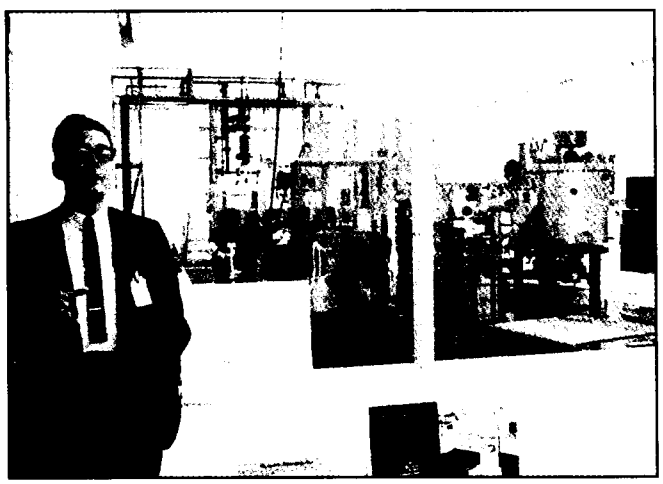
ASTROBIOLOGY

Returning Alien Rocks Right the Second Time

The first time astronauts brought rocks and soil back from the moon, efforts to protect Earth from possible contamination were "a travesty," says meteoriticist John Wood. Exposures to Apollo lunar material meant that if anything pathogenic had come with them, "we'd have been in bad trouble," says Wood, of the Harvard-Smithsonian Center for Astrophysics in Cambridge, Massachusetts. To do it right the next time—when Mars rocks are returned as early as 2014—researchers need to start deciding now how to handle extraterrestrial samples both safely and cleanly, according to a report* released last week by the U.S. National Research Council (NRC).



A flawed first try. The complex vacuum chamber used to contain the first Apollo moon rocks proved unreliable and unnecessary.

The challenge of avoiding infecting Earth with any ET life or dirtying Mars samples with terrestrial materials will require a quarantine facility "unlike any in existence," says Wood, who chaired the NRC committee. "It's not an insurmountable task, [but] we need to get started."

Memories of Apollo's troubles heightened the urgency. At the Lunar Receiving Laboratory (LRL) in Houston, "there was not really enough time to do what needed to be done," says Wood. When samples arrived in 1969, tight schedules and NASA's stress on astronauts' convenience combined to make contamination happen. The hatch was popped open while the Apollo capsule was still bobbing in the Pacific, and a leak in the receiving lab sent 11 exposed people into quarantine with the astronauts. Others fled the area to avoid guards charged with enforcing quarantine rules, according to the report.

Although the first Mars sample return won't have astronauts to contend with, it will require a receiving facility more stringent than any now used to contain exotic killers like the Ebola virus. In biological containment facilities, the chamber containing the biological agent is kept below atmospheric pressure so that the inevitable leaks will let outside air in but prevent anything inside from getting out. In a clean room designed to keep samples pristine, the reverse is true. The room is held at a higher pressure to keep chemical contaminants out. But any Mars sample receiving lab must "simultaneously achieve biological containment and clean room conditions in one facility," says Wood.

The challenge of keeping anything from getting in or out while examining Mars samples mandates 7 years of planning and construction before the samples arrive, the NRC committee concludes, plus whatever time is first required to sort out the technical problems. That means starting now, the committee says, even if the first samples don't get here until 2014. With the LRL's lapses in mind, the committee also recommends that NASA keep it simple this time around—no chilling the samples to Mars temperatures or keeping them at martian atmospheric pressure. NASA welcomes most of the committee's recommendations, says NASA's planetary protection officer, John Rummel. "I would hate to think we'd make the same mistakes" as Apollo workers, he says, "and this report gives us some good guidelines to avoid them." –RICHARD A. KERR

* www.nap.edu/books/0309075718/html/index.html

SMITHSONIAN INSTITUTION

Director of Natural History Museum Quits

The director of the world's most visited museum has resigned to protest a planned reorganization that would separate the museum's scientific and educational roles. Robert Fri, who heads the Smithsonian Institution's National Museum of Natural History in Washington, D.C., said in a memo to his staff on 28 May that he cannot commit to the proposed changes. He plans to step down by October.

About three-quarters of the Smithsonian's 425-member scientific staff are based at the

ScienceScope

Stretching Out India may become the latest outpost for the Massachusetts Institute of Technology's (MIT's) high-tech Media Lab. The Indian Cabinet last week approved $16 million for the Media Lab Asia project, which hopes to join MIT and India's information technology ministry in what could eventually become a 10-year, $1.25 billion technology development push. A new multidisciplinary research center, to be opened later this year in a new facility outside Mumbai, will be a pilot project modeled after the original Media Lab in Cambridge, Massachusetts, and one established last year in Dublin, Ireland.

