For Scientific Research, Clinton Proposes Best Budget of His Presidency

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BY JEFFREY BRAINARD

WASHINGTON

PRESIDENT CLINTON last week called for lifting caps on federal spending to help fuel an expansion in financing for university-based research of 8 percent, to $17.8-billion, in the 2001 fiscal year.

The president's budget would provide large increases for research projects in the physical sciences and computing, which administration officials said was meant to keep pace with big jumps in federal support for biomedical research in recent years.

Last week's announcement fleshed out the details of a proposal made last month to increase financing for the National Institutes of Health by 5.6 percent, to $18.813-billion, and to give the National Science Foundation its largest budget increase ever. The N.S.F.'s budget would rise by 17 percent over the 2000 fiscal year, to $4.572-billion. Those two agencies together support about 70 percent of federal financing for basic and applied research at universities.

Top Republican lawmakers last week rejected Mr. Clinton's overall budget as too extravagant. However, G.O.P. leaders have shown a willingness to consider further significant increases in science spending in 2001.

LOPSIDED PRIORITIES?

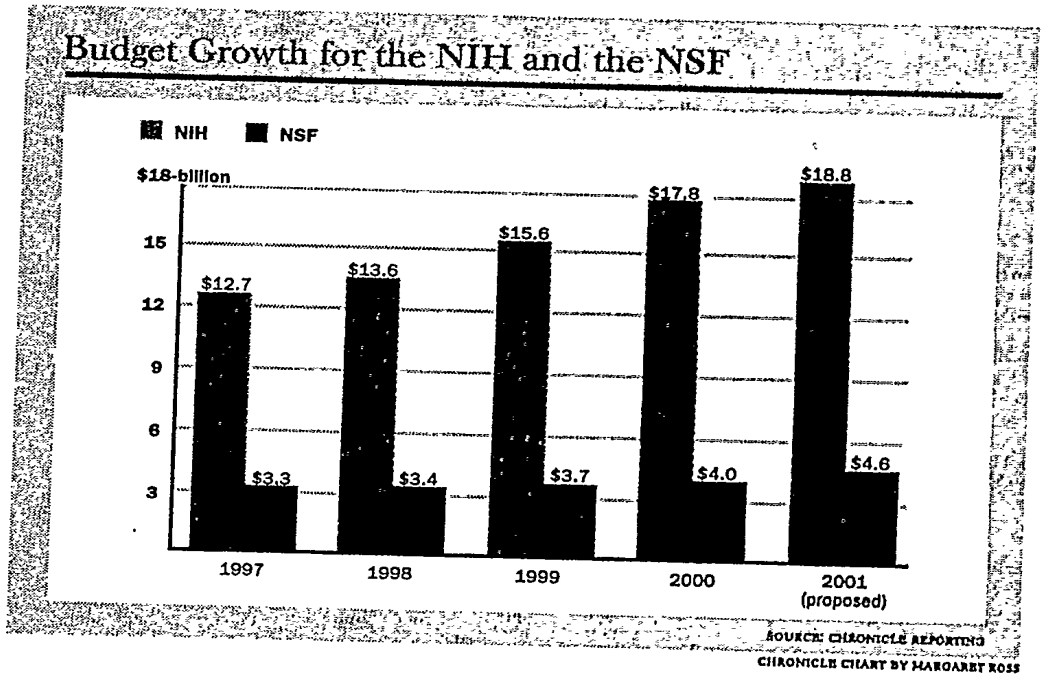
The budget reflected concerns of scientists and officials inside and outside of the administration that federal spending was becoming lopsided in favor of biomedical research.

Congress has particularly favored the N.I.H. in the past two years, providing budget increases of 15 percent each year, much larger than those requested by Mr. Clinton.

In announcing the budget, the president's science adviser, Neal F. Lane, and other administration officials repeatedly mentioned the need for a "balanced portfolio" of financing that supports such fields as physics and computer science as well. Mr. Lane headed the N.S.F. before taking his current position, and has been credited with helping to persuade President Clinton to adjust spending priorities.

Supporters of biomedical research nevertheless hoped to persuade Congress to support yet another increase of 15 percent, for 2001. Under the proposed increase of 6 percent, the N.I.H. would reduce the number of new, competitively awarded research grants, a prospect that worries scientists.

Even so, Mr. Clinton's budget for 2001 would provide the largest increase to university researchers over all of any he has submitted during his seven years in office. Earlier in his tenure, he had proposed increases at or below the rate of inflation. But if Congress accepts his plan for 2001, federal support for academic scientists would have risen by a total of 53 percent over Mr. Clinton's two terms in office—an increase roughly twice as fast as inflation. Under the president's plan:



- The Energy Department's science budget would rise 12 percent, to $3.151-billion—the largest such increase since 1992.
- Spending on research at the National Aeronautics and Space Administration would rise by 6 percent, to $5.165-billion. NASA's administrator, Daniel S. Goldin, promised to "engage, to a much larger degree, the university community" in that work.
- Pentagon spending on basic research would grow by 4 percent, to $1.217-billion, while applied research would dip by almost 8 percent, to $3.144-billion.
- Agriculture Department grants for research, education, and cooperative extension involving universities would grow by 2 percent, to $1.096-million.

