

gross R&D totals, funds that go to support research in colleges and universities show the sharpest proposed increase of all the categories of R&D spending. Realization of the growth, however, may be a year off.

**Fiscal 1971's** spending on development programs by all Federal agencies is off only \$335 million from this year's \$9.47 billion. But for the future, the new spending authority the President seeks for development projects is down twice as far to \$9.4 billion, compared to this year's \$10.1 billion and 1969's \$10.3 billion.

And in the overall support and conduct of research, as distinct from development, the proposed spending level for fiscal 1971, at \$5.574 billion, is up \$124 million. But the new research authority Mr. Nixon is requesting for the Congress would double that growth, going to a \$5.8 billion level from this year's \$5.5 billion.

Even that is only a 5.5 percent jump, barely enough to keep up with the estimated 5 percent annual increase in the cost of doing research.

It is in the university research area that the increase exceeds, even if only slightly, the inflationary climb in expenses, bringing the authorization request back up to the 1968 level.

This is not an effect that will be felt during the budget year starting July 1. Spending for the year will be held to \$1.475 billion, just a bit above this year's \$1.45 billion.

Where the jump comes is in the request for authority to spend beyond that in future years; there the President is seeking a 7 percent increase from this year's \$1.4 billion to \$1.5 billion.

The slightly more than \$100 million in new money will not be evenly distributed. It will be felt most in the areas being given the highest priority: almost \$60 million for researchers doing work for the Department of Health, Education and Welfare, with the emphasis on health, and \$35 million more for the National Science Foundation, which fares best of all research agencies on a percentage basis. NSF is being given a sharp, new twist in the direction of support for interdisciplinary research in ecological and environmental problem areas. This is where a need is being sharply felt for such an innovative funding approach (SN: 1/10, p. 44).

**Atomic Energy Commission** and NASA university-support programs have both come in for cuts, while such other problem-oriented agencies as the Departments of Agriculture, Interior and Justice are expecting to be spending more money with universities in such areas as pest-, pollution- and crime-control research. Defense Department cuts in support of university research

are minimal: a bare \$81 million in 1971 spending and \$3 million in authorized funds. But Defense had already trimmed both categories back some \$25 million to accommodate to Congressional demands.

Presidential Science Adviser Dr. Lee A. DuBridge says that in the last days of the budget-writing process, when all

agencies were taking what Budget Bureau Director Robert P. Mayo called "one last turn of the screw," the important research programs were relatively unaffected.

In the succeeding stories, the editors of Science News will review significant aspects of the first Nixon budget proposal in greater detail. □

## SCIENCE FOUNDATION

### Interdisciplinary research mechanism

During the years since its founding in 1952, the existence of the National Science Foundation has come to be justified in a number of ways. It has been called the flywheel agency, supporting good basic science that could not be justified in the budgets of more mission-oriented agencies. It has also been called a pilot agency, developing for university-based research support techniques, which, if they work, would be adopted by other, fatter agencies.

The problem has been one of justifying the existence of an agency with no function other than the support of basic research in a Government lacking a coherent science policy beyond the exploitation of science's role in the fulfillment of a Government mission.

**This year** the Science Foundation seems to be coming into its own, developing its own justifications. But the change has been accomplished because the Foundation has learned to live by the rules of an applications-oriented Government, rather than because the Foundation has taught the Government to live by the somewhat ephemeral rules of basic science.

Consequently, in the budget President Nixon sent to Congress this week, the Science Foundation was singled out among Government agencies for an increase—from \$440 million this year to \$513 million next—which, while not large in absolute dollars, more than holds the line for university scientists with shrinking alternative sources of Federal funds.

The effects will not be felt immediately.

President Nixon has ordered the Foundation not to spend any more during the year that starts July 1—fiscal 1971—than it is expected to spend during the present 1970 fiscal year: \$489 million.

But he is seeking authority to expand the Foundation's general spending base to the \$513 million level. The difference is that for many of its programs the Foundation is not required to spend its entire authorization figure in a single year.

