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Aspects of Neanderthal Culture and Adaptation

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Neanderthals were the first fossil humans to be discovered, in the mid-nineteenth century. Their ancestral status was doubted at first, but later accepted. The relationship of Neanderthals has long been debated. The question was, Were they ancestral to modern humans, or an extinct side branch? At times, they have been viewed as the direct ancestors of modern Europeans; at other times, they have been regarded as a side branch of the human evolutionary tree, with extinction as their fate. Today, the latter is the most widely supported hypothesis. Most anthropologists now believe the latter to be correct, a view that is bolstered by recent genetic evidence.

The Neanderthals thrived in Europe for around 300,000 years before modern humans arrived. The reason for the demise of this successful species remains a mystery.Homo neanderthalensis was the first fossil hominin discovered and described. Today, we have thousands of fossil specimens excavated from hundreds of sites across Europe. This record is remarkable, because it includes individuals of all ages, from premature fetuss to the very elderly.

Neanderthal anatomy represents a mixture of primitive characters, derived characters that are shared with other hominins, and derived characters that are unique to Neanderthals . In general terms, Neanderthals may be described as being robustly built, heavily muscled, and short in stature. Evidence of the heavy musculature appears in the extremely large muscle attachments and the bowing of the long bones. This structure implies that, whatever the details of Neanderthal subsistence, this species' daily life involved routine, heavy work. The short, broad trunk is consistent with life in a cold environment (Bergmann's rule)as are the short forearm and lower leg relative to the humerus and femur (Allen's rule).For much of the time of the Neanderthals' existence (between 150,000 and just less than 30,000 years ago), Europe and the Middle East were indeed cold, reflecting the end of the Pleistocene Ice Age.

The Middle to Late Pleistocene hominin fossil record of Europe is dominated by the Neanderthals. The pertinent question is the identity and fate of their ancestors. According to the multiregional evolution hypothesis, the Neanderthals were part of a gradually evolving lineage that eventually yielded anatomically modern humans in Europe. In contrast, the single-origin hypothesis purports that they represent a locally evolved species that became extinct approximately 30,000 years ago and that contributed nothing to modern European populations.

No unequivocal fossil evidence exists to prove the presence of Homo erectus in Europe. Many examples of so-called archaic sapiens have been located, however, including some recent finds at Atapuerca, in northeast Spain. These remains of many individuals include some that may be 780,000 years old. According to some proponents of the single origin hypothesis, most of these specimens should be assigned to Homo heidelbergensis, which may have been ancestral to Neanderthals in Europe; in Africa, this species can be seen as being ancestral to Homo sapiens. However, in May 1997, the discoverers of the Spanish fossils elected to name them a new species Homo antecessor. Multiregionalists view this group as evidence of a transition toward modern Homo sapiens.

As Homo heidelbergensis specimen other fossils with a similar mix of ancient and modern were found in the mid-1930s, such as a cranium at Steinheim, Germany, and skull fragments at Swanscombe, England.The most spectacular finds of recent times, however, are those at the fossil-rich Atapuerca Hills in northern Spain. In 1993, a team of Spanish researchers reported the discovery of 1300 human fossil remains (representing 30 individuals) from a single site (Sima de los Huesos), dated at close to 300,000 years old. It represents the largest single collection of early human fossil bones anywhere in the world. Like other human fossils of this age in Europe, the specimens display a mix of ancient and modern features, and were initially assigned to Homo heidelbergensis. However, in 1997, the fossils' discoverers elected to name them a new species, Homo antecessor. To supporters of the multiregional hypothesis, H. antecessor is evidence of a gradual transition to Homo sapiens. On the other hand, out-of-Africa proponents view them as a form of archaic sapiens that may have been ancestral to H. heidelbergensis, but had nothing to do with the ancestry of Homo sapiens.

These various specimens represent potential ancestors for Neanderthals. What of their fate? Beginning some 40,000 years ago, classic Neanderthal anatomy disappears in Europe, with an east-to-west progression that ends nearly 27,000 years ago. The latest evidence of Neanderthals is found at the site of Zafarraya, southern Spain. Fossil evidence indicating the presence of anatomically modern humans follows the same trajectory. For instance, modern jaw and tooth fragments from the cave of BachoKiro, Bulgaria, are dated at 43,000 years. A frontal bone with a high forehead and small brow ridges has been found at VelíkaPecˇina in Croatia and dated at 34,000 years. A similar specimen, but with more robust frontal bone, from Hahnöfersand, Germany, has been dated at 33,000 years. A large collection of somewhat robust modern human remains was found at Mladecˇ, Czechoslovakia. The age of the famous Cro-Magnon fossils, from France, is placed at approximately 30,000 years.

When Bräuer and his colleague K. W. Rimbach compared the crania of the early moderns of Europe, the early moderns of Africa, and the Neanderthals, they found a close morphological similarity between the first two but saw no link between early European moderns and Neanderthals. Similarly, Cro-Magnon skeletons exhibit a warm-adapted body stature, not the cold-adapted formula seen in Neanderthals. This character may be

taken as strong evidence of the replacement of Neanderthals and supports the single, African origin hypothesis.

Although some proponents of the multiregional hypothesis accept that Neanderthals were replaced, at least in the west, most argue for continuity. As evidence, they adduce the size of the nose in Neanderthals and later Europeans, some details of the back of the skull, and, most particularly, the shape of the mandibular nerve canal. This opening is grooved in most living people, but it is surrounded by a bony ridge in 53 percent of Neanderthals. The incidence in later, modern Europeans is just 6 percent. According to multiregionalists, this incidence is 44 percent in early moderns in Europe, indicating continuity. Stringer and Bräuer have recently criticized this claim, saying that while it might indicate gene flow between Neanderthals and early moderns, it is just as likely to be a statistical fluke. Aiello's assessment is that the anatomicaland archaeological data of Europe "do not contradict an ultimate African origin for modern humans; however, they also do not clearly substantiate this hypothesis."

