awardees return to previous levels anytime soon. "It's a very complicated problem, and it takes time to learn how to do it right," he says. "I don't do anything right the first time, but I keep learning." –JEFFREY MERVIS

PALEONTOLOGY

Earliest Animals Growing Younger?

For paleontologists, finding the most ancient example of an animal in the fossil record is usually a triumph. But sorting out a recent claim about the earliest traces of multicellular animals is turning out to be an ordeal instead. Citing ancient fossil worm tracks from central India, researchers last fall pushed the age of the first animals back from 600 million years old to a startling 1.1 billion years. But claims and counterclaims later tugged the apparent age of animals back and forth between truly ancient and more conventionally old. In the latest set of twists, reported last month at a workshop in Lucknow, India, new radiometric dates nudged the pendulum back toward a relatively young age—about 620 million years—for the fossil tracks. At the same time, workshop participants firmly rejected the fossil evidence originally used to suggest a younger age.

Stones of contention. Small structures in these rocks may be mere artifacts, or small fossils that disprove a claim of very ancient animals.

The traces in question are squiggly furrows from the Vindhyan basin, which paleontologist Adolph Seilacher of Yale University and his colleagues attributed to half-centimeter-thick worms (*Science*, 2 October 1998, p. 19). Seilacher's group came up with the stunning 1.1 billion year age from published radiometric dates on mineral grains from sedimentary rocks containing the burrows. But geochronologists quickly pointed out that the mineral grains could have been eroded from much older rock before being deposited as sediment.

So sedimentologist Dhiraj Mohan Banerjee of the University of Delhi and geochronologist Wolfgang Frank of the University of Vienna have used a different dating technique, based on the decay of potassium to argon, on volcanic ash that fell from the sky shortly before the putative worm-track sediments formed. "All these samples gave consistent ages close to 620 million years," says Frank. Although there are complications in dating these rocks, "I am absolutely confident we can reject the very old age of 1.1 billion years."

Even so, the new dates are not the final word. Frank and Banerjee analyzed chunks of rock rather than single mineral grains, a procedure that geochronologist Paul Renne of the Berkeley Geochronology Center in California calls "a little bit scary." Renne explains that whole rock may contain older or younger mineral grains, which could skew the result, and weathering may have allowed some of the rock's argon to escape, making it seem younger than it is. Seilacher also sounds a note of caution. "All of us have to think about the validity of our data," he says, "whether they be radiometric dates or fossils."

Although geochronologists may be moving toward a younger age, paleontologists at the workshop rejected the original challenge to the tracks' antiquity, published last fall by paleontologist Rafat Jamal Azmi of the Wadia Institute of Himalayan Geology in Dehra Dun, India. Azmi claimed to have used weak acid to extract "small shelly fossils" characteristic of the early Cambrian period—about 545 million years ago—from limestone laid down after the worm burrows. However, after firsthand inspection, three British paleontologists rejected the fossils as artifacts created by chemical alteration of the rock (*Science*, 6 November 1998, p. 1020).

At the workshop, none of the specialists on hand could be convinced that Azmi's fossils were actually formed by living creatures. "Azmi has lost the battle," says paleobiologist Vibhuti Rai of the University of Lucknow, one of the organizers of the workshop. What's more, says Banerjee, 15 workshop participants who subsequently accompanied Azmi to his collection sites were shocked to find that the "limestone" that was the purported source of his fossils is actually a porcellanite, a siliceous volcanic rock that would not dissolve in even strong acid. That raised the question of where the "fossils" came from.

Azmi concedes he erred in identifying the rock, but says he now thinks that his maceration and acid extraction methods somehow extracted fossils from small layers of shale within the porcellanite. Indeed, one paleontologist, Rai, says that this week he was able to extract some fossil-like structures from the rock, although he says they are artifacts, not true fossils.

Such news has made some Indian paleontologists uneasy, as they remember the professional embarrassment suffered in the late 1980s when Vishwa Jit Gupta, then at the Panjab University in India, was accused of passing off fossils from around the world as being from the Himalayas (*Science*, 21 April 1989, p. 277). Rai and other Indian paleontologists are standing by Azmi, saying that the problem may be only contamination of samples or a misinterpretation of data on Azmi's part. –RICHARD A. KERR

With reporting from Pallava Bagla in India.

U.S. WEAPONS LABS

Security Fears Prompt Computer Shutdown

Thousands of researchers at three Department of Energy (DOE) laboratories got an unexpected break from their computers last week thanks to the continuing controversy over the alleged Chinese theft of U.S. nuclear secrets. DOE officials abruptly suspended classified computing operations at the Los Alamos, Sandia, and Livermore national laboratories in New Mexico and California on 2 April and herded more than 20,000 employees—including many not involved in secret projects—to briefings on improving safeguards. Although some researchers say the time out was a necessary distraction, others worry that it could lead to new rules that will make the labs' computers harder to use but not necessarily more secure.

The unprecedented "stand-down" cut off access to all computers containing classified information and idled two of the world's fastest supercomputers while lab officials prepared new security plans. The action marked DOE's most dramatic response so far to critics in Congress, who say that lax practices have led to the theft of classified information (*Science*, 26 March, p. 1986).

