

DAYS OF RECKONING: DEFICIT WOES WEIGH HEAVILY ON SCIENCE BUDGETS

Those who thought the summit agreement between the White House and Capitol Hill last April meant that the fiscal 1990 budget would be worked out in harmony got a rude awakening on 16 October. That day, already two weeks into the new fiscal year, the government's financial squabbles became palpable. Distracted since last January by such issues as ethical and sexual behavior of House members, flag burning, abortion rights, illegal drugs and catastrophic health care for the elderly, the 101st Congress failed to complete its most unquestionably serious Constitutional obligation: a budget that keeps the Federal government functioning for a fiscal year.

Simply put, Congress, for the third time since 1986, neglected to meet budget deadlines and budget targets. What followed in each case was the agonizing consequences of the 1985 Gramm-Rudman-Hollings Balanced Budget Act: across-the-board cuts that apply with equal severity to most domestic and defense programs.

Despite a fiscal 1990 budget amounting to \$1.2 trillion, the deficit must be reduced under GRH rules to \$100 billion—though the law allows a leeway of \$10 billion before the automatic cuts are invoked. The White House Office of Management and Budget estimated a "baseline" deficit for 1990 of \$16.1 billion, pared somewhat arguably by an accounting gimmick that makes use of the Social Security trust fund surplus of \$68 billion this year. The Congressional Budget Office, shunning any short-term fixes, put the baseline deficit at \$141 billion. In the final analysis, however, OMB's numbers are the only ones that count for GRH. So Congress lopped more than \$16 billion from the discretionary domestic and defense appropriation accounts to avoid the automatic cuts.

When October arrived, the lawmakers had succeeded in enacting only one 1990 spending bill, signed by President Bush on 29 September—the

Energy and Water Appropriations Act, which includes Department of Energy research programs. But they had done nothing about resolving the impasse over deficit reduction.

Budget disarray

Accordingly, as it viewed the budget disarray on 16 October, OMB had no other choice than to invoke the phenomenon known as "sequestration," or the withholding of a small percentage of funds. In fact, GRH does not allow sequestration to apply to all programs. It fully exempts 55% of the programs in the budget—the so-called entitlements, such as Social Security, Federal retirement, medic-aid, food stamps and family support payments. However, it adversely affects discretionary military and civilian programs and services. In budget terms, all science programs are within the discretionary ambit in the sense that they operate on funds that Congress decides to grant from year to year.

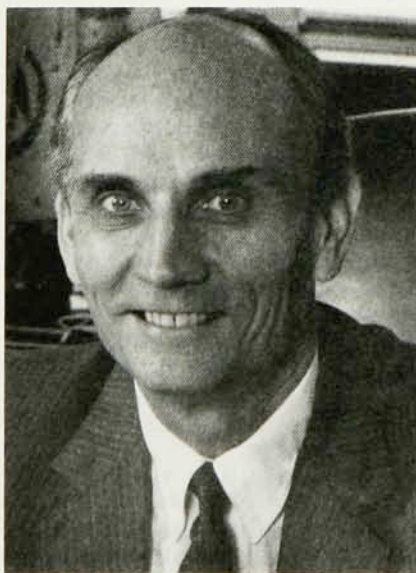
OMB imposed a 5.3% sequestration

cut on the discretionary accounts of all civilian agencies and a 4.3% reduction in the Pentagon's discretionary budget. The difference in the reduction rate is due to the GRH protocol, which exempts many DOD construction contracts for projects in the works. Nothing like that exists in nondefense agencies, where discretionary programs such as guaranteed student loans and science research may experience pain and perhaps severe suffering if sequestration applies. Congress can turn off sequestration by passing appropriations bills or an omnibus continuing resolution within GRH limits, as it did in 1987. But it must do so around Thanksgiving Day, when outlays fall due. Until then, sequestration may hardly be noticed.

For instance, at the National Science Foundation, says Sandra Toye, its controller, "we're operating on our 1989 figure until we know exactly what we can expect for 1990. We don't know for sure what we'll wind up with until sequestration is squelched, and we're not going to know that for weeks. So, prudent outlays are not only the safe thing to do, but the only sane thing.

"Fortunately, the foundation always dribbles funds out the front door in the first quarter of the fiscal year. That's typical for us," Toye observes. Because most government agencies and departments draw their budget allocations in quarterly allotments rather than all at once, they have some flexibility to maintain current spending rates on necessary programs and services. "But the prospect of operating on sequestered funds is numbing," says Toye.

The prospect seemed to dim on 17 October when a House-Senate conference committee agreed to an NSF budget. Going into the conference, the situation appeared grim for the agency. Senator Barbara Mikulski, the feisty Maryland Democrat who heads the Appropriations subcommit-



Garn: Champion of NSF funds

tee controlling NSF accounts (as well as budgets for NASA, veterans's benefits, public housing and the Federal Emergency Management Agency), sought to stick to the Senate recommendation of \$1.69 billion for the foundation's research programs. But Senator Jake Garn of Utah, the senior Republican on Mikulski's subcommittee, argued that the conferees could do better for NSF by waiting until the other allocations were finished. When that time came, Representative Robert Traxler, a Michigan Democrat and chairman of the counterpart House subcommittee, noted that his staff had kept score and calculated that \$40 million in budget authority had not been used. He proposed that \$30 million of it be given to NSF.

