Growth in R&D Spending Slows

Economic woes, federal deficit pressures force Congress, Administration to curtail plans for expanding research programs

"COMPETITIVENESS" was the buzzword that rang in the new year 12 months ago. Congress was quick to show its concern about the erosion of the nation's economic base. Countless hearings were held on the threat posed by aggressive foreign competitors and the need to beef up support for R&D. But economic events and the massive federal budget deficit, forced many legislators to abandon promises to boost funding for research.

In what was the most drawn-out budgeting process in recent memory, the Congress held the National Science Foundation (NSF) to an overall increase of 5.5% instead of the requested 16.5%. Growth in spending at the National Institutes of Health (NIH) will be contained to 8% in 1988, less than half of the increase provided in 1987. The actions may signal tighter times for basic research and applied science programs.

Congress could face more difficult budget decisions in fiscal year 1989. It must shave another $42 billion from the annual deficit, reducing annual spending overrun to $136 billion. The House and Senate leaders in November drafted a package of savings and new taxes for 1988 and 1989 to achieve this goal. But, budget analysts say not all of the savings are real and more cuts will be necessary to avoid automatic spending controls under the Gramm-Rudman-Hollings deficit reduction law.

With a presidential election ahead Congress will not have much room to maneuver. Making further reductions in entitlement and defense programs will be difficult. Comments one Senate budget committee aide, "No one is likely to try to cut entitlements with an election ahead."

The Reagan Administration still wants to increase funding for basic research and large-scale science projects, but the collapse of the stock market in October and the deficit pressures are causing Administration policy-makers to slow down some initiatives. When the President submits his 1989 budget proposal to Congress in mid-February, he is expected ask for about $100 million, instead of $360 million, to build a massive new particle collider—the Superconducting Super Collider (SSC).

Similarly, the Administration reportedly plans to roll back spending on the Space Station by $600 million to $1.25 billion. Congress also is expected to move more slowly in funding major undertakings such as the SSC and Space Station.

"These projects will not have the impetus that they had last year," says Representative Manuel Lujan, Jr. (NM), ranking Republican on the House Science, Space, and Technology Committee.

As for large expansion of ongoing research programs, Lujan told *Science* that agencies must plan for "the same spending levels with slight increases to cover inflation." In fact, Congress appears to have taken this approach with many of the research programs contained in the budget passed on 22 December. Here is how some research programs are affected:

■ **NIH's** overall budget will grow from $6.17 billion to $6.67 billion. But on average, spending for most research programs will rise by 5%. In most cases, budget conferees ended up cutting for most of NIH's research institutes $5 to $30 million below that approved by the House and Senate appropriations committees.

Not surprisingly, one area that was spared was acquired immune deficiency syndrome (AIDS) research. Congress is boosting spending on AIDS research by 72% to $448 million. It also is ordering the agency to issue 6100 new contracts and grants.

Furthermore, NIH is required to develop a plan for evaluating and making funding awards for AIDS-related grants, contracts, and cooperative agreements within 6 months. The agency must advise Congress of its progress in June and again in December.

In other action related to AIDS, the Department of Health and Human Services has been instructed to set up an advisory board on AIDS and to report to Congress with its plan by 29 February. And the Centers for Disease Control has until June to mail an AIDS information booklet to every household in the country.

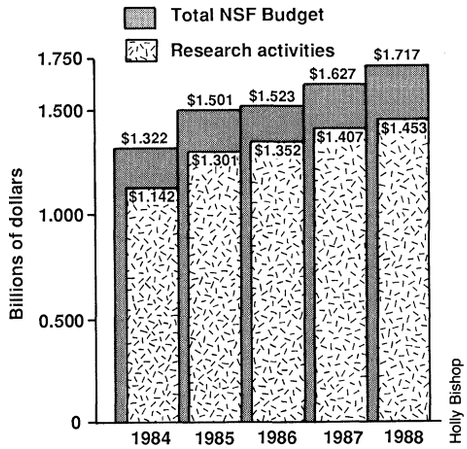
■ **NSF** director Erich Bloch stepped into the 1988 budget process hoping to win Congress' backing for a plan to double the agency's budget by 1992. House and Senate legislators, however, have held the agency to $1.7 billion. Only the science education program is growing rapidly—by some 40% to $139 million. The Antarctic research program gets a mild increase of 6.5%, bringing spending to $125 million.

The agency's largest spending function, funding an array of basic research, will receive only 3.2% more in 1988 than it did last year. Just how the agency plans to cope with this tight situation is not clear. Bloch had planned to launch about 15 new science and technology centers, 4 new engineering centers, and 3 new biotechnology centers. NSF officials estimate this would cost as much as $40 million. The agency will not decide how to scale back its plans for several weeks, says Controller Sandra Toye.

Toye also is uncertain about how many research grants the agency would end up funding 1988. Last year NSF made almost 13,000 awards at a cost of $1.32 billion.

■ **NASA** emerged from the budget process with $8.96 billion for the year, about $500 million less than what the Administration had requested. A $342-million reduction in expenditures for the Space Station accounts for most of the loss (see story p. 19).