The origin of modern humans was undoubtedly complex, involving much population movement at different times, and local population expansions and extinctions. Multiple dispersals from variable sources it can be said that population in Africa at different times and via different routes explain how morphological variability developed in the modern world. In any case, the weight of evidence offers more support for some form of single-origin hypothesis than for the multiregional evolution hypothesis.

In this paper I have assessed and examined the Neanderthal fossil record and offer an extended consideration of the archaeological record of Neanderthal behavior and society.The evolution of Neanderthals took place within the context of the geological period known as the Pleistocene, or the Ice Age.To understand the evolution of Neanderthals, it is important to know about what happened after this initial dispersal and to know when hominins first spread into western Europe and about the Lower Palaeolithic cultures of Europe and Asia. Finally, it is also important to know about developments toward the later stages of the Lower Palaeolithic. Did hominins intensify the use of fire? Is there evidence for changes in the way tools are used?

The stone-tool industry associated with Homo neanderthalensis in Europe is known as the Mousterian, after the site of Le Moustier in the Dordogne region of France. The Mousterian is a Middle Palaeolithic stone-tool industry (also known as the Middle Stone Age in Africa), and it is similar to other Middle Palaeolithic industries associated with Homo heidelbergensis and Homo sapiens elsewhere. A key feature of the Mousterian is the use of a "prepared core" technique of stone-tool knapping, known as the Levallois.

The prepared-core technique requires skill and forward planning, is an efficient use of materials, and produces blanks that can be shaped into various forms. Traditionally, these have been described by their supposed functions, but it is just as important to consider other characteristics, such as the raw material used, the cutting-edge shape, and signs of reuse.

The Levallois technique begins with the careful selection of a raw stone nodule, and then the preparation of the nodule through knapping to produce one surface that is domed. A striking platform is created at one end which, when struck, produces a flake of a predetermined shape and size. The nodule may then be prepared again, and the process is repeated until the core is too small. This technique appears in the archaeological record between 250,000 and 200,000 years ago, and it is associated with a reduction in the number of large handaxes

As far as archaeological background is concerned in looking for signs of modern human behaviour and concerned with a shift from the Middle Stone Age to the Later Stone Age in Africa, dated at some 250,000 to 40,000 years and 40,000 to 10,000 years, respectively. The equivalent stages in Europe, Asia, and North Africa are known as the Middle Palaeolithic and Upper Palaeolithic.

The end of the Lower Palaeolithic, 250,000 years ago, saw the end of innovation-poor, long-lasting stone-tool industries. With the beginning of the Middle Palaeolithic, the number of identifiable tool types quadrupled, reaching perhaps 40. The Middle Palaeolithic and Middle Stone Age technologies were characterized by the predominance of the prepared core technique, such as the Levallois technique. Flakes produced by this method may then be further fashioned each with its own putative cutting, scraping, or piercing function. Some variation exists in Middle Palaeolithic assemblages throughout the Old World, which has encouraged the development of a plethora of local names. The most generally applied name, however, is Mousterian, after the Neanderthal site of Le Moustier, in the Perigord region of France.

With the Upper Paleolithic, beginning 40,000 years ago, the number of tools more than doubled again, to as many as 100. Moreover, European tool industries cascade through at least four identifiable traditions in less than 30,000 years a pace of innovation and change unprecedented in the archaeological record. In addition to new forms of tools, raw materials that were only infrequently used earlier, such as bone, ivory, and antler, became very important in the Upper Palaeolithic industries.

Just as flakes prepared from cores characterize Mousterian (and Mousterian-like) industries in the Middle Palaeolithic, blades produced from prepared cores constitute something of a signature for the many industries in the European Upper Palaeolithic. In addition to the signature blade, Upper Palaeolithic tool makers also made extensive use of bone, ivory, and antler as raw material for some of the most delicate implements. Thus, a strong sense of directed design and elaborate use characterize Upper Palaeolithic tool assemblages.

An important issue in the context of the origin of modern humans is the dynamics of the shift between the Middle Palaeolithic and the Upper Palaeolithic . For Stanford University archaeologist Richard Klein, the evidence reveals "the most dramatic behavioural shift that archaeologists will ever detect." For this reason, the transition has been regarded as revolutionary, not gradual. If true, then it would imply that the evolution of modern morphology (which appeared more than 130,000 years ago) occurred separately from the evolution of modern behaviour (40,000 years ago). Recent discoveries in Africa may raise questions about this interpretation, however.

The European archaeological evidence for the stages in question is extensive, and it does appear to give a clear signal of a revolutionary change some 40,000 years ago. For this reason, the transition in Europe has been dubbed the Upper

Palaeolithic revolution. It coincides with the first appearance of modern humans in the region, carrying the cultural tradition known as the Aurignacian. Aurignacian sites throughout Europe show the typical blade-based technology and use of bone, ivory, and antler, not only to make points but also to create beads as body ornamentation. The sites are also associated with other characteristics of the Upper Palaeolithic: they are larger than those of the Middle Palaeolithic; open-air (as opposed to rock shelter or cave) sites are more distinctive and organized; artifacts indicate the existence of longdistance contact and even trade shells and exotic stone that must have come from afar; and musical instruments, specifically simple flutes made from bone, are present.

As the Upper Palaeolithic progressed, substantial temporal and spatial variability of style developed in artifact assemblages; the sense of cultural traditions was strongly present for the first time. Although sculpting and engraving appeared from the Aurignacian onward, evidence of cave painting did not become strong until the Gravettician, some 30,000 years ago.

The contrast between the Middle Palaeolithic in Europe (specifically, the Mousterian) and the Upper Palaeolithic is striking. Although not every aspect of Upper Palaeolithic culture, especially technological advances and artistic traditions, was present from the beginning, overall it surely offers evidence of a revolutionary changes.

