Another large, unplanned expenditure will be the federal bailout of savings and loans banks. A quarter of the industry is insolvent. The Bush Administration must cope with the crisis quickly, and it could cost as much as $50 billion. Other campaign-year initiatives may have to be trimmed or dropped if this is to be financed.

■ **Defense.** The greatest budget tension may occur at the Pentagon. With 5 years' worth of spending authorized and only 4 years' worth of money available, the Defense Department must cut back sharply. It would be wasteful to stretch out all weapons development; some projects will have to be killed. A debate is under way on whether spending should be held to a flat inflationary rate or to inflation plus 2%. The lower level is advocated by the incoming national security adviser, Brent Scowcroft, and Bush seems to agree. The reductions may be between $100 to $300 billion over 5 years. Projects likely to be affected are the "Midgetman" strategic missile favored by Scowcroft ($35 billion), the MX missile on boxcars favored by the Pentagon ($13.5 billion), upgrading the B-1 bomber ($7 billion), buying a full fleet of B-2 bombers ($70 billion), deploying some version of the Strategic Defense Initiative ($70 billion), launching a full fleet of 25 Seawolf attack submarines ($30 billion), and meeting ambitious but less visible personnel and maintenance objectives.

■ **Health.** Medicare and Medicaid will undoubtedly be trimmed, for the budget will not support the 12% rate of growth projected for them. In research, it is not clear what the new Administration will propose, although Bush said he would support AIDS-related investigations. However, growth in support for AIDS programs may begin to level out. In internal negotiations, the Office of Management and Budget has set NIH funding at $7.136 billion, a decrease of $11 million from the 1989 appropriation. AIDS-related research is set to grow from $1.3 billion to $1.6 billion, but the Department of Health and Human Services is appealing for an increase to $1.9 billion.

■ **Energy.** Two big issues stand out in the Department of Energy (DOE) budget: the cleanup of old weapons production plants and construction of the Superconducting Super Collider in Texas. There is no upper limit for the amount that could be spent to remove toxic and radioactive chemicals from the defense sites; DOE has estimated that the actual cost could run to more than $100 billion. Under sharp pressure this year to get started, particularly from Senator John Glenn (D–OH), DOE is planning to step up spending. It also may have to begin paying for the design of two new defense reactors, pegged at $6.8 billion in a low DOE estimate. Will there be room for the $4.4 billion supercollider this year? It is too early to say. But in an ominous note, Senator Lloyd Bentsen (D–TX), chairman of the Finance Committee, recently commented: "I'll be working very hard to get it [the supercollider] funded, but it's going to be exceedingly difficult."

■ **Space.** Like the Pentagon, NASA has more projects authorized than are likely to win full funding. Unlike the Pentagon, NASA seems to be riding on a wave of goodwill in Congress, driven by a fear that the Soviet space program is far ahead of the United States'. In internal negotiations, NASA is seeking a 28% growth (current dollars) in its budget. The biggest item is the space station, which is due to grow from $900 billion in 1989 to $2.1 billion in 1990, with a total cost (not counting logistic support) of more than $16 billion. The President must make a decision before June on whether or not to go forward. NASA also hopes to include in this year's budget the Comet Rendezvous-Asteroid Flyby mission and the Cassini unmanned probe to Saturn and its moon Titan. The European Space Agency voted in late November to fund the Cassini mission as the next major joint investigation with the United States. This increases the pressure on NASA to start funding its $1.5 billion share of the project, due to be launched in 1996 (see story p. 1375).

■ **National Science Foundation.** In 1987, the Administration promised to double the NSF budget in 5 years and in 1988 Congress authorized the action. But in the interim, the stock market crashed and new spending restrictions intervened. The boom has yet to arrive. NSF grows about 10% in 1989 over last year's budget. But the increase was made possible in part by cuts or restraints elsewhere in the same budget function—in urban development grants, low-income housing support, in environmental construction grants—which cannot be used again. Meanwhile, NSF is seeking increases in funding for science and technology centers and for a newly authorized "Academic Research Facilities Modernization Program." An unexpected setback occurred when NSF's radio telescope at Greenbank, West Virginia, collapsed, creating a gap in the astronomy program that will not be easy to fill. NSF director Erich Bloch said that replacing it would put "a great burden" on the agency.