Thus the growth from one budget to the next in authorized funding should be seen as more significant for the longer haul than as an index of the

PROGRAMS	Actual FY 1969	Esti- mate FY 1970	Esti- mate FY 1971
Scientific Research and Facilities Support ..	\$183.2	\$181.0	\$196.2
National and Special Research Programs ..	49.0	68.0	102.2
National Research Centers .....	28.6	27.2	37.1
Institutional Support for Science .....	37.7	41.5	55.5
Science Education Support .....	115.3	121.7	96.9
Program Development and Management ..	18.8	22.0	23.4
Subtotals .....	432.6	461.4	511.3
Misc. Adjustments ..	— 32.6	— 23.4	— 0.3
Total Salaries and Expenses .....	400.0	438.0	511.0
Foreign Currency Appropriation .....	0	2.0	2.0
<b>Total NSF Programs</b> ..	<b>400.0</b>	<b>440.0</b>	<b>513.0</b>

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### Science Foundation: Generally up . . .

Major Program Increases	
Scientific Research Project Support	
Increased Proposal Pressure .....	\$10.0
Problem-Oriented Research .....	5.0
<b>National and Special Research Programs</b>	
New Programs	
International Decade of Ocean Exploration	15.0
Arctic Research Program .....	2.0
Earthquake Engineering .....	2.0
Ongoing Programs	
Interdisciplinary Research on Problems of Society .....	7.0
National Sea Grant Program .....	3.0
International Biological Program ..	3.0
Global Atmospheric Research Program ..	0.5
<b>National Research Centers</b>	
ARECIBO (First Full Year NSF Funding— Resurfacing of Telescope) .....	4.4
National Center for Atmospheric Research (Computer Acquisition) .....	2.5
<b>Institutional Support for Science</b> .....	<b>14.0</b>
<b>Program Decreases</b>	
Supplementary Training for Secondary School Teachers of Science and Mathematics ..	—13.6
Graduate Traineeships .....	— 9.4

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### . . . at the expense of education.

actual dollars to be made immediately available to scientists. And in a time of declining research support the increase in new obligational authority can be seen as an important omen of things to come.

Within those limitations, consequently, the President's request is significant for the future of the National Science Foundation, a significance that may assure the agency a more friendly reception before Congress than it has received in recent years.

**Of the \$73 million** in increased spending authority the President is seeking for NSF, says Director William D. McElroy, somewhere between \$55 million and \$60 million is expected to be spent on and in support of a new

kind of interdisciplinary research effort geared directly to the solution of such pressing domestic problems as environmental contamination, and the problems of technology assessment (SN: 1/10, p. 44).

What McElroy calls the "new thrust" money will generally be spent under the flag of the new acronym IRRPOS, which is pronounced "urrposs" and means Interdisciplinary Research Relevant to Problems of Our Society. He envisions the establishment of teams of physicists, chemists, biologists, social scientists, engineers and technicians, as large as 150 or more, for specific assaults on such questions as nuclear power in the Chesapeake Bay area, the preservation of Lake Tahoe or reversal of the eutrophication of Lake Erie.

"You can't fund this kind of thing with \$50,000 grants," says McElroy. "You've got to put in \$1 million at a time."

And while only \$13 million in future money is specifically earmarked for IRRPOS, McElroy expects substantial amounts of ordinary research project funds and other types of university support money to be diverted to this effort.

Though this is far from the basic research support to which NSF has concentrated in the past, it is possible now because recently enacted legislation (SN: 9/13, p. 201) broadened the Foundation's mandate to include social science and applied research support.

And not only is it important to the Nixon Administration and to the Congress which must act on the NSF authorization, it is, says McElroy, "in response to pressure from the scientific community."

He cites the focus of the last meeting of the American Association for the Advancement of Science (SN: 1/3, p. 5) for his contention that some of the nation's best scientists are turning their attention in these directions, and the Foundation must be responsive.

He sees the need as so pressing that \$6 million of this year's money is being earmarked for the interdisciplinary programs, and already has under consideration some 150 grant applications under the general heading of IRRPOS.

