

Hardly a week goes by without a major archaeological discovery or the publication of a radical new theory about the human past. Reducing a year's worth of these stories to the 10 most important was a tall order, especially since our intent was to go beyond the headlines and select those we thought made a significant impact on the field—ones that will be talked about for decades. For instance, you won't find the spectacular

announcement of Hatshepsut's tooth or the latest theory about Ötzi the Iceman's murder here. Instead, we've included seemingly mundane finds with big implications; for example, squash seeds and a chicken bone both gave archaeologists major insights into the

Top 10 Discoveries of 2007

prehistory of South America. The lineup also features results of massive survey projects: data-rich maps of Cambodia's Angkor and Syria's Bronze Age site of Tell Brak are revelations in their own right. Some discoveries were eureka moments, like the one that came to an Assyriologist who unearthed hard evidence of an Old Testament figure in the British Museum's collection. Of course, many of us lobbied for stories that didn't make the final cut; you'll see those at www.archaeology.org, along with more in-depth coverage of the artifacts and sites on the following pages.

—THE EDITORS

Solar Observatory ♦ Chankillo, Peru

Travelers have noticed the 13 stone towers rising over Peru's coastal desert since at least the nineteenth century. But researchers only last year discovered the structures' purpose: they make up a sophisticated solar observatory, one of the earliest known in the Americas.

Iván Ghezzi of Peru's National Institute of Culture and Clive Ruggles of the University of Leicester showed that the arc of the 13 Towers of Chankillo, built by a still unnamed culture, corresponds almost exactly to the rising and setting sun's range of movement over a year. On the December 15 solstice, for example, the sun would have risen directly over the southernmost tower, when viewed from the west. Wooden lintels embedded in the towers date to about 300 B.C.

Tracking the sun's progress would have helped Chankillo's builders time the planting of their crops. But the towers were probably also meant to express rulers' mystical kinship with the sun, and their ability to influence its movement. "If you were just measuring seasons, there would be no need to make such great structures," says Ghezzi. "The idea was to transmit a political and ideological message about a ruler's close relationship with the sun." An enormous, circular "fortress" near the towers may have played a role in the display. —ROGER ATWOOD



Clovis Sites ♦ North America

New radiocarbon dates kept the controversy over the peopling of the Americas simmering in 2007. An analysis of dates for the best-documented Clovis sites suggests the culture arose later and was shorter-lived than once thought, a finding that some say deals a blow to the "Clovis first" theories that maintain the big-game-hunting people were the first immigrants to the New World.

Michael Waters, director of the Center for the Study of the First Americans, and Thomas Stafford of Stafford Research Laboratories in Colorado, used modern radiocarbon methods to re-date more than 20 previously known Clovis sites which had been dated with older, less precise techniques. All of the sites now seem to fall between 13,050 to 12,800 years ago. Most archaeologists still believe the Clovis people inhabited North America for at least 500 years, starting about 13,300 years ago.

Waters and Stafford contend this new 250-year window for Clovis in America is too brief for any founding population of hunter-gatherers to have dispersed across the Americas. Instead, they argue, such tightly spaced dates reflect the spread of Clovis technology and its signature fluted points through a preexisting population. But in a letter to *Science*, more than a dozen prominent archaeologists, including some who are open to the notion of a pre-Clovis culture in the Americas, insist there is no basis for Waters and Stafford's theory that technology may have spread more swiftly across the continent than humans themselves. What's really needed, they say, is more rigorous dating of all Paleolithic sites in the Americas.

"We'll be happy to date any Clovis site anyone wants," says Waters. "But the idea that Clovis was first just doesn't make any sense. Unless they had a time machine, there isn't any way for them to have spread across two continents that fast."

—MIKE TONER





The ancestors of Ivory Coast chimpanzees used stone tools more than 4,000 years ago.

Lismullin Henge ◆ Gabhra Valley, Ireland

Early last year, archaeologists working on the route of a controversial highway near the village of Lismullin, Ireland, stumbled across a vast Iron Age ceremonial enclosure, or henge, surrounded by two concentric walls. The 2,000-year-old site is just over a mile from the Hill of Tara, traditional seat of the ancient Irish kings and site of St. Patrick's conversion of the Irish to Christianity in the fifth century A.D. The discovery of the massive henge, measuring more than 260 feet in diameter, confirms the long-held belief that the area around the hill contains a rich complex of monuments.

