

NSF Gears Up for a Building Boom

The explosive growth of a 5-year-old program puts NSF at the center of a campaign to use peer review, not pork, to rebuild aging labs

Jean Futrell came to the University of Delaware from Utah in 1986 on the strength of a promise by university officials to upgrade the chemistry department, which he now chairs. In addition to allotting him four new faculty positions, the university agreed to a major renovation of the department's home in Brown Laboratory, built in 1934 and, in Futrell's words, "now hopelessly obsolete." Officials knew it wouldn't be cheap: The initial estimate for building a larger, state-of-the-art facility was an eye-popping \$68 million. In 1990 the state committed \$17 million toward the project, leaving the university scurrying to find the rest.

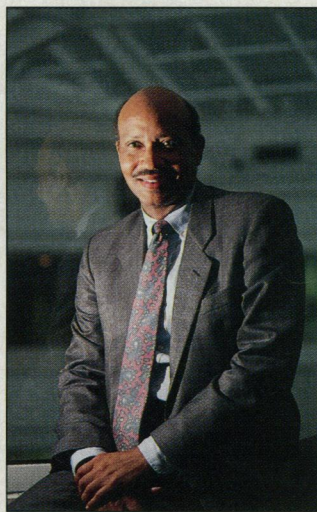
Delaware's problem is a familiar one on U.S. campuses. The year Futrell moved east, the White House Science Council estimated that the nation's research universities needed \$10 billion to renovate their aging labs and to buy new equipment, and it recommended that the National Science Foundation (NSF) create a facilities fund to address that need. Since then, however, the only formal government effort to address the problem has been a tiny program that Congress forced NSF to launch in 1989. NSF, fearing that the program would siphon money away from research, has been reluctant to push for funding increases. As a result, the program this year has only \$105 million to spend to help universities both modernize labs and buy new large equipment. Not surprisingly, competition for the money has been fierce. In 1992, for example, NSF turned down 52 of 61 proposals from universities with major research programs—including one from Delaware.

But additional help from the feds is in sight: Last month, conferees from the House and Senate agreed to give NSF \$250 million for its infrastructure program in the fiscal year that starts on



Crumbling infrastructure. Hazardous conditions such as attic labs, inadequate fume hoods, and crumbling walls add up to a \$10-billion problem for schools.

1 October. The White House has also jumped on the bandwagon. John Gibbons, assistant to the president for science and technology, has asked the new National Science and Technology Council's Committee on Fundamental Science to come up with a plan to refurbish academic facilities. Nat Pitts, who runs NSF's infrastructure program and heads the interagency task force developing the Administration's plan, says he wouldn't be surprised to see a 5-year, multi-agency initiative, spending up to \$500 million a year, "that would finally be able to make a dent in the problem." And this year the National Institutes of Health quietly began its own academic renovation program (see box).



Sky's the limit. Nat Pitts directs NSF's infrastructure program.

Alternative to pork

Why is an academic facilities program suddenly so popular? The short answer is that the universities have managed to get the attention of some influential members of Congress, in particular, Senator Barbara Mikulski (D-MD), who chairs the appropriations subcommittee that funds NSF. In fact, academic bricks and mortar have always been a congressional favorite, but in a different form: special appropriations—otherwise known as "academic pork"

—pushed by a legislator for a university in his or her district. These pork-barrel funds have grown steadily in the past decade, topping three quarters of a billion dollars in 1992 alone, and each earmark has sparked an outcry from administrators at universities that haven't dipped into the trough, complaining that the money is a drain on federal research funds.

The NSF program is supposed to provide an alternative to this controversial practice. Grants are awarded competitively, and applicants are required to document not only their need but also the project's likely contribution to science.

The grants satisfy both congressional desires to help their constituents—although the funds so far have been too meager to make much of a dent in the practice of earmarking—and scientists' wish that the money be well spent.

By all accounts, the merit-reviewed program addresses a pressing need. "It's a breath of fresh air," says Gene Block, vice provost for research at the University of Virginia and director of an NSF-funded Center for Biological Timing that studies physiological rhythms. Last year the 3-year-old center received an \$880,000 grant for renovation. "Academic labs in this country are wearing out, just like the roads and bridges, and the NSF program is one way to rebuild them," says Block.

