Neanderthals and Modern Behaviour: Did they bury their dead?

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Abstract

Because Neanderthals co-existed with *Homo sapiens* and potentially contributed to anatomically modern humans' DNA, a widespread discussion regarding their capabilities for modern behaviours, such as interment, has been demanded. This essay will first look at whether Neanderthals intentionally buried their dead by examining Shanidar IV. Then, by examining what modern behaviours are, when and how they emerged, and who possess them, this essay will try to conclude if they exhibited the behaviours characteristic of modern *Homo sapiens*. As a literature review, this essay will attempt to provide an all-encompassing overview of the differing perspectives among scholars. However, because Neanderthals do not exist outside the archaeological record, conclusions generally remain contentious. What can be concluded from the literature and research on intentional interment is that in some cases, Neanderthals probably had buried their dead. But to distinguish their behavioural capabilities based on what might be intentional interment is flawed—'modernity' is not something that archaic *Homo sapiens* or Neanderthals should possess in the first place. What has been agreed upon, is that Neanderthals had a capacity for modern behaviour, though the utilization of these behaviours were part of a complex evolutionary scale that coincided with the behavioural evolution of archaic *Homo sapiens*.

Introduction

Neanderthals are a hominin species that co-existed with *Homo sapiens* and became extinct approximately forty thousand years ago. Genetic evidence suggests that Neanderthals and *Homo sapiens* interbred and attributed to the DNA of anatomically modern *Homo sapiens* (Dalton 2010). Because Neanderthals are somewhat linked to the evolution of our species, discussion and debate regarding Neanderthal burial has been an abundant topic in the literature since the 1970's. On one end of the spectrum, researchers have romanticized the Neanderthal species, ascribing to them ritualistic behaviours including the burial of their dead (Leroi-Gourhan 1989). On the other end of the spectrum, researchers have argued against these claims and proposed that these presumed intentional burials had likely

been caused by natural processes and phenomena (Gargett 1989). This debate regarding whether Neanderthals buried their dead intentionally created a larger discussion concerning Neanderthal's capabilities for modern behaviours. However, because Neanderthals do not exist outside of the archaeological record, conclusions and theoretical stances on the discussions generally remain contentious.

The purpose of this paper is to look at the following questions. First, did the Neanderthals intentionally bury their dead? This question will be examined in relation to the Neanderthal individual, Shanidar IV. Second, from this presence or absence of evidence can it be concluded that Neanderthals exhibited modern behaviours characteristic of modern *Homo sapiens*? By examining what modern behaviours are, when and how they emerged, and who possess them, this essay will provide an all-encompassing overview of the differing perspectives among scholars.

Did Neanderthals Intentionally Bury Their Dead?

Before discussing whether Neanderthals intentionally buried their dead, it is important to illustrate what intentional burial is and what it looks like. In the simplest of definitions "…deliberate burial consists of an artificially ordered system of two related constructions: externally, the burial structure and, internally, the remains of the dead" (Smirnov 1989:212).

What is intentional burial?

Gargett (1989:161) discusses some previous archeological correlates that have been outlined by researchers at La Chapelle-aux-Saints, these include; (1) position of body, (2) a dug grave, (3) protection of the corpse, (4) food or grave offerings, and (5) ritual manifestations. However, Gargett (1989:161) deems these as too general as criteria for intentional interment. He argues that the position of the body could reflect the way an individual slept, the depression may not have been dug, and food or grave offerings could be in association accidentally (Gargett 1989:161). Although Smirnov (1989:213) agrees that body position, or arrangement, as a criterion is too general, he provides extended criteria for examining grave goods as potential indicators of intentional burial. The evaluation is based on five grounds; (1) the size of the object in comparison to the size of the mortuary structure, (2) the condition of the object, (3) the location of the object, (4) the placing of an object in the sterile layer of the pit fill, and (5) the very nature of the object.

