

# The Long Road to Modernity

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Most experts agree that *Homo sapiens* arose in Africa about 200,000 years ago and had more brainpower than earlier hominid species. But it's a matter of debate whether modern humans got smarter in one big cognitive leap or gradually developed their greater intelligence. New dating of an important hominid site in Ethiopia suggests that the road to advanced cognition was long and winding.

Anthropologists and archaeologists rely on stone tools and other artifacts to gauge the sophistication of ancient humans. About 1.7 million years ago in Africa, *Homo erectus*, an ancestor of modern humans, started using large hand axes and cleavers. This know-how spread to Asia and Europe and remained cutting-edge technology for well over a million years. Eventually, however, it gave way to the Middle Stone Age, which featured smaller and more sophisticated blades and spearheads.

Many researchers have assumed that these weapons and tools were made by modern humans, because nearly all of them have been found at sites dated later than 195,000 years ago, the age of the oldest known *H. sapiens* fossils. That would imply a big cognitive leap on the part of modern humans, as they would have essentially developed a complex technology as soon as they arrived on the scene.

But not all evidence jibes with this theory. In the 1990s, for example, archaeologists dated a Middle Stone Age site in Ethiopia called Gademotta to 235,000 years ago--implying that the technology had been maturing for a while before the arrival of modern humans--although the accuracy of that dating has been questioned. A second site, Kapthurin in Kenya, was more reliably dated in 2002 to 285,000 years ago, but researchers have been very reluctant to accept just one site as evidence that the Middle Stone Age started so early. Both sites are in Africa's volcanic Rift Valley, the birthplace of many hominid species.

Now two geochronologists from the University of California, Berkeley, Leah Morgan and Paul Renne, have redated Gademotta using the argon-argon method, an improved technique for dating volcanic rock that is considered more accurate than the potassium-argon method previously employed at the site. The new results, reported in this month's issue of *Geology*, push the artifacts at Gademotta back to at least 280,000 years ago, essentially the same age as those at Kapthurin.

Morgan and Renne suggest that the early dates at both Gademotta and Kapthurin indicate that the tools were probably not invented by modern humans but rather by ancestral hominids intermediate between *H. erectus* and *H. sapiens*. A few fossils that might represent such ancestors have been found in Africa over the past decades and are thought to be between 400,000 and 200,000 years old.

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Sally McBrearty, an anthropologist at the University of Connecticut, Storrs, and a leader of the excavations at Kapthurin, says that the new Gademotta dates provide "solid confirmation" of the early appearance of Middle Stone Age technology. And Christian Tryon, an anthropologist at New York University, says that the "major behavioral changes" represented by the early invention of these sophisticated tools may have even helped stimulate the advances in cognition that would become the hallmark of modern humans.

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