The surprise training came a few days after DOE delivered a report to Congress outlining cybersecurity lapses at several labs, including the transmission of classified files over unsecured e-mail networks. In releasing that report, done annually, Energy Secretary Bill Richardson said DOE would be working to close gaps in its com-

CREDIT: PALLAVA BAGLA

puter defenses, although the agency says its classified databases have not been breached.

Still, lab employees were surprised by the far-reaching shutdown, which the three lab directors reportedly proposed to Richardson in late March. Indeed, when one Los Alamos researcher heard rumors of the plan, he "thought it was an April Fool's joke," he said. Like others interviewed by *Science*, he requested anonymity because of the tense political atmosphere.

The extent of the shutdown varied by laboratory. Los Alamos and Livermore idled their Blue Mountain and Blue Pacific supercomputers, which run simulations of nuclear weapons' explosions. At Sandia, however, researchers were able to keep running some nonclassified programs, such as weapons safety models, on Sandia's Red supercomputer and allied machines. "The nonclassified work goes on," says lab spokesperson Rod Geer.

Keeping busy. DOE's security stand-down didn't disrupt Sandia software engineer Ron Brightwell's nonclassified work.

During the pause, staff members at Los Alamos and Livermore, which do the bulk of the nation's secret weapons science and also have classified contracts with law enforcement and intelligence agencies, were required to attend or view broadcasts or video tapes of a security briefing. Lab director John Browne led the 90-minute Los Alamos briefing, which featured descriptions of potential threats and prevention measures. Employees with security clearances also attended additional sessions that took up to a day to complete, according to lab sources. Although Sandia managers only required attendance of staff with some connection to secret material, that group included artists who create images for classified projects.

In some briefings, lab officials asked employees for ideas on how best to accomplish nine security goals set by DOE, including making it impossible to transfer classified information from secured to unsecured computer networks. The agency also wants to reduce the number of people with access to highly classified information, institute more rigorous scanning of e-mail, and require two or more people to approve file transfers.

Lab scientists had mixed reactions to the stand-down. One Livermore researcher called it "distracting" but said security "is an issue that can't be ignored." However, others fear that DOE may go too far in erecting barriers to electronic data transfer. "They may overreach if they think they can make it physically impossible to transfer classified information ... without impairing everyday activity," says one Los Alamos scientist. Another computer researcher wondered if the proposed measures "will make life more difficult for a spy—or for us."

The classified computers were expected to be back in service this week once Richardson signs off on the three labs' new security protocols. But Browne reassured his staff that the new plan won't crimp science. "We can't raise the bar so high we can't get any work done," he said in a prepared statement. "That affects national security, too."

–DAVID MALAKOFF

CREDIT: (TOP) SANDIA

STEM CELL RESEARCH

NIH Plans Ethics Review of Proposals

The National Institutes of Health (NIH) last week inched forward on its commitment to fund research on human embryonic stem cells despite a barrage of criticism from the antiabortion movement. Some researchers believe very early stem cells will be valuable for research and as a source of human transplant tissue; others say it's inappropriate to use any material taken from aborted fetuses or unwanted embryos. In addition, more than 70 members of Congress have told Secretary of Health and Human Services Donna Shalala that language in an appropriations bill forbids support for studies of human embryonic stem cells.

Mindful of the controversy, NIH director Harold Varmus has offered a technical solution. Appearing on 8 April before a special panel of advisers in Bethesda, Maryland, Varmus proposed that an outside committee review grant proposals to square them with criteria set by Congress. Essentially, the NIH would block funding of research that involves direct use of embryos or aborted fetuses but permit some carefully vetted research on stem cells derived from these sources. An outside body would examine highly rated grant proposals and approve only those that comply with NIH's guidelines.

The 13-member advisory panel assigned to help draft the rules—chaired by molecular biologist Shirley Tilghman of Princeton University and Ezra Davidson, associate dean of the Charles R. Drew University of Medicine and Science in Los Angeles—took no immediate action, but heard comments from critics and supporters of the NIH plan. One opponent, Richard Doerflinger, a staff representative of the U.S. National Conference of Catholic Bishops, argued that federal officials were wrong to make a distinction between embryos and stem cells derived from embryos, and that doing research on either destroys human life. Representatives of the Society for Developmental Biology, the American Society for Cell Biology, and the National Alliance for Aging Research were among those who spoke up for the NIH plan.

The Davidson-Tilghman panel considered adding some terms to the NIH guidelines that might make the process of screening grants more intricate. They proposed, for example, that legal restrictions already in force on the use of fetal tissue also be adapted to stem cells. And the panel seemed ready to require any researcher receiving federal funds for embryonic stem cell research to certify that donors had given proper consent for the use of their embryos.

Meeting this standard could be difficult, one observer says, because scientists are not likely to know where the embryos came from or how consent was obtained. Furthermore, donated embryos typically come from clients of private fertility clinics, which are not covered by federal rules on informed consent. Although documenting ethically correct

Co-chairs. Ezra Davidson and Shirley Tilghman head panel devising guidelines for stem cell research.