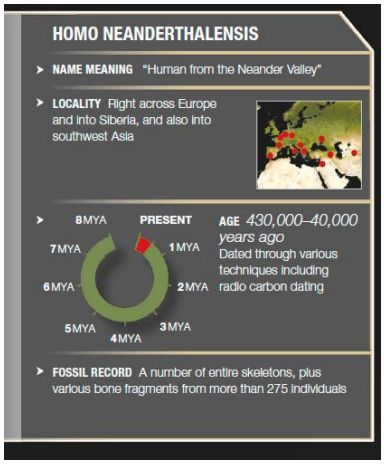
NEANDERTHAL MAN

Introduction

In 1856 skeleton was discovered from Neanderthal valley Germany led to the recognition of Neanderthals as a separate species by **Hermann Schaffhausen.** This was before Darwin wrote Origin of Species.

Neanderthals are an extinct species of genus Homo who appeared 300,000 years ago. They are closely related to modern humans, differing in DNA by just 0.12%. Remains of Neanderthals include bone and stone tools, which are found from places in Eurasia, from Western Europe to Central and Northern Asia.



Some lithic tools of **Middle Palaeolithic cultural period (especially Mousterian culture)** were discovered as associated finds with the fossil remains. Neanderthals were also referred to as the **makers of Mousterian Culture**. From most of the caves and inhabited sites, the implements of Mousterian culture were found along with the fossil findings. As in all cases with most transitional forms the skulls possess both primitive and advanced characteristics. In the **year 1864, William King coined the name Homo neanderthalensis.**

One striking feature of Neanderthals is brain size, which was actually larger than that of H. sapiens today. The average for contemporary H. sapiens is between 1,300 and 1,400 cm3, while for **Neanderthals it was 1,520 cm3**. The larger size may **be associated with the metabolic efficiency of a larger brain in cold weather.** The Inuit (Eskimo), also living in very cold areas, have a larger average brain size than most other modern human populations.

Geographical Distribution

Variation and Distribution of Neandertal Fossils (a) Gibraltar; (b) La Quina, France; (c) La Ferrassie, France; (d) Neandertal, Germany; (e) Spy I, Belgium; (f) Spy II, Belgium; (g) Monte Circeo, Italy; (h) Krapina, Yugoslavia; (i) Petralona, Greece; (j) Teschik Tasch child, Uzbekistan; (k) Shanidar 1, Iraq; (l) Skhūl IX, Israel; (m) Skhūl IV, Israel; (n) Tabūn, Israel.

Major Fossils of *Homo neanderthalensis*

Country	Locality	Fossils	Age (years)	Est. Brain Size (ml)
Belgium	Spy	2 skeletons	—	—
Croatia	Krapina	Cranial and postcranial fragments of >45 individuals	130,000	1,200–1,450
	Vindija	52 fossil fragments	28,000–42,000	—
France	Biache St. Vaast	2 crania	150,000–175,000	—
	Fontechévade	Cranial fragments of several individuals	100,000	1,500
	La Chaise	Cranium	126,000	—
	La Chapelle-aux-Saints	Skeleton	—	1,620
	La Ferrassie	8 skeletons	>38,000	1,680
	St. Césaire	Skeleton	36,000	—
Germany	Neandertal	Skullcap	—	>1,250
	Ehringsdorf	Cranial fragment	225,000	—
Gibraltar	Forbe's Quarry	Cranium	50,000	—
Iraq	Shanidar	9 partial skeletons	70,000	1,600
Israel	Amud	Skeleton	70,000	1,740
	Kebara Cave	Postcranial skeleton	60,000	—
	Tabun	Skeleton, mandible, postcranial fragments	100,000	1,270
Italy	Monte Circeo	Cranium	—	—
	Saccopastore	Cranium	—	—
Russia	Byzovaya (?)	Tools only	32,000	—
	Mezmaiskaya	Infant skeleton	36,000–73,000	—
Uzbekistan	Teshik-Tash	Child's cranium and partial skeleton	70,000	—
			Mean	**1,478.89**

Western Europe (Classic Form)

One of the most important Neanderthal discoveries was made in 1908 at **La Chapelle-aux Saints**, in southwestern France. A nearly **complete skeleton was found buried in a shallow grave** in a flexed position. Several fragments of nonhuman long bones had been placed over the head, and over them, a bison leg. Around the body were flint tools and broken animal bones.

