

# New fossil discovery shows earlier human migration out of Africa

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A multinational team of paleoanthropologists has published their findings following the unearthing last May of the oldest undisputed human fossil remains outside of Africa. The remains of two individual skulls were discovered at an archaeological site at Dmanisi, Georgia, in the former Soviet Union. These new findings have pushed back the estimated time of the first human migrations out of Africa by several hundred thousand years.

Utilizing the latest dating techniques—which include paleomagnetic measurements based on changes in the Earth's magnetic polarity, combined with a careful study of fossil animal remains at the site—the team has established, with a fair degree of certainty, that these human ancestors of our genus *Homo* left Africa and spread at least as far as Eurasia 1.7 million years ago. Another fossil human—that of a *Homo erectus* discovered at Sangiran on the island of Java—was dated in 1994 at 1.8 million years old, but that date is currently being challenged. Before these discoveries, the oldest hominid fossil found in Europe was a crushed skull from Ceprano, Italy, which had been dated at a much more recent 800,000 to 900,000 years ago.

The case for the Dmanisi find being older than the Java hominid is bolstered by the physical appearance of the remains, which resemble that of an earlier human ancestor called *Homo ergaster*, a somewhat more primitive and smaller-brained precursor of *Homo erectus*. Until the Dmanisi discovery, *Homo ergaster* remains had only been found in east Africa. The taxonomic identification of these fossil individuals remains a contentious issue, with some specialists willing to classify both fossils as simply varieties of *Homo erectus*. However the cranial capacity (brain size) of the two Dmanisi skulls, at 780 and 650 cubic

centimeters at most, would place them at the low end of the *Homo erectus* range, suggesting that they are of an older date than the Java Hominid, regardless of species classification.

Of even greater significance, however, is the apparent primitiveness of the Dmanisi humans' toolkit. Up until now, it had been thought that the first human migrations out of Africa had occurred only after the invention of the stone hand-ax associated with *Homo erectus*. This tool making ability, called the Acheulean after the place of its original discovery in France, is associated with human remains found throughout much of Africa, Europe and Asia. The toolkit of the Dmanisi humans, however, consisting of crudely made chopping tools, points to an older tool making tradition called the Oldowan, previously found only in Africa. According to University of Michigan paleoanthropologist Milford Wolpoff, "the overwhelming discovery is that there are Oldowan-using people colonizing outside of Africa."

According to Susan Anton, who co-authored the paper published in the May 12 issue of the journal *Science*, if the findings concerning the earlier departure of hominids from Africa are correct, "it is biology, not new tools, that prompted their dispersal. As soon as you get larger body sizes and brains, you see shifts in what they eat and how far they range that ultimately leads them out of Africa."

While this is undoubtedly true, it may also be the case that biological changes were bound up with cultural advances not directly associated with the making of better tools. With *Homo erectus*, for example, the growth in brain size, as well as its increased physical stature, was not accompanied by a widening of the birth canal in females, thus making it impossible for a human infant to be born with a fully developed brain. As a result, the human brain continues to grow for several

years after birth, in effect extending the gestation period and rendering the early infant vulnerable.

The problem that confronted our human ancestors—how to protect offspring that remain essentially helpless for years after birth—could only have been resolved through the development of a more complex and decidedly human social organization. This new social human, who had already acquired a taste for meat, would be a more efficient scavenger, as well as a limited hunter, capable of greatly expanding its range.

It is believed that these early humans migrated out of Africa via the Middle East, through an area known as the Levantine corridor. From there, scientists believe that climatic conditions, which prevented a turn westward toward Europe, forced these human ancestors to take a southerly route across Asia to their eventual destinations: China and what is now Indonesia.



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