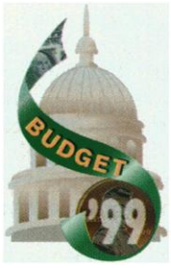
Science Catches Clinton's Eye

After years of leaving the heavy lifting to Congress, President Bill Clinton has requested a massive boost to biomedical and basic science funding in 1999. What's different about this year?



The message could be read in the broad smile of Harold Varmus, director of the National Institutes of Health (NIH), as he sat next to First Lady Hillary Rodham Clinton in the gallery of the packed House chamber. Below, her husband was telling Congress in his annual State of the Union address that the 1999 budget request would contain the largest dollar increase in history for NIH and the National Science Foundation (NSF). That commitment to research was repeated in a weeklong series of speeches by President Clinton and Vice President Al Gore on scientific topics ranging from cancer (see sidebar) to climate change, and it was spelled out in the budget request unveiled on 2 February. "It's really on their radar screen," says one amazed university official. "It didn't seem possible." Says another: "It's a historic change of attitude."

What's changed? The federal deficit has vanished amid a booming economy, partisan tensions have eased, and the R&D community has scored some successes in winning advocates in Washington. The proposed R&D budget—most of which has been packaged into a $31 billion 21st Century Research Fund for America—contains a significant increase for virtually every R&D agency, with the exception of NASA (see chart). NIH would grow by 8.4%, to $14.8 billion, while NSF's budget would increase by 10%, to nearly $3.8 billion. Overall, civilian R&D would rise 6% to $36.4 billion—marking "the largest commitment to civilian research in the history of the United States," said Gore at a White House briefing. And overall civilian R&D spending would continue growing through 2003 under a plan that the vice president added "would have been considered unthinkable only a few short years ago." Nor would defense R&D suffer greatly as a result; those programs would hold at $40 billion, with basic research growing by 6.6%.

Now that the president has offered the first projected budget surplus in 30 years, the attention shifts to Congress, which must pass a 1999 budget by 1 October. The White House numbers for next year are nearly in line with recent proposals by a bipartisan coalition in Congress led by Senator Phil Gramm (R–TX) and Senator Joseph Lieberman (D–CT) calling for civilian R&D spending to double over the next 10 years (*Science*, 31 October 1997, p. 796). But a portion of the proposed increase is dependent on congressional approval of a legal settlement between the government and tobacco companies that would generate $65 billion over the next 5 years—$25 billion of which the Administration wants to allocate to research. The fate of that settlement remains uncertain. And Clinton has ruled out using a future budget surplus for anything but Social Security. In addition, some R&D supporters want to ensure that the physical sciences are not neglected in the face of continuing growth in biomedical research budgets.

Nevertheless, the request is a far cry from last year, when NIH and NSF were accorded boosts barely in step with inflation. Such minor increases have typified the Administration's R&D strategy for the past 6 years, with the exception of government-industry technology programs that have drawn sharp opposition from Congress. Instead, the White House has relied on lawmakers to up the ante, as Representative John Porter (R–IL) has done for NIH in his role as chair of the House panel that allocates funding for the institutes. As recently as this fall, White House officials like Science Adviser Jack Gibbons were dismissing as unrealistic congressional calls for major increases, and some Administration officials predicted no new R&D spending in the 1999 request.

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Research rendezvous. NIH's Varmus and Hillary Clinton applaud science's high profile in the State of the Union address.

But a series of events in the last 6 weeks, say government, industry, and academic sources, convinced Clinton and Gore that research is a politically popular issue. One factor was the unexpectedly large revenues pouring into the U.S. Treasury from the booming economy. That extra income allowed the White House Office of Management and Budget, which is focused on balancing the budget, to push for more spending in areas like R&D, says Representative George Brown (D–CA), ranking minority member of the House Science Committee, who has long backed higher R&D spending.

Growing bipartisan support in Congress for basic science also greased the wheels, notes Chuck Vest, president of the Massachusetts Institute of Technology, who colleagues say lobbied tirelessly on behalf of higher R&D spending. "That [support] undoubtedly prepared the ground for the Administration to act more aggressively," he says. Indeed, the White House had become increasingly concerned that Republicans were setting the nation's R&D agenda through the appropriations process—and getting accolades for it. "The thinking was, why let the Republicans run away with this issue? Why let John Porter get all the credit?" says Al Teich, policy chief at the American Association for the Advancement of Science (which publishes *Science*).