The **skull of this male, who was possibly at least 40 years of age when he died, is very large, with a cranial capacity of 1,620 cm3**. Typical of western European classic forms of Neanderthal, the **vault is low and long**; the brow ridges are immense, with the typical Neanderthal arched shape; the forehead is low and retreating; and the face is long and projecting. The back of the skull is protuberant and bun-shaped.

The La Chappelle skeleton actually isn't a typical Neanderthal, but an unusually robust male who "evidently represents an extreme in the Neanderthal range of variation" (Brace et al., 1979, p. 117). But few other Neanderthal individuals possess such an exaggerated expression of Neanderthal traits as the "Old Man of La Chappelle-aux-Saints."

Dramatic new evidence of Neanderthal behaviour comes from the **El Sidrón site in northern Spain**. Dated to about **49,000 ya**, fragmented remains of 12 individuals show bone changes indicating they were smashed, butchered, and likely cannibalized—presumably by other Neanderthals (Lalueza-Fox et al., 2011). Because the **remains of all 12 individuals** were found together in a cave where their remains had accidentally fallen, they all probably died (were killed) at about the same time. Lying there undisturbed for almost 50,000 years, these individuals reveal several secrets about

Neanderthals. First, they are hypothesized to all have belonged to the same social group, representing a band of hunter-gatherers. Their ages and sex support this interpretation: three adult males, three adult females, five children/adolescents, and one infant. What's more, genetic evidence shows that the adult males were all closely related, but the females weren't. It seems that Neanderthals practiced a patrilocal form of mating, in which related males stay together and mate with females from other groups.

Western Asia (Progressive Form)

Israel Neanderthal specimens from Israel are less robustly built than the classic Neanderthals of Europe, though again, the overall pattern is clearly Neanderthal. One of the best known of these discoveries is from Tabun. Tabun, excavated in the early 1930s, yielded a female skeleton, dated by thermoluminescence (TL) at about **120,000–110,000 ya.**

A more recent Neanderthal burial of a large male **comes from Kebara, a neighbouring cave at Mt. Carmel**. A partial skeleton, dated to **60,000 ya,** contains the most complete Neanderthal thorax and pelvis yet found. **Also recovered at Kebara is a hyoid**—a small bone located in the throat, and the first ever found from a Neanderthal; this bone is especially important because of its usefulness in reconstructing language capabilities.

Iraq A most remarkable site is **Shanidar Cave, in the Zagros Mountains** of northeastern Iraq, where fieldworkers found partial skeletons of **nine individuals, four of them deliberately buried**. One of the more interesting skeletons recovered from Shanidar is that of a male (Shanidar 1) who lived to be approximately 30 to 45 years old, a considerable age for a prehistoric human. He is estimated to have stood 5 feet 7 inches tall, with a cranial capacity of 1,600 cm3.

ANATOMICAL CHARACTERISTICS

The crania of the Neanderthals are striking in appearance. Their cranial capacities ranged from about 1,200 cc to 1,640 cc, well within the modern range, but their foreheads were still sloped, the backs of their skulls broad, and the sides bulging.

The cranial vault is long, with a low forehead and a swelling, or **"bun," at the rear**.

The brow ridges were still large, but smaller at the sides than in H. erectus, and they were **filled with air spaces (called the frontal sinuses**), unlike the solid ridges of H. erectus. The brow ridges of the Neanderthals were also rounded over each eye, rather than forming a straight line, as in earlier archaic.

