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WHEN ARCHAEOLOGISTS PETER BIEHL AND FRANCOIS BERTEMES decided to excavate a 7,000-year-old circular enclosure outside of Goseck, Germany, in 2002, they didn't expect to make any major discoveries, certainly nothing that might rewrite the history of Neolithic Europe. "We had just started our archaeology program, and we wanted a place near the university for our students to practice," says Biehl, formerly a professor at Halle-Wittenberg University and now at Cambridge. Combining Global Positioning System data with archaeological evidence from the site, they soon discovered that the two southern gates of the henge marked the start of the summer and winter solstice, making the enclosure possibly the world's oldest solar observatory. The farmers of Neolithic Central Europe, who most scholars believed were a generally unsophisticated group who tilled the land with basic wooden tools, were actually measuring the heavens far earlier than anyone had ever believed.

The Goseck enclosure and hundreds of similar wooden circular henges were built throughout Austria, Germany, and the Czech Republic during a 200-year period around 4600 B.C. While the sites vary in size—the one at Goseck is around 220 feet in diameter—they all have the same features. A narrow ditch surrounds a circular wooden wall, with a few large gates equally spaced around the outer edge. While

Solar Circle

A 7,000-year-old henge in eastern Germany may be the world's first observatory.

scholars have known about the enclosures for nearly a century, they were stumped as to their exact function within the Stroke-Ornamented Pottery culture (known by its German acronym, STK) that dominated Central Europe at the time.

But the Goseck site has helped provide an answer. As one of the best preserved—and now one of the most thoroughly researched—enclosures, it shows that the sites were used, at least in part, to worship celestial objects and constellations. "This was probably the first monumental architecture in the world," says Biehl, noting that the sites served as ritual observatories two thousand years before the ancient Egyptians erected pyramids along the Nile. Since the Halle team released its initial research on the Goseck site in 2003, interest in the enclosure has swelled. Thousands of tourists have visited the area, which is located about 40 miles southwest of Leipzig, and the media has dubbed Goseck the "German Stonehenge," although the site predates the monument in southern England by more than two millennia and contains no standing stones.



This Neolithic henge, first excavated outside the town of Goseck in eastern Germany in 2002, was reconstructed in time for last year's winter solstice.

by ULRICH BOSER



To accommodate growing interest, officials in the German state of Saxon-Anhalt built a reconstruction of the enclosure on the original site last fall. To ensure authenticity, workmen stripped more than 2,000 oak posts by hand so that the henge would look like it had during Neolithic times. When the site was finally opened on December 21, just in time for the winter solstice, more than 2,000 people gathered to watch a pale winter sun blaze its last rays on the southeastern gate of the enclosure like it had 7,000 years ago.

SCHOLARS HAVE BEEN STUDYING the enclosures of Central Europe for nearly a century without any breakthrough success. "In European prehistory, this is one of the riddles," says Harald Stäuble of the Archaeological Institute of Saxony. "There are so many of the [henges], but we don't really understand their function." One of the first excavations took place over 75 years ago outside of the town of Mühlbach in Lower Austria. The archaeologists didn't find much, but

they were able to document Neolithic postholes that formed a circle with a diameter of 138 feet. At the time, scholars thought that the henges served as forts or animal pens. Why else would Neolithic villagers build a large enclosure with seven-foot-high walls?

Archaeologists continued to uncover dozens of similar sites during the twentieth century. While the enclosures differed in size, ranging from 60 to almost 500 feet in diameter, they all had the same basic features: a concentric ditch, a palisade, and two or four gates equally spaced around the perimeter. There were no buildings or homes within the enclosures, and they were typically located on a hill, not far from a small village. And all the 250 or so enclosures—even one as far south as Croatia—date to a relatively short time span between 4800 and 4500 B.C. "The most astonishing [thing] is that they are all so similar," says Gerhard Trnka, an archaeologist at the Institute for Pre- and Proto-History at the University of Vienna. "This is a clear architectural concept."

Over time, scholars realized the henges most likely had a social function, not an agricultural or military one. Most of the sites didn't show significant traces of phosphate in the soil, a telltale sign of animal husbandry, nor did they seem particularly well fortified. A few even had an earthen embankment surrounding the outside of the palisade that would have made it particularly easy for attackers to overwhelm the site.

Archaeologists also began finding evidence of ritual practices, including ceremonial pottery and female clay figurines. There were even signs of human sacrifice at some of the enclosures. At the Ippesheim henge in Bavaria, for instance, archaeologists uncovered the body of a young woman buried headfirst in the exact center of the henge, suggesting that she had been the victim of a consecration ritual. But without more evidence, it was difficult to speculate on the exact nature of the rituals and ceremonies.