Reading a shift in the political winds, science advocates joined the R&D debate with letters, phone calls, and public statements urging the Administration to back increased R&D spending. "There were a lot of small pressures exerted," says Nan Wells, government relations director for Princeton University's Washington office.

The result of that rising level of support for research burst into view last week. The morning after his State of the Union speech, the president headed for the Uni-

versity of Illinois to reiterate his support for basic research, while Gore held a White House briefing on cancer research (see sidebar) and then jetted off for a weekend of R&D-related events in California. Clinton's weekly radio address was devoted to climate change, and on Monday Gore headlined a cast of research agency heads in briefing the media on the Administration's R&D budget, a task normally left to the science adviser. The next day, the president visited New Mexico's Los Alamos National Laboratory to underscore the R&D theme in this year's budget request.

Early reaction from R&D supporters on Capitol Hill to the 1998 request has been cautiously optimistic. "I'm pleased that [Clinton] has joined the Congress in recognizing the need to invest adequately in scientific research," says Representative James Sensenbrenner (R–WI), House Science Committee chair. "However, my optimism is tempered by the fact that President Clinton acknowledged the need to invest in a lot of programs in his Tuesday speech." He adds that he is concerned about several specific issues, such as the $200 million drop in NASA's budget proposed by the Administration. "I'm keeping my powder dry," Sensenbrenner says.

The emphasis on biomedical research worries some lawmakers, who fear that the physical sciences are playing second fiddle. "The budget [request] may be a little bit out of balance," says Brown. "On the other hand, I'm not going to knock it." Vest disagrees, noting that the proposed 10% boost for NSF—which funds basic research in areas ranging from astronomy to zoology—is clear proof that the White House wants to focus on more than just biomedical science. Gore, Gibbons, and Varmus went out of their way on Monday to emphasize that the proposed funding increases would benefit a wide range of disciplines. "We at NIH deeply depend on what happens in physics," says Varmus.

Regardless of the final spending levels, the bitter partisanship that has characterized the debate over science since the Republicans took control of Congress in 1995 seems to have faded. "There is today a window of opportunity for you to help craft a national program of public investments in which R&D has a prominent, consistent, and lasting place," Lieberman told members of the Universities Research Association at a meeting last week in Washington. But he warned that the new consensus requires the active participation of researchers. He urged scientists "to engage forcefully in the political process—and explain both to taxpayers and lawmakers the practical value of what you do."

Here are highlights of the overall R&D request by individual agencies:

• **National Science Foundation:** Researchers will get larger and longer grants if NSF gets its requested 10% increase, boosting its budget to $3.77 billion. And the largess would be spread across disciplines, with its six research directorates getting hikes ranging from 11% to 16%. The extra $345 million proposed by the president would allow NSF "to do more of what we already do well," says director Neal Lane. The number of new grants would rise by 6%, the average size of an award by 8%, and their duration would stretch from 2.4 years to 2.7 years.

Featured prominently in NSF's 1999 request are two issues close to the heart of Clinton and Gore—education and information technology. NSF would get $25 million in a $75 million initiative with the Department of Education to study how schools use computers and other educational technologies, as well as $25 million toward the White House's $110 million Next Generation Internet project to bolster university research capacities. (However, this week a federal judge blocked NSF from spending $23 million from a pot created by the registration of Internet addresses to pay for its share of NGI in 1998.) It's also proposing big boosts in programs to support undergraduate research, junior faculty, and cross-disciplinary graduate training. In addition, NSF has asked for $40 million to maintain the congressionally mandated Plant Genome Initiative begun this year, and $21 million to build the Polar Cap Observatory in northwestern Canada that Congress rejected last fall.

• **National Institutes of Health:** NIH would get a $1.15 billion increase in this budget, an 8.4% raise to $14.8 billion. But key Republican appropriators such as Representative John Porter (R–IL) and Senator Arlen Specter (R–PA) have already begun pushing for a 1999 increase of 15% as part of a doubling of NIH's budget in 5 years. The Administration agrees that NIH's budget should be doubled—but in 10 years, not five. And it has added a conditional clause: It assumes that the entire NIH increase will be funded from new tobacco litigation revenue.

