skeptical that the deluge altered the course of civilization. "I'm certain we have a flood," says Pitman. "But did it cause a diaspora? We can only speculate."

Now some of this speculation will be put to the test. In July, a team from several institutions—including the Massachusetts Institute of Technology (MIT), Ballard's Institute for Exploration (IFE), the University of Pennsylvania, and the Archaeological Museum in Sinop, Turkey—plans to use sonar to plumb the murky waters off Sinop for signs of settlements. A preliminary survey last July turned up promising results, says expedition coleader David Mindell of MIT, who organized the conference on deep-sea archaeology (see p. 929) where these findings were unveiled. According to Mindell, a side-scan sonar dragged from a hired fishing vessel revealed "shapes that are too large for a shipwreck and too regularly shaped to not be manmade" in coastal water 60 to 80 meters deep. If more probing by sonar indicates that the shapes are the remains of settlements, Mindell says, the team will use standard techniques—sediment coring and magnetometry, for instance—to date them. To test the theory fully, researchers will put on their detective hats and try to trace the hasty retreat of these erstwhile Black Sea dwellers—a migration that, if it happened, may be tied to the surge of farming across eastern Europe around the time of the flood.

The effort is the fruit of a budding collaboration between Ballard and archaeologist Fredrik Hiebert of the University of Pennsylvania, Philadelphia, to look for a deep-sea trade route between Sinop and ports along the Black Sea's northern coast. "I was like a kid in a candy store when Bob laid down a map of the Black Sea and said, 'Where shall we go?' " recalls Hiebert, who had begun land excavations around Sinop 3 years ago. The duo saw great potential for the preservation of artifacts—shipwrecks and other relics—in the Black Sea's oxygen-free waters below about 200 meters. "The anoxic bottom conditions make the waters rich with archaeological potential found nowhere else on Earth," says Mindell.

But after last summer's sonar survey, the team now thinks that there might be more sensational relics closer to shore. When Ballard, whose IFE is footing part of the expedition's cost, saw the grainy images of possible settlements, says Mindell, "he told me, 'This is the next *Titanic*.' " This summer, before going into deep water, the team will probe for near-shore settlements.

The researchers say they aren't out to prove the veracity of the biblical flood story, in which Noah and his family built an ark and rounded up two of every creature on Earth. "Noah's flood is not a testable hypothesis," says Hiebert. "We will test whether there was a strong level of occupation in the [Black Sea] basin when the sea level was low." Of course, there is one way to test the Noah story directly, jokes Mindell: "We could look for pairs of animal skeletons, too." —RICHARD STONE

AIDS

Cheap Treatment Cuts HIV Transmission

CHICAGO, ILLINOIS—A large study spanning three African countries has provided the strongest evidence so far that a relatively cheap and simple drug treatment can reduce the spread of HIV from infected pregnant women to their babies. The so-called PETRA trial also showed that one variant of the treatment is ineffective, a conclusion that the researchers say they could only have reached because they compared three different treatment regimens to a placebo. In 1997, the trial came under attack by critics who called that strategy unethical.

Funded mostly by the Joint United Nations Program on HIV/AIDS (UNAIDS), the trial involved 1792 HIV-positive pregnant women in South Africa, Tanzania, and Uganda who volunteered to test the ability of the anti-HIV drugs AZT and 3TC to prevent transmission. A preliminary analysis of tests conducted on 1326 babies at 6 weeks of age, presented here by Joseph Saba of UNAIDS at the largest annual U.S. AIDS conference,* showed that two types of treatment were effective. The most intensive strategy—in which the mothers were treated with the two drugs from the 36th week of pregnancy through 1 week after delivery and the baby was treated for 1 week—reduced the risk of transmission by 50%. Only 8.6% of the babies became infected, compared with 17.2% in the placebo group. Starting the same treatment at the onset of labor, they found, resulted in a transmission rate of 10.8%—a 37% reduction in risk. "This is a very important finding for developing countries," said Saba, noting that poor women often do not seek health care until labor begins. [A smaller study in Thailand last year indicated that treating the mother with AZT for 4 weeks before delivery cuts the risk of transmission by 50% (*Science*, 27 February 1998, p. 1299).]