For some schools, in fact, the NSF program is the key to an up-to-date science facility. Take the chemistry laboratories at Reed College, a small college in Oregon. "Our chemistry building was built in the 1940s, in part with student labor," explains Douglas Bennett, who is now vice president of the American Council of Learned Societies but was provost of Reed College when it submitted its proposal in 1990. "A member of the accreditation site team called it decrepit; in reality, it was unsafe." Although Reed's \$816,000 grant covered only a tenth of the cost of the overall renovation, which was completed in 1992, Bennett says "it made a great deal of difference in soliciting outside donors that NSF had certified the need and the importance of the project."

Similarly, Notre Dame College of Maryland, a small women's college in Baltimore,

NIH Adds to the Facilities Boom

When it comes to funding academic research, the National Institutes of Health (NIH) is indisputably the federal government's 800-pound gorilla. But in providing money to renovate campus research facilities, NIH has played second banana to the National Science Foundation (NSF)—even though the NSF's existing program itself is far too small to meet universities' construction needs (see main text). Now NIH is getting a chance to catch up.

Last year, for the first time in decades, Congress gave NIH the authority to spend money on new construction. (Previously, only three of NIH's 24 institutes and centers could do so.) The \$7-million appropriation is too small to help more than a handful of labs, but competition is fierce: Seventy institutions responded to a January solicitation for proposals to renovate basic and clinical research facilities and animal-care facilities.

"Clearly, the money is a drop in the bucket of what's needed

out there," says Doris Merritt, associate dean of the Indiana University School of Medicine, who chaired the advisory board created to review the proposals. "But we reviewed each application on its scientific merits, as though there were an unlimited amount of money available."

While unlimited funds are clearly a dream, prospects for growth appear good. Both the House and Senate versions of the 1995 NIH budget now pending in Congress contain \$20 million for the program, and Merritt predicts applications will soar if the pot swells. NIH is also a member of an NSF-led task force that is developing a governmentwide plan for academic facilities. Meanwhile, the first half dozen or so NIH winners are expected to be announced later this month, with awards ranging from \$500,000 to \$2 million.

—J.M.

has asked NSF for \$500,000 to help fund a renovation project that will cost an estimated \$7 million. The NSF program offered more than a chance at the money; it also helped Notre Dame officials through the application process. Last fall, Mikulski helped to arrange a meeting between Pitts and the president of the college, and in February the school sent a three-person team to an NSF-funded workshop to help potential applicants learn the ropes.

Indeed, the program is designed to ensure that small schools like Notre Dame and institutions that train large numbers of minority students get a substantial share of the pie. So far, NSF has handed out 168 facilities grants, totaling \$92.5 million, and 63 instrumentation grants, totaling \$29 million. (This month NSF plans to announce the latest round of awards, totaling \$105 million.) Large universities, those that get more than \$3 million a year in NSF research grants, have captured 47% of the facilities awards, while small schools, those receiving less than \$400,000 a year in NSF grants, have collected 29% of the total. Minority institutions have won 10% of the awards, close to the 12% figure stipulated in the 1988 law establishing the program.

Another goal is geographic distribution, but that has proved more difficult to achieve: 53% of the facilities awards have gone to 10 states, and seven states have been shut out. To try and improve those figures, Pitts has at times acted as a traveling salesman for the program. Last year, for example, he went to Pierre, South Dakota, for a national meeting of officials involved in another NSF program, called EPSCoR, that tries to foster scientific excellence in more than a dozen "have-not" states. When he pointed out that South Dakota was the only state that had not even applied for infrastructure funding, there was an embarrassed silence. Finally a state legislator stood up and told Pitts, "I promise you that

every EPSCoR school in South Dakota will have a proposal into NSF next year."

