

Two Cheers for Democracy: Science and Technology Politics – *Bill Green*

Probably not since the period after World War II, the era of Vannevar Bush's *Science: The Endless Frontier* (1945) and William T. Golden's report to President Truman recommending the creation of the post of Science Advisor to the President, has there been as much discussion as in recent years on the structure of science within the United States government (Golden, unpublished). Examples of works that have played significant roles in that discussion are the collection of essays edited by Golden in 1988, *Science & Technology Advice to the President, Congress and Judiciary*, the reports of the Carnegie Commission on Science, Technology, and Government, and the National Research Council's report, *Allocating Federal Funds for Science and Technology* (Press 1995), which was produced by a very distinguished committee chaired by Frank Press, president of the National Academy of Sciences from 1981 to 1993, and before that President Carter's science advisor.

For 12 of my 15 years in the House of Representatives, in my role as ranking Republican on the House Appropriations Subcommittee on Veterans Affairs, Housing and Urban Development, and Independent Agencies, I faced many of the issues from the current debate. In addition to the two cabinet departments, the independent agencies for which we originated appropriations included the National Aeronautics and Space Administration (NASA), the Environmental Protection Agency (EPA), the National Science Foundation (NSF), and the Federal Emergency Management Agency, as well as a host of smaller entities with some science and technology responsibilities, such as the Office of Science and Technology Policy (OSTP) and the Council on Environmental Quality (CEQ), both part of the Executive Office of the President, and the Consumer Product Safety Commission.

Thus, in originating our appropriations bill, which annually accounted for approximately 30 percent of the nation's domestic discretionary spending, we had to deal with both competition for funds among scientific disciplines and the claims of science and technology versus those of other parts of the federal government. Those problems were aggravated by the fact that during the 12 years that I served on the subcommittee, the Consumer Price Index rose by 59 percent while our allocation of funds from the full Appropriations Committee rose by only 17 percent. The pressure on our allocation did not represent any

hostility towards us by the full Appropriations Committee. Instead, it represented the crowding out of all discretionary federal spending by the entitlement programs, most notably Medicare, Old Age and Survivors Insurance, and Medicaid. That was a decision made annually by the full Congress in its budget resolution.

One idea that has gained prominence in recent years as a means of restructuring the government's science enterprise is the creation of a Department of Science and Technology to encompass all the science and technology functions now spread about the executive branch. That would be followed by science and technology authorizing committees in the House and Senate that would take over all the science and technology jurisdictions of the other committees and similar appropriations subcommittees.

The idea has obvious appeal. It is, at least on initial contemplation, simple, and appears to improve accountability. It may, however, fall into the category which I think H. L. Mencken once described when he said that every problem has an answer which is obvious, simple, and wrong.

Moving things around is always a temptation. At one point in my Congressional career, I was vexed with NASA for seeming to give priority to putting people in space rather than maximizing the science return from space. I contemplated introducing legislation to move NASA's science responsibilities and funding to the NSF, leaving NSF grantees the option to hire NASA, private sector, or even Soviet cosmonauts in furtherance of their research.

My staff ultimately persuaded me that such a shift was unlikely to change the political and public relations pressures that drove the manned space program, and was just as likely to result in less space science as in more. The only sure outcome was that the shift would have disrupted space science for at least a year as the change was made. But there are larger reasons why I am skeptical of a Department of Science and Technology. The fact is that federal agencies do science and technology for many reasons, reasons that may be important to an agency mission though they would not be to a science department. Should an EPA, for example, have to justify to a Science and Technology Department funding research on

the clean-up of a particular kind of hazardous waste site that the agency feels is a major problem?

The fact of the matter is that the two agencies would have different criteria in making decisions and there would be no reason to expect a Science and Technology Department to have expertise on all the issues EPA must consider in setting its priorities.

Let me give another example from our subcommittee. The VA runs a medical research program, funded at around a quarter of a billion dollars. Though to some degree it focuses on rehabilitation medicine and obvious VA interests, that is far from being the exclusive focus of the program. Even without a Science Department one might ask why this program stands alone at the VA instead of being folded into, and subject to the priorities of, the National Institutes of Health.

There is a reason. The funds are used as bait for medical schools to affiliate with VA hospitals. Since studies have clearly shown that VA hospitals with medical school affiliations perform better than those without them, this inducement to medical schools to affiliate with VA hospitals is an important element in maintaining quality in the VA's \$17 billion a year medical system, the nation's largest single health care system. The quarter of a billion dollars is modest science funding, at least by Washington standards, and certainly if measured by the scale of NIH, but for the VA, it has a very large payoff for the department's mission, a payoff that would be totally lost in a shift to a Science Department.

