The Provision of Science Advice to Policymakers: a US Perspective

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Issue: Decision-makers are freighted with scientific or technological considerations that are often politically volatile.

Relevance: Legislators should have effective access to the best possible information, intelligence and counsel on issues of science and technology, which are often crucial to the future of their country, and indeed the future of humankind.

The horrific attacks of September 11, 2001, on the World Trade Center in New York City and the Pentagon outside Washington, DC, demonstrated how products of Western science and technology (S&T)–jet aircraft and avionics–could be employed to assault citadels of American economic and military power. At the time of writing, in mid-October, the United States is responding with cruise missiles and laser-guided bombs directed at the Talibanin Afghanistan –and with drops of food parcels for the Afghan people.

Clearly the consequences of September 11 for makers of U.S. policy–economic, foreign and military–are deep and wide-ranging.

The nation's intelligence and law enforcement agencies, for example, have come under criticism for weaknesses in tracking the September terrorists, who were obviously not technologically illiterate.

In Washington, D.C., an envelope containing anthrax was this month targeted at the Majority Leader of the U.S. Senate, Tom Daschle (Democrat-South Dakota), while in both Florida and New York City, anthrax was apparently aimed at leading television and newspaper journalists, one of whom, Judith Miller, is co-author, with her *New York Times* colleagues, Stephen Engelberg and William Broad, of a new book, *Germs: Biological Weapons and America's Secret War* (Simon & Schuster). A recent study by the General Accounting Office found the Federal government as well as state and local health departments unprepared for this latest threat. Meanwhile Senators and Representatives are holding hearings in Washington on the challenge of bioterrorism.

Although in office less than a year, President George W. Bush is confronted with decisions he surely did not anticipate. But if reacting effectively to September 11 must now be his overriding concern, there are other judgments the new president and his team must make that are, like making war, also laden with scientific and technological dimensions.

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Here is only a partial list of such issues: global warming, missile defence, stem cell research, wireless technology proliferation, energy, AIDS epidemics in Africa and India.

Not only are the policy challenges the Bush Administration must face complex and contentious but to meet them, the President of the United States lacks the decision-making authority of a British Prime Minister. For in the American separation-of-powers constitutional system, characterized as well, in contrast to European arrangements, by relatively undisciplined political parties, in making national policy, Congress counts! This is a lesson President Bush is learning every day.

All the more is the power of the elected Senators and Representatives in Congress to shape policy made obvious by the current political configuration in Washington, DC: a Republican in the White House, a Republican majority (narrow) in the House of Representatives and a Democratic majority (one vote) in the Senate.

In influencing policy, the U.S. Congress has three principal instruments: writing the laws that authorize the activities of the government, appropriating (or not appropriating) funds necessary to carry out the laws, and overseeing their implementation.

Although Senators and Representatives wield great and often decisive authority in setting policy, and despite the ballooning relevance of scientific and technological factors to more and more of the questions on which Congress votes, very few legislators have been educated as scientists or engineers. Given the kinds of persons attracted to campaigning for election to public office, this observation should surprise no one.

Nearly thirty years ago, in 1972, Congress responded to its perceived need for science and technology advice by creating the Office of Technology Assessment (OTA).

Governed by a Technology Assessment Board, consisting of six Senators and six Representatives, evenly divided between Democrats and Republicans, OTA was advised by, in addition to its professional staff, a group of ten experts from the public.

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In 1995, however, following the elections of 1994, with Republican victories in both Senate and House of Representatives, Congress, by refusing it funds, killed OTA. Said Lord (Wayland) Kennet, a British leader in technology assessment, "The Office of Technology Assessment (OTA) was the trailblazer for all the later European institutions...."

"The disappearance of OTA has not only been of sad importance to all who work in parliamentary technology assessment in Europe; it has been a bit baffling. That the leading technological state in the world, a democracy like us, should have abolished its own main means of democratic assessment left us aghast...."[1]

The demise of OTA has obviously not resolved the question of how Congress gets S&T advice. Indeed, last June, a group of scholars, Congressional staffers and leaders of industry met in Washington to explore prospects for filling the knowledge gap left by the death of OTA.[2]

Suggestions for enabling Congress to obtain S&T advice developed at the June meeting as well as from other quarters are even now under consideration on Capitol Hill. Congressman Amo Houghton (Republican –New York); John H.