Speaking at a AAAS colloquium last April, House budget analyst Michael Telson summed up the situation. "The zero-sum mentality imposed by Gramm-Rudman-Hollings," he said, has fundamentally changed the way budgets are written. As a result, "spending for R&D will become more difficult to increase, and the scientific community will have to work harder to retain its support." ■ ELIOT MARSHALL

NSF Names First 11 Science Centers

The National Science Foundation has ended an extended period of suspense by designating its first 11 science and technology centers and announcing that it will provide a total of about $24.7 million to fund them in the coming year.

Successful proposals for the university-based research centers were chosen from among 323 entries. A 23-member review panel winnowed the competing proposals down to 48 finalists. The winners were research teams from California, Illinois, Michigan, New Jersey, New York, Oklahoma, Texas, and Virginia. Awards for the first year vary in size from $900,000 to more than $4 million; the centers will be funded for an initial 5-year period.

The 11 proposals chosen and levels of funding:

■ University of California at Berkeley. Center for Particle Astrophysics. $1,825,000.

■ University of California at Santa Barbara. Center for Quantized Electronic Structures. $2,100,000.

■ California Institute of Technology. Center for the Development of an Integrated Protein and Nucleic Acid Biotechnology. $3,050,000.

■ University of Illinois, Champaign-Urbana. Center for High-Temperature Conductivity. $4,250,000.

■ Michigan State University. Center for Microbial Ecology. $1,100,000.

■ Northwestern University. Center for Advanced Cement-Based Materials. $1,750,000.

■ University of Oklahoma. Center for Analysis and Prediction of Storms. $900,000.

■ Rice University. Center for Research on Parallel Computation. $4,100,000.

■ University of Rochester. Center for Photoinduced Charge Transfer. $1,650,000.

■ Rutgers University. Center for Discrete Mathematics and Theoretical Computer Science. $1,825,000.

■ Virginia Polytechnic Institute and State University. Center for High Performance Polymeric Adhesives and Composites. $2,124,000.

The science and technology center con-

cept was floated in President Reagan's 1987 State of the Union message as part of his economic competitiveness initiative. The foundation had aimed at launching the first centers in the 1988 budget, but Congress declined to provide special funding for them and the overall budget increase of about 6% last year was too small to stretch to financing the centers. Startup of the centers program was, therefore, postponed to the current budget year.

NSF's statement announcing the selections says the centers are being established to "promote basic research that can most effectively be accomplished through centers—complex research problems that are large scale, of long duration, and that may require special facilities or collaborative relationships."

NSF's increasing support for centers and group research has roused anxiety among some academic scientists who see the trend as posing a threat to the foundation's traditional sponsorship of research grants for individual investigators. NSF director Bloch has persistently championed the new centers, but has insisted that a balance will be maintained between the two modes of research support (*Science*, 3 April 1987, p. 18).

Commenting on the 11 centers chosen, Bloch said that "People will see if they look objectively at the topics and at the people who are participating that it is an outstanding set of research topics that could not have been done in any other way but through the centers approach."

The new centers are modeled on the existing NSF engineering research centers established to promote research and education in engineering through interdisciplinary projects and links with industry. Like the engineering centers, the science and technology centers are intended to foster transfer of basic research results for industrial application, but the science and technology centers do not require formal participation by industry as the engineering centers do.

Establishment of a total of 25 engineering research centers were projected when the program was begun in the early 1980s, but so far 18 are in existence.

In discussing the possible total number of science and technology centers that might be established over the years, Bloch says that in the past he has "thrown out a number like a hundred." He acknowledges that this was "optimistic" and says that NSF has not set any total number of centers as a goal.

