



◀ **Sacred circle.** Carved central slabs are surrounded by massive monoliths nearly 5 meters tall.

## ARCHAEOLOGY

## Seeking the Roots of Ritual

In the hills of Turkey, researchers are slowly uncovering the world's oldest monumental structures, strange monoliths built by hunter-gatherers perhaps 11,000 years ago

**GÖBEKLI TEPE, TURKEY**—Dawn was still half an hour away when Klaus Schmidt arrived at his hilltop dig site here, but a half-dozen workers from a nearby village were already waiting for him. It was the end of the dig season, and the enthusiastic, white-haired German was there for one last look. He picked his way down steep excavation layers toward a massive, T-shaped slab of rock rising 3 meters out of the ground.

The gentle light of dawn illuminated more T-shaped limestone megaliths and then still more, arranged in circles and ovals down the hillside. Some were carved with stylized arms; on others, a carved menagerie of snakes, spiders, boars, foxes, birds, and other beasts crawled and soared.

Schmidt, of the German Archaeological Institute (DAI) in Berlin, claims that these are the world's oldest monumental structures, which he has painstakingly uncovered since 1995 (see sidebar, p. 280). Radiocarbon dating and stone tool comparisons indicate that they are 11,000 years old. So these great stone circles were erected before metalworking, before pottery, before the domestication of animals, even before most signs of agriculture.

Although people began painting in caves thousands of years earlier, Göbekli

Tepe, in southeastern Turkey, “is the first manmade holy place,” says Schmidt. He and others say that the site upends traditional notions about the development of symbolism. Archaeologists once hypothesized that agriculture gave early people the time and food surpluses that they needed to build monuments and develop a rich sym-



bolic vocabulary. But Göbekli Tepe raises the alternative possibility that the need to feed large groups who gathered to build or worship at the huge structures spurred the first steps toward agriculture. “This shows sociocultural changes come first; agriculture comes later,” says archaeologist Ian Hodder of Stanford University in Palo Alto, California, who notes that the first domes-

ticated wheats are from this region. “You can make a good case this area is the real origin of complex Neolithic societies.”

If Göbekli Tepe is truly 11,000 years old, it also challenges the idea that symbolism and agriculture were first developed in the Levant—the area that includes modern Jordan, Israel, and Syria—and spread north. “The idea that the origins of monumental architecture were in the south has been turned on its head,” says archaeologist Gary Rollefson of Whitman College in Walla Walla, Washington, and an editor of the journal *Neolithics*. “What Klaus is picking out there now is far earlier than anyone expected. That’s all back on the drawing board now.”

### A hunter-gatherer's paradise

Göbekli Tepe means “navel hill” in Turkish, and at 780 meters high, it seems a natural gathering spot, the highest point for kilometers. The site was first examined—and dismissed—in the 1960s by University of Chicago anthropologist Peter Benedict, who assumed that the flints and broken slabs of limestone littering the area were the remnants of an abandoned medieval or Byzantine cemetery.

Schmidt first visited the hilltop in 1994, after a local farmer had run his plow into a rectangular piece of limestone. Schmidt found not a gravestone but the top of a large, buried pillar, and he quickly recog-

nized that the scattered flint tools on the surface resembled those from nearby sites that predate pottery. As he began digging, the mystery grew. He uncovered one huge, elaborately carved ritual structure after another, but no houses or signs of settlement. The people who built the monuments apparently backfilled them thousands of years ago, and the bones that turned up in the loose fill were all from either humans or wild animals, not from domesticated animals.

So just how old are the monuments? Because most of the bones found are from backfill, dating them yields muddled results, and Schmidt has fewer than two dozen direct radiocarbon dates. Instead, he chiefly relies on comparing the stone tools and other artifacts with those from sites with more radiocarbon dates. This relative

dating puts the early layers at Göbekli Tepe in the beginning of a distinctive period called the Pre-Pottery Neolithic B, dated elsewhere to about 11,000 years ago. Although the dates aren't precise, the artifact comparisons are convincing, and a few hundred years of fudge time "don't really matter," says Harvard University archaeologist Ofer Bar-Yosef.

