Beijing-Yale center, which officially opened 18 months ago, is riding that wave of support, says Deng: "We try to understand basic biology. And we focus on *Arabidopsis* and rice because it's a good model system as well as an important economic crop."

The recent ban on foreign investment doesn't affect Yale's participation in the center, Deng says, nor did it stop Monsanto this summer from pledging approximately $750,000 over 5 years to support the center's programs. "It's not considered an investment by a foreign company," notes Deng about the contribution, which he says will "strengthen an exchange program and lessen our dependence on university funds."

Despite the current impasse, both Deng and Killmer believe that properly licensed GM crops will one day be commonplace among China's 350 million peasant farmers. But they offer different reasons for their optimism. "They are facing a use-it-or-lose-it situation," says Killmer, referring to work by Chinese scientists, including discoveries based on the sequencing of the *indica* rice genome, that could wind up in the hands of foreign competitors. "And that may be the thing that breaks the logjam."

For Deng, it's a simple matter of waiting until the government decides the time is right: "In the long term, these GM crops will be approved [for commercial sale]. All of the scientists I know are optimistic. But I don't know how long it will take."

–DING YIMIN AND JEFFREY MERVIS

Ding Yimin writes for *China Features* in Beijing.

ARCHAEOLOGY

Armenia Uncovers a Bronze Age Treasure Trove

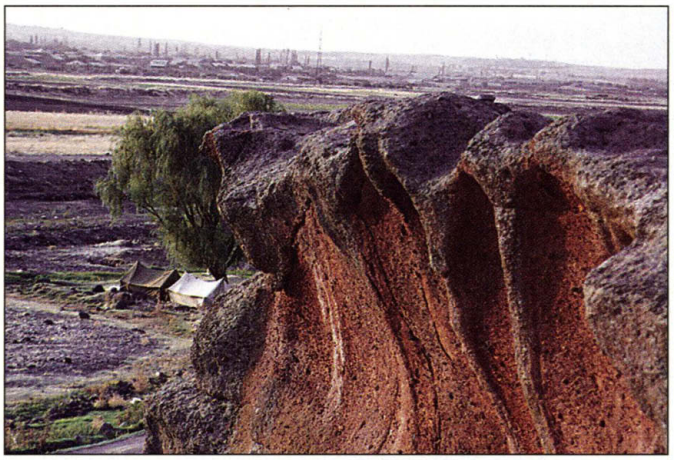
With the help of private money, Armenian researchers are unraveling a site full of impressive stonework and ritual artifacts

AGARAK, ARMENIA—From a distance, the cliff face and its curling overhang look like a giant wave about to break over the central Armenian plain. Up close, something more spellbinding comes into view: The lip of the 15-meter bluff sports what seems to be a meter-long, v-shaped ram's head, complete with coiling horns, chiseled from the volcanic rock. Farther along the edge, in eroded bas relief, are what looks like the nostrils and horns of a bull. A third, more deeply eroded feature might have been a dragon's head.

"Just look at it, it's beautiful," says Boris Gasparyan of the Institute of Archaeology and Ethnography (IAE) in Yerevan. In just two field seasons since excavations began here in Agarak, an Armenian team has uncovered a prodigious number of artifacts and mysterious carvings that promise to shed new light on the peoples of the Caucasus from the Early Bronze Age some 5000 years ago right up to the Middle Ages. "It's an incredibly important site," says Adam T. Smith, an archaeologist at the University of Chicago and one of the few Western experts to have visited Agarak. "A comparatively small portion of the site has been excavated, and yet the results are quite fantastic."

A few years ago, the site was on the verge of being lost forever. Just before the excavations started, a nearby quarry was planning to expand onto the site and extract the rock, known as tuff, a popular building material in the Caucasus. Fortuitously, Gasparyan had befriended Michael Gfoeller, then an official at the U.S. Embassy in Yerevan who also happens to be an archaeology buff. Gasparyan showed him around a number of Armenia's rich historical sites. "I realized that Armenia today is like Egypt in the 1820s: an undiscovered country of immense cultural wealth," Gfoeller recalls. Gasparyan similarly wowed Gfoeller's brother Joachim, a wealthy businessperson, during a visit. Joachim Gfoeller was so enthralled that he set up a foundation to support archaeological research in the impoverished nation.

Agarak was an obvious first project, says Gasparyan, now the foundation's local director. The cliff is hard to miss: Part of it was blasted away during construction of a road that passes within feet of the site, and fragments of Bronze Age pottery had also been found there. But once excavations started, even Gasparyan and his colleagues were astonished by the extent of the remains. In 2001, the dig team swelled to 100 at the height of the summer season. That many workers "is unheard of in this day and age," says anthropologist Philip Kohl, an expert on the Caucasus at Wellesley College in Massachusetts, who says the operation's scale is reminiscent of archaeology's golden age in the colonial era before World War II.



Spot the ram's head? Armenian archaeologists claim that this volcanic outcrop was worked by Early Bronze Age sculptors.

CREDIT: DMITRI ARKAKELYAN AND ARTHUR GYULGAZIAN

By the end of last summer, the huge team, led by IAE's Pavel Avetisyan, had peeled away the surface soil from nearly 5000 square meters of the site—still only a fraction of its claimed 200-hectare extent. "Agarak is notable for its sheer size," says Smith, who is co-leader of an excavation of Late Bronze Age fortresses in Armenia. If it is truly that large, says Kohl, who has not yet seen it, then "understanding and evaluating the significance of the site may take decades."

