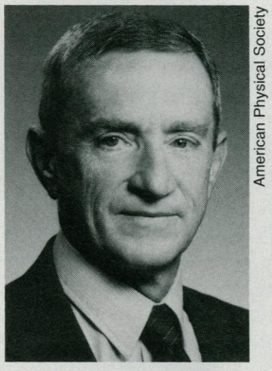
Tilting at the Space Station

They've won no votes as of yet, but 14 scientific societies that defended science in the budget wars are making history. Then again, are they making trouble for themselves?

IT WAS A NERVY THING FOR SCIENTIFIC SOCIeties to do—to go before the news cameras and tell the world that the darling of the aerospace industry, Congress, and the president is a waste of money. But that is exactly what happened last week when Robert Park, director of the Washington office of the American Physical Society, led a high-profile campaign to stop the space station. Just as the Senate Appropriations Committee was about to take a vote divvying up the limited funds available in 1992 for the National Science Foundation (NSF) ($81 billion), the National Aeronautics and Space Administration (NASA), the Environmental Protection Agency, housing programs, and veterans' benefits, Park and the leaders of 14 societies put out a position statement warning of "the excessive cost of the proposed space station" and voicing a concern about the "possibility of a reduction in funds for the National Science Foundation."

What made the stance especially courageous was the political risk that NASA's powerful friends might seek revenge. "Some people are really mad," one Administration aide told *Science*, speaking on background. White House officials, he added, "have threatened repercussions." What kind? The aide wouldn't specify, but he suggested they could turn up in the budget later. The scientific societies may not have to wait long. As a result of last week's voting, the Senate appropriations bill contains an implicit threat to the NSF budget—a potential reduction of $105 million—that could be exercised at the discretion of White House budget chief Richard Darman, a keen supporter of the space station who has made it clear that he will use hard-ball politics if necessary to keep the project alive. This figure represents the portion of the NSF Antarctic research program that the Senate committee assumes will be paid by the Defense Department. Congress tried to shift domestic expenditures into the military account last year, but Darman's office ruled the tactic out of order. It could do the same again this year (see box).



American Physical Society

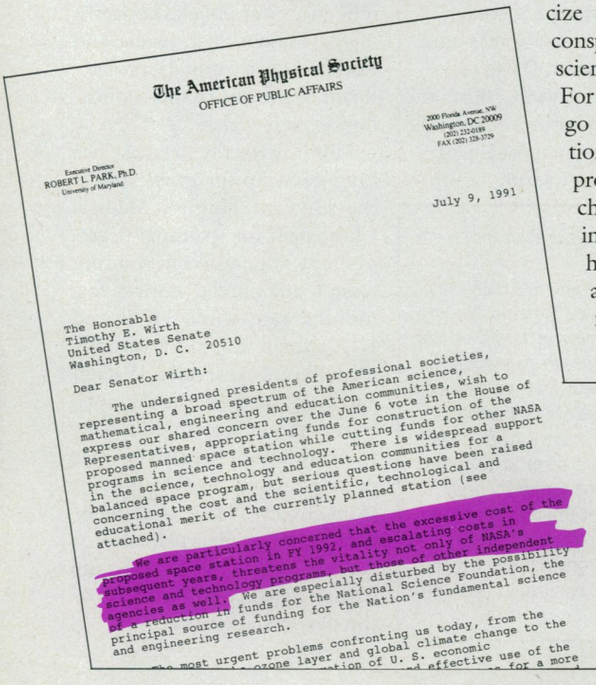
Robert Park

It isn't often that scientists join such targeted political campaigns, and the only thing rarer than a Z particle in Washington, D.C., is getting 14 scientific societies to agree on a public policy position that appears to criticize a scientific project. But two things conspired in recent months to cause the scientific societies to break with tradition. For one, the House decided on 6 June to go ahead with the $30-billion space station while freezing certain basic research projects in NASA's budget. For another, changes adopted by Congress last year in the budget process had come to a head, pitting R&D projects against one another—and against unrelated domestic programs—in a death struggle for survival (see p. 261).

Here was the crunch: If the appropriations committee were to approve all the funds requested by NASA for the space station and stay within its spending limits, what projects would be sacrificed? And, as Park notes, even if Congress is able to put together a budget that supports the station through 1992 without harming other scientific programs, the funding crisis will return in a more acute form in 1993. So he and his 14 allies decided the time had come to take a stand.