The match between archaeological and fossil evidence in Europe is quite good. For instance, wherever hominin remains have been found with Mousterian assemblages, they have been Neanderthal. Virtually all hominin fossils associated with Upper Palaeolithic assemblages have been modern humans. Two exceptions to the latter generalization have been identified, at the French sites of Arcy-sur-Cure and Saint-Césaire. Although the fossil evidence at Arcy-surCure is fragmentary, a classic Neanderthal partial skeleton has been found at Saint-Césaire. These sites are interesting because the tool assemblages represent an intermediate form between Mousterian and Aurignacian, termed Chatelperronian.

Some scholars have argued that the intermediate nature of the Chatelperronian technology indicates the presence of a population in biological transitions that is, changing from Neanderthal to modern humans. The anatomy of the SaintCésaire individual shows no such characteristics, however . The age of the skeleton, recently dated at 36,000 years, leaves little or no time for an evolutionary transition to local modern human populations. In any case, the site postdates the earliest Aurignacian sites, which have no local precursors. One possible explaination of the Chatelperronian is that it was developed by late Neanderthal populations that had cultural contact with incoming modern human populations.

Although no consensus has been reached on the meaning of the European archaeological evidence, a strong case can be made for its support of revolutionary change as a result of population replacement. It does not, however, address the issue of the origin of modern humans.

In East Asia, chopper and flake tools characterize most Lower Palaeolithic sites. Paradoxically, the earliest date for an Acheulian industry anywhere outside of Africa is at the site of Bose in China (Yamei et al. 2000). Bose is also the only site in China where handaxes have been uncovered.Other than Bose, the earliest well-dated Acheulian site outside of Africa is GesherBenotYa'akov, Israel, located to the north of the Sea of Galilee in the northern extension of the East African Rift Valley. Dated to 780,000 years ago, GesherBenotYa'akov is similar to African Acheulian sites. Bifaces are made on very large flakes, and handaxes and cleavers are common. The excavations at GesherBenotYa'akov have also produced limited evidence for the use of fire and for the cracking of nuts.

It is beginning only 500,000 years ago that Acheulian sites became common across Europe, in the Middle East, and on into the Indian subcontinent—the geographic region known as Eurasia. There is regional variation in the Eurasian Acheulian, but taken as a whole, these industries show some significant contrast with the African Acheulian. Cleavers are almost completely absent from the Eurasian Acheulian, and handaxes are the major type of biface.Boxgrove, located in West Sussex in southern England, is among the earliest known Acheulian sites in Europe and one of the most extensively excavated.No evidence for the use of fire or of a base camp has been found at Boxgrove.

Not all sites in Europe dating later than 500,000 years ago have produced handaxes. The Clactonian is an industry in England of simple flake tools contemporary with the Acheulian.Clactonian is distinct from the Acheulian.The site of Bose has produced the oldest known handaxes outside of Africa. However, handaxes manufacture never became widespread among early hominins in East Asia. In Europe, Acheulian industries appeared only 500,000 years ago, hundreds of thousands of years after the first arrival of hominins. Even after the widespread appearance of handaxes in Europe and western Asia, there were industries, such as the Clactonian, that did not involve handaxe manufacture.

Historically, archaeologists have considered the toolkits of Neanderthals to have been vastly inferior to those produced by modern humans. When the toolkit called the "Châtelperronian" was first discovered in France, it was assumed to have been made by modern humans. However, later finds and improved dating techniques have led many to conclude that it is actually a Neanderthal toolkit. Along with the Uluzzian culture of Italy and Greece, the Châtelperronian appears to show the Neanderthals as having been more ingenious and creative than previously thought. Interestingly, these toolkits and cultures only appear after modern humans have entered Europe, and some experts have argued that the Neanderthals must have had contact with modern humans, and learned how to make these tools from them. It is still a debatable question-- the association of Châtelperronian toolkits with the Neanderthals.

The discovery of Châtelperronian tools close to a Neanderthal burial at La Roche-à-Pierrot (St-Césaire) led archaeologists to conclude that Neanderthals made these tools. But the archaeology involved complex layering, and some experts do not accept the association. As well as tools, the Châtelperronian culture includes personal ornaments, such as pendants made from animal teeth. It seems that their makers were just as interested in image and personal adornment as we are.

Human remains from Lagar Velho, Pestera cu Oase, Cioclovina, and Mladec may be Neanderthal/modern human hybrids; the archaeological sites of Châtelperron, Roc-de-Combe, and St-Césaire contain Châtelperronian tools.

All living humans are members of the species Homo sapiens, also known as modern humans. Neanderthals are at

once similar to modern humans and yet highly distinctive. The significance of the similarities and differences between Neanderthals and our own species is the focus of intense debate. Some scientists argue that the similarities are so strong that Neanderthals must be merely a subspecies—Homo sapiens neanderthalensis—of our own. Others argue that despite the similarities, the differences warrant the creation of a distinct species—Homo neanderthalensis—for the Neanderthals.Neanderthals have some important attributes .

The similarities between modern humans and Neanderthals are rooted in their shared ancestry. Unfortunately, there is some controversy surrounding the identification of the last common ancestor of modern humans and Neanderthals. Three scenarios have been posed for the evolution of Neanderthals:--

1. Neanderthals and modern humans each evolved separately from populations of Homo erectus, possibly through local intermediate species. According to this scenario, the evolution of Neanderthals and modern humans took place in parallel, in separate geographic areas. Neanderthals, a species (or subspecies) adapted to cold climates, evolved in Europe.
2. The common ancestor of modern humans and Neanderthals was a distinct species that itself evolved from Homo erectus and lived between 700,000 and 300,000 years ago. One candidate for this critical intermediate position is Homo heidelbergensis. Neanderthals and modern humans then each evolved separately from this intermediate species in parallel, in separate geographic areas.
3. Neanderthals and modern humans did not evolve in isolation; rather, there was a constant exchange of genetic material, or gene flow, between the two populations. This possibility cannot be ruled out; however, some degree of isolation must have existed in order for Neanderthals to evolve some oftheir characteristic skeletal traits. According to this model, Neanderthals and modern humans are members of a single species.

