

## Energy Seminars Look at New Federal Directions

The policies and priorities of the new Administration are central themes of the fall/winter regional energy seminars. The upcoming Boulder seminar will assess the consequences of commitment to a particular fuel source. In Atlanta last month, seminar participants discussed the more active role state and local governments now have in energy issues.

*Colorado.* Oil shale development is one of those energy subjects which almost inevitably sets off lively discussions. The technologies that will be used to exploit this energy source, and the effects of their development, are to be the focus of the last 1981 AAAS Regional Energy Seminar. "Western Oil Shale: Benefits, Risks, and Uncertainties," will be held 7 December at the University of Colorado's Memorial Center in Boulder.

Oil shale is found worldwide, with deposits in Colorado and Utah so extensive and rich they could supply the nation's oil for many years. But oil shale development has raised a host of complex technological, economic, environmental, and social issues. What are the opportunities and risks from the perspectives of the financial community, industrial developers, state and local governments, and the public? Are they worth taking? Are the technologies for use sufficiently developed? Would the potential benefits outweigh social and economic problems? Is the environment resilient enough to withstand the changes which would be brought about by oil shale development?

The seminar will address the three major reasons for disagreement concerning oil shale development.

1) Lack of information—some people are unaware of likely risks and benefits.

2) Lack of clear responsibility—who must accept risks and who will resolve problems? Community, state, regional, and federal officials often look to each other for solutions, while questions go unanswered.

3) Lack of communication—information is too often not available to interested decision-makers, scientists, and others.

The Boulder seminar will provide an information exchange among technical professionals, government policymak-

ers, private industry, and the public. The principal focus will be a preliminary assessment of the risks surrounding oil shale development, as perceived by the different parties at interest. Cooperating organizations for the seminar, along with the AAAS, are the National Conference of State Legislatures; Sigma Xi, the Scientific Research Society; and the University of Colorado at Boulder.

*Georgia.* Amid gloomy prospects for reduced federal support for meeting energy needs, a note of optimism was sounded at the recent AAAS regional energy seminar in Atlanta. "Georgia's Energy Future: Issues and Alternatives for Policymakers" examined the current energy situation and future development options for the Southeast, using Georgia as a case study.

Planning for the future and exploiting indigenous resources will enable the southeastern states to improve their prospects for energy development; that was the conclusion of the participants of the 1 and 2 October seminar held on the campus of the Georgia Institute of Technology.

Both keynote speakers, Maxine Savitz and E. Milton Bevington, cited energy conservation as the region's single greatest resource.

Savitz, deputy assistant secretary for conservation and renewable energy at the U.S. Department of Energy, considers energy savings "not easy" but "doable." Stressing that conservation resources are virtually untouched, Bevington, president of Servidyne Company, Inc., asserted that "America has the private initiative, imagination, and know-how to tap conservation reservoirs for profit."

Participants saw an opportunity for state and local governments to control their own energy futures with less Washington interference as a positive effect of new federal policies.

Representative T. W. Edwards, chairman of South Carolina's Joint Legislative Committee on Energy, stressed teamwork and cooperation among counties, states, and communities as new block grant programs replace categorical grants. He called for "communication and pooling of resources among the gov-

ernmental entities," as the best response to federal energy funding reductions.

The "iron triangle" of the bureaucracy, Congress, and beneficiaries of federal programs has operated without state and local representation, according to Christopher Warner, associate minority counsel of the U.S. House of Representatives Committee on Energy and Commerce. But he noted that "the new era for federal budget planning could mean more access to Congress for state and local governments and the public at large." Warner felt that given the flexibility to develop their own programs, the local administrators should look to private initiatives to meet their energy needs. Agreeing, Mayor Robert Drakeford of Carborro, North Carolina, urged local governments to call upon the private sector for innovative financing and conservation efforts.

In an energy profile of the region, Tom Wilbanks, associate director, Energy Division, Oak Ridge National Laboratory, pointed out that although the southeastern states are primarily energy importers, they are relatively well endowed with renewable energy resources, particularly biomass and other solar options.

The region has a large stake in solving the energy problem. One factor is that the electric utilities are big energy consumers. Residential consumption, adjusted for heating/cooling days, is actually higher in the Southeast than in the Northeast and Midwest. This is because the climate promotes a high use of air conditioning, the region has a large proportion of single family dwellings, and many residences lack adequate insulation.

Overall, the region currently has abundant electricity at a stable price because much electrical generation is produced by coal, for example, 85 percent in Georgia. It is, after all, noted Gerald Horton, vice president for public affairs at Georgia Power Company, economic realities and not federal policies that weigh most heavily in energy policymaking. He said it is a "paradoxical situation that now when there is strong government support for the nuclear option, no new nuclear plants have been ordered (since 1980) because costs are prohibitive."

