

group of hominids, which includes both humans and their prehuman ancestors through to a common ancestor also related to the apes.

In the old system, *hominid* refers solely to the bipedal ape lineage. The hominid in current understanding includes both the lineages of the apes back to a common ancestor and the lineages of humans back to a common ancestor.

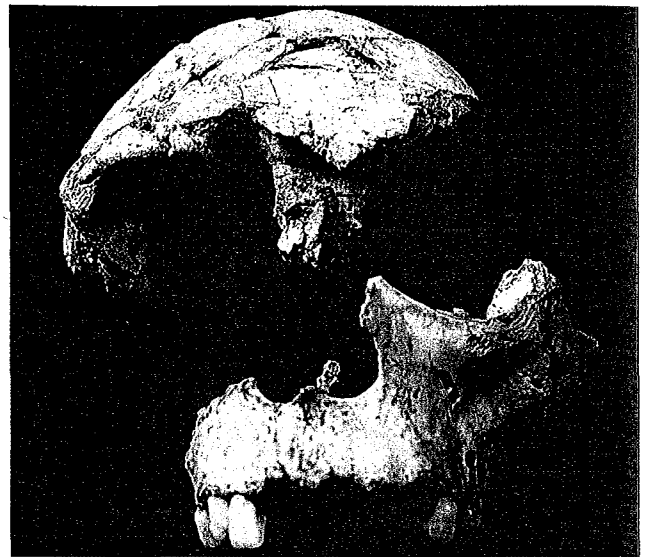
— Andrew J. Waskey



HOMO ANTECESSOR

Homo antecessor is the designation given a fossil hominid from the Lower Pleistocene of Atapuerca, Spain, defined in 1997 by Bermúdez de Castro, Arsuaga, Carbonell, Rosas, Martínez, and Mosquera, in *Science* magazine. The name *antecessor* is the Latin word meaning “explorer,” “pioneer,” or “early settler.” Assigning this name, they emphasized that these hominids belong to the first population as yet known in the European continent. The fully modern midfacial morphology of the fossils antedates other evidence of this feature by about 650,000 years. The midfacial and subnasal morphology of modern humans may be a retention of a juvenile pattern that was not yet present in *Homo ergaster*. Consequently, *Homo antecessor* may represent the last common ancestor for Neandertals and modern humans.

From 1994 to 1996, nearly 80 human fossil remains were recovered from level six (*Aurora stratum*) of the Pleistocene cave site of Gran Dolina (TD), Sierra de Atapuerca, Burgos, Spain. These remains were found in sediments located about 1 m below the Matuyama-Brunhes boundary. In 1997, Bermúdez de Castro and his colleagues described the TD6 fossils and defined a new species, which exhibits a unique combination of cranial, mandibular, and dental traits. Midfacial topography shows a modern pattern and infraorbital surface with true canine fossa. The supraorbital torus is double-arched. The superior border of the temporal squama is convex, and there is the presence of a styloid process. The mylohyoid groove extends anteriorly nearly horizontal and courses into the mandibular body, the thickness of which is clearly less than that of *H. ergaster* and *Homo habilis* s.s. There is an absence of alveolar prominence at the M1 level.



Source: Photo by Eustoquio Molina.

The extramolar sulcus is narrow. The lateral promi-nentia is smooth and restricted to the level of M2. The design of the inner aspect of the corpus is similar to that of European Middle Pleistocene fossils. Mandibular incisors are buccolingually expanded with respect to *H. habilis* s.s., but postcanine teeth are smaller and within the range of *H. ergaster*, *Homo erectus*, and *Homo heidelbergensis*. The maxillary incisors are shovel-shaped. The mandibular canine is mesiodistally short.

The holotype is a fragment of right mandibular body with M1, M2, and M3 (ATD6–5) and an associated set of teeth from the same individual. Holotype and paratypes are provisionally housed in the Museo Nacional de Ciencias Naturales, Madrid, Spain. The final repository of the fossils is the Museo de Burgos, Spain.

— Eustoquio Molina

See also Atapuerca; Arsuaga, J. L.; Bermúdez De Castro, J. M.; Hominoids

Further Readings

- Bermúdez de Castro, J. M., Arsuaga, J. L., Carbonell, E., Rosas, A., Martínez, I., & Mosquera, M. (1997). A hominid from the Lower Pleistocene of Atapuerca, Spain: Possible ancestor to Neandertals and modern humans. *Science*, 276, 1392–1395.
- Carbonell, E., Bermúdez de Castro, J. M., Arsuaga, J. L., Díez, J. C., Rosas, A., Cuenca-Bescós, G.,

Sala, R., et al. (1995). Lower Pleistocene hominids and artifacts from Atapuerca-TD6 (Spain). *Science*, 269, 826–830.

