Report to the Association—1973

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Governance and Public Affairs

Last November some 440 candidates stood for election in what, I am sure, was the largest and most complicated election in Association history. With the election of the present Council, the Association has changed from government by appointed representatives to government by elected representatives, and the effect of this change in the years ahead I can only believe will be profound. Some 250 persons were elected to office by the membership at large, by the electorates, or by the section committees. Dr. Margaret Mead, curator emeritus of ethnology at the American Museum of Natural History and adjunct professor of anthropology at Columbia University, was elected to the post of president-elect. Dr. Ruth M. Davis, director of the Institute for Computer Sciences and Technology of the National Bureau of Standards, and Dr. Chauncey Starr, president of the Electric Power Research Institute, were elected to the Board of Directors.

At its March meeting, the Board adopted a policy of not accepting position-available ads for *Science* from foreign employers who discriminate on grounds that would not be allowed for U.S. employers. Ads from any source that indicate a preference based on religion, sex, race, or national origin are also not acceptable. At the same meeting, the Board agreed that no official activities would be scheduled at the Cosmos Club since women at present are not eligible for membership.

Dr. Edward E. David, Jr., vice president for research, development and planning at Gould, Inc., Chicago, was elected by the Board to fill Dr. Daniel P. Moynihan's unexpired term on the Board. Dr. Moynihan's resignation came as a result of his appointment as U.S. ambassador to India.

At its June meeting in Mexico City, the Board's discussion was turned to the grave concern felt in the scientific community for the dissolution of the President's Science Advisory Committee and Office of Science and Technology and the alienation of the Office of the President from the scientific and technological community that this action implied. It was the strong view of the Board that AAAS should undertake initiatives of an informal nature directed toward facilitating communication between scientists and government leaders. Accordingly, during the fall, several very fruitful conversations were held with Mr. John Sawhill, associate director of the Office of Management and Budget for Natural Resources, Energy and Science. At the same time, Dr. Leonard M. Rieser and Dr. Abelson, in his capacity as president of the American Geophysical Union, took an active role in the newly formed Committee of Scientific Society Presidents. The latter organization has undertaken discussions recently with Vice President Ford and in the future expects to have discussions with other government leaders. Its purpose is to recommend formal organizational mechanisms that will increase the effective contribution of scientists and engineers to the formulation of national policy.

At its December meeting, the Board of Directors, after a series of discussions with representatives of the American Bar Association, voted unanimously to accept the invitation of that organization to jointly conduct a permanent National Conference on Science, Technology, and the Law. The Conference (a committee) will concern itself with long-range policy issues in which the perspectives of scientists, engineers, and lawyers converge.

Communications and the Public Understanding of Science

The three AAAS books which have most recently appeared represent an evolution in the style and direction of the Association's publication program. *Separation and Depression*, which deals with the experimental and clinical literature on a significant medical problem, is based on a symposium held at the Chicago annual meeting and represents the long tradition of scholarly books published by the Association. *The Maturing of American Science*, an intellectual history of modern American science as seen through a selection of AAAS presidential addresses, was specifically prepared by Professor Robert Kargon of the Johns Hopkins University to commemorate the Association's 125th anniversary. *Energy and the Future*, by Allen Hammond, William Metz, and Thomas Maugh, based on a widely read series in *Science*, presents a clear exposition of the technical dimensions of the problem of how energy needs may be met in the future. Introduced first in August, its second printing of 10,000 copies is almost exhausted and a third printing has been ordered. This represents a new kind of printing venture for AAAS —a highly readable, technically competent book for a broad audience —and one of potentially great public usefulness. A highly successful experiment, it may well be the first of a series of such volumes dealing with the fundamental aspects of topics that are both timely and of wide social significance, and could set the style for the AAAS publications program. A similar volume on cancer is currently under discussion.

Urbanization in Desert Areas, which was brought out last summer by another publisher, was prepared by the Committee on Arid Lands.

A massive study, *Electric Power Consumption and Human Welfare*, was completed by a task force commissioned by the Committee on Environmental Alterations and directed by the Committee's chairman, Professor Barry Commoner. Arrangements for publication are under way.

