# TOP 10

# Discoveries of 2008

For some archaeology buffs, 2008 will always be the year of *Indiana Jones and the Kingdom of the Crystal Skull*. And we have to admit we were glad to see Indiana back in action again after a 20-year absence (we loved it when he name-checked legendary Australian archaeologist V. Gordon Childe). But we did have some quibbles with the film; let's just say we're not big fans of the theory that aliens invented agriculture and leave it at that.

We also got more letters on our "Indy Spirit Awards" (May/June 2008), a list of archaeologists who embody the adventurous ethos of Indiana Jones, than we have for any other story in years. Most of them took us to task for failing to mention one or another larger-than-life archaeologist. We got enough background from these letters for a decade of profiles.

But as much as crystal skulls were the year's most prominent "artifacts," we're more likely to remember 2008 as the Year of the Earliest North American Coprolites (ancient human feces), or perhaps the Year of the Imperial Roman Marble Heads (two were unearthed in central Turkey). Both stories made our list of the most important discoveries of 2008.

On the next seven pages, you will find the other discoveries that really excited us, along with our first annual list of endangered archaeological sites—ranging from the great Indus city of Mohenjo-daro in Pakistan to the rock art of Utah's Nine Mile Canyon.

Sadly, reports of site destruction seem to be just as frequent as announcements of important finds. That's why we were heartened to learn that the world's earliest oil paintings had been identified in caves in Afghanistan's Bamiyan Valley, where the Taliban dynamited two colossal Buddha statues in 2001. Even with the world's heritage disappearing at an alarming rate, there are still amazing discoveries to be made.

—The Editors

## Sacred Maya Blue | Chichén Itzá, Mexico

Maya blue, the brilliant and long-lasting paint that graces scores of Maya sites, is one of just a handful of man-made pigments known to the ancient world. It had special significance, and was associated with sacrifice and Maya deities, including the rain god Chaak. While scientists have long known that it is produced by chemically binding indigo to a clay mineral (palygorskite) with heat, it's not clear exactly how the Maya made it. Dean Arnold, an anthropologist at Wheaton College in Illinois, now believes that making Maya blue was an integral part of the ceremonies in which it was used.

Arnold examined a bowl at the Field Museum in Chicago that had been retrieved from Chichén Itzá's Sacred Cenote, a flooded sinkhole that was a site of countless ritual offerings and more than 100 human sacrifices (many of which had been painted with the distinctive blue). He and his team found that the bowl contained traces of indigo, palygorskite, and copal incense, a tree sap burned as an offering to the gods and used for medicinal purposes. "It doesn't seem to me to be much of a jump to say that one of the ways that Maya blue was created was in the act of ritual itself," says Arnold, through the heat of burning copal. The resultant offering to Chaak would have held both the copal's healing properties and the pigment's mystical power.

**This bowl may have been used in sacrificial rituals to make Maya blue—a pigment that has not lost its brilliance on the murals at Bonampak.**

Not everyone is sold on the theory. Scientists who study ancient pigments believe that the presence of copal and Maya blue together doesn't indicate that one was burned to create the other, or that producing the pigment had any ritual significance. "They're not anthropologists and they don't understand perhaps how ritual works," says Arnold in response to his critics. "I'm just surprised there was so much interest in this. It just bowls me over." Well, anything that relates to human sacrifice will certainly turn a few heads.

—Samir S. Patel

## Wari Masked Mummy | Lima, Peru

Not all big discoveries come from out-of-the-way places. In August, Peruvian archaeologists announced they had found an intact mummy from the Wari culture in a burial mound beneath a busy Lima neighborhood. Wrapped in six layers of cotton and llama-wool textiles, the 1,700-year-old mummy was probably a working mother. A team led by archaeologist Isabel Flores also found knitting needles, balls of yarn, and other items associated with weaving buried with the mummy. "She must have been the chief of the weavers, or head of a knitting circle or a guild that made textiles," says Flores.

The mummy, one of three found in the mound, along with the body of a possibly sacrificed infant, wore a wooden mask with a feminine face and large blue eyes made of seashells—a captivating detail that has earned her the nickname la Dama de la Máscara (the Mask Lady). The team removed the mummy for laboratory analysis after excavating gourds, kitchen vessels, textiles, and other objects that accompanied the Mask Lady and the other mummies. Surrounded today by apartment towers and trendy restaurants and shops, the adobe mound in the city's Miraflores district is considered one of the most important surviving structures built by the so-called Lima culture, which flourished for about 500 years from A.D. 100. With the discovery of the graves, archaeologists now have further evidence of the Wari sweeping into the area from the southern Peruvian highlands and occupying the Lima culture's major ceremonial sites.

