Chapter 3: Becoming Human

# Chapter Summary [Copied from Olszewski 2019, Chapter 3]

* The Pleistocene epoch, which began 2.6 million years ago, was characterized by numerous climatic fluctuations between colder/drier and warmer/wetter intervals. These have implications for the movement of hominins out of Africa.
* The first movement out of Africa was by *H. erectus* and occurred after 1.9 million years ago. They took Oldowan technology with them and appear to have moved relatively rapidly, with sites appearing in Eastern Europe 1.7 million years ago and in Southeast Asia 1.6 million years ago.
* Hominins reach Western Europe 1.4 million years ago and were characterized by Oldowan technology.
* Acheulian technology develops in Africa 1.7 million years ago, but does not appear outside of Africa until after 800,000 years ago when *H. heidelbergensis* migrated out of Africa.
* The origins of modern humans and their relationship to Neandertals were originally examined by two different sets of ideas. The recent single origin model states that modern humans evolved in Africa and then migrated out and replaced all other hominins in the Old World. The multiregionalism model claims that gene flow between hominin populations over time and space allowed all hominin populations in the Old World to develop into modern humans. These perspectives were based initially on data from fossils and archaeology.
* Genetic analyses of mtDNA and nuclear DNA in modern humans, Neandertals, and the Denisovans now shows that modern humans who migrated out of Africa interbreed with Neandertals and Denisovans because some of their genes are found in living human populations. Thus, the assimilation model that includes a mainly African origin, but with gene flow between modern humans and sister lineages such as the Neandertals and Denisovans, currently explains the origins of modern humans more accurately.
* *H. floresiensis* is a small-bodied hominin in Indonesia with unusual skeletal features. These suggest that this hominin may be descended from Asian *H. erectus*, but in the context of dwarfing seen in island populations of other animals. Alternatively, these features may indicate that there was a migration out of Africa that was pre–*H. erectus*.
* Identifying modern behavior in the archaeological record is difficult, although most researchers agree that evidence for symbolic behavior is one key characteristic.
* Middle Stone Age Africa has many sites with examples of symbolic behavior, usually recognized from the presence of shells that may have been strung as personal ornamentation, red ochre that could be ground and used for coloring such as body painting, and ochre chunks with engraved lines that may be artistic motifs. Other features include the use of bone to make spear points and harpoons.
* Language is the most fundamental symbolic system of humans. Pinpointing its origin in the paleoanthropological record has been of interest, although this is difficult to do because evidence for the anatomical structures needed is usually indirect. There has been considerable debate about whether Neandertals had language like that of modern humans. We do know that both Neandertals and modern humans have the same human form of the FOXP2 gene, which is necessary for spoken language.
* Neandertals are often portrayed as not having all the features of modern human behavior. However, there is increasing archaeological evidence that they did at least occasionally use personal ornamentation and pigments, especially in the period after 65,000 years ago. Whether they deliberately buried their dead is still an open question.
* The distinctive skeletal signature of Neandertal populations does not exist in modern human populations. This means that Neandertals did go extinct around 39,000 years ago. Suggestions for why this extinction event occurred include the biological adaptations of Neandertals, a volcanic winter effect initiated by volcanic eruptions in Italy and the Caucasus, and their general lack of improvements in cultural technologies to help mitigate the especially cold climatic conditions in Europe after 40,000 years ago. Competition with incoming modern humans may also have been a factor.

# Key Terms

**Acheulian**: flaked stone tool tradition characterized by bifaces such as handaxes. It first appears in Africa 1.7 million years ago, but not in the Middle East and Europe until after 800,000 years ago.

**Assimilation model**: an interpretive model for the origin of modern humans that combines elements of multiregional and recent single origin models. The assimilation model states that modern humans originating in Africa were later able to interbreed with other hominin populations such as Neandertals and Denisovans.

**Basal Ganglia**: a subcortical structure in the brain responsible for motor control and sequencing; it is important in the production of human speech sounds.

**Basicranial Flexion**: a series of measurements along the base of the skull that have been interpreted as indirect evidence for the length of the pharynx and thus for whether or not various hominin species were capable of producing human speech sounds.

**Blombos Cave**: an archaeological site in South Africa with evidence for symbolic behaviors around 100,000 years ago.

**Boxgrove**: a coastal region in England with several sites dating to 500,000 years ago and later. It is the earliest area in northern Europe with the Acheulian tradition. Bifaces are associated with butchery of animal carcasses and rare hominin fossils are identified as *Homo heidelbergensis*.

**Chatelperronian**: an Early Upper Paleolithic tradition made by Neandertals in France; it contains evidence for bone tools and personal ornamentation at sites such as Grotte du Renne.

**Denisova Cave**: genetic analysis of a fossil hominin bone found at this Siberian site indicates that this population is distantly related to Neandertals. More important, however, the Denisovans must have interbred with later modern humans because about 4–6% of their genes are present in the gene pool of some Pacific region populations.

**Diepkloof Rock Shelter**: an archaeological site in South Africa with evidence of art in the form of engraved geometric patterns on ostrich egg shell containers that date to 60,000 years ago.

**Dmanisi**: a 1.7 million-year-old site in the Republic of Georgia that contains fossils of early *Homo erectus* (sometimes classified as *Homo georgicus* or *Homo ergaster*), animal bones, and choppers and flakes. It is one of the earliest sites known outside of Africa.

**FOXP2**: the human form of this gene regulates the growth and development of the basal ganglia, a brain structure that is important in motor control and sequencing for bipedalism and for spoken language.

