Archaeology

EXPOSED!
The World’s Largest Underground Army

SKELETONS ON WALL STREET?

SATELLITES DIG FROM THE SKY

THE ICEMAN COMETH
What Is Archaeology?

Who cares about stuff that’s old, broken, half-rotted, and falling apart? Who likes to pick through garbage dumps?

Archaeologists do, because archaeology (ar-kee-AH-luh-gee) is the study of the material remains of past peoples. An archaeologist’s goal is to learn about people who have been dead for a long time but left things behind.

Finding artifacts, or objects made by humans, is the first step. Archaeologists have to recover these artifacts, preserve them, and unlock their secrets: How were they made? Why were they made? Who used them?

Step by step, archaeologists piece together a tale of human history. It’s a story that changes each time new artifacts are found, and it’s never finished. Many artifacts are lost forever. And many human activities leave no objects behind. But this account is the best picture we have of people and places from long ago.

In 1991, German hikers accidentally discovered Ötzi the Iceman, who is named for the area in the Alps where he was found. Tests showed that he froze to death 5,300 years ago. He was so well preserved that scientists were able to study the contents of his stomach. His last meal was goat meat and cooked grain.

Mary Leakey was a well-known paleontologist (a person who studies past geological periods through fossils). In 1978 in Tanzania, Africa, she followed a trail of fossilized footprints belonging to hominins, humanlike species that walked upright. The prints date from 3 million to 3.7 million years ago. Two adults and possibly a child made them. The prints show a well-developed foot arch and a striding gait.

A garbage dump from the 1960s is a treasure chest, full of “valuables” like corn on the cob, old newspapers, and other things people toss out. These items reveal a lot about the lifestyle not just of the ’60s, but of many earlier decades. Landfills used to preserve garbage instead of letting it rot. Landfills were improved in the 1990s.
Archaeology is a very young science. In the 18th and 19th centuries, the people who dug up artifacts were mostly treasure seekers, not scientists. They were “still attracted by pretty things, rather than by real knowledge,” wrote one scientist in 1904. Sometimes they even blasted sites open with dynamite, which could damage the artifacts inside. This engraving shows a discovery of mummies in Egypt in 1860.


Archaeology Hat Trick
If you want to be an archaeologist, consider learning a second skill or trade, because archaeologists have to wear several hats to get their job done.
Where Do Archaeologists Dig?

Earth is so huge that artifacts can be almost anywhere – on the ocean floor, inside caves, or buried underground. So how do archaeologists know where to look? Sometimes they get lucky, as when a worker digging a new basement finds a 2,000-year-old bowl. Usually, though, archaeologists can’t rely on pure luck. Instead, they have to use science and history to pinpoint promising sites.

Historical records, such as maps of battlefields, help to narrow the search. Poking around under modern cities or towns is another good way to search, because many were built on the remains of older cities. Checking out areas near rivers and other water sources is another smart thing to do. Humans have always settled near water.

Archaeologists also look for strange land features, using planes, radar, and a trained eye. Take a flat rain forest, for example. If there are unusual mounds amid dense jungle, ruins of human-made structures may be hidden within them. Any hills or holes that don’t seem natural may contain buildings – or even entire cities!

Egypt, Africa (1922)

Tutankhamen’s Tomb

In life, he was a lesser king. But in death, King Tut is the world’s most famous mummy. While other royal tombs were looted, both Tut’s body and the treasures buried with him remained almost intact for 3,245 years.
Can you see the ancient Roman camp in this aerial photo? Here’s a hint: It’s pretty rare to find floor plans with rooms, walls, and doors in a wheat field. The underground ruins make the soil different depths, where the wheat grows darker or paler. That’s why the outline of the camp is so visible. These ruins are in Austria, which used to be part of the Roman Empire.

Archaeologists of the future may wonder who is buried here. It’s the tomb of U.S. president Ulysses S. Grant and his wife, Julia.

Archaeologists have many friends in high places. Satellites and equipment on a space shuttle spotted faint trails in the vast Arabian desert. Countless camels and people had worn those trails down. Archaeologists followed the trails to where they all met, and they found the ruins of a legendary, 5,000-year-old city called Ubar. Its 10-foot walls enclosed a once-busy trading center, which had been active from around 2800 BCE to about 300 CE.