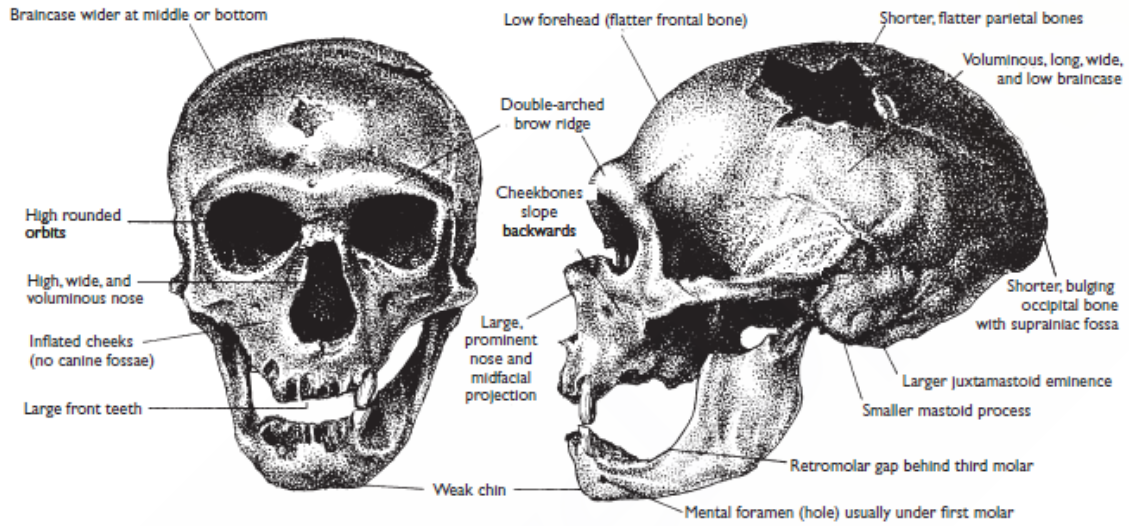
The face was large and prognathous, with a broad nasal opening and wide-set eyes. Weak chin.

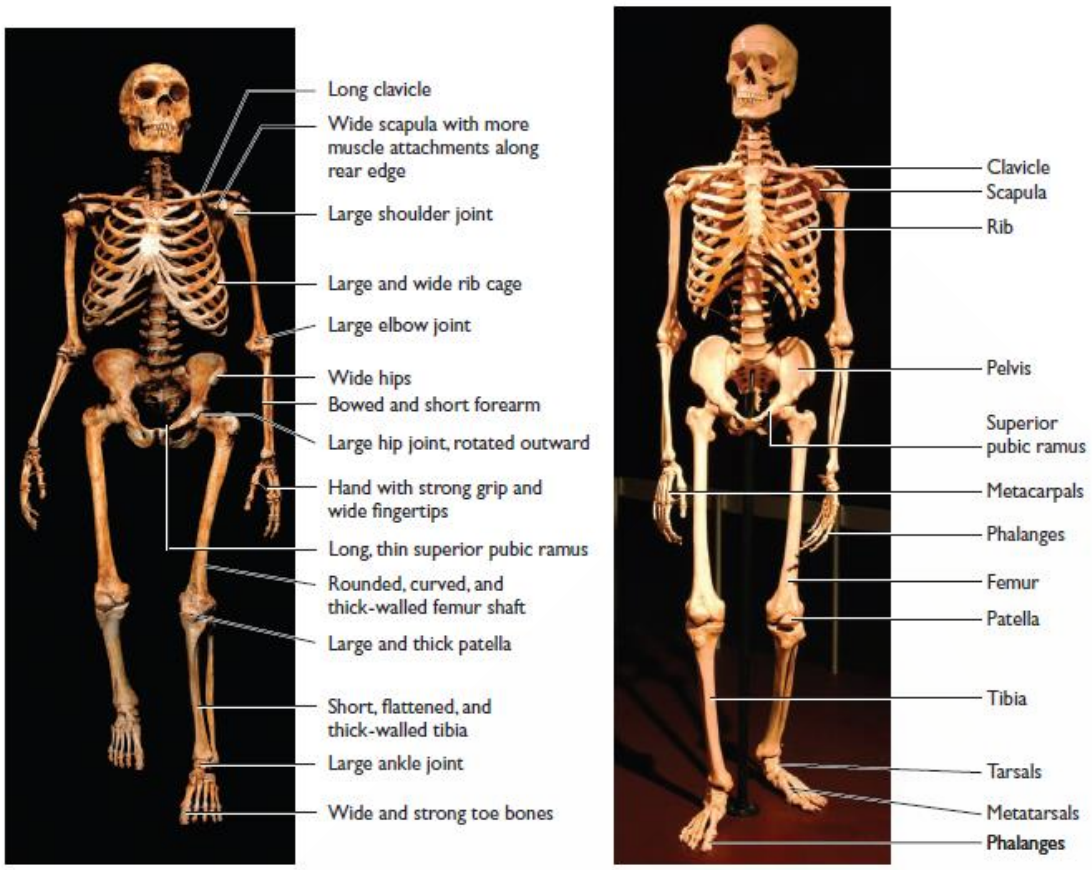
From the neck down, there were striking features. **The bones of the Neanderthals, even the finger bones, were more robust and had heavier muscle markings** than their modern counterparts. The Neanderthals were stocky, muscular, powerful people. This is seen even in the bones of Neanderthal children, so it is assumed to be a result of inheritance, not simply of a hard-working lifestyle.

