

Congress dips into pork barrel for DOE energy budget

Few scientists remember a time when the Federal government considered grants to universities to be improper if not unconstitutional. Yet, into the 1930s the leaders of the National Academy of Sciences objected in principle to private institutions accepting Federal funds. Don K. Price of Harvard's John Fitzgerald Kennedy School of Government attributes the government's decision to sponsor science after World War II to a "a brilliant feat of political strategy." In no other country, he observes, "did a group of scientists manage to persuade their government to not only give up its scruples against public support of private science, but also work out the arrangements of those whose authority was based on knowledge rather than votes." Because science funding often applies to esoteric subjects that politicians know nothing about, a procedure called peer review was developed so that scientists not directly involved with the work could judge the merits of a project or investigator—a situation that enables Congress, which controls the Federal purse, to avoid such troublesome issues as choosing among public and private institutions or dealing with sensitive questions relating to church and state. Even so, says Price, it is sometimes easy to forget that science's Washington connection is "novel and fragile."

All this took on real meaning last April as HR 3132, a \$22.3-billion appropriation bill covering the Department of Energy and dozens of separate water projects for FY 1984, began shuffling through Congress. Some scientists and many politicians wondered if the traditional arrangements were operating well—if at all. Aspects of the DOE research budget, it seemed, began to resemble those Congressional pet projects in the water bill that, by tradition, come from the "pork barrel," such as the Tennessee-Tombigbee Waterway in Alabama and Mississippi or the Stonewall Jackson Dam to be built in West Virginia.

What suggests the similarity is the way the House of Representatives on the afternoon of 12 May ignored the



With pained and puzzled expressions, House and Senate members confer on final details of FY 1984 budget resolution for Department of Energy and separate water development projects.

budget authorization report of its own Committee on Science and Technology and transferred \$5 million from one of the Reagan Administration's "highest priorities" in the FY 1984 science budget, construction of a National Center for Advanced Materials at Lawrence Berkeley Laboratory, for a down payment on a new Vitreous State Laboratory building at Catholic University of America, then snatched another \$5 million from various basic research programs to spend on a chem-

istry building for Columbia University. In neither case did DOE or the House Committee review the facilities—nor, for that matter, did any scientific peer group review proposals for the projects.

"The amendments came to the House floor without any advance notice," says a DOE official, "apparently with the blessing of the Speaker"—Representative Thomas J. (Tip) O'Neill (D-Mass.). "The word went out that these were the Speaker's amendments," recalls a House science committee aide. "Tip

O'Neill threw his weight behind both measures, and that's a matter of impressive proportions in the House."

Budget unveiled. The events leading to the budget amendments bore a striking resemblance. In both cases, Catholic and Columbia universities had tried and failed for years to secure Federal funds for new science centers. Both had attained international recognition for research that its administrators and staff feared would decline without advanced new facilities.

In the case of Catholic U's VSL, since its founding in 1968 it had developed several applications of glass materials research—notably, encapsulation of high-level radioactive wastes for long-term storage, fiber-optic geophones for oil exploration, optical components for copier and facsimile machines, and infrared radar and missile guidance systems. Created out of an Office of Naval Research contract under Project THEMIS, the laboratory now has an annual budget of \$1.2 million, one third of this from military and civilian government agencies.

Soon after William J. Byron, S.J., arrived at Catholic University last September as its new president, Theodore Litovitz, VSL's co-director, convinced him of the need to centralize and modernize. "We occupy space on different floors, in hallways, in three buildings," says Litovitz. "We had a choice: expand and upgrade our facilities or cut back our programs." Under Byron's direction, approaches were made to DOE to support a new VSL building—to no avail. Then, when Byron learned that the President's science adviser, George Keyworth II, had inserted a request for \$25.9 million for NCAM in the FY 1984 budget, at the last minute last February, Catholic U moved quickly. It hired a Washington firm of lawyer-lobbyists, Schlossberg-Cassidy and Associates, known for raising Congressional support for bricks and mortar at universities—most recently, a nutrition center for Tufts and veterinary-medicine buildings for the universities of Washington and Pennsylvania. Byron and Litovitz met with Congressmen to win their hearts and minds for VSL. Litovitz prepared a proposal for Congressmen that purposefully avoided technical details about plans and programs.