Although the site may predate systematic agriculture, the people who carved these pillars faced no shortage of resources. Animal and plant remains suggest that 11,000 years ago this place teemed with gazelle, aurochs, and deer. Groves of fruit and nut trees lined the rivers, and flocks of migrating birds paused here regularly. "It must have looked like a paradise, ideal for hunter-gatherers," says Angela von den Driesch, an emeritus archaeozoology professor at Ludwig Maximilian University in Munich, Germany, who has classified animal remains at the site. The region was so rich that people could have settled down while still supporting themselves with hunting and gathering; archaeologists have found such villages within 160 kilometers of the site.

Von den Driesch is one of a number of archaeologists, plus a revolving cast of eager German students and about 60 local workers, who excavate the site for 4 months each year. They drive to the site before dawn to dig, returning in the afternoon to a traditional, high-walled compound Schmidt owns in the middle of Urfa's old city. One day last fall, a dozen students quietly sorted and weighed bone fragments and artifacts in the compound's courtyard as the afternoon cooled into evening. It's a surprisingly unpretentious operation, given the imposing nature of the site and the roughly \$300,000 in funding Schmidt receives each year from DAI and the German Research Foundation.

Clearing a space at a long table, Schmidt pulled out a mottled, purple schematic of the site—a sort of bird's-eye x-ray put together after a ground-penetrating radar scan in 2003. The excavated portion—3500 square meters, just 5% of the 9-hectare site's total—was represented by a white square. All around it, the scan revealed oval groups of buried monoliths dotting the hillside like dark-purple bomb craters.

Schmidt says there are at least 20 ceremonial structures still underneath the soil, and perhaps more. "It's much more complex and advanced than we thought," he says. "Clearly, they could communicate with each

other and organize something really complicated. I didn't expect hunter-gatherers could or would build something like this."

The most spectacular ritual space, which encompasses features seen at the others, is nestled in the dig's western corner. Two 5-meter-tall, T-shaped pillars stand in the center of a circle of slightly smaller slabs, each weighing an estimated 5 to 7 tons. Parallel lines carved into the slabs' sides slant back in a V and meet at the narrow front edge like clasped hands, suggesting a stylized person. The two central stones face the valley, and the surrounding pillars face



**Peering into the past.** Klaus Schmidt (*top*) uncovered pillars carved with frightening beasts like this lion.

inward toward the center of the circle. In sharp contrast to the stylized human shapes, the sides of the slabs are carved with images of animals: complex arrangements of spiders and snakes, foxes and wild boars, vultures and cranes.

There's no way to know for sure what these figures meant, but there are some clues. Schmidt says the lack of female symbology largely rules out fertility rituals. And the contrast between the designs carved on the pillars and bones that litter the backfill seems meaningful. The backfill yields gazelle, aurochs, red deer, boar, goats, sheep,

oxen—all wild—plus a dozen different bird species, including vultures, ducks, and geese. Yet the pillar carvings are dominated not by prey but by more dangerous creatures: leopards, lions, foxes, and vultures, plus spiders, snakes, and scorpions. "The symbology is dominated by nasty animals," says Stanford's Hodder. "It's a scary, fantastic world of nasty-looking beasts."

### The cathedral on the hill

So what was this place? Schmidt is adamant about what it's not, although not everyone agrees with him. Despite the site's size, and the contemporary villages not far away, Schmidt insists this was no settlement. He's convinced that the circles were designed to be open to the sky, like Stonehenge. Telltale signs of settlement—such as hearths, trash pits, and small fertility figurines—are conspicuously absent. And the hilltop is a long hike from any water sources. "We know what settlements from these times look like," Schmidt says. "This isn't one of them." Instead, Schmidt argues that hunter-gatherers from across the region gathered here periodically, pooled their resources temporarily to build the monuments for some ritual purpose, and then left.