Cosponsors, along with the AAAS, were Atlanta University; the Fernbank Science Center; Georgia Institute of Technology; Georgia Office of Energy Resources; and Sigma Xi, the Scientific Research Society.

The AAAS Regional Energy Seminar Series is funded in part by a grant from the U.S. Department of Energy.

For further information, contact Patricia S. Curlin, program administrator, Regional Energy Seminars, at the AAAS address, 202-467-4310.

## Arthur Livermore Announces Retirement

In 1963 Arthur H. Livermore took a 1-year leave of absence from Reed College to help the AAAS design the study program "Science—A Process Approach." Now, 18 years later, Livermore is retiring as head of the AAAS Office of Science Education.

During this time, Livermore has seen the Association's involvement in issues of science education grow to include a wide range of activities.

Livermore's interest in curriculum development was sparked when he served as co-director of the Chemical Bond Approach (CBA), one of the earliest efforts made at improving science curricula. The CBA conceived a prototype high school chemistry course.

"Science—A Process Approach," was originally tested in 11 school systems around the country. At last count the program had been used by approximately 7 million schoolchildren.

That study program was one of the projects guided by the AAAS Commission on Science Education (1962–1974). As deputy director of education at AAAS, Livermore worked closely with the Commission as it assessed the status and needs of science education in the United States. With funding from the National Science Foundation (NSF), the Commission was established to direct programs and develop materials designed to improve science instruction and the education of science teachers. It developed a clearinghouse on science curricula and prepared guidelines for teacher preparation in elementary and secondary science and mathematics. The Commission also passed, in 1972, a resolution urging that creationism not be taught as science in any school system. (The AAAS Board of Directors and Council also passed similar resolutions in 1972.)

Another AAAS/NSF effort to improve the quality of science teaching has been



Arthur Livermore

the Chautauqua Short Courses for Science Teachers. Since its inception in 1970, under the direction of then Education Office head John R. Mayor, Livermore has worked closely with the Chautauqua program. These courses, for college-level science teachers, are aimed at enabling participants to keep up-to-date on current research in the sciences. Livermore's involvement with the program has centered on identifying and including outstanding men and women from a broad range of scientific disciplines as Chautauqua lecturers. Approximately 3000 college teachers took Chautauqua courses during the 1980–81 academic year.

In addition to improving the teaching of science, Livermore has long been interested in making science entertaining and accessible to young people. From 1956–59 he hosted a biweekly television program, "Secrets in Science," for junior high school students in Portland, Oregon. In recent years this concern has resulted in increasing participation of junior and senior high school students at the AAAS Annual Meeting. Beginning with the Boston meeting in 1976, Youth Symposia, Conversations with Scientists, and presentations of student papers from the junior academies of science have drawn several thousand young people to the Association's meetings. He has also administered the small student research grants which the AAAS makes available through the state academies of science.

Science education at AAAS has reflected Livermore's international interests as well. He has conducted workshops and seminars on elementary and secondary school science and mathematics in Argentina, Chile, Israel, Japan, the Philippines, and West Germany.

In 1971, at the request of the U.S. Department of State, Livermore went to Penang, Malaysia, to serve as training adviser to the Regional Center for Education in Science and Mathematics. There, elementary science and mathematics educators from eight Asian countries explored the latest developments in

their fields and in teaching techniques. They then passed along these developments and techniques to other educators in their home countries.

Another international initiative was the exchange of scholars with the Znanie Society of the Soviet Union. This program, which Livermore directed from 1973 to 1980, allowed outstanding scientists to lecture at several universities in the host country. Experts from a broad range of disciplines visited between the two countries during the program.

Most recently, the Chinese have become involved in AAAS science education programs. This past spring, symposiums on microcomputers and atmospheric science were conducted in the People's Republic of China, after the Chinese had indicated their particular interest in these subjects. Livermore helped to organize the groups and served as a consultant to the China Association of Science and Technology while in Beijing and Shanghai.

Livermore has long served as the Association's resident expert on Japan. In 1965 he edited the AAAS symposium volume, *Science in Japan*. This interest has continued, and in 1979 he was co-organizer of the joint United States/Japan Seminar on Science and Society, in Honolulu.

Livermore's retirement does not signal his withdrawal from science education activities. In addition to being a consultant to the AAAS, he serves as science adviser and lecturer at the Washington (D.C.) International School, adjunct professor at the University of West Virginia, and chair of the Governmental Affairs Committee of the American Institute of Chemists.

## Nomination of AAAS Fellows Invited

The AAAS Executive Office invites groups of three Fellows to nominate AAAS members for fellowship, provided that in each instance at least one of the three sponsors is not affiliated with the institution of the nominee. In order to be considered in 1982, nominations must be submitted no later than 5 March. Nomination forms should be requested from the Executive Office at the AAAS address.

A Fellow is defined as "a Member whose efforts on behalf of the advancement of science or its applications are scientifically or socially distinguished." Examples of areas in which nominees may have made significant contributions