Garn and Representative Bill Green of New York, the principal Republican member of the House subcommittee, backed Traxler. When other members spoke up for NSF, Mikulski agreed to raise NSF's total appropriation to \$2.1 billion, an overall increase of 11.6%—closer to President Bush's 14% request in his budget last February and more than either the House or Senate had voted earlier for fiscal 1990.

Later that day, however, the scorekeepers found that the conferees had overspent their total budget allocation and that NSF and other agencies had to take a 1.12% hit. In addition, all agencies were assessed 0.43% for the President's war on drugs. That left NSF's full appropriation at \$2.07 billion and its research program at \$1.69 billion. Moreover, \$19.7 million of the foundation's money was designated for a new academic research facilities program—a program that NSF Director Erich Bloch fought against, to no avail. But these may not be the final figures if sequestration strikes. Sequestration's 5.3% reduction would cost NSF another \$100 million in research funds, holding the agency to a mere cost-of-living increase of 4%.

DOE's appropriation caused similar problems. The department's general science and research program was given \$1.1 billion, the Supercolliding Super Collider \$225 million, magnetic fusion \$331 million and basic energy sciences \$596 million. OMB's requirement to lop the GRH sequestration of 5.3% from these amounts, plus the further 0.43% cut imposed to pay for the war on illegal drugs, would lower the funding for the SSC to \$213 million this year and that for magnetic fusion to only \$312 million.

Shocking the senses

There are many, including legislators

and economists, who believe that GRH may be for the best—that it will bring Washington to its senses about fiscal responsibility. "Gramm-Rudman-Hollings lays on a discipline that Congress is unwilling to impose on itself," says Senator Warren B. Rudman, a New Hampshire Republican who is one of the law's authors. "It's something like a two-by-four across the backside of a recalcitrant mule."

It also causes problems. "It's stress time again at the foundation," says

Toye. "Our plans for doubling the NSF budget by 1993 are totally disrupted. The reductions in our 1990 request clearly cause problems for our research programs. We are in a state of suspended animation. The prospect of sequestration sets limits on how many principal investigators we can fund and how many graduate students and postdocs we can support. It also puts in abeyance anything new and unusual we can undertake. The consequences are mind-boggling."

—IRWIN GOODWIN

AID FOR SUPERCOMPUTERS AND NETWORKS WEIGHED IN CAPITAL

By releasing a wide-ranging plan to almost double the government's annual funding of advanced computing R&D, the White House on 8 September lent its support to legislation with similar goals now under consideration in Congress. The strategy offered in the readable 47-page report, "The High Performance Computing Program," would require \$1.9 billion over five years, beginning in fiscal 1991, to supplement the government's current expenditures in high-technology computing, which amount to about \$500 million spent annually by four agencies—the Department of Energy, the Defense Advanced Research Projects Agency, NASA and the National Science Foundation. The report proposes augmenting the funding for programs in these agencies by an amount that gradually increases from \$150 million the first year to almost \$600 million in the fifth year. The injection of cash into the present R&D program would be split about evenly between computer hardware and software.

As described in the report, the program consists of four parts: high-performance computer hardware; advanced software technology and algorithms; basic research and training scientists and engineers; and a national research and education network, which would bear the unpronounceable designation of NREN. Nearly a fifth of the proposed budget increase would go to developing a national computer network that would link widely dispersed universities with government and industrial research labs.

The network also would have a larger purpose: to serve as the prime mover for optical-fiber communications that would eventually connect every office, home and business in the country. The agencies that devised

the plan recommend development of a network that could transmit data at 3 billion bits per second, in contrast with the 45 million bits per second that NSF expects to phase in by next fall in its supercomputing and networking system, NSFNET.

In testimony before committees in the House and Senate, D. Allan Bromley, director of the White House Office of Science and Technology Policy, which released the report, observed that when the examination of advanced computing systems began in 1983, the study group believed "the overriding reason for a national network was to provide access to supercomputing centers for the bulk of American university faculty and students who could not participate in research at the frontiers of high-performance computing. We then learned that an equally important reason is collaboration—the sharing of software and databases and the natural association of geographically distributed but functionally complementary individuals. Perhaps one day researchers will as easily share information with colleagues via NREN as they talk today by telephone."

Leveraging the industry

Achieving that goal is only wishful thinking right now. Bromley observes that the interagency plan calls for a coordinated government, industry and university collaboration. Though high-performance computing is a vital strategic, commercial and scientific technology, Bromley asserts, the nation's leadership and diversity in commercial supercomputing has declined in recent years, with Control Data and Honeywell departing the field and Japanese companies making rapid progress. He suggests that the proposed program will exert strong leverage on