manned missions to the moon and Mars in the 21st century were also nixed by Congress. NASP was cut $24 million to $95 million, and $37 million for the manned exploration initiative was cut entirely, as was $15 million for using the Mars Explorer satellite for a mission to the moon. The good news for planetary missions was that only $3 million was cut from the $148 million requested for the CRAF/Cassini mission (see p. 628). The Senate had suggested a $50-million cut.

Defense-related research—an area many felt was vulnerable as legislators looked for ways to make the expected "peace dividend" a reality—did fairly well. Congress authorized $3.77 billion for the Pentagon's technology development accounts in fiscal 1991, $33.5 million more than the President's budget request. Programs in early design phase technology development, high performance computing, and manufacturing technology all received strong support. There is also $5 million for a Critical Technologies Institute to be established as part of the White House Office of Science and Technology Policy.

So once again the budget process has lurched to an end. What started with months of (mostly) rational debate over scientific and social priorities, ended in political expedience as politicians fought for their home districts and pet projects and avoided goring sacred oxes. For the time being, science funding appears to be mostly on the sacred side of the ledger. ■ JOSEPH PALCA

How Geography Boosted DOE's Budget

Despite the wailing and gnashing of teeth in many Department of Energy–funded programs (*Science*, 26 October, p. 501), a few R&D accounts were carefully sheltered from the budget-cutting storm. Why? Geography. Tucked away inside these accounts is $115 million earmarked by Congress for specific research facilities, most of which just happen to be in the home districts of powerful appropriations committee members. The following are the projects that Congress inserted into the budget and the relevant committee members.

Funds earmarked by the House: $4.8 million for the Advanced Technology Center at Indiana State University (John Myers, R–IN); $10 million for a Center for Energy Resources Management at the University of New Orleans (Lindy Boggs, D–LA); $10 million for the Energy Science Research Facility at Boston College; $5 million for the Advanced Technology Research Center at Oklahoma State University (Wes Watkins, D–OK); $5.7 million for the Nebraska Centers for Science and Technology at the University of Nebraska (Virginia Smith, R–NE); $3 million for the Midwest Superconductivity Consortium headquartered at Purdue University (John Myers, R–IN); $10 million for the Biomedical Research Facility at the University of Alabama at Birmingham; and $10 million for the Biomedical Research Facility at Case Western Reserve University (Louis Stokes, D–OH).

Funds earmarked by the Senate: $10 million for the Center for Nuclear Medicine Research in Alzheimer's Disease and Related Disorders at the Health Sciences Center at West Virginia University (Robert Byrd, D–WV); $6 million for the Gazes Cardiac Research Institute of the Medical University of South Carolina (Ernest Hollings, D–SC); $12.5 million for the Neurosensory Research Center at the Oregon Health Sciences University (Mark Hatfield, R–OR); $12.5 million for the Biomedical Research Institute at Louisiana State University Medical Center (Bennett Johnston, D–LA); $4 million for the Diagnostic Instrumentation and Analysis Laboratory at Mississippi State University (Thad Cochran, R–MS); $4 million for the Physical Sciences Center at Fort Hays State University in Kansas; and $4 million for the Center for Energy and Environmental Education Facility at the University of Northern Iowa (Tom Harkin, D–IA, and Charles Grassley, R–IA).

"Except for the most egregious cases, we don't even try to stop individual projects," says Association of American Universities president Robert Rosenzweig, who has long complained about scientific pork-barreling. "All you do is get someone angry at you."

■ DAVID P. HAMILTON

Slick Fix for Hubble Space Telescope?

By sacrificing one of the Hubble Space Telescope's six scientific instruments and replacing it with a set of corrective optics, NASA officials believe they can restore the remaining instruments to full scientific productivity despite the focusing flaws of the telescope's misshapen primary mirror. "Everyone who's looked at the idea feels very positive about it," says astronomer Robert Brown of the Space Telescope Science Institute in Baltimore. Along with the institute's Holland Ford, Brown cochaired a panel of astronomers, opticians, engineers, and astronauts who looked at a wide variety of proposals to fix the telescope before giving this one their unanimous endorsement.

"It would be a dream if it works," agrees NASA's Hubble program scientist Edward J. Weiler, who heard a formal report from the panel on 26 October. Weiler says the proposal should cost only a few million dollars, but cautions that a detailed study of its technical feasibility and cost will take about 6 to 8 weeks.

The proposal calls for the replacement to be made by space shuttle astronauts during their next visit to the telescope, now tentatively scheduled for June 1993. It would come in addition to a previously planned upgrade of the telescope's workhorse instrument, the Wide Field/Planetary Camera, which will contain corrective optics of its own. At the same time, the astronauts may also replace Hubble's two solar-power panels; extreme temperature changes as the telescope passes from night to day have caused the panels to "jitter," interfering with the most sensitive observations.

The key to the new proposal is a piece of equipment known as the STAR: the Space Telescope Axial Replacement unit. Currently sitting in storage at NASA's Goddard Space Flight Center, STAR looks from the outside like one of the telescope's four "axial" instruments, which together form a ring around the base of the spacecraft. These include the Faint Object Camera, the Faint Object Spectrograph, the High-Resolution Spectrograph, and an ultrasensitive light meter known as the High Speed Photometer. But on the inside, STAR is little more than a hollow box. It was built as a kind of insurance policy: if one of the axial instruments had not been ready as launch time approached, STAR would have been put in its place to keep the telescope in balance. Now, however, the panel has proposed to create a "smart" STAR by filling it with a set of subtly curved mirrors. The astronauts would insert it in place of one of the existing instruments—probably the High Speed Photometer, which is considered less essential than the others. And it would then intercept and correct the aberrated light from the primary mirror before reflecting it into the remaining three instruments.

■ M. MITCHELL WALDROP