Although the White House has stressed cancer research this year, the NIH budget documents indicate that funding increases will be widely distributed. NIH director Harold Varmus says the budget aims to increase the number of new and competing NIH grants by 8.4%, to 8267. He estimates that this would raise the success rate for NIH grant applicants from 29% to 33%. In addition, the budget provides a better than average boost for the National Human Genome Research Institute

HIGHLIGHTS FROM THE PRESIDENT'S REQUEST

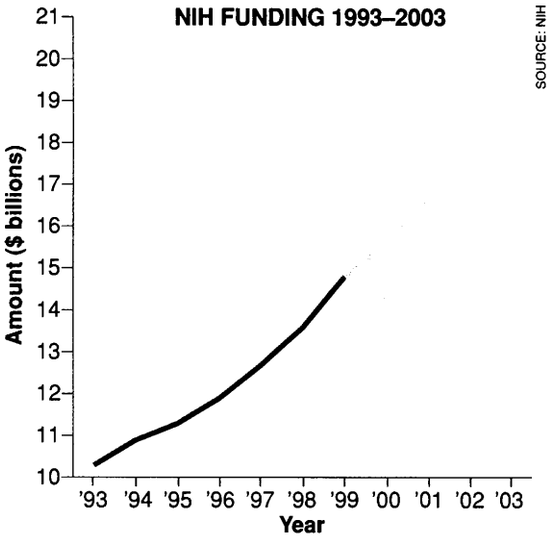
Name	FY 1998	1999 Request	% Change
National Institutes of Health	$13.65 billion	$14.80 billion	+8.4%
Cancer research	$2.90 billion	$3.2 billion	+10.0%
Number of new and competing grants	7625	8267	+8.4%
National Science Foundation	$3.43 billion	$3.77 billion	+10.0%
Research	$2.55 billion	$2.85 billion	+11.8%
Education	$633 million	$683 million	+8.0%
Defense Department			
Basic research	$1.04 billion	$1.11 billion	+6.6%
NASA	$13.64 billion	$13.47 billion	–1.3%
Space science	$1.98 billion	$2.06 billion	+3.7%
Life and microgravity research	$214 million	$242 million	+13.0%
Energy Department	$16.6 billion	$18 billion	+8.4%
Spallation Neutron Source	$23 million	$157 million	+583%
Large Hadron Collider	$35 million	$65 million	+85.7%
Stockpile stewardship	$4.15 billion	$4.5 billion	+8.5%
Agriculture Department			
National Research Initiative	$97 million	$130 million	+34%
Commerce Department			
National Institute of Standards and Technology	$673 million	$715 million	+6.2%
National Oceanic and Atmospheric Administration	$2.05 billion	$2.18 billion	+5.9%
Environmental Protection Agency			
Research and development	$539 million	$487 million	-9.6%
U.S. Geological Survey	$759 million	$807 million	+6.3%
Total Defense R&D	$40.4 billion	$40.3 billion	–0.3%
Total Civilian R&D	$35.7 billion	$37.8 billion	+5.8%
Total R&D	**$76.2 billion**	**$78.2 billion**	**+2.6%**

SOURCE: PRESIDENT'S 1999 BUDGET

A New Link Between Tobacco and Cancer

One of the biggest winners in the 1999 budget proposals is cancer research—and the Administration is going out of its way to emphasize that fact. On 29 January, 4 days before the budget was officially released, Vice President Al Gore announced in a packed auditorium at the Executive Office Building in Washington, D.C., that the Administration is proposing "the single largest increase in cancer research in history"—a $4.7 billion boost over the next 5 years.

This 65% raise for cancer is part of a planned 50% increase through 2003 for the National Institutes of Health (NIH), funded by a proposed settlement of lawsuits against tobacco companies. The first installment will be a 1999 boost of $1.15 billion (an 8.4% raise above NIH's 1998 budget of $13.6 billion). In addition, the Administration intends to set aside $750 million for a 3-year experiment that would reimburse Medicare cancer patients for the cost of participating in NIH-funded clinical trials. The focus on cancer is justified, Gore said, because "many experts believe that we are at the cusp of important new breakthroughs ... that merit or justify a much greater investment in research." Donna Shalala, secretary of Health and Human Services (HHS), added that the Administration's goal is to let researchers know that "the science money is going to be there in the future, and you're going to be able to sustain a career." Shalala said she has been trying to reduce the uncertainty of research funding: "That is the real significance" of this budget, she said, "not just the diseases we are going to attack."



Career numbers. An expanding NIH budget will help biomedical researchers "to sustain a career," says HHS's Shalala.

The biomedical community was delighted. NIH director Harold Varmus said as the numbers were unveiled this week: "All the NIH [institute] directors are extremely happy." Shalala described them as "ecstatic." Speaking for the Coalition for Health Funding—a loose association of organizations that claims to represent 40 million health workers—Jordan Cohen, president of the American Association of Medical Colleges (AAMC), called the Administration's budget "very gratifying." Yet AAMC and the coalition aren't completely satisfied: They will urge Congress to appropriate even more for NIH in 1999—a 15% increase.

