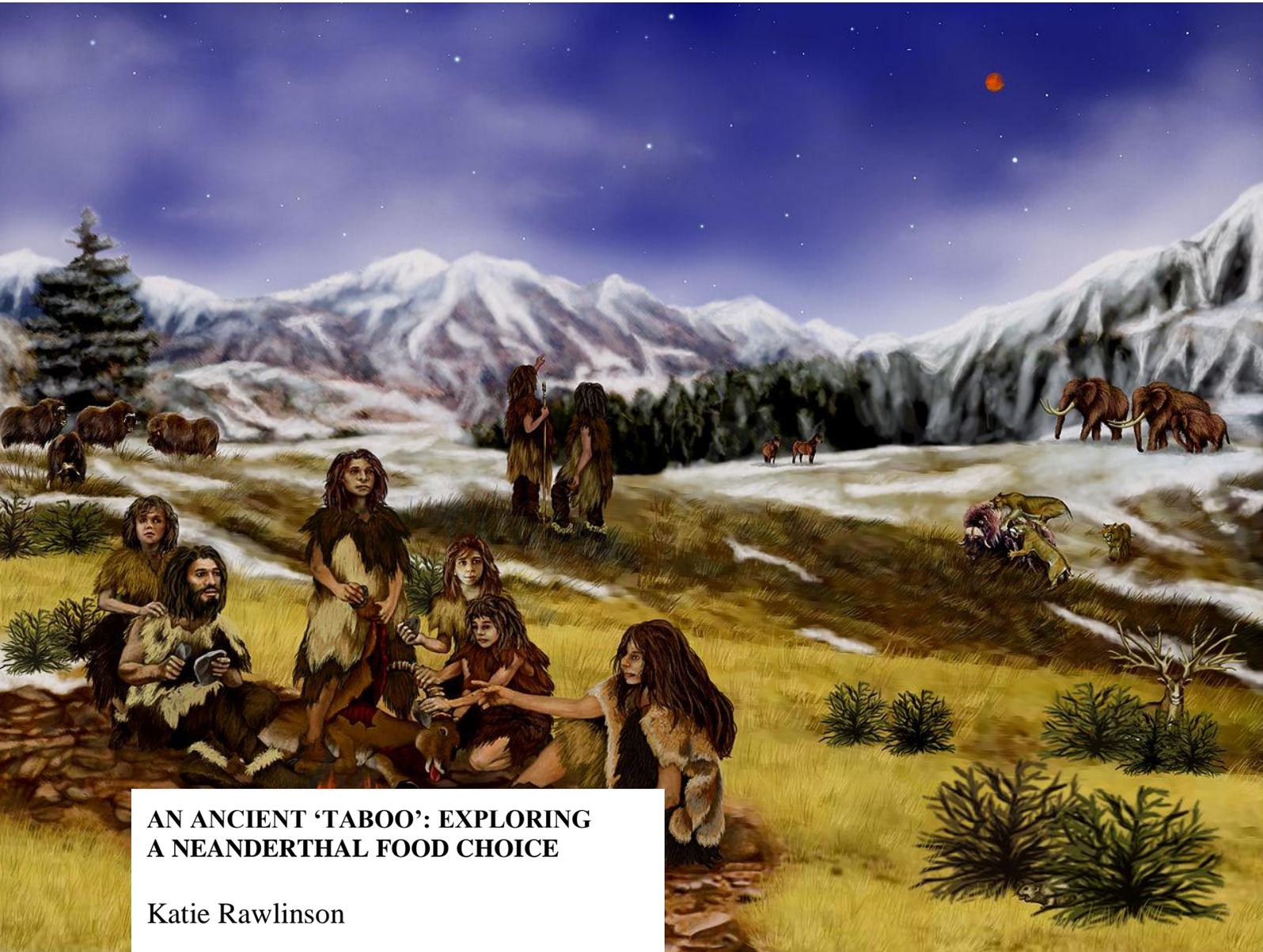


# HARTS

# & Minds



## **AN ANCIENT 'TABOO': EXPLORING A NEANDERTHAL FOOD CHOICE**

Katie Rawlinson

HARTS & Minds: The Journal of  
Humanities and Arts

Vol.2, No.1 (Autumn 2014)