Keyworth, by contrast, sent the NCAM budget item to Capitol Hill without meeting with key members of Congressional science and appropriations committees. Thus, from the moment that he placed NCAM in the DOE budget, Keyworth, still a novice in the ways of Washington, had miscalculated. He had expected, as he declared at the time, that Congress would readily agree to endorse a project he claimed would help the country "consolidate

Tip O'Neill, the most influential member of the House of Representatives, let it be known that DOE budget requests for Catholic and Columbia universities were "the Speaker's amendments."



and expand its leadership in materials science," as well as serve as a model for academic, Federal and corporate research. He had not reckoned on the reaction to the \$250 million NCAM facility. Materials scientists bombarded members of Congress and editors of journals in opposition to NCAM and its lack of peer review. They accused Keyworth of making a secret deal with David A. Shirley, director of LBL, to rejuvenate the lab's aging accelerator program and provide a new mission to meet the national need for advanced materials. The centerpiece of NCAM would be a new synchrotron light source in the photon range of 0.1–5000 eV (PHYSICS TODAY, June, page 17). One of the most forceful assaults came from Philip W. Anderson of Princeton and Bell Labs. In a letter to Representative Don Fuqua (D-Fla.), chairman of the House Science and Technology Committee, Anderson deplored the absence of a traditional peer review before NCAM was placed in the budget and the dearth of details about it from the White House and LBL. "The manner in which this project reached the DOE budget has produced reactions of shock or of cynical acceptance in the science community," wrote Anderson. "To my knowledge, this is the first case of funding at this level in the history of American science where consensus has

not preceded a budget request."

Meanwhile, back at Catholic University, Byron appealed for support of the Vitreous State Lab from his board of trustees, which includes 15 bishops from around the nation, and by House members he knows personally, such as Representative Lindy Boggs (D-La.), who serves on the appropriations subcommittee that deals with the DOE research budget. The board, in turn, got busy. House Majority leader Jim Wright (D-Tex.) received a phone call from the bishop of Ft. Worth. Boggs heard from the bishop of New Orleans. Representative F. James Sensenbrenner (R-Wis.), the ranking minority member on the House Science and Technology Subcommittee concerned with energy R&D, was called by the bishop of Milwaukee. O'Neill was called by Boston's Humberto Cardinal Medeiros, who asked the House Speaker to sponsor legislation to raise \$13.9 million for the lab.

Hot topics. On 28 April, a few days after the House Science and Technology Committee had completed its deliberations, O'Neill sent Fuqua a letter urging him to find some money in the authorization measure to support Catholic U's VSL, which he called "worthy" and "in need." On the morning of 12 May, the lab was Topic A in Wright's office when the majority lead-

er met with Byron, Boggs and Cassidy.

Topic B in Wright's office that day was the proposed National Chemical Research Center at Columbia University, which did not require any outreach by the church militant. Chemistry at Columbia includes such topics as energy conservation and conversion processes, photosynthesis, catalysis, polymers and isotope separation. As a center of research and teaching, it attracted some \$4.5 million in Federal support last year. Still, it sprawls through parts of two crumbling structures—one built in 1889, the other in 1927. "In the 1960s, when universities everywhere were expanding, Columbia was sleeping," says Nicholas Turro, chairman of Columbia's chemistry department. "There is a sense here among chemists that our research efforts are in danger of collapsing, like our buildings." After hearing about DOE's intention to back NCAM, Columbia decided to ask for \$20 million from the Federal government and raise another \$12.5 million from private donors. To do this, the university engaged Schlossberg-Cassidy to make the Washington connection.

In mid-afternoon of 12 May, after discussing such controversial energy technologies as DOE's Clinch River breeder reactor and the Stirling automobile engine, the House turned to basic science matters. O'Neill and Fuqua had tapped Representative Norman Y. Mineta (D-Calif.), whose district in Santa Clara is close to the Lawrence Berkeley lab, to introduce an amendment to the DOE authorization bill that called for "redirecting" \$5 million from a line item on NCAM to Catholic University's VSL. Then, Majority Leader Wright extolled VSL as "thoroughly worthwhile and... the kind of thing that nobody disagrees with—at least I can't imagine any knowledgeable person disagreeing with it."

With the backing of the most powerful members of the House, Mineta's amendment was assured of passage, but Sensenbrenner strongly objected. "The subjects presented to this body are so diverse and complex," he stated, "that we cannot, as 435 members sitting together, effectively and adequately consider the merits of any proposal." The VSL proposal had not been submitted to the Science and Technology Committee, he argued, nor did it contain the kinds of information needed to decide whether the lab should be funded. The proposal lacked information about the lab site, said Sensenbrenner, and technical details about the proposed research. "This project can no longer hide behind the veil of scientific research, but must instead be seen for what it really is—political pork. Unless my colleagues wish to emasculate the authorization process and politicize

scientific research... by encouraging every college and university... to obtain a facility, regardless of duplication or its value to the nation, I urge rejection..." In the end, however, VSL was approved by a vote of 259 to 115.