Full of tall, new buildings, Tarragona is a modern Spanish city, but it’s rich with ancient ruins. The legacy of the vast Roman Empire can still be seen in the remains of a public meeting place, arenas, and other structures left by the long-ago rulers.

Imagine you are a future archaeologist excavating a giant landfill where we have dumped our garbage. You’re excited that there’s so much to sort through, but it makes you wonder: Why did we produce so much trash?
Uncovering the Terra-Cotta Army

Shi Huangdi became China’s first emperor in 221 BCE. He ruled China until his death, 11 years later. The empire survived much longer – until 1912. But Shi Huangdi’s army has lasted longest of all.

Artisans (craftspeople) of the emperor’s day created an army of life-size soldiers out of terra-cotta clay. Rows and rows of foot soldiers, crossbow shooters, chariot drivers, and other figures still stand guard in Shi Huangdi’s massive tomb. It was discovered in 1974, near the city of Xi’an in central China, where local farmers were drilling for water. The tomb is still being uncovered, but up to 8,000 terra-cotta soldiers are believed to be inside it. Many statues of horses and chariots have also been found. In addition, the tomb contains the remains of a palace, storehouses, and stables.

How do archaeologists recover and keep records of so many artifacts? What do they learn from all these things? Excavating (digging up) an army-size site requires, first of all, an army-size crew.

**First,** archaeologists map the site. The map shows walls, doorways, underground chambers, wells, and anything else that’s left. It also includes large natural objects, such as boulders.

**Archaeologists** make a grid over the site with strings held by stakes. The grid helps archaeologists keep track of where artifacts are found. Each square of the grid is numbered to identify its location. A second number indicates the level, or depth in the ground, where each artifact is found.

**Forensic** scientists are experts at collecting and understanding evidence. Some specialize in human remains and can put together a skeleton, filling in missing parts. They may even use the skull bones to create a realistic likeness of the person.

**Dynamite** and gunpowder can move lots of rock in a hurry. But to safeguard artifacts, a lighter touch is needed. Diggers use dental picks, paintbrushes, toothbrushes, trowels, small shovels, and other small tools to free artifacts from rubble.

**Some computer scanners** can actually “see” inside a sarcophagus, or outer coffin. This image of a 3,000 year-old Egyptian mummy was made without opening its sarcophagus and disturbing it. Scientists were able to “unwrap” the mummy's body.
GREAT FINDS

SCREENERS SIFT
buckets of dirt for small, overlooked artifacts. A nail, a button, or even a peach pit may pro-
vide important information.

LARGER artifacts are drawn or photographed ex-
actly as they lie. A ruler is often includ-
ed in photos to show an object’s size.

RESTORING broken artifacts is a slow, precise process. Here, a scientist com-
pletes the recon-
struction of a shattered sculpture, creating a priceless artifact.

ALTAMIRA, northern Spain (1879)
Cave Art
At first sight, archaeologists and other experts thought these painted figures seemed too modern. Could early humans have drawn them 20,000 years ago?
Later, 300 similar caves were discovered. The answer became a definite yes.
Shipwrecks and Ruins

The name Edward Teach sounds friendly enough. But when American colonists heard Teach’s other name – Blackbeard – they shivered in fear. Blackbeard was a pirate in the early 18th century. With his long, full black beard, he purposely looked fierce to scare people, so they wouldn’t fight back when he robbed them. Before British forces killed him in 1718, Blackbeard had looted dozens of ships.

In 2011, archaeologists confirmed that a wreck found off the coast of North Carolina in 1995 was Blackbeard’s ship. A sunken pirate ship might contain fantastic booty, like gold, jewels, and even a toothpick! A toothpick? Yes, because to an archaeologist, any clue to the past is a treasure, no matter how dull it might seem.

Most shipwrecks are found in shallow water – often less than 50 feet deep. Over time, waves and currents break up and scatter parts of these vessels. As much as 30 feet of sand can bury them. A machine called a propwash (sort of like a vacuum cleaner in reverse) blows away the loose sand and mud to reveal the underwater finds.