Lastly, Pettitt (2002:8) provides another list of six deliberate mechanisms for distinguishing what constitutes as intentional interment. First, means of disposal may exclude burial—though this will not be discussed further for the lack of archaeological correlates in these cases (Pettitt 2008:8). Secondly, although the location of the body may be unmodified, the body may still have been deliberately placed there (Pettitt 2008:8). Third, a body may be placed in a deliberately excavated feature without the inclusion of grave goods (Pettitt 2008:9). Fourth, a body may be placed in an excavated feature with the addition of grave goods or marking of mortuary space (Pettitt 2008:9). Fifth, re-excavation and removal of a buried body

would indicate deliberate burial (Pettitt 2008:9). Lastly, a body may be deliberately placed in an excavated feature with more formalized inclusion and placement of grave goods (Pettitt 2008:9).

Gargett's position on Neanderthal burial

In reviewing the literature, Gargett (1989:157) recognized that often Neanderthals were believed to have buried their dead and performed rituals that suggest an emotional capacity equal to our own. Garrett states, "usually these anomalous sediments are interpreted as representing some sort of humanlike consciousness or spirituality" (1989:157). What he argues is that these inferences have been incorporated into the scholarly view without any serious criticisms (Gargett et al. 1989:157). By using sedimentology, cave geomorphology, and taphonomy, Gargett (1989) attempts to disprove six sites that were believed to be examples of intentional interment. His conclusions state that processes other than purposeful human behaviour have produced all of the deposits in question (Gargett et al. 1989:177). From this, he argues that all Middle Palaeolithic burials can be explained by natural phenomena and that Neanderthals did not bury the deceased (Gargett et al. 1989:177). Lastly, Gargett (1989:177) argues that because Neanderthal's seemingly did not bury their dead, a reappraisal of their cultural capacity should be examined.

This essay will now look at one of the sites that Gargett discussed in question of intentional interment. The site itself will be discussed first, followed by two theories by Leroi-Gourhan (1989) and Lietava (1991) of why this might be a deliberate burial. Gargett's (1989) argument of the site will be explored, followed by the rebuttal of Leroi-Gourhan.

Shanidar Cave

Shanidar cave, located in northern Iraq, is often regarded as intentional interment due to the high frequency of pollen associated with the nearly complete Neanderthal remains referred to as Shanidar IV. Shanidar IV was discovered in an occupational deposit of loose brown sandy loam soil with small-sized stones lying above. Originally, it was believed by the excavators that Shanidar IV was killed and preserved by a rockfall (Kooijmans 1989:324). However, after further analysis it was believed that the breakage of the skeletal elements was not a result of a collapse in the cave, but, instead, occurred due to the weight of sediment overlying the deceased individual (Kooijmans 1989:324).

In 1975, Arlette Leroi-Gourhan published her paper on the soil samples associated with Shanidar IV. While examining the soil samples found and collected from the cave, she recognized a pattern of pollens that maintained a fairly uniform sequence (Leroi-Gourhan 1989:562). Then, Leroi Gourhan came across two samples, 313 and 314, that appeared to be different from the otherwise uniform samples. By analyzing Ralph Solecki's original field notes, Leroi-Gourhan was able to discuss the position of these samples. Sample 313 was collected from below and to the west of Shanidar IV and sample 314 was collected twenty centimetres north east of Shanidar IV (Leroi-Gourhan 1989:563). The number of composites in these soil samples greatly

exceeded those of other samples and many of these pollens were clustered in groups.

On further analysis, Leroi-Gourhan (1989:562) claimed that certain clusters had retained the form of the anther—the part of the stamen containing the pollen. However, only seven of the 28 different plants were found in these clusters. This led Leroi-Gourhan (1989:562) to believe that these complete flowers had been introduced into the cave at the same time. To further support her theory, Leroi-Gourhan (1989:562) discusses the improbability that these flowers could have been introduced into the cave via bird, rodent, or mammalian coprolites. As well, she rules out the possibility of wind by observing the position of the cave in the local geography/landscape and the relationship between the cave entrance and flower species found nearby. That is to say, because the flowers were found fifteen metres from the cave entrance, Leroi-Gourhan proposes that it would take the force of a hurricane to blow in the bouquet of flowers to where they were found in the cave (Kooijmans 1989:324).