Although very strong and stocky, the Neanderthals **were relatively short.** Estimates put the average **for males at 5 feet 6 inches and for females at 5 feet 3 inches**. Their short stature was partially a result of relatively short lower legs. The lower arms were short as well. **All these physical features hint at adaptations to a strenuous lifestyle and to cold climates.** Shorter, heavier bodies with short limbs conserve heat better than narrow, long-limbed bodies features hint at adaptations to a strenuous lifestyle and to cold climates.

As evidence, the limbs of the Neanderthals from warmer Southwest Asia are relatively longer than the limbs of those living in ice-age Europe, who faced some of the extreme climates of the glacial advances.

Another possible adaptation to cold has been suggested by several investigators (Menon 1997). In eight Neanderthal skulls, they found triangular bony projections in the nasal cavity unlike anything seen in modern humans or in any other human ancestors. These projections are thought to have provided increased surface area for the nasal mucous membranes, which would have helped warm and moisten the cold, dry air of Europe during the Pleistocene glaciations. It has also been suggested that the large sinus cavities served a similar function. Moreover, it is thought that the larynx of the Neanderthals was higher in the throat than in modern humans which would have prevented them from gulping in cold, dry air through the mouth.





Neandertal **Modern *Homo sapiens***

CLASSICAL AND PROGRESSIVE NEANDERTHALS

There is a range of variation in fossil Neanderthals. Some of the Neanderthals had pronounced ridges over their eye sockets (brow ridges) as well as other protrusions of the skull not generally seen in modern humans. They were more muscular than modern humans. They had flatter, broader noses than modern humans. They had receding chins. Their brains were somewhat larger than those of modern humans (this does not necessarily mean they were smarter). These characteristics are most strongly displayed in specimens from Europe, so-called Classic (La Chapelle-aux-Saints) Neanderthals.

These characteristics were less pronounced in the Neanderthals of the Middle East, known as Progressive (Tabun, Skhul) Neanderthals. Does this mean that Progressive Neanderthals were less different from modern humans than were the 'Classics'? **The progressive varieties lived much earlier than the classical one. The more massive build of Neanderthals, and other features such as flatter noses, especially of the Classic form, has been interpreted as an adaptation to the harsh glacial climates of Ice Age Europe.**

However, generous intermingling of Classic-type and Progressive-type amongst both cool and warm region limits the idea of mutual exclusivity. Both Classic-type and Progressive-type morphological traits appear almost simultaneously in the same region amongst similar temperature occurrences.

However, for UPSC let's see the major differences in Progressive and Classical Neanderthal

SI No.	CHARACTER	CLASSICAL NEANDERTHALS (LA CHAPELLE AUX SAINTS)	PROGRESSIVE NEANDERTHALS (Mt. CARMEL)
1.	Cranial capacity	1600cc	1400cc
2.	Skull	Large and Broad	Long and Less broad

3.	Forehead	Receding	Less Receding
4.	Occipital region	Protruding	Less protruding
5.	Supraorbital ridge	Large and Continous	Large and there is tendency to separate in the middle
6.	Orbits	Less rounded	More rounded
7.	Upper jaw	Projecting	Not Projecting
8.	Nose	Broad and large	Less Broad
9.	Chin	Absent	Present but weak
10.	Teeth	Large	Relatively smaller
11.	Body built	Stocky	Medium
12.	Surface of the skull	Rough	Less rough