Deep wrecks are usually better preserved than shallow ones are, but those deeper wrecks are difficult to explore.

Air is lighter than water, so balloons head for the surface when they are inflated underwater. That tendency to rise is called buoyancy. In this recovery, divers use buoyancy balloons to lift ancient pottery from the seafloor to the surface.

Wood rots quickly in water. Coins, gold bars, iron cannons, cookware, and other metal objects last longer. A metal detector can locate these objects, even when they’re hidden by coral. A device called a magnetometer can find steel and iron from a ship’s hull.

Ethiopia, Africa (1974)
Lucy, Breakthrough Humanlike Skeleton

Although skeletons older than Lucy’s 3.2 million years have since been found, Lucy’s is the most famous by far. Other skeletons are dated as “before Lucy” or “after Lucy.”
In May 1941, two British aircraft carriers, 19 battleships and cruisers, 21 destroyers, and six submarines joined forces to sink one German battleship named the Bismarck. The Bismarck tried to escape, but the British warships blasted it to bits. Half a century afterward, scientists found the battered remains 600 miles west of Brest, France, in waters 15,700 feet deep.

Caribbean coasts are dotted with shipwrecks, marked on this map with Xs. Why did so many ships sink? Early sailors didn’t have accurate maps, so they hugged the coastline. Plus, they needed to resupply their ships on land. As a result, many 16th- and 17th-century ships struck coral, rocks, or sandbars and sank. Hurricanes and storms took countless others. Out of 36 ships in a fleet that sailed from Spain in 1552, only two made it back home.

Underwater archaeology is the excavation, or exposure, of shipwrecks and other sunken sites. The ocean isn’t a natural place for humans, so working underwater creates many problems.

First, the archaeologists must become expert scuba divers.

Second, they have to get used to spending limited time underwater in not very comfortable situations.

Third, they must spend a great sum of money on a ship, a crew, and equipment. Of course, the rewards are great too. Underwater archaeologists have recovered vessels ranging from ancient trading ships to World War II battleships.

Think Piece! Shipwrecks can be underwater graveyards. Do you think it’s right to disturb them?
Where They Lived

These early humans and civilizations thrived centuries ago. Thanks to archaeologists, they live on.
1. Early hominins: 6 million to 1.8 million years ago
2. Neanderthals: 400,000 to 28,000 years ago
3. Cro-Magnon man: 40,000 to 10,000 years ago
4. Ancient China: 5000 BCE to 1662 CE
5. Mesopotamia: 5000 BCE to 1862 CE
6. Ancient Egypt: 4500 BCE to 30 BCE
7. Megalithic civilizations: 5000 BCE to 1500 BCE
8. Ancient India: 4000 BCE to 1500 BCE
9. Ancient Greece: 1200 BCE to 323 BCE
10. Ancient Rome: 753 BCE to 476 CE
11. Persian Empire: 550 BCE to 642 CE
12. Maya: 1500 BCE to 1521 CE
13. Mogollon, Anasazi, and Hohokam: 100 CE to 1600 CE
14. Mongolian Empire: 1206 CE to 1380 CE
15. Byzantium and Ottoman Empire: 330 CE to 1922 CE
16. Incas: 1200 CE to 1532 CE
17. Aztec: 1345 CE to 1521 CE
18. Easter Island: 700 CE to 1700s CE
Some Facts about Artifacts

The saying “You are what you eat” often rings true in archaeology. The daily diet of a people shows how healthy and wealthy the society was. It may be revealed by food-related remains such as seeds, pollen (plant spores), animal bones, campfire sites, and cooking tools.

The royal tombs of ancient Egypt were filled with the richest foods available. Egyptians believed that the dead needed food in the afterlife. The land in Egypt was one of the most fertile and productive areas in ancient times. As their tombs reveal, most people there ate well, and royalty ate very, very well.

But food-related items aren’t the only clues we can use to discover the truths of past cultures. Three other rules also apply: You are what you wear, you are what you own, and you are what you live in. Look at what you eat, own, wear, and live in. What if you were frozen in time, and archaeologists of the 23rd century wanted to figure out how you lived? What wrong ideas – and right ideas – might they get from studying artifacts of your existence?

