

In the case of the Troy "pocossin," the notebook reveals—in the precise, but spidery script of the nineteenth century surveyor—that this un-farmed, largely un-cut area is just about the same today as it was over a hundred years ago. We read, "Chinkapin tree abt. 2° diam. N. 8 degr. E 4 chains 6 lnks. to small stream. Forest—Gum, wtr. oak, magnolya, willow. N. 5 degr. W up steep incline 8 chains 14 lnks. to large forked chestnut." In 1955 the chinquapins and the chestnuts are gone—victims of the chestnut blight, but magnolia, scrub oaks of various species, and "gums" still characterize the area. The frequent references to "chinkapin" and chestnut trees, however, attest to their relative abundance in times past. Armed with such data, how much more meaningful is the present descriptive study of the area! Indeed, if carefully done, a comparative study as outlined here would add a significant note to scientific knowledge, and might well be worthy of publication.

Another source, sometimes overlooked, is the large aerial photographs available at the county offices of the United States Department of Agriculture, which are used as base maps for soil surveys. These photographs may extend back twenty years or more. To a high school student, a twenty year old aerial photograph is like something out of ancient history. These aerial photographs may be used for tracing out an outline base-map of the study area. If there is a meandering stream or river within the area, however—or even a pond which is becoming filled in—the changes which can take place with respect to the position of the banks are sometimes little short of startling, even in a relatively short span of time. The photographs are quite clear. With the magnifying glass it is possible to locate single isolated trees, which can be used on the ground as reference points.

A comparative ecological study will yield many benefits to the students undertaking such a project. They will learn to use their own knowledge and resources, without recourse to previous studies or specific directions obtained from text material, and yet will be able to present results which are both interesting and significant.

A Terraced Laboratory

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Countless opinions and arguments concerning laboratory and lecture techniques have achieved much to direct attention and effort into improvement. The biological fields have been fortunate that trials and changes have taken a positive but conservative approach, rather than coining new terms which are supposed to herald profound innovations. Too many of these mutations are, under critical examination, only new exaggerations and are doomed to oblivion after the first appeal is exhausted.

In general whether it be the formal laboratory of Asa Gray or the working companionship of student and teacher so common during the beginning of the sciences, the fundamentals are similar. The laboratories are all basic in approach and the instruction has always been in the presence of materials. The only exclusion needed are those courses using a laboratory merely for titular needs.

The patterns of teaching in the biological science courses in colleges are more varied than in high school, but many colleges and most high school biology courses use a combination of discussion, discourse, investigation, and demonstration. With this pattern of combined techniques there has been little choice of rooms. Most teachers however, are aware of the advantage of conducting a lecture, discussion or demonstration where the students are elevated on steps.

At Montana State College the "Ohio State" method of teaching botany is employed. This method of teaching makes use of discussion, discourse, investigation and demonstration techniques in varying proportions during each period. For use in this course a trial laboratory with the student tables on raised platforms was established for use by four of the six sections.

The room was a small lecture room, which after conversion is a laboratory for 32 students. The alteration consisted of building 4 steps 5 feet wide with risers of 8 inches. The tables are 26 feet long, 18 inches wide, and 28 inches high. Electrical outlets are easily available for each student unit. The chairs have a single

tubular leg, a back, and are spaced with an isle of 18 inches between the back of the chairs and the next table.

The advantages of having the students elevated on steps for laboratory work was found to be even more important than steps in lecture rooms. An instructor can observe the activities of 32 students at all times with ease and the students can see demonstrations or the blackboard without the usual dodging and weaving to see around one or more persons in front of him.

Incidents to illustrate the ease in keeping in close contact with the class are many, but two that come to mind are: a request was made early in the course that the students examine slide number 1 under the low power of their microscope. The students started with their observation, but in looking over the room it was observed that one student was attempting to use the high power. In another exercise a number of plants were available for each group of two students for examination. The students were asked to remove a leaf from the geranium plant and tear the leaf in a prescribed manner for examination of the epidermis. The geranium on the instructors desk was pointed out for those not knowing the plant, but upon looking over the room two students were about to remove a leaf from a begonia plant.

To be certain a regrettable tendency of many is to let these students proceed and learn through wrong-doing. Such practice is time consuming and students should not be deserted for the sake of such discipline. Especially where it is important to keep the class together, the work can be facilitated greatly by having each student in full view as he works.

The fear of regimentation of students through unified class activities will be quickly dispelled upon seeing the class in action. There is no pressure to make specific or traditional conclusions. The materials should be examined simultaneously, but the latitude in examination and interpretation limitless.

After using the new laboratory for a period of 3 months, a decision was made by the instructional staff using the room that the advantages were important and an attempt should be made to convert another laboratory

used for beginning classes into a similar arrangement. Rooms used for single subject which employ the use of discussion, discourse, investigation and demonstration should receive remodelling consideration. The best opportunity comes, however, to those planning a new laboratory. The cost of the terraced laboratory will be very little more, but the effectiveness will be great.

Teachers Spearhead Conservation

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What are the teachers doing about conservation?

This question came to me while I was visiting in one of our great cities, with a population of a million or more people. While there I tried to locate somebody interested in what, to me at least, are the biggest problems of the day—land and water use, soil erosion, wildlife conservation, economy in the utilization of strategic materials, saving our national parks and wildlife refuges from exploitation, protection of our last remaining wilderness areas, etc., etc. You can complete the list!

I visited the museum of natural history in this city. Aside from some well-prepared exhibits illustrating the ecological and historical relations of some of the plants and animals, there was little evidence of interest in conservation. Indeed I was directly informed by one of the workers at the museum that there was nobody in the place who was particularly concerned.

I went to the biology department of a great university. There I met with some most estimable gentlemen, evidently of outstanding personality, competence, and capacity, but apparently so much absorbed in the training of premedics and a miscellaneous assortment of undergraduate students that they had little time for conservation. I toured the zoological garden, a wonderfully developed enterprise, with numbers of valuable specimens, splendid buildings and grounds, but no very direct conservation emphasis.