All Those In Favor

There is an important difference between the major bills for federal support of education now being considered by Congress and those that have been introduced in former years. In general—and of course there are exceptions—the major current bills emphasize improvement of quality, while earlier ones emphasized funds for school construction and for general purposes. Thus both the Administration bill and the Hill-Eliott bill (see analysis and comparison of these bills in Science, p. 389, 21 Feb. 1958) provide funds, in some cases with matching funds provided by the states, for the employment of additional teachers of science and mathematics or the improvement of salaries of teachers in these fields, for the employment of consultants or supervisors to improve teaching in science and mathematics, for help to teachers who wish to improve their knowledge of the subjects they are teaching, for the purchase of laboratory equipment, and for scholarships and fellowships for superior students.

Most of these provisions are of interest to the large number of scientists who are concerned with improving our educational system. Yet relatively few scientists have expressed their interest effectively as far as members of Congress are concerned. There are two easy explanations. First, only recently has general information concerning the major bills been widely available. Second, it is not the custom of the scientific community to "write to your Congressman." From the Congressman's standpoint, however, the lack of expression of interest means lack of interest. Members of Congress are quite ready to say that they depend to a considerable extent upon the voluntary expressions of interest and advice they receive from their constituents and that they find these expressions a useful guide in deciding what is desirable and what is wanted by the informed members of the public. In fact, several members of Congress have made it clear that they would like very much to receive more advice from persons who are well informed concerning educational and scientific matters.

At present, probably the most useful advice would concern general principles to be observed in legislation and the types of federal support that would be most desirable. There is not yet any bill ready for vote, and, for that matter, the bills that will be voted on have probably not yet been written. After the conclusion of hearings that are now being held, it is likely that the responsible committees will write new bills based upon those already submitted but modified on the basis of information and advice received during the hearings or in correspondence. When these bills have been written, it will be appropriate to express endorsement or criticism of specific bills or provisions of those bills.

The responsible committee in the Senate is the Committee on Labor and Public Welfare (Lister Hill, Ala.; James E. Murray, Mont.; Mathew M. Neely, W. Va.; John F. Kennedy, Mass.; Pat McNamara, Mich.; Wayne Morse, Ore.; Strom Thurmond, S.C.; H. Alexander Smith, N.J.; Irving M. Ives, N.Y.; William A. Purcell, Conn.; Barry Goldwater, Ariz.; Gordon Allott, Colo.; and John Sherman Cooper, Ky.), and in the House of Representatives, the Subcommittee on Education (Carl Elliott, Ala.; George S. McGovern, S.D.; Edith Green, Ore.; Stuyvesant Wainwright, N.Y.; and Donald W. Nicholson, Mass.). Letters, telegrams, or personal visits to any
of these committee members, and, indeed, to any member of either House, would be appropriate and helpful.

Decisions in science are reached by a somewhat different method from decisions in Congress; hence the rules of the "scientific game" are quite different from those of the "Congressional game." But it is Congress that will enact legislation affecting science and education, and it is Congress that writes the rules for deciding on the legislation to be enacted. One of those rules is that persons who have an informed interest in proposed legislation are expected to tell Congress what they want.—D. W.

National Library Week—16-22 March 1958

Wake up and read! is the slogan of a nationwide campaign to increase the reading of books which will reach its climax during National Library Week, 16–22 March 1958. Sponsored jointly by the American Library Association and the National Book Committee ("a society of citizens devoted to the use of good books" founded in 1954), the campaign will stress the joys and profits of better reading. The AAAS, NEA, and many other national educational, cultural, and technical organizations have heartily endorsed this undertaking. State and local committees everywhere are active in promoting library open house, special exhibits, programs, and a myriad of other events and activities to focus attention in two directions, on the great wealth of good books flowing regularly from the presses and on the underutilized, and often inadequate, library resources in the United States.

A 1955 Gallup poll disclosed that 61 percent of American adults had not read a book, other than the Bible, during the previous year and that only 17 percent of those interviewed were reading a book at the time of the survey. From other surveys we learn that America is only one-third as literate as Great Britain and only one-fifth as literate as Sweden, in terms of adult book reading. We are told that one-half of American adults live within a mile of a public library, but only one-fifth of them ever enter it. Among American college students the situation is equally unpromising, for the average reading of this group is one book a month, and it is reported that many find it possible to complete a college curriculum without any reading other than assigned textbooks. Is the fact that only 12 percent of the homes constructed during the past decade have built-in bookshelves a clue? We think it is.

Two conferences on the development of lifetime reading habits, one with reference to secondary education held in June 1954, and one with reference to college undergraduates held at the University of Michigan 21–22 February 1958, disclosed that an inquiring mind and permanent interests in reading usually are developed initially in the home and supplemented by the resources of the community library. While some "converts" may be made of nonreaders during high school and college days, the percentage is small. If there are few or no books at home, and if the community and school libraries (where they do exist) are unattractive, poor in book resources, and uninspired in administration, then there is no climate for the growth of the will-to-know and the development of a lifetime companionship with books.

The AAAS, in cooperation with the National Science Foundation, has operated since the fall of 1955 an experimental traveling high school science library to encourage collateral reading in science and mathematics by high school students so that their perspectives might thereby be broadened and their interest in science careers stimulated. This program and its booklist have been very popular. The proportion of science and mathematics books in the libraries of schools applying for the program usually is quite small, and often the few books available are out of date. In many instances the annual amount appropriated for school library books is no more than the sum necessary to replace lost or worn-out books.