The extraordinary amount of archaeological remains on the Hill of Tara—burial mounds, religious enclosures, stone structures, and rock art dating from the third millennium B.C. to the twelfth century A.D.—makes it Ireland's most spiritually and archaeologically significant site. Construction of the new M3 highway, meant to ease traffic congestion around Dublin, threatens not only the Hill of Tara's timeless quality, but also newly discovered archaeological sites in the surrounding valley.

Lismullin, seen at right in an aerial shot taken during excavations, and other sites that stand in the way of the new road are now approved for destruction. Although archaeologists and concerned Irish politicians are rallying support worldwide for the protection of the Hill of Tara (see www.savetara.com to learn more about the effort), the iconic site remains in great peril. At press time, the European Commission had initiated legal action against the Irish government over the M3, charging Ireland with failing to protect its own heritage.

—JARRETT A. LOBELL

Ancient Chimpanzee Nutcrackers

◆ Taï forest, Ivory Coast

Archaeologists led by Julio Mercader of the University of Calgary have uncovered the first known ancient chimpanzee archaeological site, a grouping of stone hammers that were used by apes 4,300 years ago to smash open nuts. By analyzing pollen grains embedded in the stones, the team was able to identify five species of nuts the tools were used to open, four of which are not eaten by humans. The discovery shows that stone tool use is not a behavior that chimpanzees learned recently by watching the farmers who live in the area, as some skeptics believe. Mercader thinks that humans and chimpanzees may have inherited stone tool use from an ancestral species of ape that lived as long as 14 million years ago.

Although using a big rock to smash open a nut may seem like a simple task, Mercader sees the stones as clues to much more complex behavior. "There is clear evidence that chimpanzees understand what raw materials they need," he says, pointing out that the apes prefer specific, durable types of stone, such as quartzite or granite. Knowing where to find the stones also requires planning and a good memory in a thick jungle where visibility is only about 40 feet.

The number of behaviors that are uniquely human has been steadily dwindling as scientists learn more about our primate cousins, but producing cutting tools still seems to be beyond the abilities of chimpanzees living in the wild.

"If you go to a nut-cracking site today, you would find there are flakes that come off of the hammers," Mercader says. "What we haven't seen is a chimp picking up any of those by-products and using them."

—ZACH ZORICH



The Year in Controversy

Informal and often passionate scholarly debate is increasingly carried out on archaeological e-mail discussion groups. And 2007 provided the rowdy online communities with plenty of controversial theories and discoveries to argue about. One disputed new theory posits that an exploding comet explains the disappearance of the Clovis culture from North America around 12,800 years ago. On the basis of tiny carbon spheres and a sooty, carbon-rich dirt layer, some researchers theorize that the Clovis people were fragmented or wiped out by the explosion and an ensuing continent-wide firestorm. Many remain skeptical, but the theory also conveniently explains the extinction of Pleistocene megafauna like the mammoth, as well as the global cooling event called the Younger Dryas.

In Iran, another discovery is the source of more academic intrigue. Near the site of the 5,000-year-old city of Jiroft, archaeologists found three tablets inscribed with cryptic symbols that they believe are linear Elamite, a rarely seen early form of writing. The tablets look like obvious forgeries to some, but others, including respected art historian Holly Pittman of the University of Pennsylvania, think they are genuine and just the tip of the iceberg.



Titanic director James Cameron eyes a 1st-century A.D. ossuary at a press conference called by filmmakers who claim the box held Jesus's bones.

Much farther out on the archaeological fringe is the claim that limestone boxes found in Israel once held the remains of Jesus, his family, and Mary Magdalene. At a circus-like press conference, filmmaker and deep-sea enthusiast James Cameron (flanked by, among others, University of North Carolina–Charlotte theologian James Tabor), explained that the ossuaries have inscriptions referring to Mary Magdalene and “Yeshua bar Josef,” or “Jesus, son of Joseph.” The conclusions—based in part on a bit of statistical sleight-of-hand involving the rarity of the name “Ringo” in 1960s Liverpool—have been largely dismissed as wishful thinking, at best. —SAMIR S. PATEL

Greater Angkor ♦ Cambodia

The capital of a Khmer state that flourished between the ninth and fifteenth centuries, Cambodia's Angkor is one of the most intensively studied sites in the world. But it continues to inspire more questions than answers, the most fundamental being why the sophisticated Khmer Empire collapsed. In 2007, research into the mysteries of the world's largest preindustrial city reached a milestone with the completion of a 10-year mapping project, which yielded clues suggesting that the sprawling metropolis may have collapsed under self-induced environmental pressures related to overpopulation and deforestation.

