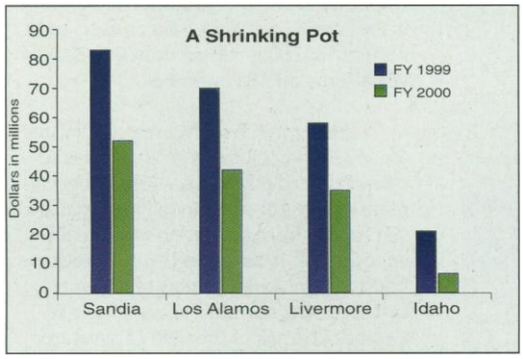
DOE LABS

Congress Shrinks Lab Chiefs' Flexible Funds

If you don't like the way an institution is run, go after its budget. Congress has just applied that logic to a special fund controlled by the directors of the Department of Energy's (DOE's) national laboratories, slashing the amount available for hiring young scientists and funding high-risk research. Four national labs, including the three nuclear weapons centers, have been hit especially hard by the reductions, which lab officials hope to reverse next year. Lawmakers say that some reprogrammed money has been mismanaged in the past and that the cuts are needed to keep the labs focused on priorities determined by Congress.

The accounting change restricts the flexibility that Congress gave lab directors in 1991, when it created an account called the Laboratory Directed Research and Development (LDRD) fund. The mechanism currently allows each lab to divert up to 6% of the funds it receives from the federal government and other sources to carry out relatively small research projects, usually costing from $25,000 to $500,000 per year. The money is awarded to lab scientists through a competitive process. Language in the 2000 DOE budget bill signed into law last month, however, would reduce the LDRD tax (divertible funds) to 4% and exempt environmental cleanup programs—a major piece of the budgets of several labs—from any tax.



Less discretion. Some DOE labs are reeling from cuts in a so-called "lab-directed" research account.

Although smaller DOE labs often do not impose the maximum tax for a variety of reasons, some of the larger labs, including the Los Alamos and Sandia nuclear weapons laboratories in New Mexico and the Lawrence Livermore laboratory in California, have used it to amass annual funds of $50 million or more (see graph). Lab administrators say the money has been essential for attracting young researchers with fresh ideas and for backing risky research, such as forays into materials and computer science, that have evolved into lab mainstays. "LDRD provides us with cherished freedom and creativity in basic research," says Dan Hartley, Sandia's vice president for laboratory development.

But LDRD spending has also attracted scrutiny—and criticism—from some members of the House Appropriations Committee. Representative Ron Packard (R–CA), chair of the spending panel that oversees DOE's budget, and other lawmakers are unhappy that LDRD siphons funds from programs Congress has approved, such as environmental cleanup efforts, and that some labs have funded projects of little relevance to DOE's mission. "The concern is that when you give a lab director $70 million to spend, it will be used for their priorities, not the nation's," says one House aide. Opponents of LDRD funding have pointed to internal DOE reviews over the last decade that have found instances of mismanagement of LDRD dollars and accounting practices that diverted more funds than were allowed under the rules. In past years the Senate has rebuffed House efforts to scale back or eliminate LDRD. But this year, after the House voted to cancel the program, Senate negotiators succeeded in restoring only part of the funds.

At Los Alamos National Laboratory, the change has produced a "traumatic" 40% cut in the lab's $70 million LDRD budget, which wholly or partly funds hundreds of scientists, says Klaus Lackner, acting associate director for strategic and supporting research. To avoid layoffs, he says the lab is shifting some scientists to weapons projects with more stable funding and focusing the remaining LDRD money on supporting young researchers and funding projects—such as those in the life sciences—unlikely to find backing elsewhere. "We started from the premise that postdocs must be able to go on," he says.

At Sandia, where LDRD funds have dropped from $83 million to $52 million, officials worry that the funding uncertainty could cause "some of our brightest, youngest people" to leave, Hartley says. Similar fears are being voiced at Livermore, which lost $23 million of its $58 million LDRD budget. "We are focusing our resources on protecting our long-term strategic investments," which supplement existing work in such areas as computing and the effects of aging on nuclear weapons, says Rokaya Al-Ayat, Livermore's deputy director for LDRD.

Also hard hit by the change was the Idaho National Engineering and Environmental Laboratory, which relies heavily on environmental cleanup funds that can no longer be taxed for LDRD funds. The lab's new director, Billy Shipp, is confident that he and DOE headquarters staff can find a way to continue many existing activities despite a cut from $21 million to $6 million, in part by getting congressional permission to use money from other programs.

Lab officials are also thinking about the best way to restore LDRD funding in next year's appropriations bill. Bill Appleton, Oak Ridge's deputy director for science, says scientists must convince House members that LDRD "is one of the few ways that the labs have of doing innovative research that has major payoffs down the line." At stake, say he and other lab officials, is their ability to attract the best talent and stay at the forefront of science. **–DAVID MALAKOFF**

PALEONTOLOGY

Fossils Give Glimpse of Old Mother Lamprey

Evolution went on a creative spree about 540 million years ago. Over the course of less than 20 million years during the Early Cambrian period, a huge diversity of animals appeared for the first time, including many of the major groups living today, such as arthropods, mollusks, and various sorts of worms. Notably missing from this party—known as the Cambrian explosion—was any member of our own lineage, the vertebrates. Until now the oldest unambiguous vertebrate fossils dated back 475 million years. But this week our genealogy took a giant leap back in time. Chinese and British paleontologists reported in *Nature* that they have found the fossils of 530-million-year-old vertebrates—fossils that have other paleontologists in awe. "I was absolutely amazed the first time I saw these fossils. They're just unbelievable," says Phillippe Janvier, a paleontologist at the Museum d'Histoire Naturelle in Paris who is an expert on early vertebrates.

You might expect that such ancient creatures would be primitive, transitional forms linking us to our pre-vertebrate past. Yet surprisingly, the fossils are actually full-fledged vertebrates—more advanced, in fact, than some vertebrates alive today. As a result, paleontologists think fossils of even older vertebrates must be waiting to be discovered, perhaps in rocks dating from well before the Cambrian explosion.

The two fossils come from a site in southern China called Chengjiang, already famous for its Cambrian treasures, where the fine-grained rock retains impressions of muscles and other soft tissues. "Chengjiang really takes your breath away," says Simon Conway Morris, a paleontologist at the University of Cambridge. After learning that two different teams of paleontologists, one led by Degan Shu of Northwest University in Xian, had unearthed the vertebrate fossils, Conway Morris

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