STONE AGE PEOPLE

worldwide made axes, spears, scrapers, and other stone tools. Some knives made of flint (a stone that flakes easily) are as sharp as a modern surgeon’s knife. This skull underwent brain surgery 4,000 years ago. The holes in the head had begun to heal, which means the patient survived, at least for a while.

WHICH IS BETTER

for cutting down trees: a stone ax or a bronze ax?
Archaeologists hacked down trees with both kinds of axes and found that it makes no difference. Only iron (shown), which became available after the Stone Age and the Bronze Age, makes the job go faster.

Honduras (1830s–1840s)

Maya Civilizations

For centuries, dense jungle hid the massive ruins of great cities built by the Maya. In 1839, archaeologists discovered Copan (ko-PAN), Honduras, and then found dozens of other long-lost sites.
Today, clothes can be giveaways to a person’s origins. The same was true more than 3,800 years ago. In western China’s Tarim Basin, archaeologists found mummies with hair and clothes intact, all preserved naturally by the dry air and freezing winters. The wool garments they wore featured a northern European weave called twill, and the skeletons had European features. What were these blonds and redheads doing in China, and what happened to their descendants?

Typically, archaeologists are able to use ancient writings and art to understand dead civilizations. But that works only if they can read the messages in these artifacts. The Voynich manuscript (right), found in Italy, is about 600 years old, and it still has not been read. It’s written in Latin, but the words are in code, and they make no sense. Why would someone want to encode a book about plants?

Players of the game of Ur took the rules to their graves 4,500 years ago. (Ur was a city in Sumer, in modern-day Iraq.) We may never know how to play the world’s oldest-known board game. Archaeologists have tried to figure it out by pondering questions like these:

Do the game pieces look like any modern ones?

How many different kinds of pieces does this game use?

Based on the pieces, how many players could participate in a game?

Is the board a track, and if so, where does it start and end?

What could the designs on the board mean?

Who owns artifacts like this pottery vessel? In 1990, the U.S. government passed the Native American Graves Protection and Repatriation Act. It requires all museums to examine their collections of Native American objects and human remains.

Each Native American nation must be notified if the museum has any of the nation’s ancestors’ material. A lot of this material has been returned to the correct peoples, especially human remains and sacred artifacts or objects used in funeral ceremonies.
Challenges Faced by Archaeologists

Archaeologists have to deal with many challenges, including forces that attack and destroy artifacts. Most are microscopic, like bacteria, and some are invisible, like wind and earthquakes. The elements that cause rust are both! Of course, humans can be a problem too. Looters and vandals have been ruining sites since at least the time of ancient Egypt.

Luckily, planet Earth has a few “safe houses” – places where artifacts have lasted for thousands of years. Bacteria are not a problem because the safe house is too hot, too cold, or too dry. The objects are sheltered from wind and waves. Earthquakes, volcanoes, and hurricanes can’t get at them – and neither can destructive humans. Where are these safe havens?

 Decomposers are organisms that break down dead plants and animals. Bacteria and mold are two good examples of things that cause rot. Artifacts survive best in places that decomposers don’t like. If an area is too hot, cold, dry, acidic, or oxygen-poor, artifacts do well. Outer space is a perfect place to store things, but here on Earth, mountaintops, caves, deserts, and polar regions are good choices.

 Don’t worry – bog people aren’t creatures in a horror movie. They’re 1,000-year-old northern Europeans. Many were strangled, stabbed, or hanged (see the cord around this one’s neck?). The bogs they were thrown into preserved them so well, some still have their hair. The acid in the bogs killed decomposers, so the bodies didn’t rot away.

 The lively town of Port Royal, Jamaica, attracted pirates in the 17th century. Now it attracts fish and archaeologists. Two-thirds of Port Royal sank into the sea after a 1692 earthquake. Its size and submerged locale make it hard to explore. A tavern, a shoemaker’s shop, a carpenter’s shop, and other buildings could take a century to excavate and study.
From the 1st to the 8th centuries CE, the Moche people lived in what is now Peru. Modern-day grave robbers found Moche tombs filled with gold. Starting in 1987, archaeologists rescued some tombs’ artifacts, but some were already gone.