The distinctiveness of a Neanderthal skeleton makes it easy to identify. The skull is elongated compared with the skull of a modern human, with an occipital bun at the back and a large, projecting nose in front. The forehead is sloping and the chin almost absent. As in Homo erectus, there is a brow ridge over the eyes; however, in Neanderthals, this ridge is double arched. The skull is not as thick as that of Homo erectus, but is still thicker than the norm among living humans. The molars of Neanderthals were large, and the front teeth show marks of wear, indicating the regular use of the incisors as tools in preparing food or gripping hides. The Neanderthal body is stocky and similar in proportion to modern humans adapted to cold climates. Particularly notable are a broad rib cage and bowed, long bones. The muscle insertions are well developed, and the bones are generally robust. Although Neanderthals were completely bipedal, the way they walked was slightly different from that of modern humans.

The overall impression one forms of Neanderthals is that they were very strong and well adapted to cold climates. Among the features tied to a cold-weather adaptation are the projecting face and large nose. These features distinguish Neanderthals from both Homo erectus and modern humans. Studies of fossil remains of Neanderthal children indicate that many of the characteristic Neanderthal features developed quite early in childhood.

Body weight for the Neanderthals is estimated at 63.5 kilograms for males and 50 kilograms for females; statures are estimated at 1.67 meters for males and 1.60 meters for females. Despite their short stature, Neanderthals had large brains, an average of 1450 cubic centimeters and some 1700 cubic centimeters larger than the modern average. The significance of the larger brain remains a matter of speculation.This is considerably larger than the brain of Homo erectus

Inevitably, brain size impinges on the question of Neanderthals' capacity for spoken language. Does a human-size brain imply a human level of language capacity? Nothing in the neuroanatomy of Neanderthals would deny this capability. Most anthropologists assume that if Neanderthals did indeed have some form of vocalization that was more advanced than in nonhuman primates, it was probably rather basic.

The oldest fossil that can be clearly classified as a Neanderthal was discovered at Biache-Saint-Vaast in northern France. Biache has been dated to 175,000 years ago.A possible older date has been proposed for a Neanderthal fossil, found at the Ehringsdorf site in eastern Germany, which has been dated between 200,000 and 250,000 years ago.The Biache and Ehringsdorffossils suggest that Neanderthals first appeared in Europe in the latter part of interglacial.

The most recent date for a Neanderthal fossil is roughly 30,000 years ago, from sites such as the Mezmaiskaya Cave, Russia, the source of one of the Neanderthal fossils from which DNA was successfully extracted. Neanderthals thus lived through two complete glacial cycles, beginning with interglacial Oxygen Isotope Stage 7 and ending with glacial Oxygen Isotope Stage 3. Neanderthals survived through rapidly changing climatic conditions, including the deep glacial advances of Oxygen Isotope Stage 6 and the very warm conditions of the early part of interglacial Oxygen Isotope Stage 5.

Neanderthal fossils have been found across a wide area stretching from western Europe to central Asia. The southern limit of the distribution of Neanderthal fossils is in the Middle East. No Neanderthal fossils have been found in either Africa or East Asia. Neanderthal fossils and archaeological remains have been found in a wide range of ecological zones, including open temperate grasslands in northern Europe and Mediterranean-climate woodlands in the Middle East.

Archaeological research presents a subtle picture of Neanderthal culture and adaptations. The archaeological period during which Neanderthals occupied Europe and the Middle East is known as the Middle Palaeolithic.

As far as stonetools are concerned Neanderthals only rarely made handaxes. After having been a central part of the hominin tool kit for over a million years, handaxes rapidly disappeared from the archaeological record around 200,000 years ago. Rather than fashioning bifacial tools from cobbles or very large flakes, Neanderthals made tools by retouching the edges of flakes. The flakes used by Neanderthals as tools were not made haphazardly. The

dominant approach to tool manufacture during the Middle Palaeolithic is known as prepared-core technology, a technique in which the person making the tools carefully shaped the core to control the form of the flakes produced.

Within the narrow range of Neanderthal stone tool technology, there is surprising diversity. With some important exceptions, the Lower Palaeolithic is characterized as showing a great deal of uniformity across broad geographical areas and long time scales. This is not the case for the stone tool industries made by Neanderthals, which show a great deal of variation, both in the location and nature of the retouching and in the shape of the flakes on which the tools were made. The study of variation in Middle Palaeolithic stone tools has played a critical role in developing archaeological methods of artifact analysis. Understanding these tools is key to understanding Neanderthal adaptation, culture, and cognition.

In the early twentieth century, excavations of Neanderthal sites in Europe were undertaken on a massive scale.Analysis of prehistorian François Bordes andLewis Binfordabout the stone tools from their excavations is debatable andUltimately, it became a classic debate over the relative importance of culture and biological adaptation in archaeology. However, a number of studies emerged that undermined some of the central arguments of both Binford and Bordes.

The debate between Binford and Bordescentered on the shared premise that the typology developed by Bordes was valid. On this shared basis, the two researchers went on to argue whether variation in the types of tools found was the result of ethnicity or site function.

In the 1980s, American archaeologist Harold Dibble (1987) developed an elegant critique of the Bordes typology. Dibble pointed out that stone tools have a lifetime of use, or use-life, that includes resharpening. This quality of stone tool technology is known as the Frison effect. During its use-life, a single piece might pass through several forms as it undergoes resharpening. Dibble argued that this is exactly what happened with sidescrapers during the Middle Paleolithic. The types of tools that Bordes saw as desired end products were actually stages in a process of a tool's use-life. A flake could begin as a single scraper, become a double scraper, and then become a convergent scraper as it passed through successive stages of resharpening , a simple sidescraper could be transformed into a transversal sidescraper.

