Science and the Lame-Duck Budget

President Reagan's final budget again calls for increased support for selected areas of R&D, including several big science projects, at a time of severe fiscal austerity, but uncertainties abound

THIS WEEK, President Reagan sent Congress a $1.15-trillion budget for fiscal year 1990, which begins on 1 October—almost 9 months after he leaves office. It is a last hurrah to continue the themes Reagan has pursued for the past 8 years: increases in defense spending, cuts in some domestic programs, and an attempt to bring down the federal deficit without raising taxes.

As in previous Reagan budgets, science and technology occupy a generally favored position, with substantial increases proposed in selected areas at a time when much of the rest of the budget is under severe pressure. Overall, federal spending on R&D would rise by 7%, to reach $67.3 billion in fiscal 1990, with another $2.4 billion earmarked for construction of facilities.

These proposals should be treated with more than a grain of salt, however. Like most of Reagan's previous budgets, it has been declared "dead on arrival" at Capitol Hill, where Congress is expected to reorder the overall priorities. Moreover, President-elect George Bush will propose changes of his own to the Reagan budget within a few weeks of taking office.

In addition, the threat of the infamous Gramm-Rudman-Hollings deficit reduction law continues to cast uncertainty over the whole federal enterprise. Automatic, across-the-board cuts will be triggered next fall unless the projected federal deficit in fiscal 1990 is less than $110 billion. The deficit this year is expected to be about $160 billion.

Reagan's fiscal 1990 budget would, in theory, reduce the deficit to $92.5 billion, largely by cutting farm subsidies, limiting the growth of payments under Medicare and Medicaid, selling off $6-billion worth of federal assets, and eliminating a variety of programs such as subsidies for urban mass transit that are deemed the responsibility of state and local governments. Viewed against those cutbacks in popular programs, the increases accorded many science and technology programs are remarkable. But they may not all be politically sustainable.

Overall, support for nondefense R&D would increase by 7%, or $1.6 billion, to reach $23.3 billion. Defense R&D, which now accounts for two-thirds of all federal R&D spending, would rise by a similar percentage, from $41.3 billion to $44 billion. Spending on basic research would be increased by some 6%, about 2% above the anticipated rate of inflation (see table).

Several "big science" programs would be initiated or continued. They include the space station, whose budget would jump from $900 million this year to $2 billion in fiscal 1990; the Superconducting Super Collider (SSC), which would get $250 million, up from $100 million this year; and the project to sequence the human genome, whose budget would rise from $45 million to $127.6 million.

The proposed budget would also sharply increase support for research associated with AIDS, step up spending on global environmental problems such as the greenhouse effect, and provide for a 14% boost in the budget of the National Science Foundation.

Outside the favored areas, however, the picture is less rosy, with increases generally held at or below the rate of inflation. And in some cases—several energy R&D programs and some programs funded by the National Oceanic and Atmospheric Administration, for example—the Reagan budget echoes earlier Administration proposals in seeking deep cuts.

How these R&D proposals will play on Capitol Hill in the midst of the bigger drama of the overall budget remains to be seen. This year, moreover, the uncertainties are heightened by the fact that key appropriations subcommittees that handle the budgets for civilian science agencies will be under new management (see box). The Reagan lame-duck budget will be the starting point for the coming debate, however. Following are some specific highlights.

■ **Biomedical research.** Once again, AIDS is the big winner in the budget proposals for the Public Health Service, including the National Institutes of Health. Total federal spending on AIDS research and education would rise by 24%, from $1.28 billion in fiscal 1989 to $1.60 billion next year. AIDS, in fact, is now roughly on a par with cancer in terms of total federal research dollars.

This burgeoning growth in AIDS funding masks a relatively modest budget for other areas of biomedical research. At NIH, the total budget would rise from $7.1 billion to $7.5 billion, but growth in AIDS research would account for almost half the increase. In addition, NIH's share of the genome project would jump from $28 million this year to $100 million next. Funding for the rest of NIH, outside these two areas, would grow by only 2.3%.

The total number of new and competing grants funded by NIH for research that does not involve AIDS would shrink under Reagan's budget proposals, from 5128 this year to 4556 in fiscal 1990. In contrast, new AIDS grants supported by NIH would climb from 601 to 732.