“Angkor was a vast inhabited landscape...larger than anything previously known,” says Damian Evans, deputy director of the Greater Angkor Project (GAP) and lead author of the group's findings. Their map covers more than 1,100 square miles, detailing thousands of features that were part of an elaborate irrigation system.

The GAP team combined previously existing ground surveys, aerial photos, and radar remote-sensing data provided by NASA's Jet Propulsion Lab to create the comprehensive map. It shows an urban center surrounded by dispersed agricultural villages, local temples, and small reservoirs. The team



This computer reconstruction of Angkor Wat is based in part on a new map of the site and the vast urban landscape that surrounded it.

found evidence of silted canals and breached waterworks that suggest the people of Angkor were eventually unable to maintain the vast irrigation system because of erosion and increased flooding. The map also shows the metropolis extended miles beyond the ruins within today's Angkor Archaeological Park. “Extremely valuable archaeological material stretches far beyond the World Heritage zone,” Evans says. —KAREN COATES



one-and-a-half pound gold donation to a temple made by an official, or “chief eunuch,” Nebo-Sarsekim.

“At first I was just pleased to have found a reference to the title ‘chief eunuch,’ as these officials are mentioned very rarely in the sources,” says Jursa. “Then it suddenly came to me that this text was very close chronologically to an episode narrated in Jeremiah 39 in which Nebo-Sarsekim is mentioned, and that I might actually have found the very man. So then I got quite excited and instantly went and checked (and double-checked) the exact spelling of the name in the Hebrew Bible and saw that it matched what I had found in the Babylonian text!”

The tablet is dated 595 B.C., the ninth year of Nebuchadnezzar II’s reign. The Book of Jeremiah relates that after Nebuchadnezzar took Jerusalem in 587 B.C., he committed the prophet Jeremiah to Nebo-Sarsekim’s care.

“It is so incredibly rare to find people appearing in the Bible, who are not kings, mentioned elsewhere,” says Jursa. “Something like this tablet, where we see a person mentioned in the Bible making an everyday payment to the temple in Babylon and quoting the exact date, is quite extraordinary.”

—LAURA SEXTON

Nebo-Sarsekim Tablet

◆ The British Museum, UK

Last June, Austrian Assyriologist Michael Jursa was doing what he has done since 1991, poring over the more than 100,000 undeciphered cuneiform tablets in the British Museum. But while analyzing records from the Babylonian city of Sippar, he made a startling discovery with Biblical implications. It came in the unlikely form of a tablet noting a

Museums Return Looted Artifacts

It was a collective “oops” heard ‘round the world. Between 2005 and 2007, four major American cultural institutions acknowledged that some celebrated pieces of ancient art in their collections—for which they had paid millions—may have been looted from archaeological sites in Italy and Greece and trafficked through shady antiquities dealers. Following landmark agreements, the museums have returned (or are in the process of sending back) dozens of illegally excavated artifacts to their countries of origin.

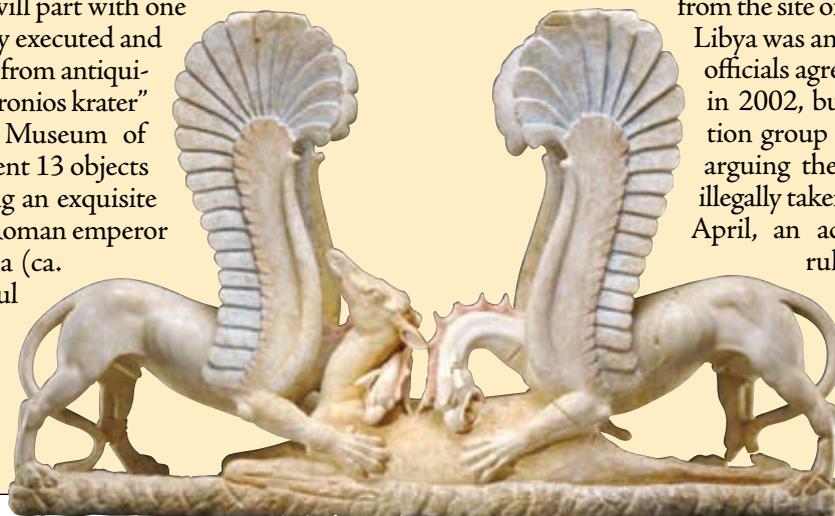
The Metropolitan Museum of Art in New York has already transferred title of 21 artifacts to Italy and in January 2008 will part with one of the most beautifully executed and well-preserved vessels from antiquity, the so-called “Euphronios krater” (ca. 515 B.C.). The Museum of Fine Arts in Boston sent 13 objects back to Italy, including an exquisite marble statue of the Roman emperor Hadrian’s wife, Sabina (ca. A.D. 136). The J. Paul