Leroi-Gourhan was able to identify the following herbaceous plants (Lietava 1991:263). They include: *Achillea*-type, *Centaurea solstitialis, Senetio*-type, *Muscari*-type, *Ephedra altissima,* and *Althea*-type. The *Senetio* and *Muscari* flowers are of brilliant blue and yellow colours respectively. The observation of brilliant coloured flowers convinces Leroi-Gourhan that Shanidar IV was deliberately buried, and an aesthetic component of burial ritual was employed as well. That being said, the *Althea*-type poses a problem. *Althea* belongs to the *Malvaceae* family and is very large and covered in spikes. This plant is found in excessive amounts in these soil samples relative to the rest of the cave (Leroi-Gourhan 1989:564). Although it is difficult—if not impossible—to infer the aesthetic preferences of the Neanderthal population at Shanidar with regard to burial practices, there has been an alternative explanation for the over-abundance of this seemingly unpleasant plant. Lietava (1991) discusses the medicinal potential of the plants found in these soil samples. By analyzing the historical medicinal uses, as well as the contemporary pharmacological uses, Lietava (1991) compiled a list of potential purpose for each plant found in the soil samples 313 and 314 from Shanidar IV.

Mentioned by Homer and Plinius, *Achillea* species were useful for wounds. More specifically, yarrow (*A. millefolium)* was used as a panacea—an all-encompassing remedy (Lietava 1991:264). Modern pharmacological analysis shows that this plant contains oils whose principal components are azulene-like compounds (Lietava 1991:264). These compounds contain anti-inflammatory and anti-hemorrhagic effects. Apparent in folk medicine for centuries, *Centaurea solstitialis* contains effective substances such as: cichoine, saponines, azulogenic, and sesquiterpene lactones (Lietava 1991:264). These have strong diuretic effects as well as antiseptic properties that can suppress the growth of microbes. Historically, *Senecios'* earliest use is evidenced in old Anglo-Saxon chronicles (Lietava 1991:264). Some of the alkaloids found within certain plants of this genus reduce the permeability of capillaries and, in turn, have hemostyptic effects that promote the stoppage of bleeding. In modern pharmacological settings, it has been found that a large number of these

alkaloids have atropine-like properties and can be used as a muscle relaxant (Lietava 1991:264). *Muscari*-type plants have been reported to provide contradictory medicinal properties. Former pharmacological analysis mentions that the plant has hepatotoxic (damaging to liver cells), diuretic, and deliriant properties, whereas more recent analysis indicates that the plant has antiseptic properties. Lietava (1991:264) concludes that, because the medicinal properties of *Muscari*-type plants remain uncertain, more research about the potential applications of this group need to be performed. Used in Chinese traditional medicine, *Ephedra* was used for its sudorific (to cause sweating), antitussive (to prevent or relieve a cough), antipyretic (to prevent or reduce fever) and anti-inflammatory actions (Lietava 1991:264). Modern pharmacological analyses show that *Ephedra* contains an alkaloid called ephedrine. This alkaloid acts on the cardiovascular system by elevating blood pressure and treats conditions linked with hypotension (abnormally low blood pressure) (Lietava 1991:264). As well, ephedrine stimulates the central nervous system, which suppresses fatigue, mobilizing forces, and causes euphoria (Lietava 1991:264). Lastly, *Althea* from the *Malvaceae* family is a highly appreciated plant in both traditional and pharmacological respects. Presently, the root of this plant is used because of the high concentration of mucilage (Lietava 1991:265). This mucilage manifests anti-microbial, anti-inflammatory, and mucolytic effects and is applied to purulent skin affections and injuries (Lietava 1991:265). As well, it can be used as an expectorant to treat coughs in respiratory diseases (Lietava 1991:265)

Although it was at first believed by Leroi-Gourhan that these plants served an aesthetic purpose in ritualistic burial, it is now thought that these plants had a more utilitarian purpose—which might explain the presence of *Althea.* These findings raise the suspicion that Neanderthals inhabiting Shanidar cave may have had knowledge of the curative effects of these plants. "The pharmacological analysis has brought evidence of the high therapeutic potential of the flowers found in the Shanidar IV Neanderthal grave, suggesting that it might have been this potential rather than aesthetic sense that led to the selection of the plant species for the burials" (Lietava 1991:265).