CONDUCT OF BASIC RESEARCH BY MAJOR DEPARTMENTS AND AGENCIES

(In millions of dollars)

Department or agency	Obligations			Outlays		
	1988 actual	1989 estimate	1990 estimate	1988 actual	1989 estimate	1990 estimate
Agencies supporting primarily physical sciences and engineering: [1]						
National Science Foundation	1,433	1,553	1,754	1,399	1,527	1,638
National Aeronautics and Space Administration	1,113	1,438	1,462	1,019	1,318	1,407
Energy	1,183	1,303	1,389	1,171	1,304	1,402
Defense—Military functions	873	939	929	836	936	954
Interior	126	147	128	129	148	131
Commerce	31	30	28	28	31	29
Other Agencies [2]	7	7	7	8	8	7
Subtotal	4,767	5,418	5,697	4,589	5,270	5,567
Agencies supporting primarily life and other sciences: [3]						
Health and Human Services	4,086	4,417	4,756	3,914	4,152	4,621
(National Institutes of Health) [4]	(3,794)	(4,062)	(4,175)	(3,644)	(3,837)	(4,161)
Agriculture	477	490	511	457	479	499
Smithsonian Institution	75	79	87	73	78	85
Environmental Protection Agency	27	44	76	28	40	73
Veterans Affairs	17	19	16	16	18	16
Other Agencies [5]	20	21	17	20	18	18
Subtotal	4,703	5,070	5,463	4,507	4,786	5,311
Total	**9,470**	**10,488**	**11,160**	**9,096**	**10,056**	**10,878**

1 Includes mathematics and computer sciences.
2 Includes the Corps of Engineers, the Tennessee Valley Authority, and the Department of Transportation.
3 Includes psychology and social sciences.
4 Totals for NIH in 1988 and 1989 include HIV funding. For 1990, all HIV funding is proposed as a separate element within DHHS, the National HIV Program, and is not included in the NIH totals.
5 Includes the Departments of Education, Labor, Justice, and Treasury, and the Agency for International Development.

Source: OMB

A boost for biology. *AIDS and the genome project would account for much of the increase in basic biology.*

Similar patterns would prevail in the Alcohol, Drug Abuse, and Mental Health Administration, where non-AIDS funding would drop from $1.694 billion to $1.642 billion, while support for AIDS-related programs would rise from $174 million to $218 million.

■ **National Science Foundation.** NSF is requesting a budget of $2.15 billion next year, a 14% increase over this year's funding. Two years ago, the Reagan Administration set a goal of doubling by 1992 NSF's 1987 budget of $1.62 billion. But the hefty increases proposed in the past 2 years have not been fully funded by Congress. NSF director Erich Bloch, ever hopeful, noted at a press briefing that the 1990 proposals are again in line with a doubling by 1992.

Support for individual investigators and facilities would continue to account for the lion's share of NSF's budget, increasing from $1.192 billion to $1.321 billion. But support for research centers and group research would rise at a faster rate, growing from $319 million to $376 million. During the Reagan years, support for groups and centers has accounted for a growing share of NSF's budget, rising from about 10% in 1982 to 17% this year. The proposed budget would provide for the establishment of 10 to 12 new science and technology centers, in addition to the 11 established late last year.

The foundation's science and technology education programs are set to increase by a more modest 11%, from $171 million to $190 million. These activities have been a perennial favorite of Congress, however, which in the past has pumped more money into them while holding down increases in NSF's research programs.

■ **Defense.** The overall request for defense programs would provide for a real increase of 2% above inflation. Congress is expected to cut the request considerably, however, and there is even talk of holding the defense budget constant.

Of the $44 billion proposed for defense R&D, most of it is at the development and testing end of the spectrum. Less than $1 billion is earmarked for basic research.

The biggest increase in R&D would go to the Strategic Defense Initiative, which would jump from about $4 billion this year to $5.9 billion next (including some $300 million channeled through the Department of Energy). There is virtually no chance that Congress will come through with such a massive increase, however, and it remains to be seen whether the Bush Administration will trim back the request.

In the strategic weapons area, the Bush Administration will face a difficult early decision on modernizing the intercontinental ballistic missile force. The Reagan budget contains funds to proceed with its plan to deploy up to 100 MX missiles on rail cars, but contains no money to continue development of Midgetman, a single-warhead missile favored by Brent Scowcroft, Bush's national security adviser.