Then, in the 1980s, scholars also started to hypothesize that the henges were oriented toward celestial objects that marked the passing of the seasons; some of the gates seemed to face the rise of the constellation Pleiades or the sun during the winter solstice. While some believed that the enclosures could have helped early farmers figure out the best time to plant their crops, they, again, did not have enough information to prove the theory conclusively.

What the evidence did make clear,

Peter Biehl and Francois Bertemes directed excavations at the Goseck site; below, the southeast gate during the 2003 field season.

however, was that the henges may have been the Central Europeans' first effort to define their territory. This attempt to delineate their space, according to some archaeologists, was an outgrowth of moving from a roving, hunting-and-gathering society to a sedentary, agricultural one, a process that began in Central Europe about 700 to 800 years before the construction of the enclosures. "What's interesting from a grand perspective is that this is the first time you see formal territorial markers, people getting together and peeing on a chunk of land to claim it as their own," says Florida State archaeologist William Parkinson. "In the Paleolithic era, you just didn't have any types of big rituals like this...that involve significant modification of the landscape."



Left: courtesy IFA; below: J. Lipalko

THE FACULTY AT HALLE UNIVERSITY had known about the enclosure at Goseck for years. A 1991 aerial photograph showed dark circular ridges under a wheat field, an unmistakable sign of a long-forgotten Neolithic enclosure. The team hesitated, however, because henge excavations tended to be large and without many artifact finds. But when Biehl, Bertemes, and the undergraduate students started digging up the site in 2002, they found it to be remarkably well preserved with hundreds of artifacts from pottery sherds to flints to wood tools. The enclosure was also unusual because the ditch was almost perfectly circular and had three gates instead of the more common two or four. While not all the radiocarbon dating has been completed, initial study of the pottery dates the henge to about 4700 B.C.

Courtesy IFA



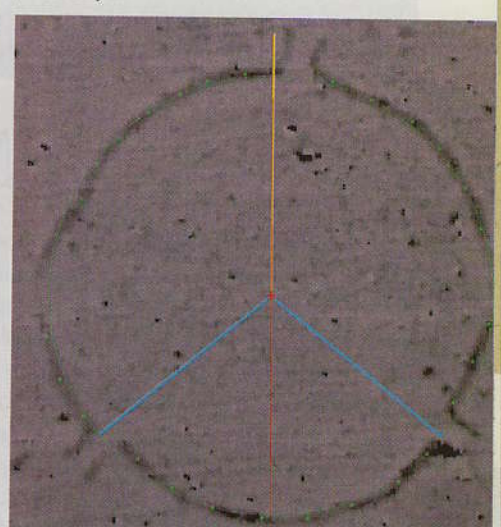
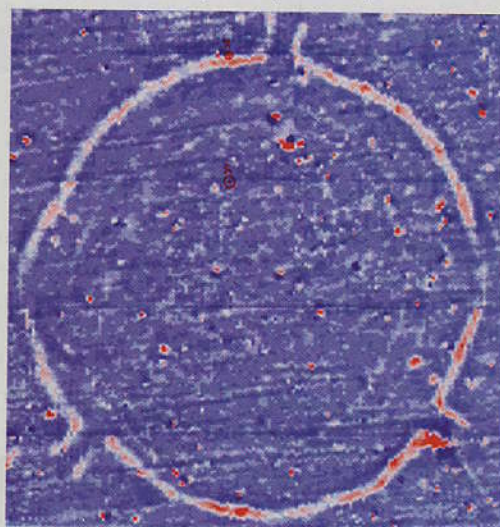
"We always suspected that they had a sophisticated astronomy," says Biehl. "This is the first time we can prove it."

The research team then tapped Ruhr University's Wolfhard Schlosser. An astrophysicist by training, Schlosser used historical data and GPS satellite technology to show that the southeastern gate of the observatory corresponds to the point on the horizon at which the sun rose at the beginning of the winter solstice some 7,000 years ago. The southwestern gate matches up with the summer solstice. "We always suspected that they had a sophisticated astronomy," says Biehl. "This is the first time we can prove it."

But some archaeologists are skeptical about the importance of the discovery. "I would belong to those scientists who are not on board with the whole observatory interpretation," says

each enclosure was probably multifunctional, serving as a mix of marketplace, town square, and temple. "It's absurd to think that they were built so that once a year someone could look through a door."

The Goseck research team agrees that the henges most likely had various uses, but they argue that the enclosures—most certainly the one at Goseck—were largely ceremonial sites. "The main purpose was to demarcate the place as something separate from the village," says Bertemes. He points out that the most salient feature of the henges was that someone on the outside would not be able to look in. "It was a special place, a place for rituals," he says.