Gibbons, former Science Advisor to President Clinton and former director of OTA; and M. Granger Morgan, Professor and head of the Department of Engineering and Public Policy at Carnegie-Mellon University, Pittsburgh, joined recently to propose in effect a new OTA, also bipartisan and bicameral, but in response to criticisms of the old OTA, one with "strategies" to perform studies more rapidly, to ensure that the needs of the minority are well served, and to supply technical advice...to other congressional support organizations...."[3]

Representative Rush D. Holt (Democrat-New Jersey), one of two physicists in Congress, has introduced legislation to re-establish OTA; since September 11, prospects for action have dimmed. Senator Jeff Bingaman (Democrat-New Mexico), however, is still pressing for $1 million for a technology assessment pilot project in the General Accounting Office.

Given that Members of the House of Representatives serve terms of but two years, some lawmakers had charged that OTA took too much time to complete its studies. Many Republicans also criticized OTA analyses of defence and environmental issues as too "liberal".

Conversations with former OTA leaders cast a different light on such complaints. Requests for rapid response reports were, indeed, answered but with caveats. On the allegation of "liberal" bias, OTA directors countered that the objections were often to the substance of OTA's conclusions, for example, to OTA's scepticism about the technological feasibility of missile defence proposals.

"People want science-based decisions, and they're all for that until the scientific consensus is politically inconvenient", House Science Committee Chairman Sherwood Boehlert (Republican-New York), has observed.[4]

Certainly the issues Congress confronts that are freighted with scientific or technological considerations are often politically volatile–stem cell research, genetically produced foods, alternative energy sources, missile defence policy, global warming, nuclear power.

A revived–and reformed–OTA is not the only vehicle to which Congress could turn for S&T counsel. Ten years ago, while serving on the Carnegie Commission on Science, Technology, and Government and, having previously been a Member of the House of Representatives (Democrat-Indiana) for twenty-two years (1959-1981), the author chaired the Commission's Committee on Congress. The Carnegie Commission produced a series of reports on how all three branches of the Federal government–executive, legislative and judicial–could more wisely and effectively deal with issues with scientific or technological dimensions. This article will only cover the aforementioned committee concerning Congress.

One of our reports addressed the question of expert S&T advice from outside Congress while another focused on the analysis and advice Congress received from OTA, the Congressional Research Service of the Library of Congress, General Accounting Office and Congressional Budget Office.[5]

The third report focused on organizational and procedural reforms, with particular attention to long-range planning and goal setting, committee structure and the budget process.[6]

Although recommending several reforms in its operation, our Committee found the activity of the Office of Technology Assessment resulted in a product, "full-scale assessment...that is widely used and appreciated by Congress, the scientific community, the public, and individuals and organizations in other nations".[7]

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We said, too, that scientists and engineers should become more active in policy-making and that Federal agencies, academic institutions, corporations and professional societies should encourage such involvement.

Just one indicator of the S&T universe to which the President and Congress today direct their decisions is that in the Fiscal Year 2001, the Federal government will spend over $90 billion on Research and Development (R&D), a figure some observers estimate could next year easily exceed $100 billion.

With expenditures of tax dollars of such magnitude, it is not surprising that in his recent book, *Science, Money and Politics*, the nation's leading science journalist, Daniel S. Greenberg, has written a brilliant, irreverent but powerfully documented study of the ties that bind American science to money and politics.

Greenberg's sharply critical analysis demonstrates how the ability of American scientists to win Federal funds is brought to bear with great effectiveness not only on the executive branch but also on Congress.

