RADIATION BIOLOGY

NAS to Lose Contract for A-Bomb Study

Just months shy of the 50th anniversary of the atomic bombing of Hiroshima and Nagasaki, the U.S. Department of Energy (DOE) has upset radiation biologists studying its lingering effects. DOE has decided to remove the National Academy of Sciences (NAS) as co-administrator of the Radiation Effects Research Foundation (RERF), the body funded jointly by the United States and Japan that has been conducting long-term studies of atomic-bomb survivors. The move has prompted concern about the future of a collaborative research effort into the health effects of radiation that has lasted more than 40 years.

New P.I. Geoffrey Howe.

Columbia University is expected to take over the U.S. portion of scientific management of RERF, which was created in 1975 as the successor to the U.S.-run Atomic Bomb Casualty Commission and has monitored the health of 120,000 people who survived the blasts. DOE itself is expected to assume financial management of the $18 million U.S. share of RERF's running costs, which previously was given to NAS to administer. A proposal from Columbia has completed a series of departmental reviews and is awaiting the signature of Tara O'Toole, DOE's assistant secretary for environment, safety, and health.

RERF scientists were informed about DOE's plans in the past 2 weeks. Last weekend, during a stormy meeting at the organization's headquarters in Hiroshima with Harry Pettingill, director of DOE's Office of International Health Studies, many of the foundation's American and Japanese staff scientists expressed concern about the move. They argued that if DOE plays a greater role in RERF's management, the foundation's scientific independence and credibility could be damaged.

In an interview with *Science*, Pettingill said that the department's decision was motivated by two main concerns: the need to reduce what DOE viewed as NAS's high overhead costs in running RERF, and a desire to "expand the scientific capability of RERF" by turning it into a "center of excellence" closely aligned with American universities. "The academy wasn't equipped to do this kind of thing," Pettingill says. "Maybe someone [else] could do a different job."

John Zimbrick, the NAS official directly responsible for RERF matters, takes exception to this rationale. "We could have put together an excellent program," he says. And in an exchange of letters between DOE Assistant Secretary O'Toole and NAS President Bruce Alberts in December and January, which *Science* has obtained, Alberts offered a point-by-point refutation of the department's arguments for ending the academy's 48-year role in RERF. Nevertheless, NAS officials insist that they will do nothing to hinder a smooth transition to Columbia University, which is slated to take over this fall.

NAS officials are openly disappointed by DOE's decision, however. "We believe that we remain uniquely qualified to oversee the RERF," says Paul Gilman, executive director of the academy's commission on life sciences. And a number of radiation experts told *Science* that they share the worries of their colleagues in Japan about compromising RERF's ongoing scientific work. "I am very concerned because the [atomic-bomb survivor study] is the major radiation study in the world today," says epidemiologist Elaine Ron of the National Cancer Institute. "The NAS has brought integrity to RERF, because most people think of the NAS as a high-quality organization without any political aspects." Warren Sinclair, past president of the National Council on Radiation Protection, adds that he "would not have personally contemplated what DOE is doing," adding that NAS has been a "good scientific buffer" between RERF and the U.S. government.

According to epidemiologist Itsuzo Shigematsu, chair of RERF, this buffer effect has been critical in gaining the trust and cooperation of the atomic-bomb survivors. "They can cooperate with the NAS because it has a peaceful purpose," he says. If DOE takes a greater role, Shigematsu adds, "they will never cooperate in the same way." Or, as one NAS official put it privately, the academy's involvement has "protected the Japanese people from the idea that they are being investigated by the successor to the agency that bombed them."

University of Toronto epidemiologist Geoffrey Howe, who is moving to Columbia and will be principal investigator on the RERF project, says that Columbia—which was chosen in part because of its strong reputation in radiobiology—will continue to play the role of "buffer between the DOE and RERF." Howe, who all parties to the dispute agree is a highly qualified and respected scientist, says that "if DOE said we had to do this research and that research, I wouldn't take the contract."