"**Treasury raid.**" Some 20 minutes later, Representative Charles B. Rangel (D-N.Y.), whose district embraces Columbia University, spoke for less than a minute on behalf of the proposed chemistry center at the university. In opposition, Representative Robert S. Walker (R-Pa.) argued that Rangel's amendment was "a \$5 million raid on the Treasury. It was subjected to no hearings... We had no information to work with..." One piece of information the House did have concerned the cuts in the DOE budget to make up for the Columbia project—\$1 million from proposals to upgrade Van de Graaff accelerators at Yale and the University of Washington, as well as \$1 million from DOE's high-energy physics budget, \$2 million from the university instrumentation program and another \$1 million from magnetic fusion. The House hailed Columbia by another whopping majority, 216 to 149.

"When you consider how quickly and easily Columbia and Catholic universities got what they wanted, without any peer review or Congressional deliberations," Sensenbrenner said later, "it makes the NCAM proposal appear rational by contrast." But when the House Appropriations Committee report emerged on 24 May, it "deferred without prejudice" the DOE budget request for NCAM, stating: "The Committee is concerned with the manner in which this project, which is estimated to cost a total of \$174 million before it is finished, was inserted into the budget by the Administration after the DOE had transmitted its budget requirements to the Office of Management and Budget. This is highly unusual and results in extreme fluctuations in a constrained basic energy sciences budget that may result in undesirable impacts throughout the program. The committee is also concerned that the customary and desirable peer review of this project was not undertaken... Peer review in the scientific community is a recognized and necessary element to ensure that all possible aspects of proposed research be observed. The absence of peer review may have inhibited the site selection and may have resulted in a less-than-optimum concept for an overall materials science center. It may be, for example, that additional materials-analysis technologies such as neutron scattering or submicron facilities or other examination methods might have been included in this proposal had the normal reviews been conducted. It may be, in fact, that

a more extensive review of the institutional capabilities that exist at other national laboratories and throughout the university community could yield benefits to the final materials center concept." Thus, the committee stated, a complete peer review is required "in time for a reevaluation of this project in the fiscal year 1985 cycle." Toward that end, DOE appointed an ad hoc panel last April under Albert Narath of Sandia Laboratories to evaluate NCAM. The Narath panel expects to deliver its report to DOE by the end of August.

In the Senate, though, \$3 million was restored to the DOE budget for NCAM, and no money was allocated for either Columbia or Catholic universities. Finally, on 28 June, in less than five minutes of discussion, a Senate-House conference committee resolved the differences and, giving something to everyone, which is not unusual in such circumstances, authorized NCAM to receive \$3 million, Columbia's chemistry building \$5 million, and Catholic U's VSL \$5 million. The next day, the House approved the DOE bill, 337 to 82, and three hours later the Senate did likewise, 82 to 12, thus sending the budget measure to the President for signature. The bill contained a passage that the conference committee insisted on including: "The conferees agree that, prior to obligation of funds provided for the National Center for Advanced Materials, the Vitreous Laboratory and the National Center for Chemical Research, the DOE shall conduct a technical review and approve each project."

Political lessons. What lessons can be learned from this episode? "Congress needs to know in advance of its budget debates which items are most important for the country and which are pure pork to satisfy special interests," says H. Guyford Stever, who was President Ford's science adviser. "The case for NCAM just wasn't strong enough for Congress to act favorably on it. It also wasn't clear that the lack of peer review for NCAM also applied to the other proposals. The political process is rife with inconsistencies."

Columbia's Turro recognizes that "We have been criticized by some, including Jay Keyworth, of serving narrow, partisan interests and behaving like greedy vultures. To this we say our goals are to improve the nation's scientific and technological capabilities by advancing basic research and producing future chemists." He admits that Columbia may have been mistaken to engage in lobbying to champion its cause. "That strategy seems unscientific and possibly inappropriate for a university," says Turro, "but it's not likely we would be getting a center without pursuing such a strategy."

As for accusations of circumventing peer review, says Litovitz of Catholic U, "Since when do brick and mortar ventures need to be weighed in the scales of pure science? It happens that every one of our research programs has been through review. But when we sought

money for a building, we couldn't get any. This may be the best thing that ever happened to us. Whenever we called on DOE, nobody was much interested. Now we have earned respect. We're even asked to make presentations about our work to DOE." —IG

NSF adds 5 more years to theory center

In reviewing the first three years of the Institute for Theoretical Physics at Santa Barbara last fall, a panel of ten physicists reported to the National Science Board, the governing board of NSF, that it is "strikingly successful... even more so than anticipated." The review group, headed by Peter Carruthers of Los Alamos National Laboratory, commended the institute's leaders, faculty and participants for developing a "unique atmosphere" of "special excitement" and "high expectations" in which new directions are explored across disciplines by senior physicists working alongside postdoctoral fellows from the US and abroad. Accordingly, the panel's recommendation came as no surprise: "The reviewers enthusiastically support the proposed continuation of the institute for a second five-year period." In due course last April, the Science Board reached the same conclusion, meaning that NSF will continue to sponsor the institute to 1989.

