

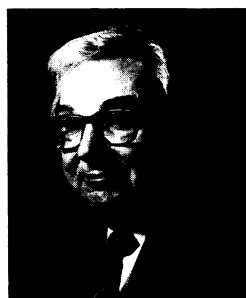
ratory building] in your indirect cost rate" if Congress funds the building. James Savage, a political scientist at the University of Virginia and an expert on the subject, agrees that new indirect cost limits are "going to really add to the drive for earmarking."

Earmarked projects often bypass public hearings and nearly always elude peer review and site selection procedures. Any one of them taken in isolation probably wouldn't cause a fuss. But considered in bulk, they worry the defenders of federal science funding—like Brown, who chairs the House Committee on Space, Science, and Technology—and, on the other side of Capitol Hill, Senators Sam Nunn (D-GA) and John Danforth (R-MO).

The "drastic increase" in the number of participants in the "pork-barrel game," Brown said last week, undermines long-term planning for academic facilities and undercuts the authorizing committees in Congress. Brown has declared war on the use of earmarks, claiming, "We're going to change it."

But Wyatt says he's discouraged: "I wish I could give a more optimistic projection, but I see no prospects for a decrease; if anything I see more and more pressure to earmark....I am alarmed by it."

So is the picture really so gloomy? Can the rising tide of pork be turned back? Possibly. The remedies, at least in principle, seem clear, according to Brown, Wyatt, and others. They say the solution is twofold. First, it would help to have funds for congressionally backed research centers pass through a merit review system, possibly based at the National Science Foundation (NSF). Although many agree that's a good idea, only a pittance has been appropriated for such a system. So far, the Administration has been willing to put only \$20 million into this category, a "tiny" amount compared to the amount that's earmarked each year for special projects, says Wyatt. In the past 3



George Brown

years, he notes, Iowa State University alone has won through earmarking more than the entire NSF academic facilities budget. The NSF channel will not provide a real alternative, Wyatt says, unless more money is appropriated.

The second part of the remedy—congressional restraint at the trough—seems less likely to come about. Even Brown admits it will require "unprecedented levels of discipline," but he is already laying out a strategy, which may involve a head-to-head confrontation with members of the appropriations committees. Brown claims that other authorizing committee chairmen will join him, including John Dingell (D-MI). "Our funding priorities are not worth a damn," Brown says, unless they are developed in a rational way rather than "by the whim of senior committee members."

■ ELIOT MARSHALL

Yesterday's Pork Projects: Where Are They Now?

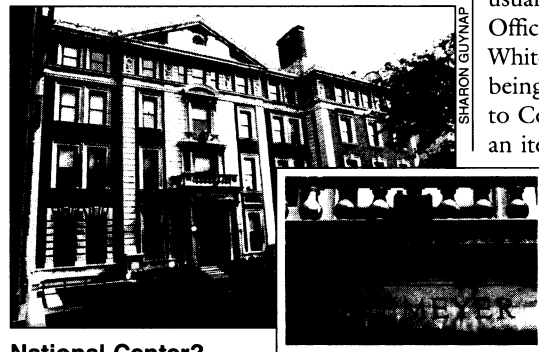
Right where they always were—but not necessarily doing what they were funded for, our correspondent discovers



THE PROCESS BY WHICH Congress funds scientific research is full of twists and turns and mechanisms understood only by a rare breed: the Avid Budget-Watcher. Members of the breed recall 1983 with particular fondness. In that year an ingenious mechanism that had never been employed before was spotted: the "Congressional Initiative." Here was a kind of budgeteer's magic wand. Forget about the hazards of peer review; all a congressman had to do was wave the wand and portions of the nation's energy research budget turned to pork.

Since 1983 the innovation has found many new applications. Congress has used it to fund some two dozen projects despite the fact that their proposers never stood before their scientific peers. Indeed, the process has accelerated and the pork dollars have climbed. The projects individually, and the trend generally, have aroused deep concern in the scientific community, where grant-seekers are being forced to compete ever harder for precious federal research dollars. But few

critics—or supporters—of pork projects have taken the trouble to examine their history to find out whether they lived up to the stellar advance promises offered by their congressional sponsors. Have these projects truly improved U.S. competitiveness in international markets, as has so often been the rationale? Have they driven the development of advanced technology? Since few in the research community have time to delve into the history of pork, it isn't surprising that



National Center?
Columbia University's chemistry building, site of one of the first congressional pork projects.

until now there has been little data on these questions. In an attempt to get some preliminary answers, *Science* chose three pork projects of the 1980s (more or less at random) and asked, "Where are they now?"