—Roger Atwood

University of Chicago doctoral students Virginia Rimmer and Benjamin Thomas read an eighth-century B.C. stele inscription that is helping illuminate Iron Age concepts of the soul.

## Kuttamuwa's Soul | Zincirli, Turkey

Archaeologists from the University of Chicago's Oriental Institute got a crash course in linguistics this summer. Digging at ancient Sam'al, capital of an Iron Age kingdom in southeastern Turkey, they were thrilled when they excavated an extremely well-preserved eighth-century B.C. funerary stele depicting a high official named Kuttamuwa. But a 13-line inscription on the basalt monument revealed that they had, in fact, unearthed something more. In it, Kuttamuwa refers to food offerings made where his stele was displayed, including "a ram for my soul that is in this stele."

"It's the first inscription to make really clear what these people understood about the afterlife in terms of the soul," says archaeologist David Schloen, who directs the Neubauer Expedition at Sam'al. The Sam'alians probably cremated their dead, a practice rejected by the kingdom's neighbors in the West Semitic world, who for centuries believed it taboo to burn one's bones, the soul's final resting place. "Here, the soul was thought to inhabit this stele," he says, "which may have been a way to preserve the individual's memory without the body or the bones."

The 800-pound stele, the only inscribed example ever found in its original context, was discovered in an annex to Kuttamuwa's house, surrounded by remnants of food offerings and fragments of stone bowls similar to those depicted in it, indicating that the room was a private shrine. The students who excavated it had just taken a class on the dialect in the inscription, notes Schloen. "Boy, did they luck out!" —Eti Bonn-Muller

## American Genes | North America

The remarkable discovery of 14,300-year-old feces in eastern Oregon's Paisley Cave provided the earliest direct evidence of human colonization of the Americas. Known in the laboratory as coprolites, the feces were proof positive that humans lived in North America well before the Clovis people, long thought to have been the first arrivals, around 12,000 years ago. Thanks to a new technique for isolating genetic samples from materials such as ice, soil, and now fecal matter, researchers were able to extract human DNA from the coprolites. The improbable "artifacts" opened a new chapter in the debate over the identity of the first Americans.

But Paisley Cave wasn't the only source of genetic evidence reshaping ideas about how and when the Americas were settled. A multinational team of geneticists completed the most comprehensive study yet of Native American mitochondrial DNA (the genetic material contained within the organelles that provide human cells with energy). By looking at variations in the DNA between different modern-day Native Americans, the researchers determined that the first people probably arrived about 18,500 years ago. "It looks like there was a migration out of Asia into Beringia and there was a stopover for a few dozen generations," says geneticist Scott Woodward of the Sorenson Molecular Genealogy Foundation. "Then these people spread quite rapidly into the Americas." But not so rapidly that they couldn't take a pit stop in a cave in eastern Oregon.

—Zach Zorich

## Oldest Oil Paintings | Bamiyan, Afghanistan

An international team of conservators and archaeologists found the world's oldest-known oil paintings in a maze of caves in Afghanistan's Bamiyan Valley, where the Taliban blew up two gigantic stone Buddha statues in 2001.

The team started work in the area five years ago, investigating ways to preserve Buddhist art in some 1,000 caves that had been ravaged over the years by the harsh natural environment, rampant looting, and the infamous explosions. They found that about 50 of the caves were once adorned with glistening murals depicting images of Buddha, *bodhisattvas*, and female devotees. One unique scene shows the Persian solar deity Mithra, riding a chariot driven by four winged horses.

In 2008, their research revealed that paint samples from 12 of the caves contained "drying oils," most likely walnut and poppy-seed oils, which are key ingredients in oil-based paints. In the ancient Mediterranean world, drying oils were used in medicines, cosmetics, and perfumes. Scholars long believed they were first added to paints much later in medieval Europe. "There was no clear material evidence of drying oils being used in paintings before the 12th century A.D. anywhere in the world, until now," says Yoko Taniguchi, a Japanese conservation scientist on the team. The murals at Bamiyan, which lay on the Silk Road where goods and ideas flowed between East and West, date to the mid-seventh century A.D. "This is one of the most important art-historical and archaeological discoveries ever made," she says. "It indicates more complicated material and technical interconnections in this area than previously thought."