The audiotape program continues to be well received. The tapes produced at the Washington meeting have had a brisk sale and *Speaking of Science*, volume I, issued in mid-1972, and *Speaking of Science*, volume II, issued last spring, have attracted very favorable attention. The latter are half-hour conversations between distinguished scientists and science journalists on a wide range of topics. Volume III of *Speaking of Science* has now been issued and *Energy: A Dialogue*, designed to complement *Energy and the Future*, shares the appeal of the book. Three new projects are under consideration: observations by Nobel laureates concerning science and scientists; a series

on cancer; and highlights from the recent meetings, held in Washington, of the International Union of Pure and Applied Physics.

Science Books, the Association's book review journal for science teachers and science librarians, has both increased the scope of its coverage and introduced special editorial material. All composition is now handled by computer, making retrieval of editorial material for inclusion in *Science Book List* and *Science Book Lists for Children*, the Association's periodically issued bibliographic source books, substantially easier. *Science for Society: A Bibliography*, now in its fourth annual edition, continues to attract the favorable attention of teachers and students, and its volume of distribution is building.

The staff of the Research News Department of *Science* has been brought to full strength and research news has become a fully established section of the magazine. A wide range of production and manufacturing changes, including new methods of composition and printing, are being attempted with a view toward greater efficiency and economy in the printing of *Science*.

A special publication, *Community Information Expositions*, which is based on "Capital City Readout," an experiment in exposition communication on social and environmental issues carried out in the context of the 1972 Washington meeting, was prepared under a grant from the National Science Foundation. This document has created wide interest throughout the country, especially because of increased involvement at the community level with expositions in connection with the forthcoming bicentennial year.

AAAS has been involved in television since the late 1960's, first in connection with the annual meeting and more recently in collaboration with the professional staff of WGBH, Boston, headed by Michael Ambrosino, a widely experienced and talented producer. NOVA, a new series of 13 one-hour science programs, was developed by WGBH, with help in planning from AAAS, for airing in the spring of 1974. Funding in the amount of $1.25 million was provided by the Corporation for Public Broadcasting, the Carnegie Corporation of New York, the National Science Foundation, and Polaroid to underwrite this series. Topics include the Colorado River, the development of anesthesia, the origins of life, and whales, dolphins and men. Financial assistance from the National Science Foundation and the Rockefeller Foundation made possible the Association's role in this collaborative experiment.

Science, Education, and Community Service

Science: A Process Approach, the Association's curriculum for the teaching of science at the elementary grade level, is now used with some 3 million children throughout the nation. The first major revision is nearing completion and is being tested in selected school systems. It will be produced and distributed commercially by Ginn and Company, the Educational Publication Division of the Xerox Corporation. The Association's contract with Xerox provides not only for royalties but also for a fund from which to finance present and future revisions.

The Commission on Science Education has initiated a program of developing and trying out instructional modules for use in science teaching at the secondary level. And, along with the Office of Opportunities in Science, it is exploring with the American Personnel and Guidance Association possibilities of carrying out a joint program oriented toward career counseling in science.

The program of Chautauqua-type Short Courses for College Teachers of science and mathematics, funded by the National Science Foundation and now in its fifth year, has continued to win high praise from its participants. It is now the ambition of the staff to extend it beyond its present 12 field centers to some 18.

The Association's long-standing program of spring and fall seminars for members of Congress, selected legislative staff members, and science attachés of foreign governments has been complemented by the inauguration of a program of congressional fellowships for young scientists and engineers, which has been enthusiastically received by members of Congress. Under the joint auspices of AAAS, the American Physical Society, and the Institute of Electrical and Electronic Engineers, with AAAS responsible for overall management, the program last year enrolled six fellows. They have received the following appointments and have entered fully into the work of their host office or committee: Dr. Benjamin Cooper, Senate Interior Committee; Dr. Ronald Larson, House Committee on Science and Astronautics; Mr. Elliot Segal, Senator Magnuson's office; Dr. Michael Telson, Senate Interior Committee; Dr. Jessica Tuchman, Subcommittee on the Environment, House Committee on Interior and Insular Affairs; and Dr. N. Richard Werthamer, Congressman Mosher's office.

