

Finding Lucy: The Leakeys and the Search for Human Origins

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The skeleton of Lucy, discovered in Africa in 1974, is 3.2 million years old.

Until the 1950s, European scientists believed that *Homo sapiens* evolved in Europe, or possibly in Asia, about 60,000 years ago. Since then, the excavation of fossil bones in East Africa, pioneered by Mary and Louis Leakey, has revealed that *Homo sapiens* may have emerged in Africa much earlier.

Human origins

Most scientists agree that the human species emerged somewhere in Africa about 200,000 years ago. This understanding is based on fossilized bones and skulls that have been uncovered in East Africa and dated accurately by radiometric dating. These bones and skulls range from 25,000 to 4.4 million years old, and show many different stages of human and primate evolution. These fossils have been uncovered by paleoarchaeologists — scientists who study the material remains of the entire human evolutionary line.

Based on the fossil evidence, paleoarchaeologists currently tell the following story: For 99.9 percent of our history, from the time of the first living cell, the human ancestral line was the same as that of chimpanzees. Then, about 5 million to 7 million years ago, a new line split off from the chimpanzee line. The new group appeared in the open savanna rather than in the rain forest or jungle. The old group in the rain forest continued to evolve, and two of its species remain in existence: the common chimpanzee and the bonobo.

The new group in the savanna evolved over the millennia into several species. It's unclear how many, but at least 18 different ones. Finally, only one was left: *Homo sapiens*. All the species before us back to our common ancestor with chimpanzees are now collectively called “hominins.” (They used to be called “hominids.”)

Try visualizing it like this. Imagine your mother holding hands with her mother. She, in turn, is holding hands with her mother. Keep going back in time for 5 million years. The final clasping hand would belong to an unknown kind of ape whose descendants evolved into chimpanzees, bonobos, and, ultimately, your mother. If we count each generation as averaging 14 years, there would be about 360,000 hand-holders in the hominine line. We can thank Richard Dawkins, a contemporary English biologist, for this metaphor.

Paleoarchaeologists debate what names to put on the bones they find. They have to decide which ones ought to be considered a separate species. No central authority determines this. So paleoarchaeologists discuss among themselves and try to reach a consensus. They more or less agree on three main categories of species before *Homo sapiens*; these are *Australopithecus* (2 million to 4 million years ago), *Homo habilis* (1.8 million to 2.5 million years ago), and *Homo*

erectus (2 million to 4 million years ago). Clearly, some of these species must have overlapped during hominine evolution.

What scientists know took many years to figure out. The first early human fossil bones were found in Europe — Neanderthals in Germany in 1857 and Cro-Magnon in France in 1868. Java Man was found in Sumatra, Indonesia, in 1894. Most paleoarchaeologists in the 1920s and 1930s felt certain that *Homo sapiens* must have evolved in Europe, or possibly Asia, since a group of fossils known as Peking Man was found in China in 1923 to 1927. Africa, widely known then as the “Dark Continent,” was not considered a possibility, largely due to racist thinking.



Louis Leakey measures an ancient skull found in Tanzania

The Leakeys look to Africa

When did anyone start looking in Africa for hominine fossils? One German professor found a *Homo sapiens* skeleton in 1913 in Tanganyika (now Tanzania). A professor in South Africa found

a child's skull there in 1924. But archaeologists denied that these bones were significant. The first to make credible finds were an English couple, Louis and Mary Leakey.

Louis Leakey was born and grew up in Kenya, in a tiny mission village near Nairobi, now the capital of Kenya. Louis's parents were missionaries from England. Louis spent much of his childhood hunting and trapping with the local Kikuyu boys. He spoke Kikuyu as a native language and went through initiation rites with his Kikuyu peers. At the age of 13, Louis built his own house, as was Kikuyu custom. He also found some relics that he recognized as ancient hand axes. At 16, he traveled to London to enter Cambridge University and become an archaeologist.

Mary Nicol grew up in England, but her father was an artist who took his family traveling each year, mostly in southern France. He loved Stone Age history and showed Mary archaeological sites in France. She was only 13 when he died, and her mother sent her to strict Catholic schools in London. Mary rebelled and was expelled several times. At 17, she took charge of her own education, learning to fly a glider and to draw, and attending lectures in archaeology.

Mary and Louis met in London in 1933 when she was 20 and he 30. Louis was married at the time — with one small child and another on the way — but he and Mary nevertheless began an affair. In 1935, she joined him in Tanzania during one of his expeditions. They married the following year once his divorce was complete. Louis's actions cost him his research fellowship at Cambridge University.