Article © HARTS & Minds  
Image © Randii Oliver\*

# AN ANCIENT ‘TABOO’: EXPLORING A NEANDERTHAL FOOD CHOICE

*Katie Rawlinson*

## **Abstract**

In the examination of cannibalism within Neanderthal (*Homo neanderthalensis*) groups, the appearance, social context and implications of cannibalistic activity have generally been overlooked; instead the focus has often been on the barbaric nature of this behaviour. Cannibalism remains a taboo subject in most westernised societies, yet there are certain populations in which cannibalistic activity is carried out for reasons that range from ritual to survival. Contemporary studies have provided a modern-day perspective on the subject, but they continue to be heavily affected by western moral principles; their responses to the subject still generally fall within a spectrum ranging from revulsion to morbid fascination. These attitudes have played an influential role in how we view our ancestors. However, early discoveries of Neanderthal sites, and the early preconception of a brutish hominin with an attributed tendency towards cannibalistic activity have since given way to the belief that they share substantial similarities to ourselves. This is possibly the result of an attempt to ‘humanise’ their behaviour and bring it closer to what is now considered socially acceptable.<sup>1</sup> Consequently, the proximity of Neanderthals to modern humans in terms of co-existence, genetics and behaviour, intrigues us and is the focus of this research. Indeed, it is due to this similarity that the techniques which are used to establish the possibility of cannibalistic activity in Neanderthals also have the potential to be applied to other hominins.<sup>2</sup>

**Key Words:** cannibalism, Neanderthal, behaviour, consumption, *Homo sapiens*, TSEs

\*\*\*\*\*

## **Why are we fascinated by cannibalism and to what extent does it influence our perception of our ancestry?**

Cannibalism largely remains a ‘taboo’ subject amongst Western societies due to its portrayal in the press. The more prominent cases are carried out by those who have murdered individuals for the purpose of consuming them (known as ‘psycho-pathological cannibalism (criminal)’ ) and those who commit cannibalism for survival.<sup>3</sup> These two types of cannibalism in particular have become the basis of way that it is viewed by both the general public and the scientific community. For instance, in 1981, whilst studying in Paris, Issei Sagawa murdered and cannibalised a Dutch woman, Renée Hartevelt.<sup>4</sup> Deemed to be mentally incompetent and unable to stand trial, Sagawa was returned to Japan where, after being hospitalised for a year, he went on to serialise a novel of his crime.<sup>5</sup> His subsequent role as a talk show commentator resulted in his status as a ‘bunkajin’ (a person with expertise in a specific area) from 1986 until 1997. However, in more recent years interest in this part of his life has decreased, and his past crime now affects his ability to lead a ‘normal’ life.<sup>6</sup> The reaction to this case is in stark contrast to other examples of such crimes, including that of Albert Fentress, a former school teacher, who spent 20 years in a psychiatric hospital for killing and eating a Poughkeepsie student.<sup>7</sup> In the case of Sagawa, this media attention led to eventual celebrity status as a television host, whereas Fentress was relegated to a psychiatric hospital for two decades. These two cases demonstrate that although the reason and purpose behind the cannibalism were largely the same (both being identifiable as criminal cannibalism) the reactions of the public, and the punishments received, are drastically different. This is potentially a reflection of the time when these

---

acts were committed, and also of the country and region in which they occurred. As such it can be difficult to categorise acts of cannibalism, particularly if other influences are not incorporated. It is also notable that within much of the literature on cannibalism, it is the perpetrators, not the victims, who are remembered, and their crimes sensationalised.

