specimen is anesthetized in urethane. Then two or three drops of 1:2000 methylene blue should be injected into the body cavity at several points, until the worm is distended. After ten minutes the dorsal wall should be slit, the worm pinned out on a wax pad, and the digestive tract carefully removed. The nephrostomes, which have a special affinity for the stain, can be clearly seen *in situ* (Cole 1925, 1934b). Since a nephrostome projects through the anterior septum of the segment in which the bulk of the nephridium lies, it is difficult, in unstained specimens, to avoid tearing the nephrostome away from the rest of the nephridium. But, when the organ is stained by the method just described, there is little difficulty in making a complete dissection. The nephridium should be transferred to a slide and a coverglass applied. Features readily observable include the general form of the organ, the roundworms infesting it (Section 20), and the beating of the cilia covering the nephrostome.

(To be continued in February 1955 issue)

Postage Stamps and Biology Teaching

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Teachers must of necessity be constantly on the lookout for new and better methods of presenting learning materials to their students. Many unique and original ideas evolve in answer to this constant challenge. Recently, I encountered a method which, I am sure, is not only unique, but also adaptable and effective. This method involved the use of postage stamps as a teaching device in biology classes.

When I first observed stamps being used as a teaching device it was done as an individual project in a high school biology class. The class was studying the different areas of the world, and how the plants and animals in them differed. It soon developed that most of the students were aware only of the usual run of foreign animals, elephants, tigers, polar bears, and the like; thus their thinking in regards to the fauna of any region was distinctly stereotyped. One boy in the class, however, collected foreign stamps as a hobby and soon adapted this avocation to a project which greatly aided the teacher in correcting some ideas of the class, as well as influencing several other students in the class to take up this educational hobby.

The project, as completed, consisted of several ten by twenty inch cards each representing some region of the world. Displayed on these cards were neatly arranged stamps from one or more countries in that particular region. The stamps selected were ones depicting the animals of a given country. Since many countries have issued very attractive series along this line, a wide and representative cross-section was available for each region. The beautiful colors and pictures, combined as they were with samples of the native language, made the display an immediate hit with the students.

In this first project seven regions were represented: Australia, The Latin American Highlands, The Latin American Tropics, The Cold Northlands, The Old World Deserts, India and the Far East, and Africa South of the Sahara. In the lower left hand corner of the card a small world map was reproduced, and the countries represented on that particular chart were colored. After the stamps and pertinent information had been placed on the card the whole thing was covered with a sheet of cellophane. This protective measure made it possible for the students to pick up and examine at close range the individual cards without damaging or losing the stamps.

The novelty of this presentation method caused an appreciable increase in interest over more conventional methods of teaching this subject matter and, apparently as a result, the students seemed to have less difficulty in altering their preconceived notions to fit the facts. Retention, too, proved high, and once again proved the maxim that interest and learning go hand in hand.

Like any project, the benefit was not all on the part of the class. The student presenting these cards found a way in which he, normally a rather bashful student, could contribute to the class. This, and similar projects which followed on other phases of the course, seemed to develop in him a feeling of self-confidence and I am sure he gained much

prestige in the eyes of his classmates as a result of his very different type of project.

Perhaps the thing which most strongly recommends this type project, however, is its versatility. It lends itself not only to presenting the animal life of an area but also the plants, agriculture, landforms, culture, economic life and a whole host of other topics.

Adapting a Camera Lucida for Drawing by Microprojection

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In a previous issue of this journal the authors presented a method of constructing an easily made microprojector for use on a vertical microscope for drawing purposes.[1] The device consisted of two front-surfaced mirrors in a mailing tube, utilizing the periscopic principle for bending light rays from a microscope horizontally and then downward onto drawing paper. For many types of drawings this method of tracing projected images was easier than using a camera lucida.

The authors have incorporated a camera lucida in a similar type of microprojector which is even easier to construct than the previously described one. For those who possess a camera lucida, the only other materials needed are one front-surfaced mirror and a cardboard tube.

A cardboard tube was selected which would slide down over the ocular and the draw tube of the microscope. The one illustrated was from a mailing tube which had a metal end crimped to the ends of the cardboard for extra strength. This tube was notched to hold the mirror at a 45° angle over the top of the ocular. The notch was made by inserting a wooden rod into the tube for support while sawing part way through both the tube and the rod at a 45° angle. With the wooden rod in place, a ¾ inch drill was used to cut a hole in the wall of the tube to provide an outlet for the light beam reflected from the center of the mirror (Fig. 1).

The lower part of the tube was notched in such a manner that it could be pushed down over the ocular to rest on the top of the clamp of the camera lucida with the prism and filter portion of the camera lucida turned back out of the way, as shown in Fig. 1. The mirror should be almost in contact with the knurled rim of the ocular. Care must be taken to prevent the mirror surface from being marred.

The inside of the tube was painted with waterproof black drawing ink to reduce reflections. Black lacquer was used on the outside. After the photograph was made, black plastic electrical tape was used to seal the notch holding the mirror to reduce the entry of dust.

As shown in Fig. 2, another temporary mount for a front-surfaced mirror can be made by cutting a 45° angle slot in a short piece of thick-walled rubber tubing. Cellulose tape, as shown in the illustration, or a rubber band can be used to hold the tubing against the draw tube of the microscope with the slot just above the top of the ocular.

A 45° angle microprojection prism could be used in lieu of the two types of mirror mounts mentioned above, but mounted prisms are expensive and most of these cannot be clamped to the draw tube of the microscope while the camera lucida is clamped in place. An unmounted, silvered prism, obtainable from war surplus supply companies, can be used if a soft ring of rubber or other material is utilized to support the prism above the ocular in such a way as to prevent damage to the upper lens.

[1]Davis, L. R. and Bowman, G. W. An Easily Constructed Microprojector for Drawing Purposes, Amer. Biol. Teacher, Vol. 15 (6): 150-151, 1953.