To date, fellows have taken significant roles in the preparation of several staff studies, including one on energy resources and another on health care delivery. The significance of the fellowship program is conveyed by a comment made by a leading member of Congress: "The present fellows have been serving in Congress for only a few months, but I believe the value of the program has been amply demonstrated already. The remainder of the fellows' stay in Washington I feel will enhance, not change, these impressions." AAAS participation last year was made possible by a grant from a private donor. Funding of the program constitutes a persistent worry, but it is the strong conviction of the Central Office staff that every effort must be made not only to maintain the program but eventually to expand it to three or four times its present size. The program is being conducted by the Office of Science and Government under Dr. Richard Scribner.

Another internship program was administered last spring by the Communications Department, under Mr. James Butler, to familiarize students interested in careers in science journalism with the nature of science policy and the ways in which it is evolved. The program consisted of a series of week-long visits to Congress and to major executive agencies in Washington, prefaced by intensive seminars with experienced science journalists. Each week's program was offered for a small number (for example, five) graduate students of journalism.

During the past year, the Association, with the help of the National Science Foundation, initiated a series of community seminars in various parts of the country. Built on the model of the town meeting, they are public forums that bring together scientists, engineers, and laymen to discuss both the technical and the public policy aspects of important issues cast in the context of local and regional problems. In 1973, seminars on the energy problem were held in Providence, Rhode Island; Portland, Maine; Chicago, Illinois; and Tucson, Arizona. In future years, other pressing issues will be confronted in similar fashion. The experience of the

Portland seminar, held in December, is representative. About 100 persons, representing state and local government, education, science and engineering, and the private industrial sector, including Maine Governor Kenneth M. Curtis, met for 2 days. The program involved a discussion of alternative energy sources, energy conservation, and matters of state, regional, and federal policy planning. As a result of his experience at the seminar, Governor Curtis requested that a group of conference participants be gathered to form a special advisory group to state government. The local cosponsor of the seminar, the Center for Research and Advanced Study of the University of Maine, was asked to assist in the selection of this group.

The Association has also taken a major role in AISLE, An Intersociety Liaison Committee on the Environment, a consortium including AAAS and 16 other professional societies. AISLE's main activity will be the introduction of scientific and engineering knowledge into state and local decision-making. In January 1974, AISLE held a workshop/conference on energy with the New York State Assembly in Albany which brought together 40 members of the legislature and 60 professionals for 2½ days to consider in detail questions bearing immediately on current state energy legislation and to make specific recommendations for legislation.

On rather a different dimension of public service, the Office of Opportunities in Science, with the financial support of the Ford Foundation, has undertaken to review and evaluate the role of rosters in advancing the career objectives of scientists and other professionals who are women or members of ethnic minority groups. As part of this project, the Association conducted a major workshop directed toward assessing the value of rosters and seeking ways of coordinating the sizable number of roster projects now under way.

The Committee on Science and Public Policy, at the invitation of the Honorable Olin Teague, undertook an analytical study of the July 1973 hearings held by the House Committee on Science and Astronautics on the reorganization of the federal science and technology advisory structure. Its report should be useful to the House Committee as it prepares for further hearings on this subject.

The Committee on Science in the Promotion of Human Welfare has under way a program of conferences and workshops on the structure of social institutions as they relate to the effective applications of science to major problems of society. The first symposium was held at the 1972 Washington meeting and the second at the 1974 San Francisco meeting.

AAAS and International Science

Promotion of international science on a project-by-project basis is not new to the Association. Its exchange of meeting representatives with the British Association for the Advancement of Science, for example, represents a long-standing tradition. More recently, it has participated with Znaniye, the Soviet association, in an exchange of lecturers. During the past year, the AAAS sent to the U.S.S.R. Dr. Ariel C. Hollinshead, associate professor of medicine and director of the Laboratory for Virus and Cancer Research, George Washington University Medical Center; Dr. J. Arthur Campbell, chairman, Chemistry Department, Harvey Mudd College; Mr. Frederick J. Doyle, research scientist for mapping systems, Topographical Division, U.S. Geological Survey; and Dr. David A. Grant, professor of psychology, University of Wisconsin. Znaniye sent Dr. Valery Ivanovich Popkov, vice-chairman of the Znaniye directorate and laboratory chief of the Krzhezhanovisjy Power Institute, and Dr. Valentin Augustovich Schteinberg, director of the Institute of History of the Latvian Academy of Science and a deputy of the Supreme Soviet of the Latvian S.S.R., to the United States and Dr. Y. Fishevsky, first deputy chairman of the Znaniye directorate, to Mexico City. Lectures are presented to both scientific and lay groups and a variety of opportunities are created for an exchange of views.

