



science news OF THE WEEK

To be first in everything

President Nixon's new budget contains good news for a worried scientific community

If the scientific establishment has become slightly paranoid in recent years about what it has viewed as neglect and mistreatment by an unsympathetic Administration and unconcerned populace, relief of the symptoms and possibly even a cure seem promised by the new Federal budget.

The fiscal 1972 budget submitted to Congress last week by President Nixon is the most generous to research and development of any since 1967. Except for a few fields such as space and atomic energy, scientists and engineers now have reason to be in better spirits when they consider the prospects of tapping the Washington money coffers. It is a long way from budget proposal to Congressional approval, but some of the pessimism so evident in the last year or so should be dispelled.

Total Federal obligations for research and development are increased 7.6 percent, from \$15.6 billion last year to \$16.7 billion. Research accounts for \$6.5 billion of the total, a 9.3 percent boost; development, \$10.2 billion, up 6.5 percent. Last year research funding advanced only slightly over

the previous year, and development funding dropped considerably.

Even anticipating an inflation factor of, say, 5 percent, the budget should provide for an increase in actual R&D activity; this has not been the case in the previous few years.

"We are endeavoring to keep United States science and technology number one in the world," says the President's Science Adviser, Edward David. According to him, the science budget is a policy document which says, among other things, that "R&D is a very high priority item in this Government.

"We intend to maintain our pre-eminence," Dr. David says. "The message is that the R&D community can look forward to the future with confidence."

Academic researchers have reason to be especially confident. The budget gives research in colleges and universities a whopping 14.7 percent increase, from \$1.65 billion in 1971 to \$1.90 billion in 1972. That is a stimulant reminiscent of the heyday period of science a decade ago when 15 percent annual R&D increases were common.

Reflecting a trend begun last year with the almost unanimous support of scientific and political leaders, the National Science Foundation is given a greater share of the responsibility for funding basic research in the United States. Its budget is up 23 percent from \$506 million to \$622 million.

Much of the new research money is directed toward major national problems. Research on cancer will be accelerated through the previously announced new \$100-million program (SN: 1/30/71, p. 81). Research in the Department of Transportation on highway safety will increase by \$28 million, or 100 percent. R&D for an improved air traffic control system will increase by \$14 million, or 16 percent. R&D by the Department of Justice to improve law enforcement and reduce crime will more than double, to \$25 million. Research in the marine and atmospheric sciences under the new National Oceanic and Atmospheric Administration will increase about 10 percent. NOAA will strengthen its efforts in weather-modification research, the detection and tracking of violent storms

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and weather observation and forecasting. R&D funding for sulfur oxides control and for water hygiene research by the Environmental Protection Agency will double.

These increases are dwarfed by a boost of \$909 million in the Department of Defense budget for research, development, test and evaluation. The White House Office of Science and Technology says this 12 percent increase in Defense R&D "reflects a major policy decision that it is now time to increase our investment in Defense R&D so as to improve the near term readiness of our non-Vietnam committed forces and to assure their technical adequacy in the longer range." Some \$153 million of the new money will be for research. Emphasis will be on fundamental and applied research of military significance, such as electronics, oceanography, materials science and lasers. Defense support of basic research is expected to hold constant in 1972.

Another major policy decision is primarily a result of present surpluses of new graduates and of older job-seekers in many areas of science and engineering. Graduate traineeships and fellowships will be greatly cut back.

Institutional development programs aimed at maintaining and improving quality will be kept; those aimed at increasing the number of research-oriented graduate schools and research students will be eliminated.

"We are changing the method of support of students," says Dr. David. "We want to tie the support to specific research activities to get them into the fields we want." The new policy goes contrary to the public recommendations of several academic science leaders, such as National Academy of Sciences President Philip Handler.

In general, however, scientists will find more to please them than to pain them in the new budget. The surprise is that so many areas of research are due for increases. Dr. David disputes a suggestion that the more generous treatment of science may be merely a spin-off of Mr. Nixon's attempt to use deficit spending to pour more money into the depressed economy.

