Photos Stephen Siegel

Town Meeting of Science: A strong voice perhaps too late to stem the budgetary tide.

SCIENCE POOR MARCH

Fighting the budget bite

The scientific community raises a united voice—quite possibly too late to help

Before World War II Government thought of scientists as odd ducks with chalk on their tweed coats who skipped meals to work in their laboratories. No official seriously considered spending any significant amount of honest taxpayers' money on some scientist's abstruse scheme.

Then science looked as if it had won the war. Radar, sonar, proximity fuses and a host of other devices, and finally the atom bomb, convinced Government that science, and its daughter, technology, are worth feeding.

The result was a boom in Federal spending for science. At first it was keyed to military applications, but later the largess was extended to almost every branch of science and technology. With the advent of the space race in 1957, no one in Government dared do anything but spend when the word science was spoken.

The largess has about ended, it appears, and the coach shows signs of turning back into a pumpkin.

Scientists bankrolled by the Government are facing a need to justify themselves that they never faced in the decade just past. Federal research and development spending, after a decade of growth averaging 22 percent a year, in 1964 began to slack off. Since then it has averaged only a 2.5 percent increase each year, and now research and development programs are preparing to bear the brunt of the $6 billion spending cut ordered by Congress for the next fiscal year.

Somewhat belatedly, scientists realize that the springs are drying up. The National Science Foundation, the only Federal agency whose primary purpose is the support of basic research, saw 20 percent of this year's budget cut out by the House. This was the largest single percentage cut suffered this year by any agency.

There is a chance that the Senate will restore a little of the $100 million cut out of the foundation by the House. Even if it does so, however, there is the danger that later cutting by the Bureau of the Budget, made necessary by the need to come up with the full $6 billion in cuts, will take it and more away again. Many scientists feel that the slash threatens the long-term survival of the agency as a whole.

In response to the foundation misfortunes and to the situation in general the prestigious New York Academy of Sciences called an emergency Town Meeting of Science June 21 to consider "the crisis facing American science." The main concern was that drastic cuts in Federal science spending will cause permanent damage to research groups that will disband, to universities attempting to train scientists, and to the image among young people of science as a career—the latter two already in trouble.

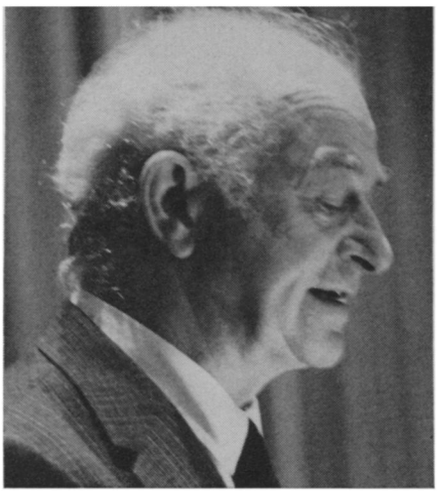
The academy is drafting a message to President Johnson saying that the cuts proposed will be a disaster. Scientists were urged to abandon their traditional image of detachment from politics and to stage their own poor march on Washington.

"The cuts cannot be made up by future spending," said Dr. Minoru Tsutsui, academy president. Dr. Linus Pauling, winner of Nobel Prizes in Chemistry and Peace, reinforced this view:

"Scientists cannot be turned off one year and turned on the next. I am convinced that if these cuts in the budget are made, even if only for one year, scientific research and education will be set back so greatly that the whole economy of the United States . . . will suffer seriously for many years."

Never before has research in biology and medicine held out such hope for humanity, Dr. Pauling adds. "It would be an act of national folly, of national insanity, to extinguish or to dim this beacon of hope for suffering mankind."

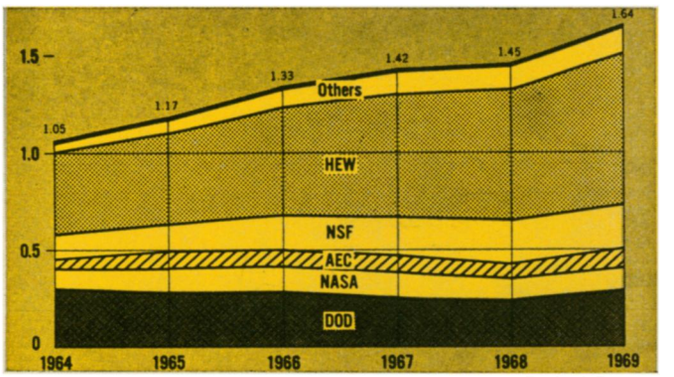
Dr. Bentley Glass, academic vice president of the State University of New York at Stony Brook and president elect of the American Association



Pauling: national folly.

