Early Humans

Where did early humans live? How did they live, and what happened to them? To answer these questions, scientists study the evidence left by prehistoric people. Although researchers have new and better ways of studying the past, there is much we still do not know.

Historians rely mostly on documents, or written records, to create their pictures of the past. However, no written records exist for the prehistory of humankind. In fact, prehistory means the time before writing was developed. The story of prehistoric humans depends on archaeological and, more recently, biological evidence. Archaeologists and anthropologists use this information to create theories about our early past.

Archaeology and Anthropology

Archaeology is the study of past societies through analysis of what people left behind. Archaeologists dig up and examine artifacts—objects made by humans. Artifacts may be tools, weapons, art, and even buildings made by early humans.

Anthropology is the study of human life and culture. Culture includes what people wear, how they organize their society, and what they value. Anthropologists use artifacts and human fossils to create a picture of peoples’ everyday lives. Fossils are rocklike remains of biological organisms—a leaf imprint or a skeleton.

Archaeologists and anthropologists have developed scientific methods to carry out their work. They excavate, or dig up land, at sites around the globe to uncover fossil remains of early humans, ancient cities, burial grounds, and other objects. The examination and analysis of these remains give archaeologists a better understanding of ancient societies. By examining artifacts such as pottery, tools, and weapons, for example, these scientists learn about the social and military structures of a society. By analyzing bones, skins, and plant seeds, they are able to piece together the diet and activities of early people. One of the most important and difficult jobs of both archaeologists and anthropologists is dating their finds.
Dating Artifacts and Fossils

Dating human fossils and artifacts helps scientists understand when and where the first humans lived.

One method used to determine age is radiocarbon dating. All living things absorb a small amount of radioactive carbon, or C-14, from the atmosphere. After a living thing dies, it slowly loses C-14. By measuring the amount left in an object, a scientist can figure its age. This method is accurate for objects no more than about 50,000 years old.

For objects dating back to 200,000 years ago, scientists can make relatively precise measurements using thermo-luminescence. This measures the light given off by electrons trapped in the soil surrounding fossils and artifacts.

Microscopic and biological analyses of organic remains—such as blood, hairs, and plant tissues left on tools and weapons—give scientists still more information. Such analyses have shown that blood molecules may survive millions of years. This recent scientific discovery is especially useful in telling us more about humans, their use of tools, and the animals they killed. Ancient deoxyribonucleic acid (DNA) is providing new information on human evolution. The analysis of plant remains on stone tools yields evidence on the history of farming. All of these techniques give us insight into the lives of early peoples.

✓ Reading Check  Describing How do archaeologists and anthropologists determine the ages of fossils and artifacts?
Louis and Mary Leakey spent most of their lives searching for clues about early human life. They made a dramatic discovery of a skeleton at Olduvai Gorge in East Africa. According to their son:

"My father was ill that morning, so my mother set out alone... but found very little until just before noon, when she noticed a scrap of enormously thick bone protruding from beneath the surface. She instantly realized that it was part of a hominid skull—and that two teeth were embedded in the rock just above it. Elated, she drove back to camp to tell my father Louis. As he remembered it, she rushed in crying, ‘I've got him! I've got him! I've got him!’"

—Richard Leakey, TIME, July 17, 1959

Leakey’s discovery of a hominid in 1959 was the oldest at that time—about 1.8 million years old.

**People in History**

**Louis Leakey** 1903–1972

Paleoanthropologists study early human society. For three generations, beginning with the husband and wife team of Louis and Mary, the Leakeys have searched for early human remains in Africa. Born in Kenya, Louis discovered some stone tools and an interest in prehistory. In the 1930’s, Louis and Mary began looking for evidence of early humans at Olduvai Gorge. Mary is credited with discovering *Proconsul africanus* in 1948, *Australopithecus boisei* in 1959, *Homo habilis* in 1960, and an 89-foot-long trail of early human footprints called the “Laetoli footprints” in 1979. What do the Leakeys' finds illustrate about where early human life began?

**Mary Leakey** 1913–1996

**Richard Leakey** 1942–present

Richard, a son of Louis and Mary, found his first fossil at age six. Meave, a zoologist, joined Richard’s expedition in 1969. Richard and Meave focused their search at Koobi Fora, near Lake Turkana in Kenya. Over a thirty-year period, this Leakey team made 200 significant fossil finds.

