

A TIME OF ANXIETY FOR RESEARCH AS SENATE PANEL MICROMANAGES NSF

Congressional committee reports are often boring. Not so the report issued on 9 September by the Senate Appropriations Committee to accompany HR 2491, the fiscal 1995 appropriations bill for the Departments of Veterans Affairs and Housing and Urban Development and the independent agencies. This is the legislation that rules the budgets and approves the programs for such agencies as the National Science Foundation, NASA, the Environmental Protection Agency and the White House Office of Science and Technology Policy. The report's message is unmistakable: Each agency is directed to examine its own programs and priorities, to devise a strategic plan for more efficient and effective operations and to establish specific and measurable performance milestones that Congress can use in determining which activities should thrive or perish when allocating budgets.

The Senate committee's naked micromanagement has aroused anxiety, anger and alarm among some members of Congress and within the academic research community. The reactions are not surprising given the adversarial tone of the committee's approach in redirecting science programs, as it says, "to maximize the return on the public's investment in science and technology and to ensure Federal resources are used efficiently and appropriately." NSF is scolded, for instance, for neglecting to advance "strategic" research that might yield more immediate economic and social benefits.

In fact, the report declares that 60% of NSF's research budget should be devoted to such research and threatens that unless this happens Congress will shift some funds from the foundation to such agencies as the National Institute of Standards and Technology, the National Institutes of Health and the Pentagon's Advanced Research Projects Agency, which already "seem poised to pursue critical technologies with entrepreneurial vigor and enthusiasm." (For excerpts from the report, see the box on page 110.) The com-



Mikulski: Directing changes without debate.

mittee also directs NSF to be more aggressive in recruiting industrial partners for its programs and calls for a thorough reevaluation of the National Science Board, NSF's governing body, urging that more of its members come from high-technology industries.

The report is the product of Barbara Mikulski, the Maryland Democrat who heads the Senate subcommittee that oversees the budgets of NSF, NASA, EPA and other independent agencies, and her chief committee aide, Kevin Kelly, who joined Mikulski's staff after graduating from Georgetown University law school in 1989. Mikulski and Kelly wrote similarly unambiguous but less prescriptive language for NSF into the Appropriations Committee report last year. While a committee report does not carry the force of law, it is considered a persuasive edict that agency officials ignore at their peril—particularly when it comes from an appropriations panel.

To be sure, last year's Mikulski-Kelly report led Walter E. Massey, then NSF's director, to appoint a special commission on the future of the foundation. The commission's final report, only 11 pages in length, speaks of NSF's two goals that should

be pursued in some sort of balance: One is to support world-class basic research on the frontiers of knowledge, and the other is to increase its funding of so-called strategic research areas that have reasonable expectation of payoff for technological or social applications (PHYSICS TODAY, December 1992, page 70).

Debate over NSF's mission has simmered since the commission's somewhat Delphic statement. The Senate report has reopened the argument. Two days before Massey left Washington to join the University of California system as provost, he informed Mikulski at a committee hearing that about 55% of NSF's research portfolio might be considered strategic. So increasing the proportion of strategic research to 60% would not be a tragic turn from the agency's traditional purpose of backing the best research by creative scientists.

One of the first salvos fired at the Senate committee came from the American Physical Society's executive board, which sent a letter to Congress asserting that the section of the report directing NSF to support more strategic research should "be stricken" from the bill. In similar letters to Mikulski and Representative Louis Stokes, chairman of the House Appropriations subcommittee overseeing NSF, Bruce Alberts, the newly elected president of the National Academy of Sciences, urged Congress to "avoid prescriptive language such as the funding formula found in the Senate report that might change significantly NSF's mission." Expressing his dismay at the report, Richard Zare, a physical chemist at Stanford, wrote PHYSICS TODAY seeking a generally accepted definition of strategic research. "If strategic means a tighter, more direct coupling between what is done at American universities under NSF support and what immediately benefits US industry," Zare stated, "then I fear that this view may be quite destructive in accomplishing the goal of furthering the nation's economic competitiveness."

Representative George Brown Jr, chairman of the House Committee on Science, Space and Technology, sent

Directives for Radically Redirecting NSF

The following excerpts are from a section subtitled "The Future of the NSF" in the report (103-137) of the Senate Appropriations Committee on the bill (HR 2491) to fund the Departments of Veterans Affairs and Housing and Urban Development and independent agencies. The report was prepared at the direction of Senator Barbara Mikulski of Maryland, who heads the appropriations subcommittee that oversees NSF, and was adopted by the full committee, led by Senator Robert Byrd of West Virginia.

"The committee believes that the National Science Foundation is at a crossroads in its future. Either the foundation will evolve as envisioned by the Commission on the Future of the NSF . . . or it will drift in a direction that moves it further and further from broad national interests in science and technology. In short, the foundation can be at the heart of helping to shape the Administration's science and technology policy in pursuit of specific national goals or it can diminish into becoming nothing more than a national endowment for science. . . .

