tion is based on its applied research in areas such as communications, navigation, and robotics. Even so, Kröll and other scientists at DLR's sprawling research complex near Cologne emphasize that basic research plays a crucial role. According to Rupert Gerzer, a molecular medicine researcher who directs DLR's Institute of Aerospace Medicine, "we balance our activities in basic research and applied research." While the institute focuses on medical research involving microgravity conditions, his scientists have also used lessons learned from monitoring astronauts in space to develop "telemedicine" techniques to connect remote patients with physicians.

Station stasis

To many German space scientists, the solution to the budget squeeze seems clear: Delay or scale back Germany's substantial commitment to the space station and divert that money to the national space effort. If it were still possible, "I would try to delay the space station in order to free more money for basic space science," says Lüst, who had supported the space station as ESA's director-general from 1984 to 1990, at a time when Germany's space budget was growing.

But the research ministry and Kröll say Germany will not delay or back away from its commitment to the space station. In fact, the federal Cabinet approved the decision in July to make the space station the central focus of Germany's space activities over the next few years. Even so, Kröll has made it clear to NASA that Germany "will not be able to increase our budget for the space station, under any circumstances. This project must stay on budget: A 20% overrun on our part might endanger the German space program."

Many German space scientists question the space station's value for scientific research, and Lüst also asserts that—despite the research ministry's desire for commercial applications—the station offers little commercial potential. But Kröll—while he cautions against overestimating the space station's direct commercial potential—believes the station "will offer tremendous opportunities for research" and that such research eventually will have commercial applications. Herwig Ötti, DLR's associate director for space programs, agrees: "The space station is a technological challenge as well as an investment in the future."

Meanwhile, for Germany's space scientists, more investment in the present would be appreciated. While Lüst says he worries about the budget trends, he is hopeful that "this difficult financial period will be overcome without great losses in talented young people. Germany has built a good research program over the last 30 years, and I hope we will be able to keep it."

–Robert Koenig

Robert Koenig is a writer in Bern, Switzerland.

ANTHROPOLOGY

Native Claims Muddy Waters In Fight Over Australian Lake

MELBOURNE—In April 1994, engineers drained the waters of Lake Victoria in New South Wales (NSW) to carry out repairs to a sliding gate that regulates its path to the Murray River. They hoped to refill the lake quickly, but the receding water exposed what appeared to be an ancient burial site extending through a line of sandy islands. A team of archaeologists and Aborigines went to examine the site and rebury the skeletons in accordance with Aboriginal beliefs, but nobody was prepared for the magnitude of the job.

Colin Pardoe, curator of physical anthropology for the South Australian Museum in Adelaide and the man who assembled the assessment team, estimates that the site contains 10,000 burials, some going back 10,000 years. That makes it "the largest hunter-gatherer cemetery in the world," says Pardoe. "People freaked out, even archaeologists," recalls Jeannette Hope, an archaeologist later hired by the Murray Darling Basin Commission to coordinate an environmental impact assessment of the site.

JEANNETTE HOPE

A history revealed. Researchers examine signs of ancient civilization exposed after Lake Victoria was drained.

The discovery delayed plans for refilling the lake until local authorities could figure out what to do. Under the state's National Parks and Wildlife Act of 1974, the existence of Aboriginal relics at the site means that the lake can't be restored unless a "consent to destroy" is obtained from the NSW government. As the austral summer approaches—the second with the lake unfilled—local graziers and irrigation farmers are getting anxious about their vulnerability to a drought. They want the lake refilled. Local Aboriginal groups, one of which has filed a native title claim to the site, are split on what its fate should be. And researchers such as Pardoe (see sidebar) have all but given up hope of studying its rich archaeological record. "Lake Victoria is a can of worms," says Peter Clark of the Department of Land and Water Conservation.

Next month, *Science* has learned, the commission's environmental impact statement will recommend that the lake be refilled. The report will argue that it is possible to retain the lake as a water storage and still protect the sites. The recommendation will go to NSW authorities, who will make the final decision.

Shaping their deliberations is the rich history of the land occupied by the lake, which sits near the border with South Australia and is part of the floodplain of the Murray River. For the past few thousand years, it has been a seasonal wetland, rising and dropping with each flood cycle. Long a sacred site in Aboriginal mythology, it was also the setting for the Rufus River massacre, a 1841 clash between white cattlemen and the native population. In the 1920s, the flow of the river was altered to provide "drought insurance" for the region.

Traditional mythology, according to independent anthropologist Sarah Martin, views the lake as the ascension to Nurelli, a Dreamtime creator of the Murray River and Lake Victoria. Burial there was said to assure passageway to the spirits in the sky. That belief, says Martin, who was called in to review the lake's anthropological significance, accounts for the cemetery's great size and its use over thousands of years.

Pardoe also believes Aboriginal cemeteries in this region served as symbols of "corporate" land use and suggest a settled lifestyle over many generations. According to Aboriginal lore and linguistic and archaeological evidence, the Murray and Darling region encompassing Lake Victoria was occupied by the Maraura-Barkindji (also spelled Paakantji) tribes. In ancient times, says Pardoe, the cemetery would have been "like a neon sign proclaiming [tribal] territory."

