

DAVID H. GUSTON

Forget Politicizing Science. Let's Democratize Science!

Since the publication last year by Rep. Henry Waxman (D-Ca.) of a report alleging that the Bush administration has been inappropriately manipulating scientific reports and advisory committees, science policy has become an issue with surprisingly long political legs. The administration dismissed Waxman's report as a partisan distortion and a politicization of science in its own right. But this charge became somewhat harder to sustain with the publication of a like-minded report by the Union of Concerned Scientists and a letter, signed by a left-leaning but still bipartisan group of scientists, again alleging that the administration has inappropriately played politics with the findings of government scientists and with appointments to federal scientific advisory panels.

John Marburger, director of the White House Office of Science

David H. Guston (guston@rci.rutgers.edu) is associate professor and director of the Public Policy Program at the Bloustein School of Planning & Public Policy of Rutgers, The State University of New Jersey. In January 2005, he will join Arizona State University and its Consortium for Science, Policy, and Outcomes as professor of political science.

Science advising in government is unavoidably political, but we must make a concerted effort to ensure that it is democratic.

and Technology Policy, eventually responded with his own defensively toned report. The political right also took aim with a critique of leftist science in *Politicizing Science*, published by the conservative Hoover Institution. Without close examination of each allegation, it is hard to judge whether one side is engaging in the more significant distortion or whether both sides are merely viewing business as usual through a lens fractured along partisan lines.

Regardless, such allegations that science has been politicized are unproductive. I also suspect

them of being somewhat insincere, in the same way that Louis, the Vichy Prefect of Police in *Casablanca*, was "shocked, shocked" to find gambling in the back room at Rick's, even as he collected his own winnings. From the \$120 billion for scientific R&D that the government provides, to the petty power plays that plague departmental governance, science is deeply political. Asking whether science is politicized distracts us from asking, "Who benefits and loses from which forms of politicization?" and "What are the appropriate institutional channels for political discourse, influence, and action in science?" Arguing over whether science is politicized neglects the more critical question: "Is science democratized?"

Democratizing science does not mean settling questions about Nature by plebiscite, any more than democratizing politics means setting the prime rate by referendum. What democratization does mean, in science as elsewhere, is creating institutions and practices that fully incorporate principles of accessibility, transparency, and accountability. It means considering the societal outcomes of research

at least as attentively as the scientific and technological outputs. It means insisting that in addition to being rigorous, science be popular, relevant, and participatory.

These conceptions of democratization are neither new nor, when applied to science, idiosyncratic. They have appeared in discussions about science at critical historical junctures. For example, the Allison Commission, a congressional inquiry into the management of federal science in the 1880s, established the principle that even the emerging "pure science" would, when publicly financed, be subject to norms of transparency and accountability, despite John Wesley Powell's protestations. After World War II, the creation of the National Science Foundation (NSF) hinged on establishing a politically accountable governing structure. These concerns exist at the heart of arguments made by theorists such as Columbia University philosopher Philip Kitcher, who describes the accessible and participatory ideal of "well-ordered science" in his *Science, Truth, and Democracy*. They likewise exist in many current science agencies and programs, but there they often fly under the radar of higher-profile issues or have been institutionalized in ways that undermine their intent.

They do not exist, however, as an agenda for democratizing science. Below, I attempt to construct such an agenda: a slightly elaborated itemization of ways to democratize both policy for science and science in policy.

Policy for science

In the past, critics of elite science attempted to democratize policy for

science by expanding the array of fields that the federal government supported, as Sen. Harley Kilgore attempted to do with the social sciences in the early debate over NSF, or by creating programs that were explicitly focused on societal needs, as Rep. Emilio Daddario did with NSF's Research Applied to National Needs. These approaches were problematic because public priorities are just as easily hijacked by disciplinary priorities in the social sciences as in the natural sciences. Moreover, at a basic research institution such as NSF, applied research may be either too small to have great influence on the larger society or just large enough to threaten the pure research mission. My agenda for democratizing policy for science takes a different tack by broadening access across the sciences and across the levels at which priorities are set.

