population—by January 2002. The agreement was reached with the U.S. Department of Agriculture (USDA) in response to charges the agency had brought against the lab in 1998 and 1999, ranging from storing the chimps' food improperly to performing unsafe veterinary and surgical procedures that led to the deaths of several animals.

As part of a consent decision signed on 24 August, the Alamogordo, New Mexico–based foundation will also allow a USDA-approved external review team to examine its operations and records and has agreed to implement that team's recommendations. Furthermore, the foundation has agreed not to breed or buy any new chimps, to employ an adequate veterinary staff, and to handle the animals in a way that does not cause them "behavioral stress, physical harm, and unnecessary discomfort."

The Coulston Foundation is a private breeding and research facility supported by the National Institutes of Health (NIH); it conducts research on AIDS, toxicology, spinal cord injury, and vaccine development. The lab also houses chimps left over from the U.S. Air Force's space program and uses them in research (*Science*, 22 May 1998, p. 1186)

According to USDA spokesperson Jim Rogers, the lab paid a $40,000 penalty in 1996 to settle an investigation into the deaths of seven animals. But in 1997, after two more chimps had died, the USDA started a new investigation, leading to a formal complaint in 1998. This complaint was amended this year to include the deaths of three more chimps. By signing the consent decision, the foundation has ended USDA's investigation without admitting the charges. But animal rights activists, who have attacked the foundation for alleged mistreatment of its animals, are claiming vindication. Eric Kleinman, a spokesperson for In Defense of Animals (IDA) in Mill Valley, California, says that the Coulston Foundation lacks the staff and the resources to look after its 600 chimpanzees.

"The Coulston lab has a history of problems in this area," adds Roger Fouts, co-director of the Chimpanzee and Human Communication Institute at Central Washington University in Ellensburg. Fouts is also on the board of directors of the Center for Captive Chimpanzee Care, a sanctuary for retired research chimps that has filed a suit protesting the Air Force's decision to hand over its chimps to Coulston.

Frederick Coulston, the foundation's president, declines to discuss the USDA's charges, but says implementing the agreement "will result in a better foundation." Coulston also says the lab's research is continuing. It is a contractor for an NIH-sponsored study of benign hypertrophy of the prostate—a condition that causes urinary difficulty in older males—in some 100 chimps. According to the consent decision, the USDA may reduce the number of animals to be transferred out of the facility "based on changes in research needs and funding."

The consent decision does not specify where the chimps should go. The lab has already started giving away some chimps to an animal sanctuary, Coulston says. But he notes that the destinations have to be chosen carefully, because sanctuaries are not bound by the Animal Welfare Act, and they are not subject to government oversight. Fouts is also concerned about the chimps' fate. "There are only a few groups that can take in chimps, and none with 300 vacancies," he says.

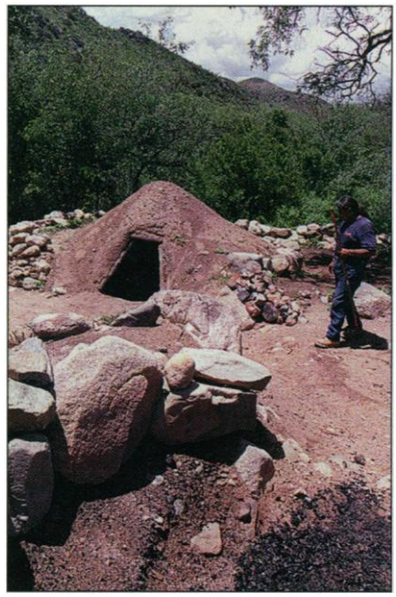
"You can't give them to just anyone," Coulston agrees. **–ELIZABETH NORTON LASLEY**

Elizabeth Norton Lasley is a free-lance writer based in Woodbury, Connecticut.

GAMMA RAY ASTRONOMY

Array Plans Blocked By Indian Ritual Site

TUCSON, ARIZONA—Two cosmologies have collided on telescope-dense Mount Hopkins south of here—and the loser for now appears to be the Smithsonian Institution's plan to build the largest array of ground-based gamma ray telescopes in the world. On 31 August the U.S. Forest Service rejected the Smithsonian's request to build a $16.6 million telescope array on national forest land near the base of the mountain, citing the proximity of a Native American sweat lodge. "Those folks let us know they did not think the telescopes were compatible, and we made a tough call," says John McGee, supervisor of the Coronado National Forest.



Culture clash. Sweat lodge is located less than a kilometer from site of planned telescopes on Arizona's Mount Hopkins.