Gargett (1989:176) argues that no clear evidence for purposeful burial exists in any of the Shanidar deposits, including Shanidar IV. This claim is based on the lack of grave pits or non-naturally occurring protective strata for the deposition of the bodies. In relation to the pollen found in the soil samples from Shanidar IV, Gargett (1989:176) first makes the abundance of pollen seem less important by comparing it to samples from peat bogs or lake bottoms despite the two environments being so dissimilar. However, he does recognize that the pollen count for Shanidar IV is unusually high number for the cave as a whole. Gargett (1989:176) illustrates that the presence of an anther convinced the investigators that Neanderthals had buried the dead with flowers at Shanidar. Despite Leroi-Gourhan's (1989) explanations that wind and other transportive agents should be ruled out, Gargett (1989:176) makes an argument for wind being the most probable cause for the accumulation of pollen in the cave. "There is a good chance

that any strong wind blowing at the mouth of the cave would carry tender flowers as well as twigs and branches some distance into the cave" (Gargett et al. 1989:176). Lastly, Gargett (1989:176) states that even if alternative transportive agents could be ruled out there is still a lack of demonstrable association of the pollen with the burials. In Solecki's original field notes he states that the two samples 313 and 314 were taken from *about the same level* on which the skeleton lay (Gargett 1989:176). This statement leaves Gargett (1989) unconvinced that Shanidar IV was intentionally buried with flowers.

In response, Arlette Leroi-Gourhan explains that transportation of these pollens by both wind and animals are not probable (Gargett et al. 1989:182). In relation to wind, Leroi-Gourhan describes the improbability that the wind had blown the seven species of brightly coloured flowers onto the burial soil of the Neanderthal (Gargett et al. 1989:182). In regard to animals as transportive agents, Leroi-Gourhan (Gargett et al. 1989:182) brings up the point that if these plants had been brought in by animals it is more likely that the anthers would have been discovered near the mouth of the cave. Solecki supports Leroi-Gourhan's rebuttal to Gargett and states "For Shanidar Cave, the evidence appears to make this argument [ie. Gargett's] hard to swallow" (Kooijmans et al. 1989:324).

Modern Behaviours

In looking at deliberate burials, Robert Gargett (1989) argued that all presumed intentional interments during the Middle Palaeolithic can be explained by natural phenomena and that therefore Neanderthals were not capable of modern behaviours. This inference regarding Neanderthal behaviour has sparked widespread debate among scholars. Is the lack of definite evidence for deliberate burial due to a lack of modern or symbolic behaviour, or is it a result of poor archaeological preservation?

April Nowell (2010:437) discusses this debate in an all-encompassing literature review based on four key questions. First, she asks what specifically constitutes modern behaviour and what are its archaeological signatures. Second, is the appearance of these behaviours a sudden and rapid "revolution" or do they appear in the archaeological record gradually? Third, are these behaviours exclusive to anatomically modern *Homo sapiens* or were Neanderthals capable of exhibiting these behaviours as well? And last, was the appearance of these behaviours a result of new cognitive abilities or were they the result of cultural, historical, social, and demographic factors?

What is Modern Behaviour?

Until more recently, modern behaviours have been defined by using a select list of traits that could be empirically observed in the archaeological record. Before discussing what has changed in the literature in the last decade, an overview of these trait lists will be explored.

i. Chase and Dibble

Chase and Dibble (1986) examined the archaeological evidence available from the Middle Palaeolithic and discusses what could be considered modern behaviour. They determined four classes of behaviour that could indicate symbolic action. These categories are; (a) lithics types and

assemblages, (b) burials, (c) ritual other than burial, and (d) art (Chase and Dibble 1986).

In regards to burial, there are two major issues that arise. The first is the question of whether the interment was intentional. Two sites that Chase and Dibble (1986:272) suggest that yield good evidence are La Chapelle-aux-Saints and La Ferrassie. Despite the on-going debate regarding which sites can be deemed intentional, Chase and Dibble (1986:273) argue that deliberate burials definitely do occur in Neanderthal contexts. "This is the earliest evidence for such behaviour during the course of human evolution" (Chase and Dibble 1986:273).