**Gran Dolina at Atapuerca**: an archaeological site with deposits containing choppers and flakes dating as early as 1 million years ago; fossil hominins (*Homo ergaster* or *Homo antecessor*) are found ca. 800,000 years ago with evidence for cannibalism.

**Grotte du Renne**: a French Middle Paleolithic site with evidence for Neandertal bone tools and personal ornamentation.

**Herto**: a site in Ethiopia (Africa) that yielded anatomically modern human (*Homo sapiens*) fossils dating to 160,000 years ago.

***Homo erectus***: the earliest hominin in genus *Homo* that is essentially skeletally modern from the neck down; *H. erectus* appears in Africa 1.9 million years ago. They migrate out of Africa around 1.7 million years ago to the Middle East, parts of Eastern Europe, Southeast Asia, and East Asia.

***Homo floresiensis***: hominins from the island of Flores in Indonesia (Southeast Asia) who lived between 75,000 to 17,000 years ago. Their small stature and small brain size, along with other primitive skeletal features, suggest that they are an isolated population descended from either *Homo erectus* or earlier australopith-like hominins. They overlap in time with *Homo sapiens*.

***Homo heidelbergensis***: a later member of genus *Homo* that appears in Africa 800,000 years ago or slightly earlier; they migrate out of Africa and into the Middle East and Europe carrying biface technology with them.

***Homo neanderthalensis***: hominins living in Western Eurasia (Europe, Middle East, Central Asia) between 250,000 to 30,000 years ago. Although they have a distinctive set of skeletal features, recent nuclear DNA studies indicate that Neandertals could interbreed with skeletally modern humans. As a result, Neandertals are sometimes classified as a subspecies (*Homo sapiens neanderthalensis*) of modern humans.

**Jebel Irhoud:** in Morocco, site of the earliest known *Homo sapiens* fossil specimens dating to 315,000 years ago.

**Larynx**: the “voice box”; an organ in the throat that uses puffs of air to vibrate and produce sounds.

**Levallois**: a special way of knapping a core so that it is shaped in a way that allows the removal of a thin, well-shaped flake. These are known as Levallois flakes and Levallois points, and are found in both Middle Stone Age and Middle Paleolithic stone artifact traditions.

**Liang Bua Cave**: an archaeological site on the island of Flores in Indonesia (Southeast Asia) that yielded the remains of *Homo floresiensis*. It also contains flaked stone artifacts and animal bones such as the dwarfed, elephant-like, extinct *Stegodon*.

**Middle Paleolithic**: an archaeological term used for the period between 250,000 to 50,000 years ago in Western Eurasia (and sometimes for northern Africa). The actual end of the Middle Paleolithic is as late as 30,000 to 25,000 years ago in some parts of Europe.

**Middle Stone Age**: an archaeological term for the period between 300,000 to 50,000 years ago in Africa. The MSA is used by some researchers to represent all of Africa, but by others to represent only Sub-Saharan Africa (in this case, the term “Middle Paleolithic” is used for northern Africa).

**Mitochondrial DNA**: a type of DNA located outside the nucleus in a cell; it is passed down from mothers to their children and represents maternal lineages. It is very useful in examining the relationship of Neandertals to modern humans as well as human migration events in prehistory.

**Multiregionalism**: also called the multiregional model, an interpretive model for the origins of modern humans, it is based on the evolutionary process of gene flow and hypothesizes that modern humans everywhere in the Old World evolved locally from more archaic hominins.

**Olorgesailie Basin**: an area in Kenya in East Africa, it contains many important archaeological sites with Early Stone Age (Acheulian) bifaces.

**Omo Kibish**: a site in Ethiopia (Africa) that yielded fossils of early *Homo sapiens* (anatomically modern humans) dating to 195,000 years ago.

**Pharynx**: the part of the throat above the larynx (voice box); in modern humans, the pharynx is long and this aids in the production of the variety of sounds found in modern languages.

**Pinnacle Point 13B**: an archaeological site in South Africa with some of the earliest evidence for potentially modern human behaviors (use of red ochre and diet expansion to include shellfish), dating to 164,000 years ago.

**Pleistocene**: a geological epoch (sometimes called the Ice Ages) beginning 2.6 million years ago and lasting until 10,000 years ago; the first hominins of genus *Homo* and the first stone tools appear at the beginning of the Pleistocene.

**Recent Single Origin**: an interpretive model for the origins of modern humans, it is based on the idea that modern humans originated only on the continent of Africa and spread from there to other world regions; it hypothesizes that modern humans replaced more archaic hominins living in regions outside Africa.

**Sangiran**: a site on Java in Indonesia (Southeast Asia), it contains the remains of *Homo erectus* from 1.6 million years ago.

**Schöningen**: an archaeological site of *Homo heidelbergensis* in Germany, dating to 400,000 years ago, with several wooden spears associated with horse bones.

**‘Ubeidiya**: dating to 1.5 million years ago, this site in Israel in the Middle East is early evidence for the movement of *Homo erectus* out of Africa.

**Upper Paleolithic**: an archaeological term widely used in the Old World (except for Sub-Saharan Africa) to represent the period from 45,000 to 9700 cal BC. In Europe, all of the Upper Paleolithic cultures, except for the Chatelperronian, are the result of modern humans and their adaptations.

**Zhoukoudian**: a *Homo erectus* site in China dating to 750,000 to 410,000 years ago; it has evidence for Mode 1 chopper/chopping tools and fauna representing animals that these hominins scavenged and ate.