was the Permian-Triassic (P-T) boundary, a layer of rock marked by evidence of extinctions and a globally recognized shift in carbon isotopes. In tens of meters of rock laid down before the boundary, the researchers found sandstones filling broad channels, as if deposited by meandering rivers. Above the extinction bed, the river deposits are entirely different. They are typical of quick-flowing, "braided" river systems carrying large amounts of water and sediment in narrow, interconnecting channels.

The scene of the crime. Extinctions in 250-million-year-old rock (foreground) were followed by heavy erosion (lighter rock above and beyond).

CREDIT: P. WARD/UNIV. OF WASHINGTON, SEATTLE

The group's preferred explanation is the loss of the larger rooted plants, including the recorded extinction of the treelike seed fern *Glossopteris*, that held the soil in place, especially along stream and river banks. Montgomery can often see the same sedimentary transition when forests are clear-cut today. At the P-T boundary, it seems to have been global. "The pattern they see is matched beautifully in Australia and Antarctica," says Retallack, based on his own work. Everywhere the transition occurred, says Ward, "it was fast. This was a really rapid, short-term event."

The rapidity shows up best in marine sediments. In the 21 July issue of *Science* (p. 432), paleontologist Jin Yugan and his colleagues at the Nanjing Institute of Geology and Palaeontology in China and paleontologist Douglas Erwin of the National Museum of Natural History in Washington, D.C., showed that the devastating extinctions in the sea took place even faster than anyone had thought. Radiometric dating of the P-T outcrop at Meishan, China, had narrowed the generally accepted duration of the extinctions from millions of years to less than 500,000 years (*Science*, 7 November 1997, p. 1017). Now, by conducting a detailed census across the boundary of 333 species of everything from fish to microscopic foraminifera, they find that all the extinctions could have occurred in a single bad day 251.4 million years ago, says Erwin, just as many species clearly went extinct in a geologic instant 65 million years ago at the moment of an impact.

For the moment, an impact is just one of several contenders to explain the P-T extinctions. The most discussed of the possible earthbound causes centers on lavas known as the Siberian Traps, whose million-year-long eruption coincided with the P-T extinctions as near as radiometric dating can place them (*Science*, 6 October 1995, p. 27). Four other extinctions, both major and minor, have now been linked in time with huge basaltic lava eruptions like that of the Siberian Traps (*Science*, 18 August, p. 1130). So far, however, no one has found a decisive link between cause and effect.

To shorten the list of potential mass murderers, researchers are combing the P-T geologic record for clues. In south China, Jin and his colleagues reported, the spike in carbon isotopic composition precisely coincides with the extinctions. It may mark a collapse of biological productivity in the sea in parallel with the ecological disaster on land. Other researchers have reported a huge spike in the amount of fungal remains around the world. The spike, which begins just before the extinction in south China, may be a sign of massive decay on land. So far, however, the big picture refuses to snap into focus. The Siberian eruptions could be behind all this, says Erwin, but "it's still difficult to pin down the extinctions to a single mechanism."

–RICHARD A. KERR

FRENCH SCIENCE

New CNRS Chief Hopes to Deliver on Science

PARIS—For years, French research ministers have prodded the nation's scientists to make their research pay off for society. But that message has been slow to sink in. Last week, the government gave the assignment to a biologist who has done exactly that, but who believes that the carrot works better than the stick.

Geneviève Berger takes charge of the CNRS with orders to nudge France's basic research agency out of a malaise stemming from a steady decline in research funding, the graying of the agency's scientific cadre, and debates over how best to reform the $2.2 billion behemoth (*Science*, 30 July 1999, p. 647). "The CNRS has been slipping for several years," says chemist Pierre Potier, a former government science adviser. "Madame Berger is very courageous to agree to lead it."

As director of the CNRS Laboratory of Parametric Imagery in Paris, in the early 1990s Berger co-invented the first instrument to use ultrasound to visualize human bones. The device is now used worldwide for diagnosing osteoporosis. "I would find it

ScienceScope

Help Wanted The United Kingdom may open its borders to droves of foreign high-tech workers. Worried that the nation's economic engine may begin to sputter as record-low unemployment rates make it harder for businesses to find qualified workers, the government next week plans to unveil a proposal to relax its strict immigration laws.