The Armenian team has found traces of intensive stone working: steps leading to niches carved into the cliffs, horseshoe-shaped cavities connected by channels cut into the tuff, and trapezoidal blocks. "The total expanse appears to have been carved, shaped, and molded to human life," says Smith, who adds that such features "suggest some sort of ritual installations, such as altars or other monuments."

The Armenian team has also begun unearthing the remains of stone houses clustered along a street, along with a bounty of terra cotta statuettes and ceramic artifacts linking the site to the Kuro-Araxes, a culture widespread in the Caucasus in the 29th to 27th centuries B.C. The researchers suggest that the bluff was an open-air temple, complete with housing for the priests. According to Smith, that's "an entirely reasonable starting hypothesis that will undoubtedly be subject to intense questioning as the research proceeds."

Although it might take decades to fix Agarak's position in the Kuro-Araxes culture, the site has already begun to spark vigorous debate. Some experts doubt, for instance, whether the bas relief heads along the cliff edge were carved by human hand. "I would have some reservations about the anthropic

Former residents? These burial pits are pegged to the Hellenistic period.

character of many of these 'carvings,' " says archaeologist Pierre Lombard of Lumière University in Lyon, France. Although impressed by the site and the Armenian team's work, Lombard, an expert on the ancient Middle East, suggests that the "animal heads" could possibly be an effect of erosion. Others, however, argue that weathering alone is unlikely to have produced such features.

Also mysterious are thousands of tiny round pits, ranging from the size of silver dollars up to teacup saucers, which are scattered across much of the exposed top of the bluff. "We can't explain these," says Gasparyan, who speculates that they might have been used for anchoring posts. "They are far too regular" to have been simply from erosion, says Smith, but when they were made might be an "irresolvable issue," he says.

If the Early Bronze Age finds aren't tantalizing enough, the Armenian team has also uncovered evidence of habitation from more recent periods: Urartian amphoras from the 8th to 6th century B.C.; coins bearing the profiles of Alexander the Great and Octavian Augustus, and sarcophagi with skeletons buried with either pagan or Christian ritual that span a period from the 4th century B.C. to the 4th century A.D.; glazed and cooking pottery from the 12th to 14th centuries; and ceramics and coins of the Khanate of Yerevan from the 17th and 18th centuries. "I cannot think of a site anywhere in the Caucasus with such a millennia-long length of occupation," says Kohl, who is eager to see Agarak for himself. "That fact alone makes the site important and noteworthy."

After the threat of destruction just a few years ago, Agarak's future now seems secure. The Armenian government has designated much of the site a national park, and the Gfoeller Foundation has put up $60,000 to fund the first few years of a long-term excavation. It's also funding preliminary excavations elsewhere in Armenia and claims to have found a cavern with paintings that could date from the Stone Age, as well as a site in northern Armenia with evidence of early hominids—an important find if true, but not a big surprise considering its proximity to the famed Dmanisi site in neighboring Georgia. The foundation's support, predicts Smith, "will be a magnet for researchers and students from around the world." And that's exactly what Armenia's suddenly resurgent community of archaeologists and anthropologists is hoping for.

–RICHARD STONE

ANIMAL MODELS

Can a Mouse Be Standardized?

With new generations of mutant mice on the horizon, some researchers question the meaningfulness of standard behavioral tests and the wisdom of minimizing the mouse environment

OXFORD, UNITED KINGDOM—Georgia Mason moves quietly from cage to cage, peeking in on mice dimly visible by the glow of a red lamp. "This one spends her time 'route tracing,' " says Naomi Latham, one of Mason's graduate students at the University of Oxford, as she slides a cage from the rack. Within the shoebox-sized cage, a mouse appears to perform a slapstick comedy in fast-forward mode, chasing herself around and around in a tight circle. "She does that for hours at a time," Latham says. Mason points out a mouse with all its whiskers missing. "Sometimes they pluck out all the fur from the face." By filming their mice in near darkness with a sensitive camera, Latham and Mason are cataloging a variety of such repetitive behaviors collectively known as stereotypy.

Studying bizarre mouse habits might seem obscure, but the need to work out which aspects of a mouse's environment cause such behavioral quirks is becoming urgent. New techniques are speeding the creation of mutant mice used to study the links between genes and behavior. But there's accumulating evidence that the typical living conditions of lab mice might induce odd behaviors, from the subtle to the profound, that might obscure genetically based differences.

Idiosyncratic. Despite seemingly standardized environments, mice sometimes behave unpredictably.

The result: The same experiment can have different outcomes in different labs.

That point was driven home 3 years ago in a project led by John Crabbe, director of the Veterans Affairs' Portland Alcohol Research Center in Oregon (*Science*, 4 June 1999, p. 1599). This was the experiment no one in the field wanted to do: Mice of the same strains, born on the same day, were tested with a standard array of behavioral tests in three independent laboratories. To the horror of behavioral geneticists, the results varied wildly between labs, despite efforts to rear the animals in the same way and test them at the same time under seemingly identical conditions. Following up on this study, Crabbe and his colleagues report in the January 2003 issue of the *Journal of Neuroscience* that certain strains of mice are much more active in some laboratories than others, and this confounds certain behavioral tests. But the critical differences between laboratory environments remain a mystery.

One ultimate aim of research such as Mason's is to figure out those differences and use that knowledge to improve standards for the mouse environment. But that will involve "a balancing act," says Pat Nolan, a geneticist at the U.K. Medical Research Council's Mammalian Genetics Unit near Oxford. The advantage of simplifying the

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