The Association's most dramatic international project to date has been the Mexico City meeting conducted cooperatively with the National Council of Science and Technology of Mexico. This meeting, a people-to-people dialogue on the roles and problems of science and technology in development, attracted some 5500 persons over a 2-week period. There were ten major symposia that dealt with significant themes, each lasting several days, and some 30 supporting symposia of a primarily technical nature. Participants came from every country in the Americas—North, Central, and South—and several countries outside the Western Hemisphere. The AAAS's share of the costs totaled approximately $450,000, of which $260,000 came from special gifts and grants and the remainder from Association reserves.

Discussions held during the Mexico City meeting led to the formation of an Inter-American Committee to (i) plan for a sequel to Mexico City in from 3 to 5 years; (ii) stimulate the formulation of associations for the advancement of science in Latin America and enhance cooperation among them; and (iii) create a hemispheric language journal of general science patterned after *Science*. Meetings of the Committee have taken place in Bogotá on the occasion of the meeting of the Colombian Association for the Advancement of Science and in San Francisco in connection with the 1974 meeting. The Committee will meet in Brazil in July at the annual meeting of the Brazilian Association for Progress in Science. The U.S. representatives to the Committee are Dr. Philip Abelson, Dr. William Bevan, and Dr. Leonard Rieser.

Opportunities for future cooperation with Asian scientists were also explored at the San Francisco meeting. Under the auspices of the Asia Foundation, representatives of the Association met with representatives from Asia to begin discussions of possible areas of cooperation.

The British Association has expressed a desire to participate with AAAS in its 1976 annual meeting in Boston as part of the British Bicentennial Commission's role in the U.S. bicentennial observance. A special committee appointed by Dr. Glenn Seaborg and consisting of Dr. Rieser, Dr. Bevan, Dr. Roger Revelle, and Dr. Gerald Holton will work with representatives of the British Association in planning for a joint project.

Largely under the leadership of Dr. Seaborg, the Board of Directors has arrived at the view that international science is an area of commitment of sufficient importance to merit program involvement marked by greater coherence and more explicit continuity. An ad hoc task force, appointed by Dr. Seaborg and working during the past year under a grant from the Rockefeller Foundation, presented its recommendations to the Board of Directors in time for their consideration at the Board's December meeting. Chief among these were (i) that the Association establish an international program to be administered through an Office of International Science; (ii) that the major focus of the program be directed toward the less developed nations; and (iii) that a Board commitment of the order of $100,000 per year for 5 years be made

to insure the basic function of the office.

An International Office has been established and Dr. Irene Tinker has been appointed as its director. Dr. Tinker comes to AAAS with wide experience on problems of development in India and Indonesia. The initial project of the Office, brought to AAAS through the initiatives of Section H (Anthropology), is concerned with the effects of cultural variables on population change. The work consists of (i) a series of technical support projects in which information is being collected about the influence of population change on families, communities, and similar small social units in less developed countries and (ii) the preparation of a comprehensive position paper on this subject to be presented to the State Department for consideration as the U.S. contribution to the International Population Year (Bucharest, 1974). In addition, guidance will be provided to 12 other nations in the preparation of their position statements, and study centers to examine the relation of cultural factors to population change will be established in seven other countries. Working with AAAS in this program are the Research Institute for the Study of Man and the Smithsonian's Center for the Study of Man. The work is supported by a contract with the Agency for International Development.

The AAAS has also begun participation in activities related to the International Women's Year in 1975.

Administration

Early last year the Association's roster was placed on computer in a service provided by the McCall Information Services Company of Wilton, Iowa. In February the membership was asked to register their primary section (electorate) for purposes of voting, and by May some 67,300 members had indicated such affiliation. With this transition of circulation and membership records, the Association can, for the first time in recent years, generate section rosters completely and accurately.

Mr. William Engelman, who joined the Association's staff in December 1972 as director of personnel services, has placed into effect systematic personnel recruitment and employment procedures, developed an employee classification system and a rational structure for salaries, and prepared a personnel manual.