That is not to say that there are not places where consolidation or revamping of federal science activities might not be beneficial. One place that comes to mind is science education. Both the Department of Education and the NSF have programs in this area, and other federal agencies also see it as a responsibility. Thus *Science in Air and Space: NASA's Science Policy Guide* notes that, "throughout most of its history, NASA has explicitly undertaken a major role in the support of graduate education and the education and training of graduate students." The report goes on to propose that "NASA and its research community must become more actively involved in pre-college education." If there was any coordination among these various education programs, it was certainly not evident to those

of us who were in Congress, and it might well make sense to have some sort of coordination.

The real issue facing the United States government in relation to its science and technology effort is how much money science and technology are to get as a whole, and how to divide up that money among the various claimants in the science and technology community. Creating a Department of Science and Technology would not by itself resolve those questions any more than the existence of NSF today tells us what its overall appropriation should be or how to divide that appropriation among its several directorates.

Another example of the difficulties in deciding how to allocate funds among claimants, even in a narrow range of disciplines, is the report *Setting Priorities in Space Research: An Experiment in Methodology* (National Research Council 1995). The group involved in the effort was unable to arrive at a consensus on procedural instruments to be used to make allocations in this field.

At the outset of my recommendations on these issues, let me note that I have been very favorably impressed by the mechanisms that are in place to get advice on priorities and funding needs within individual disciplines. The agency advisory committees and peer review mechanisms, the OSTP and the various White House advisory committees, and the National Research Council system seem to me in general to do an excellent job, and I found their work very helpful when I was in Congress.

Candor requires me to state that the National Research Council has appointed me to its Space Studies Board, but I can assure you that I reached my conclusions well before that appointment. In my view, both initial budgetary decisions (how much to propose *in toto* for science and technology) and at least the first cut as to how funds should be divided up by disciplines, must be determined by the White House. In that respect, science and technology are not different from other areas of federal activity.

For example, it is the White House that decides how much to propose for transportation infrastructure and how to divide it up among the several transportation modes. Who at the

White House should have primary responsibility for recommending those decisions to the President? The two obvious players are the OSTP and the Office of Management and Budget (OMB). I would see the internal White House process as a joint effort of the two, as indeed I believe it is now and has been for some time.

Because the head of OSTP, the Science Advisor, is something of an advocate for science to the President, I would see OMB as having the larger role in balancing science's claims against other claims on the federal list. Once that choice has been made, I should think that OSTP, because of its expertise, would have the larger role in making the decisions among the science and technology disciplines.

Still, to decide who is responsible for decisions does not tell us how it should be done. White House budgeting will function within a larger process, such as zero-based budgeting or management-by-objectives, which are examples of approaches that the White House has used to operate its overall budgeting system. How are the specific science and technology choices to be made? I have found the recommendations in the National Research Council's Press report, to which I have previously referred, an excellent start. Though by its own terms more suggestive than prescriptive, the Press report recommends that a science and technology budget be an integral part of a federal budget. That contrasts with the current system, in which the science components spread throughout the many agency budget requests are pasted together after the presidential budget recommendation is completed.

Under the system proposed in the Press Report, science and technology funding levels would be decided by determining what was necessary “to maintain a world-class position in fundamental science and technology and a leadership position in select fields.” OMB calls to agencies to start the budget process, and agency responses would reflect that premise. Congressional budget procedures would be changed by having the Budget Committees track the extent to which individual appropriations bills meet administration requests.

Finally, having such a device to provide a rationale for the administration's science funding requests would strengthen them in competition with other claims on federal funds. But to

be candid, it would not truly tell us what to do when there just is not enough money to go around – another way of saying when the political system decides it has other priorities.

In the end, given our democratic system, whatever process we choose for making government science and technology decisions is always going to be messy. As E. M. Forster put it, two cheers for democracy. We are, after all, dealing with a perfectly normal situation in which the useful things on which we can spend money require more money than we have to spend. For those of us with an economics background, it was always difficult for government entities not subject to the marketplace to make such decisions in the absence of a means of determining the marginal benefits and the marginal costs of various alternative programs.

There is, of course, another way of looking at the problem. It is Robert Browning's observation in his poem Andrea del Sarto, “Ah, but a man's reach should exceed his grasp, or what's a heaven for?”