CULTURE CHARACTERISTICS

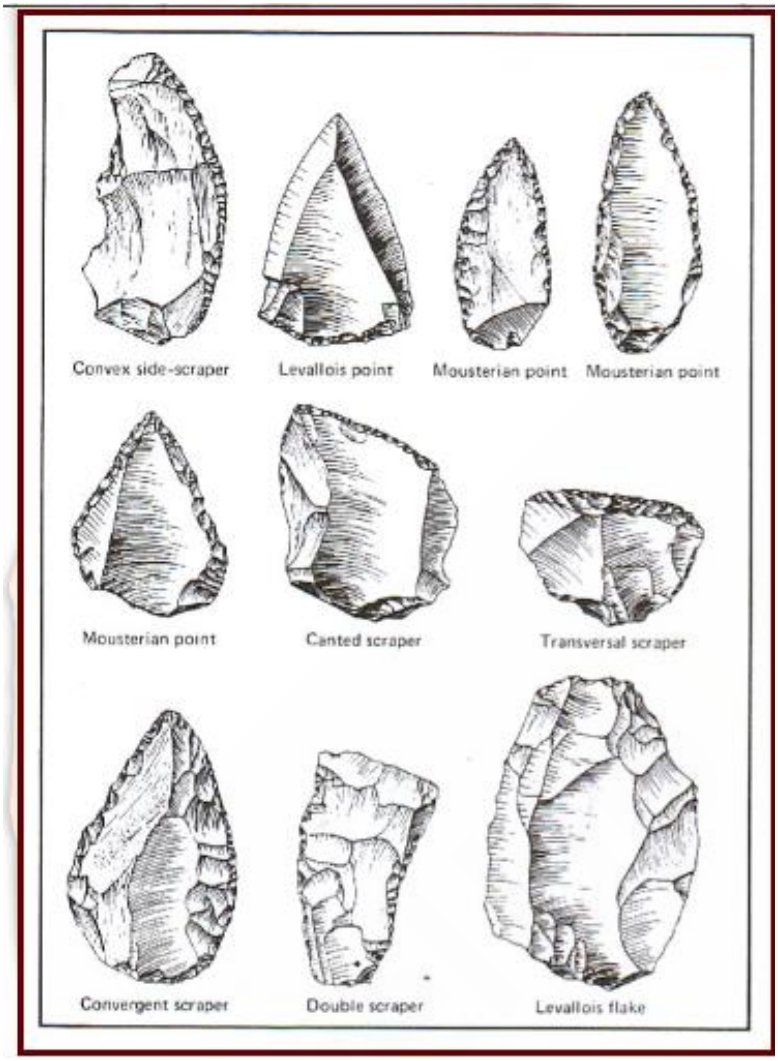
Tools

Called the **Mousterian technique** (or flake tool), after the site of Le Moustier in France. This culture's stone tool technology, lasting about 300,000–30,000 yBP, includes a complex and distinctive type of **flaking called the Levallois.** This technique involves preparing a stone core and then flaking the raw materials for tools from this core. **These flakes were sharpened and shaped by precise additional flaking, on one side or both, to make specialized tools.**

Tools included **small hand axes made from disk-shaped cores**; flake tools, such as well-made **sidescrapers and triangular points**, probably used as knives; denticulate (toothed) instruments produced by making notches in a flake, perhaps used as saws or shaft straighteners.

This tool assemblage consists of smaller proportion of large core tools like hand axe and cleavers and bigger proportion of flake tools like scrapers. These scrapers might have been used for scraping hides or for working of wood.

Some of the tools like points might have been hafted or attached to shaft or handle as they were thinned or shaped on one side.



Subsistence

We know, from the abundant remains of animal bones at their sites, that Neanderthals were **successful hunters**. But though it's clear that Neanderthals could hunt large mammals, they may not have been as efficient at this task as Upper Paleolithic modern humans.

Recent archaeological discoveries have shown that Neanderthals also expanded their range of available foods **to include marine resources**—a subsistence strategy previously thought to have been developed later by modern humans during the Upper Paleolithic. From the island of Gibraltar, new evidence has shown that some Neanderthals gathered **shellfish and hunted seals and dolphins,** displaying no difference in their hunting behaviour from modern humans of the same region (Stringer et al., 2008).