Getty Museum in Malibu agreed to return 40 pieces of ancient art to Italy by the end of 2007, including a marble sculpture of griffins attacking a doe (325–300 B.C.), a signature piece in the Getty’s collection. And this past October, the Princeton University Art Museum’s 18 months of discussions with Italy over 15 works culminated in the return of eight artifacts. The repatriations are archaeological victories of sorts; however, the objects’ find spots are lost forever, along with their true histories.

But what comes around, goes around. Since 1989, Libya has demanded that Italy return a second-century

A.D. statue of Venus—taken by Italian troops from the site of Cyrene in 1912, when Libya was an Italian colony. Roman officials agreed to return the statue in 2002, but an Italian conservation group appealed the decision, arguing the statue had not been illegally taken from Libya. This past April, an administrative tribunal ruled that the statue be

returned. Fortunately, the Italians will not have much difficulty filling the empty display case. —ETI BONN-MULLER



The Getty’s sculpture of griffins attacking a doe is on its way home to Italy.

Squash Seeds ♦ Ñanchoc Valley, Peru

New research favors the idea that agriculture began in the New World shortly after it first appeared in the Old World. Tom Dillehay of Vanderbilt University has the squash seeds to prove it.

Found in buried house floors in the northern Andean Ñanchoc Valley, the seeds were discovered near other floral remains, including peanut shells, quinoa grains, and cotton bolls, as well as stone hoes, grinding stones, plots for planting, and small-scale canals for irrigation. With accelerated mass spectrometry, Dillehay's team dated the remains to between 6,000 and 10,000 years ago, with the 10,000-year-old cultivated squash seeds being the oldest. Similarly old evidence of other species of squash has also been found in Mexico and Ecuador.

Across the world, in the Fertile Crescent, the domestication of rye, wheat, and barley between 12,000 and 10,000 years ago helped mark the transition from nomadic lifestyles to sedentary agricultural communities that would lead to more complex societies. Plant cultivation appears to have played a similarly central role in the tropical dry forest of the Ñanchoc Valley. Over several thousand years, the people settled down, planted more, managed their water supply, and built ritual mounds—steps toward the more advanced Andean cultures to come. According to Dillehay, “Not only do people domesticate plants, but the plants in some ways domesticate people.”

—SAMIR S. PATEL



Tell Brak ♦ Syria

Archaeologists have long believed that the world's oldest cities lay along the fertile riverbanks of southern Mesopotamia, in what is now Iraq. There, in a land of plenty, went the idea, powerful kings began coercing their subjects to live together some 6,000 years ago. Their great invention—the city—later spread throughout the Near East. But last August, Harvard University archaeologist Jason Ur and two British colleagues turned that idea on its head. Their intensive field survey and surface collection of potsherds at the site of Tell Brak in northern Syria revealed that an ancient city rose there at exactly the same time as urban centers first sprouted up in southern Mesopotamia, but followed a very different model of development. “Urbanism,” says Ur, “is not one brilliant idea that occurred one place and then diffused.”

Tell Brak first came to scientific attention in the 1930s when British archaeologist Max Mallowan and his wife Agatha Christie started excavations there. But recently, a team led by Cambridge University archaeologist Joan Oates has unearthed new clues to the city's early years. By 3900 B.C., the ancient metropolis sprawled across some 130 acres and boasted a flourishing bureaucracy and skilled artisans turning out fine marble chalices and other luxury goods for the ruling class.

