Hominid Species Essay, Research Paper

Hominid Species

The time of the split between humans and living apes used to be thought to have occurred 15 to 20 million years ago, or even up to 30 or 40 million years ago. Some apes occurring within that time period, such as Ramapithecus, used to be considered as hominids, and possible ancestors of humans. Later fossil finds indicated that Ramapithecus was more closely related to the orang-utan, and new biochemical evidence indicated that the last common ancestor of hominids and apes occurred between 5 and 10 million years ago, and probably in the lower end of that range. Ramapithecus therefore is no longer considered a hominid. The species here are listed roughly in order of appearance in the fossil record (note that this ordering is not meant to represent an evolutionary sequence), except that the robust australopithecines are kept together.

Ardipithecus ramidus

It is the oldest known hominid species, found in the Middle Awash region of Ethiopia in 1994 by Tim White and dated at 4.4 million years. Most remains are skull fragments. Indirect evidence suggests that it was possibly bipedal, and that some individuals were about 122 cm (4′0″) tall. The teeth are intermediate between those of earlier apes and A. afarensis, but one baby tooth is very primitive, resembling a chimpanzee tooth more than any other known hominid tooth. Other fossils found with ramidus indicate that it may have been a forest dweller. This may cause modification of current theories about why hominids became bipedal, which often link bipedalism with a move to a savannah environment.

Australopithecus anamensis

This species was found in 1994 by Maeve Leakey in Kanapoi and Allia Bay situated in North Kenya. The material consists of 9 fossils, mostly found in 1994, from Kanapoi, and 12 fossils, mostly teeth found in 1988, from Allia Bay. Anamensis existed between 4.2 and 3.9 million years ago, and has a mixture of primitive features in the skull, and advanced features in the body. The teeth and jaws are very similar to those of older fossil apes. A partial tibia is strong evidence of bipedality, and a lower humerus is extremely humanlike.

Australopithecus afarensis

A. afarensis existed between 3.9 and 3.0 million years ago. The first of its fossils were found in the mid 1970s along the East African Rift valley. Afarensis had an apelike face with a low forehead, a bony ridge over the eyes, a flat nose, and no chin. They had protruding jaws with large back teeth. Cranial capacity varied from about 375 to 550 cc. The skull is similar to that of a chimpanzee, except for the more humanlike teeth. The canine teeth are much smaller than those of modern apes, but larger and more pointed than those of humans, and shape of the jaw is between the rectangular shape of apes and the parabolic shape of humans. However their pelvis and leg bones far more closely resemble those of modern man, and leave no doubt that they were bipedal. Their bones show that they were physically very strong. Females were substantially smaller than males, a sexual dimorphism. Height varied between about 107 cm (3′6″) and 152 cm (5′0″). The finger and toe bones are curved and proportionally longer than in humans, but the hands are similar to humans in most other details. Most scientists consider this evidence that afarensis was still partially adapted to climbing in trees, others consider it evolutionary baggage.

Australopithecus africanus

A. africanus was found by Raymond Dart in 1925 in a limestone quarry (Tuang) in South Africa. Africanus existed between 3 and 2 million years ago. It is similar to afarensis, and was also bipedal , but body size was slightly greater. Brain size may also have been slightly larger, ranging between 420 and 500 cc. This is a little larger than chimp brains (despite a similar body size), but still not advanced in the areas necessary for speech. The back teeth were a little bigger than in afarensis. Although the teeth and jaws of africanus are much larger than those of humans, they are far more similar to human teeth than to those of apes. The shape of the jaw is now fully parabolic, like that of humans, and the size of the canine teeth is smaller compared to afarensis.

Australopithecus garhi

This species was named in April 1999. It is known from a partial skull. The skull differs from previous australopithecine species in the combination of its features, notably the extremely large size of its teeth, especially the rear ones, and a primitive skull morphology. Some nearby skeletal remains may belong to the same species. They show a humanlike ratio of the humerus and femur, but an apelike ratio of the lower and upper arm. Australopithecus afarensis and africanus, and the other species above, are known as gracile (slender) australopithecines, because of their relatively lighter build, especially in the skull and teeth. Despite this, they were still more robust than modern humans.

Australopithecus aethiopicus

A. aethiopicus existed between 2.6 and 2.3 million years ago. This species is known from one major specimen, the Black Skull discovered by Alan Walker in 1985, and a few other minor specimens which may belong to the same species. It may be an ancestor of robustus and boisei, but it has a confusing mixture of primitive and advanced traits. The brain size is very small, at 410 cc, and parts of the skull, particularly the back portions, are very primitive, most resembling afarensis. Other characteristics, like the massiveness of the face, jaws and single tooth found, and the largest sagittal crest (a bony ridge on top of the skull to which chewing muscles attach) in any known hominid, are more like that of A. boisei.