Mr. William Chapman was appointed director of finance in May. His immediate attention was directed toward the design of program-oriented budgeting procedures and procedures for accurate budget forecasting, rapid and frequent financial reporting, and improved program unit costing.

The committees on Opportunities in Science and Science and Public Policy were organized and moved ahead vigorously with their programs. The Office of Opportunities in Science is headed by Dr. Janet Brown. The Scientific Manpower Commission, now a participating organization of AAAS, took up residence at the Association's offices at 1776 Massachusetts Avenue. The Commission, headed by Mrs. Betty Vetter, works closely with both the Office of Opportunities in Science and the Office of Science Education.

AAAS budget for 1974

Revenue	
Dues of annual members	$2,250,000
Nonmember subscriptions	875,000
Subscriptions: *Science Books*	55,000
Advertising in *Science*	2,300,000
Sales	
Books	157,000
Reprints from *Science*	105,000
Back issues of *Science*	10,000
Binders and emblems	15,000
Audiotapes	225,000
Annual Meeting	
Registration and exhibits	115,000
Royalties and permissions	30,000
Receipts from grants	1,582,000
Investment income	
Dividends and interest	200,000
Total—revenue	$7,919,000
Expenses	
Administration	
Staff	$ 193,000
Operations	29,000
Board of Directors	15,000
AAAS sections	24,000
AAAS divisions	24,000
Committees	
Council Affairs	27,000
Nominations and Elections	30,000
Arid Lands	5,000
Scientific Manpower Commission	25,000
Board Reserve	100,000
Total—Administration	$ 472,000
International Office	
Staff	$ 55,000
Operations	335,000
Total—International Office	$ 390,000
Business Office	
Staff	$ 460,000
Operations	659,000
Total—Business Office	$1,119,000
Editorial	
Staff	$ 827,000
Operations	3,160,000
Total—Editorial	$3,987,000
Annual Meetings	
Staff	$ 93,000
Operations	154,000
Committee on Meetings	7,000
Total—Annual Meetings	$ 254,000
Education	
Staff	$ 242,000
Operations	590,000
Total—Education	$ 832,000
Communications	
Staff	$ 249,000
Operations	403,000
Committees	
Public Understanding of Science	11,000
Publications	2,000
Total—Communications	$ 665,000
Science and Society	
Staff	$ 92,000
Operations	24,000
Committees	
Environmental Alterations	5,000
Science in the Promotion of Human Welfare	4,000
Science and Public Policy	5,000
Industry, Technology, and Science	4,000
Total—Science and Society	$ 134,000
Opportunities in Science	
Staff	$ 47,000
Operations	11,000
Committee on Opportunities in Science	8,000
Total—Opportunities in Science	$ 66,000
Total expenses	$7,919,000
Net revenue (expense)	0

Long-Range Financial Planning for the Association

It has become particularly important that the Association do long-range financial planning for the remainder of the 1970's. Advertising revenue and the size of the membership, the two chief factors affecting the Association's level of income, have not changed since the middle and late 1960's, respectively. Meanwhile, the overall costs of operating have risen significantly in the last decade and a half, and the outlook is for continuing significant increases. For example, second-class postage will go up about 15 percent per year in the 1970's; the cost of paper will also experience the same proportional rate of increase; wages in the printing industry may go up as much as 18 percent per year, and telephone charges 10 to 15 percent per year. The situation is further complicated by the fact that the dues level changed hardly at all during the 1960's, and we are hard pressed to find a way of bringing the rate of increase back on schedule without significant losses in membership.

In 1973, 28 percent of the Association's income derived from dues; the remaining 72 percent was generated by Association staff and committees. Approximately 40 percent came from advertising and subscription revenue; about 19 percent from grants and contracts; and the rest from product sales and investments. In short, for each dollar of dues paid by our members, approximately three are generated from other sources. If the wide-ranging activities of the Association are viewed as benefits of membership, then mem-

bership can only be viewed as a financial bargain. This point is best made in terms of the cost to the member of *Science*, the most tangible benefit of membership. It costs the Association $28.41 a year to place a copy of *Science* each week in the hands of the individual member. Meanwhile, $10 of his dues are allocated for this purpose.

We cannot be optimistic about significant increases in advertising revenue. Product sales and investment represent only a minor portion of revenue, so that even if they were to be increased significantly, they do not represent the key to the problem of income. Vigorous efforts have been made in recent years to effect operational economies and to improve efficiency, but many costs are beyond the Association's control.