The henge showed up as dark ridges in a wheat field in a 1991 aerial photograph of the site, left. A magnetometer survey confirmed the anomaly. Analysis shows that the southeast entrance to the henge marked the winter solstice and that the southwest gate was aligned to the summer solstice. Though some archaeologists question the interpretation, Biehl believes the site was a kind of solar observatory.

Archaeological Institute of Saxony's Stäuble. He takes issue with the presentation of the Goseck site as the first solar observatory, arguing that Central European farmers were able to identify the solstices much earlier than 4700 B.C. "These people had been farming for almost 1,000 years. They knew how to study the sun and stars before they built [the Goseck henge]. They needed to [know that] in order to put out their crops," he says.

Stäuble's bigger concern is that scholars will now view all the enclosures as observatories. While the henges were similar in design, each of them had their own meaning and function, Stäuble says. "We are trying to find one clue that will explain all of [the enclosures]," he adds. "That is not the best way to understand them." In fact, Stäuble contends that

THE HALLE TEAM HOPES that their continuing research on the Goseck enclosure will provide an unprecedented peek into the culture of Central Europe during the Middle Neolithic. The people who lived near the site were part of the STK culture that dominated the area during the fifth millennium B.C. Because of a lack of historical sources, not a great deal is known about the social and political practices of the culture; even what language they spoke is still debated. To be sure, scholars have long agreed that the group practiced farming with basic wooden tools and had an egalitarian social structure without any centralized political hierarchies or ruling chieftains.

As the Halle team unearths the villagers' wood and clay longhouses—one has already been excavated—they believe they'll show a society more sophisticated than previously imagined. "They must have had [some] social and political hierarchy," Biehl says, noting that the ditch of the henge was cleaned out several times. "You don't build something like this and keep it clean without any organization." Biehl believes that dozens of people lived near the henge in a small village of wood-and-clay huts, farming grains and keeping a variety

of livestock, and that the upkeep of such a henge showed a greater social complexity that scholars previously believed. The presence of a shaman within the village also shows a significant degree of ritual sophistication.

The person who watched for the appearance of the solstice probably served as one of the leaders of the small community. "You have to imagine a shaman going in there," Biehl says. "This person had a great deal of power [because] without knowing the solstice, you wouldn't know the time to put out the grains. If they were too late or too early, a village could starve to death. The harvest could be completely ruined." Biehl says that other accounts from the Neolithic up to the Middle Ages show that the solstice has played an important role in European agricultural societies, helping farmers figure out the best time to plant their crops and providing an important demarcation of the passing of time, adds Biehl.

While the research team will never be able to fully document the rituals that were performed inside the enclosure, some clues can be gleaned from the large pits that were dug near the southeastern and southwestern gates. The walls of

the holes show a high degree of calcification, a sign that large fires burned in them. And while the pits were cleaned out during the Neolithic era, the research team found significant quantities of bones, both animal and human, at the bottom, including a severed human hand. "Most likely human sacrifices took place here," says Biehl.

Near the southeastern gate, the archaeologists also found a headless skeleton, which had been scraped clean of all its flesh before it was buried. Biehl suspects that the body may have been part of a consecration ritual. "It could show us that the person was buried here just before the construction of the monument as a type of initiation," he says.

Over the next few years, Biehl and Bertemes want to excavate the Neolithic village as well as the Bronze Age community that lived near the site. "This is not a rescue excavation. We won't just look at one gate or a palisade. We plan to excavate the whole site. It's a real luxury," says Biehl. He will continue to lead excavations at the site. "I hope that I will be able to show in a few years how this community functioned," he says.

GERMANY'S NEW APPROACH TO THE PAST

WHEN PETER BIEHL AND Francois Bertemes announced their findings in 2003, it came on the heels of another prehistoric blockbuster discovery from almost the exact same area. In late 2002, archaeologists from the State Museum of Prehistory Saxon-Anhalt publicized the recovery of the Nebra sky disk. Looters had uncovered the 3,600-year-old bronze disk on a wooded hillside 15 miles east of Goseck, and after an elaborate sting operation, officials seized the disk from the looters—and soon pronounced it to be the earliest-known diagram of the heavens. ("Star-Crossed Find," News, January/February 2003).

While the henge is more than 2,000 years older than the sky disk, some scholars believe that the tracings on the dinner-plate-size object could have been based on observations made at Goseck. Both artifacts, explains astrophysicist Wolfhard Schlosser, identify the solstice at almost the exact same latitude. He also says that the markings and astronomical knowledge used to make the items are similar. "Absolutely there is a likeness to the henge at Goseck," he says.