Critics of the PETRA trial—including the consumer advocacy group Public Citizen and *New England Journal of Medicine* editor Marcia Angell—argued that a 1994 study conducted in the United States and France had made further use of placebo testing unethical. That study indicated that treating the mother with AZT for an average of 11 weeks before birth, coupled with an intravenous drip of the drug during labor and treating the baby for 6 weeks after delivery, could reduce HIV transmission from 25.5% in the control group to 8.3%—a drop of nearly 70%. Although critics of the PETRA trial acknowledged that this intervention is too expensive and cumbersome for poor countries, they contended that it should be used as a yardstick against which simpler regimens should be tested (*Science*, 16 May 1997, p. 1022).

The PETRA researchers point out, however, that such a study could have led to a wrong—and dangerous—conclusion. A third arm of their study, in which the mother was treated when she went into labor but the baby was given no treatment, saw a transmission rate of 17.7%—better than the 25.5% rate seen in the untreated arm of the 1994 study. If that study had been the only point of comparison, the researchers might have concluded that the so-called intrapartum treatment worked. But in the PETRA study, the transmission rate in the placebo group was about the same as in women who got the treatment. "You would never have seen without a placebo control that intrapartum alone does not do anything," says virologist Jaap Goudsmit of the University of Amsterdam, a principal investigator of the study.

Peter Lurie of the Public Citizen Health Research Group, the lead critic of these trials, says such arguments boil down to the ends justifying the means. "The question always will be, 'Could we have gotten to this point in

HIV TRANSMISSION FROM MOTHER TO BABY

Treatment	No. of babies tested	No. HIV+	% infected	% reduction in risk
From 36 weeks to 1 week postpartum; baby treated for 1 week	359	31	8.6	50
From onset of labor to 1 week postpartum; baby treated for 1 week	343	37	10.8	37
From onset of labor to delivery; no treatment of baby	351	62	17.7	0
Placebo	273	47	17.2	0

SOURCE: J. SABA *ET AL.*

* 6th Conference on Retroviruses and Opportunistic Infections, 31 January to 4 February, Chicago, Illinois.

a way that was more protective to the patient?' " says Lurie, an M.D. who studies ways to slow HIV's spread with behavioral interventions. Lurie adds that "I don't think the intrapartum treatment made any sense from the get go." He contends that these drugs take several days to build up to levels high enough to have an impact, so giving them just hours before delivery and not treating the baby would not be expected to work.

Lynne Mofenson, a pediatrician at the National Institute of Child Health and Human Development who has been involved with many of these transmission studies, scoffs at this. "He doesn't know what he's talking about," says Mofenson. Studies have shown that AZT is quickly transmitted from a pregnant mother to her infant, she says, and although it may take a few days to reach "peak" levels of drug in the blood, that does not prevent it from working right away. "There was good reason to think that the intrapartum regimen might be effective," says Mofenson. "Many of us were very sorry to see it didn't work."

These results are not the last word from the PETRA study. About 70% of the mothers enrolled in the study breast-feed—another route of HIV transmission—so the researchers will analyze transmission rates again when the babies are 18 months old.

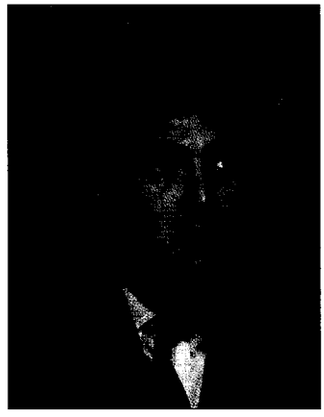
–JON COHEN

NUCLEAR PHYSICS

MIT's Bates Lab Gets Sudden Reprieve

Massachusetts Institute of Technology (MIT) officials say they were "shocked" last Monday to learn that the Department of Energy (DOE) planned to end its support of the university's Bates Linear Accelerator Center. Although they knew the facility, part of the school's nuclear science laboratory, would be vulnerable in a tight budget, they were optimistic that money would be found to keep it running. But there was no mistaking the message: The shutdown was mentioned several times in the president's budget request, released on 1 February.

