

## TRANSITIONAL FORM

### RHODESIAN MAN

The pre-modern humans of the Middle Pleistocene (that is, after 780,000 ya) generally succeeded H. erectus. One of several individuals found in **the Kabwe (Broken Hill) (The Rhodesian Man)** Lead mine in **Zambia** has enormous **brow ridges**, but the **facial bones** and the **muscle attachment** areas on the back of the skull for the neck muscles are quite small compared with those of Homo erectus in Africa. The **cranial capacity is about 1,300 cc**. The skull is similar in appearance to those of early archaic hominids from Europe. Both the Zambian and the European skulls have erectus like characteristics: a large face, large brow ridges, and thick cranial bones.

Widely known as Broken Hill-1 (also Kabwe-1), the Rhodesian Man is an **almost complete cranium** discovered on **June 17th, 1921** in a lead and zinc mine, 18 meters below the ground level, at Broken Hill, Northern Rhodesia (now Kabwe, Zambia). It was sent in the same year to London, where it remains one of the key treasures of the Natural History Museum.

This is a challenging specimen for the understanding of our African ancestors. The circumstances around the discovery do not help to assign precise data to this fossil. It was found by a miner and there were no scientists around, so the initial collection of data was not the desirable: for example, the exact position and the relation to animal remains in the area. The discoverer had no clear memories of the finding. He explained that the surroundings were basically soft material, and the only few bones present were some bat bones plus a human tibia discovered one meter away on the same day. This likely corresponds to the same individual of the cranium. **Broken Hill was initially dated to 130 KYA**. In any case it is considered the oldest first human ancestor found in Africa. **Many scientists include this specimen within the Homo heidelbergensis species, together with the European Middle Pleistocene specimens.**

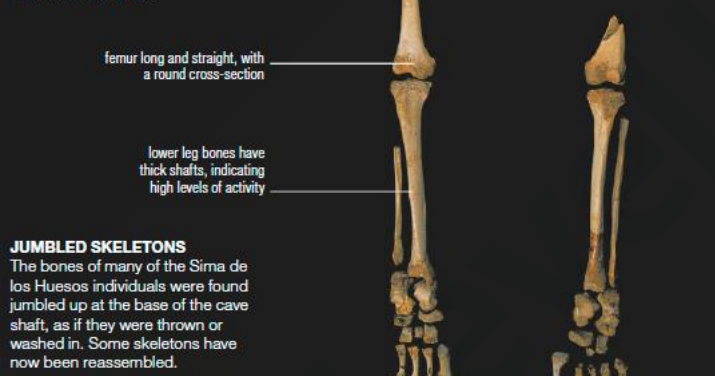
The **earliest premodern humans exhibit several H. erectus characteristics**: The face is large, the brows are projected, the forehead is low, and in some cases the cranial vault is still thick. Even so, some of their other features show that they were more derived toward the modern condition than were their H. erectus predecessors. Compared with H. erectus, these premodern humans possessed an increased brain size, a more rounded braincase (that is, maximum breadth is higher up on the sides), a more vertical nose, and a less angled back of the skull (occipital).

We know that premodern humans were a diverse group dispersed over three continents. **Deciding how to classify them has been disputed for decades, and anthropologists still have disagreements. However, a growing consensus has recently emerged. Beginning perhaps as early as 850,000 ya and extending to about 200,000 ya, the fossils from Africa and Europe are placed within Homo heidelbergensis (and includes Rhodesian Man), named after a fossil found in Germany in 1907.**

In our own discussion, we recognize H. heidelbergensis (and including Rhodesian man) as a transitional species between H. erectus and later hominins. Keep in mind, however, that this species was probably an ancestor of both modern humans and Neanderthals. It's debatable whether H. heidelbergensis actually represents a fully separate species in the biological sense, that is, following the biological species concept.

