

**ON THE RECORD**

**“Some never make a pregnancy, some die before term, some die of disease, some live but are large. And some are just fine — those are the real mysteries.”**

Reproductive biologist Mark Westhusin describes the lottery of cloning. He brought the first cloned cat and deer into the world. The first cloned dog is reported on page 641.

**“This hair sample could not have come from the hairy bipedal animal that was reportedly sighted in Teslin last week.”**

Geneticist David Coltman dashes hopes of proving Bigfoot's existence, after mitochondrial DNA from hair found near a suspected sighting produced a 100% match with bison sequences.

**SCORECARD**

**Room to think**  
Between 2001 and 2003, the floor space dedicated to scientific research at US colleges and universities rose 11% to 16 million square metres, making it a real growth area.

**Remains of the day**  
Fossil hunters could soon get a chance to seek signs of life on Mars. NUGGET, an instrument proposed by NASA, would use neutron beams to peer inside rocks and draw three-dimensional images of any remains within.

**NUMBER CRUNCH**

NASA TV is taking over the world...

**50,000** The peak number of simultaneous webcast streams sent out by NASA for the Mars Rover landings in January 2004.

**118,000** The peak number of streams sent out for the Deep Impact mission on 4 July 2005.

**433,000** The peak number of streams sent out for the space shuttle launch on 26 July 2005.

Source: NASA

## Shadow hangs over research into Japan's bomb victims

On 6 and 9 August 1945, nuclear bombs dropped by the United States flattened the Japanese cities of Hiroshima and Nagasaki. The explosions killed 120,000 people; at least twice as many have since died from the effects of being exposed to radiation.

The attacks changed the political landscape for ever, but they have also made a major impact on science. The Radiation Effects Research Foundation (RERF) laboratories in Hiroshima and Nagasaki have tracked more than 80,000 survivors of the bombings, and the knowledge gained now forms the basis of our understanding of how radiation causes cancer, as well as the radiation protection standards used in hospitals and nuclear facilities. Yet 60 years on, uncertainties over US funding, and the foundation's ageing facilities, are causing fears about the future of a project that is still far from the end of its scientific life.

Over the past six decades, researchers at RERF have collected vast amounts of data from surveys, health examinations and biological samples, providing a resource for epidemiologists around the world. The survivors were a normal slice of the Japanese population. And unlike subsequent disasters such as Chernobyl, where some of the exposure came later through environmental contamination, almost all the radiation was delivered when the bomb detonated, making it easier to estimate each person's dose.

“We are talking about the biggest epidemiological study ever conducted,” says Yuri Dubrova, an expert on the effects of radiation on the human germline at the University of Leicester, UK. “The data from RERF produced information that is still the gold standard in terms of cancer studies. This is ongoing and astoundingly important research.”

Charles Land of the US National Cancer Institute in Bethesda, Maryland, says that with some 45% of survivors still alive, the most useful information may be yet to come. “There's still a lot to learn,” he says. “As the exposed population ages, there is going to be a lot more information coming from the survivors.”

Studies over the past decade or so are also starting to suggest that exposure to radiation increases the risk of many diseases besides

cancer, and that there may be no safe dose for treatments such as radiotherapy (see ‘Fallout beyond cancer’, below).

But despite the project's value, many experts are worried about its future. The foundation's budget has been around ¥3.8 billion (US\$33.8 million) for several years. Until 1996, half of that came from the United States, but its contribution has dropped to 38%.

Then last year, the US Department of Energy (DoE) suggested cutting its annual contribu-

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tion. Full funding was eventually delivered four months late and is guaranteed for another two years, but some are edgy that a similar situation could arise again. “Let's hope the DoE doesn't try any more of the tricks it did last year,” says Mark Little, an epidemiologist at Imperial College London. “It's vital they keep going for the foreseeable future.”

Little has worked with data from RERF for the past 15 years, and was lead author of a letter sent to *The Lancet* last year in protest at the proposed budget cuts (M. P. Little *et al. Lancet* 364, 557–558; 2004). He says that the foundation's facilities in Hiroshima, housed in prefabricated huts built in 1949, are run down. Roofs leak and leaves blow into labs. There are also staffing problems. “There have been significant departures of epidemiologists,” says Little. “They are struggling

### Fallout beyond cancer

Over the past decade, it has become clear that those who witnessed the Hiroshima and Nagasaki bombings do not just face an increased cancer risk. They also have higher rates of high blood pressure, stroke, and liver and kidney problems, among others.

When first identified in the early 1990s, some doubted that these effects were real, as there was no obvious way for radiation to cause such diseases. But more data have strengthened the evidence and the effects are now widely accepted. Around 4,500 survivors have died of heart disease since the bombs, for example, and 100 of these are associated with the radiation.

“We've been discovering what in the past would have been unthinkable as damage from radiation exposure,” says Kazuo Neriishi, who