First, engage user communities and lay citizens more fully in review of funding applications. Such "extended peer review" increases the presence of public priorities without mandating research programs or diluting quality. The National Institutes of Health (NIH) pioneered a modest form of extended peer review by including citizens on its grant advisory councils, but the councils' reviews of study sections' recommendations have a pro forma quality. The NIH Web site acknowledges that "the use of consumer representatives may be extremely helpful in the review of certain areas of research," but it still holds "it is often neither necessary nor appropriate to include consumer representatives in peer review." A more thorough use of extended peer review occurs at

the National Institute on Disability and Rehabilitative Research of the Department of Education, which seeks input from relevant disability communities in funding decisions and post-hoc review. Disciplinary research such as that supported by NSF would be less likely to benefit from such input, although priorities across areas of inquiry, such as climate research, would benefit from an understanding of what public decisionmakers want and need to know. For the vast majority of mission-oriented public R&D spending, such participation is likely a better way to ensure the conduct of basic research in the service of public objectives, a goal sought by a diverse set of analysts, including Lewis Branscomb and Gerald Holton ("Jeffersonian science"), Donald Stokes ("Pasteur's Quadrant"), and Rustum Roy ("purposive basic research"), not to mention policymakers Sen. Barbara Mikulski (D-Md.) ("strategic research") and the late Rep. George Brown ("science in service of society").

Second, increase support for community-initiated research at universities and other research institutions. National R&D priorities are driven by large private investments. Through changes in intellectual property, public investments have become increasingly oriented toward the private sector, even as private R&D spending has grown to twice the size of public R&D spending. "Science shops"—research groups at universities that take suggestions for topics from the local citizenry—offer the opportunity for community-relevant priorities to emerge from the bottom up. This research might include more

applied topics that are unlikely to draw grant money, such as assessments of local environmental health conditions. It might also facilitate connections between research universities and local economic interests that are less dependent on intellectual property. These connections would be akin to agricultural or manufacturing extension, and they could be funded in the same politically successful way. By allowing some of the priorities of the research enterprise to emerge more directly from local communities, science shops can help reinvigorate the concept of "public interest science," articulated in the 1960s by Joel Primack and Frank Von Hippel, and help set a research agenda that is not captive to large economic interests.

Third, restructure programs in the ethical, legal, and societal implications (ELSI) of research. If ELSI programs, such as those funded with the genome or nanotechnology initiatives, are to facilitate democratic politics and improve the societal impacts of knowledge-based innovation, they need to meet two criteria. First, they must extend into research areas that have not already been designated for billion-dollar public investments. Such a change would not only protect them from being swamped by the mere scale of technical activity but would also allow them to identify technical areas prospectively and have an influence on whether and how such large-scale public investments are made. Second, ELSI research must be more directly plugged back into the policy process. ELSI programs should include more technology assessment and "re-

search on research," areas that can contribute to understanding the role of science and technology in broader political, economic, and cultural dynamics, but from which the federal government has pulled back intramural resources. ELSI programs should also have institutional connections to decision-makers, as the genome program initially did. In addition to setting aside three to five percent of the R&D megaprojects for ELSI work, the federal government should set aside a similar amount for all R&D programs over a certain size, perhaps \$100 million, and should fund much-expanded research programs in the societal dynamics of science and technology through NSF.

Democratizing science advice

Discussion of the democratization of science advice borders on the current controversy over politicization. Despite their recent political currency, issues of science advice will not attract media or move voters in the way that issues of guns and butter will, and thus the circuit of transparency and accountability will be incomplete. In earlier periods of reform, concerns about the politics and process of expert advice led to the Federal Advisory Committee Act, which mandates transparency in the actions of advisory committees and balance in their membership. A recent report by the General Accounting Office (GAO) found that agencies need better guidance to implement the balance requirement, but more wide-ranging action is needed.