## A controversial species

Originally applied only to the European fossils, the term *Homo heidelbergensis* was later used to describe all fossils from both Europe and Africa from between 600,000 and 300,000 years ago, making this species the common ancestor of Neanderthals (in Europe) and *Homo sapiens* (in Africa). However, despite their similarities, there are also clear regional differences. Many anthropologists believe the remains belong to more than one species, probably descended from *Homo ergaster* or *Homo erectus*, and that the African finds should not be included in *H. heidelbergensis* but ascribed to a different species called *Homo rhodesiensis*, which ultimately evolved into early *H. sapiens* in Africa 300,000–200,000 years ago. In contrast, European *H. heidelbergensis* evolved into the Neanderthals—and possibly also the Denisovans—more than 400,000 years ago. Fossils from the Sima de los Huesos site in Spain, previously thought to have been *Homo heidelbergensis*, have been shown to be early Neanderthals on the basis of both bone and DNA analysis. Nevertheless, these remains of around 30 individuals provide the most complete picture of *Homo* anatomy before the emergence of definitive Neanderthals and modern humans.



## Africa

In Africa, premodern fossils have been found at several sites. One of the best known is Kabwe (Broken Hill) or Rhodesian Man. At this site in Zambia, fieldworkers discovered a complete cranium, together with other cranial and postcranial elements belonging to several individuals. In this and other African premodern specimens, we can see a mixture of primitive and more derived traits. The skull's massive browridge (one of the largest of any hominin), low vault, and prominent occipital torus recall those of *H. erectus*. On the other hand, the occipital region is less angulated, the cranial vault bones are thinner, and the cranial base is essentially modern. Dating estimates of Kabwe and most of the other premodern fossils from Africa have ranged throughout the Middle and Late Pleistocene, but recent estimates have given dates for most of the sites in the range of 600,000 to 125,000 ya.

**Bodo** is another significant African premodern fossil. A nearly complete cranium, Bodo has been dated to relatively early in the Middle

Pleistocene (estimated at 600,000 ya), making it one of the oldest specimens of *H. heidelbergensis* (Rhodesian Man) from the African continent. The Bodo cranium is particularly interesting because it shows a distinctive pattern of cut marks, similar to modifications seen on butchered animal bones. Researchers have thus hypothesized that the Bodo individual was defleshed by other hominins, but for what purpose is not clear. The defleshing may have been related to cannibalism, though it also may have been for some other purpose, such as ritual. In any case, this is the earliest evidence of deliberate bone processing of hominins by hominins

A number of other crania from South and East Africa also show a combination of retained ancestral with more derived (modern) characteristics, and they're all mentioned in the literature as being similar to Kabwe. The most important of these African finds come from the sites of Florisbad and Elandsfontein (in South Africa) and Laetoli (in Tanzania). The general similarities in all these African premodern fossils indicate a close relationship between them, almost certainly representing a single species (most commonly referred to as *H. heidelbergensis*). These African premodern humans also are quite similar to those found in Europe.

**Key Premodern Human (*H. heidelbergensis*)  
Fossils from Africa**

Date	Site	Evolutionary Significance
130,000+ ya	Kabwe (Broken Hill, Zambia)	Nearly complete skull; mosaic of features (browridge very robust, but braincase expanded)
600,000 ya	Bodo (Ethiopia)	Earliest example of African <i>H. heidelbergensis</i> ; likely evidence of butchering

## Europe

More fossil hominins of Middle Pleistocene age have been found in Europe than in any other region. Maybe it's because more archaeologists have been searching longer in Europe than anywhere else.

The time range of European premodern humans extends the full length of the Middle Pleistocene and beyond. At the earlier end, the Gran Dolina finds from northern Spain are definitely not *Homo erectus*. The Gran Dolina remains may, as proposed by Spanish researchers, be members of a new hominin species.

However, Rightmire (1998) has suggested that the Gran Dolina hominins may simply represent the earliest well-dated occurrence of *H. heidelbergensis*, possibly dating as early as 850,000 ya.