Current law limits foreign workers to temporary stays in the country. The new plan would allow up to 100,000 skilled workers a year to permanently move in and fill jobs in fields such as information technology and teaching, the *Sunday Telegraph* reported on 3 September. Conservative lawmakers, however, are already taking shots at the proposal, arguing that the current rules are sufficient to sustain the boom.

Biomedical Balance The National Institutes of Health (NIH) shouldn't encourage universities to churn out any more biomedical scientists—but it should strive for greater balance in how they are trained, a new National Academy of Sciences report recommends. Currently, the agency's National Research Service Award (NRSA) training program gives grants to universities to help roughly 7000 graduate students a year pursue multidisciplinary studies. Twice that number get NIH funds through grants to individual researchers, who then hire students to work on specific projects.

In the future, however, the proportion of students drawing money from each funding pot should be about equal, concludes *Addressing the Nation's Changing Needs for Biomedical and Behavioral Scientists*, the 11th report in a series that began in 1975. By gradually shifting funds from more focused assistantships to broader NRSAs, NIH can better train researchers able to bridge the gaps separating disciplines, says the report committee, led by medical professor Howard Hiatt of Harvard Medical School in Boston.

NIH officials generally agree with the goal and are considering guidelines that would "encourage" universities and investigators to fund more generalized training, says agency training officer Walter Schaffer. But in an unusual addendum to the report, psychologist John Kihlstrom of the University of California, Berkeley, warns that the behavioral sciences may get short shrift without further reforms. The panel, he says, did not fully consider "the actual and potential contributions that the behavioral and social sciences can make to health and health care."

Contributors: Bernice Wuethrich, David Malakoff, Richard Stone

Berger. Journal citations aren't the be-all and end-all.

more satisfying that there are thousands of such machines distributed because of my research than to be cited thousands of times in the scientific literature," Berger told *Science*. Still, the invention is the fruit of years of fundamental research, she notes, adding that "there is a continuum between basic and applied research, not a division."

Berger, 45, has spent the last 9 months as technology director in the Ministry of Research under research minister Roger-Gérard Schwartzenberg, who proposed her for the CNRS post. Whereas Schwartzenberg's predecessor, Claude Allègre, leaned heavily on CNRS researchers to spend time in the universities and industry and wanted to tie promotions to such activities, Berger says that "mobility should be encouraged by promotions, but in no case should researchers [who do not move] be penalized."

Berger's political baptism will come later this month after the government unveils its 2001 budget proposal, and researchers are rooting for her. "Berger is a first-class scientist," says Etienne-Emile Baulieu, a lab director at the biomedical agency INSERM and the inventor of RU-486, the so-called "abortion pill." She "will be very good for the CNRS."

–MICHAEL BALTER

JAPANESE BUDGET

Big Hikes Sought for Life Sciences, IT

TOKYO—Genomics, information technology, and ocean drilling are the big winners in the proposed 2001 budget for Japan's major science agency. The requests, submitted this week, indicate the government's continued commitment to science and technology despite flat overall spending for the fiscal year beginning next April.

The increase "reflects the feeling among our political leaders that [science budget] increases are needed to secure the country's economic future," says Nobuhiro Muroya, deputy director of planning for the Science and Technology Agency, which in April will become part of a new Ministry of Education, Culture, Sports, Science, and Technology. The growth also erases fears among many scientists that the government would shift its focus after having achieved a 5-year goal last year to double the country's spending on science and technology, to 17 trillion yen ($162 billion). The overall science budget, which includes several other agencies, won't be known until later this month, and it won't be finalized until December.

One of the biggest jumps within the new superministry is in the life sciences, where spending at research institutes and on large projects will rise 25% to $963 million. The increase particularly benefits the Genomic Sciences Center at RIKEN (the Institute of Physical and Chemical Research), where the budget will nearly double, to $152 million. The center plans to accelerate its work on the structural analysis of human proteins and to launch a new bioinformatics group.