—Eti Bonn-Muller

## First European | Atapuerca, Spain

Ancient hominin bones found in northern Spain's Atapuerca Mountains have pushed back the arrival of humans in Europe to roughly 1.2 million years ago, some 500,000 years earlier than once believed. While digging at Sima del Elefante (Elephant Cave), paleoanthropologists unearthed a chunk of lower-jaw bone containing an incisor and parts of four other teeth that belonged to *Homo erectus*, the first human species to migrate out of Africa. The discovery is challenging the idea that Europe was settled by small, scattered groups of humans. "The arrival of people in Europe was much earlier than first thought and probably more continuous," says Jose M. Bermudez de Castro, codirector of the Atapuerca excavations. "We have populations that are living in Europe over a longer period, so maybe [occupation] isn't so sporadic."

Within the cave's 10-foot-square excavation area, the team has also found flints that were used as simple stone tools and pieces of bison bone with cut marks, as well as a large number of bird bones. Whether the animals were hunted or scavenged is an open question, but despite the apparent availability of meat, the person found at Sima del Elefante was probably not in good health. Preliminary analyses show he or she may have suffered from tooth infections and abscesses.

The ancient jaw may just be the beginning of the surprises from Sima del Elefante. Only about one-tenth of the site's total area has been excavated and the sediment extends 6 to 10 feet below where the jaw was found, which means there may be many more important discoveries in store.

—Zach Zorich

# Under Threat

Even as major discoveries were made throughout the year, important sites worldwide were threatened with imminent destruction. Our list is just a sampling of those that will be lost without intervention on an international scale.—The Editors

## Sabu

Near the village of Sabu, in the northern Sudanese Nile Valley, hundreds of rock-art panels dating as far back as the Neolithic period will be inundated by the Kajbar Dam, now being built downstream. No archaeologists have made a systematic study of Sabu, meaning its depictions of giraffes, New Kingdom ships, and Christian churches will be lost forever.

## Bulgaria

Like its neighbors, Bulgaria is rich in archaeological remains—ancient Greek, Thracian, Roman, Byzantine, and Ottoman. But rather than draw millions of visitors each year to its ancient sites, this poor Balkan country mainly exports its cultural heritage. The transition from Communism to a free market economy has left Bulgaria exposed to the swirling forces of the global illicit antiquities trade. Desperate poverty means huge numbers of Bulgarians—up to 4 percent of the entire population—are involved in the trade.

**Rock art at the Sudanese site of Sabu features New Kingdom–period boats.**

**A mud-brick wall in the lower town of the Indus center Mohenjo-daro shows signs of severe salt damage.**

## Nine Mile Canyon

More than 10,000 prehistoric images of hunting scenes, bighorn sheep, and abstract designs adorn the cliffs of Utah's Nine Mile Canyon. Created by the Fremont people, who lived in the region from A.D. 300 to 1300, the images have been under threat since natural gas deposits were discovered nearby in 2004. Thick clouds of dust raised by energy-related trucking in the canyon adheres to the images, obscuring them and causing long-term damage.

## Mohenjo-daro

Mohenjo-daro in Pakistan was one of the largest cities of the Indus Valley civilization, which thrived between 2600 and 1900 B.C. Today, the square-mile mud-brick city is threatened by high groundwater and salt deposits that are destroying the site's ancient bricks.

