(Continued from page 368)

wide policy issues like the comprehensive nuclear test ban treaty, nonproliferation, energy technologies, climate change, and electricity restructuring," says physicist and DOE Undersecretary Ernest Moniz. The $4.5 billion nuclear stockpile stewardship program is central to the proposed treaty, he says, and DOE efforts to work with Russia to limit proliferation of weapons have earned widespread praise. Although Congress is unlikely to support an Administration plan to spend $330 million more for energy technologies in connection with climate change, the request has raised the profile of energy issues.

Fourth is President Bill Clinton's push to increase spending on civilian basic science. In addition to being welcome news for managers like Krebs and Moniz—who was brought in last fall to oversee the department's science and technology programs and the DOE labs—the campaign has meant increased White House attention to DOE. Vice President Al Gore, for example, visited Oak Ridge National Laboratory in Tennessee in February to announce plans for the $1.3 billion Spallation Neutron Source, and Peña was one of five Cabinet-level officials who joined Gore at a February briefing on the Administration's R&D initiatives.

### Plodding progress

But although DOE's financial and political outlook is far sunnier today than in 1995, its internal problems have not gone away. An inspector general's report released last week criticized DOE for failing to coordinate R&D efforts across the department. And the Government Accounting Office (GAO), in an upcoming study requested by the House Science Committee, is expected to fault the department for relying on self-regulation in running its own facilities rather than following federal environmental, safety, and health regulations devised by other agencies.

DOE officials admit that R&D efforts are poorly coordinated but say they have a pilot program to follow external regulations. They also cite steps such as linking contractor pay to performance, a more streamlined procurement system, and simpler safety regulations. "We were doing roughly an audit a day, and now we're down to a few a year, which is about right," says Oak Ridge director Al Trivelpiece.

Another GAO study for the committee that's due out this spring will criticize the department's progress in achieving the type of overall lab management reform that Galvin and others have proposed, sources say. "Don't expect dramatic change," says Curtis. "The political system only permits incremental improvements, and I don't think the system has a desire to change." Adds one former DOE official: "It is all tied to politics. If you try to close down the DOE field office in Albuquerque, [Senator Pete] Domenici [R–NM] won't let you."

Reforming the way DOE runs its labs may be Moniz's toughest job. One big problem is getting the issue onto an already crowded agenda. Subjects like waste cleanup and deregulation of the electric utility industry "are what make you toss and turn at night," recalls Curtis, leaving little time for back-burner topics such as lab management.

Although the labs have made progress in reducing their own red tape and improving ties with universities, they also share the blame, according to some observers. "The labs are pretty much responsible for their own goldbricking," says former Secretary O'Leary, citing stockpile stewardship's ballooning costs as an example of the labs' ability to influence their own programs. "It's the most inflated budget in town." Advocates like Moniz disagree, saying that the program has a solid technical basis and that its costs are reasonable.

Moniz does admit that DOE has made only "modest" progress on lab reform but adds that his plan to lay out clear missions for each lab is a necessary and important step in achieving reform. "It's like turning a big tanker," says Moniz. "It would be counterproductive and probably not possible to make dramatic changes in course." Adds one former DOE insider: "For any major change, you would have to have the president and Domenici agree."

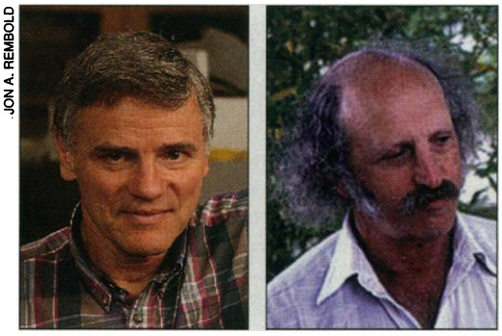
Although Moniz's appointment signals a new focus on DOE science that heartens R&D supporters, the department's future depends on Peña's successor. Deputy Secretary Elizabeth Moler is the favorite, but other names were emerging last week. Whoever is selected will have the chance to parlay a bigger budget, higher political profile, and bipartisan support for civilian and defense science spending into a level of respectability for the agency that was unthinkable just a few short years ago.

**–Andrew Lawler**

BIOMEDICAL RESEARCH

# Kansas City Institute's Big Plans

A new biomedical research organization is taking shape in Kansas City, Missouri, that may one day rival some of the world's large biomedical charities. On 9 April, the Stowers Institute for Medical Research announced a $125 million tax-exempt state bond for building construction. The money allows it to start renovating a 55,000-square-meter medical center in Kansas City, where it plans to house an initial staff of 100 (20 of them with Ph.D.s), possibly growing to 600. According to the institute's co-founder, financier James Stowers Jr., 74, the organization will focus on the genetics of development and growth, including cancer. It will not be involved in clinical studies but will concentrate strictly on "cutting-edge basic science."



JON A. REMBOLD

CALIFORNIA INST. OF TECHNOLOGY, PASADENA

**Prime movers.** Leroy Hood *(left)* and Eric Davidson are helping define the Stowers Institute's agenda.

For scientific leadership, Stowers has been relying heavily on geneticist Leroy Hood of the University of Washington, Seattle, and Eric Davidson of the California Institute of Technology (Caltech) in Pasadena, both members of the National Academy of Sciences. Hood, best known for his work in developing automated DNA sequencing, is the chair, and Davidson, who studies genes that control development, is a member of the institute's scientific advisory board.

Stowers and his wife Virginia, 68, are both cancer survivors, and, Stowers says, "that's what motivated us" to consider giving their wealth to medical research. "My wife and I wanted to give back something more than money to the people who made our success possible." They launched the institute in 1994 by donating shares in the investment company they founded, American Century Funds. In January 1998, J. P. Morgan & Co. bought an interest in the company, converting the donated shares into a $327 million cash endowment for the institute. The Stowerses plan to leave the remainder of their assets—currently estimated at more than $1 billion—to the institute upon their death. They hope others will make gifts, too. Stowers says if these funds grow as rapidly as those he's managed in the past, the endowment may be worth $30 billion in 25 years.

