US budget

Biosciences lose out to defence

Washington

A HUGE increase in defence spending, including defence research and development, dominates President Reagan's proposed budget for fiscal year 1987. Total federal obligations for research and development, including facilities, are estimated at $63,000 million, 16 per cent above the 1986 level of $54,000 million. Military programmes in the Departments of Defense and Energy, as in previous years, account for most of the increase. But substantial increases are also proposed for the National Science Foundation (NSF) and the National Aeronautics and Space Administration (NASA). The physical sciences in general have been relatively well treated. Biomedical research is a different story.

The budget continues all the well-known Reagan themes. Budget authority for the Strategic Defense Initiative (SDI) will increase from $2,800 million in 1986 to $4,800 million in 1987, Congress permitting. Research and development by the Department of Defense would increase to 60 per cent above its 1984 level; only $21,000 million of the $63,000 million budget for federal research and development would be non-defence, $7,600 million of that for non-military basic research. Pet Reagan hates such as the Sea Grant programme of the National Oceanic and Atmospheric Administration and the computer sciences and technology and fire and building research programmes at the National Bureau of Standards are scheduled (as they have been before) to be killed. The Environmental Protection Agency takes a 7 per cent cut.

Tension between the administration and Congress over the budget is unusually high this year, because of last year's controversial legislation setting fixed targets for reducing the federal budget deficit in each of the next five years. Under the Gramm–Rudman deficit reduction act, automatic across-the-board cuts will come into effect if Congress fails to pass budgets meeting the target.

The new 1987 budget proposal foresees total spending of $944,000 million, with a deficit of $143,600 million, just under the limit specified by Gramm–Rudman. But the administration's refusal to consider tax increases, together with a 12 per cent increase in total military spending, has meant hefty cuts to many domestic programmes, which Congress is unlikely to approve. Instead, the appropriate committees and Congress as a whole can be expected to make several changes, with the result that the actual budget for the financial year beginning on 1 October 1986 will probably look even less like the President's proposal than usual, if Gramm–Rudman stands. But further uncertainty was introduced last week when a federal judicial panel unanimously ruled the automatic cuts provision of Gramm–Rudman unconstitutional; the question will now go to the Supreme Court, which is not expected to rule before the summer.

Meanwhile, the administration's proposals are as follows.

National Science Foundation

The foundation's budget request is $1,685.7 million, an increase of 8.4 per cent. Even so, the mood at NSF is temperate. Director Erich Bloch points out that in 1983 constant dollars, the 1987 request represents a negligible increase over the 1985 amount (after a decrease in 1986). The foundation says that even if Congress should approve the full request, that would be only just good enough, in part because of the increasing complexity — and cost — of research equipment. But in the Gramm–Rudman era's scramble for funds, full approval seems unlikely.

NSF lists for "special emphases" for 1987: biotechnology, computational science and engineering, global geosciences and broadening participation in research and education. If NSF sustains budget cuts during the impending legislative fray, the foundation would probably seek to protect them.

NSF is planning to establish between two and four new multidisciplinary biotechnology research centres, as well as an undefined number of so-called mini-centres. A 50 per cent increase to $84 million is wanted for computational science and engineering; the global geosciences effort would jump from $17 million to $35 million, and would include the development of Earth-based and satellite observational instrumentation, a project for which the administration has a special enthusiasm.

NSF's plans to expand participation in science and engineering research and education include $4 million for the new Minority Research Centers of Excellence programme and a $13 million increase over the $50 million spent in 1986 to improve undergraduate research.

Two more of the agency's pet projects are seeking increased support. NSF's supercomputer centres stand to gain almost 19 per cent over their current $45.2 million, but the total, $53.6 million, will be spent on bringing on stream the five centres now being set up. NSF has chosen to push networking and software research rather than to establish new centres in 1987, even though the National Science Board's initial mandate called for 10 facilities.