The requests for 2001 also point to a heavy investment in information technologies. A program to connect all the nation's universities in a high-capacity, high-speed communications network is seeking an 8% increase, to $406 million. Funding for research into next-generation networks and communications technologies would more than double, to $411 million.

Funding for the ocean drilling program (*Science*, 13 November 1998, p. 1251) would rise by nearly 12%, to $79.5 million. The centerpiece of the program is a $350 million drill ship with expanded capabilities. The funding increase "means we now have the entire budget needed to complete the drill ship," says Takeo Tanaka, head of the ocean drilling program at the Japan Marine Science and Technology Center. The boost in next year's budget also provides funds to operate the ship after its completion in 2004, and to plan a scientific program that will begin in 2006.

Not all scientific efforts are faring so well, however. The National Astronomical Observatory failed to win construction funds for an array of millimeter and submillimeter radio telescopes jointly planned for the Atacama desert of northern Chile by the United States, Europe, and Japan. But Masato Ishiguro, director of the project for the observatory, hopes for money in time to begin work in 2002.

–DENNIS NORMILE

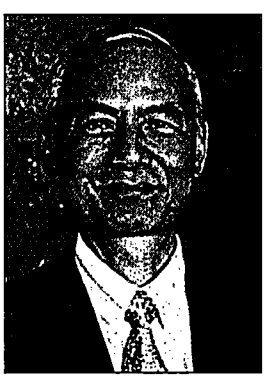
CIVIL LIBERTIES

Academies Fault Reno Over Handling of Lee

The already tangled tale of Wen Ho Lee, the nuclear weapons physicist jailed for allegedly copying classified information from computers at Los Alamos National Laboratory in New Mexico, took another twist last week. While federal judges feuded over whether the suspect should be released to home detention before his trial, the country's scientific establishment attacked Attorney General Janet Reno over the way Lee is being treated.

On 31 August the presidents of the nation's preeminent science academies released an open letter that blasts Reno. Lee has been "a victim of unjust treatment," say the presidents, since he was jailed last December following a yearlong investigation into possible spying at Los Alamos. The letter—signed by Bruce Alberts of the National Academy of Sciences, William Wulf of the National Academy of Engineering, and Kenneth Shine of the Institute of Medicine—also complained that Reno had failed to respond to two earlier letters inquiring about his treatment, including alleged restrictions on contact with his family and the use of shackles while in solitary confinement. A one-page letter that they received in May from a Department of Justice (DOJ) official "was not a satisfactory response," they said. Noting the academies' efforts on behalf of political prisoners in other countries, Wulf told *Science* that even some repressive foreign regimes "had done a far better job" of answering routine letters protesting the treatment of jailed scientists.

But Wulf says the trio might not have publicly raked Reno over the coals had they known about another letter that DOJ sent to a workers' advocacy group at Lawrence Livermore National Laboratory in California. Two weeks before the academies released their letter, DOJ senior counsel Richard Rogers sent the Society of Professional Scientists and Engineers (SPSE) a three-page discussion of Lee's treatment, including assurances that he was shackled only when being moved and was allowed visits from his family. The letter, which responded to an SPSE letter protesting Lee's treatment, "is much more explicit than the one we got," Wulf said after receiving a copy from *Science*.



Captive. Wen Ho Lee's treatment in jail draws fire.

Rogers says that "it's unfortunate" that a copy wasn't sent to the academies. He says he is "sorry about" the oversight and isn't sure why it occurred.

DOJ may be able to make amends with its next letter. Wulf and his colleagues also want to know how the government plans to punish an FBI agent who apparently gave misleading testimony at a court hearing last year that led a judge to jail Lee pending his trial, scheduled to start in November. Last week the judge ruled that Lee could go home, a step widely seen as a blow to the government's case. A few days later, however, a higher court unexpectedly stepped in to block the release, sparking what is likely to be another lengthy—and confusing—round of wrangling over Lee's fate.

–DAVID MALAKOFF

CREDITS: (LEFT TO RIGHT) CNRS; AP PHOTO/CBS-TV