The group failed to sway a single vote, however. The appropriations committee approved $2 billion for the space station next year, exactly the amount the Administration requested (see box). As for risking retaliation down the road, "There's always a sort of whispering campaign that suggests that's about to happen to you," says Park. "We certainly got some indications that people were threatening, yes." However, "Those of us who went ahead and signed [the letter] felt we had an obligation to speak out on what the proper priorities should be." Park is still counting on the possibility that the full Senate may still hear the scientists' pleas and act on them. But the only senator who has indicated publicly that he wants to stop the space station is Dale Bumpers (D–AR)—and he also would kill the physicists' favorite big project, the Superconducting Super Collider.

So the decision to thrust some scientific societies deeper into politics than they are usually willing to go—damn the consequences—may prove to be a fateful one. It took life on 9 July when Park and Annette Rosenblum of the American Chemical Society held a press conference to release the letter their group delivered to the appropriations committee. Then, acting on his own, Park published a feisty op-ed piece in *The Wash-*



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Executive Director
ROBERT L. PARK, Ph.D
University of Maryland

July 9, 1991

The Honorable
Timothy E. Wirth
United States Senate
Washington, D. C. 20510

Dear Senator Wirth:

The undersigned presidents of professional societies, representing a broad spectrum of the American science, mathematical, engineering and education communities, wish to express our shared concern over the June 6 vote in the House of Representatives, appropriating funds for construction of the proposed manned space station while cutting funds for other NASA programs in science and technology. There is widespread support in the science, technology and education communities for a balanced space program, but serious questions have been raised concerning the cost and the scientific, technological and educational merit of the currently planned station (see attached).

We are particularly concerned that the excessive cost of the proposed space station in FY 1992, and escalating costs in subsequent years, threatens the vitality not only of NASA's science and technology programs, but those of other independent agencies as well. We are especially disturbed by the possibility of a reduction in funds for the National Science Foundation, the principal source of funding for the Nation's fundamental science and engineering research.

The most urgent problems confronting us today, from the ozone layer and global climate change to the ation of U. S. economic effective use of the for a more

PETITION AND PETITIONERS

American Chemical Society
American Crystallographic Association
American Geophysical Union
American Mathematical Society
American Society of Zoologists
Consortium of Social Science Associations
Institute of Food Technologies
Sigma Xi
The Acoustical Society of America
The American Physical Society
The Mathematical Association of America
The Optical Society of America
The Society of Industrial and Applied Mathematics
The Society of Rheology

NASA Squeezed, NSF Expands—for Now

When 14 scientific societies last week urged Congress to reconsider its commitment to the space station, their reasoning was straightforward: The station's voracious appetite for federal dollars threatens to eat into more important science projects. The scientists believe their concerns are already being borne out. The bills passed by the Senate Appropriations Committee on 11 July and the House of Representatives a month earlier both provide about $2 billion for the station while cutting the Administration's budget request for space science.

The House bill would continue the space station by freezing all new expenditures on space programs, an impractical solution. This stop-gap measure threatened to play havoc with efforts to improve the shuttle, stifle aerospace R&D, and hobble unmanned science programs such as the advanced x-ray telescope (AXAF) and the global climate and atmospheric monitors known as the Earth Observing System (EOS) (see *Science*, 14 June, p. 1483).

The measure approved last week by the Senate Appropriations Committee, and likely to clear the Senate, would still cut the Administration's $7.198-billion request for NASA research and development by $650 million, taking $260 million from space science and applications, $216 million from space transportation projects, and the remainder from commercial programs and aerospace R&D. Science programs still in trouble are AXAF (down $60 million and delayed a year), the CRAF comet rendezvous mission (down $112 million and deleted), and EOS (down $50 million).

But even as it recommended these cuts, the panel went out of its way to scold the "critics of the space station" for claiming that the project would "cripple science." In a report accompanying the bill, the staff wrote that space station funding would rise in this bill by $128 million, while space science would go up $245 million, representing 23% of the combined funds for space flight and R&D. At the same time, the report scolds NASA for trying to be "all things to all people," and starting more projects each year than it can afford to finance. The report notes that it is "wholly unrealistic" to expect NASA's funding to grow at the rate of inflation plus 10%, as would be necessary to finance everything NASA says it intends to do. Instead, the committee instructs the agency to plan on a low growth rate of around 3% to 5% for the next 2 years. As for the future financing of space science, NASA is told to provide "no less than 20%" of what it spends on R&D and space flight.

Meanwhile, over at the National Science Foundation (NSF), officials are pleased because the bill would give the agency a 14% budget increase. If the full Senate approves, which could happen as early as this week, it would put NSF almost within reach of the full amount sought by the Administration ($2.7 billion). The Senate committee bill falls about $77 million short of the president's request, and the version that passed the House is only about $3 million short. While the House zeroed out a proposal for a new laser interferometry gravitational wave observatory (LIGO), the Senate committee bill would restore it, but at the same time spend $62.5 million less than the House in the general research category. The Senate bill would give a big boost to educational and human resource programs—$75 million more than the Administration and $30 million more than the House.

