain 'N Slidemount (manufactured by Learning Things, Inc., Littleton, Mass. 01460). Lastly, set the specimen aside to dry.

Because these mountants are water-soluble, the small amount of water left under the wing will dissolve the mountant. We do not allow the wing to dry completely; thus we avoid air bubbles. Should bubbles occur, they may be moved to one side of the preparation with a needle and, when dry, removed with a razor blade.

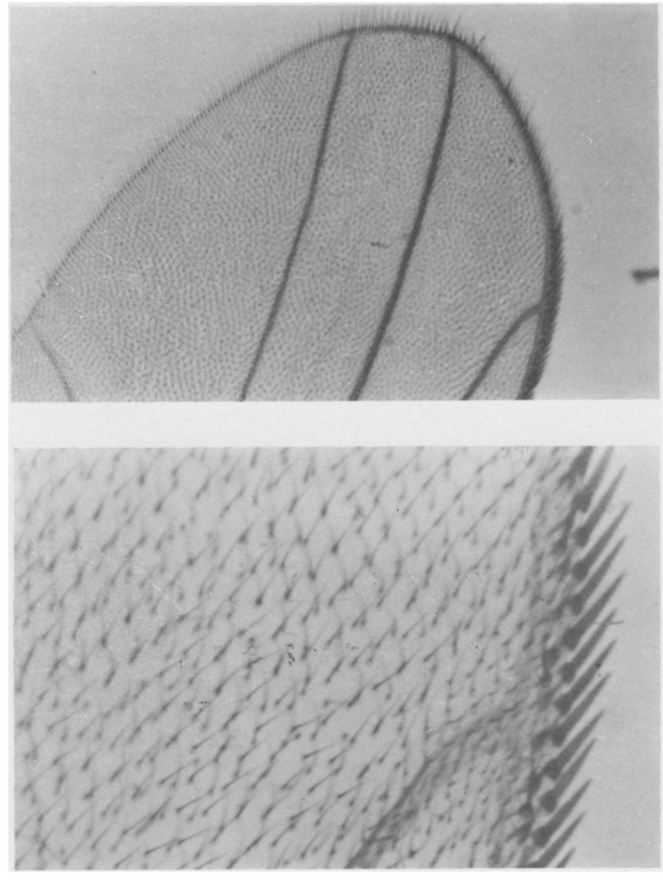
The mountants may be applied directly to the specimen. If a specimen floats to the surface of one of the mountants, place an additional drop on the specimen. Larger specimens may require additional layers of the medium, with drying between applications.

Because cover slips are not used, this technique is simple and is readily learned by inexperienced students.

The accompanying photomicrographs are of a *Drosophila* wing. Fly eyes and other organs may be treated similarly for permanent preservation.

These media are also useful for slowing a moving specimen. We use tropical fish embryos to show circulation and the development of the fish from the egg. The embryos remain alive in these mounting media for as long as 2 hours. Several other available water-soluble media do not support life.

Slides may be projected with projecting microscopes, including the carbon-arc projector. The prep-



Mount of fruit fly wing. Above, × 100; below, × 430.

arations are not harmed by the heat, nor do they boil, as conventionally mounted preparations sometimes do.

Early chick embryos may be mounted on polyvinyl chloride sheets for projection through a 35-mm projector. Several layers of the medium may have to be applied, depending on the size of the specimen; each layer is dried before the next is added. The sheets are then cut to fit a 35-mm slide-holder and projected.

The versatility of these mounting media is easily demonstrated with a wide variety of living things found in freshwater plankton. We have also successfully mounted fern spores, bread molds, tardigrades, sponge spicules, and frog parasites. Specimens such as fern sori are placed on a slide in a drop of water and thoroughly crushed to release the spores. The material is then partly dried. Either of the mountants is applied by forming a ring around the material and gradually filling in the ring. This prevents the specimen from moving ahead at the edge of the medium.

Specimens may be flushed from glass slides with water; or they may be lifted off with a razor blade and stored for future use. Plastic slides may be bent to pop off the specimen, which can be saved.

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RADIOISOTOPE DEMONSTRATION OF CARBON DIOXIDE UPTAKE

Every biology textbook discusses the role of radioactive tracers in the investigation of the biochemistry of photosynthesis. Demonstration of radioactive carbon (^{14}C) uptake by land plants involves the addition of an acid to a radioactive carbonate. Although this can be done in an enclosed chamber or under a hood, it is inconvenient, and there is some hazard that the released radioactive carbon dioxide ($^{14}CO_2$) may escape during the demonstration. In the procedure described here the inconvenience and the hazard are eliminated by the use of a water plant. The purpose of the procedure is to show that light is essential for the uptake of carbon dioxide in photosynthesis.

The main materials are a Geiger counter (preferably one with an end window tube) and a carbonate containing 50 μCi (microcuries) of ^{14}C. The latter is usually available from the supplier as sodium carbonate ($Na_2{}^{14}CO_3$) or barium carbonate ($Ba^{14}CO_3$). The quantity 50 μCi is that generally licensed for use by any teacher, with or without special training in the use of isotopes. The other materials are a water plant, such as *Elodea;* fingerbowls; and planchets.

To carry out the demonstration, first dissolve the 50 μCi of ^{14}C in 500 ml of distilled water. Pour equal amounts of the solution into fingerbowls—one labeled "light," the other "dark." Also, attach a "Caution" label to each bowl. Into each fingerbowl put a healthy sprig of *Elodea* or similar water plant. Cover the bowls with glass plates. Place one bowl in good light and the other in the dark for 12–24 hours. (The amount of time is not critical. One might modify this experiment to determine how soon after exposure to light the uptake can be detected.) At the conclusion of the time chosen, remove the plant and rinse it thoroughly in tap water, to wash off all external traces of the radioisotope. Flush this rinse water down the drain with plenty of tap water. Then, dry the plants completely. (This may be hastened by using a heat lamp.) After dessication, place the residue of each plant in a separate planchet and count with the Geiger counter.

The demonstration may be repeated a number of times, using the original solution.

To prepare radioautographs of treated plants, proceed through the rinsing stage but do not dry the plants; instead, enclose them in plastic wrap, press them, and place them in cassettes with no-screen x-ray film. Expose them overnight and then develop the films.

Comparison of plants placed in the light with those kept in the dark provides results that are spectacular and clear-cut. Further questions that students and teachers may wish to explore, using the above techniques, are the following:

1. How does the color, kind, or intensity of light affect the uptake of ^{14}C in *Elodea*?
2. In what plant part or parts is ^{14}C uptake greatest?
3. How is the age, maturity, or health of a plant related to ^{14}C uptake?
4. How is ^{14}C uptake affected by prolonged periods of dark before demonstration? By prolonged periods of light?

Normal precautions should be taken in disposing of the radioisotope. Dilute the radioactive solution with plenty of tap water and discard in the sewer. The radioactive plants should be incinerated, outdoors.

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A "CLOCK" FOR *DROSOPHILA* CROSSES

A hindrance to the use of the fruit fly *Drosophila melanogaster* in genetic studies is the need to obtain virgin females for the crosses. Collecting the virgin flies is particularly difficult in the high-school laboratory. One needs to separate males from females within 8–10 hours after eclosion (emergence from the pupa case), because after that time the females mate, and controlled crosses are no longer possible. While I was a graduate student at Purdue it was the task of the graduate assistants to keep the genetics laboratory open until 10 P.M. so that the students could separate the sexes in their stock bottles; then the