Dibble argued that Bordes was wrong in his view of Neanderthal society, saying that, as Binford had argued, ethnicity was an illusion. Perhaps all variability could be accounted for by the degree to which tools were exhausted. In place of Binford's site function model, Dibble proposed that variability in Middle Palaeolithic stone tool industries could be explained on the basis of access to raw material and the degree of mobility of the inhabitants of the site. The farther the sites were from sources of raw material, the more the scrapers would be retouched. The more mobile a group of hunter-gatherers was, the more likely the members of the group would be to maintain their tool kit, and, in turn, the more likely the number of pieces intensively retouched would be to increase. By following flint knapping rules Neanderthals were able to control the form of flakes produced.

Nowadays, Neanderthal ethnicity refers to strongly held traditions in the way stone tools are manufactured. These traditions require that knowledge and skill be transmitted between generations by learning.Boëda has demonstrated that Neanderthal stone tool manufacture was highly sophisticated learned behavior. At the same time, Dibble has alerted us to the critical importance of raw material and mobility in identifying which tools will be found on a site.

The site of La Cotte de St. Brelade is located on what are today the Jersey Islands in the English Channel. Excavations uncovered the remains of at least 20 mammoths and 5 woolly rhinos at the foot of a steep rock face (Scott 1986)and it seems clear that Neanderthals were hunting very large animals at this site.Four Middle Palaeolithic sites in southern France have produced evidence of specialized hunting of bovids, both aurochs and steppe bison. At Mauran, a 25-square-meter excavation produced a minimum number of individuals count of at least 136 bison. The excavators do not think that this was a mass kill site, but rather a seasonal occupation where animals were hunted and butchered.

From the discovery of the wooden spear at the Lower Palaeolithic site of Schöningen, we can assume that such tools were used, although they are rarely preserved. Graphic proof that Neanderthals used stone-tipped spears in hunting has been found at the Middle Palaeolithic site of Umm el Tlel in Syria (Boëda et al. 1999). Umm el Tlel is an open-air site with 57 levels of Middle Palaeolithic occupation and excellent preservation of animal bones. The site has not been precisely dated, but it is over 50,000 years old. At Umm el Tlel, a fragment of a Levallois point was found embedded in the cervical vertebra (neck bone) of a wild ass. The point had clearly entered the bone while the animal was alive, and the blow most likely immobilized it. The excavators have demonstrated that the spear had to have entered the animal with considerable force and was more likely to have been thrown than thrust.

Rare evidence of exploitation of fish, shellfish, and other marine resources by Neanderthals comes from a series of sites on the coast of Gibraltar. At Vanguard Cave in Units C and D, dated by radiocarbon to 42,000 years ago, a hearth was found with approximately 150 mussel shells along with seal and dolphin bones. Two of the seal bones have clear cut marks. Bones of terrestrial mammals, including deer and boar, were also found in this context, indicating a very broad diet for the Neanderthal occupants of the site (Stringer et al. 2008)

Toreconstructing diet,the evidence for Neanderthal hunting is overwhelming, but it provides little information about the role of meat in the diet. Studies of the bone chemistry of Neanderthal fossils from Belgium, France, and Croatia suggest that Neanderthals were essentially meat eaters . In ecological terms, these studies have demonstrated that Neanderthals were at the top of the food chain, or at a high trophic level. The chemical signature of Neanderthal bones matches that of predators such as lions and wolves (Bocherens et al. 2001).

Although some isotope studies suggest that meat made up as much as 97% of the Neanderthal diet (Balteret al. 2002), studies of the calculus adhering toNeanderthal teeth provides evidence for the use of plant food. Dental calculus found on Neanderthal teeth from El Sidrón Cave in Spain incorporated traces of conifer wood that provide supporting evidence for Neanderthal use of toothpicks (Radini et al. 2016). Alternatively, the inner bark of trees might have been a component of the Neanderthal diet (Sandgathe and Hayden 2003). A biochemical analysis of the dental calculus from El

Sidron found evidence for cooked plant food and inhalation of smoke from wood fire (Hardy et al. 2012). The traces of plant foods in the El Sidron dental calculus included chemical compounds found in bitter-tasting non-dietary plants such as yarrow and chamomile. This discovery suggests that Neanderthals might have been using plants for their medicinal properties.

Regarding site organization and the use of fire,the evidence from animal bones and from the chemical analysis of Neanderthal fossils demonstrates that Neanderthals were hunters. Neanderthal sites include specialized kill sites, such as Mauran, but most appear to fit well with Glynn Isaac's (1978) concept of a base camp . These sites are sheltered locations to which meat and other resources would have been brought for consumption. Many of the Neanderthals' base camp sites are located in caves, which serve as excellent depositional contexts with well-preserved archaeological remains. Many Neanderthal sites show evidence of intensive occupation and a deep accumulation of archaeological layers. Microscopic analysis of the sediments found in Middle Palaeolithic cave sites shows that, although some of the fill is made up of sediments blown into the cave, a large proportion of the deposits, including charcoal, bone fragments, and fragments of stone tools, are the products of human activities.

Although alignments of stones are occasionally reported, evidence for any kind of construction at Neanderthal sites is rare. A possible exception is a circle of large mammoth bones found at the site of Moldova in the Ukraine, a configuration that has been interpreted as the remains of a hut. The careful horizontal excavation of cave sites has begun to show that there is spatial organization to Neanderthal habitations. Kebara Cave, Israel, is a Neanderthal cave site dating to approximately 50,000 years ago (Bar-Yosef et al. 1992). The horizontal excavation of the central part of the cave indicates that the main living surface was relatively clean, while the sides of the cave were refuse areas into which bones were tossed. A feature found in the central area appears to have been a pit used for the collection of discarded material. At Bruniquel Cave in southern France, archaeologists have made the stunning discovery that 175,000 years ago Neanderthals built circular structures deep in the cave using stalagmites as building materials (Jaubert et al. 2016). Fires were lit in these structures but the function of this activity remains unknown.

The most significant features found at Kebara Cave were hearths. In horizontal excavation, these hearths were poorly defined, and no stones were used to delimit a fireplace. Vertical excavation of the site produced a section that is striped black and white. Microscopic analyses of these deposits show that they are the remains of numerous simple fires. The black layers are charcoal, the white layers ash. Similar evidence of an extensive use of fire is found on most Neanderthal sites. In addition to burnt sediments, burnt flint and bone are very common. Neanderthals were also able to make adhesives by extracting resin from birch bark, a process that would have required careful control of fire (Mazza et al. 2006).