The nascent engineering research centre network grabbed a $12 million increase over this year's budget of $23 million. Six centres have been established so far, and NSF hopes to have 15 by the end of 1987.

National Institutes of Health

The proposed total budget for the National Institutes of Health (NIH) is $4,936 million, a substantial drop from the $5,353 million comparable figure appropriated by Congress for 1986. This repeats a now familiar pattern: the administration proposes cuts for NIH, only to have Congress reverse them and vote huge increases a few months later. But this year, because of

US research and development budget ($ million)

	1985 actual	1986 estimated	1987 proposed
Defence-related	31,099	33,485	41,823
Health and Human Services	5,444	5,524	5,471
(NIH)	(4,824)	(4,905)	(4,672)
Energy	4,901	4,785	4,886
NASA	3,235	3,594	4,051
NSF	1,346	1,334	1,508
Agriculture	941	922	907
EPA	320	334	310
R&D facilities	1,894	1,812	1,734
All other	2,205	2,048	1,847
Total	51,385	53,836	62,537

Due process of law

IN anticipation of legal challenges to the constitutionality of Gramm-Rudman, the bill itself contains specific procedures to be followed. Rather than proceed from district court to appeals court to Supreme Court, any challenge goes first to a special panel of federal judges who issue a ruling. If there is an appeal against the panel's ruling, the case goes immediately to the Supreme Court.

In fact, challenges did arise. Several congressmen joined a suit brought by the National Treasury Employees Union. On 7 February, the panel issued its ruling declaring the automatic-cuts provision of Gramm-Rudman unconstitutional.

Now it falls to the heavily burdened Supreme Court to make a final determination. That decision is unlikely to come before July. Until then, federal agencies will have to live in fear of next fall's Gramm-Rudman axe. □

NASA's air-breathing hypersonic "Aerospace Plane".

the Gramm–Rudman Act, there is less confidence that Congress will come to the rescue, and NIH officials are acting "as if they really think it's going to happen", according to one congressional observer.

In addition to the sharply lowered budget for 1987, the administration is proposing a rescission to the NIH 1986 budget of $62 million. This is on top of $230 million that is to come out of the 1986 budget because of automatic Gramm–Rudman cuts this year. But the $62 million rescission will occur only if Congress specifically approves it within 45 days, which must be considered doubtful.

Most of the savings sought at NIH would be achieved by limiting the total number of extramural research grants to 18,000 — 776 less than Congress intended for this year. By focusing on the total number of grants, NIH hopes to shift the debate from the number of new grants awarded each year, which has been a continuing battle with Congress. But most congressional sources last week expressed incredulity that the proposed NIH budget could be taken seriously; most probably, there will at least be some restoration of the budget in the direction of last year's figure.

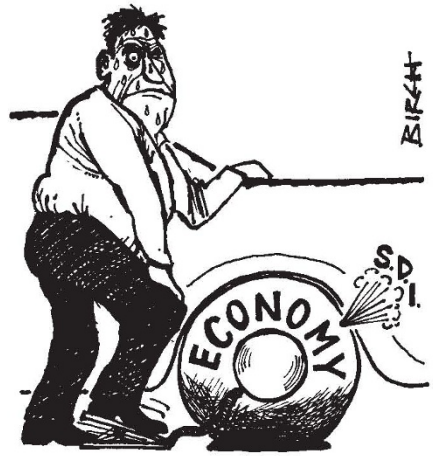
If not, the number of new and competing extramural grants will be 5,519 this year (6,100 had previously been agreed); this number would decrease steadily to the administration's long-sought target of 5,000 in 1989. In the short term, the rescissions may mean that NIH will have to reduce the dollar value of research grants.

A total of $213 million is proposed for research into and control of acquired immune deficiency syndrome (AIDS), to be determined as a special fund in the office of the assistant secretary for health. A sum of $46 million would go to the Centers for Disease Control, $144 million to NIH, $14 million to the Alcohol, Drug Abuse and Mental Health Administration and $10 million to the Food and Drug Administration. The total appropriated for AIDS research in the current year was $244 million, but the combined effects of Gramm–Rudman and the proposed rescission would reduce that to $193 million.