"The increase was a matter of getting through to the President the importance of R&D," Dr. David said in an interview. "He is tremendously interested in having this country be first in everything." □

research at interdisciplinary laboratories on 12 university campuses. Both of these projects were previously funded by the Department of Defense.

Emphasis in the new project-support money will be given to increasing fundamental research in the biological sciences, engineering, chemistry, oceanography and the social sciences. The biology of human cells will gain particular attention, to broaden the understanding of diseases, genetic damage and fundamental life processes. Physics research funding is being increased, to pay additional operating costs of new facilities like the Indiana cyclotron and to support research by the increasing numbers of physicists turning to NSF as other agencies redirect their research.

Funding of national and special coordinated research programs will be nearly doubled, to \$166.6 million. This includes increases of \$3 million for the International Biological Program, \$5 million for the International Decade of Ocean Exploration, \$1.3 million for the Ocean Sediment Coring Program, \$1.5 million for the Arctic Research Program, \$6 million for oceanographic research operations and facilities and \$19 million for Antarctic research logistics, previously handled by the Department of Defense.

The biggest new request among the coordinated research programs is an additional \$47 million for what NSF collectively calls Research Applied to National Needs (RANN). This is its new title for research programs like weather modification, earthquake engineering, interdisciplinary research relevant to problems of society (IRPOS, an acronym whose demise will not be regretted) and other such interdisciplinary efforts.

The silver lining does not extend to all NSF efforts, however. A policy decision has been made by the Administration to cut back or eliminate programs that increase the capacity of institutions to train larger numbers of scientists and engineers. As a result, NSF has had to reduce traineeships, fellowships and institutional grant programs.

The program for science development grants to institutions, funded last year at \$20 million, has this year been eliminated entirely. Institutional grants for science—to maintain the quality of existing programs rather than develop new ones—have been reduced from \$14.5 million to \$12 million. Graduate fellowships and traineeships have been cut from \$28.3 million to \$20 million. NSF postdoctoral fellowships have been eliminated. And the funds for institutes, college teacher programs and science faculty fellowships have been reduced from \$35.6 million to \$26.8 million. □

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Exhilarating new role

SCIENTIFIC RESEARCH PROJECT SUPPORT	ACTUAL FY 1970	ESTIMATE FY 1971	ESTIMATE FY 1972
ATMOSPHERIC SCIENCES	\$ 7.9	\$ 9.2	\$ 11.9
EARTH SCIENCES	7.8	8.0	10.0
OCEANOGRAPHY	8.9	10.0	15.0
BIOLOGICAL SCIENCES	40.9	43.5	57.8
PHYSICS	28.2	30.8	43.0
CHEMISTRY	17.4	19.5	27.7
ASTRONOMY	5.8	6.4	8.6
MATHEMATICS	12.7	13.4	15.9
SOCIAL SCIENCES	15.4	17.4	27.5
ENGINEERING	16.7	17.7	27.6
INTERDISCIPLINARY LABORATORIES	—	—	12.8
TOTAL	161.7	175.9	257.8

*NSF budget:
More money
for individual
researchers
in all
scientific
fields.*

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For years science policy leaders in universities and in the Government have been urging an enlarged role for the National Science Foundation in the funding of research in the United States. Last year the ice was broken when NSF's funds shot up 15 percent to \$505.9 million. This year's budget proposal accelerates the climb.

The President's 1972 budget calls for a 23 percent increase in total NSF obligations, to \$622 million. To an agency that for much of its two decades was treated like a stepchild of the mission-oriented agencies, the elevation in status must be exhilarating.

The boost will allow NSF to expand its support both for fundamental research in nearly all fields of science and for research directed toward the

solution of major national problems.

Some \$81.9 million in new money will be available for scientific research project support. This will increase the total for this central purpose—the funding of individual investigators—to \$257.8 million. About \$27 million of this new money will fund initiatives in areas where new knowledge and understanding are expected to lead to eventual solution of social, environmental and engineering problems. About \$40 million of the new money will allow NSF to support important research no longer supported by other Federal agencies because of changes in program priorities. Nearly \$2 million will go for operation of the National Magnet Laboratory in Cambridge, Mass., and nearly \$13 million for materials