The Media Lab, founded in 1985, has worked on everything from virtual reality gear to nimble robots. Indian officials hope such creativity will help public-private research teams invent technologies that will be relevant to everyday life in rural areas.

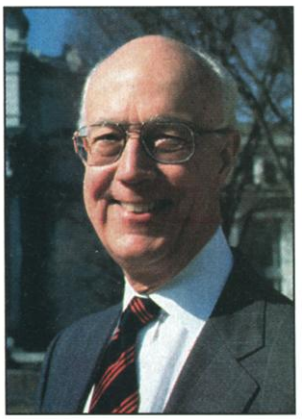
ReFlux Can the Fast Flux Test Facility (FFTF) survive another near-death experience? In 1996 and again this year, Department of Energy (DOE) officials decreed that the research reactor, which has sat idle on Washington state's Hanford nuclear reservation since 1992, be dismantled (*Science*, 1 December 2000, p. 1666). But last month Energy Secretary Spencer Abraham gave the reactor a reprieve, pending a review of its potential uses by physicist Mike Holland of Brookhaven National Laboratory in Upton, New York.

A lengthy review completed just last year concluded that producing medical isotopes for cancer treatment and plutonium for space batteries wasn't worth the $314 million needed to restart the reactor and $58 million annually to operate it. But FFTF supporters convinced Abraham that the study overlooked income-generating possibilities.

Holland's report is due in July, but critics already are furious. "This is essentially a huge illegal waste of money," says Gerald Pollet, director of the Seattle-based environmental group Heart of America. He charges that the turnabout violates DOE contracts and diverts funds from Hanford cleanup projects. If Holland recommends restart, Pollet predicts that DOE will face a gauntlet of lawsuits from environmentalists and Oregon and Washington state officials, who oppose reopening the facility.

Contributors: Wayne Kondro, Jocelyn Kaiser, Constance Holden, Dennis Normile, Robert Koenig, Pallava Bagla, Robert F. Service

CREDITS: (TOP TO BOTTOM) J. A. WOOD; DOE



Leaving. Robert Fri says he can't commit to the Smithsonian's reorganization plan.

Natural History Museum, including geologists, anthropologists, paleontologists, and systematic biologists, as well as technicians who manage the museum's extensive collections of rocks, plants, animals, and artifacts. Many of these researchers have been up in arms in the 2 months since the new Smithsonian secretary, Lawrence Small, proposed closing some research units and reorganizing scientific activities into several centers of excellence (*Science*, 13 April, p. 183; 11 May, p. 1034).

Under the new plan, the role staff scientists would play in the museum's exhibits and other educational activities is unclear. Researchers are now actively involved in the design and content of museum exhibits and public programs, and the public has always "recognized exhibits as the veneer with the research and collections behind them," says David Dilcher, an evolutionary biologist at the University of Florida, Gainesville, who is on the museum's advisory board. "If you cut the threads that pull these three things together, then what will become of natural history at the Smithsonian?"

Fri, who led the museum for 5 years, said he could not implement Small's proposed plan: "I do not feel that I can make that commitment enthusiastically," he wrote in his memo. In a prepared statement, Small paid tribute to Fri's contributions but had no comment about his reasons for resigning. Fri's replacement has not been named.

Museum staff members were disappointed by Fri's decision. "He has been a good manager. He has brought stability that we had not had at the museum," says Smithsonian paleontologist Brian Huber. But they weren't surprised. Both Dilcher and advisory board member Emilio F. Moran, an anthropologist at Indiana University, Bloomington, said Small had excluded Fri from the planning process for some time. "Many of us are very concerned about the very top-down, nonconsultative approach of the secretary," says Moran.

Small's proposal to shift the museum's research into a separate administrative center, says Dilcher, will leave the museum a "skeleton devoid of the energy of the scientists." He says he understands why Fri apparently does not want to become the caretaker of these bones. **–ELIZABETH PENNISI**

CANCER RESEARCH

Transatlantic War Over *BRCA1* Patent

PARIS—It was not the usual press release hyping a scientific discovery. Last week, when a French–U.S. team reported a newly identified mutation in *BRCA1*, a human gene linked to elevated risk for breast and ovarian cancer, the Institut Curie announced the result with a broadside against Myriad Genetics, a Salt Lake City, Utah–based biotech firm. Myriad holds at least 17 patents worldwide on the use of *BRCA1* and a related gene, *BRCA2*, and has developed an automated test for mutations in these genes. But because the test doesn't pick up defects like the newly identified mutation, Curie claimed, it represents "a potential danger" to French cancer patients.