Burials

While we now have earlier evidence of intentional human burials, the first and most famous evidence comes from the Neanderthals. Although many of these "burials" have now been attributed to natural causes, at least thirty-six Neanderthal sites show evidence of intentional interment of the dead, and in some graves there were remains of offerings— stone tools, animal bones, and, possibly, flowers.

The first potential discovery of a Neanderthal tomb occurred in 1908 at La Chapelle-Aux-Saints in south-western France. The well-preserved state of these 50,000-year-old bones led researchers to suggest that Neanderthals buried their dead well before modern humans arrived in western Europe.

Evidence from the La Chapelle site also suggests that Neanderthals were like us in that they cared for their sick and elderly. **The skeleton discovered belonged to a Neanderthal who was missing most of his teeth and showed signs of hip and back problems that would have made movement difficult without assistance**. Before they took care of his dead body, the other members of his group would have had to have taken care of his living one.

The evidences at Le Moustier, France and at Shanidar cave in Iraq indicate the possibility of funeral rituals. A flint tool kit and food offerings are often placed with the dead man. **Shanidar cave in Iraq shows the skeletal remains of handicapped man along with the pollen as humans might have put flowers in the grave.**

Cave or Rock Shelter Dwelling

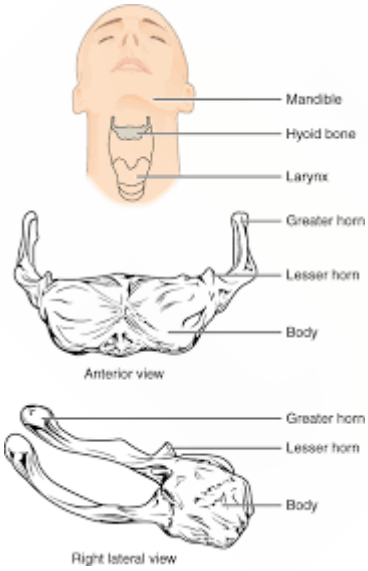
The Neanderthals lived in caves and rock shelter. The caves were made more comfortable for winter dwelling by covering it with animal skins. Though there is evidence of use of fire by Homo erectus, **Neanderthals seem to have relied more on fire as there were thick layers of ash in many rock shelters and caves.**

Fire was regularly lit both for warming and for cooking. Several caves reveal distinct hearth places with remains of charcoal.

Bear-cult

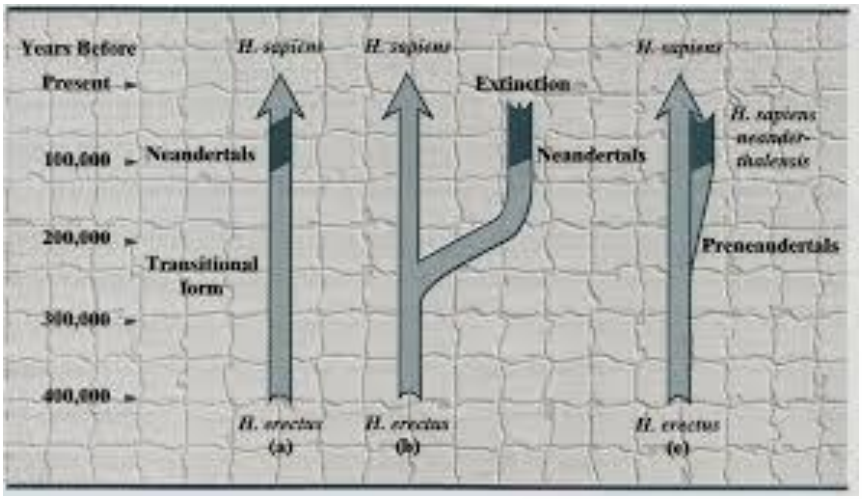
The existence of an ancient bear cult among Neanderthals in Western Eurasia in the Middle Paleolithic has been a topic of discussion spurred by archaeological findings. The Neanderthals would have worshiped the cave bear (Ursus spelaeus) and ancient bear bones have been discovered in several different caves and are believed by some archaeologists to be evidence of a bear cult during the Paleolithic. It was not the mere presence of these bones that intrigued archaeologists, but their peculiar arrangement. Upon excavation, archaeologists on site determined that the bones were found arranged in such a way that it was not naturally possible.