NSFers are nervous about one thing in the Senate committee bill, however—a reduction in funds for the Antarctic program. The Senate committee cut $105 million from this appropriation, assuming that the Defense Department will make up the difference, for it is arguably responsible for certain environmental, safety, and logistical costs. When Congress tried this gambit last year, however, the White House budget office blocked it and NSF research programs had to be cut by $40 million at the last moment. This could happen again.

While many lobbyists may be grumbling about the battles they lost, senators on the appropriations committee praised Barbara Mikulski (D–MD), chairman of the subcommittee that drafted the bill, for producing a "balanced" plan. By Mikulski's count, her panel had to weigh 1300 special congressional pleas, or "member's requests" for federal funds. Some of them made it into the legislation, including new construction projects in Mikulski's home state of Maryland, in the state of the ranking Republican on her panel, Senator Jake Garn (R–UT), and the state of the full committee chairman, Robert Byrd (D–WV). For example, NASA's budget includes $20 million for the Christopher Columbus Center of Marine Research and Exploration in Baltimore, Maryland; $6 million for a "classroom of the future facility" at Wheeling Jesuit College in West Virginia; $10 million for a new software validation center at West Virginia University; and $10 million for a "new space dynamics lab" at Utah State University. ■ **E.M.**

ington Post the next day mocking the station as an "orbiting pork barrel" and comparing it to the savings and loan bailout. The article ran alongside a defense of the station by White House Science Adviser D. Allan Bromley, who argued that by going ahead with the project, the United States could "embrace a new age of exploration" and inspire a generation of kids to become scientists. Park took another well-publicized crack at the station in an 11 July debate on the MacNeil-Lehrer television show. Bromley was invited to respond, but demurred, pleading other commitments.

This media blitz got a lot of attention, but it made some scientific societies uneasy. "Good PR, bad GR [government relations]," quipped Casey Dinges, legislative manager for the American Society of Civil Engineers (ASCE). Like a few other groups, the ASCE was involved in early meetings at which a protest letter was considered, but eventually dropped out. The final statement, says Dinges, was "too anti-space station from my society's perspective." Dinges wonders what the campaign achieved, noting that the vote in the Senate appropriations committee was unanimous to continue work on the space station.

Other engineering societies followed the lead of the Institute of Electrical and Electronics Engineers (IEEE), which was originally in the group drafting the protest letter. It was known as the "June 6 Committee," named for the day on which the House rejected the advice of its own appropriations committee (which tried to kill the station), voting instead to keep it alive, while freezing everything in NASA's budget (*Science*, 14 June, p. 1483). Not only was the NSF budget in danger, but so were NASA's aeronautics and space R&D programs. Some IEEE leaders wanted to speak out. But the IEEE left the June 6 Committee, according to George Sponsler III, chairman of the IEEE R&D policy committee, because "the whole concern was that [the letter] might have been read as opposing the space station, so the IEEE couldn't endorse" it. On 25 June, the society gave an alternative recommendation: Reduce the station to a $10-billion project.

Several additional groups dropped out for technical or policy reasons, including the Materials Research Society, the American Society of Mechanical Engineers, and the American Astronomical Society. The American Association for the Advancement of Science was never invited to join, says one official, "because we never sign statements like that."

The astronomers were divided up to the end. "I don't think we have any real quarrel with the [American Physical Society] position," says Peter Boyce, executive officer of the American Astronomical Society. "But we just didn't want to sign it." Why not? "We felt that it was not a good thing to do, to raise the fight again after having lost so one-sidedly and unexpectedly in the House," says Boyce. "You've got to look at the stand of the people who were on the Senate committee," Boyce explains. They had strongly endorsed the station, as had a group of 50 senators. The astronomers also were put off by the emotionalism of the debate in the House—including "comments by various people about the scientific community being naive and greedy." Furthermore, it isn't wise to kick one's benefactor in the shins, and NASA is now a bigger supporter of basic astronomy grants than NSF. In many ways, says Boyce, NASA has been "more responsive" to astronomers' requests than NSF.

To the pragmatists' argument that there was much to lose and little to gain by hammering on the senators about the space station, even Park conceded at his press conference on 9 July that, "We are not sanguine about our prospects" of changing any votes in the committee. So why did he go ahead with the protest? "We have an obligation to state our concerns as clearly and forthrightly as we can." At least one Senate aide who deals with science legislation responded favorably to the protest. "If there are concerns out there, it's good that we hear about them," he said, noting that when NSF was in trouble 3 years ago, there was silence from the scientific community.