The attack is the opening volley in a battle over the right of Myriad—which earlier had won a hard-fought battle over its patent position in the United States—to market its test in Europe (*Science*, 12 December 1997, p. 1874). The Curie and 16 other labs are considering a challenge to a European patent awarded to Myriad last January for *BRCA1* and *BRCA2* applications. Officials at Myriad—whose researchers played a key role in the discovery of both genes—have vowed to protect their intellectual property.

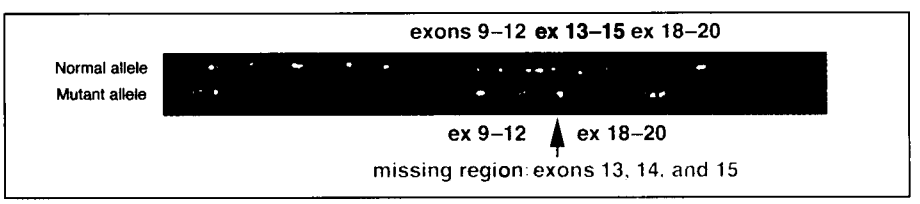
Mutations in *BRCA1* and *BRCA2* are thought to be responsible for up to 10% of all breast cancers. A team led by Curie geneticist Dominique Stoppa-Lyonnet describes the new mutation—a deletion of three exons, or coding regions, in *BRCA1*—in this month's issue of the *Journal of Medical Genetics*. They discovered the mutation in a patient at Cedars-Sinai Medical Center in Los Angeles who had been diagnosed with breast and ovarian cancer, as well as in other women in her family. She had previously been tested with Myriad's BRACAnalysis technique, which uses automated sequencing to scan for mutations and deletions. But Myriad's test does not detect large-scale DNA deletions or rearrangements, and it failed to pick up any *BRCA1* or *BRCA2* mutations in the patient.

The Curie-led team identified the three-exon deletion (covering 11,600 DNA base pairs) using a technique called combed DNA color bar coding. The technique was developed in 1994 by Aaron Bensimon, a co-author on the *Journal of Medical Genetics* paper, and his Institut Pasteur colleagues. Pasteur has patented the technique, which consists of stretching out DNA strands on treated glass and visualizing their structure with fluorescent molecular probes. In the paper, the team argues that such large-scale alterations—several of which have been identified over the past 3 years—may account for as much as 36% of all *BRCA1* mutations, and that the Pasteur technique should be considered as an alternative or supplement to Myriad's test.

That's where the Curie's attack on Myriad comes into play. Myriad's European patent, and several it has pending, may make it impossible for European clinicians to use the Pasteur technique for *BRCA1* and *BRCA2* testing, Stoppa-Lyonnet contends. "Their patent gives them the right to demand a monopoly," she says. The dispute reflects a broader concern among many European researchers that current interpretations of European patent law allow biotech and drug companies to put a lock on the use of human genes (*Science*, 23 June 2000, p. 2115).

Myriad officials counter that the French criticisms are off base. "If there is a technique that can detect a mutation not detected by our test, we are not stopping anyone from getting that test done," says Greg Critchfield, president of Myriad Genetic Laboratories, a subsidiary that markets BRACAnalysis. However, if Myriad were to develop techniques to detect large deletions and rearrangements, the company would have the exclusive right to use them, Critchfield claims. "What gives [Curie] the right to take over our discovery?" he asks. "A company has to protect its intellectual property rights."

France's Genetics and Cancer Group—a network of 17 labs, including the Curie, that conduct *BRCA1* and *BRCA2* testing using a variety of methods—is discussing a legal challenge to the patent Myriad received in January. This "opposition" procedure must be filed within 9 months of the award of a patent—in this case, no later than October. Stoppa-Lyonnet says that the group will decide whether to file an opposition "in the coming weeks." **–MICHAEL BALTER**



Patently obvious? A previously undetected mutation in the *BRCA1* gene has sparked patent row.

CREDITS: (TOP) SMITHSONIAN INSTITUTION/NATIONAL MUSEUM OF NATURAL HISTORY; GAD *ET AL.*, *JOURNAL OF MEDICAL GENETICS*, JUNE 2001