

1964

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### Recommended Citation

Christensen, Cameron L. (1964) "Collection and Culture of Lower Animal Forms," *Iowa Science Teachers Journal*: Vol. 2 : No. 2 , Article 11.

Available at: <https://scholarworks.uni.edu/istj/vol2/iss2/11>

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# Collection and Culture of Lower Animal Forms

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The trend in secondary biology is to use living material in so far as it is possible. Biology instruction, as it



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has advanced beyond the descriptive level, has included more projects requiring living animals. The local collecting and culturing of some of these organisms adds just that much more biological experience to the course.

The common and most used method of collecting the less mobile aquatic organisms has been to obtain organic material from the bottom of a body of water. To find what has been collected, the debris was washed or scraped into a container of clean pond water. This method requires a great deal of work and time. The results are, at times, not too rewarding.

The collecting of "lower" aquatic organisms is made much easier by the placing of microscope slides or glass plates directly into the habitat of these animals. This can be accomplished by placing slides in an old slide box and weighting it so it can be submerged. In time, the organisms will attach themselves to the slides and can thus be studied directly without the need of being transferred several times.

This method is neither new nor was it developed by the author. It's use has never been wide-spread. Slide box collections have been used for many years by scientists at the Iowa Lakeside Laboratories and elsewhere for collections of aquatic insect larvae, hydra, sponges, and many of the less mobile protozoa. It is simple and fool-proof enough that students can do much of the collecting themselves. An interesting result is that the science

student becomes a scientist complete with research problems to be developed.

The advantage of having the students doing the collecting is two-fold. First, the pupil collecting, identifying and observing the life processes of organisms is carrying on scientific studies. The students tend to develop a scientific way of thinking and scientific attitudes as they record and write up their observations. Second, the idea that organisms such as suctoria, sponges and hydra are exotic creatures that must be imported from far away places does not form. The student thus develops confidence and interest in science as he finds he is able, with only limited knowledge to carry on scientific study in his own locality with a minimum of outside help. The



William Schmidt, biology instructor at Ellsworth Junior College, holds a slide box containing several pairs of glass slides. With the cover in place, and a weight attached, the entire assembly can be submerged for several days in a lake or stream. Examination of the slides after recovery reveals a large number of protozoa, green and blue-green algae, and diatoms.

following materials are needed:

1. Pails, buckets and cans.
2. A roll of strong cord.
3. Heavy objects suitable for weights (the

- city dump is full of such objects)
4. Slide cases\* (the slots must be widened so that two slides can be inserted in each one).

\*Suitable slide holders can be easily constructed in the school shop or home workshop.

If commercial slide boxes are to be used, the bottom should be taken out so that the current may carry through it. It is also advisable to nail the box as glue has a tendency to let



Tim Kleemeier, Dave Wheatley, and Lynn O'Leary, biology students from Rockwell City, recover a submerged slide case from North Twin Lake.



The slide case and the glass slides in it are placed in a container of lake water. In this way organisms attached to the slides can be transported to the study area or back to the classroom.

go. A hole drilled in the ends of the box will make it possible to attach the weight and a cord for supporting it upright in the water.

The preparation of the slide box from this point is simple. Secure about sixteen slides (eight pair) and with rubber bands, bind each pair tightly together. Next, place the eight pair into the slide box and hold them in place by use of more rubber bands. A strong cord of some length may be attached at one end of the box and the weight at the other.

Place the slide holder near the bottom of an open body of water. This may be a lake, pond, river or even a dredge ditch. Secure the retaining cord to any handy object: a tree limb, bridge or fence.

Leave the slides submerged for a



On-the-spot examinations of organisms collected by the slide box method, and by other means can be made in the field. The tail gate of a station wagon serves as a laboratory bench.

period of from one day to a week. If the time is too short, the organisms will not have attached themselves in sufficient numbers to study. If the time is too great, the slides will have accumulated so much sediment that nothing else can be observed. The time factor will have to be determined for each location.

Retrieve the slides in the holder and place in a container filled with

water from the same body of water. The shock of environment change is reduced by this procedure and the death rate is slower and not so great.

Place enough of the collected water to cover a slide in a petri dish and place the lower microscope slide of the exposed pair in the dish. The upper slide of the pair commonly has so much sediment affixed to it that little can be observed so it should be discarded.

The slide may now be observed with a hand lens, a wide field, or compound microscope. It is not advisable to submerge lenses into the water, but no apparent damage is evident if they are cleaned and dried immediately after use.

The use of slides for collecting will result in a great diversification of organisms. It is advisable to have a large number of keys available for student use. The book, *Taxonomic Keys To The Common Animals Of The North Central States*, by Eddy and Hodson will suffice in most cases. To limit the length of this paper only a few will be mentioned.

The "tested" Sarcodina and the Suctoria, classes of Protozoa, show up commonly on these slides. If spring studies are made, small fresh water sponges are in evidence but are sometimes difficult to recognize unless the observer is trained to recognize them. Should the slides be placed in shady slow-moving water green, brown, and black hydra can be found attached to the slides. Insect larvae will be found at times. The caddicefly in his self-built case draws student interest.

A check of the work listed in the references will offer culture methods for the more common organisms collected. Some are difficult or almost impossible to maintain for long periods of time.

#### 1. Sarcodina and Suctoria

Fill a gallon jar with pond water, containing some green plant material, and place the slides containing these protozoa at the bottom. This aquarium should be placed where it will receive light but never direct sunlight. The survival time under

these conditions ranges from one to two months.

#### 2. Fresh Water Sponges

There is no good method to maintain active cultures of sponges. They will last for a week or two if left in the water where they were collected or placed in a clean balanced aquaria.

The most accepted method to maintain hydra is in pond water containing green plants and a culture of *Daphnia*. Should a large number be collected they can be maintained with no consideration for three months by placing them in a small covered container of pond water on the bottom shelf of the refrigerator.

#### 4. Insect Larvae

They will grow and even develop to maturity in a well-balanced large (5 or more gallon) aquarium if *Daphnia* or other fresh-water crustaceans are present in sufficient number.

The collecting and culturing of aquatic organisms in high schools has often been neglected because of the large amount of time and effort needed, and the poor results obtained. It is hoped that this simpler and somewhat surer method will result in more diversified use of these organisms in secondary biology studies.

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The unsleeping eye of science also has discovered that neither the tapeworm nor the hookworm has a heart.

The largest infant ever born in this world is the calf of a blue whale. At birth, the whale calf measures up to 25 feet long and weighs several tons. In contrast, a polar bear cub weighs about a pound upon emergence from its mother, and can be cuddled in a woman's hand.