Egypt, Africa (1799)

The Rosetta Stone

Egyptian hieroglyphs are picture symbols used in an ancient written language. For centuries, they had remained a mystery, until Napoleon Bonaparte’s soldiers found this tablet. The Rosetta Stone shows one message written in three languages. French scholar Jean-François Champollion decoded it in 1822. He used the Greek text, which he could read, to figure out the two unknown Egyptian hieroglyphic scripts.

Robert Falcon

Scott and his crew reached the South Pole in 1912, soon after Roald Amundsen beat them to it. Unfortunately, the Scott party didn’t make it back. Just 11 miles from safety, they starved and froze to death on the ice. The freezing cold preserved their bodies and their cabin. But now, Antarctic glaciers (moving rivers of ice) are slowly carrying what’s left of the Scott expedition out to sea.

Vegetation grows fast in the rain forest, so an abandoned city doesn’t stand a chance. Rampant jungle growth can bury buildings, roads, and other ruins in just a few decades. Plus, the roots, weight, and moisture of all that growth can damage structures. Here are some of the ruins in Cambodia’s ancient city of Angkor.
Unsolved Histories

Archaeologists don’t have all the answers, and sometimes the answers they do have turn out to be wrong. Unsolved histories go beyond just a few confusing artifacts.

Scientists are still trying to solve centuries-old murder mysteries, such as: Who killed the Iron Age European bog people and tossed them into bogs? And why? What happened to the Anasazi people of the southwestern United States?

**HUNDREDS OF**
Anasazi lived in Chaco Canyon (now New Mexico) around 1,200 years ago. It seems that life was good to them. The cliffs protected them from enemies and from wind, rain, and other forces of nature. We can see by their network of roads that they traded with other cultures. That much is all clear, but we don’t know why the Anasazi disappeared. Was it because of over-farming or drought? Did an enemy drive them away? Or was it something else?

**In the Southeastern and midwestern U.S. are ancient earthen mounds. They served as religious sites, temples, defenses against enemies, and tombs.**

Several Native American cultures built them from 3000 BCE to 1000 CE. When Europeans found the mounds, some didn’t want to believe that native peoples had made them. In the 19th century, someone put fake texts into a mound, hoping to convince people that early Europeans were the mound builders.

**Prehistoric peoples came to America about 15,000 years ago. They left a skimpy but very real trail of artifacts behind. The first Europeans known to arrive were Vikings, who beat Columbus by 500 years. Archaeologists found clear evidence of this in the form of a Viking village in eastern Canada (above).**

**Did an Irish monk named Saint Brendan beat the Vikings to America by 500 years? Legend says the trip took seven years in an ox-hide boat. But that same legend says Saint Brendan stared down “sea-cats,” giant sheep, and talking birds. Iceland is the closest place to America where evidence of 6th-century Irish monks has been found.**

**Qumran, West Bank, near the Dead Sea (1947)**

The Dead Sea Scrolls

Looking for his goat, a boy walked into a cave and found the Dead Sea Scrolls hidden in clay jars. The scrolls are 2,000-year-old religious writings. They tell the story of the Jewish people under Roman rule in the 1st century CE.
United States, who carved pueblos (villages) out of cliffs and then suddenly abandoned them?

The biggest mysteries of history raise questions about whole continents. For example, who was the first

European explorer to set foot on American soil? It definitely was not Christopher Columbus, no matter what archaeologists used to think and history used to teach.

**A How did people in 3100 BCE move megaliths (giant stones) to Stonehenge in England?** It’s one of history’s most celebrated mysteries, thanks to the site’s popularity. Archaeologists determined in 2015 that many of the stones were taken from quarries in Wales, about 180 miles away! Stonehenge was used for burials starting around 2500 BCE. As new burials were made at the site, others were re-arranged, and new megaliths were added. The site is designed to showcase astronomical events, so it may have been used as an observatory.

**The name Piltdown Man has almost come to mean “hoax.”** From 1912 to 1954, top scientists believed the Piltdown Man skull showed evidence of a previously unknown hominin from human prehistory. Piltdown Man appeared to have the jaw of an ape and the braincase of a modern human. The hoaxter who created this phony skull was never caught.