Despite the fleeting but high-profile prominence of criminal cannibalism, particularly within the weeks after it occurs, cases of survival cannibalism are remembered and recorded into history. There is a vast amount of historical documentation for survival cannibalism, including the French famine (1570), the settlers of Virginia's Jamestown Colony (1609-1610), the Donner Party (1846), the Russian famine undertaken by peasants (1921) and the Andes plane crash (1972). In all of these situations, people were driven by starvation to commit acts of cannibalism in order to improve their chances of survival. The most recent examples of survival cannibalism come from reports of a 'hidden famine' in North Korea: parents, apparently driven mad by hunger, are said to have killed and consumed their children.<sup>8</sup> It is typically only this survival cannibalism that ignites social sympathy; however, reactions remain varied, as can be seen from the examples in North Korea, where authorities execute those that commit acts of cannibalism. This extreme reaction may be a result the involvement of children in these cases. The social sympathy which accompanies survival cannibalism appears to take on a different form depending on the ages of those involved, and in this instance might account for the severity of the reaction.

Arguably, the increasing interest in cannibalism and the subsequent increase in available literature has resulted in the development of public opinion, particularly when it is addressed within tabloid media.<sup>9</sup> These actions have not only been recorded in a documentation and factual way, but have also since been included for 'entertainment' value both within literature and films. A morbid fascination with this behaviour appears to be prevalent, especially due the increasing availability of various media resources and both modern-day cases and the archaeological discoveries of cannibalism attracting public attention; this has been explored by Mike Parker Pearson, Shirley Lindembaum, Mark Landler and Peggy Sanday.<sup>10</sup> Therefore, as can be seen, the approaches these publications take vary, either providing typological summaries or sensationalising the topic, in turn creates bias about how cannibalistic activity is perceived.<sup>11</sup>

The archaeological evidence of cannibalism has been attributed to several of our ancestors, ranging from those as far back on our evolutionary tree as the Australopithecines through to modern-day humans (*Homo sapiens*). It is harder to definitively identify acts of cannibalism as we go further back through the archaeological record, due in no small part to diminishing skeletal remains. Nonetheless, the explanations given for cannibalistic behaviour vary widely depending on which of the hominins are being associated with this behaviour. For instance, interpretations of prehistoric cannibalism tend to attribute it to dietary sustenance, likely as a consequence of aggression or environmental stress (for example, a lack of food).<sup>12</sup> It is argued, however, that it was not until the emergence of anatomically-modern humans (early *Homo sapiens*) that acts of cannibalism took on a symbolic and cultural meaning.<sup>13</sup> The rhetoric used to describe cannibalism in both of these contexts differ, possibly providing an indication as to the authors' perspective on the issue: the notion of dietary sustenance implies that cannibalism was a choice, whilst amongst anatomically modern humans cannibalism is often identified as required for survival.

Given the diversity in hominins, the broad range of dates, and the intricacies of the debate that surrounds these interpretations, I have focused on a single hominin group, Neanderthals. For both the scientific community and the general public, Neanderthals have been at the centre of various controversies since their discovery due to their close

relationship with anatomically-modern humans. This closeness occurs in areas which range from their co-existence and potential interbreeding with anatomically-modern humans, to their similar behavioural traits both in their sites of occupation and hunting techniques. At one point in our history Neanderthals were our closest living relatives, and the wide acceptance of this fact caused a significant turning point in the interpretations of Neanderthals: the perception that Neanderthals were 'brutish' began to be broken down leading to attempts to redefine their image by attributing morality to Neanderthal behaviour.<sup>14</sup> The quantity of data available from the archaeological and skeletal record for Neanderthal behaviour allows the question of prehistoric cannibalism to be revisited in light of the evidence that social bias has played a part in previous interpretations of this behaviour.

### **Classifying Cannibalism in the Archaeological Record**

The complex nature of cannibalism can make it difficult to differentiate from other funerary activities (such as secondary burials in which defleshing, but not consumption, occurs). Criteria have been established to ascertain which sites have evidence of cannibalistic activity rather than evidence of other post-mortem cultural practices.<sup>15</sup> The criteria rely heavily on the ability to understand what the evidence, in the form of markings and breakages that are left behind on the remains, signify. For example, when analysing skeletal remains, certain patterns made on the bones can provide strong evidence of accessing bone marrow and the cutting away of muscles and tendons. These patterns can be indicative of cannibalistic activity, but they are also typical of butchering patterns that have been identified on the faunal remains of animals that have been recovered during archaeological excavations.

