

## Questions of Science Literacy

### Addressed by Rutherford/AAAS

The state of science education in the United States has been targeted for special attention by the AAAS Board of Directors. Both the Board and the AAAS Council passed resolutions calling for a reverse in the decline of science education in this country. In addition, the theme for the 1982 Annual Meeting will be "Toward a National Commitment of Education Excellence in Science and Engineering for All Americans."

In February, F. James Rutherford, former assistant secretary of the U.S. Department of Education and previous assistant director for science education at the National Science Foundation, joined AAAS as adviser on science education to the Board of Directors.

In a conversation with Joan Wrather of the Office of Public Information, Rutherford described the science education situation and his role at AAAS.

\* \* \*

*Why has the AAAS decided to become more active in science education at this time?*

Mr. Carey, AAAS presidents, and the Board of Directors have become increasingly worried about the deteriorating state of affairs in science education throughout the country. They came to realize, as scientists, as educators, as concerned citizens, that at the very time in which the science education of all youngsters needs to be better than ever, if our preeminence as a scientific and technological nation is to be preserved, we are in fact allowing it to weaken dangerously. Students are permitted to take less and less science and mathematics, science textbooks are out-of-date, laboratory teaching equipment is worn out or obsolescent, there is a shortage of qualified secondary school science and math teachers, a shortage not likely to be made up since the universities are turning out very few new science teachers, national test scores continue to drop in science and mathematics, and so on.

It was in the light of this alarming picture that the Board concluded, as expressed in its recent resolution, that

somehow the AAAS must now engage itself more fully in helping to turn things around. The question that I was asked to address was, What can AAAS do to help get science education back on its feet again and keep it there?

*Are there areas within the field of science education where particular attention is needed?*

I agree with Allan Bromley that graduate education in science and mathematics in America is the match of any in the world, probably the best. It's less clear that that's true with undergraduate education. On the whole, we seem to do pretty well by science majors, but poorly when it comes to the mathematical and scientific education of nonspecialists. And in precollege levels it's altogether clear that our science education is very weak.

It seems to me that finding and sustaining solutions to our problems of economic productivity and military preparedness requires achieving a high level of scientific/technological literacy among decision-makers and workers. The existence of an elite, highly trained cadre of scientists and engineers is not sufficient. It takes a large number of well-educated people to operate a technology-based democratic society. We're simply failing to do that both quantitatively and qualitatively. My strong bias is that it's not career education that is our gravest problem, but the one of decreasing science literacy in the general population.

*Does the role for the AAAS change in light of the projected cuts in federal funding for science education?*

Such a retreat on the part of the federal government would make it more urgent than ever that AAAS provide national leadership in science education. In a society in which educational policymaking and the financial support of education is widely dispersed, it is extremely difficult to bring about change or to address national problems involving education. In science education matters,

AAAS is in a unique position, because of its nature, to provide some direction. It has resources, capabilities, and linkages that set it apart from all other institutions, public or private, national or local. And it has standing among a broad range of scientists and engineers, teachers, university administrators, legislators, government officers, the media, and, increasingly, the general public.

If government won't, then it's all the more important that AAAS take the lead in developing a national strategy for improving the science education of all Americans, and that it help mobilize the various scientific communities to get behind the effort.

*What do you intend to recommend to the Board?*

It is too early to answer that question. Mr. Carey and the Board have made it amply clear that they are interested in the long run health of science education and are not seeking a quick fix. My job is to work with the Board to formulate a plan of action that makes sense for the AAAS, that is imaginative in its approach to the problems that exist, and that the Association can stick with for the decade or longer that it takes for anything to have a lasting impact on our complex educational system. In the end, recommendations for action need to be based on what AAAS can do that is unique, on sound estimates of what human and other resources it has or can expect to marshal, and on an analysis of which aspects of "the science education problem" are most in need of reform and most likely to respond to AAAS efforts.

In the process of formulating strategies and proposing program options, I am consulting widely with leaders in the AAAS, the affiliated scientific societies, and the state academies. Also, the Board is anxious for me to seek ideas from science teachers, school administrators, museum directors, and others who have special interest in the quality of science learning. Many concerned individuals have written to me expressing their ideas on what the AAAS should (or should not) do. This is helpful and I would like to encourage more such communications.

Proceeding in this deliberate way will take somewhat longer than if we were simply to launch an attack on some of the known problems right away. Nevertheless, by taking the time to think this

## 1982 Exhibit

The AAAS Marketing Department invites members to recommend possible exhibitors for the 148th Annual Meeting & Exhibit to be held in Washington, D.C., 3-8 January 1982.

When you see something you think might interest other AAAS members, let us know. You'll find ideas in ads, brochures, and of course, at other exhibits. Whatever they are, wherever you find them, pass them on to us, and we will try to find out if an exhibit is available.