Fernández-Jalvo, Y., Díez, J. C., Bermúdez de Castro, J. M., Carbonell, E., & Arsuaga, J. L. (1996). Evidence of early cannibalism. *Science*, 271, 277–278.

HOMO ERECTUS

Homo erectus (literally “upright man”) is an extinct hominin that lived between 1.8 million and 50,000 years ago. The first fossil found of this species (the type specimen) was a skullcap discovered in 1891 by Eugène Dubois. However, the species was not named until 1894, after a femur (thigh bone) was discovered not far from the skullcap. The femur was nearly identical to that of a modern human, prompting Dubois to name a new species: *Pithecanthropus erectus* (literally “upright ape-man”). Both fossils were found in Trinil, Java. The type specimen was named “Trinil 2” and the femur “Trinil 3.” They are more commonly known as “Java Man.”

In 1927, Davidson Black named a new species *Sinanthropus erectus* (literally “Northern upright man”), based on a tooth discovered at Zhoukoudian near Beijing (Peking), China. The later discovery of 14 calvaria (skull caps), limb bones, and many more teeth strengthened his claim. One of these calvaria became better known as “Peking Man.” As more fossils of *erectus*-like hominins were discovered, paleoanthropologists began to recognize the similarities between *Pithecanthropus/Sinanthropus* and specimens that had been assigned to the genus *Homo*. Eventually, both *Pithecanthropus* and *Sinanthropus* fossils were subsumed into the species *Homo erectus*.

The morphology of *Homo erectus* changed very little over its 1.8 million years of existence. Compared with australopithecines and earlier *Homo*, *Homo erectus* had smaller teeth, a shorter face, and a humanlike projecting nose. The numerous skulls that have been discovered show a significant increase in brain size compared with earlier hominins. On average, the cranial capacity of *Homo erectus* was about 900 cc, although its range (750 cc–1,250 cc) overlaps that of modern humans (1,000 cc–2,000 cc).

Compared with modern humans, *Homo erectus* possessed a robust and somewhat primitive-looking

skull, face, and dentition. In general, the skull is long, and the forehead is low in profile. The face has marked brow ridges, and the back of the skull has a marked projection for attachment of strong neck muscles. The skull bones are thick compared with modern humans. Many of the Asian specimens (in particular) exhibit a sagittal keel, a ridge running along the top of the skull. All *Homo erectus* specimens lack the projecting chin of modern humans.

Their robusticity notwithstanding, below the neck *Homo erectus* looked very much like modern humans. Much of what we know about their postcranial skeleton (below the skull) comes from a nearly complete skeleton from Lake Turkana, known as “WT 15000” or “Nariokotome Boy.” Nariokotome Boy would have been quite tall if he had reached adulthood (perhaps 180 cm, or 6') but the average height of *Homo erectus* was about 170 cm (5'7"). This size represents a dramatic increase in stature compared with earlier *Homo*. Postcranial remains establish that *Homo erectus* was a committed biped with none of the adaptations to tree climbing observed in earlier hominins. It has been suggested that their somewhat narrower hips indicate that there were more efficient bipeds than the average modern human.

Compared with earlier hominins, *Homo erectus* exhibited greater control over its environment. This species developed a more sophisticated tool kit and may have mastered how to control fire. In addition, it was very likely the first hominin to move outside Africa. *Homo erectus* is known for developing Acheulean tools. These tools are found in high densities in Africa, Europe, and western/south Asia and are rare in East Asia. Like the Oldowan tools used by *Homo habilis*, Acheulean tools did not have specialized purposes. The Acheulean hand axe (a pear-shaped tool with sharp edges on all sides and a picklike point) was likely a kind of “Swiss Army knife” used to cut, scrape, pound, and dig. In addition to hand axes, the Acheulean tool kit included cleavers, scrapers, and notched tools. The greater diversity of tools likely indicates greater reliance on them.

Where and when hominins first began to use and control fire is the topic of much disagreement. Some paleoanthropologists attribute this innovation to *Homo erectus*. The earliest, although highly questionable, claim comes from East Africa (Koobi Fora) and dates to about 1.5 million years ago. Other, also dubious evidence comes from South Africa (Swartkrans), dating to 1 million years ago. Until recently, the best-supported