

Two physicists on Capitol Hill

The authors, who were last year's APS Congressional Scientist Fellows, evaluate the impact on Congress, the APS and themselves.

Benjamin S. Cooper and N. Richard Werthamer

In the 28 May 1973 issue of *Physical Review Letters* there appeared an unusual "Help Wanted" ad:

"... the Council [of the American Physical Society] at its meeting on 22 April authorized a Congressional Fellowship Program. Funds were appropriated to support up to two APS Congressional Fellows—physicists who will serve for a year in the Offices of Senators, Representatives, or Congressional Committees beginning September 1973. Any physicist who wishes to apply should submit a resume, references, and a statement indicating how his background and interests qualify him for the position ..."

More than thirty physicists, including ourselves, answered this solicitation. A selection committee interviewed nine of the applicants in early July and, one morning in early September we, the two duly appointed APS Congressional Fellows, began our tenure in Washington.

Now, with the conclusion of the first year of this experiment in public affairs, we here review the experience of the program and attempt to evaluate its impact—on Congress, on the Society and on ourselves.

The APS was not alone in its decision to contribute members to aid the Congress. The American Association for the Advancement of Science also selected three Fellows, and the electrical and mechanical engineering societies contributed one Fellow each. All except the last participated in an extensive initial orientation period, organized by the AAAS Office of Science and Society Programs, which introduced us to the Congress—its members, staff personnel and information resources. (See Table 1 for a list of congressional committees

dealing with science and technology.) On the basis of these numerous collective meetings as well as individual placement interviews, we were all soon located in an office of our choice and immersed in its work.

A hectic life

Our placements, Cooper with the Committee on Interior and Insular Affairs, chaired by Senator Henry Jackson, and Werthamer with Congressman Charles Mosher, exhibited some desirable although unintentional sym-

metries. One of us worked in the Senate, the other in the House; one worked for a Democrat, the other for a Republican, and one worked with a Committee staff while the other worked with a member's personal staff. The other Fellows were distributed in a similarly wide and varied way. Despite these

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The Congressional Scientist Fellows for 1973-74 and, in parentheses, the organizations that sponsored them, are: (seated, left to right) Benjamin Cooper (APS), Barry Hyman (ASME), Michael Telson (AAAS), and (standing, left to right) Richard Werthamer (APS), Jessica Tuchman (AAAS), Elliot Segal (AAAS) and Ronal Larson (IEEE).

contrasts, which lend unique and personal qualities to the activities of each Fellow, a number of common threads run through our experiences.

Among these commonalities were the kinds of demands placed on us as Congressional staff members—for clear and concise writing; for a generalist's approach to issues, with the ability to shift quickly into an intensive analysis of a particular point as it enters the center of political attention; for a feeling of the importance of the interaction between often conflicting personalities, outlooks, and goals, and for severe discipline to accomplish one's tasks in the face of a hectic and overcrowded professional life.

Our activities as Fellows

The Senate Interior Committee, in addition to a jurisdiction over national parks and wilderness areas, Indian affairs and the administration of the US territories, has the responsibility for large areas of energy policy. In the Senate, energy-policy analysis had been essentially a cooperative effort involving the Committees on Interior Affairs, on Commerce, on Public Works, and to a lesser extent, the Joint Committee on Atomic Energy. These have operated under the collective umbrella of the National Fuels and Energy Policy Study, authorized by a Senate resolution.¹ In practice, the staff of this Study works closely with that of the Interior Committee, resulting in an enhanced output of energy-related legislation under Senator Jackson's leadership. The Study's membership has recently been enlarged to include the Senate Committees on Finance, Foreign Relations, Government Operations and Labor and Public Welfare.

The Interior Committee used their APS Fellow, Cooper, to broaden and deepen the capabilities of the staff to assess energy-related data and information. The effort resulted² in an increased awareness of the magnitude and impact of the Arab embargo, which began shortly after the start of the Fellowship tenure. In addition, a comprehensive energy information bill, S.2782, was drafted during this period.

