A Suggested Change in High School Laboratory Time

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The increased high school enrollment, consequent to the social and economic changes during the past two decades, has brought many new problems to educators. The attempts to solve these problems led to a closer examination, and in some cases a restatement of the aims of secondary education. This restatement of aims seems especially potent in the field of natural science.

Formerly high school science courses were thought of as opportunities for acquiring such rudimentary knowledge of a special field, with skill in the techniques and manipulation of apparatus as would be useful in college work. To afford such opportunity for the student the double laboratory period was established.

The change in the character and aims of high school students brought us classes whose members are far more interested in the application of scientific principles to the every day problems of life than they are in the verification of truth, the discovery of facts or the acquisition of skill and technique.

I wish to suggest a restatement of aims for Secondary School Biology and a change in method consistent with these aims.

The aims are:

1. To acquire an understanding of laws and principles manifested in living things.
2. To acquire an intelligent conception of biological terms in common use.
3. To give the student a lasting appreciation of and desire for the beautiful and interesting in his environment.
4. To cultivate a due appreciation of the sacrifices made and difficulties overcome by scientists in their efforts to combat disease and ignorance.
5. To instill respect for law and order and to recognize that every effect comes from a cause, and that if one furnishes a cause one must expect effects.
6. To stimulate a willingness to make some contribution to the enrichment of our surroundings and to biological knowledge.

We may find that changed economic and social conditions make desirable a change in both method and allotment of time for class work, but hesitate to break with the traditional procedure. This seemed to be my own state of mind until circumstances over which I had no control forced me to cover the high school biology course with one section of the class who could devote to this subject only five single periods a week.

In planning the work for the group I decided to require previous preparation for the laboratory period, assigning a definite project for each student. The students soon recognized the necessity for this previous prep-

aration and came to the laboratory with a definite idea of what they were to do and how it was to be done, thus avoiding the mechanical following of instructions.

The single period schedule gave opportunity for having the laboratory exercises at the time we wished in order to correlate these exercises with the subject for class discussion. This close correlation enabled us to initiate logical thinking based upon the operation of laws and principles manifest in living things.

The demonstration method seemed to offer the most economical and effective use of much of our laboratory time. We used diagrams, models, charts, slides, films and opaque pictures.

The quizzes which followed these demonstrations proved that the students had clear cut ideas of structure and that they were able to discuss the adaptations of the forms studied quite intelligently.

A lantern equipped for slides and opaque projection materials was an effective means of acquainting the students with many of the beautiful, interesting forms of life.

The National Geographic Magazine is an excellent supplement to text book material. For example, a beautifully illustrated article, "The Life and Work of the Honey Bee," used with the lantern during our study of beneficial insects, gave the class in one period a better conception and greater appreciation of the honey bee than could have been possible in twice that time spent in dissection and the study of specimens.

A film on the life and work of such men as Mendel, Pasteur and General Gorgas, conveyed a genuine appreciation of the sacrifices made by scientists in their efforts to make the world a better and happier place in which to live.

The care of a set of terraria, a balanced fresh water and salt water aquaria stimulated the members of the class to efforts which resulted in the establishment of aquaria and terraria in their homes.

The time saved from individual laboratory work made possible more field trips, visits to museums and parks. These excursions encouraged the students to make personal collections of insects, flowers, leaves, etc., and provided an interest in the study of such topics as seed distribution, forest preservation, protection of wild life and other related problems.

Good models obtained from standard biological dealers helped the students to visualize mitosis, root and leaf structures, etc., while the use of film strips obtained from the United States Department of Agriculture gave adequate conception of plant and animal diseases as they affect our social and economic life.

My experience with this group convinces me that in our present crowded high school courses, where we are expected only to reach an average, that the lecture demonstration method will accomplish our aims better in a single period than is possible in the double laboratory period where individual work is required.