First, recreate an Office of Technology Assessment (OTA) to restore the policy-analytic balance

between Congress and the Executive Branch in matters scientific and technological. Without competition from a co-equal branch, Executive-based science advice has a monopoly, and monopolies in the marketplace of ideas do not serve democracy. There have been recent, behind-the-scenes efforts to reconstitute a congressional capacity for technology assessment, including a pilot project at GAO. A positive finding from an independent evaluation of that project encouraged Representatives Holt, Houghton, Barton, and Boehlert to draft a bill authorizing \$30 million for an Office of Science and Technical Assessment (OSTA) in GAO. The bill specifies that OSTA assessments would be publicly available, thus contributing to democratic politics as well as providing competition for Executive Branch expertise. Even if OSTA is authorized and funded, its influence would remain to be seen. But establishing OSTA would create, at least in part, a public deliberative space for science and policy that a modern democracy requires.

Second, enhance the transparency and accountability of expert deliberations through discussion and articulation of science policy rules. The decision rules for guiding how experts provide science advice require more scrutiny and better articulation. Even supposing that science advice were purely technical, any group of experts larger than one still needs a set of decision rules by which to settle disagreement. The character of such rules, e.g., linear and threshold models for assessing risk, is familiar in environmental policy. Such rules also include the ad-

missibility of evidence, the definition of expertise and conflicts of interest, the burden and standards of proof, and the mechanisms for aggregating expert opinion. A particular example of the last rule would be instituting recorded votes within expert advisory committees, rather than pursuing a vague consensus as most panels do. Committees of the National Toxicology Program make recommendations for the biennial Report on Carcinogens by recorded vote, and it seems salutary as it both specifies the relative level of agreement within the committee and creates a record that can be used to assess the objectivity and balance of a committee, thus providing information for a more democratic politics of expertise. A second example is the Supreme Court's *Daubert* decision, which describes considerations that trial judges should apply when deciding on the admissibility of expert testimony. Every venue of expert deliberation evaluates expertise implicitly or explicitly, yet the rules for such evaluations are rarely the focus of study, public discussion, or democratic choice.

Third, increase the opportunities for analysis, assessment, and advice-giving through the use of deliberative polling, citizens' panels, and other participatory mechanisms. Such "participatory technology assessment" circulates views among citizens and experts,

promotes learning about both science and democracy, and generates novel perspectives for policy-makers. These mechanisms are more familiar in European settings, where the Danish Board on Technology uses citizens' panels for public education and government advising, and the Netherlands Office of Technology Assessment develops other forms of public input. NSF has recently funded quasi-experiments in face-to-face and Internet-mediated citizens' panels, and the Nanotechnology Research and Development Act endorses the use of such panels, among other outreach techniques, to inform the National Nanotechnology Initiative (an arrangement that also connects ELSI to policy). At Rutgers, I have recently created a Center for Responsible Innovation, the mission of which includes outreach to and collaboration with communities in addition to research and teaching at the nexus of science and society. At Arizona State University, the Consortium for Science, Policy, and Outcomes is implementing a research agenda called "real-time technology assessment" that combines traditional technology assessment with historical, informational, and participatory approaches in an effort to incorporate intelligent feedback into knowledge-based innovation. One could imagine building the capacity to foster exchanges among experts, citizens, and civic

organizations at all major research universities—not to replace more technocratic methods, but as a necessary complement for a system of democratic science advice, analysis, and assessment.

Some readers will surely find this agenda not nearly far-reaching enough to democratize science. Others will just as surely think it threatens the autonomy and integrity of science. And there are most certainly grander ways of perfecting our democracy that, although not directly dealing with science, would transform it as well.

Such betwixt and between may be uncomfortable rhetorically, but I think it wise politically. Science and democracy have both been around for a long time without being perfected, and my agenda will not complete the task. These incremental steps, aimed at further implementing broadly recognized values of accessibility, transparency, and accountability, will admittedly not democratize science immediately and thoroughly. Neither will they condemn it to populist mediocrity. What pursuing this agenda might do, however, is foster the intellectual and political conditions for a relatively more democratic science to flourish within the current wanting environment. Discussing this agenda may, at the very least, shift the focus from sterile argument over politicizing science to deliberation about democratizing science.

Copyright of Issues in Science & Technology is the property of University of Texas at Dallas and its content may not be copied or emailed to multiple sites or posted to a listserv without the copyright holder's express written permission. However, users may print, download, or email articles for individual use.