Classifying the defining features of cannibalism enables the establishment of the criteria which regulate the claims for cannibalism within the archaeological record. These criteria focus on the available skeletal evidence rather than attempting to address the complex nature of this behaviour; thus, they enable the assessment of the occurrence of cannibalism to be objective and done without clouding the physical evidence with interpretations and bias. The criteria are essential for identifying the potential for early cannibalism due to the difficulty in identifying acts of cannibalism without the presence of human myoglobin, a protein found in the heart and muscles, within human coprolites (fossilised faeces). In this way, they allow for the identification of the attributes of cannibalism from the study of human remains through the assessment of whether the following were present:

1. Brain exposure
2. Facial mutilation
3. Burnt bone
4. Dismemberment
5. A pattern of missing elements
6. Greenstick – the splintering of long-bone shafts exposing marrow cavities
7. Cut marks
8. Bone breakage
9. Anvil or hammer stone abrasions
10. Many missing vertebrae
11. Fragment end-polishing (deriving from cooking in a coarse ceramic pot).<sup>16</sup>

Site	Engis	Krapina	Combe Grenal	Les Pradelles (Marillac)	La Ferrassie	Moula-Guercy	Grotta Guattari	El Sidrón	Dederiyeh	Vindija
Brain Exposure		Yes					Yes	Yes		
Facial Mutilation					Yes	Yes				
Burnt Bone		Yes								
Dismemberment		Yes	Yes		Yes	Yes	Yes	Yes		Yes
A Pattern of Missing Elements		Yes								
Greenstick – The splintering of long bone shafts exposing marrow cavities		Yes				Yes		Yes		
Cut marks	Yes	Yes	Yes	Yes		Yes	Yes	Yes		Yes
Bone Breakage		Yes				Yes		Yes	Yes	Yes
Anvil or Hammerstone Abrasions						Yes		Yes		
Many Missing Vertebrae										
Comparable to Faunal Processing (at the site) <sup>17</sup>						Yes	Yes	Yes		Yes
<b>Total Matches:</b>	<b>1/11</b>	<b>7/11</b>	<b>2/11</b>	<b>1/11</b>	<b>2/11</b>	<b>7/11</b>	<b>4/11</b>	<b>7/11</b>	<b>1/11</b>	<b>4/11</b>
Further Evidence (Supports notion of cannibalism) <sup>18</sup> :		Fragmentary remains				Fragmentary remains Polished post-mortem	Widening of foramen magnum Skull in circle of stones	Fragmentary remains Flakes/adhering flakes		Fragmentary remains Retouching

Table 1: Criteria for cannibalism compared to key sites.<sup>19</sup>

No single criterion is considered sufficient to support the notion of cannibalism; instead Parker Pearson argues that a significant proportion of these criteria need to be met in order to provide a strong supporting argument in favour of cannibalistic activity occurring at a site.<sup>20</sup> In order to increase the relevance of the previously established criteria to prehistoric cannibalism sites, I have adapted the criteria so that they can be used as a guideline in assessing the suspected evidence of cannibalism amongst the hominins of the Palaeolithic. Although they encompass a wide range of identifiable bone modifications, when examining the evidence from Neanderthal remains, criterion 11 provides an unfair comparison. This is because archaeological evidence indicates that Neanderthals, particularly those dated to the middle Palaeolithic, rarely cooked their food. There is also a lack of evidence suggesting that cooking pots existed prior to the Neolithic. Subsequently this criterion was not used when assessing the evidence for Neanderthal cannibalism; instead criterion 11 was replaced with ‘comparable to faunal processing (at the site)’, in reference to butchery marks which appeared on discarded faunal remains, and to the discard patterns of both the faunal and Neanderthal remains. Therefore, directly comparing the skeletal evidence for fauna and hominin remains recovered from the same archaeological layers at a site and analysing the techniques by which they were processed allows for the assessment of whether human and faunal assemblages were subjected to similar processing techniques and discard patterns.<sup>21</sup>