The second issue regards the interpretation of the behaviour. Burial of the deceased can mark the transition in the life cycle for the individual, and in turn reflect culturally bound religious belief or existential philosophy concerning a person's soul (Chase and Dibble 1986:273). Alternatively, however, burial could also simply be a means of disposing a decaying body. Unfortunately, most burial ritual or ceremony may not leave archaeological traces except in the form of non-perishable grave goods.

Chase and Dibble (1986:273) observe that the grave goods do in fact differ between the Middle and Upper Palaeolithic in both abundance and diversity. During the Middle Palaeolithic grave goods appear to include simple mundane everyday items whereas in the Upper Palaeolithic they start to see items of personal adornment (Chase and Dibble 1986:273). The question they pose then is whether these mundane items found in Middle Palaeolithic burials are actual offerings to the dead, or if they were in association only fortuitously (Chase and Dibble 1986:274).

What is concluded is that although deliberate burial seems to be present in the Neanderthal context, there is no site that demonstrates a presence of symbolism, cultural values, or ritual (Chase and Dibble 1986:276). However, the act of burial in itself and the skeletal evidence for trauma suggests that the Neanderthals cared for their deceased beyond anything seen in other primate groups (Chase and Dibble 1986:276). "Burial, in its simplest and non symbolic sense, could be seen as a continuation of such care or a relocation of earlier emotional attachment" (Chase and Dibble 1986:276). Therefore, what Chase and Dibble (1986:283) argue is that, despite the lack of the archaeological evidence indicating symbolic or ritual behaviour, emotional attachment appears to have originated during the Middle Palaeolithic, as indicated by the burial of their dead.

ii. McBreaty and Brooks

In reaction to the Eurocentric models being implemented to define modern behaviour, McBreaty and Brooks created a list of traits for modern behaviour outside of Europe (Nowell 2010:440). By examining the African archaeological record, they defined modern behaviour using four sets of behaviours; (a) abstract thinking, (b) planning depth, (c) behavioural, economic, and technological innovativeness and (d) symbolic behaviour (Nowell 2010:440). The archaeological or "on the ground" correlates of these behaviours can also be divided into four groups; (a) ecology (by looking at migration patterns and diet), (b) technology (raw materials, tool forms, etc.), (c) economic and social organization (exchange networks, seasonality of

resource exploitation, domestic spaces, etc.), and (d) symbolic behaviour (Nowell 2010:440). The archaeological correlate for symbolic behaviour is most often seen within burials and their associated grave goods.

iii. Implications of These Trait Lists

Henshilwood (2003:627) argues that the current debate over origin, age, and spread of modern behaviour is focused on distinguishing the behavioural traits and empirically analyzing them as opposed to developing the body of theory that defines modern behaviour. "The collective idea appears to be that we can develop a litmus test for modern human behaviour grounded in material correlates of specific behaviours considered to be unique to, or indicative of, a modern human intellect" (Henshilwood 2003:628). The goal of Henshilwood's (2003:631) paper is to discuss the quality of these traits as test implications to discern the origins of behavioural modernity.

First, Henshilwood (2003:631) asks if the tests implications are unambiguous—is the presence or absence of a trait explained in only one way. The argument Henshilwood (2003:631) provides here relates to the Eurocentrism of the majority of trait lists. If a set of traits has its empirical grounding in Europe its applicability to Africa is weakened (Henshilwood 2003:631). Not only is the European Middle Palaeolithic record more temporally complete and chronologically secure than that of the African Middle Palaeolithic, basic environmental differences are also a major contextual distinction (Henshilwood 2003:631). For example, the seasonal fluctuations found in Europe may have resulted in earlier technological differences than Africa, where plant foods are available year-round. Therefore, these technological differences in the European record should not be used as a measure of behavioural modernity in Africa (Henshilwood 2003:631). The argument Henshilwood (2003:632) makes is that several of the behavioural traits used as test implications can be explained alternatively in terms of resource intensification.