Shock quickly turned to elation, however. Within minutes of the budget's formal release, Energy Secretary Bill Richardson was on the phone to MIT President Charles Vest explaining that the department had changed its mind. The proposed budget for fiscal year 2000 would be amended to continue support for the 30-year-old facility, the secretary told Vest, including funds for a new detector to study the magnetic properties of atomic nuclei. Instead of spending $2.5 million next year to decommission the accelerator, DOE now plans to request $14.5 million for the Bates Large Acceptance Spectrometer Toroid (BLAST) and for other experiments that will keep the lab running until 2004 or 2005. It is not clear, however, where DOE will find the additional money in a budget that holds funding for high-energy and nuclear physics essentially steady. And congressional appropriators still get the last word.



Bates and switch. Energy Secretary Richardson quickly rewrote last week's budget request to fund MIT's Bates lab.

By all accounts, Richardson, a former Democratic congressman from New Mexico and good friend of the president, made a unilateral decision. The original plan to close Bates followed a recommendation from DOE's Nuclear Science Advisory Committee (*Science*, 16 October 1998, p. 389) that other facilities should receive priority in a tight budget. Department R&D managers had accepted the advice and decided to concentrate scarce resources at the department's new flagship nuclear physics facility, the Thomas Jefferson National Accelerator Facility in Newport News, Virginia. White House budget officials had even mailed letters, in response to inquiries from concerned scientists, saying that the budget would contain money only to decommission the lab. "Bates will cease operations at the end of FY 1999," notes DOE's FY 2000 budget document, "and fabrication of the BLAST detector is discontinued."

But even as those words were being readied for publication, says Martha Krebs, head of DOE's Office of Science, Richardson was reviewing the decision to close Bates. Krebs says she learned about the reversal for the first time on Tuesday morning—1 day after she had briefed the media on a research agenda that did not include Bates. Several factors were working in the lab's favor, she noted: "They're doing good science, they train a lot of students, and MIT is managing the facility effectively. In addition, it's the only university-based accelerator that DOE supports." In the end, Krebs says, "the Secretary decided that [flat funding] should not be a limiting factor in whether or not to operate Bates."

Richardson's phone call meant a last-minute wardrobe change for MIT's dean of science, Robert Birgeneau, who was scheduled to be the bearer of bad tidings during a visit to the lab Tuesday afternoon. "I had picked out a black tie to reflect the somber message I would be conveying," he says. "After President Vest called, I decided to switch to a pink shirt and brightly colored tie."

A dimmer view of the reversal comes from Claus-Konrad Gelbke of Michigan State University in East Lansing, chair of the Nuclear Science Advisory Committee. "The operation of Bates would be impossible at the president's budget request [for nuclear physics]," he says. "I just hope that they aren't planning to solve the problem by taking the money from Peter to pay Paul."

And although the new plan may be good news for the lab's 85 staff members and collaborators, even its supporters say that Richardson's sudden change of heart reflects poorly on the department's decision-making process in setting scientific priorities. "I've never seen anything like that in my 28 years here," says one science lobbyist. "In the end, I think they did the right thing. But it makes DOE look pretty bad."

–JEFFREY MERVIS

SOLAR PHYSICS

SOHO Learns the Cruder Arts of Navigation

Like an explorer forced to rely on landmarks after losing his compass, the Solar and Heliospheric Observatory (SOHO) is now taking its cues from the sun thanks to an innovative solution to an equipment failure that had threatened to end the spacecraft's mission. SOHO's latest problem began on 21 December, when the last of its three gyroscopes failed (*Science*, 8 January, p. 155). But last week, ground controllers at NASA's Goddard Space Flight Center in Greenbelt, Maryland, beamed aboard SOHO a jury-rigged software program that has reoriented the spacecraft. By relying on a sun sensor instead of the gyroscopes, engineers say, the craft should be able to keep its bearings for at least four more years.

After the gyroscope failure, the craft started spinning slowly and tripped into a safety

Steady eye on the sun. Image from SOHO probe.

CREDITS: (TOP) SAM KITTNER; (BOTTOM) SOHO/EIT