

## Science and Technology

# Will budget-cutting mania make the U.S. second-rate in science?

by Marsha Freeman, Science & Technology Editor

Will an obviously patriotic President reverse 40 years of American excellence in scientific achievement?

This will be the case if the Reagan administration, taking its cue from the Office of Management and Budget, continues into 1982 the policies articulated in 1981. The President's best intentions will not reconcile a British-style budgetary massacre with the requirements of science as the motor of economic growth for the country.

On March 10 the administration made public its changes in the Carter FY82 budget. Severe cuts in the space, fusion, nuclear, and science-education programs produced an immediate reaction from the Congress and in the scientific community. The New York-based Fusion Energy Foundation announced a nationwide "Science Alert" and mobilized its membership to actively register its alarm to the Congress and the President.

Over the spring and summer the Congress held hearings on the 1982 budget and was able to restore funding through fiscal 1982 for major programs in energy, space science, and science education. Correctly reading the danger signals, Congress also held preliminary hearings to make it clear that key members will fight OMB's latest attempts to restructure or eliminate whole sections of R&D in the fiscal 1983 budget. Among other things, the hearings demolished the Heritage Foundation's claim that American industry could make up for cuts in federal funding for medium- and long-term research and development. A key question now is whether pro-growth representatives in the administration itself, such as NASA chief Dr. James Beggs, and elsewhere, can convince the President to personally reverse the OMB policies.

### **Fusion at a turning point**

Fusion energy, the potentially unlimited process which will use hydrogen from water for fuel, can only be developed with continued federal support. Over the last two years of the anti-nuclear Carter administration, a coalition of scientists, congressional supporters, and Fusion Energy Foundation spokesmen initiated a cam-

paign which succeeded in establishing a national commitment to develop commercial fusion energy, when Congress passed the Magnetic Fusion Energy Engineering Act of 1980.

This legislation, which mandated the operation of a Fusion Engineering Device by 1990 and a commercial demonstration reactor by the year 2000, has come under attack by Reagan administration spokesmen, beginning last spring. Pleading budgetary constraints, the OMB and Carter leftovers in the Department of Energy tried to eliminate all engineering design work and experimental new projects in the FY82 budget for magnetic fusion.

Congress restored the budget to at least keep pace with inflation, to a level for FY82 of \$456 million. All the key projects, such as the Fusion Materials Irradiation Test facility, the upgraded Mirror Fusion Test Facility, and the Elmo Bumpy Torus next-step reactor, survived the first budget of this administration, though at a reduced level.

The international fusion community and various specialists in the United States concluded over the past two years that the magnetic fusion program was ready to move into the engineering phase with large-scale participation from high-technology industry. This judgment is now being questioned by people lacking any technical expertise, whose political agenda does not include developing unlimited energy.

At high levels of the administration, no significant opposition has emerged to this attempt to reverse the mandate of the law. There will be a fight on fusion funding during Congress's deliberations of the FY83 budget, but it is not clear whether the issue of the overall direction of the program will be brought to the fore.

It was this general policy impasse that motivated DOE fusion director Edwin Kintner to hand in his resignation on Nov. 30. Other capable people in fusion have left the government as well. The future of the top-notch scientific teams in the national laboratories and

industry is on the line.

For the past 15 years, funding for the U.S. space effort, administered by the National Aeronautics and Space Administration (NASA), has been declining in real dollar terms. There is no follow-up in the manned space program to the Space Shuttle, and NASA's planetary and space science efforts have been continuously pared down.

OMB Director David Stockman threatened to eliminate one-third of the \$6 billion NASA budget when he came to Washington, a threat he toned down as he met resistance. Nonetheless, the OMB cut all of NASA's new starts for FY82 until Congress restored funding for the most vital programs.

### **Space: regaining lost ground**

Unlike the situation in the Department of Energy, the top brass at NASA is determined to regain the lost ground of the past decade. Dr. James Beggs, NASA Administrator, has stated that the space agency needs an increase of nearly \$1 billion in fiscal 1982 to both keep up with inflation and begin new programs for the 1980s.

This is the only way the United States will keep its now tenuous lead in space. For the first time in history, there is now a non-American rocket (the European Ariane) available in the West for launching communications satellites and other instruments into Earth orbit; the U.S. cannot expect to stay in the forefront of space technology without a strong NASA effort.

Stockman has proposed a \$6.2 billion FY83 budget, compared to NASA's request for \$7 billion. No new starts, such as the Venus Orbiting Imaging Radar satellite, are included in the Stockman budget, and even the half-completed Galileo mission to Jupiter is cancelled.

Beggs has directly countered the OMB actions and the rhetoric from presidential Science Adviser Dr. George Keyworth by beginning studies on the next-step possibilities leading to a permanently manned space station, and by having NASA engineers at various laboratories participate in the Solar System Exploration Committee's plans for resurrecting NASA's planetary exploration programs.

This committee, headed by Dr. Noel Hinners, a former chief of NASA's Office of Space Science, has put forward a comprehensive 20-year plan which includes missions to six planets, to the Moon, and to asteroids and comets. The committee proposes that the funding for planetary missions be doubled from its pitiful level of \$200 to \$300 million per year over the 1970s to between \$300 and \$400 million in constant dollars.

Dr. Hinners has pointed out that between 1974 and 1977 the planetary budget, adjusted for inflation, fell by a factor of four. Dr. Beggs has often stated his intention

to reinstate long-range planning for NASA's manned and unmanned programs so that they are not made subject to the vagaries of the budget cycle.

There can be no long-range space conquest, however, and no adequate scientific base if U.S. nuclear energy development is given "the right to die." The attempt to eliminate all the advanced nuclear research and development programs from the federal budget will ensure that nuclear power has no future in the United States.

### **'Free enterprise' or progress?**

In its FY82 budget request for the DOE, the administration zeroed out the Barnwell nuclear fuel reprocessing center, the high-temperature gas-cooled reactor program, and other necessary R&D efforts. There is, as yet, no initiative to develop the fusion/fission hybrid reactor, which would use thermonuclear fusion energy to produce fissile fuel for light-water nuclear power plants.

And the administration, in its promotion of "free enterprise," has foolishly proposed that the near-bankrupt nuclear industry pay for the Barnwell plant. Knowledgeable people in the industry remember that it was not Westinghouse but President Eisenhower and the following administrations that created the civilian nuclear industry, and insist that it is the responsibility of the federal government today to make sure there is a future for advanced nuclear technologies.

The administration's "free-market forces" dogma has also infected its policies in the crucial field of nuclear export, where the United States should be pre-eminent internationally. Science Adviser Keyworth and other administration spokesmen indicate that the Export-Import Bank will not help to make U.S. power plant sales competitive with the low-interest financing available in other exporting nations. The loss of potential contracts in Mexico, Egypt, Taiwan, and other developing countries is likely.

There is no question that the presently stated policies of the administration, as presented mainly through the OMB and the Science Adviser's office, will be seriously questioned by Congress. The response from the scientific community, however, has been disappointing thus far. The National Academy of Sciences has said that if funds for R&D money are limited, they should be shifted from development to basic research.

There are murmurs in the fusion community that it might be best to let the Fusion Act fade away unnoticed rather than "antagonize" the administration by pushing such an aggressive fusion effort. On the contrary, nothing but a frontal assault on this false and destructive slashing of the nation's science programs will prevent what would be a blunder of historically decisive proportions.