CREDIT: NORMA JEAN GARGASZ/*TUCSON CITIZEN*

Gamma rays emanate from the most powerful and mysterious phenomena in the universe—quasars, supernovae, and the black hole–powered infernos called blazars. Even though they are blocked by the atmosphere, they can be studied from the ground using a technique that scientists from the Smithsonian's Whipple Observatory pioneered at Mount Hopkins in 1968. Gamma ray photons slamming into the atmosphere create a cascade of charged particles, which emit a faint glow of light, known as Čerenkov radiation, that carries clues about the energy and direction of the original gamma ray photon. Whipple scientists have been observing the Čerenkov glow with a single 10-meter optical reflector. They had hoped to maintain their world leadership with a seven-reflector array of 10-meter optical dishes, called VERITAS, for Very Energetic Radiation Imaging Telescope Array System, funded by the Smithsonian, the Department of Energy, and the National Science Foundation.

Their preferred site, a secluded 4-hectare parcel not far from the observatory's existing base camp, offered excellent shielding from light pollution from the valley below and already has roads and power service, significantly lowering costs. However, it lies less than 1000 meters from a small earth-and-log sweat lodge operated by a Tucson-based group of American Indians called To All Our Relations. The Indians, with the support of at least four Arizona tribal governments, say the array would ruin the lodge's sanctity and disrupt the Indians' twice-monthly traditional steam ceremonies and cleansing rites, in violation of the American Indian Religious Freedom Act of 1978.

More pointedly, Cayce Boone, the 46-year-old Navajo who founded the lodge and obtained a Forest Service permit for it 9 years ago, declared recently that "gamma ray activity and our spiritual practices are not compatible." He cited a 1996 executive order requiring federal agencies to "avoid adversely affecting the physical integrity of Indian sacred sites." The Forest Service appears to have deferred to Boone's concerns in rebuffing the Smithsonian. "There were other factors, such as an emphasis on grazing and wildlife habitat in that area, but the sweat lodge was a significant factor," McGee said.

The decision has left the Indian group jubilant and the scientists struggling to find an alternative site. "We feel great: This sets a precedent that you can't just roll over Indian people with these projects," declares Boone, a technician for a Tucson cable television network. By contrast, Trevor Weekes, principal investigator for the Whipple project, frets that the ruling could cause his group to be eclipsed by at least three other gamma ray observatories from Japan and Germany

that are already approved and under construction (*Science*, 30 April, p. 734). "We're very disappointed, because we've been leading this field and now we're on hold while our rivals move ahead," Weekes says.

There is a chance, however, that astronomers may be able to proceed with VERITAS—possibly even at Mount Hopkins. Weekes says he hopes to discuss with the Forest Service the feasibility of two alternative sites in the vicinity of the present Whipple base camp. Although both sites suffer from rougher ground and greater exposure to transient light, they retain most of the cost savings of the original plan. Another possible site in Mexico would be considerably less accessible, he notes.

Even better, both of the Arizona alternatives lie more than a mile from the sweat lodge. Smithsonian officials hope that distance will allow Trevor Weekes's high-energy view of the universe to coexist with Cayce Boone's more traditional one. **–MARK MURO**

Mark Muro writes from Tucson, Arizona.

CANCER RESEARCH

A New Way to Combat Therapy Side Effects

For decades, physicians have been treating cancer with chemotherapy and radiation, and for decades, the side effects have been brutal. Because the treatments damage healthy tissues even as they kill tumor cells, patients develop anemia, infections, vomiting, diarrhea, and other problems. These side effects can be so severe that they prevent patients from receiving effective treatment. Now, by capitalizing on their knowledge of a powerful tumor suppressor gene, researchers may have found a better way to ease side effects in some patients.