Hors d'oeuvres

Take the National Center for Chemical Research (NCCR) at Columbia University, funded as one of the first two Congressional Initiatives in 1983. Did this institution deserve its \$23.7 million total authorization? Before addressing the evidence on this issue, it is worth recalling that, unlike most of the projects that request Department of Energy (DOE) funding, the Columbia chemical research center hadn't been reviewed first by a DOE committee. That is, the NCCR appeared in Congress before experts in the field had evaluated the project's goals, means, and value compared to other proposals. Moreover, if the NCCR proposal had played by the usual rules, it would then have gone to the Office of Management and Budget and the White House to get their input, all before being included in a presidential budget sent to Congress's Appropriations Committee as an item in the Energy and Water Development Bill. This typical procedure, which the NCCR was bypassing, is intended to permit the coordination of scientific concerns and energy policy, and to remove science as much as possible from the reach of individual legislators—a kind of anti-pork protection device.

But in 1983, Congress took a page

from the White House playbook. The White House science adviser George Keyworth was gung ho for the building of a proposed National Center for Advanced Materials (NCAM) in California. So he invented the term "Presidential Initiative" and simply popped his center into that year's presidential budget, which in turn automatically fed the notion into the Energy and Water Development Bill. The beauty of what happened next was that congressmen in droves denounced Keyworth's initiative, and NCAM was "deferred" (later to be funded, after peer review).

But people in Congress know a good idea when they see one. If there could be a Presidential Initiative, why not a Congressional Initiative? Lo and behold, in the same paragraph denouncing Keyworth for his temerity, Congress inserted two non-peer-reviewed projects of its own—both of which were funded. One was the National Center for Chemical Research at Columbia University.

Notice the immediate attraction of the term "National Center" to give your pet pork a posture of dignity. If you want to identify pork in an energy appropriations bill, look for construction projects whose benefits would redound to the proposing congressman's home state—and look for one of two epithets: "National Center" or "demonstration project." Oh, and look for especially flowery language depicting the elevated aspirations of a project—say "to increase the country's competitiveness in the international marketplace..." or "to meet the growing challenge of energy independence..." It is against such claims that *Science* measured several pork projects.

Lions' pork

To assess what we found, please bear in mind that the author of this piece has a conflict of interest—Columbia is the author's alma mater (Ph.D. '87)—which makes him especially embarrassed to reveal that although he used to walk through the campus every day, he does not recall passing a National Center for Chemical Research. But it had to be there somewhere—after all, the evidence resides in 5 consecutive years of the *Congressional Record*: a National Center at Columbia University received \$5 million in '84, \$3 million the next year, \$7.7 million the next, and \$4 million in each of the next two—an endurance record among Congressional Initiatives. So where was the building?

Imagine the relief to discover that Campus Information was similarly baffled—and so was nearly everyone else asked. A blank stare or, "You must mean the chemistry building," was the usual response. Nor had

any indicator of a National Center for Chemical Research appeared over at the chemistry building in the decade since the center got funded—there was no sign indicating the presence of a National Center, and no piece of stationery with a letterhead bearing the name could be found. "I don't know what the phrase 'National Center' really means," said Professor Nick Turro of the chemistry department.

Turro explained further: "What



Shifting sands. *St. Christopher's Hospital in Philadelphia, where an "energy demonstration project" has become an "optimal design" for a new building.*

we do in this building is train students and do research—the same thing done by any good chemistry department anywhere," Turro told *Science*. "If someone were to ask me to show them the Chemistry Center, meaning the part funded by the DOE, I would show them the renovated part [of this building and its] annex. But you can't really chop up the chemistry department based on where people sit."

Anything wrong with renovations and an annex posing as a National Center? Turro doesn't think so: "We had a decaying facility, and the only way we could afford to repair it was through external funding. The university had to figure out some way of getting funds, and chose the legislative route."