■ **Space programs.** The budget for the

New Hands on the Purse Strings

The uncertainties inherent in President Reagan's lame-duck budget are compounded by the fact that three key congressional subcommittees that handle the budget requests for civilian science agencies will have new chairmen this year.

In the House, the retirement of Representative Edward Boland (D–MA) will result in a change in the leadership of the appropriations subcommittee that has responsibility for the National Aeronautics and Space Administration, the National Science Foundation, and the research programs of the Environmental Protection Agency. The new chairman will be Robert Traxler (D–MI). The companion subcommittee on the Senate side will also have a new chairman—Senator Barbara Mikulski (D–MD). She succeeds William Proxmire (D–WI), who retired last year.

R. Traxler

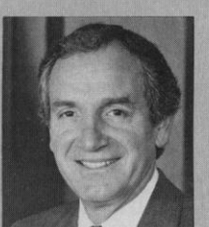
Traxler has served on the subcommittee since 1974 and is seen as an active supporter of NASA and NSF. While a strong advocate of manned space flight and general science, his style is different from that of his predecessor. It is expected that the scientific and business communities will find him far more accessible than Boland was. Traxler has asked subcommittee director Richard N. Malow to stay on, an action that will contribute to continuity in many NSF and NASA programs. Nevertheless, it is apparent that Traxler will be in command of the subcommittee staff, rather than dependent on it for direction. He is perceived as being bright and decisive. He has traveled with agency director Erich Bloch on several occasions and has shown an interest in many of NSF's research programs.

During her 11 years in Congress, Mikulski has not been particularly active in science-related issues. But she has supported the space station, the shuttle program, and a range of activities related to the Chesapeake Bay and its cleanup. David Gardner of the Sierra Club said that Mikulski "has an overall good environmental record." As for NSF, Mikulski, whose constitutents include Goddard Space Center, last year voted in favor of a $1.9-billion fiscal 1989 budget for the agency. Raymond Bye, congressional liaison at NSF, says, "It's too soon to characterize Mikulski" and her views concerning the agency. He notes, however, that she is spending quite a bit of time at the agency being briefed by NSF officials.

Bettmann Newsphotos

B. Mikulski

The National Institutes of Health and other health agencies will also have to deal with a new lineup in the Senate subcommittee that handles the budget for the Department of Health and Human Services. The subcommittee will be chaired by Senator Tom Harkin (D–IA).



T. Harkin

A farm boy and former Navy pilot who is largely responsible for the creation of the National Institute on Deafness and other Communication Disorders, Harkin has been a member of the health subcommittee since his election in 1984 and has supported his previous chairmen, Senator Lawton Chiles (D–FL), who retired this year, and Senator Lowell Weicker (R–CT), who lost his seat. Both Chiles and Weicker were loyal patrons of NIH, and worked year after year to keep the coffers full. Harkin, an attorney, is not unfamiliar with science. But he is largely an unknown to the circle of lobbyists who represent America's medical schools and universities. Harkin is better known for his work on the agriculture committee and for his interest in the problems of rural dwellers.

■ WILLIAM BOOTH, MARK CRAWFORD, MARJORIE SUN

National Aeronautics and Space Administration is set to climb from $10.9 billion to $13.3 billion. A dominant factor in the increase is the $1.1-billion addition to the budget for the space station.

Congress last year decreed that some of the fiscal 1989 funds for the space station could not be spent before 15 May 1989, to give the new Administration a chance to review the program. Presidential candidate George Bush voiced early support for a manned space station, however, and he is expected to proceed with the program. But a recent call by a committee of the National Academies of Sciences and Engineering to take another look at the rationale for and scope of NASA's design (see page 164), could make the project more vulnerable on Capitol Hill.

Elsewhere in NASA's budget, funds are included for a start on the Cassini mission to Saturn and its moon Titan, a project that will be conducted jointly with the European Space Agency.

■ **Department of Energy.** The item in DOE's R&D budget that is likely to draw most political attention is the $250-million request for the SSC. The funds would be used to support continuing research, particularly on superconducting magnets, and to begin construction of the facility at a site recently selected in Texas—Congress willing.

Although the SSC would account for a substantial fraction of the increase in DOE's basic research budget, funding for other high energy physics programs would grow by 10% and nuclear physics programs would get a 15% increase. DOE's budget would also permit construction to begin on a 7- to 9-billion-electron-volt synchrotron at Argonne National Laboratory and the Compact Ignition Tokamak, a next-generation fusion machine at Princeton.

