

Life Sciences in American Schools

*Aim of life science courses
is to present modern knowledge
about biological sciences.*

A GENERATION ago it was nice to have a course in biology in high school. It was part of a general background and helped one appreciate the world in which we live. Biology was a cultural subject.

Today biology is an essential subject. Today's high school students are tomorrow's citizens and they will have to participate in the great debates and policy determinations in the areas of radiation and fallout, fluoridation, public health, group medicine, mental disease, agricultural surpluses, foreign aid, space travel, overpopulation, and many other biologically oriented social problems.

Some of these problems were unknown a generation ago and all have increased in urgency and importance. The biological literacy of our citizenry will not only affect our survival but is essential to the integrity of our society.

With regard to the biological sciences, the two major questions facing our

schools are whether we are offering (a) the right kind of biology and (b) enough biology. Answers to the first question, in conjunction with similar evaluations for other significant areas of the precollege curriculum, will largely determine the answers to the second question.

The Biological Sciences Curriculum Study is now involved in a careful investigation of this important first question.

Origins of the BSCS

For many years, unlike their colleagues in the fields of physics and chemistry, the biologists have not had a single strong central organization. Their professional activities were generally pursued through a great variety of small scientific societies centered around restricted disciplines, such as genetics, botany, herpetology, mycology, fisheries, plant pathology, and anatomy.

In 1948 a number of these independent societies, while still maintaining their separate identities, joined together to form the American Institute of Biological Sciences. The AIBS soon developed a

Arnold B. Grobman is director of the *Biological Sciences Curriculum Study*, American Institute of Biological Sciences, University of Colorado, Boulder.

number of programs that went beyond the activities the individual societies could attempt either separately or collectively. Early in its history and well before the era of satellites, the AIBS evinced great interest in biological education. One of its first successful ventures was the Visiting Biologists Program in which distinguished biologists visited small liberal arts colleges, where such a scientist was not in residence, and provided great intellectual stimulation for students and faculty. During the present academic year these biologists are visiting a number of secondary schools as well.

Another educational activity of the AIBS was the development of the secondary school film series being sponsored by the Ford Foundation. Under this program a tenth grade biology course is being put on film and will be available for nation-wide use in September 1960.

The most recent AIBS effort, and one with great potentiality for the improvement of biological education in America, is the Biological Sciences Curriculum Study. The BSCS began its operations in February 1959, with initial grants from the National Science Foundation totaling almost \$750,000. The Study is national in scope and has established headquarters on the campus of the University of Colorado in Boulder.¹

BSCS Organization

General policy of the Study is determined by a Steering Committee which consists of one or more persons representing the following categories: profes-

¹ The BSCS is publishing a periodic Newsletter. It may be obtained by writing to: The Director, Biological Sciences Curriculum Study, University of Colorado, Boulder.

sors of biology, high school biology teachers, science coordinators, science educators, state department personnel, medical and agricultural educators, and university administrators.

The largest single group on the Steering Committee consists of the professional biologists, for we believe that the design of a new curriculum in biology should depend heavily upon a solid knowledge of modern biology. Men working on the frontiers of the science have such knowledge. Chairman of the Steering Committee is Bentley Glass of the Department of Biology of Johns Hopkins University. The Study itself was organized by the AIBS Education Committee under the chairmanship of Oswald Tippo of the Department of Botany of Yale University.

The central office staff of the BSCS is small, since most of the work is being done by consultants and committees. The present major committees are: Content of the Curriculum, Innovations in Laboratory Instruction, Teacher Preparation, Gifted Students, and Publications.

Design of the Study

In a number of ways the design of the Study is different from that in physics at M.I.T. and the mathematics study centered at Yale University. The Physical Sciences Study Committee has produced an excellent single course for the secondary schools. The School Mathematics Study Group is developing a curriculum for grades seven through twelve. The biologists are interested in making recommendations about education in the life sciences over a broader area—from kindergarten through graduate and professional schools. They are also concerned with effective use of mass communications media for the biological education

of that great bulk of our population who will no longer be classroom students. Primary attention is being initially focused at the high school level, since this is considered to be the pivotal area in American education today.