More recent and more completely studied *H. heidelbergensis* fossils have been found throughout much of Europe. Examples of these finds come from Steinheim (Germany), Petralona (Greece), Swanscombe (England), Arago (France), and another cave site at Atapuerca (Spain), known as Sima de los Huesos. Like their African counterparts, these European premoderns have retained certain *H. erectus* traits, but they're mixed with more derived ones—for example, increased cranial capacity, less angled occiput, parietal expansion, and reduced tooth size.

The hominins from the Atapuerca site of Sima de los Huesos are especially interesting. A total of at least 28 individuals has been recovered from Sima de los Huesos, which literally means "pit of bones." In fact, with more than 4,000 fossil fragments recovered, Sima de los Huesos contains more than 80 percent of all Middle Pleistocene hominin remains in the world.

**Key Premodern Human (*H. heidelbergensis*)  
Fossils from Europe**

Date	Site	Evolutionary Significance
300,000?– 259,000? ya	Swanscombe (England)	Partial skull, but shows considerable brain expansion
?600,000– 400,000 ya	Sima de los Huesos (Atapuerca, northern Spain)	Large sample; very early evidence of Neandertal ancestry (>400,000 ya); earliest evidence of deliberate body disposal of the dead anywhere

## Asia

Like their contemporaries in Europe and Africa, Asian premodern specimens discovered in China also display both earlier and later characteristics. Chinese paleoanthropologists suggest that the more ancestral traits, such as a sagittal ridge and flattened nasal bones, are shared with *H. erectus* fossils from Zhoukoudian. They also point out that some of these features can be found in modern *H. sapiens* in China today, indicating substantial genetic continuity.