The decision, says the institute's director, Walter Kohn, is "extremely gratifying as a vote of confidence in everyone associated with our way of doing theoretical physics." Until the board acted, there had been some anxiety on the top floor of Ellison Hall on the campus of the University of California at Santa Barbara, where the institute has been located since its start in September 1979. Doubts had been expressed within the physics community about the wisdom and effectiveness of a centralized theory center with a large proportion of visitors, staying typically from a few months to a year. The panel's report erased such doubts. "In the few years of its existence," the report said, "the institute has emerged as a leading national facility with programs and research at the forefront of theoretical physics." It has achieved international recognition, with about 40% of the 500 visitors who spend more than a month there coming from outside the US, usually on their own money.

The interdisciplinary nature of the institute, the panel observed, is "an instrument for expanding the conceptual scope of theoretical physics" and accelerating the collaboration of physicists with different specialties and diverse interests. Indeed, the report

went on, "unplanned interactions may turn out to be the most important feature of the institute." "Theorists thrive on interactions," says Boris Kayser, who spearheaded the founding of the institute within the NSF physics division. The institute's staff and visitors, who sometimes refer to themselves as "Santa barbarians," variously describe the place as "lively," "stimulating" and "bushy-tailed."

While NSF does not plan to increase its funding much beyond the current level of \$1.4 million annually, the institute has attracted grants of \$25 000 for each of its first three years from IBM and \$10 000 per year from Xerox, as well as smaller gifts from corporations and individuals. In addition, NASA is contributing \$250 000 this year and intends to provide similar amounts for at least another two years. When Caltech's William A. Fowler learned of NASA's support at a recent meeting of the NSF Physics Advisory Committee, he exclaimed: "It's significant for another Federal agency to sponsor the institute. That's a rare happening."

According to Kohn, NASA's support is going to help resolve an urgent need—access to computers. This was one of the high-priority problems identified by the Carruthers panel last year. The theorists have been using Univer-

sity of California's VAX 780 computers and a Cray I at Los Alamos for number crunching, but need additional computer time (PHYSICS TODAY, May 1982, page 23). To ease the pressure, a VAX 750 will be delivered in the next month or two. What's more, Kohn is negotiating with Glenn Culler of CHI Systems Inc. to acquire an array processor that will extend VAX computing power tenfold.

The Carruthers panel also suggested that the institute's advisory board "should be representative of the entire physics community, including experimentalists." While the board has functioned well, the panel said, "we encourage wider community participation in the selection of future members," with particular sensitivity to "the needs of subfields of physics, such as atomic and nuclear physics and new areas which may arise in the future and may not be represented in the permanent staff." One experimentalist, Richard A. Muller of Lawrence Berkeley Laboratory, already is on the board. Moreover, accepting the panel's recommendation, Kohn wrote to Robert Marshak, in his capacity as president of the American Physical Society, seeking nominations to the board. In September, when new members will be rotated onto the board, additional nontheorists are likely to be appointed.

Besides Kohn, the permanent staff now consists of James Langer, who came from Carnegie-Mellon University, Frank Wilczek, from Princeton, and J. Robert Schrieffer, from the University of Pennsylvania, who spends one-third of his time at the institute. The latest addition is Douglas Eardley, an astrophysicist, from Harvard. Kohn and the board are now actively recruiting another staff member from the community of elementary-particle theorists. "We are going to maintain the same high standards as in the past," Kohn said in an interview, "even if it takes a little time."

Finally, the panel pointed out, "of critical importance for continued success of the institute," is a successor to Kohn, who will step down when the institute reaches its fifth birthday next year. The panel calls for a new director with "breadth of competence, experience and interest in physics"—criteria used by a search committee under Paul C. Martin of Harvard. In June that committee sent a short list of six names to Richard Blankenbecler of SLAC, who is chairman of the institute's advisory board. Because the institute's programs have to be formulated more than a year in advance, says Blankenbecler, the board will try to decide on Kohn's replacement at its September meeting. "It is remarkable that people are taking this so seriously," he says. "It means the institute, despite its youth, is a force in physics." —IG □



Walter Kohn is gratified by vote of confidence in Santa Barbara physics theory institute.