Excavations in Ibex, Vanguard, and Gorham's Caves in Gibraltar have revealed evidence of Neanderthal occupation—in the form of hearths and stone tools—dating to possibly as late as 28,000 years ago. This makes Gibraltar the most recent Neanderthal occupation site discovered. At the time that Neanderthals inhabited this area, the sea level was much lower, due to glacial conditions in Northern Europe. Evidence from Vanguard and Gorham's Caves has shown that Neanderthals enjoyed a much broader diet than was previously supposed. Easy access to the water enabled them to capture monk seals, while they ate dolphins, which probably washed up on the shore. There is also evidence of them cooking mussels.

Neanderthal base camps were apparently modest encampments that included central living areas with hearths and peripheral areas that were used as dumps. There is no evidence that the hearths were maintained or constructed. One significant complication in the study of Neanderthal cave sites is that the caves were shared (although not at the same time) by Neanderthals, hyenas, and, in some cases, cave bears. Distinguishing which aspects of the bone assemblage are the results of Neanderthal activity is critical.

Neanderthals lived by hunting and gathering, probably in small, nomadic groups, an existence that, judging from their extremely robust anatomy and large muscle attachments, evidently required extraordinary strength. The Mousterian flakes could be used for many purposes, including cutting flesh, scraping hides, and working wood. Mousterian assemblages show little use of bone, antler, or ivory.

There is abundant evidence that for many Neanderthals life in the Ice Age was harsh, but there is also evidence that they were resourceful and successful. Mousterian sites are known from a range of habitats including coastlines, inland plains, and upland areas. The climate was highly seasonal, and collections of animal remains indicate that Neanderthals were specialized seasonal hunters, targeting animals like reindeer in the winter and red deer in the summer. Many adult bones show healed fractures, suggesting that these interactions with large animals were dangerous. Analysis of fossil bone chemistry suggests that Neanderthals relied on meat, but there is also archaeological evidence from coastal sites that they exploited mussels and marine mammals, and from studies of dental plaque that they ate cooked cereal grains. At Moula-Guercy, France, the Neanderthals themselves may have been butchered: the hominin bones here show the same patterns of breaks, stone-tool cut-marks, and distribution as butchered deer

Although Neanderthals would not have ridden animals, like Rodeo performers, Neanderthal hunters would probably have experienced dangerous and potentially life-threatening close encounters with large animals.Neanderthal skeletons often show a high frequency of injury. To assess possible causes, anthropologists Thomas Berger and Erik Trinkaus compared the injury pattern with those of different groups of modern humans. They found that the Neanderthal pattern was most similar to that of North American Rodeo riders. Neanderthals exploited a range of prey, such as ibex, red deer, and wild boar. Research has shown that they were skilled hunters, making decisions about strategy in a similar way to later Homo sapiens populations.

While most experts believe that Neanderthals lived in strong family groups, new genetic evidence suggests that these groups had "patrilocal" base. This means that while males born into a family would have stayed with the group into adulthood, females would move away into other families.

Remains of Neanderthals have often been found in caves, sometimes in circumstances suggesting deliberate burial, as at the Kebara Cave in Israel, for example. A 40,000-year-old

skeleton discovered in a cave site near La Chapelle-aux-Saints, France, was found together with a bison leg, other animal bones, and some flint tools. And a woman's skeleton was also found in an exaggerated fetal position in the cave of La Ferrassie. Many other examples are described in the literature, often with the assumption that burial was deliberate and associated with ritual practice.

Some of the "burials" can probably be explained by natural events, such as the collapse of cave roofs on occupants or abandoned bodies, and thus are devoid of ritual. But chance would have to be invoked in too many other cases to explain associations of bodies and stone tools, of alignments of bodies, and so on. The evidence is convincing that Neanderthals, and probably other archaic sapiens, occasionally buried their dead with a degree of ritual that we recognize as human. The act of burial is probably one reason why so many Neanderthal skeletons have been recovered.

Finally, there have been many tantalizing hints over the years that Neanderthals practiced cannibalism. A detailed analysis of cutmarks and breakage patterns on 78 bones from the cave site of Moula-Guercy, in southern France, appears to confirm that suspicion. The bones of red deer and Neanderthals in the same cave appear to have been handled in identical fashion. "The circumstantial forensic evidence of cannibalism is excellent," commented Alban Defleur, head of the French/American team that carried out the study. "No mortuary practice has ever been shown to leave these patterns on the resulting osteological assemblages." In other words, the object of the ancient slicing and bone breaking was to get meat, not to observe ritual.

In the context of treatment of the dead,the discovery of intact Neanderthal skeletons in cave sites rapidly led archaeologists to conclude that Neanderthals buried their dead, in turn leading to speculation that the Neanderthals had a concept of an afterlife. Although in many cases the evidence for Neanderthal burial can be questioned (Gargett 1989), in a number of instances it is clear that the corpse was placed into a pit dug into the ground. Particularly clear evidence was found at Kebara Cave, where the outline of the burial pit could be traced stratigraphically. Moreover, if Neanderthals were not burying their dead, it is hard to understand why complete skeletons are recovered with no evidence of disturbance by scavengers.

At Kebara Cave, the burial pit is shallow, and there is no evidence of any ritual beyond placing the body in the pit. More extravagant claims, however, have been made about a number of other sites. One such claim asserts that a Neanderthal at Shanidar Cave, Iraq, was buried with flowers (Leroi-Gourhan 1975). The claim is based on an analysis of pollen recovered from soil collected near the skeleton. However, significant questions remain about the association of the soil with the skeleton and the source of the pollen.

One of the few sites to have produced detailed evidence of an object deliberately buried with a Neanderthal is Amud Cave, IsraelIn the context (Hovers, Kimbel, and Rak 2000). At Amud Cave, a Neanderthal infant was found in a natural niche in the side of the cave, together with the upper jaw (maxilla) of a red deer, which was resting against the child's pelvis .