"To see these kinds of increases after so many lean years is very reassuring," said Gene D. Block, vice president for research

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and public service at the University of Virginia.

Mr. Block also directs an N.S.F.-financed center at Virginia that studies biological clocks, and he applauded the proposed increase for that agency. Although the university depends heavily on the N.I.H.'s support for biomedical research, the science foundation finances a wider variety of research projects at Virginia, because its mission is to improve all disciplines of science, Mr. Block said.

"We have worried that the N.S.F. seemed to lag behind," he said. "Increases there have a very broad effect on institutions."

CONTROVERSY OVER SPENDING CAPS

By proposing to lift the spending limits required by the 1997 balanced-budget agreement, Mr. Clinton avoided an old controversy, but ignited a new one.

For the 1999 and 2000 fiscal years, Mr. Clinton had suggested levying new taxes on tobacco to help finance increased spending on scientific research and other priorities without exceeding the mandatory spending caps. Republican leaders in Congress had rejected the new taxes as gimmicks, but in the end they supported increased financing for research.

This year, Congressional leaders say Mr. Clinton's plan to exceed the caps would involve too much new spending in too many different areas. Lawmakers said the budget would not allocate enough money for tax cuts. And they predicted it might dip into the Social Security surplus. Mr. Clinton said it would not.

"We're probably going to have difficulty meeting the president's expectations," said a House of Representatives staff member who works on research spending. "But if we can get an allocation" of funds from Congressional leaders "that matches all the expectations, that's great," the staff member said, speaking on condition of anonymity.

Administration officials have cited the swelling federal surplus to justify increased spending on science.

Mr. Lane, the presidential adviser, said that federal support for research and technology was partly responsible for the nation's strong economy, and that further increases represented a wise investment. The budget plan, he added, "substantially increases the university-based research that will ensure a strong [science and technology] work force in the 21st century."

FUNDS FOR TECHNOLOGY

The budget also proposes increases for multiagency research projects favored by the administration. Those include work on information technology and "nanoscale-level" science and technology, which involves manipulating atoms to create stronger, more efficient materials and devices. Most of the spending in both areas would flow to university-based researchers.

Support for information-technology research, which got a spending boost this year, would continue its rise in 2001 with a gain of 35 percent, to $2.315-billion. Seven federal agencies would share the funds, with the N.S.F. receiving the largest portion, $740-million.

Among other topics, the agency would study how to expand the capacity of computer systems to keep pace with the rapid growth of the Internet, said Rita R. Colwell, director of the N.S.F. "Very soon, we'll be hooking millions of systems and billions of information appliances to the Internet," she said at a budget briefing.

Ruth L. Kirschstein, acting director of the N.I.H., says some of the agency's funds will go to "try to either eliminate or narrow the gap" in the relative health of white and minority Americans.

N.I.H.

Spending on nanoscale research would rise by 83 percent, to $495-million. Scientists hope the research will lead to such advances as exceptionally strong, lightweight materials; much smaller transistors and memory chips; and methods to detect individual cancerous cells in the body.

"The administration believes that nanotech will have a profound impact on our economy in the early 21st century, perhaps comparable to that of information technology or cellular, genetic, and molecular biology," Mr. Lane said.

The $495-million would be shared among six agencies, with the N.S.F. getting the largest share, $217-million.

Following are details about the research budgets of individual agencies:

National Institutes of Health

Although the Clinton administration proposed $1-billion more for the N.I.H. in 2001, the agency's actual gain would be less. The budget would tap $259-million of the agency's funds to help finance studies of public health and policy by other agencies in the Department of Health and Human Services, especially the Agency for Healthcare Research and Quality, and the Centers for Disease Control and Prevention. The Clinton administration has shifted N.I.H. funds in this way before, but for smaller amounts.

NIH Research Grants

National Institutes of Health officials want to slow the growth of new research grants because of the agency's growing commitment to financing multiyear grants.

	New grants	Continuing grants
1997	7,390	18,528
1998	7,578	19,782
1999	8,565	20,163
2000	8,950	22,337
2001*	7,641	23,833

*proposed

Note: New grants are competitively awarded and include renewals and supplemental grants. Continuing grants are not competitively reviewed after they are initially awarded.