Australopithecus robustus

A. robustus had a body similar to that of africanus, but a larger and more robust skull and teeth. It existed between 2 and 1.5 million years ago. The massive face is flat or dished, with no forehead and large brow ridges. It has relatively small front teeth, but massive grinding teeth in a large lower jaw. Most specimens have sagittal crests. Its diet would have been mostly coarse, tough food that needed a lot of chewing. The average brain size is about 530 cc. Bones excavated with robustus skeletons indicate that they may have been used as digging tools.

Australopithecus boisei (was Zinjanthropus boisei)

A. boisei was found at Lake Turkana, Northern Kenya and existed between 2.1 and 1.1 million years ago. It was similar to robustus, but the face and cheek teeth were even more massive, some molars being up to 2 cm across. The brain size is very similar to robustus, about 530 cc. Some consider boisei and robustus to be variants of the same species. Australopithecus aethiopicus, robustus and boisei are known as robust australopithecines, because their skulls are more heavily built. However, in the same sedimentary layer, another cranium was also found belonging to a species of hominid named Homo ergaster. This hominid species is believed to be a different geographical population of Homo erectus

Homo habilis

H. habilis, “handy man”, was so called because of evidence of tools found with its remains by the Leakeys in1961. Habilis existed between 2.4 and 1.5 million years ago. It is very similar to australopithecines in many ways. The face is still primitive, but it projects less than in A. africanus. The back teeth are smaller, but still larger than in modern humans. The average brain size, at 650 cc, is considerably larger than in australopithecines. Brain size varies between 500 and 800 cc, overlapping the australopithecines at the low end and H. erectus at the high end. The brain shape is also more humanlike. The bulge of Broca’s area, essential for speech, is visible in one habilis brain cast, and indicates it was possibly capable of rudimentary speech. Habilis is thought to have been about 127 cm (5′0″) tall, and about 45 kg (100 lb) in weight, although females may have been smaller.

Homo erectus

H. erectus was first found by Eugene Dubois in 1881 and existed between 1.8 million and 300,000 years ago. Like habilis, the face has protruding jaws with large molars, no chin, thick brow ridges, and a long low skull, with a brain size varying between 750 and 1225 cc. Early erectus specimens average about 900 cc, while late ones have an average of about 1100 cc. The skeleton is more robust than those of modern humans, implying greater strength. Body proportions vary; the Turkana Boy is tall and slender (though still very strong), like modern humans from the same area, while the few limb bones found of Peking Man indicate a shorter, sturdier build. Studys of the Turkana Boy skeleton indicate that erectus may have been more efficient at walking than modern humans, whose skeletons have had to adapt to allow for the birth of larger-brained infants. Homo habilis and all the australopithecines are found only in Africa, but erectus was wide-ranging, and has been found in Africa, Asia, and Europe. There is evidence that erectus probably used fire, and their stone tools are more sophisticated than those of habilis.

Homo sapiens (archaic)

Archaic forms of Homo sapiens first appear about 500,000 years ago. The term covers a diverse group of skulls which have features of both Homo erectus and modern humans. The brain size is larger than erectus and smaller than most modern humans, averaging about 1200 cc, and the skull is more rounded than in erectus. The skeleton and teeth are usually less robust than erectus, but more robust than modern humans. Many still have large brow ridges and receding foreheads and chins. There is no clear dividing line between late erectus and archaic sapiens, and many fossils between 500,000 and 200,000 years ago are difficult to classify as one or the other.

Homo sapiens neanderthalensis (was Homo neanderthalensis)

Neandertal man existed between 230,000 and 30,000 years ago and was found in the Neander Valley in Germany in 1856. The average brain size is slightly larger than that of modern humans, about 1450 cc, but this is probably correlated with their greater bulk. The brain case however is longer and lower than that of modern humans, with a marked bulge at the back of the skull. Like erectus, they had a protruding jaw and receding forehead. The chin was usually weak. The midfacial area also protrudes, a feature that is not found in erectus or sapiens and may be an adaptation to cold. Neandertals mostly lived in cold climates, and their body proportions are similar to those of modern cold-adapted peoples: short and solid, with short limbs. Men averaged about 168 cm (5′6″) in height. Their bones are thick and heavy, and show signs of powerful muscle attachments. Neandertals would have been extraordinarily strong by modern standards, and their skeletons show that they endured brutally hard lives. A large number of tools and weapons have been found, more advanced than those of Homo erectus. Neandertals were formidable hunters, and are the first people known to have buried their dead, with the oldest known burial site being about 100,000 years old. They are found throughout Europe and the Middle East.

Homo sapiens sapiens (modern)

Modern forms of Homo sapiens first appear about 120,000 years ago. Modern humans have an average brain size of about 1350 cc. The forehead rises sharply, eyebrow ridges are very small or more usually absent, the chin is prominent, and the skeleton is very gracile. About 40,000 years ago, with the appearance of the Cro-Magnon culture, tool kits started becoming markedly more sophisticated, using a wider variety of raw materials such as bone and antler, and containing new implements for making clothing, engraving and sculpting. Fine artwork, in the form of decorated tools, beads, ivory carvings of humans and animals, clay figurines, musical instruments, and spectacular cave paintings appeared over the next 20,000 years.

325