Annual Report of the Executive Officer

As AAAS makes the turn from 1985 to the new year, the affairs of the enterprise we call "science" are again in transition. The capacity and the promise of science are at a peak. But looming up are grave concerns for the support of general science as the Congress adopts a desperate approach to bringing down the government's massive budget deficit. Forced economies aimed at a zero deficit in 5 years, without balancing tax increases, will strike blindly at the besieged corner of the budget where science lives. Along with the hazards facing research, hopes fade for public reinvestment in precollege science education as well as a start on overtaking the obsolescence in the tools and facilities upon which advanced research depends. Five years of austerity may not resemble a disaster at first sight, but it is long enough to set in place a pattern for resource allocation that would be hard to reverse in the uncertain 1990's. Government's priorities will come first in the competition for marginal dollars, and the engines of general science could be throttled down to idling speeds with troubling long-term consequences for American scientific leadership. With all this, the long-standing partnership of science with government faces severe stress, a potential victim of failed public policy management. The challenge to the sciences themselves is to prevent an unsightly scramble for comparative advantage between and among their respective disciplines and institutions.

While AAAS will not be immune to indirect fallout from government's budgetary agonies, its direct exposure is very slight because we have not depended unwisely on federal funds. In 1985, only 1½ percent of our total revenues came from government. While this limited assistance has supported very significant work, AAAS has met its responsibilities mainly from dues income, advertising carried in its principal publications, grants from foundations and industry, voluntary contributions, and earnings from cautious investments. The effect has been to shelter our operations from unpleasant surprises.

While AAAS has distanced itself from overreliance upon federal funds, the same cannot be said for the research enterprise itself. University-based research is deeply mortgaged to the government's budgets and preferences, and, while industry is increasing its share of support, it remains a minority stockholder. Over the last four decades, government's willingness to step up to this responsibility has produced an extraordinary scientific capacity in the United States. The emerging question is how this capacity is to be sustained henceforth at a level of excellence and productivity. To put it another way, can we preserve the value of the prodigious national investment we have made in scientific excellence in the face of counterpressures to bring the budget back to earth? If the indications are that we have built a capacity that is no longer affordable, relative to other goals and objectives, a troubled future is in prospect. The question has an immediacy that is undeniable, and the scientific community and the political community must address it together.

The problem does not stop with the funding relationship with government. The contemporary truth is that science's chances hang to a great extent upon the intersecting directions of foreign and defense policy, fiscal management, provisions of a changeable tax code, alternating moods regarding technology transfer, falling trade balances, and other political contingencies. Such a churning environment generates more discontinuities than stability. The outward elegance of scientific progress masks these hazardous trails, but they are real enough. A peaceable kingdom it is not.

The writ for AAAS's agenda is spelled out in our constitution, which mandates five objectives: to further the work of scientists, to facilitate cooperation among them, to foster scientific freedom and responsibility, to improve the effectiveness of science in the promotion of human welfare, and to increase public understanding and appreciation of the importance and promise of the methods of science in human progress. With the support of the Board and Council, AAAS has a formidable array of activities which respond to its charge:

■ *Science*, the 105-year-old journal of the AAAS, is published weekly with a circulation averaging more than 155,000.

■ *Science 86*, now in its seventh year, is published monthly for an adult, educated readership, with an average circulation of 700,000. To date, the magazine has won a dozen major honors for editorial and design achievement.

■ With the sponsorship of the Committee on Science, Engineering, and Public Policy, and in collaboration with a group of other science, engineering, and higher education associations, annual reports are published on the federal budget for research and development and a major colloquium is held each spring to evaluate R&D funding priorities and related issues.

■ Under guidance from the Committee on Science, Arms Control, and National Security, reports are published and congressional and media briefings are provided on complex aspects of arms control and its relationship to national security objectives.

■ An annual meeting of the AAAS presents some 200 symposia and lectures covering disciplinary and interdisciplinary developments and policy issues across the spectrum of the sciences and engineering with saturation coverage by the U.S. and foreign media.

■ The Committee on Public Understanding of Science and Technology sponsors a range of studies, symposia, and joint activities with science centers and museums, public lectures, and awards, together with the Mass Media Science and Engineering Fellows Program, which selects young scientists and engineers to work for 10-week periods at broadcast and print media sites.

■ The Committees on Climate and on Arid Lands sponsor symposia and research programs relating to the effects of climate change and the understanding of natural and other influences on desert conditions.

