Oldest Fossils of Homo Sapiens Found in Morocco, Altering History of Our Species

Fossils discovered in Morocco are the oldest known remains of Homo sapiens, scientists reported on Wednesday, a finding that rewrites the story of mankind's origins and suggests that our species evolved in multiple locations across the African continent.

"We did not evolve from a single 'cradle of mankind' somewhere in East Africa," said Philipp Gunz, a paleoanthropologist at the Max Planck Institute for Evolutionary Anthropology in Leipzig, Germany, and a co-author of two new studies on the fossils, published in the journal Nature. "We evolved on the African continent."

Until now, the oldest known fossils of our species dated back just 195,000 years. The Moroccan fossils, by contrast, are roughly 300,000 years old. Remarkably, they indicate that early Homo sapiens had faces much like our own, although their brains differed in fundamental ways.

Today, the closest living relatives to Homo sapiens are chimpanzees and bonobos, with whom we share a common ancestor that lived over six million years ago. After the split from this ancestor, our ancient forebears evolved into many different species, known as hominins.

For millions of years, hominins remained very apelike. They were short, had small brains and could fashion only crude stone tools.

A composite reconstruction of the earliest known Homo sapiens fossils from Jebel Irhoud in Morocco based on micro computed tomographic scans of multiple original fossils.CreditPhilipp Gunz/Max Planck Institute for Evolutionary Anthropology

Until now, the oldest fossils that clearly belonged to Homo sapiens were discovered in Ethiopia. In 2003, researchers working at a site called Herto discovered a skull estimated to be between 160,000 and 154,000 years old.

A pair of partial skulls from another site, Omo-Kibish, dated to around 195,000 years of age, at the time making these the oldest fossils of our species.

Findings such as these suggested that our species evolved in a small region — perhaps in Ethiopia, or nearby in East Africa. After Homo sapiens arose, researchers believed, the species spread out across the continent.

Only much later — roughly 70,000 years ago — did a small group of Africans make their way to other continents.

Yet paleoanthropologists were aware of mysterious hominin fossils discovered in other parts of Africa that did not seem to fit the narrative.

In 1961, miners in Morocco dug up a few pieces of a skull at a site called Jebel Irhoud. Later digs revealed a few more bones, along with flint blades.

Using crude techniques, researchers estimated the remains to be 40,000 years old. In the 1980s, however, a paleoanthropologist named Jean-Jacques Hublin took a closer look at one jawbone.

The teeth bore some resemblance to those of living humans, but the shape seemed strangely primitive. “It did not make sense,” Dr. Hublin, now at the Max Planck Institute, recalled in an interview.

Since 2004, Dr. Hublin and his colleagues have been working through layers of rocks on a desert hillside at Jebel Irhoud. They have found a wealth of fossils, including skull bones from five individuals who all died around the same time.

Just as important, the scientists discovered flint blades in the same sedimentary layer as the skulls. The people of Jebel Irhoud most likely made them for many purposes, putting some on wooden handles to fashion spears.

Many of the flint blades showed signs of having been burned. The people at Jebel Irhoud probably lit fires to cook food, heating discarded blades buried in the ground below. This accident of history made it possible to use the flints as historical clocks.

Dr. Hublin and his colleagues used a method called thermoluminescence to calculate how much time had passed since the blades were burned. They estimated that the blades were roughly 300,000 years old. The skulls, discovered in the same rock layer, must have been the same age.

Despite the age of the teeth and jaws, anatomical details showed they nevertheless belonged to Homo sapiens, not to another hominin group, such as the Neanderthals.

Resetting the clock on mankind's debut would be achievement enough. But the new research is also notable for the discovery of several early humans rather than just one, as so often happens, said Marta Mirazon Lahr, a paleoanthropologist at the University of Cambridge who was not involved in the new study.

"We have no other place like it, so it's a fabulous finding," she said.

The people at Jebel Irhoud shared a general resemblance to one another — and to living humans. Their brows were heavy, their chins small, their faces flat and wide. But all in all, they were not so different from people today.

"The face is that of somebody you could come across in the Metro," Dr. Hublin said.

The flattened faces of early Homo sapiens may have something to do with the advent of speech, speculated Christopher Stringer, a paleoanthropologist at the Natural History Museum in London.

"We really are at very early stages of trying to explain these things," Dr. Stringer said.

The brains of the inhabitants of Jebel Irhoud, on the other hand, were less like our own.

Although they were as big as modern human brains, they did not yet have its distinctively round shape. They were long and low, like those of earlier hominins.

Dr. Gunz, of the Max Planck Institute, said that the human brain may have become rounder at a later phase of evolution. Two regions in the back of the brain appear to have become enlarged over thousands of years.

“I think what we see reflect adaptive changes in the way the brain functions,” he said. Still, he added, no one knows how a rounder brain changed how we think.

The people of Jebel Irhoud were certainly sophisticated. They could make fires and craft complex weapons, such as wooden handled spears, needed to kill gazelles and other animals that grazed the savanna that covered the Sahara 300,000 years ago.

The flint is interesting for another reason: Researchers traced its origin to another site about 20 miles south of Jebel Irhoud. Early Homo sapiens, then, knew how to search out and to use resources spread over long distances.

Similar flint blades of about the same age have been found at other sites across Africa, and scientists have long wondered who made them. The fossils at Jebel Irhoud raise the possibility that they were made by early Homo sapiens.

And if that is true, Dr. Gunz and his colleagues argue, then our species may have been evolving as a network of groups spread across the continent.

John Hawks, a paleoanthropologist at the University of Wisconsin who was not involved in the new study, said that it was a plausible idea, but that recent discoveries of fossils from the same era raise the possibility that they were used by other hominins.

Carl Zimmer

https://www.nytimes.com/2017/06/07/science/human-fossils-morocco.html?_r=0