On the basis of the evidence from sites such as Kebara Cave and Amud Cave, it appears that Neanderthals did at times bury their dead in small pits, perhaps placing objects in the pits with the deceased. However, such a reverent approach to the dead is not always found on Neanderthal sites. Analyses of the Neanderthal skeletal remains from the sites of Moula-Guercy, France, and Krapina, Croatia, show clear evidence of cut marks that are likely theresult of cannibalism. The Moula-Guercy Neanderthal remains had been treated like all other animal bones. Evidence of butchery includes cut marks from defleshing and percussion marks from smashing the bones to obtain marrow (Defleur et al. 1999).

There is currently no known artwork from Middle Paleolithic Neanderthal archaeological sites. Occasionally, archaeologists have claimed to have found bones with signs of incisions. However, in every case, it has been shown that the incisions were the result of gnawing by carnivores or some other natural process. There is growing evidence to suggest that Neanderthals would have worn ornaments, such as pierced shells, and perhaps they even used body art as well. Some scientist view body art and adornment as a form of communication, and think this hints at the possibility that Neanderthals used language of some kind.

There is evidence that Neanderthals used mineral colors. On a number of Neanderthal sites, small blocks of red ochre and black manganese are found in archaeological contexts. Some of these pieces show clear signs of scraping by a stone tool. The function of these colorants remains an enigma, as no painted objects have ever been found. Some scientists have speculated that the Neanderthals would have painted their bodies or even practiced tattooing.

The existence of Neanderthal base camps suggests that Neanderthals, like modern hunter-gatherers, lived in societies characterized by sharing. Certainly, there is no evidence from Neanderthal sites of any markers of status or wealth. There is also almost no evidence at all, with the exception of the possible grave offering at Amud, of any kind of ritual object.

Understanding the structure of Neanderthal societies remains difficult. Although some evidence of reverence toward the dead exists in the form of burial, there are also clear cases of cannibalism. We can say little about gender roles in Neanderthal societies or about how a social hierarchy was established. The studies of stone tool manufacture do show that technical knowledge was passed between generations and that there is a persistence through time in local traditions of tool manufacture. Whether this translates into ethnicity is questionable. We know of no objects with which Neanderthals could have displayed their group identity. Whether the colorants found on Neanderthal sites were used for such a purpose is a matter of speculation.

There is no clear basis for determining Neanderthal group size; however, the overall sense is that, given the small size of most sites, the groups occupying them must have been relatively small as well.Thestriking point is that, while many sites are quite small, they show signs of intensive activity. In cave sites, this activity led to the buildup of deep stratigraphic deposits. One possibility is that Neanderthals were far more sedentary than modern human hunter-gatherers. Perhaps the reason the cave sites show such a buildup of sediments is that they were inhabited continuously. Such a pattern of occupation would be in sharp contrast to the high-mobility strategies practiced by recent hunter-gatherer groups.

Inthis wayNeanderthals share many features with modern humans, including a large brain size. There are also distinctive

Neanderthal features, many of which are adaptations to cold weather. The pattern of similarities and differences between modern humans and Neanderthals has led to debate over the evolutionary relationship between the two groups. The main question is whether there was gene flow between populations of modern humans in Africa and populations of Neanderthals in Europe or whether the two populations were two distinct species that evolved in isolation from Homo erectus or an intermediary species. Neanderthals occupied sites over a wide range of ecological settings, including fully glacial and interglacial Europe. There is clear evidence that Neanderthals hunted large animals. Stable-isotope analysis indicates that meat was a major component of the Neanderthal diet. Neanderthal sites have no constructed features; however, evidence of the intensive use of fire is often found. Analyses of variability in Middle Paleolithic stone tool assemblages have produced a wide range of interpretations. Neanderthals appear to have buried their dead in some cases and practiced cannibalism in others. At one site, there is evidence that a Neanderthal child was buried with the jaw of a red deer. There is no evidence of Neanderthal (Middle Paleolithic) artwork.

Thus reassessing the archaeological record some key "modern" traits identified include the ability to plan ahead, complex social networking, technological innovation, the flexibility to adapt to changing environments, symbolism, and ritual. Consensus has been growing that Neanderthals may have expressed some, or all, of these traits at various times and places. For example, the Neanderthal Châtelperronian industry at Arcy-sur-Cure and St Césaire in France includes technological innovations such as worked bone, items of personal adornment, and new stone-tool forms. Elsewhere there is evidence that Neanderthals could create composite tools using adhesives (Harz Mountains, Germany), exploit aquatic resources (Vanguard and Gorham's Caves, Gibraltar), hunt selectively (OrtvaleKldaRockshelter, Georgia), and bury their dead (La Ferrassie, France). Perhaps the question ought not to be whether Neanderthals were capable of modern behaviors, but whether these abilities arose through gradual change or a sudden revolution in biology and cognition.