■ The newly constituted Committee on Population, Resources, and Environment undertakes interdisciplinary projects intended to facilitate cohesion among data bases and researchers in these three dimensions of population-related studies.

■ Through the Office of Opportunities in Science, with guidance from its external committee, AAAS conducts an array of programs focused upon enhancing motivations and careers in science and engineering for women, minorities, and the physically handicapped.

■ With direction from the Committee on Scientific Freedom and Responsibility, AAAS is concerned with timely intervention for human rights of scientists and engineers throughout the world, monitoring governmental attempts to inhibit the flow of unclassified research information, and issues of social responsibility in science and codes of professional ethics.

■ In the international science arena, joint programs and symposia are under way with science associations in Central and South America, the People's Republic of China, India, and the Federal Republic of Germany. In addition, a full schedule of topical

seminars is held for science counselors of foreign embassies in Washington, D.C.

■ The Office of Communications and Membership arranges and coordinates press briefings, other support services to science reporters, and AAAS science commentaries for radio broadcast, in addition to directing membership drives.

■ The Meetings and Publications Office administers the Annual Meeting, coordinates the planning for symposia and colloquia, and manages the publication of a growing family of AAAS-sponsored books and special reports.

■ The Office of Science and Technology Education directs programs for the production of educational films, classroom materials, and other special projects for teachers, students, and administrators aimed at strengthening the quality of precollege education in science and mathematics education in U.S. schools.

■ The AAAS–American Bar Association Conference of Lawyers and Scientists holds joint meetings, arranges symposia, and publishes articles bearing upon the intersection of law, science, and technology.

■ Four regional divisions (Pacific, Southwestern and Rocky Mountain, Arctic, and Caribbean) conduct annual and special meetings, address regional concerns in science, and publish materials and studies having special regional significance.

■ The officers of the Association see to its governance, determine its behavior and activities in conjunction with the Council, and may testify before committees of the Congress in matters of importance to the advancement of science or lead AAAS delegations at international meetings.

■ The Sections have the principal responsibility to propose symposia for the Annual Meeting, to recommend the election of Fellows, and to report on matters referred to them.

These dimensions of the AAAS agenda are cited as a reminder to our members that their interest in what transpires in the Association should extend beyond awareness of our weekly journal, *Science*, flagship though it indeed continues to be. If science is to be "advanced" by AAAS, more than a prestigious and deservedly honored journal is called for, as this report has gone to some pains to point out. AAAS is action-oriented, from science and technology policy through to precollege science education, public understanding, international initiatives, and problems of scientific freedom and arms control. All this mirrors the new centrality that science has in the troubled contemporary world.

This annual report would be much longer than it ought to be if it attempted to recount all of the output of AAAS's activities during 1985. But it will suffice to briefly note some of them:

■ *Science*'s new editor, Daniel Koshland, took a firm hold on the editorial course of the journal, seeking out lead articles and reports for publication and tackling the slow turnaround time for accepting or declining manuscripts.

■ *Science 85*, edited by Allen Hammond, dedicated its sixth anniversary issue to 25 cogent articles on forthcoming steps in the advance of science and technology. For the fourth straight year, the magazine was nominated for a National Magazine Award.

■ In the field of science and mathematics education, AAAS launched a major new project entitled *Project 2061: Education for a Changing Future*, the first phase of which will identify what basic science and mathematics students should be learning to provide the knowledge they will need as adults after the turn of the century.

■ In the light of achievements on behalf of disabled scientists and engineers, AAAS received special recognition from the National Organization on Disability National Awards Program.

■ The Committee on Science, Arms Control, and National Security completed for publication a book on *The Verification Challenge: Problems and Promise of Strategic Nuclear Arms Control Verification*, together with a monograph on *The Strategic Defense Initiative: Some Arms Control Implications*.

■ The Board of Directors revisited the People's Republic of China to observe the major new directions for science and technology adopted in 1985.

■ Eight seminars for science attachés were held on topics such as the 1986 R&D budget, the Strategic Defense Initiative, advances in genetic engineering and vaccine development, and methods of exploration geophysics.

■ The Western Hemisphere Cooperation Program provided initiatives and secretariat to the Interciencia Association, which observed its tenth year with five symposia in as many countries, and admitted four new countries to membership.

■ A lecture by and reception for Argentine President Raul Alfonsin was held at the Museum of Natural History in New York.

■ A team of forensic scientists assembled by AAAS spent 5 weeks directing a training program in Argentina for the identification of the skeletal remains of the "disappeared," persons assumed to have been abducted and killed by government forces in the 1970's. Workshop members subsequently presented their results to Argentine judges investigating human rights abuses.