Secondly, Henshilwood (2003:631) questions the theoretical grounding of these test implications. To answer this question, Henshilwood (2003:633) targets two points; (1) the legitimacy of the test implication relative to the variability expressed in that trait among modern hunter-gatherers as well as other mammalian species, and (2) the way this trait articulates with our understanding of other aspects of technology. By using bone tools as an example, Henshilwood (2003:633) illustrates that the presence or absence of worked bone as a test implication for modern human behaviour is problematic. In areas where bone tools are absent it does not necessarily mean that their potential as tools were not recognized. Bone could have been used instead for marrow extraction. Henshilwood states, "it seems unlikely that these hominids did not recognize the potential utility of bone as a raw material…[but the] more likely explanation [for the absence of bone tools] is that they frequently chose not to use bone" (2003:633). He then suggests that the focus of research should be on *why* these tools are absent.

Lastly, Henshilwood (2003:631) questions if the empirical records for the Middle Palaeolithic versus the Upper

Palaeolithic are taphonomically comparable. Taphonomy can impact the empirical record in two ways; (1) the material correlates of behavioural traits are sensitive to diagenesis (the physical and chemical changes that occur during the conversion of sediment to sedimentary rock), and (2) the processes of decalcification and organic decomposition will successively compact sediments such that the time resolution of older sediments will be less than that of younger sediments (Henshilwood 2003:634).

In conclusion, modern human behaviour cannot be defined by the simple presence or absence of items on a derived trait list (Henshilwood 2003:636). They must unambiguously measure behavioural modernity, "seeking evidence of continuity from pre symbolic to symbolic material behaviour and focusing on behavioural systems that require substantial amounts of brain power will produce a better understanding of what modern human behaviour is and help to identify when and where it developed" (Henshilwood 2003:637).

Is the Emergence of Modern Behaviour Sudden or Gradual?

It was traditionally believed that modern behaviours emerged with the transition between the Middle and Upper Palaeolithic. However, because of the accumulating evidence of archaeological correlates of modern behaviour during the Middle Palaeolithic, other theories pertaining to the emergence of modern behaviour have come forth.

There are two main models for the emergence of modern human behaviour as outlined by Henshilwood (2002:1278). The first, described by Nowell as a "human revolution" (2010:441), is a late and rapid appearance at about 40 to 50 thousand years ago subsequent with the transition between the Middle and Upper Palaeolithic (Henshilwood 2002:1278). The second model discusses modern behaviours as an earlier, though gradual, emergence (Henshilwood 2002:1278).

The first model of a "human revolution" has been argued by Paul Mellars (1990) in his book 'The Emergence of Modern Humans'. In this analysis of the Middle and Upper Palaeolithic transition, Mellars concludes that the behavioural changes seen in the Upper Palaeolithic were on account of a biological change (Chase et al. 1990:58). This change emphasizes the discontinuity of the Middle to Upper Palaeolithic and suggests a replacement theory of anatomically modern *Homo sapiens* over other hominin species, such as Neanderthals (Chase et al. 1990:59). This view deems Neanderthals as evolutionary 'dead ends' and without any relation to modern humans (Chase et al. 1990:59).

This model poses a few issues and in turn is refuted by a few scholars. What Chase and Dibble bring to light is that; (a) a large amount of behaviour is archaeologically invisible, and (b) even though a biological basis for a new behaviour must exist before that behaviour can be adopted, it does not follow that a new behaviour will be adopted as soon as that biological basis exists (Chase et al. 1990:58). What is being said is that the changes in biology cannot be assumed to be associated with changes in the archaeological record. Also, change in behaviour has little relevance to the taxonomic debate concerning the archaic and modern populations (Chase et al.

1990:58). What the authors (Chase et al. 1990:59) maintain is that there is no single point in time where a line can be drawn between modern and archaic behaviour. Therefore, they argue for the gradual emergence of modern behaviour. In accordance with Chase and Dibble's position, Lindly and Clark (Chase et al. 1990:59) conclude from examining paleontological, technological, subsistence, symbolic, and settlement-pattern data that there is in fact biological and cultural continuity across the Middle-to-Upper-Palaeolithic transition in Eurasia.

Is Modern Behaviour Unique to Modern Humans?