Less favored are a variety of R&D programs on fossil fuels, energy conservation, and renewable energy technologies, which are again slated for radical surgery.

■ **Global environment.** A priority in this budget is a coordinated set of research programs aimed at gaining a better understanding of human impacts on global processes such as climate change, ozone depletion, and desertification. A committee under the chairmanship of Dallas Peck, head of the U.S. Geological Survey has drafted a preliminary program spanning seven federal agencies, and the budget would boost spending for these activities from $134 million this year to $191 million in fiscal 1990.

■ COLIN NORMAN

With reports from William Booth, Mark Crawford, Marjorie Sun, and M. Mitchell Waldrop.

U.S.–Soviets Sign Collaboration

Paris

After months of negotiation, a 5-year agreement to promote increased collaboration between the United States and the Soviet Union in eight fields of basic scientific research was signed in Paris last Sunday by U.S. Secretary of State George Schultz and the Soviet Foreign Minister, Eduard Shevardnadze.

The agreement is a major step in rebuilding formal ties between the U.S. and U.S.S.R. scientific communities—ties the United States ended when the Soviet Union invaded Afghanistan in 1979. Schultz and Shevardnadze welcomed the agreement as a sign of improved relations between the two countries.

Under the terms of the new agreement, a joint commission will be established to oversee and encourage joint activities in the fields of geosciences, engineering sciences, scientific problems of the Arctic, life sciences, science policy, chemistry, mathematics, and theoretical physics.

Specific projects will be defined in separate memorandums of understanding negotiated between individual agencies or scientific organizations in the two countries. According to Soviet officials, two of these are currently under discussion—one between the National Science Foundation and the Soviet Academy of Sciences, the other between the U.S. Geological Survey and the U.S.S.R. Ministry of Geology. The others are expected to follow shortly.

The text of the agreement makes it clear that activities such as exchange visits, conferences and joint projects in "basic scientific research," rather than research "designed for the transformation of new discoveries into applied technologies," are the focus.

U.S. concerns over possible Soviet access to U.S. technological know-how are addressed in a detailed, seven-page appendix setting out the rules that will govern the intellectual property rights covering all scientific activities carried out within the framework of the agreement.

The 5-year agreement can be renewed for a further 5 years through mutual agreement, but it can also be terminated at 6 months' notice by either side. ■ DAVID DICKSON

Europe Bans Boeuf à l'Estradiol

Europe is imposing bogus safety standards on beef, according to U.S. officials who are caught up in a 7-year-old wrangle with the Common Market over the practice of doping cattle with sex hormones.

The European Community (EC) banned the sale of meat from hormone-treated cattle on 1 January as a health risk, blocking imports from the United States valued at $100 million a year. Most U.S. cattle are given hormone implants because they accelerate growth without greatly increasing the demand for feed.

The EC claims that its ban is designed to protect citizens from overdosing on sex hormones, but American officials think it is designed to protect European farmers from competition. Last week, a trade war loomed on the horizon as U.S. and EC officials threatened one another with retaliatory tariffs.

The EC's agricultural counselor in Washington, Derwent Renshaw, says that "our consumers have expressed a strong preference to eat hormone-free meat," and the ban on treated beef imports is simply a manifestation of this health concern. He maintains that Europe has not raised a trade barrier, and that the U.S. retaliation is "illegal." While there may be no evidence that hormone-treated beef is risky, Renshaw says, neither is there any evidence that it is safe.

Lester Crawford, director of the U.S. Department of Agriculture's Food Safety and Inspection Service, blasts the EC policy as disingenuous. First, he says, it cannot be enforced. Methods of hormone use are so sophisticated now that it is often impossible to tell whether or not meat in the supermarket comes from a treated animal. Three of the five hormones used in the United States are identical to those the animal produces itself, and residues are within the natural range. For the two synthetic hormones, residues are so low as to be barely detectable—in the range of 1 to 20 parts per billion. No excess residues have been found in U.S. beef in the past 6 years of government monitoring.

The EC insists, however, that it will accept only beef that the exporting government certifies has come from animals that were never given hormones. Crawford's response: "We cannot certify a lie." He says that analytical tools permit one to identify traces of synthetic hormones in some cases, but they cannot support the categorical statement that an animal has never received