### **Analysing the evidence of cannibalism at Neanderthal sites**

This article considers ten Neanderthal sites with evidence of modifications to the human remains that have, at some point since their discovery, been attributed as sites of cannibalistic activity (Table 1). Remains with cut-marks were recovered from all of the sites apart from Les Pradelles (also known as Marillac) and Dederiyeh; many of the remains with such marks had the same pattern as those identified on faunal remains.<sup>22</sup> Furthermore, at the sites of Vindija, Moula-Guercy, and Combe Grenal, the Neanderthal remains were found scattered on the cave floors alongside the faunal remains, and these were uncovered within the same stratigraphy. Although this distribution of the remains may have been a result of natural processes, the argument for cannibalism is stronger in cases where the Neanderthal remains appear to have been discarded in a similar fashion as the faunal remains, due to the lack of evidence of burial practice.

Despite the fact that the evidence from a number of the sites has been interpreted as the result of cannibalistic activity, usually during the initial interpretative period, later reinterpretations of the evidence have often replaced the suggestion of cannibalism. From the first discovery at Neander Valley in Germany through to the modern-day research regarding their cognitive abilities and ability for compassion, there have been substantial changes in the perception of this ancestral species.<sup>23</sup> As a result, these modified remains (apart from those from Moula-Guercy and El Sidrón) have subsequently been attributed to defleshing, secondary burials and other funerary practices and ritual behaviour, rather than cannibalism. The majority of the scientific community currently attribute all but two of the sites to non-cannibalistic mortuary rites or external agents, such as predator activity. Nevertheless, a question remains as to whether this is a valid viewpoint, or merely motivated by a desire to attribute ‘morality’ to Neanderthal behaviour as we establish that they share increasing similarities to anatomically modern humans.

### ***Analysis of Grotta Guattari***

One of the early examples of suspected cannibalism was the lowland cave called Grotta Guattari, in Monte Circeo, Italy, dated between 100,000 to 50,000 years old. A damaged

Neanderthal skull (Circeo 1) was recovered and provided one of the earliest examples of modification to Neanderthal remains.<sup>24</sup> The base of the skull showed evidence of widening, and was originally argued to be the result of an attempt to access the brain. For several decades after the discovery it was considered the best known example of ritual cannibalism by Palaeolithic hominins.<sup>25</sup> However, following further investigation, the opinion that the Circeo 1 skull was an example of Neanderthal brutality, or potentially even spirituality, no longer appeared within much of the academic literature.<sup>26</sup> The first coherent argument refuting cannibalistic behaviour at Grotta Guattari was provided in 1986 by White and Toth, who drew attention to the lack of cut-marks, or any other signs of hominin intervention, on the cranium.<sup>27</sup> Instead they proposed the alternative interpretation that hyenas (*Crocuta crocuta*) were responsible for the accumulation of and modifications to the bone assemblage (a mixture of faunal and Neanderthal remains) at the Guattari cave.<sup>28</sup> This argument has strong supporting evidence collected from the various occupation layers, in which an accumulation of animal remains, particularly red deer, and the analysis of the evidence, such as gnawing damage, indicate that it was used as a maternity den by spotted hyenas through.<sup>29</sup> Further analysis of the bone assemblage showed that carnivore activity had modified the remains with tooth marks found on the skull and mandible. These marks are now accepted as being caused largely, if not entirely, by the spotted hyenas; this shift is a clear example of how archaeological interpretations develop alongside techniques.<sup>30</sup>

#### ***Analysis of Combe-Grenal and Les Pradelles***

Combe-Grenal and Les Pradelles (Marillac) meet minimal criteria for cannibalism, however the location of the cut-marks on both of the craniums supports this interpretation rather than alternatives, such as ritual defleshing. Moreover, the cranial cut marks are typically found in areas of muscle attachment and are close together, intersect and are more irregular in their appearance, a pattern that is commonly accepted as an indicator of defleshing for cannibalism.<sup>31</sup> Despite this, both of these sites are not considered to have enough evidence to support the suggestion of cannibalism. However, the quantity and quality of the skeletal record which has been analysed for these sites should not be taken as an accurate snapshot of the whole site. Thus, despite the small number of criteria that both sites meet, the presence of cannibalism should not be disregarded.