This slew of discoveries—and dramatic pronouncements—heralds a new era in German archaeology. After the end of World War II, German archaeologists avoided discussing the achievements of prehistoric Central Europe-

ans because the Nazis had attempted to prove their belief in German superiority—and their war against the Jews—through the gross manipulation of archeological evidence ("Hitler's Willing Archaeologists," January/February).

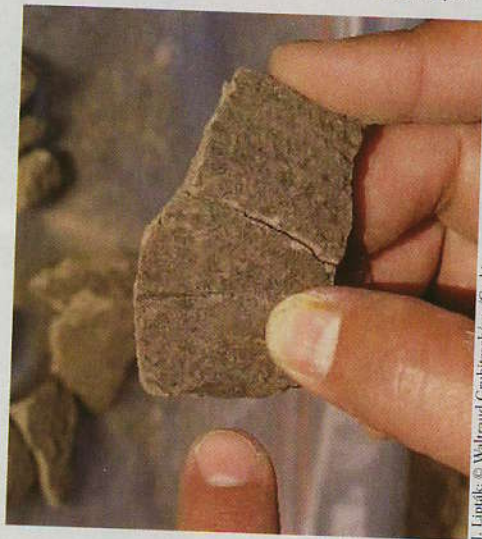
For decades after the end of the war, the country's scholars avoided fully interpreting prehistoric Central Europe culture, most especially anything that could be viewed as glorifying early Germanic people. "It was just find and label," says University of Wisconsin-Milwaukee archaeologist Bettina Arnold. "Archaeologists would play it safe and make catalogs, interminable catalogues, like listing and mapping all the Bronze Age shaft-hole ax heads in Central Europe."

Recently, however, a new generation of German scholars have moved up the academic ranks and been far more willing to develop theories and place prehistoric objects within a broader context. "They are taking a more anthropological approach to archaeology," says Arnold. She cites the Goseck research as an example, saying, "they are trying to look at the ideology of that society. That's critical." University of Vienna's Trnka agrees. "This generation is developing new theories, more interpretations," he says. "This idea that you look through the gate at the sky. No one would have done that 30 years ago. They would have been afraid [for their career]."—UB





The reconstructed henge drew thousands of tourists last year. Pottery found at the site shows the characteristic stroke decoration of Neolithic farming culture in Central Europe.



J. Lippak © Waldtraud Grubitschepa/Corbis

Ultimately, Biehl and Bertemes also hope to find out why the henge was eventually abandoned. There is no evidence that the henge was destroyed, no fires or evidence of an attack. It seems rather that one day the Neolithic villagers just got up and headed out. “We know that remains of the site could be seen until the Bronze Age,” says Bertemes. As evidence, he notes that the villagers built their defensive moat within inches of the ditches of the old enclosure. “We think that they knew it as a place built by their forefathers,” he says.

WHEN SAXON OFFICIALS OPENED a reconstruction of the Goseck henge at sundown on December 21, the event made headlines across Europe. Amid the sounds of drumming and bagpipes, a procession holding torches walked across the fields and into the enclosure. The accompanying festivities included speeches, a light show, and, of course, some good German beer and bratwurst. “We thought that only 200, maybe 500, people would come. But almost 2,000 were there,” says Andreas Northe of Halle University, who helped organize the event. “In the end, it was a big party.”

The research team made every effort to ensure that the reconstruction was as accurate as possible. More than 2,000 oak poles were used to create the palisade, and each one was carved by hand to look like it had been made with Stone Age tools: The timber was stripped of its bark, variegated, tarred, and then stuck into the ground.

Still, some features were beyond reproduction. Because

extensive erosion had occurred at the site over the past seven millennia, the research team couldn’t determine exactly how deep the circular ditch was. And while Neolithic Central Europeans typically painted their ceremonial objects in bright yellows and reds, there was no way to be sure that the Goseck enclosure had been similarly decorated. In the end, Biehl and Bertemes decided to leave the henge in its natural colors—and dig the moat to a depth of about six feet.

Although Saxon officials conceived of the reconstructed henge as a way to boost tourism to the area, it did offer some new scholarly perspectives. Biehl, for one, was surprised at just how secluded one feels within the site. “[The reconstructed henge] makes me feel claustrophobic, not in the negative sense,” he says. “More like you are in an enclosed space, protected.”

While opening day has come and gone, hundreds still visit the reconstruction every weekend. And in March, Saxon officials opened an information kiosk for the site in a nearby fourteenth-century castle. “People are very interested in pre-history,” Northe says. “There will probably be another party for the summer solstice.” And that means that the reconstructed henge will probably serve some of the same functions as the original: a place for people to gather, engage in rituals, and better understand the world they live in. ■

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