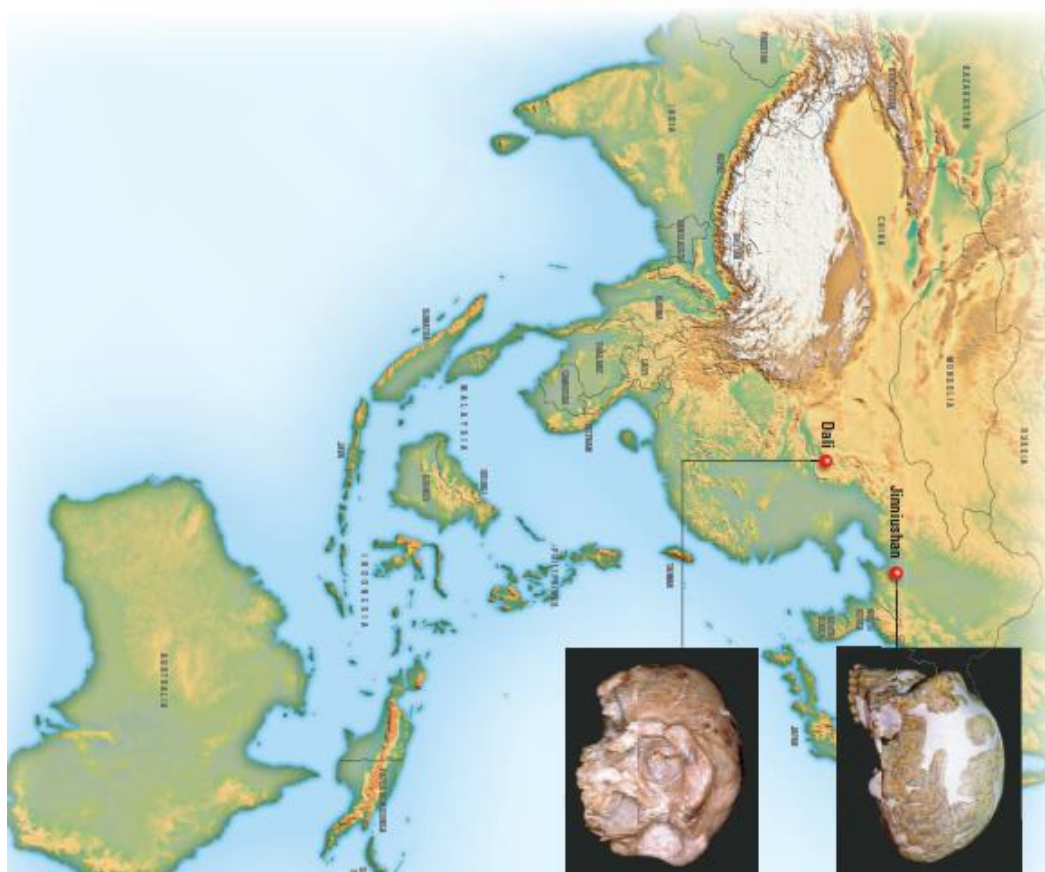
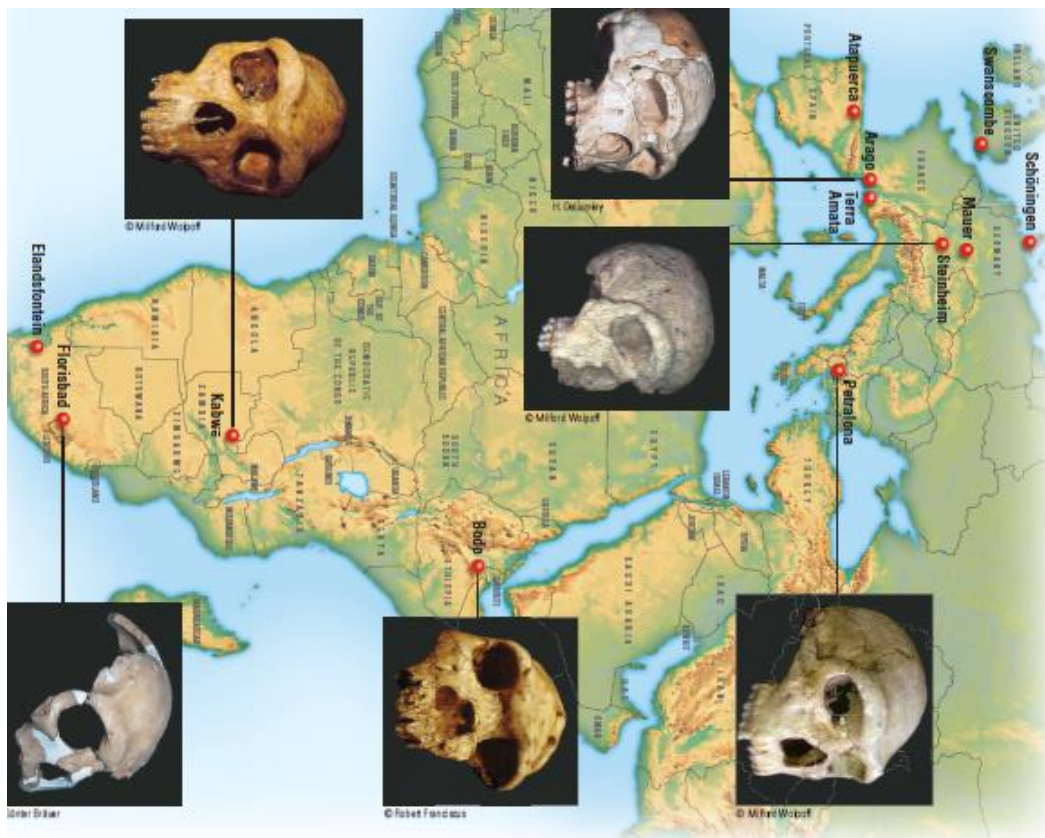
Dali, the most complete skull of the later Middle or early Late Pleistocene fossils in China, displays *H. erectus* and *H. sapiens* traits, with a cranial capacity of 1,120 cm<sup>3</sup>. Like Dali, several other Chinese specimens combine both earlier and later traits.