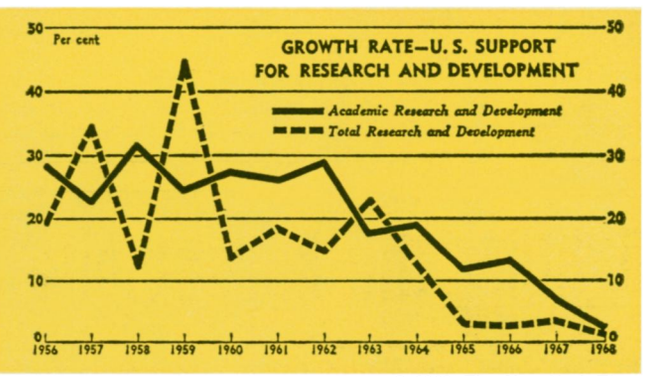
Mead: failure to communicate.

Glass: catastrophic decrease.



Budget Bureau

University research: the way it was supposed to be.



The growth rate of funding nears the zero point.

for the Advancement of Science, quoted Dr. Donald Hornig, the President's science adviser, as saying (some time ago) that an annual growth rate of 15 percent is required to keep basic research healthy.

Noting that recent cuts in the budgets of the agencies supporting science have halted growth, Dr. Glass says the additional cuts "will bring about a catastrophic decrease" in science funding.

Dr. Glass points out that most of the basic research is done in universities. It is on the newly emerging scientist looking for post-doctoral training that the ax will fall. "Better to cut all fresh outlays for roads, better to stop all subsidies of transportation and agriculture, better even to diminish our greatly needed funds for the health and care of the aged than to shortchange the education of our youth. The nation that elects that road is doomed to stagnation, frustration, violence and dissolution."

Whatever the warnings and impassioned pleas, however, it seems that they come too late to save the funds this year. Representative Lester Wolff (D-N.Y.) said as much when he chided scientists for their previous silence. "We have heard little from the scientific community. Your journals are surprisingly silent. You must make yourselves known to Congress. I'm afraid it comes late."

Dr. Margaret Mead, anthropologist and vice president of the New York Academy, echoed Wolff, as did Dr. Walter S. Baer of the President's Office of Science and Technology. Dr. Mead said scientists have failed to communicate to laymen "the excitement of science." Dr. Baer said Congressional indifference to more science is not rooted in a "few Neanderthalic Congressmen" but reflects a growing feeling that basic research isn't as important as scientists believe.

"Should the Vietnam war end tomorrow," he says, "there would be more than enough claimants to spend that money five times over. Should high energy physics grow faster than the model cities program? Should fundamental genetics or biochemistry grow faster than programs for health care delivery? Should academic science as a whole be given more emphasis than preschool education or new employment programs?

"These are questions that are very difficult to answer, but we in the Executive Office of the President have had little help from the scientific community in marshalling arguments which present the case for science."

Many scientists, of course, believe there is no easy dichotomy between the good of science and the good of people. A case in point, they say, is the International Biological Program, United States participation in which has been reduced almost to nothing this year (SN: 6/1, p. 517).

The agency in charge of the program in the United States is the budget-besieged National Science Foundation, which carried a $700,000 line item in its budget for the program. This is the only money IBP stands even a small chance of getting this year, and it is highly likely that some or all of it will go the way of the NSF's $100 million.

Yet scientists working in the program feel that their studies of man's interaction with the ecology of his planet is vital and cannot be put off.

Similar in concept is another foundation-supported international effort, the Global Atmospheric Research Program. This is designed to amass an integrated body of knowledge about the earth's atmosphere and weather. It too is threatened with little or no U.S. support as a result of the cuts.

The expected decrease in NSF appropriations will affect other areas as well, including programs once supported by the Office of Naval Research or other divisions of the Department of Defense and then scheduled for NSF

funding and now dropped (SN:9/2/-67, p. 225).

Notable among these are radio astronomy projects at Cornell University, which operates the 1,000-foot radio telescope at Arecibo in Puerto Rico, and others at the California Institute of Technology, the University of California in Berkeley, and the Universities of Michigan and Illinois.

Although the cuts for the Arecibo installation are expected to be more damaging than for the University of Illinois, the latter serves as an example of the predicament.

Dr. George C. McVittie, British-born head of the astronomy department that operates the 400-foot radio telescope near the campus, last January requested NSF support for its radio sky survey and other programs. Now he finds that not only will he be lucky to get some one-fourth of the $219,000 required to pay staff salaries for a year, but that he will owe the university $40,000 by the end of June.

The degree of Congressional disenchantment with science can be measured by the blow dealt to the National Institutes of Health, which traditionally has been given more than it asks.

This year the budget called for about $1.13 billion, an increase of $76 million in new obligational authority, which would have been only enough to pay for the rising cost of living. The House Appropriations Committee, however, cut out about $38 million, pushing the suggested appropriation below the prior year's appropriation for the first time in the agency's history.

The committee acknowledged in recommending the cut that NIH will have to reduce the "pace and scope" of its research grants. Most of the cut, $32.6 million comes from grant funds.