Please include the name of the company or agency, the product, and as much specific information as possible about whom we might contact regarding the item. Send recommendations to Steve Pike, marketing manager, at the AAAS address.

through carefully and to consult widely, we stand a much better chance of coming up with a plan that we can all get behind and *that will make a difference*. That's what the Board wants, and so do I.

## Energy and Health to Be Discussed in Berkeley

Energy independence is often cited as a goal for the United States. But what might be the costs, in terms of human health, of reaching this goal?

This will be the subject for the second 1981 AAAS Regional Energy Seminar, "Energy Independence: Consequences for Human Health," to be held 28-29 May in Berkeley, California.

There are implications for both human health and health care delivery systems of achieving energy independence through conservation and the increased development of domestic energy resources. What these implications might be, and the links between energy and health, will be addressed in two ways.

Present and possible strategies for achieving energy independence and their potential consequences for human health will be presented. This discussion will include scientific assessments of indoor air pollution; effects of energy conservation on special populations, such as the elderly; worker health; and health effects of traditional, nuclear, and nonconventional energy technologies.

In the second part of the program, participants will discuss how energy independence might affect the delivery of health care services. The particular needs of hospitals and other health care deliverers will be discussed by representatives from hospitals, health planning organizations, the energy industry, and health designers.

Featured speakers will include Honor-

able George E. Brown (D-Calif.); Edward Alpen, associate director, Lawrence Berkeley Laboratory; John Holden, Energy Resources Group, University of California, Berkeley; Warren Winkelstein, dean, School of Public Health, University of California, Berkeley; Judith Davenport, chair, Department of Social Work, University of Wyoming; Burt Kline, director, Division of Energy Policy and Programs, Bureau of Health Facilities, U.S. Department of Health and Human Services; Peter Brinckerhoff, executive director, West Central Illinois Health Systems Agency; and Michael Peevey, California Council for Environmental and Economic Balance.

Along with AAAS, cosponsors of the seminar, "Energy Independence: Consequences for Human Health," are the Western Center for Health Planning; American Lung Association of California; Bureau of Health Facilities, U.S. Department of Health and Human Services; California Energy Resources, Conservation and Development Commission; Intermountain Consortium for Energy; National Alliance for Energy Contingency Planning for Health Resources; School of Public Health, University of California, Berkeley; and Sigma Xi, the Scientific Research Society. The AAAS Regional Energy Seminar Series is supported by a grant from the U.S. Department of Energy.

The first 1981 AAAS Regional Energy Seminar, "Northeast Tribes and Communities: Energy Needs and Alternatives," will be held in Hanover, New Hampshire, 7-8 May (see *Science*, 3 April, pp. 36-37). It will focus on the energy needs and the technologies available to northeastern Native American tribes and communities. Major program areas will center on energy technologies and resources, planning and conflict resolution, and energy policy.

For further information on the AAAS Regional Energy Seminar Series, contact Patricia S. Curlin, senior program associate, at the AAAS address (telephone 202-467-4310).

## Short Courses at Pacific Division, Annual Meeting

The AAAS Office of Science Education has arranged two 1-day Short Courses in the Sciences, to be held in conjunction with the AAAS Pacific Division Annual Meeting in Eugene, Oregon. One course will be addressed to college and university science teachers, and the other course to secondary school science teachers. The purpose of the courses is to provide opportunities for teachers to update and enliven their classroom teaching with the spirit and findings of current research.

For college and university teachers:

"Passive Solar Heating of Energy Buildings: The Coming Revolution," George Tsongas, Engineering and Applied Science, Portland State University.

For secondary school teachers:

"The Eruption of Mount St. Helens: Causes and Effects," Michael Fiasca, Science Education, Portland State University; Thomas Benson, Earth Sciences, Portland State University; and Steve Carlson, Earth Sciences, Clackamas School District, Oregon.

Courses will be offered on 14 June from 9:30 a.m. until 4:30 p.m. at the University of Oregon at Eugene. Registration for each course is \$50. Each course will be limited to 30 participants; applications will be honored on a first-come, first-serve basis.

To register for a course, send a letter of application and check or money order to Joseph M. Dasbach, Office of Science Education at the AAAS address. Your letter should include name, address, telephone number, name of school, academic field, and the classes you teach. Make check or money order payable to American Association for the Advancement of Science (or AAAS).

Letter of application must reach AAAS by 1 June 1981. For further information write Joseph M. Dasbach or call 202-467-4464.

**For more information about the activities and publications described in AAAS News, write to the appropriate office, AAAS, 1776 Massachusetts Avenue, NW, Washington, D.C. 20036, unless otherwise indicated.**