Sure enough, in April four proposals arrived at NSF, including a \$910,000 request

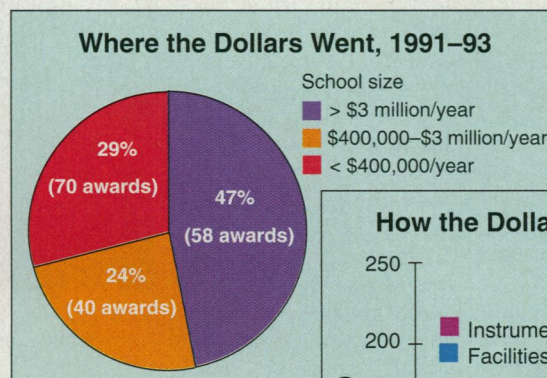
often have to prescreen proposals from several departments. New construction is prohibited, on the theory that upgrades should take priority over expansion; awards are limited to \$2 million; and proposals must be tied directly to research, which excludes requests for classrooms and support services. In addition, institutions must put up matching funds. (The smallest schools and minority

institutions need only contribute 20% of what NSF spends.)

Those tight restrictions usually leave a university with a lot of unmet needs, even if NSF says yes. Delaware's Futrell says he was already unhappy with limits on the size and scope of the renovation. "We have a \$6-million need for lecture rooms, computer labs, and so on," he says. Getting a rejection just made things worse. "I support the principle of peer review, especially if

NSF has \$500 million a year," he says, "but with only \$16 million [the amount available in 1992 for facilities], I'm not above looking for alternatives."

Although Futrell failed to get the state's congressional delegation to push for earmarked funds, a second bid to NSF with more detailed architectural plans and a comprehensive timetable did the trick. In the spring of 1993 Delaware was awarded \$2 million. The chemistry faculty has already moved into a new \$34-million building, the Lamont duPont Laboratory, funded by public and

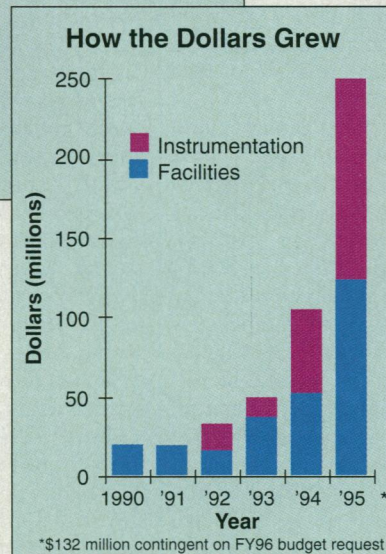


Divvying up the dollars. Applicants for the growing pot of money are divided into three categories, based on the amount of grant money they get each year from NSF.

from the University of South Dakota (USD) to renovate a chemistry building that dates back to 1915. "If the state gets a grant, we'll feel like very proud parents," says Richard Anderson, who heads NSF's EPSCoR program. Anderson should lay in a supply of cigars: Last week USD officials received word that they would be getting \$145,000 toward renovating part of the psychology building.

A helping hand

For the most part, however, Pitts' problem has been too many applications for the small pool of money rather than too few. To make scarce funds go as far as possible, institutions are limited to two applications a year, meaning that major research universities



private sources, and last month Brown Lab was gutted as part of an \$8-million renovation. Futrell says the NSF money was a definite help in enticing other donors, as well as in attracting topnotch faculty and students.

Such happy endings are likely to become more common thanks to the successful push for a larger program led by Mikulski. In keeping with the NSF's preference for research over infrastructure, the Administration's fiscal year 1995 request for the program was a modest \$55 million, half of its current budget. A frustrated Mikulski, who in past years has fought to revise NSF's requests upward by tens of millions of dollars, went even further this year. The bill that passed the Senate last month called for a \$300-million program—a figure that was reduced to \$250 million by a House-Senate conference (*Science*, 26 August, p. 1169).

Although Mikulski compromised on funding levels, she didn't give an inch on the strong language that she attached to her bill. She chided the White House for studying the problem of decaying facilities for 8 years without offering a solution. And she issued an unusual warning: The additional funds, which have been added to NSF's overall budget, will be withdrawn unless NSF requests at least as much for the program in the 1996 fiscal year as Congress gave it in 1995. The Senate report also requires the White House to lay out a 5-year plan for academic facilities renovation—exactly the sort of examination that Gibbons has now launched—before it will release the extra money.

As the NSF program grows, officials may come under pressure to relax some of its current rules, including those that require a strict merit-based review. Pitts, who was asked to submit a plan by 1 February, says he can imagine two scenarios. One would be to build a "virtual agency," with representatives from several research agencies meeting to decide jointly, and on a competitive basis, which projects will be funded. The second, more traditional, approach would create a model program that individual agencies could tailor to meet their own needs and preferences. The latter approach would put NSF on alert against even the whiff of pork because, as Pitts puts it, "some agencies have no history and no experience with merit review."

