

Biological Appreciation—an appreciation of biological contributions, including current events, for avocational background.

By offering these new and varied courses we feel that the period of interest of biology students could be prolonged, and that many other students would become interested.

## THE BIOLOGY EXCHANGE IDEA

The establishment of a biology exchange service is one of the most interesting and educational activities that a biology club can undertake. The exchange idea allows boys and girls an outlet for a natural inclination to “swap” articles of all kinds.

One of the first projects to start after a club has decided to establish an exchange is to collect large quantities of local fauna and flora. The immediate project is to collect accurately labeled specimens in large numbers. The thought uppermost in collecting local material should be accuracy of data, specimen interest and conservation trends.

The data collected with each specimen should include exact location in terms of miles from a well established landmark. Jones farm is sufficient for local interest but “Jones farm” on the specimen record card should read three miles east and 1 mile south of Cherryvale school, Idabel, McCurtain County. These are termed “spot” locations and the range of an animal is often accurately mapped from such spot locations.

Specimen interest in its broadest sense should dominate field collecting. The animals or plants that do not interest one person or club might be the exact group wanted by another club. Interest in a particular group can usually be built up by systematic collecting designed to show

habitat relationships, genetic variations or other peculiarities. Rarity of a specimen in the local area can usually be overcome by specific exchange requests. The occurrence of a plant or animal within an area as determined by a check list does not guarantee that the local club will find that specimen.

### COLLECTING AND PRESERVING

The club, in preparing for a field collecting trip, sees that all supplies are ready and the carriers available. The type of equipment carried will depend upon the main objective of the trip.

In preparing data sheets to be recorded on the specimen card or index card in the museum, the club or trip manager sees to it that each collecting stop is a numbered station in the notes. After compiling the information for the card file the station number is all that is necessary to properly locate a given specimen. Field notes and remarks often prove very valuable in identification.

Special methods and techniques are employed for many animal groups. Most of the animals taken in the field can be preserved in formalin of five to eight per cent strength. Ethyl alcohol may be used for the same purpose. Opinion differs as to the best way of killing the animal to preserve it. It may be dropped directly into the formalin or chloroformed, or drowned. The latter technique has many advantages for reptiles and amphibians.

A specimen drowned in an air tight container has the advantage of being limp and flexible and easily handled. Amphibians and reptiles are injected or slits cut in the abdomen to allow the preserving fluid to penetrate the body cavities. Injection has the advantage of swelling the animal to normal size and giving a more natural appearance. The animal can then be pinned in any position and preserving fluid poured over it.

After several hours the animal is hard or set and can be moved without altering the shape in any way. Sometimes it is desirable to preserve a snake with its mouth open. This technique is easily performed by stuffing paper or cotton in the mouth until the desired shape is reached. Leave the packing in the mouth until the animal is "set" or hardened by the preserving fluid. The packing can then be removed and the mouth remains open showing teeth and tongue.

#### MAKING EXCHANGE CONTACTS

The club makes exchange contacts by writing letters directly to another club or by having some journal print a note concerning the desirability of exchange. The latter method is productive of the best results. The cooperation of the editors of the following journals is helpful, AMERICAN BIOLOGY TEACHER; *Turtos News*; *Nature Magazine* and *National Nature News*. Affiliation with Junior Academies of science in the state or membership in a national organization is also helpful.

#### SHIPPING

The exchange club will find it helpful to notify the receiving club well in advance when to expect their shipment. The shipment of course may go by express, freight or parcel post, depending upon the size and weight of the parcels. All shipments should be prepaid to the exchange club. In packing, glass jars should be well protected by paper or packing of some sort. The individual jars of the shipment will of necessity carry many different specimens. Each specimen should be given a tag that is numbered or named. The exact name corresponding to the number is forwarded by letter. Several specimens of each species should be included in the

shipment. However, only one specimen need be tagged. The receiving club should be told that their shipment is packed in formalin of five per cent or other grade used.

The shipment of live animals from one state to another should be avoided because of the danger of spreading diseases and parasites from one place to another. Further there are legal complications in such an activity.

#### CATALOGUING AND INDEXING

The exchange service of a club may be aided greatly by the "office" that it keeps. The club needs a means of indexing its own museum materials and having the information available at all times. In addition, the letters from incoming contacts must be answered, their needs noted, and shipment date determined from stock on hand.

An efficient way of doing this is to use an alphabetical index book and write the name of the club or individual under the alphabetical listing. The letter itself is filed in a vertical file folder numbered consecutively, according to their receiving date. Then at any instant the correspondence concerning a shipment can be located, a contact verified or needs determined.

#### VALUE OF AN EXCHANGE SERVICE

The immediate value of an exchange service to a club is apparent in the more alert and enthusiastic spirit of the club. All boys and girls in the club have an equal share in the activities of the club. The personalized contact with other boys and girls is educational and inspirational. There is a wholesome pleasure in helping in a scientific way other clubs to limit or extend the range of a species of plant or animal.

The field trips necessary to such a

project are an ideal place to teach techniques, conservation and biological principles.

Such a procedure followed over a period of years will build a systematic teaching museum more valuable to the students than purchased materials. There is always the personal association, geographical locations, people and places involved in a large collection.

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## RIP VAN WINKLE SCIENCE

Among recent articles, one which arouses the most intense interest and at the same time the most mingled feelings in this reader, is by Mr. Raymond F. Forbes, and appears in the May 1937 issue of *School Science and Mathematics*.

Mr. Forbes states that the school subject most worth while to him is the one which taught him how to think. This enabled him to solve many sorts of problems in his business. That course is the most valuable for anybody who can master it, as the ability to solve personal, business, or professional problems is the great thing. Every life is full of problems, if of little else.

Such a testimonial is most gratifying to a school teacher. In spite of the everlasting and widespread criticism of formal schooling, namely, that it crams facts, facts, facts, and more facts, and gives no training in the all-important ability to think, it seems that at least one pupil got the worth while thing out of the system.

Mr. Forbes describes the method of thinking, the steps taken in solving problems, the application to life. In his own words he describes in considerable

detail: the definition of the problem, the search for indication, the formulation of alternatives, the adoption of a hypothesis, the deduction, the proof, and the application;—clearly he describes the scientific method.

This also is very gratifying to a teacher of natural science, whose subject matter field predisposes him to agree with the proposition that the main if not the sole goal of education is or should be, the inculcation of "that attitude of mind, that habit of thought, which we call scientific."<sup>1</sup>

And now comes the jolt. The course which gives Mr. Forbes these inestimable values is not a course in science! It is the old cut-and-dried college entrance course in *plane geometry* with its carefully selected and predigested battery of artificial "originals." A comparative study of science and geometry texts shows that Mr. Forbes' experience indicates a general and not an exceptional condition. Plane geometry texts give practice in scientific method; science texts do not! A little further study discloses a text for English that portrays the scientific method far better than any science text of which I am aware!<sup>2</sup>

I suppose that others must attempt to teach scientific method since science teachers will not do so. But what a condition of affairs! Are science teachers natural-born Rip Van Winkles, or do laboratory smells deaden "the higher mental processes"?<sup>3</sup>

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<sup>1</sup> *How We Think*, by John Dewey, p. iii, Heath, 1910.

<sup>2</sup> *Using English*, Book Two, by L. B. Cook, Part One, Harcourt, Brace and Co., 1935.

<sup>3</sup> *Education as Cultivation of the Higher Mental Processes*, by Charles H. Judd, Macmillan, 1936.