Compared with the 1986 planned allocations, relatively more AIDS funds would go to NIH (an increase of $22 million) than to the Centers for Disease Control (which would get $5 million less).

Aeronautics and Space

The budget requested for the National Aeronautics and Space Admininstration (NASA) is $7,694 million, a 5.3 per cent increase over the estimated 1986 budget after Gramm–Rudman cuts. Nevertheless, acting NASA administrator William Graham preferred to look at it another way last week: the 1987 total is still a reduction in real terms of 3.5 per cent from the level of the 1986 operating plan. In any event, NASA's budget is completely up for grabs again now with the loss of Challenger; NASA will save on shuttle operations until flights resume but will also lose part of the $704 million it had been expecting in reimbursible expenses from shuttle operations in the current year. The 1987 budget included $410 million for President Reagan's space station, the least that is plausible if the space station is to be in orbit by 1994 as the President has directed. The budget also included $29 million to "initiate" TOPEX, an oceanographic satellite being developed jointly with France. Officials declined to speculate on whether supplementary funds will be sought to build a Challenger replacement (cost estimates range up to $2,900 million), but legislation has already been introduced in the House of Representatives



that would do just that. NASA already has spare parts in storage that could form the basis of new orbiter to be built quickly.

About $200 million is requested for a joint project to be carried out by NASA and the Department of Defense to develop a new class of hypersonic aerospace vehicles capable of horizontal take-off and landing on normal runways. The National Aerospace Plane, as it has been dubbed, would be mainly air-breathing and would use ramjets with hydrogen fuel, operating at speeds of between Mach 12 and Mach 25 at altitudes of up to 350,000 feet. The plan is to have a test model in the mid-1990s. The idea has been developed over the past several years by NASA and the Defense Advanced Research Projects Agency; all participants believe there is still "a high degree of technical risk". The planes would serve both civilian and military uses; ten minutes from the east coast of the United States to the west coast was one claim bandied about last week. Perhaps less frivolously, the administration may be attracted to the idea of being able to deploy US forces anywhere in the world within a few hours.

Energy

The request for the Department of Energy (DOE) in 1987 is only about 1 per cent above actual spending, a decrease in real terms. But within this total there is a 11 per cent increase for the department's nuclear weapons production and support (to $4,830 million), and a 7 per cent decrease for research and development (to $4,539 million).

As in previous years, cuts of 50 per cent and more are proposed. Magnetic fusion research is also scheduled to decrease, from $365 million to $333 million. Fossil energy research is scheduled for major cuts, but there is a new clean coal technology fund for which $150 million is requested in 1987 (1986: $100 million) and a new cooperative research and development venture pool with industry is proposed. The aim is to get industry to pay for much of the research on fossil fuels traditionally supported by DOE; if successful, conservation might be handled in the same way.

Fission research for civilian reactors (including breeder reactors) is to be phased down, while nuclear space and defence power systems (including SDI) increase from $20 million to $71 million. But high-energy physics and nuclear physics both get a boost, with first-time operating funds for the Tevatron collider at Fermilab and for the Stanford Linear Accelerator. Low level development funding continues for the Superconducting Supercollider; a decision on whether to go ahead is expected this year, and budget allocation for high-energy physics is suspended until then. Funds are requested to initiate construction of the Continuous Electron Beam Accelerator Facility at Newport News, Virginia.

Agriculture

The agricultural research service does well, with a 7 per cent increase to $497 million. The service conducts basic research in plant germplasm and biotechnology. But the cooperative state research service, which deals with more local problems, will be cut by more than 15 per cent; the administration believes local problems should be researched by state governments. The animal health and disease programme would be eliminated; in previous years Congress has reinstated it.

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