

**LABORATORY #5****EARLY AND LATE “ARCHAIC” *HOMO SAPIENS* AND “ANATOMICALLY MODERN” *HOMO SAPIENS***

Traditionally, the hominins after the middle Pleistocene (middle *Homo*) belong to *Homo sapiens*. However, several new species of these hominins are now recognized by some paleontologists (e.g., *H. antecessor*, *H. heidelbergensis*, *H. helmei*, *H. neanderthalensis*, etc.). The entire group is referred to as late *Homo*, which in turn can be broken down into three temporal groups: early archaic *Homo* (or, transitional types), late archaic (including Neanderthals), and anatomically modern *H. sapiens*.

***Homo sapiens* (early archaic or transitional forms)**

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 *H. erectus* and archaic *H. sapiens*, and many fossils between 500,000 and 200,000 years ago are difficult to classify as one or the other.

Some hominid fossils from Europe which are assigned to the earliest (transitional) group include specimens from Atapuerca, Spain (*H. antecessor*), Swanscombe (England) and Steinheim (Germany). The latter are sometimes referred to as *H. heidelbergensis*. In Africa the transitional types include Broken Hill (Zambia) and Bodo (Ethiopia). From Asia the transitional fossils include specimens from the Solo and Nangdong sites (Java) and from Maba in China.

***Homo sapiens neanderthalensis* (*Homo neanderthalensis*)**

Neanderthals existed between 230,000 and 30,000 years ago. 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 *H. 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. There are other minor anatomical differences from modern humans, the most unusual being some peculiarities of the shoulder blade, and of the pubic bone in the pelvis. Neanderthals 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. Neanderthals 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*. Neanderthals 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. Western European Neanderthals usually have a more robust form, and are sometimes called "classic Neanderthals". Neanderthals found elsewhere tend to be less excessively robust and are sometimes referred to as AP progressive Neanderthals.

Neanderthal fossils from Europe include sites such as Saccopastore, Fontchevade, Ehrinsdorf, Neander, La Chapelle. From the Near and Middle East Neanderthal fossils have been found at Shanidar, Tabun, and Skhul.

### ***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.

Even within the last 100,000 years, the long-term trends towards smaller molars and decreased robustness can be discerned. The face, jaw and teeth of Mesolithic humans (about 10,000 years ago) are about 10% more robust than ours. Upper Paleolithic humans (about 30,000 years ago) are about 20 to 30% more robust than the modern condition in Europe and Asia. These are considered modern humans, although they are sometimes termed "primitive". Interestingly, some modern humans (aboriginal Australians) have tooth sizes more typical of archaic *H. sapiens*. The smallest tooth sizes are found in those areas where food-processing techniques have been used for the longest time. This is a probable example of natural selection which has occurred within the last 10,000 years.

In this lab, we will examine the crania of the hominid fossils representing late *Homo*, including the transitional, late archaic (Neanderthal) and modern *H. sapiens*.

**Exercise 1.** Using the fossil cast of an early archaic (or transitional) *H. sapiens* (e.g., Sheinheim skull) compare it to *H. erectus* and *H. sapiens*. Make a list of the features that are erectus-like and a separate list of features that are more sapiens-like.

**Exercise 2.** Compare a Aclassic@ Neanderthal skull with modern *H. sapiens*. Using the checklist given below as a beginning, make a list of the main morphological differences you observe between the two.

Feature/Trait	Neanderthal (La Chapelle or La Ferassie)	Modern <i>H. sapiens</i> (Cro-Magnon)
Cranial vault size		
Cranial vault shape		
Facial architecture		
Brow ridge development		
Occiput		
Mandible (chin)		
Teeth		

**Exercise 3.** What morphological features lend support to the belief that Skhul V (so-called Aprogressive@ Neanderthal) skull is transitional between late archaic (classic Neanderthal) and modern *Homo sapiens*?

**Exercise 4.** Mystery specimen. Compare the cranium indicated as the mystery specimen with other hominins discussed in this and other laboratory assignments concerning fossil hominins you have previously completed. How would you classify this unknown specimen? What morphological features support your observation?