

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.

This was a bit discouraging, for I remember that, at the very time I was prowling around the city in question, the Dinosaur National Monument had been threatened with invasion and commercialization; that the Defense Department was trying its best to take over 11,700 acres of the Wichita Mountains Wildlife Refuge; that wilderness areas in Oregon and California were in danger of impairment or even elimination; and that grazing and mining interests in many places were pushing hard against the moderate restrictions set up by Congress to protect the interests of the general public.

Admittedly I did not make an exhaustive study of the local situation nor did I have time to canvass all those who may have been interested. From the silence of the newspapers on the subject, however, and some of the indications mentioned above, it seemed obvious that the local consciousness of what is happening to our country, conservation-wise, north, south, east, and west, was at least not very keenly developed!

And then, in my chip-on shoulder survey, I ran into an old colleague of mine formerly in the Biological Survey in Washington. We found ourselves in agreement on the conservation issues of the day, and enjoyed commiserating about the sad state of affairs and the widespread lack of interest in conservation problems of state.

"What about the teachers?" I asked my old colleague.

"Ah, there's a fine crowd," answered he. "They are really working and doing a fine job."

This was most edifying. Maybe we are getting away from the deadly dull bookish type of biology instruction as unrelated to life as a mausoleum. Perhaps we are improving in our demonstration to our pupils and the public that of all possible subjects in the curriculum, biology is the most vital and significant for the welfare of mankind.

About this time I could not help but be more than ever impressed with the opportunities, especially for biology teachers, to tackle a real job of reconditioning not only their pupils and students but also the community itself, in knowledge of the natural resources on which we all depend so completely.

With the terrific shift of populations from

the country to the city it is perfectly clear that the responsibilities and the opportunities of teachers at all levels are correspondingly increased.

Unless inspired teachers, outdoors minded, obsessed with the intimate and important interrelationships of animals (including man), plants and their surroundings, take occasion to breathe an appreciation of the outdoors into the thousands of ecological illiterates among the city children, and the adults too, our future will not only be less secure, but a whole lot less interesting!

In order to be qualified to impart the essential inspiration, all teachers should be campers and informed conservationists. All should supplement their background information in the natural sciences and related social sciences by special training in this field. Conservation workshops, fortunately, are springing up in various places. Additional courses in resources are cropping up in some of the colleges, and a number of our leading universities have organized departments of conservation.

Almost as I write this there has come to my desk a four page pamphlet, "California A-Flame" telling the story of forest fires in this state between August 27 and September 13, 1955. Fires, 436 in number, burned in the forest and watershed lands during this two week period.

"Visualize a 3-foot boardwalk 60,000 miles long—long enough to stretch twice around the world at the equator with some to spare." Such a boardwalk could be constructed with the timber that was burned in California forests during 15 days.

"The ability of all of the burned over lands to function properly as a watershed has been seriously impaired. Certainly homes, roads, orchard groves and other improvements lying in and below the burned areas will be subjected to an almost inestimable amount of damage from floods and erosion in the months and years ahead. The extent of this damage will depend on how fast the rains come and how fast a protective cover can be restored on the burned-over lands."

This is the kind of thing we face in the conservation field, indeed, in the business of living in our modern precarious world. What are we teachers, going to do about it? The business or other types of professional men will

never do the job; the farmers are not prepared for it; the sportsmen will help, but they will need assistance and sympathetic guidance; skilled and unskilled laborers cannot, in the nature of the case be counted on. The teachers seem to be *it*. By judicious preparation for

and leadership of a campaign of public education, in diplomatic cooperation with all the other groups mentioned, the teachers can make a larger and more significant contribution than ever before to man's vast future in the United States of America.

I Am the Science Teacher

JAMES R. IRVING*

Somewhere in America, today, I plant an idea that may well influence our civilization twenty, thirty, forty, fifty years from today . . . maybe, just a few years from now.

Somewhere in a classroom this morning or perhaps this afternoon in a laboratory, I am guiding a thought or a hand that will someday hold the surgeon's scalpel, the fate of a vicious disease in a test tube, our technological destiny . . . a world of nuclear power for mankind's edification and benefit.

Somewhere in a school, today, my own love for my subject might well cast a spark into the tinder of a boy's or girl's mind. He or she, too, will then reap the boundless satisfaction from examination and study of the world around them.

Somewhere in the quiet of my office, tired, after the day's work, the enthusiasm that I show—the answer that I give—could easily be the turning point in the life of that freckle-faced boy. For bad or for good . . . a life of contribution, or one of mere existence.

Somewhere among the laboratory benches of our nation's schools, as we look through the eyepiece of a microscope, confirm Ohm's law or watch the brilliant flash of magnesium ribbon, I alone am responsible for the degree of impact of these experiences upon the observer's mind . . . whether they care about it . . . whether they remember a part of it . . . whether it's just another "laboratory exercise."

Somewhere, today, in one of America's classrooms, I have the privilege of enhancing young people's awe and reverence for a Supreme Power—God—in whose image they are created. Mine is truly a magnificent and splendid work. For he who thrills to the wonders

of himself and the universe about him takes from that experience a greater reverence for Him.

Somewhere, today, I am guiding the learner's mind to the beautiful realization that scientific progress is evolutionary rather than revolutionary in character . . . that nuclear energy concepts of this moment began with Thales' observation 556 B.C. and before . . . that each searcher for the Truth slowly and laboriously adds his bit to the Log of Truth until periodically, one of us is given insight into the cumulative value of such isolated observations—and ways of the universe are changed overnight.

Somewhere, today, let me call attention to the actual feebleness of man's unaided senses . . . that we alone cannot see so many of the world's beauties with the eye; that much of God's music is never heard; that many times forces we cannot feel predestine our existence; that taste and smell are many times muted to our environment.

Somewhere, today and every day, mine is the constant thrill of having to completely change my own thinking because of a new discovery in the research laboratories of the world. Mine is the satisfaction of a dynamic teaching life—a mind constantly in quest of the Truth.

Somewhere, . . . maybe today or tomorrow, but sometime before they leave me—I must lead my students to an appreciation of the power of humility . . . an element as closely entwined with the science scholar's soul as the love of search itself.

Somewhere, today, boys and girls will love science.

I am the science teacher!

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