In order to determine when the emergence of modern behaviour may have occurred, many scholars have compared the archaeological record of Neanderthals with that of later modern humans in order to determine whether the Neanderthals were capable of modern behaviour (Langley, Clarkson, and Ulm 2008:289). However, as outlined by Langley, Clarkson, and Ulm (2008:289) this method or framework is deemed inappropriate. This is due to the cross-species comparisons of cognitive and behavioural capabilities. What Langley, Clarkson, and Ulm (2008:290) strive to do is compare Neanderthals and anatomically modern *Homo sapiens* using a framework that does not force a distinction between the two. In other words, they debate the archaeological signatures of behavioural and cognitive *complexity* instead of *modernity* which Neanderthals cannot (and should not) possess (Langley, Clarkson, and Ulm 2008:290).

Complex behaviour is defined by Langley, Clarkson, and Ulm (2008:291) by combining the definitions for behavioural complexity and symbolic thought. According to Langley, Clarkson, and Ulm behavioural complexity is "the accumulation of 'more parts and more connections between parts' in cultural systems" (2008:291) whereas symbolic thought is "the ability to represent objects, people, and abstract concepts with arbitrary symbols, vocal or visual, and to reify such symbols in cultural practice" (291). Therefore, complex behaviour requires successive cognitive components that demand the actor to plan consecutive steps before the execution of the first step. Although symbolism is difficult to define archaeologically there is a general consensus on what manifestations could represent symbolism. This includes; figurative art, notational pieces, use of pigments, ornamentation, and body modification (Langley, Clarkson, and Ulm 2008:291). Most importantly for this essay, burial likely represents complex and abstract thought about the transition from life to death.

Langley, Clarkson, and Ulm (2008: 290) developed a chronological approach to the problem that examines the archaeological occurrence of artefacts and features that are unambiguously associated with Eurasian Neanderthals and can be considered symbolic and representative of cognitively sophisticated behaviours. Using the burials deemed 'certain' and 'probable' by Riel-Salvatore and Clark (2001), 49 instances of symbolic and complex behaviour were plotted by category at 20,000 year intervals (Langley, Clarkson, and Ulm 2008:292).

As seen in Langley, Clarkson, and Ulm's (2008:300) results, burials were the first complex behavioural manifestation.

Next, was the appearance of modified raw materials, and after that, pigment and composite technology. What their graph of symbolic and complex behaviour through time displays is that there is a clear pattern in both the number and diversity of behavioural manifestations increasing exponentially through time (Langley, Clarkson, and Ulm 2008:300). The rapid increase between 60,000 and 40,000 years ago suggests "far greater rates of symbolic and complex behavioural artefacts and features entering, or surviving, in the archaeological record during this period" (Langley, Clarkson, and Ulm 2008:300). In order to rule out environmental conditions as a motivator for this rapid increase, Langley, Clarkson, and Ulm (2008:301) examined whether this peak coincides with an interglacial period. As seen in Langley, Clarkson, and Ulm's results, "against this record of frequent and dramatic oscillations we have a gradual trend toward a peak in behaviourally complex archaeological manifestations at a time of no great warming or cooling" (2008:301). Therefore, this rapid increase of behavioural manifestations was not simply a response to environmental conditions.

The question of whether differential preservation of these artefacts and features might account for the substantial increase in symbolic and/or complex instances through time was also considered in Langley, Clarkson, and Ulm's (2008:300) discussion. This figure examines the differential rates of survival for more fragile organic artefacts versus more robust and inorganic objects (Langley, Clarkson, and Ulm 2008:300). When these are graphed separately, the same trend is mirrored and what Langley, Clarkson, and Ulm conclude is "the record may be representative of past behaviour rather than merely changing patterns of artefact survival" (2008:300).

What Langley, Clarkson, and Ulm extrapolate from their research is that "the cumulative increase in the number and types of instances demonstrated in our analysis suggests a single, directional increase in the archaeological record of behavioural complexity among Neanderthals through time that cannot be easily dismissed as the result of differential preservation or changing population size" (2008:301). Therefore, this study provides the best indication that Neanderthals underwent independent behavioural developments comparable to the behavioural evolution of our own species (Langley, Clarkson, and Ulm 2008:302).

What Attributes to the Emergence of Modern Behaviour?