Much of the Department of Defense's expenditures is not included in the approximately $40 billion piece of the budget that is considered controllable and therefore subject to cutting. Among controllable Defense expenditures, however, the Sentinel anti-ballistic missile defense system survived a first hurdle with Senate approval of $227.3 million for land acquisition and construction.

The Air Force's manned orbiting laboratory, budgeted this year at $600 million, has been attacked as a duplication of the National Aeronautics and Space Administration's elaborate Apollo Applications Program. The latter was originally budgeted at $440 million, but has been cut down by Congress to $253 million. This cut accounts for more than half of the total cut from the original $4.4 billion NASA budget, which may mean that Congress is going to have little sympathy for space stations, including MOL.

MEMORIES OF THE STEVENSON

Explosive ship to test seismic network

It seemed simple enough. The Advanced Research Projects Agency wanted a big underwater explosion to test its worldwide nuclear-blast-detection network. All the Navy had to do was sail an old liberty ship named the Robert Louis Stevenson, loaded with four million pounds of explosives, out into the North Pacific near the Aleutians, open the seacocks to flood the ship and let nature take over. As the ship sank, pressure fuses set for 4,000 feet would automatically detonate the blast.

It didn't work (SN: 10/7/67, p. 349). Instead of sinking like a stone, the Stevenson took so long about it that it drifted off and got lost in a fogbank. After a month of searching, the Navy finally found its ship, 11 miles away from the intended blast site, sitting bolt upright in 2,800 feet of water, not nearly enough to trip the fuses. Nervous officials ordered a dive-bombing run, in an effort to set off the explosion by concussion, but two dozen 2,000-pounders raised not a peep. Finally the Navy announced that the fuses had deteriorated from their long immersion, the ship was therefore safe, and the whole affair was being scuttled.

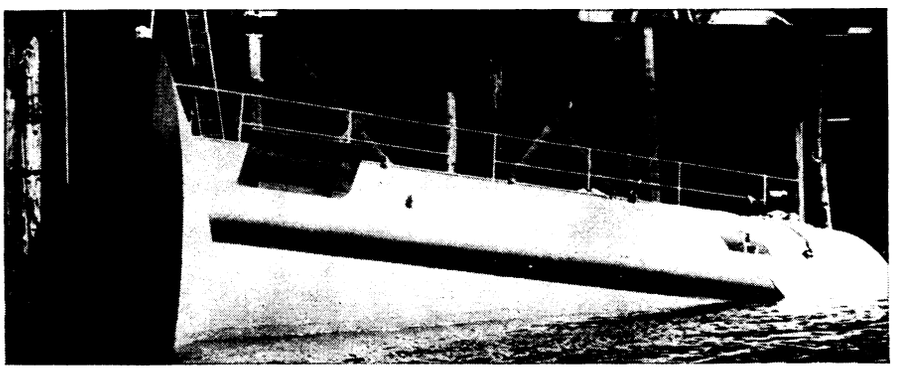
But ARPA still wants to test its network. So, late this summer, it plans to set sail with a strange green and orange vessel whose sole goal is to sink quickly on demand.

Variously described as a giant watermelon, thimble and beer can by ARPA and the Illinois Institute of Technology Research Institute, which is building the thing, the unmanned object is 50 feet long, with a diameter of 20 feet expanding outward into a 30-foot-wide skirt. A tugboat will tow it into position, which project officials hope will be the same spot off Amchitka Island where the Stevenson should have gone down.

There a radio signal will (everybody hopes) open the first of two ballast tanks to swing the capsule from its horizontal towing position into a nose-up attitude that will allow the second tank to sink it both quickly and, more important, straight down. To make sure of where it has gone, a transmitter-equipped buoy will detach itself and bob to the surface, connected to its charge by a thin cable.

Pressure fuses will again be the detonators, since they should pose no problem as long as the object sinks properly at its intended spot. The explosive charge, 250 tons of aluminized ammonium nitrate, will be much smaller than the Stevenson's, largely, according to ARPA, because the Navy was also using the earlier attempt as a way of getting rid of a collection of obsolete bombs, mines and torpedo warheads.

Although the site has been chosen chiefly for its distance from major commercial fishing areas, the State Department plans to notify governments that fish Aleutian waters of the date, time and exact location of the test. Japan has the largest interest in the area, although Korea and Canada may also be concerned. Russia, which sent a trawler and a minesweeper to observe the Stevenson blast, will also be told.



Portland Oregonian

Born to sink, the seagoing canned bomb awaits loading at its Vancouver dock.

The idea for the watermelon-thimble-beer can began the year before the Stevenson didn't work, so it has not been created simply to do what the liberty ship could not. The Stevenson was used largely because it was convenient and coincided with the Navy's bomb-disposal plans.

At first, engineers working on a towable explosives-holder were considering the rubberized fabric bags, shaped like giant sausage skins, which some oil companies were then using to transport and stow petroleum products. Because of various reasons, however, which ARPA will not specify (secrecy suggests that the Stevenson's memory still hurts), they chose the bizarre metal cannister now being constructed in a Vancouver, Wash., shipyard.