Language



Finally, we have the question of the linguistic abilities of the Neanderthals. Some investigators have reconstructed the vocal tract of Neanderthals based on the structure of the underside of the cranium. **They have concluded that because of the higher larynx noted before, Neanderthals were not capable of making all the vowel sounds of modern humans. However, a recently found hyoid bone—a horseshoe- shaped bone in the throat—from the Neanderthal site of Kebara in Israel appears fully modern.** This would mean that the vocal tract of the Neanderthals was like ours and that they could make all the sounds of which we are capable. The point, of course, is—as we said for Homo erectus —that the Neanderthals had sufficiently complex things to talk about, and just how they did so is less important than the fact that they must have talked.

Phylogenic Status



Three interpretations of the evolutionary relationships between Neanderthals and modern humans: (a) **unilinear evolution**, (b) **separate lineages,** and (c) **preneanderthals**. Ever since the first Neanderthal skulls were found in the nineteenth century, scientists have pondered the links between Neanderthals and modern humans.

Early interpretations **(a)** viewed Neanderthals as an intermediate ancestor between Homo erectus and anatomically modern humans. Their restricted geographic range and distinctive physical characteristics makes this scenario unlikely. Neanderthals also appear to have coexisted with anatomically modern humans until the relatively recent past, perhaps as little as 30,000 years ago.

A growing consensus among anthropologists holds that **(b)** Neanderthals were divergent from erectus with distinctive physical features. But they have special feature making them adapt to cold which was useless post ice age. This led to their extinction.

Paleoanthropologists tend to favour the hypothesis **(c)** that a "pre-Neanderthal" population, possibly originating in another region and migrating to the classic Neanderthal area, underwent a severe natural selection in response to the cold environment of Europe. Later this group intermixed with H.sapiens. Such an interpretation might be consistent with recent molecular testing of genetic material extracted from Neanderthal bone.

E**xtinction**

- The exact date of their extinction had been disputed.
- 2014, Thomas Higham of the University of Oxford performed the most comprehensive dating of Neanderthal bones and tools, which demonstrated that Neanderthals died out in Europe between 41,000 and 39,000 years ago
- Possible scenarios for the extinction of the Neanderthals are:
- **Physical extermination**: Neanderthals were a separate species from modern humans, and became extinct (because of climate change or interaction with humans) and were replaced by modern humans moving into their habitat between 45,000 and 40,000 years ago. Jared Diamond has suggested a scenario of violent conflict and displacement. No evidence
- **Interbreeding theory or total assimilation** Neanderthals were a contemporary subspecies that bred with modern humans and disappeared through absorption.
- **Over specialization**: presence of robust features indicate that Neanderthal were specialized for cold climate and became extinct when condition normalized.

Homo neandertalensis and *Homo sapiens* Compared

Homo neandertalensis	*Homo sapiens*
Flat-headed (platycephalic) brain case.	Higher and rounder brain case.
Cranial capacity of 1300–1750 cubic centimeters.	Cranial capacity of 900–2300 cubic centimeters.
Well-developed brow ridges with continuous shelf of bone.	Brow ridges moderate to absent; never a continuous shelf of bone.
Backward extension of occiput into a "bun."	Rounded occiput; no "bun."
Relatively flat basicrania.	Bent basicrania.
Maximum skull breadth at about midpoint (viewed from rear).	Maximum skull breadth higher on skull (viewed from rear).
Forward projection of face.	Flatter face (nose and teeth more in line with eye sockets).
Variably developed chin.	Well-developed chin.
Relatively large incisors.	Relatively small incisors.
Taurodontism (molars and premolars with enlarged pulp cavities and fused roots).	No taurodontism.
Bones thinner than in *H. erectus*.	Bones thinner than in Neandertals.
Sockets for femurs farther back.	Sockets for femurs farther forward.
Dorsal groove on side of outer border of scapula (in about 60% of specimens).	Ventral groove on side of outer border of scapula (in most specimens).
Long bones more curved with large areas for muscle attachments.	Long bones straighter with smaller articular surfaces.
More powerful muscles to flex fingers.	Less powerful grip.