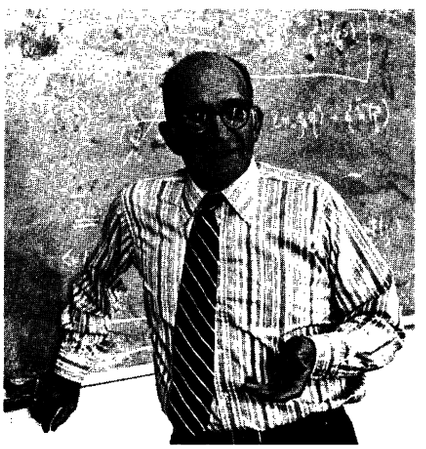
Asked to comment on the postponement of funding for the science and technology centers program and a reduction in funds below the sum originally requested, Bloch said the establishment of 11 centers represents "a solid start we can all live with." ■ JOHN WALSH

A Tiff Over Titles at Stanford

What is a professor? Where do they come from? And how do you make more of them? A squabble at Stanford University over the right of think tanks, policy shops, and multidisciplinary institutes to make their own professorial appointments has led to the resignation of Sidney Drell as co-director of the Stanford Center for International Security and Arms Control.

The departure of Drell, an internationally recognized force in high energy physics and arms control, is both a serious blow to the technical component of the arms control center, as well as the most recent flare-up in a long-running debate over who has the power to make academic appointments at universities.

Drell says he resigned in frustration after realizing that he could not retain bright, young scholars at the center because of Stanford's insistence that faculty appointments be made through departments. This rule applies not only to faculty on the tenure track—whom the university may have to feed for life—but also for what Stanford calls "parenthetical" professors, meaning those with adjunct appointments.



Drell: *Frustrated by barriers.*

As it stands now, a director of a center at Stanford must go "hat in hand" to convince one of the academic departments to make an appointment that would benefit both the center and the department. Drell says the present system creates "insurmountable barriers" for many institutes, particularly those trying to attract people who do not fit easily into departmental cubbyholes.

It is one thing to convince the economics department to make an appointment at Stanford's Center for Economic Policy Research, while it is quite another to find a home for someone examining the political, moral, or technical aspects of nuclear war. Drell contends that "a lot of creative thinking in multidisciplinary, policy-oriented areas does not have a welcome home in the departments."

The various centers and institutes at Stanford can hire their own people, but the best they can offer is a position with a title such as "senior research fellow." Without the word "professor" appearing somewhere in the title, a scholar at Stanford lacks status, and more importantly, clout. Without a faculty position, most researchers cannot call themselves a principal investigator, meaning they cannot apply for their own grants. Nor can they teach without sponsorship from someone on the faculty, or have much to say when it comes to building a program.

"It is a highly limited position. . . . You are a citizen without rights," says Ted Postol, a senior research associate at the arms control center and a protégé of Drell's who is currently considering offers to go elsewhere. Astronaut and physicist Sally Ride is also talking about leaving the arms control center for another post, perhaps one at Stanford.

The current system, though, does have its defenders. James Rosse, provost of Stanford, believes that the university is best served by keeping faculty appointments firmly rooted in the academic departments. Rosse says there is concern that policy-centers such as the Hoover Institution attract experts in areas that may only be of passing interest, yet faculty appointments are tough to undo. "If you're going to do policy-oriented work, you've got to face the fact that the topics that are receiving attention today will change," says Rosse.

Drell agrees with Rosse that academic standards must be maintained, but insists that centers can fill the bill by forming selection committees, by doing a national search, and by having the appointments approved by the provost and a counsel of elders. Drell points to other universities such as Princeton, Harvard, and Michigan that have learned to accommodate policy centers by allowing them to make their own appointments. Drell will continue as deputy director of the Stanford Linear Accelerator Center. ■ WILLIAM BOOTH