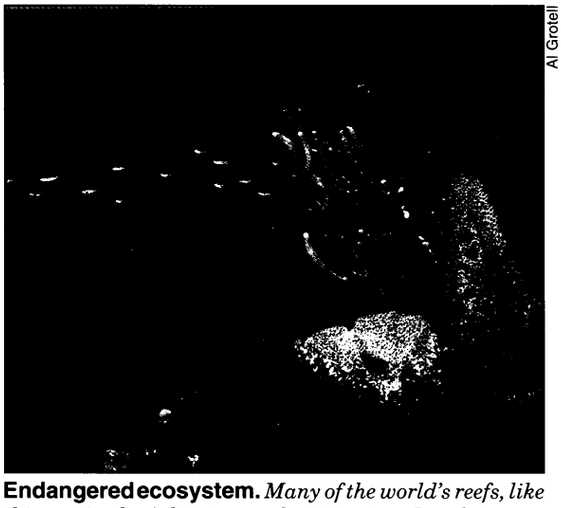
The next indication of whether the 14 societies are making any headway in their argument—or have incurred penalties—could come as early as this week, when the Senate may take up the independent agencies bill. As the bill reaches the floor, the White House budget office may release a "Statement of Position" announcing whether it is willing to go along with the Antarctic funding plan. Meanwhile, Park clings to what seems a slender reed: that Congress will listen to his logic and eliminate the space station before it enacts a final appropriations bill this fall.

■ ELIOT MARSHALL

Greenhouse Role in Reef Stress Unproven

An interdisciplinary group nixed the idea that global warming is causing coral bleaching and pointed instead to local stresses

IN THE LATE 1980S, AS CORAL REEFS throughout the Caribbean and elsewhere fell victim to a phenomenon known as bleaching, a few scientists began sounding the alarm. The message of these scientists, who included Thomas Goreau of the Discovery Bay Laboratory in Jamaica and Raymond Hayes of Howard University, was that greenhouse warming is upon us and that the exquisitely sensitive corals, reacting to elevated water temperatures, are serving as biological sentinels (*Science,* 12 October 1990, p. 213). This caught the attention of Congress, where then Senator Lowell Weicker (R–CT) and Senator Albert Gore (D–TN) held hearings, most recently just last October. At that last hearing several investigators testified that bleaching had reached its worst point ever, and this stirred up so much concern that Congress assigned the National Science Foundation (NSF) to investigate the connection between coral bleaching and global warming.



Al Grotell

Endangered ecosystem. *Many of the world's reefs, like this one in the Atlantic, are deteriorating. Local stresses —and perhaps high temperatures—may be to blame.*

Late last month investigators at an NSF-sponsored meeting rendered their verdict. Following the Miami meeting, which brought together, for the first time, climatologists, oceanographers, and meteorologists with marine biologists, ecologists, and other reef experts, the participants issued a statement saying essentially that, yes, higher temperatures seem to be at least partly at fault but, no, greenhouse warming cannot be blamed. "While many of the recent bleaching episodes do appear to be associated with high local temperatures," the group said, "our knowledge of both coral stress responses and the detailed nature of climate change make it impossible at present to claim that coral bleaching is an early indicator of the global greenhouse effect."

Global warming might eventually wreak havoc with coral reefs around the world, the experts said, but there's no proof that it's already happening. The consensus may be somewhat illusory, however, as Goreau, Hayes, and other proponents of the greenhouse connection were not invited to attend. They could not be reached for comment.

Differences notwithstanding, there is one point on which everyone agrees: Something is clearly amiss on the world's reefs. Indeed, the participants at the Miami meeting were sufficiently worried about what they see as the deterioration of coral reefs that they unanimously endorsed an international program of intensive, long-term monitoring throughout the world to collect data on all the physical and biological factors that affect reef health. The group's recommendations will go to the sponsoring agencies—NSF, the National Oceanographic and Atmospheric Administration (NOAA), and the Environmental Protection Agency—within a few weeks.

Bleaching, which occurs when corals expel the algae that reside within their cells, thereby turning snowy white, is not a new phenomenon. Indeed, it is a fairly common response to a number of stresses, including high or low temperatures, high or low salinity, high sedimentation, fluxes of visible or ultraviolet light, or pollutants. What has caught people's attention over the past few years is the frequency, severity, and unprecedented geographic scope of some of these events, which occurred almost simultaneously at locations around the Caribbean and western Atlantic (*Science,* 27 November 1987, p. 1228).

Unless the stress is especially severe, the corals regain their algae and recover. But in