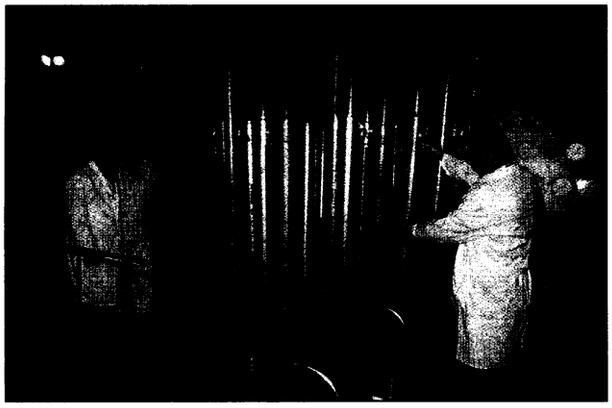
city. According to Stanford University historian David Holloway, author of the book *Stalin and the Bomb*, "Secrecy was such in the 1970s that it would have been covered up."

The Kurchatov Institute was at the heart of the Soviet Union's atomic weapons program in the 1940s, but it moved over to civilian research in the 1950s when weapons research was transferred to the secret nuclear cities in eastern Russia. Today, the Kurchatov, which is now one of Russia's State Research Centers, is home to seven research reactors. Dmitry Parfanovich, a leading researcher at the Kurchatov, told the International Conference on Nuclear Criticality Safety in Versailles that the most serious blast occurred on 26 May 1971. At the time, Parfanovich was working in the research area close to one of the institute's critical nuclear assemblies—a basic feature of a nuclear reactor. "It all happened because the structure of the critical assembly was very fragile," Parfanovich told *Science*.



Secret's out. Researchers working on a nuclear safety installation at the Kurchatov Institute.

At about 4:00 p.m., experiments at this reactor had been completed and researchers were in the process of shutting it down. This involved draining the assembly of water, which was used as a moderator. Standard procedure required the water to be drained slowly and carefully, but on that day, Parfanovich recalls, the workers were in a hurry and they used a large emergency drain at the bottom of the tank. The rapid removal of the water moderator caused the structure to heat up, creating excess pressure that buckled the base of the reactor. As a result, uranium rods came out of their sockets and dropped out of the bottom of the assembly onto the floor below, where they created a critical mass. There was a flash of radiation, then the rods melted and changed their configuration, so the reaction stopped again.

Although the blast lasted only milliseconds, Parfanovich said a technician standing nearby received a dose of direct radiation amounting to 6000 Roentgen. He died the next day of a heart attack. A researcher received more than 2000 roentgens and died 2 weeks later. Another two researchers received 800 to 900 roentgens and were saved through extensive medical treatment, but their health suffered as a result. Other staff were protected by a concrete shield and received insignificant doses.

All personnel working in the building were evacuated, and routine radiation checks revealed that some had radioactive iodine on their clothing. Vladimir Asmolov, head of the Institute for the Control of the Safe Use of Nuclear Energy (a part of the Kurchatov center), recalls that some young researchers who had contaminated clothes deliberately evaded the security and simply waited for the level of radioactivity to go down. They went drinking in an apple orchard on the grounds of the institute, which had been planted by its founder, Igor Kurchatov, "father" of the Soviet bomb. (Kurchatov liked to demonstrate the safety of his institute by eating apples from the trees.) Despite the rumors of radioactive clouds floating across downtown Moscow, Parfanovich said no emissions were traced outside the research area.

The whole incident was kept secret, even from researchers in other branches of the institute. Most knew that an explosion had taken place but had no idea of its severity. Similarly sketchy details had leaked out of another weaker blast which had happened about 3 months earlier. In this case researchers were unaware there was anything wrong with the reactor until they noticed a blue light illuminating the ceiling. Parfanovich reported that two researchers received a dose of about 1000 roentgens, and one of them later had his feet amputated.

Parfanovich told the Paris meeting that there were a total of five such blasts in research centers during the Soviet era. Asmolov thinks that the atomic research institutes and the nuclear power industry that grew out of them nevertheless had a good safety record, but that standards are now slipping. "Greater openness now about the past serves as a signal that they are trying to address safety issues seriously today," says Holloway. However, safety concerns now keep all the research reactors at the Kurchatov idle, and even the director of the Institute, Evgeny Velikhov, favors moving them outside Moscow.