**Did Stonehenge-era Europeans build these stone houses in New England 3,500 years ago?** If so, there should be Stonehenge-era garbage around them, but none has been found. It’s more likely that 18th-century European colonists built the houses using old methods.

**When mysteries can’t be solved easily (or ever) some people start to reach for far-out answers — very far out, as in outer space.** For example, some people say that aliens created Stonehenge, the pyramids, and this huge petroglyph (rock drawing) in Colorado. But there’s no good evidence to support these spacy ideas. Most archaeologists will tell you that ancient earthlings had enough know-how to create these amazing things.
Activities

MAKE A SCALE DRAWING

As you learned in the magazine, archaeologists document a site by placing a large grid over an area. Then they draw what is in each square of the grid in a square of graph paper. In that way, they make a scale drawing. Make a scale drawing of the site shown here. Use graph paper with at least half-inch squares. Copy the content of each square of the site into the corresponding square on the graph paper.

WRITE A JOURNAL ENTRY

Suppose you were a member of the team of archaeologists who made one of the discoveries described in this magazine. Pick one of the discoveries to write about. Imagine how you felt when you made the discovery. Think about the work you did to reach that moment. Write a journal entry about the experience. In your journal entry, explain the process of making the discovery. Tell about the excitement you felt when you made the discovery.
HSS 6.1 Students describe what is known through archaeological studies of the early physical and cultural development of humankind from the Paleolithic era to the agricultural revolution.

6.1.2 Identify the locations of human communities that populated the major regions of the world and describe how humans adapted to a variety of environments.

**Historical and Social Sciences Analysis Skills:**

1. Students frame questions that can be answered by historical study and research.

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**Mesopotamia**

Ever wonder when the first written records appeared, when the wheel was invented, or where our modern counting system came from? Believe it or not, these and many other innovations – like glass, farming, complex legal systems, and basic astronomy – came from one civilization, the very first: Mesopotamia.

**Ancient Egypt**

Pyramids, pharaohs, mummies, and gods: This once-powerful civilization left behind breathtaking monuments and priceless treasures. Discover the people and practices that make Ancient Egypt so alluring to the historians who have uncovered the mysteries of this long-ago civilization.

**Language**

Language is more than just the words and sounds we use to communicate. The study of language helps us understand our past. From ancient hieroglyphs and the first papyrus scrolls to sign language and computer programming, language has long been at the center of human society.

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**British paleontologist Mary Leakey** (above) wasn’t respected as a scientist at first. Her groundbreaking discovery of a prehistoric hominin in 1959, however, changed all that.

**Archaeology** often involves studying ancient burial sites. By studying objects found in graves, and how the deceased people were buried, archaeologists can learn about ancient social status and inequality.

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For thousands of years as they migrated across continents, prehistoric humans were foragers – hunters and gatherers of food. But by 8000 BCE, in Mesopotamia (the Fertile Crescent) in the Middle East, some foragers began to settle down in the region.
Ancient Persia

Greece's Golden Age

Olmec and Maya

Indian Empires

Early Romans

Christianity and Rome's Legacies

Olmec and Maya

Civil Rights

Early Greeks

Greek’s Golden Age

Ancient Persia

Science Source: Pacific Press.

On the Covers: Warriors and horses from the tomb of Chinese emperor Shi Huangdi.