Sooner pork

As a loyal alumnus, the author was greatly relieved at the news, which led him to stop number two on the old pork tour: Rural Enterprises, Inc. (REI) of Durant, Oklahoma. In 1989 Congress decreed that the DOE labs weren't doing a good job of transferring technology to the private sector. "Consequently," said the Energy and Water Development Bill, "the Committee has provided \$200,000 for Rural Enterprises, Inc., a tax-exempt, non-profit technology transfer center in Oklahoma." With the money, REI was expected to develop a "transferring technology demonstration project" to "draw together the diverse technology resources of DOE labs that are prime candidates for transfer to other private public sector entities, put

a system in place for drawing upon these resources, and transfer DOE technologies to private and public sector entities."

How does REI stack up? The organization's main function is to assist small businesses in southern Oklahoma. "Dedicated to helping Oklahomans help themselves," proclaims one pamphlet in the promotional package. Neither that package nor the organizational chart yields a hint that REI has used the funding for anything other than helping local businesses through technology transfer, development, and financial services.

Jay Ingham, a technology applications engineer at REI, cites a dozen or so interactions with DOE labs over the past 2 years, consisting mostly of passing along information culled from DOE lab reports to local industry.

The Oklahoma focus seems at odds with the sweeping national claims made in the appropriations bill—and suggests that the main issue was promotion of local economic interests, carried out by way of some political back scratching. Although REI's latest newsletter does not include any

information about the putative technology transfer demonstration project, it does contain pictures of one of Oklahoma's U.S. representatives and a full page insert about one of the state's U.S. senators. "It doesn't take a Rhodes scholar to figure out what's probably going on here," remarks one House staffer.

Healthy pork

Which brings us to random stop number three on the pork tour: the energy demonstration project at St. Christopher's Hospital in Philadelphia. Funded in fiscal year 1987 at a total of \$14.8 million, this project proved as elusive as REI's. The DOE dollars were initially given for construction of a new medical center for children that would involve the development of "new evolving energy source technologies," including solar energy. These new energy technologies, according to the description of the Initiative in the Appropriations Committee bill, "will be utilized and shared with other institutions across the nation."

Three years later, in June of 1990, the medical center was complete, but in the meantime some of the lofty ambitions mentioned in the bill had vanished—along with the original name, which had become "St. Christopher's Hospital for Children—A Model Energy Conservation Project." The new energy-saving technologies, it seems, had not panned out as anticipated. Though energy savings *had* been achieved, nearly all came through the application of conventional technologies.

That presented no problem in the world of pork. The aspirations of the project were simply redefined: "Rather than investing precious health care dollars into a demonstration project for exotic technology," reads the draft of an article about the hospital intended for hospital journals in compliance with the charge to share news of the project with other institutions, "St. Chris decided to concentrate its efforts in creating a truly optimal design."

Says Thomas Bathgate, who headed the project and wrote the draft, "I always envisioned it from the beginning as an energy conservation program rather than as a new technology project. And as a conservation program using practical methods available here and now, we exceeded our expectations—we even saved enough money to add an extra 30,000 square feet to the building." Then Bathgate adds: "What the legislators chose to call it doesn't really matter."

Pork perspectives

"Do pork projects live up to the promises made for them?" asks an official at one national laboratory who keeps copies of the Energy and Water Development Bills of past years in stacks on his desk. "Is Havemeyer [the Columbia chemistry building] a National Center or a university chemistry building? Is Rural Enterprises more a critical conduit for technology developed at national laboratories or a state promotional agency? Could peer review have spotted in advance the problems that the children's hospital encountered with the new technologies? I think the answers to these questions are obvious."

So does Congressman Harris W. Fawell of Illinois, author of a pork-buster bill introduced last June. Fawell calls pork projects in the science budget "egregious examples of greed designed to help a particular district or congressman rather than the country's science program," which is "inexcusable given the current deficit."

Other scientists, however, admit that these three—and some other pork projects—have both scientific and social value. Yet they think the projects should not be funded through the DOE budget. Says Al Trivelpiece, director of Oak Ridge National Laboratory, "Part of what was behind the initiatives was that academic institutions in this country were frustrated in their attempts to revitalize their infrastructures and after the Columbia project they began to look to the energy and water bill as a way of doing it. But I think that funding a building at a third-party institution for a project that is not a direct part of the DOE program is a misuse of the department's prerogative."