Let National Library Week turn our attention to our home library situation, to the improvement of the facilities and resources of our school and community libraries, and to the unprecedented wealth of good books now in print in the United States which should be used more widely and effectively.—HILARY J. DEASON, AAAS.
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This is a microradiograph of a striped bass scale. In microradiography one passes low-voltage x-rays through a specimen to a special fine-grain photographic emulsion in intimate contact with it. The resulting photographic image then becomes a subject for conventional photographic enlargement or photomicrography. If you already know that much, there is then some point in requesting of Eastman Kodak Company, Special Sensitized Products Division, Rochester 4, N. Y., information about an improved material for this work which we hope to have available in the near future. The same source can also provide a recently updated bibliography on results and techniques with microradiography.

But don't ask us about striped bass and the lessons to be learned from their scales or their stripes. Ask the Fish and Wildlife Service of the U. S. Department of the Interior in Washington.

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tension Div., Univ. of Oklahoma, Norman.)
17-19. Association of Southeastern Biologists, annual, Tallahassee, Fla. (J. C. Dickinson, Jr., Dept. of Biology, Univ. of Florida, Gainesville.)
18. Iowa Acad. of Science, annual, Des Moines. (C. H. Lindahl, Dept. of Mathematics, Iowa State College, Ames.)
18-19. Arkansas Acad. of Science, annual, Little Rock. (L. F. Bailey, Botany Dept., Univ. of Arkansas, Fayetteville.)
19-23. Industrial Health Conf., Atlantic City, N.J. (IHC, Room 1313, 28 E. Jackson Blvd., Chicago 4, Ill.)
20-22. American Assoc. of Colleges of Pharmacy, annual, Los Angeles, Calif. (G. L. Webster, College of Pharmacy, Univ. of Illinois, 808 S. Wood St., Chicago, 12.)
20-23. Chemical Engineering Conf., Canada-United States, Montreal, Quebec, (H. R. L. Streight, DuPont Company of Canada, P.O. Box 660, Montreal.)
21-23. American Oil Chemists' Soc., Memphis, Tenn. (Mrs. L. R. Hawkins, AOCS, 35 E. Wacker Dr., Chicago 1, Ill.)

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LETTERS

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Training of Science Teachers

In the December issue of The Scientific Monthly [85, 320 (1957)], Fletcher G. Watson advances a plan for the training of science teachers that may be suitable for teachers of physical science but is very inadequate for prospective teachers of biology. He proposes that the "biology teacher" have general inorganic chemistry (with qualitative laboratory), organic and quantitative chemistry, mathematics through the calculus, and introductory and atomic physics, plus geology and astronomy and probably meteorology, but only one year of introductory biology plus a semester of vertebrate physiology and one of plant physiology.

It does not seem to bother Watson that his "biology teacher" will have no intensive courses in botany and zoology and interrelated fields other than the two years mentioned. It bothers me very much. He thinks "Geology is important for considerations of paleontology and evolution, while astronomy involves atomic and nuclear physics and the 'big questions' of cosmogony." One can hardly deprecate these aims, but surely it would be more useful for our "biology teacher" to be well informed with regard to plant and animal biology and the integrating disciplines, so that he might consider the "big questions" of biology.

Watson thinks "genetics, cytology, and biochemistry are desirable but might be delayed to a fifth year or summer school." He seems to think that these are less relevant to the preparation of a biology teacher than astronomy, atomic physics, or geology. He does not even mention microbiology, morphology, or taxonomy.

It is not uncommon for physical scientists to lack appreciation of the scope of the biological sciences, but it seems doubtful that many would plan so scant a biology major. The de-emphasis of biological science has been so consistently practiced that, in the popular mind, the biological sciences are seldom thought of when the word science is used. Biologists have been especially lax in correcting the imbalance, as well as in pointing out to their colleagues in the physical sciences that the biological sciences are at least as broad in scope and as detailed in depth as the physical sciences.
There are other phases of Watson's article that seem regrettable. For example, he argues against the "good solid major" in science for the secondary school teacher, for, among other things, "Already those with a strong but narrow major are too attractive to industry and the Government." Does this mean that he wants us to have teachers so ignorant that no one else will want them?

The attack on the "good solid major" and the repetitious invective against the "narrowly trained specialist" are of course not new, but more of the anti-intellectual propaganda that we have too long tolerated, and in consequence of which great damage has been done to the training of teachers and the education of our youth. It would seem to be the urgent responsibility of those who are concerned about the improvement of American education to reject the fallacious notion that a teacher can be too well educated in his subject and to insist that our teachers be more thoroughly and intensively trained in the fields that they are required to teach. We need teachers, at all levels, who can inculcate a real love of learning and an appreciation of the nature of knowledge, and who will inspire young minds to genuine scholarly activity and exploration of science. Such teachers will need more than survey courses in their chosen fields.

**Sydney S. Greenfield**  
*Rutgers University, Newark, New Jersey*

Sydney Greenfield's letter merits a reply because it illustrates the traditional position and line of argument taken for years by those in special areas of science. I had anticipated comparable complaints from the chemists, the physicists, and the earth scientists because I had proposed a training program with some balance among several fields. There seems to be an unwillingness to look realistically at the responsibilities of science teachers actually employed in the schools and at how they are to be "trained in the fields they are required to teach." Certainly it is easier to contend that the pattern of courses offered for a departmental major is necessarily the best possible preparation for teaching science than to look realistically at the task required of teachers (whether we like it or not) and attempt to prepare them for beginning this important work. With Greenfield's first four paragraphs I might agree, except for the obvious misquotation regarding my suggested program of study, during the four undergraduate years, for a potential teacher of biology and general science. The actual statement was: "The biology-general science major should include organic chemistry, which is essential to an understanding of modern biology. Atomic physics would also be helpful, for radioisotopes are playing an increasingly important role in biological investigations. Some instruction in
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