–VLADIMIR POKROVSKY

Vladimir Pokrovsky is a writer in Moscow. Additional reporting by Richard Stone.

VIROLOGY

On the Track of Ebola's Hideout?

One of the many unsolved riddles about the Ebola virus is where the deadly organism hides in between outbreaks in humans. Now, for the first time, virologists may have found traces of the virus's genetic material in small ground-dwelling mammals near areas of previous epidemics. Experts welcome the findings, announced last week, but point out that it is still too early to celebrate the discovery of the Ebola reservoir.

Ebola, which first surfaced in 1976 in Congo and Sudan, causes vomiting, diarrhea, and copious internal and external bleeding. The virus kills up to 85% of its victims, and there is no known treatment. Recent epidemics have spurred an intensive search for an animal host that might support the virus, but so far to no avail. Although many species can be infected experimentally with Ebola, those captured in the wild have not had detectable levels of the virus. Some researchers speculate that the animal reservoir must be in a secluded area—deep in a rain forest, perhaps, or high in a tree canopy—whose animals have been hard to sample.

Unconvinced that local animals are spared by Ebola, Marc Colyn of the University of Rennes in France looked at animals from a variety of habitats near previous outbreaks of the disease. His team screened 242 animals, including several species of rodents, shrews, and bats, that had been captured in the Central African Republic. The researchers detected no live virus or viral antigens, but when they used a more sensitive screen—the polymerase chain reaction—they managed to pull fragments of the Ebola genome from seven animals: one shrew and six rodents from three different species. Then when they examined spleen tissue slices from these animals under the electron microscope, they saw tubular structures that looked exactly like the inner core of Ebola virus particles. "These structures are most likely defective [virus] particles

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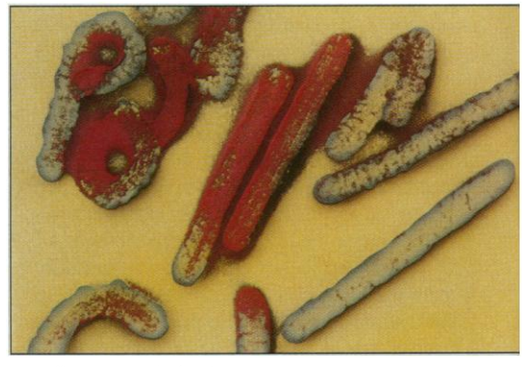


Deadly agent. Ebola virus.

that don't contain the full-length Ebola genome," says Vincent Deubel of the Pasteur Institute in Paris, who announced the group's findings at an institute retreat.

Virologist Albert Osterhaus of the Erasmus University Hospital in Rotterdam notes that it is still unclear whether these particles, if confirmed to be Ebola, indicate that the animals could harbor the infectious virus. But the study suggests that "animals in a much more accessible habitat [than the deep rain forest] have definitely been in contact with Ebola," says Osterhaus.

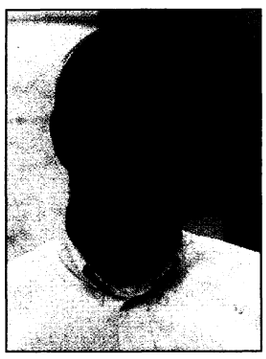
Others say the study raises more questions than it answers. The researchers "have found traces of Ebola in about 3% of the most common species around. Yet when an epidemic occurs it can usually be traced back to a single [infection]. So why don't we see more [human or primate] outbreaks if so many animals are infected?" asks Clarence Peters of the Centers for Disease Control and Prevention in Atlanta. But Peters welcomes any contribution that may help pin down the elusive Ebola hideout. "People are continually testing various hypotheses. And they should be, because it's an extremely important issue," he says.

–MICHAEL HAGMANN

SCIENCE PUBLISHING

PNAS to Join PubMed Central—On Condition

PubMed Central, a free archive of research reports planned by the National Institutes of Health (NIH), reached a milestone last week when it signed up an important contributor: the *Proceedings of the National Academy of Sciences* (*PNAS*). *PNAS*'s overseer—the governing council of the National Academy of Sciences in Washington, D.C.—voted on 13 October to donate full-text research articles to PubMed Central starting next year. The move follows a similar decision in September by the American Society of Cell Biology, which publishes *Molecular Biology of the Cell*. Both will allow PubMed Central to release their papers on the Internet after a brief postpublication delay. The academy council also added important conditions, one of which is that everything else in PubMed Central be peer reviewed, contrary to NIH's original plan to include unreviewed material.