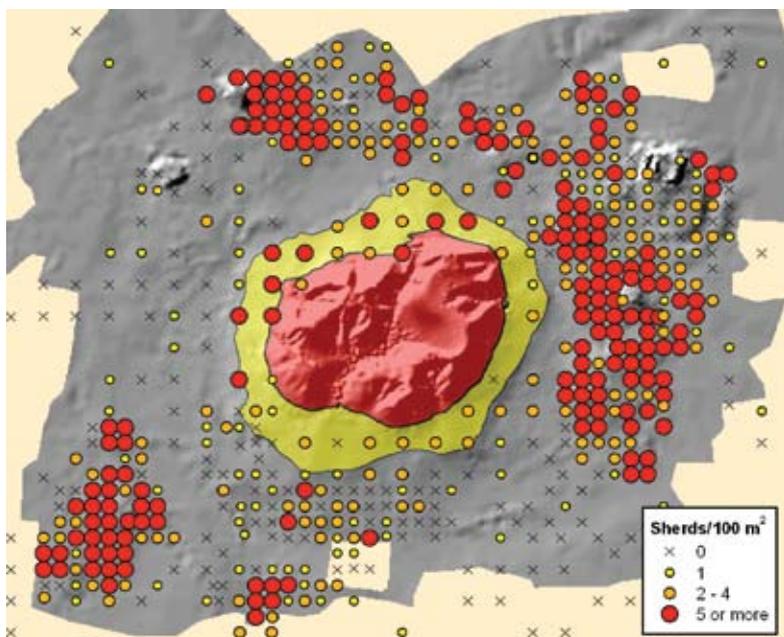
Intriguingly, Tell Brak seems to have grown from the outside in. In the south, cities began as a central settlement—under a single authority—that grew outward. But Ur's field survey shows that Tell Brak started as a central community ringed by smaller satellite settlements that expanded inward.

“There isn't a very tight control over these surrounding villages, at least at this beginning period,” says Ur. “So the assumption that we're making is that people were coming in under their own volition.”

—HEATHER PRINGLE



Pottery sherds from Syria's Tell Brak show that the Bronze Age city developed from a central core surrounded by satellite communities.



Polynesian Chicken Bone ♦ El Arenal, Chile

Scholars have long assumed the Spaniards first introduced chickens to the New World along with horses, pigs, and cattle. But now radiocarbon dating and DNA analysis of a chicken bone excavated from a site in Chile suggest Polynesians in oceangoing canoes brought chickens to the west coast of South America well before Europe's "Age of Discovery."

An international team, including bioarchaeologist Alice Storey of the University of Auckland, made the startling discovery after analyzing a recently excavated chicken bone from the Chilean site of El Arenal, a settlement of the Mapuche, a people who lived on the southern fringe of the Inca empire from about A.D. 1000 to 1500.

The team found that the chicken's DNA sequence was related to that of chickens whose remains were unearthed from archaeological sites on the Polynesian islands of Tonga and American Samoa. Radiocarbon dating shows the El Arenal chicken lived sometime between A.D. 1321 and 1407, well after Polynesians first settled Easter Island and the other easternmost islands of the Pacific.

In 1532, Spanish conquistador Francisco Pizarro recorded the presence of chickens in Peru, where the Inca used them in religious ceremonies. "That suggests chickens had already been there for a while," says Storey. "It's possible there are stylized chickens in the iconography that we have not recognized because we did not know they were there. I'm fascinated to see what [archaeologists] are going to do with this information."

—ERIC A. POWELL



DNA analysis of a chicken bone from a prehistoric site in Chile shows Polynesian seafarers first brought the birds to the New World.

KNM-ER 42700 and KNM-ER 42703

♦ Lake Ileret, Kenya

Whether they are mother-and-daughter species or two sisters, the relationship between *Homo habilis* and *Homo erectus* is becoming strained. A pair of discoveries near Lake Ileret in Kenya call into question the idea that *H. erectus*, the species from which modern humans evolved, is descended from *H. habilis*, the earliest hominid known to use stone tools.

A team of paleoanthropologists led by Meave and Louise Leakey of the Koobi Fora Research Project uncovered the upper jawbone of a *H. habilis* dated to 1.44 million years ago, and the skull of a *H. erectus* dated to 1.55 million years ago. *H. habilis* was thought to have gradually evolved into *H. erectus* over hundreds of thousands of years, fading out of existence around 1.65 million years ago. A previously discovered *H. erectus* fossil dated to 1.9 million years combined with the new finds show the two species lived together in the same lake basin for close to 500,000 years.

"I think increasingly they will be recognized as sister species that lived in the same area and did different things," says Fred Spoor of University College London and a member of the team. *H. erectus*' smaller teeth and less powerful jaws suggest it was probably eating more meat. If the two species both evolved from a common ancestor, it changes the human race's relationship to *H. habilis*. "Strictly speaking, if our scenario is correct," says Spoor, "*Homo habilis*, as we know the species, seems to be a dead branch."

—ZACH ZORICH



The discovery of a *Homo habilis* jawbone and a *Homo erectus* skull that are close in age has paleontologists rethinking the idea that *H. habilis* evolved into *H. erectus*.