■ The president of AAAS, Gerard Piel, together with presidents of 11 other scientific and engineering societies, wrote to the Secretary of Defense stating their resolve not to sponsor closed or restricted technical meetings dealing with unclassified material.

■ A first, highly successful meeting of the National Forum for School Science was held in Washington, DC. Over 300 participants discussed issues of science teacher quality and supply.

■ Representatives from more than 25 AAAS-affiliated societies participated in two meetings sponsored by AAAS to address professional ethics concerns in areas such as the use of animals in research, roles for professional groups in monitoring and investigating claims of misconduct by their members, and government regulation of professional services.

■ *Reports on Science*, coproduced by AAAS and the CBS Radio Stations News Service and featuring the editor of *Science 85*, was estimated to have reached an audience of 5 million. *FOCUS*, a 30-minute public affairs radio program produced by AAAS, was carried by affiliates of National Public Radio via the NPR satellite.

■ Special issues of *Science* were published with emphasis on chemistry, computers and supercomputers, and frontiers of biology.

■ *Science 85* sponsored the "Second Great International Paper Airplane Contest" in cooperation with the Seattle Museum of Flight and the Smithsonian Air and Space Museum, drawing 5000 entries from 21 countries.

■ In conjunction with the Scientists' Institute for Public Information and the Association of American Universities, two media round tables were held on "National Security and Scientific Inquiry" and "Supercomputers."

■ For the tenth successive year, AAAS published its special report on *R&D in the Federal Budget* and held its annual R&D Colloquium with an attendance of over 500.

■ Congressional testimony was given on the science budget before the House and Senate authorization and appropriations committees. Testimony was also given before the House Science Policy Task Force on the supply and demand for scientists and engineers and on research in mission agencies and national laboratories.

■ The Congressional Science and Engineering Fellows Program, in its thirteenth year, was supported by 17 professional societies and the Office of Technology Assessment. Thirty-one Fellows are in the 1985–86 program spending a year working for members, committees, and the OTA.

■ Ten Environmental Science and Engineering Fellows, supported by the Environmental Protection Agency, participated in a

1985 summer program designed to enrich the scientific content of that agency's programs.

■ The Science, Engineering, and Diplomacy Fellows Program is into its sixth year, with seven fellows serving a full year each in the Department of State and the Agency for International Development.

■ For the eleventh year, 17 students participated in the AAAS-sponsored Mass Media Science and Engineering Fellows Program, working at nine broadcast and eight print media sites, one of which was a Spanish language station in San Diego, CA.

■ Generous external funding made it possible to launch Project 2061 for precollege science education; to undertake a special 5-year effort to improve science and mathematics education for minority, female, and disabled youth through linkages with eight major community-based organizations; to expand AAAS leadership efforts related to arms control, science, and national security; to increase the number of participants in the four AAAS fellowship programs; to extend AAAS activities for human rights; and to expand efforts for the public understanding of science in cooperation with science and technology centers and museums.

■ Thirty-five researchers, educators, and representatives from the private and public sectors participated in AAAS's invitational meeting to (i) summarize issues raised by research on women and minorities in science and mathematics, especially at the precollege level; (ii) identify research gaps; (iii) explore responses through intervention programs; and (iv) recommend how to transfer findings into classroom practice, to decision-makers, and to the general public. The meeting results are to be published.

■ AAAS was an official observer at the United Nations Conference and sponsored two workshops at the Forum of Nongovernmental Organizations at Nairobi, Kenya, to assess achievements of the United Nations Decade for Women.

■ The Climate Committee completed its peer review of a massive assessment of the CO_2 issue for the Department of Energy, which will be published as a five-volume work.

■ The **Arctic Division** held its annual Science Conference on the campus of the University of Alaska–Fairbanks, a highlight being a special program for high school teachers and students with presentations on aurora, linguistics, plant-herbivore interactions, and plate tectonics. The **Southwestern and Rocky Mountain Division**'s annual meeting saw 275 papers presented, 68 by graduate students, and featured Peter H. Raven as the John Wesley Powell Memorial Lecturer. The **Pacific Division**'s annual meeting, held at Missoula, MT, drew an attendance of several hundred. The Division completed three new publications to add to a very impressive book list: *Late Cenozoic History of the Pacific Northwest*, whose preparation was assisted by a grant from the Sunshine Mining Company; *Phanerozoic Diversity*, copublished with Princton University Press; and a proceedings volume, *Scientific Research and New Religions: Divergent Perspectives*. Our newest regional partner, the **Caribbean Division**, cosponsored the First Pan American Chemical and Energy Congress held by the Puerto Rican Chemists Association with an attendance in excess of 600, and organized the first Halley's Comet Watch in Puerto Rico, at Humacao University College.