One large unknown remains, however: the reaction of the Japanese. As *Science* went to press, Shigematsu was writing to the Japanese Ministry of Health and Welfare requesting an inquiry into whether DOE's action violates the U.S.–Japan agreement for administering the foundation. Says Sinclair: "Changing this arrangement after more than 40 years is certainly going to upset the Japanese side."

–Michael Balter

ECOLOGY

Fishermen Threaten Galápagos

Early in the afternoon on 3 January, several fishermen armed with clubs and machetes took researchers and their families hostage at Darwin Research Station, a small laboratory on Santa Cruz Island in the Galápagos. The *pepineros*—who fish for sea cucumbers, or *pepinos*, that lie in beds off the Ecuadoran coast—said they were desperate: The government of Ecuador had just prohibited them from fishing off the Galápagos, in response to protests from scientists and tour operators who claimed the *pepineros* were harming one of the world's most fragile, and famous, ecosystems. Carmen Angermeyer, a resident of Santa Cruz, the main Galápagos island, recalls that Ecuadoran TV broadcast a chilling interview with a man in a mask, who "said if they did not get what they wanted, blood would flow."

Bloodletting, at least from humans, was avoided when troops arrived to free the hostages and remove the *pepineros* from the area. But sea cucumber beds are dangerously overfished, scientists say. And several Galápagos tortoises and sea lions were reportedly killed or mutilated prior to the occupation, according to Macarena Green, a biologist based in Quito, Ecuador, whose account of the events was forwarded to scientists over the Internet last week. Many researchers reading the dispatch now worry that the flotilla of fishermen an-

LA CONSERVACIÓN DE GALÁPAGOS

Innocent bystanders. Local fishing activity may harm habitats of Galápagos animals such as these tortoises.

chored off the islands may have introduced mainland rats and other species to some Galápagos islands, endangering the unique species that flourish there. "Galápagos is facing an ecological crisis," warns Matt James, the Sonoma State University marine paleontologist who posted Green's distress signal.

The troubles began early last year, when biologists began finding slaughtered tortoises, some "hung from trees," Green told *Science*. Locals blamed the *pepineros*, who, Green says, were trying to force the government to allow them to harvest the rich sea cucumber beds of the Galápagos, most of which is a national park. The sea cucumbers, sushi delicacies, fetch a nice price upon export. The government bowed to the demands, opening Galápagos waters to harvesting on 15 October for a 3-month trial period. It set total catch limit at 550,000 sea cucumbers, but "no effective controls and enforcement were ever applied," claims Johannah Barry, an official of the Charles Darwin Foundation Inc., which raises funds for Darwin Station. The foundation estimates the *pepineros* took at least 6 million sea cucumbers in just 2 months. The Ecuadoran press began airing concerns about overharvesting, and as public criticism mounted, the government halted the sea cucumber season on 15 December, a month early, say Green and other scientists who work in the Galápagos.

According to the Darwin Foundation, which got its reports from station personnel, 3 weeks later several armed *pepineros* stormed the park service office and the research station. Ecuador sent troops and government officials to negotiate, and initially agreed to reopen the waters to fishing; the *pepineros* released their hostages and left. But under pressure from environmental activists and from its own Ministry of Information and Tourism, which feared the loss of tourist dollars, the government reversed its decision on 12 January and said it would prohibit sea cucumber harvesting until October 1995.

All is quiet on the Galápagos at the moment. But researchers are worried that the government is considering opening a 4-month lobster season on 1 February. San Francisco State University biologist Robert Bowman, a longtime Galápagos researcher, argues that such an action would effectively declare open season on sea cucumbers again because, he says, the lobster fishers could just as easily take sea cucumbers. Ecuador's National Fisheries Institute, with the Darwin Foundation, is currently undertaking a survey of the beds. The fisheries institute favors lifting the harvesting ban, at least for local fishermen. But any final decision on fishing rights rests with the office of Ecuador President Sixto Duran Ballen, who will balance the economics of fishing against tourism and the well-being of flora and fauna.