"The . . . commission raised the committee's hopes that the foundation and the nation's scientific community had made the strategic turn that is needed to engage our country's basic research enterprise to focus more clearly on the transfer of knowledge and technology for broader national goals and objectives. During the Presidential transition, with the departure of the director, the foundation and the Science Board have given mixed signals whether the bold vision forward to which the . . . commission sought to pull science will continue. Even the National Academy report, 'Science, Technology and the Federal Government: National Goals for a New Era,' seems to suggest that performance milestones, greater accountability and an ability to provide a strategic focus on basic research must occur if science is to be a full partner in helping the US regain its competitive edge. . . .

"It is time for the foundation to move beyond rhetorical statements about the value of strategic research or the importance of using science for the transfer of knowledge and technology. That, in the committee's view, is a fact of life and political reality. Instead, it is now the time for the foundation to move to identify that which is specific, immediate and realizable in pursuit of this broader mission. The agency must spell out how much of its mission should clearly be strategic and applied in nature, and then implement those parameters through the budget process. . . . This must be done directorate by directorate. If NSF and its constituent members choose not to do this, future Federal R&D budgets should instead be allocated more generously to agencies such as the National Institute of Standards and Technology, NASA, the national energy labs or the National Institutes of Health, all of whom seem poised to pursue critical technologies with entrepreneurial vigor and enthusiasm.

"Such a transition, as painful and as difficult as it might prove for some in the scientific community, is as necessary and vital for the future of the nation as was Vannevar Bush's revolutionary vision for this community more than 40 years ago. Rather than seeing this challenge as a threat to the status quo, the academic research community should see it as perhaps the last, best chance to seize the opportunity to be an integral part of the solution to the scientific and technological problems our country and its economy now confront. . . .

"Therefore, the committee directs the foundation to revise its strategic plan, for submission by the time the President's fiscal 1995 budget is submitted to the Congress, in the following manner:

▷ To specify with particularity in each NSF program directorate and in each initiative that is part of the FCCSET interagency process, annual, quantifiable performance milestones. These milestones should include a vigorous evaluation component that guarantees that programs which begin can be terminated if they lose their effectiveness or are displaced by higher-priority initiatives. . . .

▷ To outline the balance between strategic research objectives and other more generic research. . . . Not less than 60% of the agency's annual . . . research activities should be strategic in nature. The foundation should make clear how it specifically defines each area so as not to shroud curiosity-driven activities under the rubric of strategic activities. . . . In addition, the NSF and the Science Board should outline a plan for increasing the scientific community's understanding of the vital need for this balance. . . .

▷ To review the status and funding of all existing NSF-supported research centers to determine what level of industry involvement is viable, and then to establish private-sector participation thresholds for each category of NSF centers. . . .

▷ To evaluate the structure, composition and role of the National Science Board, including future mandatory industrial memberships. . . .

▷ Finally, to outline clear and detailed working relationships with other Federal agencies like NIST, NIH, NASA, EPA, the [Pentagon's] Advanced Research Projects Agency and the Departments of Education and Energy. These plans . . . should articulate clear role differentiation and collaboration on strategic research and education activities, with multiyear goals and outcomes."

letters to Mikulski and other Congressional leaders urging them to reconsider the Senate report. "The report attempts to make fundamental changes to the roles and missions of NSF, which are statutorily mandated by the NSF Act of 1950," he wrote. Brown noted that the report misinterprets the findings of the NSF commission, which, he added, had concluded that "it would not be in the nation's long-term interest to convert the only Federal agency responsible for the health of basic research into an applied, near-term research agency." Brown further argued that "actual changes in NSF's mission statement should result from the normal authorization process and not through appropriations report language that is neither voted upon nor debated." —IRWIN GOODWIN

SENATE RESCUES SSC, BUT FINAL ACT AWAITS CONFERENCE

By the time you read this, the Perils of Pauline drama about funds for the Superconducting Super Collider in fiscal 1994 will have reached its denouement. That cliffhanger seems to be replayed in Congress year after year. This time, on the morning of 30 September, the final day of fiscal 1993, after a vociferous five-hour session on the Senate floor before a virtually empty chamber the night before, senators continued their debate and then voted 57 to 42 to allocate the full \$640 million requested by the Clinton Administration to carry on building the world's largest and most expensive scientific instrument.

But because the House had voted 280 to 150 in June to cancel the project (PHYSICS TODAY, August, page 43), the final scene was to be played at a House-Senate conference this month. That committee is likely to allow the project to go forward, since by custom it is made up of lawmakers from the House and Senate energy appropriations committees, which include some of the collider's most ardent supporters.

This year, however, opponents in the House are determined that the drama will have a different ending. They remember that the curtain fell last year on a conference committee that ignored the House vote of 232 to 181 against the project and approved the full \$550 million granted by the Senate—an allocation that was later trimmed to \$517 million to meet the overall budget reduction for the Energy Department. After last