Under pressure to pass more urgent legislation to react to the embargo, the committee assigned S.2782 a relatively low priority during the 1974 session. However, authority to gather energy data, similar to portions of S.2782, was incorporated into the legislation creating the Federal Energy Administration (Public Law 93-275) and also into a bill entitled the "Energy Supply and Environmental Coordination Act of 1974" (PL 93-319). This last piece of legislation among other things specifies procedures for converting major fuel-burning installations from oil or natural gas to coal. These first legislative reactions to



The three current APS Congressional Fellows are already deeply involved in their respective activities: **Allan Hoffman** (left) is working with the Environment Subcommittee of the Senate Commerce Committee in the areas of mandatory fuel-economy standards for new cars and contingency draft legislation on oil-import reduction and gas rationing, as well as other issues related to energy saving. **Thomas Moss** (center) is working with Congressman George E. Brown Jr in two areas of study: long-term growth trends in a post-industrial society—particularly, ways to make growth patterns less socially disruptive; and the need for R&D oriented toward protecting the human environment. **Haven Whiteside** (right) is serving on the Subcommittee on Environmental Pollution of the Senate Public Works Committee, which is working on new solid-waste legislation and is preparing to hold oversight hearings on the Clean Air Act; he is particularly involved in air-pollution and energy issues.

energy-information issues represent a beginning in the development of the energy-information capability that is required to meet Federal responsibilities in energy policy. The tasks still remain to create the institution to coordinate and maintain this capability over the long run, to define in a way consistent with the public interest the role of confidentiality in handling energy information supplied by individual companies and to authorize a survey of the energy resources held by the government on public lands. S.2782 will be reintroduced in the 94th Congress to provide the basis for discussion and resolving these issues. Table 2 lists the major bills related to energy that were passed by the 93rd Congress.

In addition to providing quantitative and analytical capabilities to the Interior Committee staff, the APS Fellowship made available an extra staff person to organize, interpret and respond to the enormous flow of information, requests for information and offers of advice that flood in on the Congress daily. And, during periods when the crush of legislative and public business abated, the presence of a Congressional Fellow made possible the examination in some detail of several issues that are relevant though not central to the Committee's jurisdiction. Cooper investigated the export of nuclear power reactors, non-proliferation of nuclear weapons, nuclear safeguards, the supply and demand of scientific and engineering manpower, the role of projections and computer simulation in "Project Independence" and the impact of energy costs and conservation strategies on consumers.

On the other side of the Hill, Representative Mosher has legislative assign-

ments particularly focused on science and technology: He is the ranking minority member of the House Committee on Science and Astronautics, which oversees the National Science Foundation, the National Aeronautics and Space Administration and the National Bureau of Standards; he is also ranking member of the Oceanography Subcommittee of the Committee on Merchant Marine and Fisheries. In addition to these responsibilities, he became the vice-chairman of the Congressional Board of the Office of Technology Assessment during the 93rd Congress.

Mosher used his APS Fellow to assist in a wide variety of activities connected both with his office and his committee assignments. Werthamer's activities ranged from the office tasks of scanning and annotating incoming literature, preparing replies to inquiries from constituents, researching topics for speeches and position papers and monitoring news about Mosher's district in northern Ohio to helping the Committee staff draft legislation and prepare hearings, and making substantive contributions to OTA policy-analysis assessments on the offshore leasing of petroleum lands, and energy.

A wide spectrum of issues underlie these activities. Besides the OTA assessment, there is a position paper on the importation of chromium from Rhodesia; a review of technical activities at NASA's Lewis Research Center; a hearing on the use of wind power to generate electricity; a speech on the value of basic medical research; a panel meeting on the reorganization of government energy R&D agencies, and an inquiry into the factors affecting Great Lakes water levels. Threading through these issues

and vitalizing them are people—citizens visiting their Congressman while vacationing in Washington or phoning for help with inflexible fuel-oil regulations; lobbyists presenting their point of view; bureaucrats and Congressional staffers with offers to assist in their fields of special competence, and the leading actors: Congressman, Senators and agency heads.

Impact on Congress

The Congressional Scientist Fellowships have demonstrated to a number of Senators and Congressmen that PhD-level scientists can be highly useful components of a Congressional staff. This perception led to the direct employment of scientists in Congressional offices as well as the enthusiastic reception of Congressional Fellows supported by professional scientific and engineering societies. The Office of Technology Assessment and the Science Policy and Environmental Policy Divisions of the Congressional Research Service represent practical evidence that Congress wants scientific and technical capabilities within the legislative branch and that this interest long predates the establishment of the Congressional Fellowships. Coupled with the growing requirements for technical policy analysis on public issues, this interest is leading to an increasing role on Congressional staffs for persons with advanced scientific training.

The sponsoring societies, through these Fellowships, provide an important selection mechanism as well as support for on-the-job training to help match scientists to Congressional staff needs. It is very unlikely, however, that Congress will develop a technical backup staff as extensive as that of the executive branch. The development of a very large Congressional staff bureaucracy would run counter to the entire style of the Congressional office, which responds, ideally at least, not to its internal momentum but to popular pressures.