Stowers says the institute will open the doors on five well-equipped laboratories in Kansas City in January 2000. This center will collaborate with four extramural research sites—Hood's lab in Seattle, Davidson's at Caltech, the lab of T cell specialist Ellen Rothenberg at Caltech, and the lab of mouse geneticist George Carlson at the McLaughlin Research Institute in Great Falls, Montana. The Stowers Institute is already supporting these four, but Stowers says "we won't have any more" satellite groups. From now on, funding will be concentrated in Kansas City, where he has deep family roots.

Stowers says that, with Hood's advice, he has adopted a distinct scientific strategy. "We wanted to focus our efforts in one area and not be scatter-gun," he says, adding that he is "not interested in just literature; I want results." Stowers Institute scientists will work from an agenda set presumably by Hood and the scientific board. Their projects will develop in an interdisciplinary fashion, with a "systems approach" to acquiring new knowledge, Stowers says, adding that he agrees with Hood that they should work in teams and study entire systems as well as their parts. Davidson says, "You can't organize science, but we hope to find and recruit people" who are interested in "looking at the complex interactions of sets of molecules" using cutting-edge technology. His own lab will be part of a $2-million-a-year consortium funded by Stowers studying the sea urchin genome.

This coherent agenda will make the Stowers Institute different from other philanthropies like the Howard Hughes Medical Institute of Chevy Chase, Maryland, says Stowers. Hughes-funded researchers remain at their universities and, according to Stowers, "there's no focus" to the overall effort. Hughes Institute President Purnell Choppin, who says he welcomes the new institute, notes that the Hughes portfolio is focused in five broad categories of biology. And he says its approach is appropriate for its size: "If we were starting over again" to create an institute of 330 investigators—the current number—"we would still do it the same way."

One key to the Stowers Institute's success will be its ability to lure "the very best scientists" to Kansas City. Stowers—who overcame the skepticism of New York financiers to create his own mutual fund in 1958—is confident that he can repeat the performance in a new sphere. Besides, Stowers explains, "Lee [Hood] says if you have the best laboratory space, the best equipment ... and have the money to pay the scientists, they're going to come." That forecast will be put to the test in the next 2 years.

–Eliot Marshall

ECOLOGY

# Restored Wetlands Flunk Real-World Test

VINELAND, NEW JERSEY—To the untrained eye, a roadside salt marsh 8 kilometers south of downtown San Diego may look like any other urban wetland: a lush carpet of tall grass teeming with fish and birds. In fact, the 12-hectare plot in the Sweetwater National Wildlife Refuge is a kind of ecological counterfeit, created in 1985 to replace natural wetlands destroyed by construction projects. But restoration ecologists were unable to fool Nature. After intense scientific scrutiny, U.S. Fish and Wildlife Service (FWS) officials last January determined that the ersatz marsh has failed to attract light-footed clapper rails—an endangered bird for which it was supposed to provide habitat—and ordered the owner of the land, the California transportation department (Caltrans), to undertake further restoration work. "It was a mistake to assume that a constructed wetland would become equivalent to a natural system," says ecologist Joy Zedler of the University of Wisconsin, Madison, whose 10-year study of the Sweetwater marsh led to FWS's ruling.

R. WEBSTER/VIREO

**High living.** Light-footed clapper rails snubbed the short grass in a restored marsh near San Diego.

Setbacks at Sweetwater and many other sites came under the spotlight last week at a tidal wetlands meeting* here that questioned the assumptions now driving a wetlands restoration boom in the United States. The U.S. Department of Agriculture estimates that since 1982, restoration and creation projects have added more than 400,000 hectares of fresh- and saltwater wetlands to the nation's inventory. And last February, the Clinton Administration unveiled a clean-water initiative that calls for government agencies to aid efforts to create 80,000 hectares of new wetlands each year over the next decade. The plan says new marshes should be "functionally equivalent" to natural systems, meaning they should be as good as undisturbed wetlands at processing nutrients, storing floodwaters, and sheltering wildlife.

But ecologists are still debating whether it will be possible to churn out wetlands that work like the real thing. Some, including Zedler, worry that many wetlands engineers have failed to learn from past mistakes. Others are more optimistic, saying that projects considered failures today may still prove successful in time.

Such natural healing was the idea behind the Sweetwater marsh. Caltrans wetland designers assumed that once the site had been graded to the right slope and tidal flow had been restored, nature would slowly mold the marsh into a form that would support three endangered species—the clapper rail, the least tern, and the bird's beak, a small plant—that were being driven to extinction by Caltrans development. But it didn't work out that way. For one thing, Zedler and her research team, then at San Diego State University, discovered that Spartina cordgrass—transplanted from nearby wetlands to provide nesting sites for the clapper rail—refused to grow to 90 centimeters, the bird's preferred height. The problem, team member René Langis found, was the marsh's sandy, nutrient-poor soil. To fix that, colleagues Kevin Gibson and Kathy Boyer added nitrogen fertilizer, which spurred the grass to grow taller. But unpredictably, the added nutrients allowed pickleweed, another marsh plant, to outgrow the desired grass.

Zedler's team also found that Sweetwater accumulated less nitrogen and produced less organic matter than nearby "reference" wetlands. Overall, using 11 criteria—such as grass height and invertebrate counts—the researchers concluded in 1990 that the created wetland was at best less than 60% equivalent to a natural

* Concepts and Controversies in Tidal Marsh Ecology, 5–9 April.