Meave and Louise Leakey were named National Geographic Society’s explorers-in-residence in 2002. The Leakey mother and daughter paleontologists found a 3.5 million-year-old skull near Turkana. Why were the Leakeys' fossil finds significant?
For decades, scientists assumed these earliest of upright creatures must also have used tools. In 1974, Donald Johanson challenged this theory when his team found a new skeleton in Ethiopia. Johanson nicknamed the female skeleton “Lucy” and suggested that she was the common ancestor for several types of early human life. Scientists called this type of hominid *Australopithecus* (aw•STRAY•loh•PIH•thuh•CUS), or “southern ape.” It flourished in eastern and southern Africa.

In a 1991 interview, Johanson explained why “Lucy” changed the ideas of many scientists about hominids that walked upright:

**PRIMARY SOURCE**

“People felt that there were a number of evolutionary changes, which all went together. That our ancestors stood up to free their hands so that they could make and use stone tools. In order to make and use stone tools, they had to have large brains . . . Here comes Lucy, about 3.5 million years old . . . very small brain, . . . and we have never found any stone tool, stone artifacts, associated with her species. Yet she is walking upright. So it appears that . . . walking on two legs, precedes by perhaps as much as a million and a half years, the manufacture of stone tools and the expansion of the brain.”

—Donald Johanson, 1991 interview

From 2.5 to 1.6 million years ago, a more advanced hominid developed with a somewhat larger brain. This hominid was named *Homo habilis*, meaning “handy human.” *Homo habilis* may have used stone tools. The earliest remains of this hominid were discovered near Olduvai Gorge. Another hominid, *Homo erectus*, “upright human,” existed from 1.8 million to 100,000 years ago. Although other hominids walked on two legs, *Homo erectus* had arms and legs in modern human proportion. Remains in Asia show that *Homo erectus* was probably the first hominid to leave Africa.

Around 200,000 years ago, *Homo sapiens* emerged. *Homo sapiens*, “wise human,” showed rapid brain growth and mastered fire. Two kinds of early humans descended from *Homo sapiens*: Neanderthals and *Homo sapiens sapiens*. In the Neanderthal, a valley in Germany, the earliest remains of Neanderthals, or Neandertals, were found. They probably lived between 100,000 B.C. and 30,000 B.C. Other Neanderthal remains have been found in Europe and Turkey. Besides using many kinds of stone tools, European Neanderthals made their clothes from animal skins. Neanderthals seem to be the first early people to bury their dead. According to some scholars, burying the dead indicates a belief in an afterlife.

**Homo Sapiens Sapiens**

The second group descended from *Homo sapiens* is *Homo sapiens sapiens*, meaning “wise, wise human.” These are the first to have an anatomy similar to people today. Physical evidence suggests that *Homo sapiens sapiens* appeared in Africa between 150,000 and 200,000 years ago. They probably spread out of Africa to other parts of the world about 100,000 years ago, replacing populations of earlier hominids in Europe and Asia. This is referred to as the “out-of-Africa” theory (or replacement theory).

Another theory, the multiregional model, states that the development from earlier hominids to anatomically modern humans occurred in different locations in Africa, Asia, and Europe. The timing and reasons for early human migrations are still debated among scholars.

By 30,000 B.C., *Homo sapiens sapiens* had replaced the Neanderthals. The Neanderthals died out, possibly as a result of conflicts with *Homo sapiens sapiens*. The spread of these first modern humans was a slow process. Over many thousands of years, *Homo sapiens sapiens* spread over the globe as they searched for food and new hunting grounds. In a whole generation, they may have moved only two to three miles. Over hundreds of thousands of years, this was enough to populate the world. Today, all humans, whether they are Europeans, Australian Aborigines (A•buh•RIJ•NEES), or Africans, belong to the same subgroup of human beings.

**✓ Reading Check  Summarizing** Identify and describe all the important stages in early human development.
The Paleolithic Age

Early humans used fire, made tools, and adapted to survive.

HISTORY & YOU Could you live in the wild with only tools you made? Read how early humans managed to survive.