■ ROBERT P. CREASE

Neuroscience at Risk at NSF

Just 2 years into Congress's "Decade of the Brain," neuroscientists—who might be expected to be riding high on the rapid pace of progress in their field—find themselves preoccupied with an unforeseen problem: a threat to neuroscience's very existence within the structure of its old ally, the National Science Foundation (NSF). Last month the NSF decided to split the units that fund biological and behavioral sciences, a move that upset neuroscientists who believe behavioral sciences to be a key part of their field (see *Science*, 18 October 1991, p. 368). And as if that wasn't worrisome enough, now comes news that the NSF is considering various reorganization plans for its biology unit, some of which recommend the dissolution of neuroscience as an entity.

"It would be the death of neuroscience for all intents and purposes at the NSF if they did the extreme thing of just atomizing it, and putting [our] proposals into programs having to do with molecular or cellular biology," says University of Arizona neurobiologist John Hildebrand, who chairs an advisory committee to the NSF for biology, behavioral, and social sciences. "It is antithetical to where neuroscience is going, which is toward understanding the neural basis of complicated behavioral phenomena, cognition, perception, and so forth."

Neuroscientists like Hildebrand are wondering why the NSF, having played a key role in the development of their field, would now decide to change its supportive stance. "A lot of the things that were revolutions in neuroscience were heavily supported at the outset by the NSF," points out physiological psychologist William Greenough of the University of Illinois at Urbana-Champaign. Critical advances such as the recognition of plasticity in the mature brain and the role of peptides as neurotransmitters were shunned at their early stages by the National Institutes of Health but eagerly funded by the NSF, says Greenough, thanks to a "good set of program directors... who had the knowledge of neuroscience, and the insight" to make enlightened decisions. "It would be unthinkable," adds Hildebrand, for the NSF to dismantle such a successful program.

But it doesn't seem to have been so unthinkable to those on a special NSF task force that last month proposed reorganization plans for biology, behavioral, and social sciences. "It is easy to read the task force report as basically recommending that... neuroscience as a unified entity would either cease to exist or be greatly reduced," says Greenough.

In response to the report, Greenough, a councillor for the Society for Neuroscience, along with fellow councillor Thomas Carew of Yale, and society president Robert Wurtz of the National Eye Institute, went to plead their case to Mary Clutter, NSF's assistant director for biology, behavioral, and social sciences, and the one who will make the final decision on the restructuring. The three weren't alone. Clutter says she has heard from "beaucoup neuroscientists... more neuroscientists than anything else."

While Clutter says she welcomes their comments, she makes it clear that she has not necessarily been swayed by them. "The NSF has in a sense protected [neuroscience] for the last 15 to 20 years," she told *Science*. "They have been given their own division.... We haven't done that for any other area."

It may, in Clutter's words, be time to "mainstream" neurobiology: putting cellular neurobiology in with other cell biology programs, developmental neurobiology with developmental biology, and so on. But the problem with that plan, counters Stanford developmental neurobiologist Carla Shatz, is that "the brain has unique problems that are not shared by other systems."

Indeed, neuroscientists insist the issue is not one of funding levels—which Clutter says will not suffer—nor of protection of their field from mainstream competition, but rather of the intellectual recognition of neuroscience as a multidisciplinary field with the unifying goal of understanding the brain. "We are not asking for more money," says Yale's Carew, "We are just saying don't rip us up—don't dissociate the discipline. Neuroscience... has to keep its integrity or it loses the thing that defines it."

Whether neuroscience as an entity will survive the reorganization at NSF may still be up in the air: Clutter is playing her cards close to her vest. "I'm considering everything," she says. "I haven't made up my mind in advance." On 31 October, after this issue of *Science* went to press, Clutter was to meet with the advisory committee headed by Hildebrand, to hear recommendations from working groups within the NSF. She will make her decision, she says, by the end of November. Until then, neuroscientists are waiting anxiously, hoping their message has been heard.

■ MARCIA BARINAGA