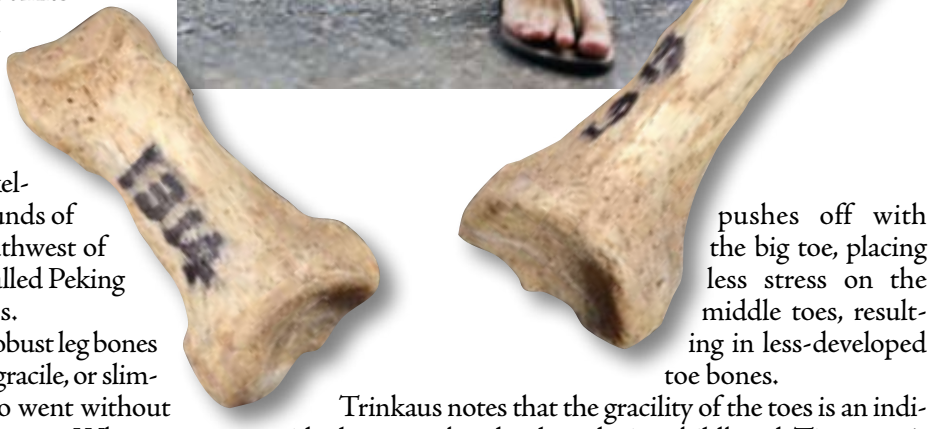
## Isin

Since the invasion of Iraq in 2003, looting has resulted in the industrial-scale destruction of some of the world's first cities. One of the most important is Isin, the capital of southern Mesopotamia beginning in 1953 B.C. For roughly 100 years Isin ruled important cites such as Ur, Uruk, and Nippur. About 25 percent of the site has been looted.

## Mirador Basin

Guatemala's north-central Petén region contains the largest concentration of Preclassic Maya cities in Mesoamerica and features the grandest architecture in the Maya world. But the sites are threatened by massive deforestation, looting, and destruction caused by equipment used in logging road construction, which itself facilitates intrusive settlements.

## Earliest Shoes | Tianyuan Cave, China

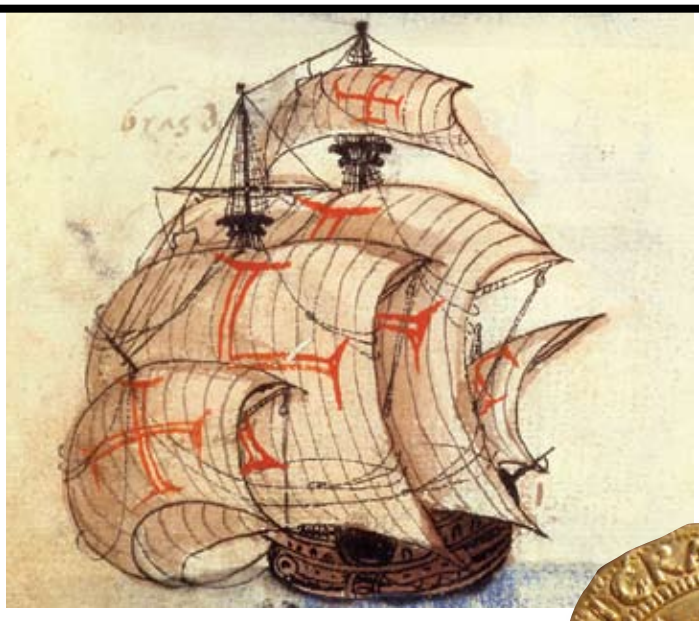


The toes of East Asia's oldest modern human show that our ancestors first began wearing shoes around 40,000 years ago, about the same time they developed more sophisticated toolkits and began creating elaborate art. Erik Trinkaus, an anthropologist at Washington University in St. Louis, came to that conclusion after studying toe bones of the 42,000-year-old skeleton dubbed Tianyuan 1. Of indeterminate sex, the skeleton was discovered in a cave on the grounds of the Tianyuan Tree Farm, four miles southwest of the site of Zhoukoudian, where the so-called Peking Man fossils were discovered in the 1920s.

Trinkaus found that Tianyuan 1 had robust leg bones but that the toes were considerably more gracile, or slimmer, than those of earlier humans—who went without shoes for millions of years and had thick toes. When one walks barefoot, the middle toes curl into the ground to give traction during push off. But when wearing a shoe, a person pushes off with the big toe, placing less stress on the middle toes, resulting in less-developed toe bones.

Trinkaus notes that the gracility of the toes is an individual pattern that develops during childhood. Tianyuan 1, it seems, had worn baby shoes.

—Malin Grunberg Banyasz



**A newly discovered 16th-century Portuguese cargo ship carried almost 50 pounds of gold coins, many of which depict the Spanish sovereigns Ferdinand and Isabella.**

## Portuguese Indiaman | Namibia

On April Fools' Day, a geologist at the Namdeb Diamond Corporation photographed something strange along newly exposed seabed off the coast of Namibia: mangled bronze pipes and heavy copper ingots. Namdeb had just constructed a massive earthen dike in the area, pushing back the Atlantic Ocean to search for diamonds on the sea floor. But when the company's consulting archaeologist, Dieter Noli, saw the unusual photos, he realized that the bronze pipes were really parts of 16th-century swivel guns—detritus, he suspected, from a shipwreck. He dropped everything, raced to the site, and swiftly convinced Namdeb to mount a major salvage excavation. "It was hugely exciting," says Noli.