In 1969, the Board adopted a resolution calling for an order-of-magnitude increase in the membership over the decade of the 1970's. It may become essential that Board and Council join in a vigorous campaign to achieve a significant increase in the size of our roster. If every member recruited a member, we could double our size rather quickly. The vigor of the Association's present programs and the challenge to the scientific community from every aspect of modern life make increasing the Association's size as important now as at any time in our history.

Off-Road Vehicle Use

AAAS Committee on Arid Lands

Recreational use of the arid lands of the United States is increasing rapidly as people seek to escape crowded metropolitan areas or to enjoy the open space and beauty of the desert. Rock hounding, hiking, camping, and sightseeing attract most of the visitors. Less common, but growing rapidly in numbers, is the use of off-road vehicles in areas with few or no roads, usually for cross-country travel. The term "off-road vehicle" refers to any motorized vehicle (motorcycles, four-wheel-drive vehicles, dune buggies, and so forth) that travels off an established road. These vehicles are our primary concern at present because of their potential for destruction. This potential for destruction is great in all areas but is most serious in arid lands. The southern California desert, with its proximity to 10 million people in and around Los Angeles, has the unfortunate distinction of having suffered greater destruction than any other arid area.

Southern California is experiencing now a recreational pressure upon its desert resources that is growing by leaps and bounds and which is almost completely uncontrolled. Other population centers in the arid West are subjected to pressures which differ only in degree from those of southern California. What is happening there provides a warning of what will happen elsewhere as leisure-time activities assume increasing importance.

The intensity of recreational use of the 16 million acres in the southern California desert is almost unbelievable, and it has only begun. In fiscal year 1968, nearly 5 million visitor-days were estimated to have been spent on the approximately 11 million acres of federal land there. In 1971, the total was estimated to be 7.5 million visitor-days, an increase of 50 percent in 3 years. By the year 1980, this figure may well rise as high as 23 million.

A 1968 survey showed that camping and sight-seeing accounted for about 50 percent of the visitor use. Hiking, rock hounding, and motorcycling represented 13, 12, and 9 percent, respectively. The 9 percent for motorcycles does not include racing motorcycles brought in for sanctioned races, which accounted for 375,000 to 450,000 visitor-days. A single Hare and Hound motorcycle race on Thanksgiving Day in 1971 had some 2,900 entries, with a total attendance of around 10,000 people. That same race in 1968 had 900 entries. Dune buggy travel was 9 percent of the total recreational use and four-wheel-drive vehicles constituted 8 percent of the total number of vehicles entering the public lands.

The end result of the unregulated use of the desert is a sharp conflict of interests among cattlemen, miners, and various groups of recreational visitors; a serious threat to the preservation of the environment in a desirable and stable condition; and a series of demands that something be done to control or prohibit many of the current activities.

Formulation of an overall plan for the recreational use of the arid regions is fraught with difficulties. For one thing, land use planning is virtually nonexistent, as is research on the impact of recreational use. Moreover, no single government agency is charged with development or control of the public lands. Blocks of land are administered by the Bureau of Land Management, the National Park Service, the Forest Service, the Bureau of Reclamation, state park and recreation agencies, sundry county agencies, state and county road departments, and the military. Additionally, some regions are spotted with large and small blocks of private land. One agency of the Department of the Interior, the Bureau of Land Management, administers two-thirds or more of the federally owned arid lands in the 11 Western states and should, logically, take the leadership in resolving conflicts in land use.

Recommendations

Our recommendations for controlling the exploitation of arid lands are based upon the following assumptions: (i) recreation is a legitimate, and soon may become the largest, use of these lands; (ii) preservation of unique flora and fauna and of scenic, educational, historic, and archeological sites is in the public interest; (iii) agriculture and mining have legitimate economic interests in desert land use; and (iv) destructive influences should be strictly controlled. The issue at hand is how much damage to the environment should be permitted in order to accommodate recreational groups.

Members of the AAAS Committee on Arid Lands in 1973 were Harold E. Dregne (chairman), David W. Goodall, Carl N. Hodges, Dean F. Peterson, Troy L. Pewe, William W. Rubey, and Richard B. Woodbury.