But Jordan and AAMC congressional liaison David Moore also acknowledge something that Administration officials do not emphasize—that all this good news is built on a shaky hypothesis. This is the assumption that Congress will pass legislation this year that once and for all settles the states' litigation against the tobacco companies, and that the settlement will bring the federal government an extra $65 billion in revenue over the next 5 years. The entire increase in the NIH budget—not to mention other elements of the science budget—is premised on the belief that Congress will make this happen. But, as Moore says, infighting over the terms of the tobacco settlement is intense, and there's no consensus in sight.

Asked what would happen if the tobacco settlement isn't approved, Shalala said: "We expect Congress to pass legislation, but if this doesn't come to pass ... we will have to identify other sources" of revenue or make cuts in other programs to pay for R&D funding increases. Shalala's assistant secretary for management, John Callahan, added, "We are committed to these priorities," and "we will deal with [a loss of tobacco income] when we come to that point in the road."

A congressional aide who works on the NIH budget worries that the Administration has "opened a can of worms" by focusing so heavily on cancer, however. The Administration may have shifted attention away from old arguments that AIDS funding is taking a disproportionate share of NIH's budget, he said, but it may be inviting a renewed debate on earmarking as lobbyists for research on other diseases eye cancer's bulging resources.

Varmus told reporters at a budget briefing that the cancer initiative should be viewed not as an earmark but as a broad commitment to build up NIH's infrastructure. He said the $4.7 billion in extra cancer money would help pay for new training programs, clinical trials databases, larger stipends, instrumentation development, and new genetics projects—all to be spelled out later. "Everyone is a winner in this budget," Varmus insists.

–Eliot Marshall

(10%), infrastructure development at the National Center for Research Resources (14%), diabetes research (11%), and AIDS vaccine research (17%), among other categories.

• **NASA:** The space agency is a relative loser in the R&D spending plan, but NASA Administrator Dan Goldin has put on a brave face. He insists that the agency is lean enough to take a $173 million decline, to $13.5 billion, without hurting its programs. And it's better than the $1 billion cut the White House was contemplating a few months ago. "For what we have on our plate today, we have adequate resources," he says. Goldin notes that space science will increase 4%, to $2 billion, providing money to begin planning a mission to Jupiter's moon Europa and a sample-return mission to Mars. Life and microgravity sciences also would get a boost—a $28 million increase to $242 million.

But the pressures to keep the space station effort on schedule will be intense. Goldin says NASA wants to take $50 million from space science and $50 million from earth science in 1998 to help cover station cost overruns, although he pledges that "we will still do everything" planned for those disciplines. Congress, however, must approve any such funding transfers. For 1999, NASA officials say the overruns could get worse, although the administrator says he's optimistic that the program is under control.

• **Energy:** The bulk of the proposed Department of Energy budget—which would increase $1.4 billion to $18 billion—goes to R&D-related programs. Of that increase, $338 million is set aside for renewable and fossil energy R&D, while the nuclear weapons stockpile stewardship effort jumps $330 mil-

SAM KITTNER

Good news. Gore led a special briefing on the proposed increases for civilian R&D spending.

lion, to $4.5 billion, to cover its growing price tag. As expected, the request also includes $157 million to start work in earnest on the Spallation Neutron Source at Oak Ridge National Laboratory in Tennessee (*Science*, 23 January, p. 470).

The news is not so rosy for the fusion program, which remains at about $228 million. "We've tried to maintain our investment," says Energy Secretary Federico Peña. "But advances in other areas needed some additional effort." And Ernest Moniz, Peña's under secretary, added that fusion must refocus on science and away from engineering. Funding for direct work on the International Thermonuclear Experimental Reactor would drop from $53 million to $12 million. But the department wants $65 million in 1999 for its participation in the Large Hadron Collider—a $30 million boost over 1998.

• **National Institute of Standards and Technology:** The Administration may be trumpeting basic science in its request, but it has not forgotten applied technology programs that in the past earned the ire of congressional Republicans. The agency wants $260 million for its Advanced Technology Program (ATP), an increase of $67 million over last year. Gary Bachula, acting undersecretary for technology at the Commerce Department, which oversees the National Institute of Standards and Technology, said he expects a friendlier reception for ATP this year on Capitol Hill. Although Congress nearly killed the program 2 years ago, both houses voted to keep it well funded in 1998. The request also includes $40 million for construction and renovation of NIST facilities in Gaithersburg, Maryland.