Today, Noli and an international archaeological team are poring over finds from one of the most important shipwrecks ever found in Africa. The mystery vessel, says the team, is a type of 16th-century Portuguese cargo ship known as a *nau*. Designed to travel what was then the longest and most dangerous sea route in the world, from Portugal to India, the nau had to survive both the battering of the Atlantic Ocean and the seas off the African cape. "The challenges were as brutal and difficult as going to the moon in the 1960s," notes Filipe Castro, a nautical archaeologist at Texas A&M University and an authority on Portuguese naus.

For decades, underwater treasure hunters have targeted some 200 wrecks of these famous ships, looting hulls for gold and other precious goods. Until the discovery of the Namibian wreck, archaeologists had never beaten treasure hunters to a nau site. Already Noli and his colleagues have identified a number of artifacts dating between 1525 and 1550—from early navigational instruments, known as astrolabes, to elephant tusks, gold coins, and 13 tons of hemispherical copper ingots.

The real payoff, however, will emerge in years to come, as archaeologists examine recovered timbers for clues to the ship's design, and iron concretions for trapped pollen, insects, and 16th-century DNA.

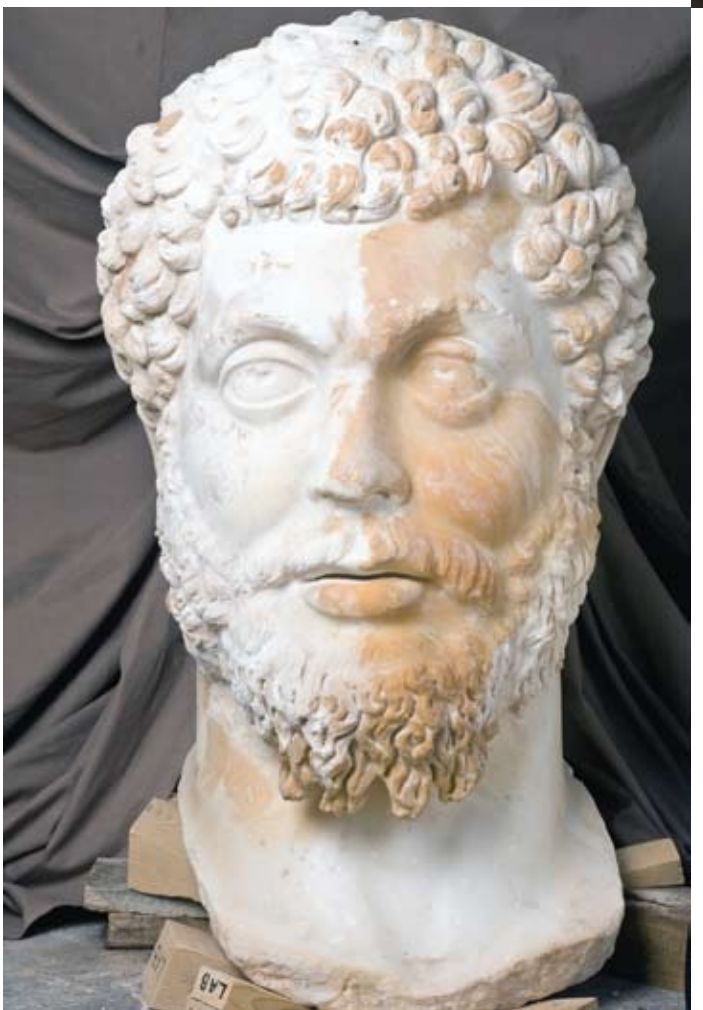
—Heather Pringle

## Imperial Colossi | Sagalassos, Turkey

Legendary emperors are coming out of the earth at Sagalassos, a classical metropolis in central Turkey. After the assassination of Domitian in A.D. 96, a new Roman dynasty arose—the Antonines. In addition to the founder, Nerva, they include some of Rome's greatest rulers, figures whose names resound today: Trajan, Hadrian, Antoninus Pius, and Marcus Aurelius. More than a millennium later, Machiavelli dubbed them the "Five Good Emperors."

In 2007, the excavator of Sagalassos, Marc Waelkens of the Catholic University of Leuven in Belgium, discovered a head of Hadrian, part of a colossal statue that once stood in the city's Roman baths. In a niche opposite Hadrian, he found the toes of another massive statue. Possibly, he thought, they were remnants of a massive statue of the empress Sabina, Hadrian's wife. There were two more pairs of facing niches in the bath.