–Richard Stone

CLIMATOLOGY

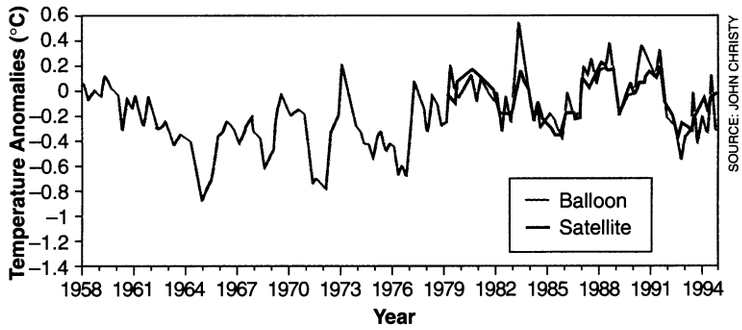
Is the World Warming or Not?

Last week the *New York Times* declared on its front page that "A Global Warming Resumed in 1994, Climate Data Show." Just a month earlier, though, *Reader's Digest* had asked "Is the Earth Really Getting Warmer?" and presented a 15-year record showing that its temperature has hardly budged. So who's right? Both conclusions are premature, say climate researchers on the sidelines: A year of data, or even 15 years, is too little to go on.

"There's a real danger in having a short record and making conclusions about whether there's global warming," says climatologist Thomas Karl of the National Climatic Data Center in Asheville, North Carolina. The longer the record the better, say Karl and others, because Earth's temperature history is full of bumps and plateaus. The longest records do show a modest but distinct warming in this century—but then another debate looms: whether an intensifying greenhouse is responsible, as climate models imply.

The *Times* story was based on several of the best records of temperature at the surface of the globe. But in the warming/no warming debate, the claim that "global warming has 'resumed' is a misnomer," says Karl. "You could say that temperatures have rebounded back to the relatively high levels of the last decade and a half."

As the *Times* pointed out, that rebound ends 3 years of cooling triggered by the eruption of Mount Pinatubo in the Philippines in June 1991. By 1994 almost all of the debris that the volcano had lofted into the stratosphere, where it blocked some solar radiation, had fallen back into the troposphere and been removed. This return to the warmth of the 1980s—when some of the warmest years on record occurred—isn't much of an argument for global warming, Karl says. "If you take away the two or three Pinatubo years," he notes, "you find that the temperatures since 1979 are relatively stationary."



Temperature plateau. The 15-year satellite record shows no warming, but it began just after global temperatures took a jump, as recorded in balloon data.

That's the point stressed by the *Reader's Digest* article. The data it presented come from satellite observations, analyzed by John Christy of the University of Alabama, Huntsville, and Roy Spencer of Marshall Space Flight Center, that provide the only truly global monitoring of temperature—and are a favorite of greenhouse contrarians. They often cite the satellite record, which shows 15 years of ups and downs but little real warming, to support their contention that the climate models predicting global warming are off-base.

But Karl and other climatologists warn against that conclusion as well. They agree about the value of satellite temperatures, with one big caveat—the satellite record is still too short. "It's really unfortunate the [satellite record] started in 1979," says climatologist Philip Jones of the University of East Anglia. He notes that it just missed a big jump in global temperature around 1977 that set up the 1980s for their record-setting highs. "If the satellites [had] begun, say, 8 or 9 years earlier," adds Karl, "it's quite likely they would be showing a significant warming."

That pulse of warming is one of two that stand out in the 140-year record of global surface temperatures maintained by Jones and David Parker of the U.K. Meteorological Office in Bracknell. The other began around 1920 and ran for two decades before hitting a plateau. Together these two warming episodes account for most of the 0.4°C of warming in this century.

That's not as much warming as greenhouse models predict—all else being equal, warming should now be averaging roughly 0.25°C per decade. For climate change to live up to the predictions, the minimal warming of the 1980s will have to accelerate into the next millennium. Climate modeler James Hansen of the Goddard Institute for Space Studies in New York City expects it will; even the short satellite record will begin to fall in line with model predictions by the turn of the century, he says. But other climate researchers wouldn't bet on that quick a resolution to the global-warming debate.

–Richard A. Kerr