But Pitts is determined to try. "If we can get [other agencies] to accept the concept, we'll have made significant progress," he says. "Merit review is what NSF brings to the table." Even Futrell admits that, in retrospect, obtaining earmarked funds for the Delaware project would have been a bad idea. "Without merit review," he says, "you'd be making grants to institutions where the best people may not want to go. And that would be a waste of money." If Mikulski gets her way, universities will at least have a realistic alternative to the pork barrel.

—Jeffrey Mervis

AGRICULTURAL RESEARCH

USDA Holds Up Grants to Make a Political Point

The good news reached Harry Frank, a biophysical chemist at the University of Connecticut at Storrs, in June. Officials at the U.S. Department of Agriculture (USDA) told him his grant proposal had cleared peer review with a good score and passed all the technical hurdles. He would, they said, receive a check during the summer. Frank recruited a postdoc and waited for the money to arrive. And waited. And waited. University rules prohibit loans in this kind of situation, and Frank had no alternate source of funding. Finally, in desperation, last month Frank managed to find a teaching assistantship to pay the postdoc's salary, which meant the student could not fully devote himself to the lab. As of 2 September, Frank was still waiting for his grant.

Harry Frank is not alone. His grant, along with those of scores of other researchers, has apparently been used by Secretary of Agriculture Mike Espy as a pawn in a political chess match with Congress. According to four USDA staffers who spoke



Squeeze play. USDA Secretary Espy put 800 grants on hold.

to *Science* on background, Espy put a "hold" on more than 800 research grants in July and August, worth about \$150 million. Most of the grants come from the \$100-million National Research Initiative (NRI), an office set up several years ago—ironically, as a small island of nonpolitical, peer-reviewed science within USDA.

Espy's decision to take NRI and other funds hostage came to light last week when Congress members led by Representative Pat Roberts (R-KS), ranking Republican on the House Agriculture Committee, accused Espy of an "unprecedented" use of research grants to bring pressure on Congress—specifically on himself and a group of conservative members who had been blocking an Administration bill (HR 3171) that would reorganize USDA. The bill would consolidate many offices and, Espy claims, save the government about \$3.2 billion. It cleared the Senate in April, but has been stalled in the House in a dispute over environmental regulations.

Espy ordered the first of two delays in processing grants in July. The impact reached Congress the next month: Roberts, for example, claims that seven research proj-

ects at Kansas State University were held up. Since then, Roberts has also heard complaints from other academic institutions. But the pressure didn't seem to make Roberts more willing to yield. Instead, he fired off an angry letter to Espy on 19 August.

Espy didn't reply to queries from *Science* about the funding snafu, but a USDA spokesperson, Jim Loftus, said the secretary gave a full explanation in a letter to Roberts on 24 August. In that letter, Espy says that if Congress fails to pass the reorganization bill, USDA will have to reduce discretionary

spending by \$140 million in 1995. Research grants fall into this funding category. Espy continues: "Because of these budget realities, we have given all grant and loan programs within the Department closer scrutiny and review." Espy notes that the Cooperative State Research Service (CSRS), which provides the grants, was not the only division affected by the "review," which he insists was not in any way "partisan." He ends the letter by urging the House members to pass the

USDA reorganization bill "to avoid serious budgetary impact."

A department official who declined to be identified conceded that "the intent" of placing a hold on grants was to "deliver a wake-up call" to Congress; it was "a device to say, 'You have to pay some attention to this.'" The official added that it was "perceivable that a political process was going on." He conceded that it was a "double-edged sword," in that grantees may have been hurt, but claimed that the goal justified the means, because "it would be a disaster if [the reorganization] didn't get through." He said that the tactic may have been effective: In the next month, the House may go along with the reorganization, possibly by agreeing to attach it to a bill, now in conference, that provides crop insurance.

William Carlson, associate administrator of CSRS, says that when Espy's office sent out a memo ordering funding held back, it didn't explain the reason. However, "it certainly came out verbally" that the intent was to create political pressure, says Carlson, adding that the politicization of CSRS grants on this scale is "totally unprecedented."