Science Squeezed Out of Debate

MELBOURNE—Colin Pardoe is considered one of Australia's foremost physical anthropologists, and a pioneer in developing a working relationship with Aboriginal communities. But those achievements have proven to be of little value in the fight over Lake Victoria, a debate in which science has played a decidedly minor role.

On the face of it, Pardoe, curator of physical anthropology for the South Australian Museum in Adelaide, seemed well-placed to be an active participant in the controversy. His previous research on Aboriginal burials along the Murray River has led him to conclude that such "cemeteries" provide evidence of long-term social structure. He also believes that the characteristic accessory bones, spurs, and holes on the skeletons offer a glimpse into the relationships between past Aboriginal populations. In particular, he says, they suggest that along the densely packed Murray, there was intermarriage among neighboring tribes but little interaction between those separated by greater distances.

Mixed blessing. Pardoe and local Barkindji during a 1994 ceremony to bless the waters of Lake Victoria.

What's more, in the last several years Pardoe has deliberately sought to reconcile Western science with the interests of Aborigines. Together with co-worker Catherine Bennett, he has applied his knowledge to a provenancing project at the museum. He has worked with tribal people to assign unknown remains, long held by the museum, to their correct tribal group based on the variation of skeletal features.

More recently, Pardoe organized the initial investigation of Lake Victoria and discovered the massive burials exposed when the lake was drained. The discovery, he recalls, seemed to offer him a chance to "finally settle down and do archaeology." It would be a blend of both scientific and human aspirations—bringing to life a 10,000-year-old story and, in the process, helping Aboriginal descendants to better understand their roots.

But it was not to be. As the significance of the site emerged, so did its capacity to attract conflict. In addition to disagreements about how such a find should be protected and managed, the site itself constituted a compelling argument for a native title claim. The interests of science took, at best, a back seat to that debate. "We knew there would be politics," says Pardoe wryly about the forces confronting him and his Barkindji collaborator, Roddy Smith. "But out of all the possibilities, he got done [in] by his mob and I got done [in] by mine." At one point, Pardoe recalls, his own peers even threatened to prosecute him for trespassing.

Whether or not the lake is refilled, Pardoe has seen a golden scientific opportunity effectively turn to brass because of the political sensitivity of the site. His appointment at the museum ends in April, and he doesn't expect to stay on. "When problems of archaeology get mixed up with politics, you feel caught in a web of molasses," he says. "After a while, it becomes impossible to deal with."

Still, Pardoe sees a silver lining in the dark clouds hanging over his field. "These are amazing times for Australia's Aboriginals; once we get over this ownership thing, the knowledge is still there. And when that day comes, I'd like to be in on it." **–E.F.**

The Maraura-Barkindji descendants, however, are split on whether to permit the site to disappear again under the lake waters. The majority of the elders are willing to allow the gates to be closed. "We want to do what needs to be done first [to protect the burials], and they can have their water," says Barkindji elder Roddy Smith. But another group is fighting such a plan. "I don't see any other cemeteries covered by water," says Ray Lawson, another Barkindji elder. "Would you want the graves of your parents under water?" While Lawson has modified his opposition in recent months, other elders remain steadfastly opposed to the reflooding.

With tensions escalating, the commission hired Hope in July 1995 to put together a team to gauge the damage from flooding and to assess the cultural importance of the site. Despite a previous report describing the site as a "catastrophe scenario," Hope was surprised at how much remained intact. The area was extremely rich in artifacts still visible in the original context. "The archaeology was amazing," she says. "You could visualize how people had lived from the shell middens, fireplaces, and grinding stones."

Hope says the 10,000-year stratigraphy preserved in the floodplain at the southern end of the lake is unique in the Murray Darling basin, Australia's only major river system, draining 15% of the continent. Adds Melbourne University geologist Jim Bowler, "Lake Victoria is a modern-day version of Lake Mungo [where stratigraphy with human remains goes back 30,000 years]. It's where prehistory and modern issues come together."

Hope concluded that the best way to protect the Aboriginal relics and cemetery, if the lake is to be used for water storage, would be to fill it to a depth of 27 meters, keep it full for as long as possible, and then drop the levels quickly below 24 meters when water is needed. Most of the burials lie at a level of 24 to 26 meters and are buried under at least a meter of sand, she noted, so a 27-meter depth would minimize erosion by waves.

Hope says that maintenance of the Aboriginal graves should be the top priority if the lake is reflooded, with quick repairs as needed after the water level drops. But with the commission seeking only a 3-year plan, the lake's long-term fate is still being hotly debated. Although draining the lake would aggravate water shortages for three states during droughts, eliminating it might ease the problem of increasing salinity in the region by allowing fresh water from the upper Murray to flush straight through the lake.

The NSW government will mull over these issues once it receives the commission's report. In the meantime, the Barkindji faction opposed to the flooding has filed a native title claim to the area, which is now owned by the State Water Corporation. A court could determine that the tribe is eligible for compensation if there are plans to alter the use of the contested land. But as with everything else involving Lake Victoria, that issue—whether flooding the lake represents change or the status quo—is also the subject of intense debate.

–Elizabeth Finkel

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