• **The National Oceanic and Atmospheric Administration:** NOAA wants $2.1 billion, a nearly 6% increase over last year. The request includes increases for the National Marine Fisheries Service's conservation programs and the modernization of the National Weather Service. Oceans and Atmospheric Research, however, would take nearly a 10% cut, falling to $251 million. Slight increases for climate and air-quality research are offset by a 10% cut to the $56 million Sea Grant program and recommendations of no funding for nine programs, including arctic research and the undersea programs sponsored by the JASON foundation. In the long term, NOAA plans to request $40 million in 2000 for a fisheries research vessel, the first of four the agency wants by 2003.

• **The U.S. Geological Survey:** USGS, the Department of Interior's science agency, would receive $807 million in the request, a 6% increase over 1998. The budget plan trims mapping, mineral studies, and research in areas such as coastal and marine geology, but adds $16.5 million in new money for cleaning up and restoring watersheds, and $15 million for a multiagency program that disseminates information on natural disasters. The request also adds $11 million to research on species and their habitats.

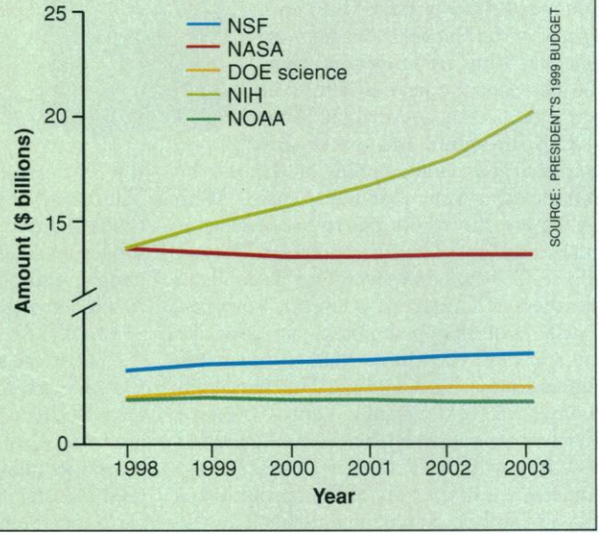
• **Department of Agriculture:** As in previous years, the White House wants a big increase for the National Research Initiative—the U.S. Department of Agriculture's (USDA's) extramural competitive research grants program, which funds areas such as food safety, the environment, natural resources, and health. The 1999 plan would boost the program to $130 million, 34% above the 1998 level. About half of this increase, plus an additional $10 million, would support a new Food Genome Initiative to study plant, microbe, and animal genomes important to food production. Meanwhile, the department would cut grants to land-grant universities.

• **The Environmental Protection Agency:** EPA would reap a 6% increase in the 1999 plan, bringing its budget to $7.8 billion. Largely because the agency plans to shift funds for research on fine particle air pollution to the office responsible for monitoring air quality, the budget for the Office of Research and Development (ORD) will shrink by 9.6%, to $487.1 million. Spending on other research programs will remain about level, says ORD Acting Assistant Administrator Henry Longest. The agency has also allotted $35 million for ORD's new research center being built in Research Triangle Park, North Carolina, where it plans to create 50 new postdoc slots for scientists and engineers. Also requested is a 13% boost, to $100 million, for the Science to Achieve Results extramural grants program.

• **Defense:** The military's R&D budget aims to promote investment in research while reducing current weapons purchases. While the total Department of Defense spending on research, development, and testing of weapons would decline by 2% in the president's request, the portion dedicated to basic research increases by 6.6%, to $1.1 billion. Applied research increases 1% to $3 billion. Overall R&D support for universities also would increase 8%, from $12.5 billion to $13.5 billion. Support for the medical free electron laser drops 51%, to $9.7 million, while basic research on biological warfare defense would climb 44%, to $88 million.

–Andrew Lawler

Playing favorites. Some R&D agencies would fare much better than others in the 5-year budget plan released this week by President Clinton as part of the 1999 request. Leading the way is the National Institutes of Health, with a projected 50% rise through 2003, while the National Science Foundation would enjoy steady growth totaling 24%. But NASA funding would drop, while NOAA spending would stagnate. Most of the rise in energy science programs takes place this year. The pro-jections do not include the eroding effects of inflation, which is currently running at less than 3%.



With reporting by Jocelyn Kaiser, David Kestenbaum, Eliot Marshall, Jeffrey Mervis, and Gretchen Vogel.