Charter member. *PNAS* editor Nicholas Cozzarelli.

CREDIT: (RIGHT) DARESBURY LABORATORY

PNAS editor Nicholas Cozzarelli, a molecular biologist at the University of California, Berkeley, says "*PNAS* is proud to be one of the charter members of PubMed Central," which he views as "a major advance for science." Cozzarelli was an early supporter of the project, conceived by NIH director Harold Varmus and several colleagues earlier this year (*Science*, 3 September, p. 1466). Although some other journal editors are concerned about the possible loss of journal income, Cozzarelli says: "We have an obligation to take a leadership role for the good of science," and "we do not foresee a significant economic impact on *PNAS* for the next few years." In addition to releasing its reports 4 weeks after publication, Cozzarelli says, *PNAS* aims to give PubMed Central copies of "all of our research content back to 1990."

The academy council placed several restrictions on the agreement, however. It set a 1-year limit on the experiment, ruled out any commercial use of *PNAS* material, and insisted that authors not be charged fees for participation in PubMed Central. In addition, the academy said that participation "is contingent upon [PubMed Central] not including" unreviewed submissions or "reports that have been screened but not formally peer reviewed," a phrase Varmus used earlier in describing how some of the material would be vetted for publication. The outlet for non–peer-reviewed reports, according to the academy, "must be completely separate."

David Lipman, director of NIH's National Center for Biotechnology Information and developer of the PubMed Central plan, sees this as no big problem: "We had always planned" to build a wall between the peer-reviewed and the non–peer-reviewed parts of the Web site, he says. He adds, "Virtually all of the potential participants that have contacted us have been interested in the peer-reviewed component." He aims to come up with a name for the unreviewed section soon.

As planning for PubMed Central continues, a private company has announced plans to launch a Web-based biomedical publication in an unspecified field that would use PubMed Central as its distribution network. Huntington Williams III, CEO of the Community of Science, a private outfit sponsored by Johns Hopkins University in Baltimore, says the proposed journal will conduct all of its editorial work, including peer review, through the Internet. Rather than making money on author charges or subscriptions, the company plans to sell Web-based advertising that will "frame" the contents on the Community of Science Web site, which will include reviewer access to papers under review. Final reports would be deposited on PubMed Cen-

ScienceScope

Crozemarie Guilty A French court this week sentenced Jacques Crozemarie, former president of France's Association for Cancer Research (ARC), to 4 years in prison and a $250,000 fine for his role in a scandal that nearly bankrupted one of Europe's leading medical charities. The 74-year-old defendant will remain free while his lawyers mount an appeal.

Crozemarie and two dozen other defendants allegedly siphoned off $50 million from the charity, which once spent about $60 million a year on research (*Science*, 9 February 1996, p. 750). But after the scandal broke in 1996, grants nearly dried up, rebounding to $40 million this year. The guilty verdict may help boost that total, ARC president Michel Lucas, a former government inspector who exposed the scandal, told French TV station LCI. "Donors have told us they would start giving more once there was a judgment," he said.

Diamond Desire Tension is rising as researchers in the United Kingdom compete for DIAMOND, a next-generation synchrotron source. Most scientists had assumed the $290 million machine, which will allow researchers to study the atomic structure of everything from proteins to ceramics, would replace the current Synchrotron Radiation Source at the Daresbury laboratory near Manchester. But this summer the Rutherford Appleton Laboratory near Oxford surfaced as a contender.

The competition marks the newest twist in DIAMOND's 6-year history. Financing problems had put the project—the biggest single investment in British science in 15 years—on hold. Then, last summer, the charitable Wellcome Trust pledged $184 million to get construction started, with the British and French governments supplying the rest (*Science*, 6 August, p. 819). But instead of speeding things up, Wellcome's involvement "opened up the site issue again," says Susan Smith, a scientists' union representative at Daresbury. If DIAMOND ends up in Oxford, she fears her lab could close. Where Secretary of State Stephen Byers will decide to place the scientific jewel, however, won't be known for at least a few more weeks.

Contributors: Pallava Bagla, Constance Holden, David Malakoff, Michael Balter, Michael Hagmann