SOURCE: NATIONAL INSTITUTES OF HEALTH

RICK BLOOM

Sen. Arlen Specter, whose committee sets spending for the N.I.H., promised to fight to increase the budget of the agency, which he says has produced advances that "have truly been astounding."

With the remaining budget growth, the N.I.H. estimates that it would award 7,641 competitive research grants in 2001—down from 8,565 in 1999 and an estimated 8,950 in 2000. The agency would continue to support 23,833 multiyear grants, which are renewed without competition.

The size of the average competitive and noncompetitive grant would grow by 2 percent in 2001—below the expected increase of 3.6 percent in the cost of doing biomedical research.

In a statement, agency officials said the N.I.H. needed to restrain the growth of new awards and amounts so as to control the increase of grants that the agency would have to support in future years. Otherwise, the N.I.H. could be stymied in attempts to begin new research.

The reduction in grant numbers troubled David G. Kaufman, president of the Federation of American Societies for Experimental Biology, the largest coalition of biomedical-research associations in the nation. Dr. Kaufman said the reduction could discourage young investigators beginning their careers.

"That is why we need to press for additional funding for the N.I.H. and maintain the commitment to doubling the agency's budget by fiscal-year 2003," Dr. Kaufman said. He called the president's proposal "a major step in the right direction."

Some observers have suggested that Mr. Clinton has deliberately low-balled the N.I.H. in his budgets, expecting that lawmakers would increase the amount above his request, as they have before.

In 1998, the Senate endorsed the goal of doubling the N.I.H.'s budget by 2003. By providing unprecedented back-to-back increases of 15 percent in 1999 and in 2000, lawmakers have set the agency on a pace to meet that goal.

Whether they will remain as generous for 2001 appears less certain than it did a year ago. In recent months, some Republicans have reportedly grown skeptical that the agency can use such large, consecutive increases efficiently.

But the N.I.H.'s champion in the Senate, Arlen Specter, a Republican of Pennsylvania, called last week for the agency's budget to rise by $2.7-billion in 2001—well more than the $1-billion increase sought by the president—to keep the institutes' budget on track to double.

"The advances which have been made by N.I.H. over the course of the past several years have truly been astounding," said Mr. Specter, chairman of the Senate appropriations subcommittee that oversees the agency.

At a press conference last week, Ruth L. Kirschstein, the N.I.H.'s acting director, said the agency's budget included additional financing to reduce disproportionately high rates of disease among minority groups; to train more clinical researchers; and to promote interdisciplinary research.

The budget would provide $20-million for a new Coordinating Center for Health Disparities within the Office of Research on Minority Health. The office would provide research grants and contracts for research and education in areas not otherwise supported by other centers and institutes at the N.I.H.

"We are going to work very assiduously to do research and try to either eliminate or narrow the gap in these domestic health disparities," Dr. Kirschstein said.

The agency would increase grants for research training, allowing it to support 15,944 pre- and postdoctoral students in full-time training positions. This year, the N.I.H. is supporting 15,874 such students.

In his budget, Mr. Clinton also asked Congress to reverse its directive that the N.I.H. defer spending part of its budget in the 2000 fiscal year. To help balance the federal budget, lawmakers ordered the agency to refrain from spending $3-billion of this year's $17.813-billion appropriation until the end of the fiscal year, September 30.

Congress would have to make the change in a supplemental appropriations bill, which it is expected to consider in April or May. While university advocates welcomed the proposal, N.I.H. officials have already said that they could make administrative adjustments to avoid disrupting the cash flow to scientists at the end of this fiscal year.

National Science Foundation

The science foundation would use about half of its proposed $675-million increase for spending on specific projects involving nanoscale research, information technology, "biocomplexity," and education research.

It would supplement the funds for those projects with $135-million diverted from other areas of the agency.

The N.S.F. would spend $136-million on biocomplexity, the study of dynamic interactions within ecosystems. The agency is spending $50-million this year in an attempt to learn how to prevent environmental degradation and to sustain ecosystems.

The science foundation estimates it would spend about $800-million in the 2001 fiscal year on all research related to the environment, up from $659-million in 2000.

That increase would appear to fall somewhat short, however, of a buildup recommended recently by the National Science Board, which is the foundation's governing body. The board sought to increase such spending by $1-billion over five

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years. Ms. Colwell, the N.S.F. director, called the president's 2001 budget plan "a good start."

The other half of the $675-million increase would go toward general basic research and education, which Ms. Colwell said would give the foundation "some of the flexibility we've been seeking for years."

Increases—which include allocations for specific projects, such as information technology—would be provided for:

- Mathematical and physical sciences, up 16 percent, to $881-million.
- Geosciences, up 19.5 percent, to $583-million.
- Biological science, up 23 percent, to $511-million.
- Engineering research, up 19.6 percent, to $457-million.
- Polar programs, up 12.8 percent, to $285-million.
- Social, behavioral, and economic sciences, up 19.8 percent, to $175-million.