Indeed, Greenberg warns:

...[S]cience is too powerful, too potent in its effects on society, and too arcane to be entrusted to the expanding alliance between a profession that has retreated into a ghetto and the commercial sector, with their shared focus on making money. While this relationship flourishes, a deadening complacency has settled over the institutions that should be protecting and advancing the public interest in science: the research agencies of the executive branch of government, Congress, the press, and, within science, leaders who should be stewards of scientific tradition, rather than apologists for its neglect. Science finds advantage and claims virtue in its detachment and aloofness from politics. But politics is the medium through which a society decides upon and implements its values and its choices. That the political system frequently goes awry and fails to work to its full potential of beneficial effects is a reason for involvement, not withdrawal. And this is especially so for an enterprise that draws heavily on the public purse and radiates powerful effects in all directions and on all things ....[8]

One obvious example of Congressional muscle is the practice of Senators and Representatives in taking advantage of appropriations bills to earmark funds for specific institutions and facilities in their own constituencies. This practice, under which Congress votes monies for buildings and research projects without peer-reviewed competition, spurred President Bush's Director of the Office of Management and Budget, in the hope of ending the phenomenon, a few weeks ago to bring together science policy and university leaders to discuss the question.[9]

Most observers, however, agree that achieving success in persuading politicians no longer to look to the interests of their own constituencies is an unlikely development.

A dramatic demonstration of congressional power to affect science is the response of the Senate and House of Representatives to the call in 1993 of Nobel Laureate Harold Varmus, former Director of the National Institutes of Health, to double the funds for science in over a decade- and that's happening. For, as a former OTA director told me, "When individual citizens believe that basic research and science can lead to life-saving cures, Senators and Representatives

will continue to vote to increase appropriations for the National Institutes of Health".

It may be tempting to throw up one's hands in despair or acknowledge with cynicism that elected politicians engage in politics. Yet experience demands that we keep pressing the case for finding ways and means of making it possible for legislators, especially those who serve in assemblies that are more than rubber stamps for the Executive, to have effective access to the best possible information, intelligence and counsel on issues crucial to the future of their country, indeed, to the future of all humankind. This means advice on issues of science and technology.[10-11]

Experience demands that we keep pressing the case for finding ways and means of making it possible for legislators to have effective access to the best possible information, intelligence and counsel on science and technology issues critical to the future of their country

Notes

1. *Parliaments and Technology: The Development of Technology Assessment in Europe*, Edited by Vig N. J., and Paschen, H., State University of New York Press, Albany, 2000, p.14.

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3. Granger, M. M., Houghton, A., Gibbons, J. H., *Improving Science and Technology Advice for Congress*, Science, Vol. 293, September 14, 2001, pp.1999-2000

4. Bettelheim, Ibid., P.1750.

5. Carnegie Commission on Science, Technology, and Government, Science, Technology, and Congress, in two parts: *Analysis and Advice from the Congressional Support Agencies*, October 1991, and *Expert Advice and the Decision-making process*, February 1991.

6. Carnegie Commission on Science, Technology, and Government, *Science, Technology, and Congress: Organizational and Procedural Reforms*, February 1994.

7. Science, Technology, and Congress: *Analysis and Advice from the Congressional Support Agencies*, Ibid., p.50.

8. Greenberg, D. S., *Science, Money and Politics*, University of Chicago Press, Chicago, 2001, p.471.
See also Greenberg, D. S., *Science in the Public Sector: Who's Making the Decisions?*, The Chronicle of Higher Education, January 19m 2001, pp. B10-B12.

9. Malakoff, D., *White House Asks Community To Oppose Earmark Projects*, Science, Vol.293, September 28, 2001, p.2364.
See also Malakoff, D. *Perfecting the Art of the Science Deal*, Science, Vo.292, May 4, 2001, pp.830-835.

10. A useful source of information on S&T issues in Washington, D.C. is *Science and Technology in Congress,* a newsletter published eight times annually by the Centre for Science, Technology, and Congress at the American Association for the Advancement of Science.

11. Brademas, J., *Technology and Social Change: A Congressman's View,* in The Impact of Science Technology, edited by Aaron W. Warner, Dean Morse and Alfred S. Eichner, Columbia University Press, New York, 1965.

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