This year, Waelkens excavated three of the four remaining niches. On August 12, his team found a colossal head of Faustina the Elder, wife of the emperor Antoninus Pius. The opposite niche, which once held the emperor's statue, yielded only a pair of male feet in sandals. On August 20, the team had better luck, unearthing, in another niche, the legs, arm, and head of a statue of Marcus Aurelius.



**Following up on their discovery of Hadrian (upper left) in 2007, excavators at Sagalassos this year found Marcus Aurelius and his foot, and the empress Faustina the Elder.**

The depictions of Hadrian and Marcus Aurelius are among the best representations of these emperors ever discovered. But the 2008 field season ended before the final niche was investigated. Says Waelkens, "It is almost certain it will yield remains of a statue of Faustina the Younger, Marcus Aurelius's wife, when we dig there next year."

—Mark Rose

# Digital Archaeology 2.0

**The Circus Maximus is just one of some 7,000 structures featured online in the Rome Reborn project, which reconstructs how the city appeared in A.D. 320.**

As more and more data go online, both laypeople and scholars are experiencing the world of archaeology in a way that would have been impossible just a few years ago.

In November, a consortium of universities partnered with Google to relaunch the Rome Reborn project, a digital version of ancient Rome as it appeared during the reign of Constantine the Great, specifically on June 21, 320 A.D. Available online at earth.google.com/rome, the digital environment faithfully reproduces all 16 square miles of the ancient capital. Probably the most ambitious virtual re-creation of an ancient site ever made publicly accessible, Rome Reborn includes more than 7,000 individual structures.

The nonprofit Cyark also relaunched its website (www.cyark.org) this year. Cyark promotes laser scanning of threatened heritage sites and serves as an online clearing-house for that information, including scans of ancient centers like Peru's Chan Chan and Mesa Verde in Colorado. Visitors can access 3-D re-creations to take measurements, study architectural forms, or just admire ancient ingenuity. (See the upcoming May/June issue for an in-depth article on Cyark's efforts to "digitally preserve" world heritage.)

The virtual rise of ancient cities wasn't the only online development that caught our eyes this year. Some archaeologists are actually using the Internet as a survey tool. La Trobe University archaeologist David Thomas and his colleagues used Google Earth to locate more than 450 previously unknown sites in Afghanistan. Thomas says that armchair archaeologists have been letting him know about places they've discovered in Central Asia using the online satellite image program. Many of them are modern structures such as old Soviet military installations, but some amateurs have succeeded in locating bona fide unknown ancient sites.

—Eric A. Powell

## Origins of Whaling | Chukotka Peninsula, Russia

In the 1950s, Alaskan archaeologists found large whale bones in a cluster of 3,000-year-old semi-subterranean houses at the site of Cape Krusenstern on the Bering Sea. The people who lived there were quickly dubbed the Old Whaling Culture, and were thought to be the earliest whalers in the world. There was just one problem. "The evidence for whaling at the site is enigmatic at best," says University of Alaska Museum curator of archaeology Daniel Odess. "The bones could be from whales that washed up onshore. Artifacts used unambiguously for whaling, like very large harpoons, don't show up in the archaeological record until 1,000 years later."

Just how the people of the Old Whaling Culture made their living has always been an open question. So when archaeologist Sergei Gusev recently discovered a village on Russia's Chukotka Peninsula that seemed to belong to the Old Whaling Culture tradition, Odess eagerly accepted his invitation to help excavate it.

While traveling to the remote site, Odess and his team fell into a discussion of what kind of evidence would definitively show that the Old Whaling Culture actually lived up to its name. "We were waiting for weather to clear at the airport and I asked my intern Tim Williams what he thought," says Odess. The Fairbanks high-school student and Yup'ik Eskimo looked up from his book, and replied simply: "A picture."

Three weeks later, on the last day of the field season, Russian archaeologist Nikolai Most was sweeping up the floor of an ancient house at the site when he uncovered a 20-inch-long walrus tusk carved with a seal, a bear, and an unmistakable image of people hunting a whale from a boat. The tusk dates to around 1000 B.C.

"I thought Tim was being a smart aleck, but he knew exactly what he was talking about," says Odess. "There's no question the carving is the earliest evidence for whaling."

—Eric A. Powell