■ Books published by AAAS include: *Enough of Pessimism, 100 Essays*, by Philip H. Abelson; *Neuroscience* (P. Abelson, E. Butz, and S. Snyder, Eds.); *Astronomy and Astrophysics* (M. Roberts, Ed.); *Biotechnology and the Environment: Risk and Regulation* (A. Teich *et al.*, Eds.); *Strategic Nuclear Arms Control Verification: An Annotated Bibliography, 1977–1984* (R. Scribner and R. Scott, Eds.); *Strategic Nuclear Arms Control Verification Terms and Concepts: A Glossary*, by R. Scribner and K. Luongo; *The Strategic Defense Initiative: Some Arms Control Implications*, by R. Scribner and J. Boutwell; *Striking a Balance: National Security and Scientific Freedom* (H. Relyea, Ed.).

■ Books published for AAAS by other publishers include: *Songs from Unsung Worlds* (B. Gordon, Ed., Birkhauser Boston); *The Breaking of Bodies and Minds: Torture, Psychiatric Abuse, and the Health Professions* (E. Stover and E. Nightingale, Eds., W. H. Freeman and Co.); *Scientists and Journalists: Reporting Science as News* (S. Friedman, S. Dunwoody, and C. Rogers, Eds., Macmillan, The Free Press); *Low Tech Education in a High Tech World* (by E. Useem, Macmillan, The Free Press); *The Verification Challenge: Problems and Promise of Strategic Nuclear Arms Control Verification* (R. Scribner, T. Ralston, and W. Metz, Eds., Birkhauser Boston); *Report* (published in French and English) and *Proceedings*, African Regional Seminar on the Role of Scientific and Engineering Societies in Development (D. Weiner, Ed.).

Earlier in this report reference was made to the sources of funding on which AAAS depends. It should be added that through the last decade our annual operating budgets have been in balance with the exception of the year of the launch of *Science 80*, our general-audience magazine for the public understanding of science. While the Association enjoys financial security, for which credit must be shared with the Board's volunteer Committee on Investment and Finance, recent operating budgets have been buffeted by a sharp fall in advertising in *Science 85*. This misfortune has not been confined to our magazine but afflicts others in the "science" category. Unlike the case with our journal *Science*, which accepts only science-related advertising and shows steady advertising growth, our popular magazine competes for consumer advertising in a capricious and unpredictable environment. The net result of this and other factors is that our 1985 operating budget, before crediting unanticipated gains from investments, is out of balance by 2½ percent. Vigorous steps are being taken to reinforce the position of *Science 86* in the advertising market.

It is never pleasant to ask our members to accept higher annual dues. We have been obliged to do so yet again. Because the government's budget deficit has reached such prodigious heights, the President and the Congress have taken direct aim at the "revenue forgone" appropriation for the Postal Service, and the bad news for AAAS and other nonprofit organizations is a 23 percent hike in postal rates beginning 1 January 1986. It is unlikely to be the last word on the matter. The "revenue forgone" appropriation is a hostage to deficit-reduction tactics and vulnerable to still heavier assault in the coming years. Adding the postal rate increase to the continued, if more modest, annual creep of general inflation, there is no escaping the necessity to adjust AAAS dues.

This retrospective on how AAAS fared in 1985 cannot omit mention of the resolution of our housing problems. Thanks to the diligence of our Associate Executive Officer, J. Thomas Ratchford, AAAS was able to lease excellent new quarters in Washington on enviable terms, ending a long period in which the Association operated from four separate locations. To cap this achievement, our former headquarters on Scott Circle was sold at a good price to a foreign government as a future embassy.

From the perspective of more than 11 years as the AAAS Executive Officer, one has a strong sense for the capacities and opportunities that define this organization and position it for the next decade. It will soon have a new chief operating officer who will quickly discover, as I did, the great good fortune of a supportive Board and Council, unbelievably generous members, and a first-rate staff. What is important for AAAS to understand is that the advancement of science, in the winding-down 20th century, cannot count only on the thrust and momentum that appear on the surface but must see as well to science's independence, its authentic drives, its openness, its claims to the people's trust, and its texture as wonder, not as imperium. ■ **WILLIAM D. CAREY**