Mary and Louis Leakey examine skull fragments

Louis chose the Oldowan Gorge, now called Olduvai Gorge, as his main area of research. It lies about 200 miles southwest of Nairobi, in present-day Tanzania. Olduvai Gorge took shape when a river cut through the sediment that had formed over 2 million years at the bottom of a huge ancient lake. About 20,000 years ago, an earthquake drained the lake; after that, the river cut a deep gorge through the sediment of the old lake bed. The river sliced mostly through the shoreline of the lake, revealing the remains of people and other animals that had once gathered there. Almost 2 million years of history are exposed in the 25-mile-long main gorge and in a side gorge 15 miles long.

Olduvai Gorge lies in the Great Rift Valley, a massive geological fault in the African plate. The fault line runs from the Red Sea southward through Ethiopia and Tanzania, down to the mouth of the Zambezi River in Mozambique. Eventually this crack in the plate will deepen so much that the eastern piece of Africa will break off and move away. Mountains and volcanoes frame the edge of the Great Rift Valley. The volcanic eruptions produce ash, which easily buries and fossilizes bones, making this ideal territory for finding fossils. After being buried under layers of soil for millions of years, the fossils are moved upward as the Earth continues to shift.

Life in the field

Life was an adventure for Louis and Mary in the Great Rift Valley. They lived in tents or mud huts with dirt floors and kerosene lamps. Often they had no fresh vegetables or fruit, living on fresh fish, canned food, rice and corn meal, and coffee and tea. Sometimes Louis shot a gazelle for its meat. Lions prowled their camps at night. On occasion, the only water available came from watering holes where rhinoceroses wallowed; the soup, coffee, and tea would taste of rhino urine. African servants cooked and served their meals and washed their clothes.

Their reward came in living outdoors amid some of the most beautiful scenery in the world. Gorgeous volcanic mountains with the Serengeti Plain spread out before them, hosting flamingos, rhinos, giraffes, lions, leopards, antelope, and zebra. The couple worked early and late in the day to avoid the hottest sun. They used a dental pick and an artist's brush to reveal, ever so slowly, the hidden fossils of long ago.

Louis and Mary found many ancient tools and fossils of extinct animals. But finding human fossils proved to be more difficult. In 1948, Mary found a primate skull that they thought might be the “missing link” connecting apes and humans, but it turned out not to be. In 1959, Mary discovered a skull that dated at 1.75 million years old. The find made the Leakeys famous and led to funding from National Geographic. In 1960, Louis found the hand and foot bones of a 12-year-old, whom he named *Homo habilis*, thus classifying this species of hominin.

Until the 1950s, fossil hunting was filled with confusion because no one had a way to date the bones. Geologists could only make an estimate based on the age of the rocks in which they were found.

Things changed that decade with the arrival of radiometric dating. Now fossil ages could be identified much more accurately. Carbon-14 atoms would not work for dates that go as far back as