Over all, the agency would support 9,600 new, competitively awarded grants, an increase from 8,470 in 2000. The median annual grant size would also rise, by 8.6 percent, to $85,000. Grants would run an average of 3 years, up from 2.9 in 2000.

The budget proposal would also increase spending for the agency's education-and-human-resources directorate by 5.5 percent, to $729-million.

However, the agency has developed a new, broader measure of its education spending that includes money for its other directorates that directly support postdoctoral researchers, trainees, and students. The 2001 budget includes an increase of 11 percent in overall spending on education, to $880-million.

The agency will celebrate its 50th anniversary at the end of this year, "and we really couldn't ask for a better way to get the N.S.F.'s next 50 years off to a tremendous start," Ms. Colwell said.

Energy Department

Of the overall 12-percent increase for the department's research programs, basic energy sciences would get the largest chunk. The budget for that division would increase by 30 percent, to $1.016-billion.

Most of the gain—$163-million—would help build the Spallation Neutron Source, a research facility at the Oak Ridge National Laboratory, in Tennessee. The agency redesigned the facility in 1999 after Congress criticized the project's management. The facility will provide neutrons for research in materials science and other disciplines.

Most other fields financed by the department's Office of Science, including fusion energy, would receive marginal increases.

The Energy Department would benefit from the administration's push for research on information technology. It would receive $667-million, 29 percent more than this year, and second only to the N.S.F.'s share in 2001. Much of the Energy Department's money in this area would not be spent on academic research, however, but on research related to maintaining the nation's nuclear stockpile.

"The administration believes that nanotech will have a profound impact on our economy in the early 21st century, perhaps comparable to that of information technology."

National Aeronautics and Space Administration

Mr. Goldin, NASA's administrator, said last week that the agency would take "very aggressive" steps to involve colleges and universities in its research programs, funds for which would shoot up 6 percent in 2001.

Among the science programs, only spending for earth sciences would drop—by 2.6 percent, to $1.406-billion. Mr. Goldin said the agency wanted to restructure that effort to make it more efficient.

He said he was especially pleased because the president's plan would give NASA its first overall budget increase in seven years. The amount would rise by 3 percent, to $14-billion.

The overall budget for the International Space Station, which some academic scientists have criticized as wasteful, would shrink by nearly 9 percent, to $2.114-billion. That proposal reflects NASA's plan to slash spending on the space station itself. However, spending would increase by 15 percent, to $455-million, to prepare scientific experiments to be conducted aboard the station.

Defense Department

The Pentagon's spending on applied research would decrease in the 2001 fiscal year by nearly 8 percent, to $3.144-billion. But spending on basic research would rise by just over 4 percent, to $1.217-billion.

The funds for basic research are especially important for higher education, because about 60 percent of that budget line goes to university-based scientists; only about 14 percent of the applied-research money flows to academe.

Some university officials had hoped for a larger increase for both basic and applied research, because the Defense Department is the leading federal supporter of academic research in certain fields, including computer science and electrical and mechanical engineering. Over all, though, the agency is the third-largest supporter of university-based research, behind the N.I.H. and the N.S.F.

Among the federal agencies involved in nanotechnology research, the Defense Department would receive the second-biggest chunk of financing—$110-million, an increase of 57 percent over this year.

Agriculture Department

The president's budget would expand spending on peer-reviewed grant programs, while providing level financing for grants distributed to states based on formulas.

The plan would provide a total of $1.096-billion for the agency's Cooperative State Research, Education, and Extension Service, an increase of 2 percent. The service is the principal source of money for agricultural research involving colleges and universities.

The budget would hold formula-driven grant programs at $543-million, the same as this year.

The plan also contains $150-million for the National Research Initiative, the department's main program in which grants are distributed based on a peer-reviewed competition. That financing level represents an increase of 26 percent over this year.

And the administration would spend $120-million, the same amount allocated for this year, on a separate competitive-grants program that aims to improve food safety and increase agricultural productivity.

Republican and Democratic members of Congress have been cool to the growth of peer-reviewed grants, saying that formula-driven programs have proved successful over time.

In addition, the budget would provide $37-million, an increase of 37 percent, for education funds for colleges. The increase would support curricular and faculty development, graduate training, the education of minority students, and the improvement of tribal colleges.

Commerce Department

Appropriations for the agency's Advanced Technology Program would increase by 23 percent, to $175.5-million. The program finances corporations, often working with universities as subcontractors, that develop major new technologies with commercial applications. Of the total in 2001, $65-million would be for new awards.

Dan Carnevale, Joel Hardi, Sara Hebel, Wendy R. Leibowitz, and Peter Schmidt contributed to this article.