In addition, a partial skeleton from Jinniushan, in northeast China, has been given a provisional date of 200,000 ya (Tiemel et al., 1994). The cranial capacity is fairly large (approximately 1,260 cm<sup>3</sup>), and the walls of the braincase are thin. These are both modern features, and they're somewhat unexpected in an individual this ancient—if the dating estimate is indeed correct. Just how to classify these Chinese Middle Pleistocene hominins has been a subject of debate and controversy. More recently, though, a leading paleoanthropologist has concluded that they're regional variants of *H. heidelbergensis* (Rightmire, 2004).

Key Premodern Human (*H. heidelbergensis*) Fossils from Asia

Date	Site	Evolutionary Significance
230,000–180,000 ya	Dali (China)	Nearly complete skull; best evidence of <i>H. heidelbergensis</i> in Asia
200,000 ya	Jinniushan (China)	Partial skeleton with cranium showing relatively large brain size; some Chinese scholars suggest it as possible ancestor of early Chinese <i>H. sapiens</i>





## Middle Pleistocene Culture

The Acheulian technology of *H. erectus* carried over into the Middle Pleistocene with relatively little change until near the end of the period, when it became slightly more sophisticated.

Premodern human populations continued to live in both caves and open-air sites, but they may have increased their use of caves.

**Did these hominins control fire?** Klein (1999), in interpreting archaeological evidence from France, Germany, and Hungary, suggests that they did. What's more, Chinese archaeologists insist that many Middle Pleistocene sites in China contain evidence of human controlled fire. Still, not everyone is convinced. We know that Middle Pleistocene hominins built temporary structures, because researchers have found concentrations of bones, stones, and artifacts at several sites. We also have evidence that they exploited many different food sources—fruits, vegetables, seeds, nuts, and bird eggs, each in its own season. Importantly, they also exploited marine life, a new innovation in human biocultural evolution.

The hunting capabilities of premodern humans, as for earlier hominins, are still greatly disputed. Most researchers have found little evidence supporting widely practiced advanced hunting. Some more recent finds, however, are beginning to change this view—especially the discovery in 1995 of remarkable wood spears from the Schöningen site, in Germany (Thieme, 1997). These large, extremely well-preserved weapons (provisionally dated to about 400,000–300,000 ya) were most likely used as throwing spears, presumably to hunt large animals. Also interesting in this context, the bones of numerous horses were recovered at Schöningen.

## A Review of Middle Pleistocene Evolution

Premodern human fossils from Africa and Europe resemble each other more than they do the hominins from Asia. The mix of some ancestral characteristics—Retained from *Homo erectus* ancestors—with more derived features gives the African and European fossils a distinctive look; thus, Middle Pleistocene hominins from these two continents are usually referred to as *H. heidelbergensis*. The situation in Asia isn't so tidy. To some researchers, the remains, especially those from Jinniushan, seem more modern than do contemporary fossils from either Europe or Africa. This observation explains why Chinese paleoanthropologists and some American colleagues conclude that the Jinniushan remains are early members of *H. sapiens*. Other researchers (for example, Rightmire, 1998, 2004) suggest that they represent a regional branch of *H. heidelbergensis*.

The Pleistocene world forced many small populations into geographical isolation. Most of these regional populations no doubt died out. Some, however, did evolve, and their descendants are likely a major part of the later hominin fossil record. **In Africa, *H. heidelbergensis* is hypothesized to have evolved into modern *H. sapiens*. In Europe, *H. heidelbergensis* evolved into Neanderthals. Meanwhile, the Chinese premodern populations may all have met with extinction. Right now, though, there's no consensus on the status or the likely fate of these enigmatic Asian Middle Pleistocene hominins**