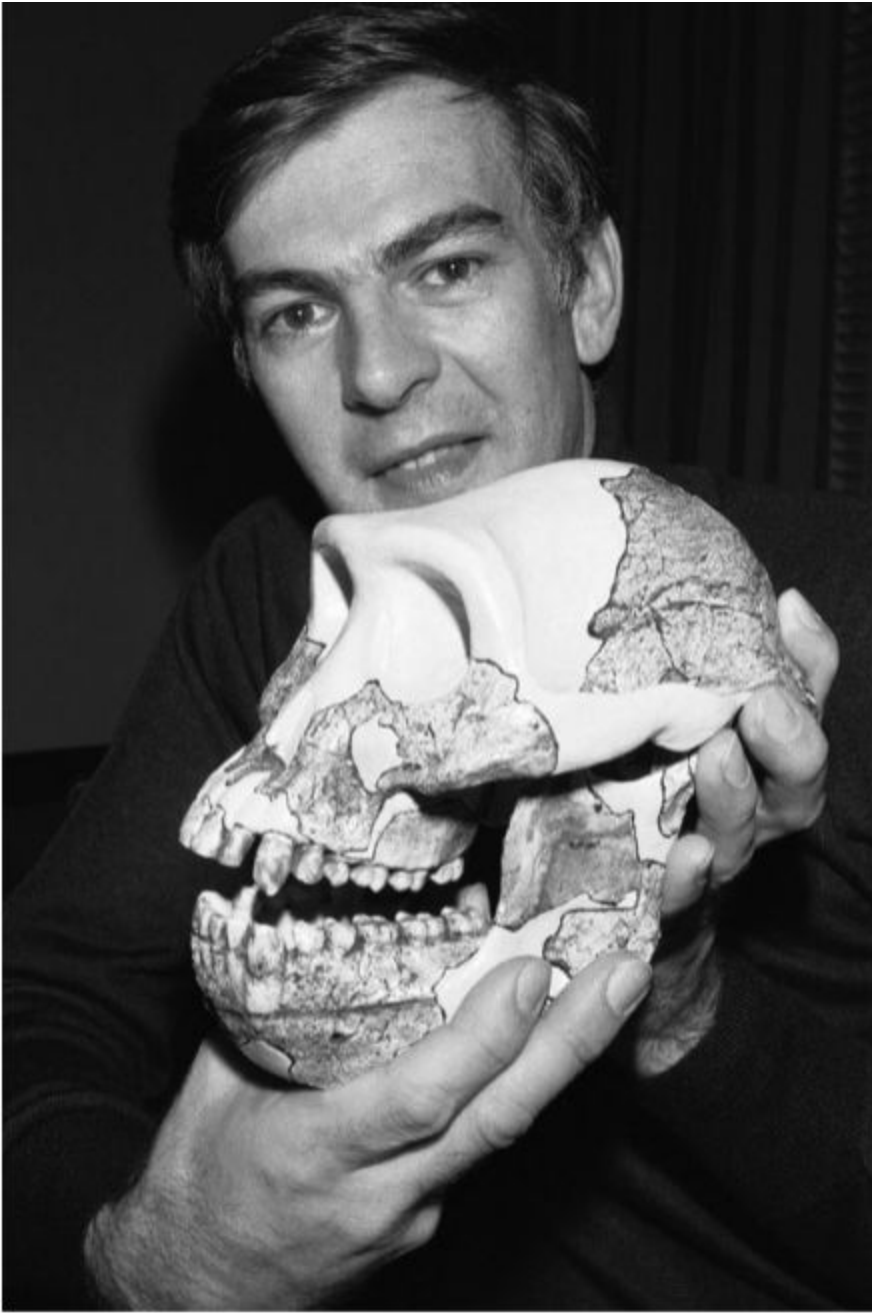
early hominins; instead, potassium found in the volcanic ash was used in a potassium-argon radiometric-dating technique.

Louis Leakey was convinced that humans had evolved from the apes, which he realized were fast losing their territory in Africa. They had never been studied in the wild, only in captivity. Since knowing more about them would provide insights into hominine behavior, Leakey took the initiative to raise money for people chosen by him to study apes in their own habitat before it was too late. He looked for young women who could do this work. In 1960, he helped a young Jane Goodall begin her study of chimpanzees in the wild. Later, he raised money for Dian Fossey to study gorillas and Biruté Mary Galdikas to study orangutans.

Finding Lucy

Meanwhile, others had begun searching for fossil bones in Africa. After Louis Leakey died of a heart attack in 1972, Mary Leakey continued working at Olduvai Gorge; however, the next spectacular find occurred in the Ethiopian part of the Great Rift Valley, at Afar. In 1974, Donald Johanson, an archaeologist, found parts of a skeleton there that dated back 3.2 million years. They were the oldest hominine bones yet discovered. Johanson nicknamed the skeleton “Lucy.”

Lucy was assumed to be female because the bones were of a small hominin, roughly 3 1/2 feet tall. Only about 20 percent of a full skeleton was found, and most of the skull was missing. Importantly, the foot, leg, and pelvis bones showed that Lucy walked upright. This was evidence that, in the human line, bipedalism came earlier than brain growth, which previously had been supposed to come first.



American archaeologist Donald Johanson holds up a plaster cast of the "Lucy" skull

The Leakey legacy

Mary and Louis Leakey raised three sons, who lived with them in the field. Their son Richard went on to run the Kenya Wildlife Service, focusing on saving elephants.

After Louis's death in 1972, Mary became a leading scientist in her own right. She initiated a camp at Laetoli, 35 miles from Olduvai, where the soil dated to 3.59 to 3.77 million years old. There, in

1976, she found an astonishing set of hominine footprints preserved in volcanic ash, more evidence that hominins of that time walked upright.

Mary Leakey lived at Olduvai long enough to see leopards and rhinos dwindle to near extinction. In 1983, she ended her fieldwork and moved to Nairobi, where she died in 1996 at age 84.

Thanks to the pioneering work of Louis and Mary Leakey, there's overwhelming evidence that *Homo sapiens* originated in Africa. Confirmed by recent genetic testing, it is clear that humans separated from the chimpanzee line 5 million to 7 million years earlier. The Leakeys spent their lives digging in the earth in the search for human origins. At a time when few others could entertain the thought, Louis demonstrated that our species had its beginnings on the African continent.