Overall spending for research and development at the agency is pegged at $3.37



NSF Budget. *NSF's core research budget will be held to an overall increase of 3.2%. The agency plans to make key decisions on the number of grants it will award in the next few weeks.*

billion, a 7.9% increase over 1987. The budget includes $100 million in 1987 space orbiter funds that were transferred to the R&D account. Legislators also instructed NASA to continue to dedicate at least 20% of agency resources to unmanned space activities.

To control project costs, Congress is continuing to impose annual spending caps on programs, including the Hubble Space Telescope, the Advanced Communications Technology Satellite, and the Upper Atmospheric Research Satellite. These caps may not be exceeded without approval.

■ **Department of Energy** (DOE) spending in the Office of Energy Research will rise 10% to $2.05 billion. The funding increase is diluted to a great degree, however, by an estimated $121 million in "earmarks"—unrequested research projects imposed by Congress. In addition, the Congress has specified that Florida State University shall receive $11.7 million to continue operations of its supercomputer center.

Support for high-energy physics programs is just $10 million below the $566 million requested by the Administration. The Congress funded $10 million in construction-related work for the SSC, but stated that research and site selection work should proceed. To avoid further delays in high-energy research experiments, legislators told DOE to provide as much budgetary support as possible. DOE officials say complying with this will be difficult because of "earmark" projects that have been attached to the budget.

Congress also authorized $8 million to begin construction of the Compact Ignition Tokamak at Princeton University. But it cut overall funding for the financially strapped magnetic confinement fusion program by $10 million to $335 million.

■ **Department of Defense** (DOD) spending for research, development, testing, and engineering was held to $37 billion, a 1% increase above 1987. Basic research is slated to receive $902 million, but DOD officials note that this contains $25 million for funding university instrumentation grants. The budget, which is less than the $918 million requested, could rise if the department classifies as basic research special projects that were added by Congress.

DOD got $85 million for the University Research Initiative instead of the $92.8 million requested. DOD officials say some ongoing research will be affected by the reduced funding.

R&D for the Strategic Defense Initiative (SDI) was cut 3.7% below 1987's level of $3.74 billion. The Administration had requested $5.2 billion for the SDI program. The National Aerospace Plane's budget is declining by $53 million to $183 million. ■

MARK CRAWFORD

Down to the Wire on U.S.–Japan Agreement

Negotiators want a new science agreement before Japan's prime minister visits the United States this month, but the Japanese find some U.S. proposals unacceptable

THE United States and Japan are still at loggerheads over proposed changes to an existing presidential-level agreement to cooperate in science and technology. The impending visit of Japan's new prime minister, Noboru Takeshita, to the United States on 12 to 15 January has given impetus to the negotiations, but several provisions proposed by the United States remain controversial, according to Administration sources.

The United States is pressing for these changes to help remedy what it regards as an imbalance in scientific exchanges and technology transfer between the United States and Japan. In response, Japan proposed several new programs this fall to support more foreign researchers to work in its government laboratories. If funded, the new programs would provide more than 100 additional fellowships for foreign scientists, which would be a substantial increase.

"It's a poker game right now. It's anybody's guess whether anything will be hammered out before Takeshita comes."

The Reagan Administration, National Academy of Sciences president Frank Press, and others complain that the Japanese have fallen short in providing reciprocal access to its research. This summer, as friction over the trade gap with Japan increased, the Administration sought to rectify the lopsided relationship in part by proposing changes to a 1980 agreement on cooperation in science and technology between the United States and Japan (*Science*, 31 July, p. 476). The agreement was due to be renewed in November, but is still in force.

Negotiations over the changes to the agreement intensified in December as delegations from each country shuttled back and forth between Tokyo and Washington for talks. Kaname Ikeda, science counselor at the Japanese Embassy in Washington, also said that the two sides "are making progress," but then added that he is "not sure whether we are close to or far from agreement." Another Administration source remarked, "It's a poker game right now. It's anybody's guess whether anything will be hammered out before Takeshita comes."

The present agreement covers a range of modest projects involving several agencies from both governments. The United States wants to add several new provisions, according to Administration sources and Japanese press reports. It has pressed to establish a new committee of high-level officials from each government to review future cooperative agreements in science and technology research; to insert language that would protect information related to national security interests; to assign patent rights to the host government even if a foreign researcher worked on an invention; and to increase foreign access to collaborative projects between government and industry.

Japan has in general resisted changing the agreement, according to Administration sources. It is willing to go along with the establishment of a joint committee, but, one Administration official says, Japan "would gut any substance of the activities we proposed," including its review authority. "So we're left with a shell." Many joint agreements are now handled by individual agencies in each country and are then basically rubber stamped by a higher level authority.

According to the same official, the language regarding the protection of information related to national security was included at the Defense Department's insistence after the disclosure this summer that the Toshiba company diverted American submarine technology to the Soviet Union. Although the proposal would not go beyond existing restrictions, Japan has resisted the provision because it "may inhibit the freedom of research," according to a 2 December news article in *Asahi Shimbun*, one of Japan's leading newspapers.

Hiroshi Inose, a leader in science policy in Japan and director general of the National Center for Science Information Systems, said