One of the basic distinguishing features of the human species is the ability to make tools. The term **Paleolithic Age** is used to designate the early period of human history (approximately 2,500,000 to 10,000 B.C.) in which humans used simple stone tools. Paleolithic is Greek for “old stone,” and the Paleolithic Age is sometimes called the Old Stone Age.

**Hunting and Gathering**

For hundreds of thousands of years, humans relied on hunting and gathering for their daily food. Paleolithic peoples had a close relationship with their environment. They came to know what animals to hunt and what plants to eat. They gathered wild nuts, berries, fruits, wild grains, and green plants. Around the world, they hunted and ate various animals, including buffalo, horses, bison, and reindeer. In coastal areas, fish and shellfish provided a rich source of food.

**The Paleolithic Way of Life**

Early humans were able to sustain themselves through the use of stone tools. To make such tools, early people used very hard stones, such as flint. They used one stone to chip away parts of another, creating an edge. Hand axes of various kinds—pointed tools with one or more cutting edges—were the most common. Hand axes eventually were set in wooden handles, making them easier to use. By attaching wooden poles to spear points and hardening the tips in fire, humans created spears to kill large animals.

Over the years, Paleolithic hunters developed better tools. The invention of the spear, and later the bow and arrow, made hunting much easier. Harpoons and fishhooks made of bone increased the catch of fish.

Early humans used sharp-edged tools to cut up plants, dig up roots, and cut branches to build simple shelters. Scraping tools were used to clean animal hides for clothing and shelter. By the end of the Paleolithic period, there is evidence of such refined tools as bone needles. These needles could be used for making nets and baskets and even sewing hides together for clothing.

Because Paleolithic people were hunters and gatherers, they had to follow animal migrations and vegetation cycles. Paleolithic humans were nomads—people who move from place to place to **survive**. Archaeologists and anthropologists think these nomads probably lived in small groups of twenty or thirty. Hunting depended on careful observation of animal behavior patterns and demanded group cooperation for success.

**The Roles of Men and Women**

The main job of Paleolithic peoples was finding enough to eat. Both men and women were responsible for finding the food needed for survival. Paleolithic parents passed on their practices, skills, and tools to their children to ensure the survival of later generations.

Since women bore and raised children, they probably stayed closer to camp. They played an important role in acquiring food by gathering berries, nuts, roots, and grains. Women taught the children which foods were edible. They trapped small animals and kept the camp safe.

In the constant search for food, men had to travel far from camp to hunt herds of large animals. What the women caught and gathered had to feed the group if there was no game. Because both men and women were responsible for finding and acquiring the food needed to sustain life, many scientists believe there was equality between them. It is likely that both men and women made decisions that affected the activities of the Paleolithic group.

**Adapting to Survive**

Groups of Paleolithic people, especially those groups who lived in cold climates, found shelter in natural caves. Over a
period of time, people created new types of shelter as well. Perhaps most common was a simple structure made of wood poles or sticks covered with animal hides. In places where wood was scarce, they might use the large bones of mammoths to build frames that were then covered by animal hides. The systematic use of fire made it possible to provide a source of both light and heat within both the caves and the handmade structures in which they lived.

**Use of Fire**

Another important result from the migration of early hominids was the use of fire. As early hominids moved from the tropics into colder regions, they needed to adjust to new climate conditions. In response, *Homo erectus* first learned to make fires. Archaeologists have discovered the piled remains of ashes in caves that prove that Paleolithic people used fire systematically as long ago as 500,000 years.

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**Field Archaeology: How We Learn about the Spread of Early Humans**

Archaeologists use scientific methods to learn more about prehistory. The techniques and materials used on a “dig” combine older tools and modern technology.

First archaeologists search computer databases, maps, aerial photos, and satellite images to find a promising site. At the site, the team will record the exact location with a global positioning device. Then using survey equipment, they map the area and set up a grid to pinpoint the location and depths of the finds. Workers still use trowels and brushes to unearth artifacts.

Once an object is found, archaeologists record it in their field notes. Then they clean, label, photograph, and enter the find on a database. A rough “dating” is made using stratigraphy, indicating age by the soil layer it was found in. Other tests—radiocarbon dating, potassium-argon dating, DNA, thermoluminescence, and dendrochronology—are done in a lab.