Is the emergence of modern behaviour primarily the result of new cognitive abilities or social, cultural, demographic, and historic factors? This question holds its premise in four distinct characterizations about the Neanderthal mind (Wynn and Coolidge 2004:467). First, it is generally agreed that anatomically modern humans (AMH) did replace Neanderthals despite the disagreement about how and when this replacement occurred. Secondly, it is thought that there was a cognitive difference between Neanderthals and AMH that accounts for this replacement. Because the archaeological record shows that Neanderthal and modern human technology and subsistence methods were not very different, the replacement could not have been due to technological differences (Wynn and Coolidge

2004:468). Third, despite the belief of a cognitive difference, it is suggested that this difference was not dramatic. This is proposed due to the fact that Neanderthals and AMH competed for resources for thousands of years, and, had the intelligence levels been substantially different, it is thought this would not have occurred (Wynn and Coolidge 2004:468). Last, much of our modern thinking is still based on abilities that have evolved long ago. Wynn and Coolidge (2004:468) suggest that it is highly unlikely that there was an absolute reorganization of the brain with the appearance of AMH.

With these premises in mind, Wynn and Coolidge (2004:467) attempt to describe the components of Neanderthal thinking. Without experimental access to Neanderthals, Wynn and Coolidge (2004:469) consult cognitive neuropsychology (studies of working memory and skilled cognition), cognitive anthropology (studies of the cognitive basis of technological activity), and cognitive archaeology (analyses of stone tool manufacture) to infer something about the Neanderthal mind.

What Wynn and Coolidge (2004:469) argue is that from evidence of skilled performance in lithic reduction procedures in the archaeological record, Neanderthals show to have the capability of long-term working memory. This requires the repetition of information in order to prevent it from fading from the memory (Wynn and Coolidge 2004:473). However, a simple mutation of this long-term working memory into an enhanced working memory would have produced fully modern thinking (Wynn and Coolidge 2004:469). In reviewing archaeological evidence, Wynn and Coolidge (2004:469) provide two scenarios of when this mutation could have occurred. The first scenario suggests that this mutation accompanied the evolution of anatomically modern humans prior to 150,000 years ago in Africa and enabled a gradual development of modern behaviour (Wynn and Coolidge 2004:470). The second scenario suggests that the mutation occurred after 100,000 years ago and produced behavioural modernity in groups that were already anatomically modern (Wynn and Coolidge 2004:470). In either of these cases, it is thought that modern humans with the enhanced working memory entered Europe sometime after 50,000 years ago and this lead to the demise of Neanderthals (Wynn and Coolidge 2004:470).

Conclusion

Distinguishing the behavioural capabilities of Neanderthals by examining what might be intentional interment is flawed in its very nature. The only information available is derived from what is archaeologically preservable, therefore, much of the broader picture is excluded from any analyses. However, scholars have attempted to create meaning of behavioural attributes despite the tremendous exclusion of what could not be preserved archaeologically.

What can be concluded from this broad analyses of the literature and research on intentional interment is that in some cases, Neanderthals probably buried their dead. Gargett (1989) may be wrong in his argument that *all* Middle Palaeolithic burials were caused by natural phenomena, but he was right in forcing a more strict and critical analyses of

Neanderthal sites during the Middle Palaeolithic. The case at Shanidar provides a good argument for intentional interment. Although the herbaceous plants at Shanidar IV could have been placed there by alternative natural forces, Leroi-Gourhan (1975), Lietava (1991), and Solecki (Kooijmans et al. 1989) pose an argument that makes it difficult to associate this occurrence to anything but purposeful human behaviour—whether it was burial ritual or for medicinal purposes.

Determining when the origins of modern behaviour occurred is also flawed by the very nature of the argument. 'Modernity' is not something that archaic *Homo sapiens* or Neanderthals should possess in the first place. The trait lists that have been arbitrarily constructed cannot be applied successfully across species and across differing environments. What appears to be emerging in the literature is that behavioural modernity occurred gradually, and instead of a Middle to Upper Palaeolithic divide, the origins are far more complex.

What is becoming a more general consensus in recent literature is that Neanderthals had capacities of modern behaviour, however, the utilization of these behaviours were part of a complex evolutionary scale that coincided with the behavioural evolution of archaic *Homo sapiens*.

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