The first question the committees are attempting to answer is a disarmingly simple one, "What knowledge about the life sciences should the average student have upon graduation from high school?" After the general parameters of this body of knowledge are defined, the working committees will begin to establish the factual and conceptual blocks of biology that should be introduced into the curriculum K through 12.

A dual approach is being used: by a committee concerned primarily with over-all content and by a committee interested specifically in laboratory presentation. It is planned that a writing conference will be held during the summer of 1960 to produce a sample textbook and laboratory manual which will subsequently be tested in about 20 centers throughout the United States involving, perhaps, 100 secondary school biology teachers and their students. The feedback from these teachers and students will be used to revise the sample text and manual during the summer of 1961. It is anticipated that preliminary editions can then be released for the academic year 1961-62. It is hoped that these will serve as models for independent textbook writers so that a great deal of flexibility will continue to be a feature of our educational system.

While this work is under way, careful studies will be made of the requirements for special categories of students, such as gifted students and college preparatory students. What will be done for them is not yet clear, for our present attention is focused on the initial course

that is being designed for the average student.

Help for Teachers

In order that such a new biology course (or courses) may be successfully taught, it is essential that teachers have opportunities to become substantially informed about the many modern developments in the life sciences. One way would be to make the new biology course, with appropriate background material, available at summer institutes. As a second method, we plan to provide very extensive commentaries for teachers along with the sample textbooks.

Still another approach that is being considered is the production of a series of monographs or review pamphlets, each of which would be written by an appropriate outstanding scholar and would be devoted to a single topic in the field of the life sciences. These pamphlets would be designed primarily for secondary school teachers; would be well illustrated and well documented. It is intended that they would be issued periodically and would be revised as new developments emerge in particular fields of study. In this way, a high school biology teacher could readily build up an effective library giving him depth in the subject matter he is teaching.

After these programs have been initiated, the BSCS will devote its attention to elementary and college levels.

At each instructional level the work of the BSCS will pass through two general phases. The first will require the greater contribution from professional biologists, for this phase will be the identification of the content of the curriculum which depends on an extensive knowledge of modern biology. The second phase will require the larger con-

tribution by secondary teachers (or elementary or college teachers according to the level) and educators, for they are far more experienced with presentation to their students.

A New Contribution

Why is such extensive support being given to such a serious effort in biological curriculum development when for many years there has been wide concern with the high school curriculum? A tremendous amount of work has already gone into the design of biological curricula at the high school level. Much of it is good, sound and solid. What is the justification, then, for this new effort? Is there a single important way in which the BSCS differs in its approach from these many independent studies that have been made over the years by high school faculty members, education faculty members, and state and urban education department staffs?

The unique contribution is that the

BSCS involves the active and cooperative participation of a large number of outstanding professional biologists who know the life sciences intimately through their firsthand investigations. These biologists bring to the new biology curriculum an exhaustive store of modern knowledge, overview and perspective that is available nowhere else in our society.

The potentialities for a great contribution become apparent because the curriculum will be devised by these scientists jointly with expert teachers, administrators and educators. I doubt if such an intensive cooperative effort could have developed in the intellectual climate that existed in America a short five years ago. The clear prospect is for a tremendous improvement in biological education in the United States. It now seems certain that this will be accomplished as part of a significant revolution in American education and not through substitution of curricula derived from totalitarian countries.

The Association for Childhood Education International

invites you to attend the

1960 ACEI Study Conference

April 17-21, 1960, Cleveland, Ohio

*Theme: **For Every Child—All That He Is Capable of Becoming***

For information write to ACEI headquarters:
1200 Fifteenth Street, N. W., Washington, 5, D. C.

Copyright © 1959 by the Association for Supervision and Curriculum Development. All rights reserved.