Thus the burden of providing Congress with extensive and detailed technical analysis will fall on organizations operating outside the legislature, such as trade associations, lobbyists, academic groups, research corporations and such professional societies as the APS. The responsibility of interpreting and placing into perspective the results of this analysis will continue to fall on a relatively small staff of generalists working directly with legislators. Some of these persons would benefit considerably from a close familiarity with science.

Impact on the APS

The professional scientific societies are only beginning to fulfill the role that is available to them in organizing the

Table 1. Jurisdiction for science and technology in the US Congress*

House of Representatives†

Armed Services: Scientific research and development for the armed services; Naval petroleum reserves; special oversight over arms control and disarmament.

Commerce and Health: Interstate transmission of electric power and natural gas; allocation and movement of petroleum; energy conservation and energy information; rail transportation; public health care and facilities.

Interior and Insular Affairs: US Geological Survey; resources in the public lands; mining; special oversight over nonmilitary research and development.

Merchant Marine and Fisheries: Oceanography, coastal zone management, fisheries and wildlife conservation.

Public Works and Transportation: Land and air transportation; water power and water pollution.

Science and Technology: Non-nuclear energy and environmental research and development; National Bureau of Standards; National Aeronautics and Space Administration; National Science Foundation; space exploration; National Weather Service; science scholarships.

Senate

Aeronautical and Space Sciences: National Aeronautics and Space Administration; space exploration.

Armed Services: Scientific research and development for the armed services; Naval petroleum reserves; space activities pertaining to the military.

Commerce: Transportation, communications and civil aeronautics; National Bureau of Standards; interstate shipments of power and natural gas; coast and geodetic survey and oceans policy; National Weather Service; energy conservation and environment.

Interior and Insular Affairs: Non-nuclear energy research and development; resources in the public lands; mining; US Geological Survey; allocation of energy supplies; energy information; environment and land use.

Labor and Public Welfare: National Science Foundation; health.

Public Works: Water power and water pollution; air pollution; interstate highways.

Joint Committees

Joint Committee on Atomic Energy: Control and use of atomic energy; national laboratories now operated by the Energy Research and Development Administration (formerly the Atomic Energy Commission).

* Whereas the jurisdictions of these committees include science and technology explicitly, all the committees of Congress occasionally consider issues with a technological component. The topics listed are neither rigid nor exhaustive, but indicate general areas of jurisdiction and oversight.

† Reflects reform proposals accepted by the House on 8 October 1974.

Table 2. Major energy-related legislation passed by the 93rd Congress

Public Laws and dates passed

PL 93-153	Rights of Way through Federal lands (Trans-Alaska Pipeline), 6 Nov 1973
PL 93-159	Emergency Petroleum Allocation, 27 Nov. 1973
PL 93-182	Emergency Daylight Saving Time Energy Conservation, 15 Dec. 1973
PL 93-239	Emergency Highway Energy Conservation (National Speed Limit), 2 Jan. 1974
PL 93-275	Federal Energy Administration, 7 May 1974
PL 93-319	Energy Supply and Environmental Coordination, 22 June 1974
PL 93-409	Solar Heating and Cooling Demonstration, 3 Sept. 1974
PL 93-410	Geothermal Energy Research, Development and Demonstration, 3 Sept. 1974
PL 93-438	Energy Reorganization (creates the Energy Research and Development Administration and the Nuclear Regulatory Commission), 11 Oct. 1974
PL 93-473	Solar Energy Research, Development and Demonstration, 26 Oct. 1974

Passed and vetoed

S.2589	National Energy Emergency Act; the veto of 6 March 1974 was sustained in the Senate.
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Pending in House-Senate Conference*

S.425	Surface Mining Control and Reclamation
S.426	Toxic Substances
S.1283	National Energy Research and Development Policy
S.4706	Deepwater Ports