References

1. Beerli P, Edwards SV. When did Neanderthals and modern humans diverge? EvolAnthropol 2002;11(suppl. 1):60–68.
2. Hublin J-J, et al. A late Neanderthal associated with Upper Paleolithic artifacts. Nature 1996;381:224–226.
3. Klein RG. Neanderthals and modern humans in West Asia. EvolAnthropol 1995, 96;4:187–193.
4. Smith FH. The Neanderthals: evolutionary dead ends or ancestors of modern people? J Anthropol Res 1991;47:219–238.
5. Spencer F. The Neanderthals and their evolutionary significance: a brief historical survey. In: Smith F, Spencer F. eds. The origins of modern humans. New York: Alan R. Liss, 1984:1–49.
6. Stringer C. New perspectives on the Neanderthals. EvolAnthropol 2002;11(suppl. 1):58–63.
7. Roger Lewin. Human Evolution: An Illustrated Introduction2005, Blackwell Publishing Ltd ,USA pp179-187
8. Howell FC. Some thoughts on the study and interpretation of the human fossil record. In: Meikle WE, et al., eds. Current issues in human evolution. San Francisco: California Academy of Sciences, Memoir 21, 1996:1–38.
9. Harrold FB. Mousterian, Chatelperronian, and Early Aurignacian: Continuity or Discontinuity? In: Mellars P, Stringer CB, eds. The Human Revolution. New Haven: Princeton University Press, 1989:677–713
10. Klein RG. The Archaeology of Modern Humans. EvolAnthropol1992;1:5–14.
11. Klein,RG. Anatomy, Behavior, and Modern Human Origins. J World Prehistory 1995;9:167–198
12. Roberts,Alice Evolution The Human Story,DK Publishing, New York, 2011:150-61
13. Balter, V., et al. "Les NéandertaliensÉtaient-IlsEssentiellement Carnivores? RésultatsPréliminaires sur les Teneursen Sr et en Ba de la PaléobiocénoseMammalienne de Saint-Césaire." ComptesRendus de l'Académie des Sciences: Earth and Planetary Sciences 332 (2001): 59–65.Balter, Vincent, et al. "Ecological and Physiological Variability of Sr/Ca and Ba/Ca in Mammals of West Europe Mid-Wurmian Food Webs." Palaeogeography, Palaeoclimatology, Palaeoecology 186 (2002): 127–43.
14. Binford, L. "Archaeological Perspectives." In New Perspectives in Archaeology, edited by S. Binford and L. Binford, 5–32. Chicago: Aldine, 1968.
15. Binford, L. In Pursuit of the Past: Decoding the Archaeological Record. New York: Thames and Hudson, 1983.
16. Binford, S., and L. Binford, eds. New Perspectives in Archaeology. Chicago: Aldine, 1968
17. Boëda, E. "Levallois: A Volumetric Construction, Methods, and Technique." In Definition and Interpretation of Levallois Technology, edited by H. Dibble and O. Bar-Yosef, 41–68. Madison, WI: Prehistory Press, 1995.
18. Boëda, E., et al. "A Levallois Point Embedded in the Vertebra of a Wild Ass (Equus africanus): Hafting, Projectiles and Mousterian Hunting Weapons." Antiquity 73.280 (1999): 394–402.
19. Binford, L. R. "Archaeological Systematics and the Study of Cultural Process." American Antiquity 31 (1965): 203–10.
20. Bordes, F. A Tale of Two Caves. New York: Harper & Row, 1972
21. Bar-Yosef, O., et al. "The Excavations at Kebara Cave, Mt Carmel." Current Anthropology 33.5 (1992): 497–550
22. Aiello, L. C., and P. Wheeler. "The Expensive-Tissue Hypothesis." Current Anthropology 36.2 (1995): 199–221.
23. Dibble, H. "The Interpretation of Middle Paleolithic Scraper Morphology." American Antiquity 52 (1987): 109–17.
24. Dibble, H. "The Interpretation of Middle Paleolithic Scraper Morphology." American Antiquity 52 (1987): 109–17.
25. Defleur, A., et al. "Neanderthal Cannibalism at Moula-Guercy, Ardèche, France." Science 286 (1999): 128–31
26. Gargett, R. "Grave Shortcomings: The Evidence for Neanderthal Burial." Current Anthropology 30.2 (1989): 157–90.
27. Isaac, G. L. "The FoodsharingBehavior of Protohuman Hominids." Scientific American 238 (1978): 90–108.
28. Hardy, K., et al. "Neanderthal Medics? Evidence for Food, Cooking, and Medicinal Plants Entrapped in Dental Calculus." Naturwissenschaften 99.8 (2012): 617–26.
29. Jaubert, J., et al. "Early Neanderthal Constructions Deep in Bruniquel Cave in Southwestern France." Nature 534.7605 (2016): 111–14.
30. Mazza, P. P. A., et al. "A New Palaeolithic Discovery: Tar-Hafted Stone Tools in a European Mid-Pleistocene Bone-

Bearing Bed." Journal of Archaeological Science 33.9 (2006): 1310–18

31. Balter, V., et al. "Les NéandertaliensÉtaient-IlsEssentiellement Carnivores? RésultatsPréliminaires sur les Teneursen Sr et en Ba de la PaléobiocénoseMammalienne de Saint-Césaire." ComptesRendus de l'Académie des Sciences: Earth and Planetary Sciences 332 (2001): 59–65.Balter, Vincent, et al. "Ecological and Physiological Variability of Sr/Ca and Ba/Ca in Mammals of West Europe Mid-Wurmian Food Webs." Palaeogeography, Palaeoclimatology, Palaeoecology 186 (2002): 127–43.
32. Bocherens, H., et al. "New Isotopic Evidence for Dietary Habits of Neanderthals from Belgium." Journal of Human Evolution 40 (2001): 497–505
33. Radini, A., et al. "Neanderthals, Trees and Dental Calculus: New Evidence from El Sidron." Antiquity 90.350 (2016): 290–301.
34. Scott, K. "The Large Mammal Fauna." In La Cotte de St. Brelade 1961– 1978, edited by P. Callow and J.M. Cornford, 109–38. Norwich, UK: Geo Books, 1986
35. Yamei, H., et al. "Mid-Pleistocene Acheulean-Like Stone Technology of the Bose Basin, South China." Science 287.5458 (2000): 1622–26
36. Leroi-Gourhan, A. "The Flowers Found with Shanidar IV, a Neanderthal Burial in Iraq." Science 190.4214 (1975): 562–64
37. Hovers, E., W. H. Kimbel, and Y. Rak. "The Amud 7 Skeleton—Still a Burial. Response to Gargett." Journal of Human Evolution 39 (2000): 253–60
38. Stringer, C. B., et al. "Neanderthal Exploitation of Marine Mammals in Gibraltar." Proceedings of the National Academy of Sciences 105 (2008): 14319–24
39. Michael,Chazan. "World Prehistory and Archaeology"Taylor& Francis Group,2018,101-15.

