



Science in the White House

Steve Fetter

In many countries there are few opportunities for university scientists to serve as government officials. But in the U.S., hundreds of academic scientists take positions in federal agencies or in Congress every year, through Interagency Personnel Act appointments, fellowships, sabbatical leave, or other appointments. These appointments typically last only one or two years, but the benefits are substantial. Government benefits from fresh ideas and knowledge from scientists who are true experts in their field; universities benefit from having faculty with an understanding of how government works; and faculty benefit from having an opportunity to serve the country and apply their knowledge and skills to important policy problems.

I have had the good fortune to take work in government three times: in the Pentagon for two years in the beginning of the Clinton administration; in the State Department a few years later; and, most recently, I worked for over three in the Office of Science and Technology Policy (OSTP) in the White House. Here I will focus on my experiences at OSTP.

The White House is, of course, a special place to work. During the first year I attended several meetings each week in the fabled situation room, working through various policy reviews. I felt privileged every time I walked through the doors into the West Wing.

The White House is a large and complex operation, with many offices that have overlapping portfolios. Few issues are the sole responsibility of a single person or office. When arranging a meeting, it was important to identify all of the people who would have a stake in an issue, to make sure that all views were represented. I worked on a daily basis with the people from the National Security Staff, the Office of Management and Budget, the Domestic Policy Council, that National Economic Council, and the Council on Environmental Quality. On some issues, I worked with the Office of the Vice President, the U.S. Trade Representative, and the Council of Economic Advisers.

Because portfolios overlap, collaboration is essential. And although everyone is collegial, it is also a competitive environment, with people jockeying to get their policy initiatives to the top of the agenda. For that reason it is also an entrepreneurial environment, with people looking for good policy ideas or for problems that should be addressed. Although there was no shortage of frustrations, it was inspiring to see how hard everyone worked, and how everyone worked for public good.

The director of OSTP is John Holdren, who also serves as the President's science advisor. OSTP has four divisions: Science, Technology, Environment and Energy, and National Security and International Affairs. I initially worked mostly in the national security division, and directed the environment and energy division in the final year. In between, I played the role of a utility infielder, handling issues as they arose, such as the U.S. response to the nuclear accident in Fukushima.

OSTP has two basic roles, which might be summarized as "policy for science" and "science for policy." The most important aspect of "policy for science" is setting overall priorities for research and development, and ensuring that those priorities are reflected in the programs and the budgets of all federal agencies, particularly those with large R&D efforts, such as NSF, NIH, DOE, NASA, NOAA, NIST, DOD, DHS, CIA, EPA, USDA, and USGS.

OSTP works closely with the Office of Management and Budget (OMB) on budgets for R&D programs. The OSTP and OMB directors issue a joint memorandum to the heads of all executive departments and agencies on science and technology priorities. The priorities memo for fiscal year 2014 outlined priorities in advanced manufacturing, clean energy, climate change, information technology, nanotechnology, biotechnology, and STEM education.

Agencies use this guidance in preparing their budgets, which are submitted to OMB in early September. OSTP assists OMB in analyzing and reviewing these submissions and suggesting adjustments to R&D programs. OMB returns the adjusted budgets to agencies in late November in the "passback." Agencies appeal some of the adjustments, and negotiations with OMB ensue. There is never enough money to fund all priorities, and tough decisions remain for the president. President Obama understands the value and importance of scientific research, and he has accorded high priority to R&D in these decisions.

Part of OSTP's job is to defend federal R&D expenditures to Congress and the public. Many people do not understand the nature of science and the research enterprise or fully appreciate the value of government-sponsored R&D for society. One

member of Congress said, “We’re spending over \$60 billion a year for research. What are we getting for that money?” That is a hard question to answer; if one could say with confidence what the benefits of current research will be, it would not be research. But you can identify the benefits of past research. Studies of the social returns to past R&D consistently show returns of 20-30 percent per year over the last several decades — a rate of return that far exceeds stock markets.

Much — maybe most — research expands human understanding but does not produce tangible economic benefits. But some research produces enormous benefits that cannot be foreseen. When the Office of Naval Research gave Charles Townes small grants in the 1950s to support work in quantum electronics, no one could have foreseen that it would lead to lasers and other devices that would transform dozens of industries. No one imagined that ARPAnet would one day be the foundation for the digital economy, or that the need for particle physicists to share data would lead to the creation of the World Wide Web.

Scientists must get better at explaining the significance of their research, and why it matters. A steady stream of senior scientists came through our office. Most were terrific, but I was surprised that many could not explain in five or ten minutes what they were doing and why it was important and worthy of support. Business schools teach students to give an elevator pitch — how to describe their idea in one minute, well enough so that potential investors want to hear more. They develop 5-minute and 15-minute versions in case the investor wants to hear more. We should train our graduate students to do the same thing, using language that any intelligent person can understand. If you really understand something, you ought to be able to explain succinctly to an assistant secretary or senator what you are doing and why it matters.

The budgetary process is important, but more time is spent on policy or “interagency” processes. Interagency committees are commonly chaired or convened by a White House office — usually by OSTP when the issues concern the conduct of science. This includes coordinating R&D programs across Federal agencies, to ensure that key challenges are being addressed while avoiding unwanted duplication. OSTP convenes dozens of such groups under the auspices of the National Science and Technology Council, on topics ranging from space weather to critical materials. Other “policy for science” issues include improving STEM education; streamlining visa processing for foreign scientists; promoting international scientific cooperation; protecting scientific integrity; and policies to make data and other results of federally-sponsored research widely available. The Obama Administration has made significant progress in all of these areas.

The second main role of OSTP is “science for policy.” OSTP is responsible for ensuring that the President and his senior staff have the best available scientific and technical advice, and that all of the President’s policies are informed by the best available scientific information and analysis. Science and technology play important roles in many key policy challenges and issues before the Administration, including health care, economic recovery and growth, climate change, clean energy, homeland security and cybersecurity, and nonproliferation. Accordingly, OSTP had a seat at the table on a very wide range of policy issues. One of the things I enjoyed most was the opportunity to work on a wide range of issues: nuclear weapons and arms control policy; ballistic missile defense and landmines; identifying opportunities for scientific and technical collaboration with other countries; climate change, ocean policy, and various EPA regulations; energy research and development; protecting the grid against solar storms; and earth observation satellites. It was incredibly stimulating.

These interagency policy committee (IPC) meetings are often convened at the assistant or deputy assistant secretary level. If agreement by all the key agencies cannot be reached at that level, the issue will be escalated to the “deputies” level for resolution; if agreement cannot be reached at the deputies level, the “principals” or cabinet secretaries will be convened. The deputies or principals also are convened to confirm agreements reached at lower levels on particularly important issues.

Let me close by sharing a few things I learned:

- Personal relationships matter. Be nice to people. You never know who you will be working with or for in the future.
- Information is everything. Do not count on your position or “official channels” to ensure that you are informed. Schmooze; invite people to lunch or coffee. If you are not hearing anything about an issue, it probably means that you are not in the loop.
- Generate ideas. Write them down — preferably in one paragraph, but no more than one page. Prepare an elevator speech. Be persistent. Don’t get discouraged. Wait for an opportunity.
- Do not seek credit. A common quip is that you can get a lot accomplished in Washington if you do not seek credit. This is true but frequently ignored (including by people who cite it).
- If you don’t know something, call an expert. One of the wonderful things about working in the White House is that almost anyone will take your phone call and offer to help. Resist the temptation to rely entirely on your own analysis.

Steve Fetter
Associate Provost for Academic Affairs
Professor, School of Public Policy
University of Maryland, College Park
sfetter@umd.edu

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