**CRITICAL THINKING SKILLS**

1. **Explaining** Why does it take archaeologists many years to excavate a site?
2. **Drawing Conclusions** How does archaeology provide information for maps like the one on page 5?

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At an excavation of an Inca cemetery near Lima, Peru, a man brushes dirt from a skull with hair still intact.

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![Laptops make the dig easier.](image1)

![Hand-held GPS (Global Positioning System)](image2)
Chauvet Cave

Paleolithic artists drew dangerous mammoths, rhinos, cave bears, and cave lions, but rarely depicted themselves.

Chauvet’s constant temperature of 56°F with 99 percent humidity helped preserve the paintings.

Although people never lived there, Chauvet contains remnants of fires, used to produce charcoal for drawing.

**HISTORY & ARTS**

**Chauvet Cave**

Around 35,000 years ago, Ice Age artists painted images in caves. This 20-foot (6-m)-long “Panel of Horses” was found in Chauvet Cave in southern France.

1. **Analyzing** What does the “Panel of Horses” depict?
2. **Comparing** What similarities do you see between animals in the cave art and those of today?

**DOCUMENT-BASED QUESTIONS**

At a *Homo erectus* site in northern China, remnants of hearths, ashes, charcoal, and charred bones have been dated to 400,000 years ago.

Fire not only gave warmth, but kept wild animals away from the campsite. Armed with spears, hunters used fire to flush out wild pigs for the kill. People gathered around the fire to trade stories and to cook. Cooked food tasted better, lasted longer, and was easier to chew and digest (in the case of some plants, such as wild grains), so it seems likely that nutrition improved.

Scholars believe that the discovery of a means for starting fires occurred independently throughout the world, in different places at different times. Archaeologists lack concrete evidence on how early peoples started fires. They have been able to examine the methods used by traditional peoples. On that basis, archaeologists deduce that the earliest humans used friction to start fires.

Eventually, some Paleolithic peoples developed sturdy, drill-like wooden devices to start fires. Other early humans discovered that a certain stone, iron pyrites, gave off a spark when struck against a rock and that spark could ignite dry grass or leaves.
The Ice Ages

Having fire to create a source of heat was especially important when Ice Age conditions descended on the Paleolithic world. The most recent Ice Age began about 100,000 B.C. and ended in about 8000 B.C. During this time, sheets of thick ice covered large parts of Europe, Asia, and North America. As sea levels went down, people migrated across land bridges that had not existed before.

Ice Age conditions posed a serious threat to human life, and the ability to adapt was crucial to human survival. The use of fire, for example, reminds us that early humans sometimes adapted not by changing themselves to better fit their environment but by changing the environment.

Creating Art

The importance of art to human life is basic. Art existed even in prehistory among the hunters and gatherers of the Paleolithic Age. In 1940, a bad storm near Lascaux (la•SKOH) in southern France uprooted a large tree, revealing a cave. French children playing nearby soon found the cave and the paintings inside. Many of these paintings had deteriorated, but scientists used special tools to determine what is being depicted, such as horses, bulls, and stags.

Another famous discovery was made in Spain in 1879 when a little girl wandered into a cave on her grandfather’s farm near Altamira. Like many other caves covered with Paleolithic art, the cave near Altamira shows evidence that the paintings may have been created over a span of time, not all at once. Scientists can date the art based on pigments from the paintings.

In 1994, Jean-Marie Chauvet and his friends discovered paintings in southern France. Carbon dating showed works at Chauvet Cave were nearly twice as old as those at Lascaux and Altamira, but the drawings were more advanced. Scholars had assumed the opposite—that the earliest art would be crude and gradually would become more detailed.

Using stone lamps filled with animal fat to light the caves, early artists painted with fingers, twigs, and even blew paint through hollow reeds. They mixed mineral ores with animal fat to make red, yellow, and black paint. A variety of realistically painted animals cover the caves. Few humans appear in these paintings, and when they do appear, they are drawn as sticklike figures. This has led some scholars to think the work was done for a magical or religious ritual to bring success in hunting. Others believe the paintings were made simply to please the eye. Recent discoveries of art by early humans show that prehistoric art existed in other areas of the world.

✓ Reading Check  Identifying What are two important innovations of Paleolithic peoples?