* As of 21 Nov. 1974

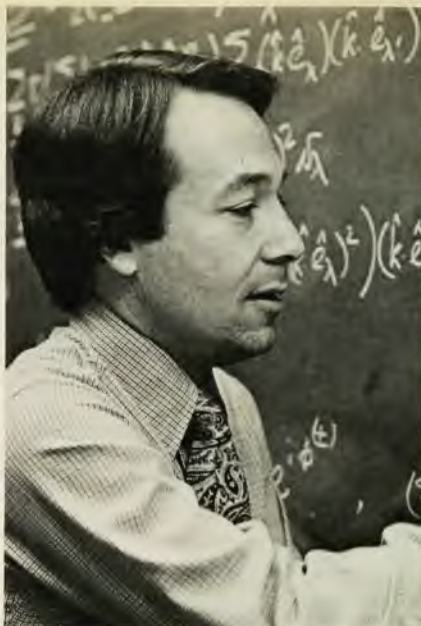
resources of their membership to provide the Congress and other institutions of government (at the State and local levels as well) with the scientific and technical analysis that they need. Being separate from the legislative process and experienced in formulating and overseeing the clarification of scientific and technical issues, these societies are ideally suited for displaying that spectrum of scientific opinion on important issues so vital to the full examination of proposed policy. Thus an essential complement to the excellent beginning APS has made with the Congressional Fellowship program would be the further development of mechanisms for instructing the public and its representatives on the scientific and technological issues that are woven into so many public policy choices.

The instructional process is the same one that scientists themselves use to examine purely scientific issues, and the role of APS in this effort is directly analogous to its role as the organizer of scientific dialogue. The Society should continue the discussion among its membership, recently begun with the creation of a Panel on Public Affairs, of how best to promote and encourage the broadly based examination of important public issues with strong scientific overtones. The aim of this examination by APS members would not be to develop an APS "position" on any set of issues but rather the clarification of the scientific questions involved and of the choices available. The "position," if any, will be developed by the legislature, using information from the societies as part of their total input.

Perturbations on our careers

One year spent out of the mainstream of a professional career spanning perhaps 35 years has more than a 3% effect on the practitioner of any discipline, and when that discipline is as rigorous, fast-moving and competitive as physics, the effect of a "lost" year is particularly significant. Thus the recipient of a Congressional Fellowship should not expect to return to physics following the Fellowship without anticipating significant modifications in career plans. Public policy work is of great value and interest; to attempt to put aside the experience gained in Washington would be to retreat from the responsibility of this knowledge.

Each of us has responded in his own way to the perturbation of the Fellowship year. Cooper has resigned from a university faculty position to continue the work he began as a Fellow—now as a professional staff employee of the Senate Committee on Interior and Insular Affairs. Werthamer has returned to his position as a research physicist at Bell Laboratories, but with a new commitment: the proposition that practicing



The authors after a one-year stint as APS Fellows: Back at Bell Labs, **Richard Werthamer** (left) theorizes at the board; **Benjamin Cooper** (right) remains on a Senate committee staff.

ing scientists have significant roles to play in national affairs.

Physicists, it is becoming realized, have undergone training, and practice a discipline, that makes them well qualified to contribute to the open, fast-moving and innovative process of analyzing and refining public proposals. (In this role, of course, physicists do not have unique qualifications among scientists.) The most important ingredient is the doctoral experience, which calls for independence, analytical judgment and clear exposition. Science and technology play substantial and thoroughly interwoven roles in a significant number of the issues that come to be debated and decided upon through the legislative process. Congressional staff must interpret these issues and place their scientific components in perspective. It is definitely helpful, in performing this task, if a member of the staff can approach scientific issues with the familiarity of a professional.

Thus there is a region of activity, neither wholly science nor wholly law or public policy, where persons with training as professional scientists can play highly constructive roles. A number of scientists now contribute in these ways, and we feel that others will be needed increasingly in the future to assist in clarifying questions associated with the environment, energy resources and utilization, health care, food production and a host of other complex issues.

Science-government links

This report on the first APS Congressional Fellowships is designed to stimulate discussion of the developing role of the scientific community in the public policy arena. The Congressional Fel-

lowship represents a very helpful link in a chain of institutions that can provide reliable scientific advice to clarify the choices that the public and their representatives must make on important policy issues.

The APS and the other professional societies, recognizing the value of the Congressional Fellowships, are continuing and expanding the program for succeeding years. We urge the APS membership and their institutions to assist—the former by contributing voluntarily to the APS dues solicitation allocated to the Fellowships, and universities and other employers of scientists by recognizing the legitimacy for regular sabbatical support of the year that the Fellows spend on Capitol Hill. (There is still some reluctance to consider ours legitimate work for physicists.)

However, other links between science and government, notably the mechanisms for tapping the considerable resources represented by the membership of APS, are still in the early stages of design; considerable debate over the role of science and scientists in the social-values-laden arena of public policy is both inevitable and necessary. As recent gatherers of a novel experience in science, technology and the legislative process, we believe that this review could make a constructive contribution to the discussion.

References

1. Senate Resolution No. 45, 92nd Congress, 3 May 1971.
2. See "An Assessment and Analysis of the Energy Emergency," Senate Interior Committee, Serial No. 93-25, US Government Printing Office, Washington, D.C. 1973.