Picture Credits: Alamy: Sun Tse: p. 4 center (Afghan Burial Ground National Monument); David Hilbert: p. 7 bottom right (restoring broken artifacts); INTERFOTO: p. 12 bottom left (David iron ax); Photo 12: p. 12 top right (amphora); Peter Barritt: p. 13 middle left (Uct); World History Archive: p. 13 lower center (Yevnich manuscript); B.A.E., Inc.: p. 13 lower right (Naive American pot); Superstock: p. 15 bottom center (Rosetta Stone); ENRIQUE CASTRO-MENDIVIL/Reuters: pp. 14–15 bottom (Moche grave); Kelley Stanley: p. 15 center (Egyptian pyramids); Bill Brooks: p. 16 lower left (Viking village site); NPS Photo: p. 17 lower center (rock drilling); Laminus: p. 19 top left (Assyrian palace); AP Images: Matt Rourke: p. 12 right (Tarim Basin mummy); Art Resource: Erich Lessing: p. 13 top right (Austrian pot); Getty Images: Luis Marden/ National Geographic; p. 14 lower right (Port Royal, Jamaica); LAWRENCE MIGDALE/ Science Source: p. 17 (Stonehenge); Three Lions: p. 16 right (studying Dead Sea Scrolls); Leopold Nekula/Sigma: p. 2 lower right (mummified man discovered in the Oxztal Alto); Mark Thuesen: p. 3 bottom left (landfill generating liquid natural gas); De Agostini: pp. 2–3 (mummy discovery); pp. 14–15 center (Robert Falcon Scott’s hut); p. 13 top center (Kamarae vase); Hulton-Deutsch Collection: p. 4 bottom center (King Tut excavation); Bill Hatcher/National Geographic Magazine: p. 5 bottom left (locals walk through the ruins of Ubir); Xavier Rossell/Gamma-Rapho: p. 6 top right (mopping the site); Katri Deits/PhotoLibrary: pp. 6–7 top (Ged); DESHAKALYAN CHOWDHURY/AFP: p. 7 upper right (sipping oil); TOM MCHUGH/Science Source: p. 6 bottom right (digging with tools); MENAHEM KAHANA/AFP: pp. 6–7 center (utting); Gordon Willie/National Geographic Magazine: p. 7 (drawing artifacts); LEON NEAL/AFP: p. 6 center (forensic facial reconstruction); WILLIAM WEST/AFP: p. 6 bottom center (computer view into sarcophagus); Lesmang/Corbis Historical: p. 7 bottom left (cave art); Michael Nicholson/Corbis Historical: p. 8 lower center (Lacy skull); JOHN READER/Science Photo Library: p. 8 lower center (Lacy, humanlike skeleton); Anne Hodalic/Corbis Historical: p. 8 top center (prop-wash); Jonathan Blair/Corbis Documentary: p. 8 bottom left (bouyancy balloons); ulstein bild: p. 8 lower right (Bismarck); Jonathan Kingston/National Geographic: pp. 8–9 (working underwater); Science & Society Picture Library: p. 12 lower left (ancient surgery); Werner Forman/Universal Images Group: p. 12 top right (Celtic pot), p. 13 top left (Peruvian jar), p. 14 bottom left (eg people); mmp0007: p. 13 top right (Mexican pot); Nathan Bem/Corbis Historical: p. 14–15 bottom (Moche artifacts); Roy Spiller/Picture Post: pp. 16–17 bottom (Pilmouth Man); Bettmann: p. 19 bottom (Dr. Mary Leakey); Granger: p. 14 lower left (mummy); Sarir Images: p. 16 top left (American Indian mounds); p. 16 bottom left (Irish monks). iStock: seraxicus: pp. 2–3 bottom (old landfill); Evalco: p. 4 lower right (skeleton); demerzel1: p. 5 middle-right (Grant’s Tomb, New York City); Robert Ford: p. 12 lower center (Maya civilization); Nickada: pp. 14–15 (Angkor growth); ivanmatev: p. 15 top center (Angkor growth); Nikkos Daskalakis: p. 16 upper right (Chauco Canyon); NASA/USGS: p. 5 bottom right (satellite image of Ubar, Oman). Photo Researchers, Inc.: Georg Gerster: pp. 4–5 top (ancient Roman camp); Science Source: John Reader: p. 2 upper right (hommin footprints); John Reader: p. 2 center (single adult fossilized hommin footprint); Jeff Roffman: p. 8 bottom right (metal detector). Shutterstock: Jaroslav Moravek: p. 4 lower left (Tutankhamen mask); M.V. Photography: p. 5 top right (Tarragona columns); nikiteve_konstantin: p. 18 bottom (journal); Vladimir Zhigile: p. 19 top right (Japanese hieroglyphs); rr SNIPER: p. 19 top center (ancient Egyptian statue). www.stonochenguas.com: America’s Stonehenge; p. 17 bottom (stone houses).

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Gary Halgren: Where They Lived, pp. 10–11.