Using Science to Help Shape The Nation's Policies

Jack Fellows didn't start out thinking of himself as a maker of policy. "As an engineer, I'd never even heard about public policy as a career," he says. "My focus was pretty much on the university environment." But after getting his Ph.D. in engineering at the University of Maryland he noticed an ad about congressional fellowships that the American Geophysical Union was sponsoring. Fellows decided to apply. "I did it just for a lark," he says, "as a break between graduate school and starting a career in academia."

This is the second in a series of six pages in *Science* linked to features on *Science*'s Next Wave, the new AAAS/*Science* World Wide Web project for young scientists (http://sci.aaas.org/nextwave). This story focuses on scientifically trained people who made the transition to a new career niche as a policy-maker.

Fellows's lark turned into a full-time passion. During his fellowship year, he met David Stockman, then head of the Office of Management and Budget, and struck up a conversation about the Landsat Satellite Program, which OMB oversaw. "I'd done my Ph.D. on this, so it was a subject I knew well," he says. Not long thereafter, he was invited to apply for a permanent position at OMB. He's now been there 13 years, staying on "because we're absolutely on the cutting edge of public policy, making decisions that have real, sustainable value to the country." And the move has paid off for Fellows's career, too: He oversees the research and development budgets of the National Science Foundation, the National Aeronautics and Space Administration, and the Smithsonian (part of the government's $71 billion R&D budget, which he also helps coordinate).

Fellows is only one of a large group of trained researchers who have made their way to positions as science advisers and science policy-makers. From the Food and Drug Administration (FDA) to the State Department, the government's decision-makers rely on the input and expertise of staff scientists, many of whom found their positions after starting off in academia or industry, or having spent a year in a congressional fellowship. Like Fellows, many of these people hadn't envisioned themselves as policy-makers while they were getting their science training.

Take Eric Flamm. Flamm, trained as a molecular biologist, is senior policy adviser in the FDA's Office of Policy. He says he had never thought of science policy as a career while he was in graduate school. Like most other molecular biology Ph.D.s, he thought he would always be a researcher—even though he wasn't absolutely sure he was cut out for a life at the bench. After earning his Ph.D. at the University of Michigan, Flamm signed on as a scientist at the National Institutes of Health (NIH). But when his 7-year stint at the NIH ended in 1987, he applied for a position approving food products with the FDA. "I came in just when the biotech industry was starting its R&D in food," says Flamm, "and I found myself writing the first regulations for a bioengineered food ingredient." Today, Flamm helps develop biotech policies at FDA, from bioengineered foods to biotech drugs to transgenic animals. "I like the mix of science and law," he says, "and I'm sure I'm making more of a contribution than if I'd stayed in research."

Many scientists in policy-making positions agree with Flamm that they're having more impact now than they would at the bench. "I worked on computer modeling of plate tectonics for my Ph.D., a field with maybe 12 people in it, whereas my work today affects the lives of people around the world," says Jonathan Pershing, the scientific officer in the State Department's Office of Global Change. Pershing helps coordinate the international implementation of the government's science policy on topics from climate change to ozone depletion.

But to offer such a range of advice, Pershing and other scientists have found they've had to become generalists rather than specialists. "I don't think I've ever been asked a question about plate tectonics, my area of expertise, in the 6 years I've been here," he says, "though I have used my analytic background to explain other technical issues." "When you're a scientist on the Hill," adds Norine Noonan, a cell biologist who until 1992 held the job Fellows has now at OMB, "you're expected to know everything from anatomy to zoology. And if you don't have the expertise on a subject, you better know someone who does."

While this may be daunting, even more difficult, say Noonan and others, is communicating scientific knowledge to your colleagues in the government. "The majority of policymakers are utterly clueless about science," says Noonan, who returned to academia after a 10-year stint at OMB and is now dean of the graduate school at the Florida Institute of Technology. "And the majority of scientists don't have a clue about communicating—about the importance of brevity and clarity, and putting technical concepts forward in a few words." "Good writing is just so important in these jobs; if you're really interested in this kind of career you should take extra courses in English, history, or philosophy, anything that forces you to write," adds Mark Schaefer, a biologist and the deputy assistant secretary for water and science at the Department of the Interior.

Most scientists in Washington also discover that they have to adjust their style of thinking, say Fellows and others. In the making of policy, "it's not a matter of whether an answer is 'right' or 'wrong', as it is in research," says Michael Telson, an electrical engineer and special assistant to the deputy secretary in the Department of Energy. "Here, it's more a matter of tastes, of preferring chocolate over vanilla." Thus, the real art is not finding the "right" answer, but finding a way to reach a consensus. "You learn to negotiate, to be a diplomat, to listen to all sides of an issue, and to take them all into consideration," says Fellows.

Scientists who can't put aside their desire for a "right answer" are apt to have trouble, he adds. "Whether you're working for Reagan or Clinton, you have to carry the water; you implement the policy of that Administration, because that's your job." At the same time, scientists in these careers are providing the government's movers and shakers with the only scientific input they may hear. "It's the main chance we as scientists have for making sure that science is brought into the decision-making process," says Frances Carr, senior science adviser at the U.S. Agency for International Development. And that alone, she and the others say, makes this kind of career worthwhile.

–Virginia Morell

For more information on making the transition to a career as a science policy-maker, please go to *Science*'s Next Wave, on the World Wide Web at <http://sci.aaas.org/nextwave>, and look under the "New Niches" heading on the home page. There you will find the stories of "Role Models" who have already made this transition, along with "Resources" that will help you make it yourself.