Rollefson and others see that as unlikely, arguing that the scale of the site would have required at least a small group of year-round residents. "To have this kind of magnet out in the middle of nowhere would be unprece-

## Just Don't Call It the Garden of Eden

**URFA, TURKEY**—From his one-man booth at the Urfa bus station, tourist official Serdar Avci spends his days handing out maps to the sights around this Turkish city. To his dismay, one destination is conspicuously missing from the tourist guides: Göbekli Tepe. “People want to come here to see these temples, but Klaus Schmidt is digging so slow!” Avci says. “How many years do we have to wait to go inside? This is a big problem, I think.”

Everyone in this city of almost a million people seems to know Schmidt's name and have an opinion about his work excavating the world's first monumental architecture (see main text). Schmidt's progress is charted by regular reports in the local papers, and a 2006 cover story in the German weekly *Der Spiegel* speculated that the site might be linked to the biblical Garden of Eden. Much to Schmidt's dismay, Turkish papers picked up the story, and the ensuing debate about whether the site was the birthplace of Adam—considered a Muslim prophet—briefly threatened to derail further excavation on religious grounds.

Schmidt has been assigned a full-time monitor from the Turkish Ministry of Culture and Tourism in Ankara to make sure he sticks to a preapproved dig plan

dedented. There would have to be so much work to carve these pillars,” he says. Indeed, Schmidt says molding and carving a single pillar would have taken months.

Some say it's just a matter of time before evidence of settlement shows up. “They haven't found much human habitation, but they will,” predicts Bar-Yosef. “It's impossible to have such a large site without people there to take care of it.” Schmidt acknowledges there must have been a few people—“personnel,” he says—but insists the site was exclusively a ritual destination rather than a settlement, which would make it unique for this period.

And researchers agree that Göbekli Tepe was a convergence point. “Certainly it was a major focus for regional celebrations or ritual activity,” says Rollefson. There are hints of a regional culture: The symbols found at Göbekli Tepe are echoed at similarly aged villages hundreds of kilometers to the south in Syria, such as one called Jerf el-Ahmar, and at slightly younger sites closer to hand in Anatolia, such as Nevali Çori. But Göbekli Tepe is clearly the grandest site and the oldest of such magnitude. “Göbekli Tepe's really the only one with that megatemple approach,” says Rollefson. “After it was built, quite a few sites with the same architecture and iconography and style appeared.” Schmidt agrees: “Here we have the religious center for settlements at least 50 kilometers away,” he says.

“Those were village churches; this is the cathedral on a hill.”

Schmidt argues that the site's antiquity and the lack of domesticated animal and plant remains is strong circumstantial evidence that symbolism and religion led to agriculture and domestication, not the other way around. “Developing from hunter-gatherers to farmers happened here and spread south,” Schmidt says. “Not just architecture and monumental architecture, but turning wild animals into domestic livestock happened here. This is the starting point for a whole front of innovation.” Indeed, the region is home to a number of domestication “firsts,” including the first domesticated wheat, which emerged only 30 kilometers away at Nevali Çori about 500 years after the Göbekli monuments were built. “Its real

importance is that it's early and large and symbolic a long time before agriculture,” says Hodder of the site.

But there are claims of domesticated rye in Syria as far back as 13,000 years ago. And many researchers think people planted wild crops for a long period before actual domesticated varieties appear (*Science*, 29 June 2007, p. 1830). Bar-Yosef notes that there's no evidence to rule out farming in this area at this time, complicating the vision of a hunter-gatherer paradise. “There's no reason to assume the builders were simple hunter-gatherers,” he says. “People can be planting wild foods.”

Bar-Yosef is also eager to have more context about the larger society that produced the site. How big did the tribe need to be to support such an intense process? “And in a simple American way,” he asks, “who paid for it all?”

Schmidt, mindful that future archaeologists may develop better techniques, refuses to be rushed. At 53, he's got 12 more years of digging until he retires, and he envisions the site's excavations lasting another half-century. Mindful of archaeology's destructive nature, he's carefully leaving something for future excavators. “The idea is not to excavate the entire settlement. The idea is to excavate as little as possible,” he says. “We just have to have enough to be sure we understand what was really going on at the site.”

—ANDREW CURRY

Andrew Curry is a writer based in Berlin.



**Neval hill.** Thousands of years of ritual building and backfill created a high point in the Turkish landscape.