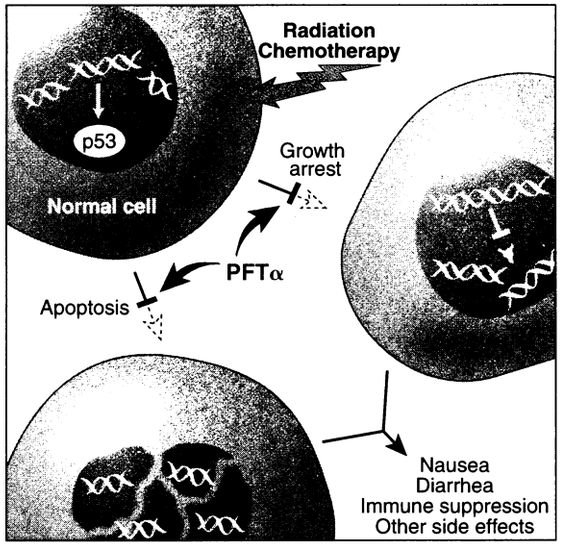
On page 1733, a team led by Andrei Gudkov of the University of Illinois, Chicago, reports that it has identified a novel compound that protects mice against side effects induced by radiation and allows them to withstand what would otherwise be lethal radiation doses. Other known compounds that help protect healthy tissue from cancer therapies have only limited effects, for example, helping restore the bone marrow's ability to make red blood cells. But because of its unusual mechanism of action, the new compound, a small organic chemical called pifithrin-α (PFTα), may protect all vulnerable tissues.

PFTα works by blocking a protein called p53. When cells are poisoned by chemotherapeutic drugs or barraged by radiation, p53 spurs them either to commit suicide or to go into growth arrest. People whose tumors contain an active *p53* gene won't be eligible for the drug, because it could help their tumors fight the therapy, too. But in about 50% of all human cancers, the *p53* gene is inactivated, and PFTα could help people with such tumors endure higher, possibly life-saving doses of radiation or chemotherapeutic drugs. It's a "beautiful" paper, says molecular biologist Scott Lowe of Cold Spring Harbor Laboratory in New York. "A lot of people are going to say, 'Gee, why didn't I think of that?' "

To come up with their drug, Gudkov's team reversed conventional thinking about the *p53* gene. Loss or inactivation of the gene is thought to be one of the genetic changes leading to cancer, presumably because it contributes to loss of growth control in tumors. That's led researchers to try to restore *p53* to the tumors lacking a functional copy. But earlier results had shown that the protein also mediates the side effects of cancer therapy. For example, the healthy tissues of p53-deficient mice suffered less damage from gamma irradiation than the healthy tissues of normal mice.

That meant that blocking p53 could potentially prevent side effects—but only if it could be done without triggering the formation of additional tumors. Many researchers doubted that was possible, but Gudkov says he gambled that a drug that blocks p53 "temporarily and reversibly" would do the trick. But first the researchers had to find such a compound. None was available, he says, "because nobody was ever interested in suppressing p53."

Because p53 turns on cell-suicide genes,



Defense line. By interfering with p53's ability to induce apoptosis and growth arrest, PFTα may protect cells against cancer therapy side effects.

SOURCE: GUDKOV *ET AL.*; ILLUSTRATION: K. SUTLIFF

ScienceScope

Teachers and Researchers: Unite! A new Russian initiative aims to bridge the gulf between universities and the nation's science strongholds, the institutes of the Russian Academy of Sciences (RAS). Russia's Ministry of Education and the U.S. Civilian Research and Development Foundation (CRDF) announced last week that three regions each will receive $1 million to create centers that bring university and RAS researchers together.

The RAS's 325-odd institutes have long been the preferred workplace for Russia's top scientists, as they can work unfettered by teaching demands. But last year, in a bid to improve science teaching, the Education Ministry and CRDF hatched a plan to create joint RAS-university centers that would be funded by U.S. foundations and Russian sources (*Science*, 29 May 1998, p. 1336).

From 80 proposals emerged three winners: Far Eastern State University in Vladivostok, whose center will focus on marine life; Krasnoyarsk State University in Siberia, which will develop techniques for environmental remediation; and three universities in the Rostov region, which will study earthquake safety and pollutant monitoring. Another four centers are expected to be announced next May.

In Flux Nuclear scientists have given a lukewarm endorsement to efforts to restart the Fast Flux Test Facility, a controversial research reactor that has been idle since 1993. The American Nuclear Society (ANS) is applauding last month's decision by Energy Secretary Bill Richardson to study a restart, but says it will only back the move if the reactor doesn't drain funds from other nuclear research projects.

On 18 August, Richardson decided to move ahead with an environmental study of using the mothballed reactor in Hanford, Washington, for everything from fusion research to medical isotope production (*Science*, 20 August, p. 1191). But critics have opposed such plans, contending that the reactor's potential for generating radioactive waste overshadows any possible benefits.

ANS president Andrew Kadak has a different worry: that the restart's estimated $400 million cost could siphon funds from DOE accounts that support university reactors and research. But he says the group will withhold final judgement until next year, when the restart study is expected to be completed.

Contributors: David Malakoff, Alexander Hellemans, Richard Stone