**McElroy insists** that the "new thrust" programs are not at the expense of support of work in the traditional scientific disciplines. In the Foundation proposals, for instance, may be found additions of \$2.7 million for engineering sciences, \$1.3 million for chemistry, \$1.6 million for biological sciences, \$3.7 million for physics, \$0.8 million for earth sciences and \$0.6 million for oceanographic research. There are also modest increases for such special research programs as the International Biological Program and the Ocean Sediment Coring Program, as

well as a new \$15 million responsibility for the International Decade of Ocean Exploration.

McElroy's agency did find money this year to take over from the Department of Defense operation of the Arecibo Observatory in Puerto Rico, including an estimated \$3.8 million for necessary resurfacing of the bowl. But NSF was unable to find funds to take over from the Atomic Energy Commission support of the Princeton-Pennsylvania Accelerator, which is scheduled to lose its appropriation in fiscal 1972. And other outstanding research going begging at Defense, such as Dr. Herbert Friedman's work in X-ray astronomy, has not yet found an NSF home.

Nevertheless, since, "We, too, had to take note of the President's efforts to hold down spending," says McElroy, the Foundation's traditional role in the support of science education is being heavily slashed.

**The Foundation will drop** from 6,066 to 4,262 the number of graduate trainees it will support. And though undergraduate education, graduate fellowships and advanced science education programs hold roughly still or grow a trifle, the traineeship cut accounts for the slash in student development funds from \$47.6 million to \$41.2 million.

The Foundation is not wiping out traineeships, says McElroy, but this was considered a good time to hold back on future commitments while other avenues of student support—loans, for instance—are broadly examined higher up in the Administration. And "the effect won't be felt for a year." By then, he hopes, something new may have developed.

In addition, support for summer refresher institutes is off from \$36.5 million to \$20.1 million and the general area of instructional program development is down from \$29.3 million to \$26.8 million with college science improvement programs taking the heaviest cut: down from \$6 million to \$4 million.

**Presidential Science Adviser Lee A. DuBridge** contends that the tailing off of support for graduate students in NSF is compensated for elsewhere. He points to increases of 13,000 new graduate education grants to be made available through the Government's health agencies and 32,000 more through the Veterans Administration.

And McElroy points out that some of the slack may be taken up by a new program "in the works" to provide education for a new breed of highly trained technologists. This program, as he envisions it, will go well beyond the master's degree level into advanced graduate training, but will be geared to the production of personnel other than research scholars. □

## HEALTH

### More care than research

President Nixon is asking Congress to approve a \$1.8 billion rise in Federal health spending in fiscal 1971, bringing outlays to a total of \$20.6 billion. While the figure looks impressive, it has not sent scientists dancing in the streets. Most of the money will be eaten up by Medicaid and Medicare programs and even there it will go more to support increasing costs than to expand aid.

In fact, the Nixon Administration plans to introduce legislation in this session of Congress that will actually cut back Federal outlays in some of the most expensive aspects of Medicare and Medicaid—namely, hospitalization. Its intention is to decrease its portion of spending, shared with state treasuries, for long-term stays in nursing homes and mental hospitals. Health, Education and Welfare officials say they wish to discourage use of such facilities for custodial purposes. The revised emphasis could save an estimated \$200 million.

Instead, if the legislation passes, the Government will focus its money on supporting ambulatory care programs, including construction of new facilities, and preventive health measures. One specific target in preventive medicine is rubella or German measles. The Government plans to foot a \$16 million bill for immunization programs.

**Excluding Medicare and Medicaid funds,** the health budget President Nixon proposes will total about \$9 billion, or \$335 million more than requested in his budget for fiscal 1970, which has yet to win Congressional approval in the wake of last month's veto of the HEW bill (SN: 1/31, p. 121). Distributed over the whole range of Federal health-related programs, from manpower training to health care delivery centers to biomedical research, \$335 million does not go far. Considering inflationary factors, programs singled out for increased funds will be operating generally at a level close to that in 1970, and projects not marked as high priority items will suffer a loss.

The spiraling cost of health care, attributed to new demands on a system deficient in manpower, facilities and efficiency, is one priority item. Programs aimed at defining and testing new approaches for health care delivery are slated to receive \$213 million, an increase of \$29 million from last year. Much of this money is channeled through the National Center for Health Services Research and Development, operating under HEW.

Regional Medical Programs, considered a keystone in efforts to coordinate