#### ***Analysis of the Engis II Neanderthal cranium***

The Awirs cave in Engis, Belgium, held partial remains in the form of skull fragments from a Neanderthal child (Engis II), estimated to be approximately three years of age at the time of death.<sup>32</sup> The frontal bone had multiple striations in three sections that were 1-2cm in length, which led to the original interpretation of being caused by a human agency rather than natural processes, but this activity was not attributed to defleshing or cannibalism.<sup>33</sup> However, later interpretations acknowledged that the identification of cut-marks on these remains is indicative of the removal of the scalp and soft tissues, but the cranium is not considered to have significant evidence of cannibalism. It is, instead, seen as an indicator of Neanderthals interacting with the skeletal remains of their own species.<sup>34</sup>

#### ***Analysis of Krapina***

The Krapina site discovered in Croatia has been an area of debate since its discovery in 1899; extensive faunal and archaeological evidence was recovered at this location.<sup>35</sup> Around eighty individuals have been represented through over 800 fragments (including nearly 200 isolated teeth); these Neanderthal remains were extremely fragmented and showed evidence of mutilation.<sup>36</sup> The skeletal remains exhibited signs of having been split

longitudinally (which suggests marrow extraction) and crushed. They also show evidence of extensive cut marks on the long bones, indicating defleshing.<sup>37</sup> These cut-marks are relatively abundant on both the cranial and postcranial remains, and are particularly prevalent on the juvenile remains.<sup>38</sup> Further analysis indicated that some of the remains had been burnt, possibly intentionally. To date it is the only site at which burnt Neanderthal bone has been recovered.<sup>39</sup> It was originally suggested that these butchery marks were an attempt to obtain brains, marrow, and other soft tissues for ritual or dietary purposes; this was supported by the evidence from the endocranial cavity.<sup>40</sup> Furthermore, there was a disproportionate representation of certain bones, with disarticulation (the separation of two bones at their joint) and disassociation (the removal of bones from the skeleton) of the remains evident at the site.<sup>41</sup> However, the original interpretation of cannibalism was received with scepticism.<sup>42</sup> Rather, it was suggested that the type of sediment at the Krapina site, requiring the use of shovels, pick-axes and dynamite in order to retrieve the archaeological material, in addition to the excavation team being made up of an assortment of people from different backgrounds (including local labourers), may have contributed to the fragmented nature of the remains.<sup>43</sup> This culminated in the argument that the post-mortem modifications were caused by natural processes and impact to the remains during excavation, rather than by Neanderthals.<sup>44</sup> Additionally, the cut-marked remains are argued to be the result of defleshing, which can be part of secondary burial rites, replacing the hypothesis of nutritional cannibalism at Krapina.<sup>45</sup> This interpretation is now widely accepted; however the Neanderthal skeletal remains that were recovered from the Krapina site met seven out of the eleven criteria discussed above (Table 1). Despite this, the general consensus remains that Neanderthals did not practice cannibalism whilst occupying this site.

### ***Analysis of Moula-Guercy***

Moula-Guercy, located within the Ardèche in the south-east of France, has been widely accepted as a site of cannibalism. The remains of at least six individuals (two adults, two adolescents and two infants), found in conjunction with a Mousterian lithic assemblage and faunal remains (in particular deer), matched seven of the eleven criteria for cannibalism.<sup>46</sup> The Neanderthal remains were processed in the same way as the faunal remains, and, in some instances, the cut and percussion marks indicate that the same implement was used.<sup>47</sup> Analysis of the cut-marks correlates to the severing of tendons and the temporalis muscle, which are indicative of the defleshing of an individual, an act that is also a precursor to cannibalism when in conjunction with other cutmark patterns.<sup>48</sup> Further evidence of cannibalism can be seen in the removal of the tongue, identifiable through the cut-marks to the lingual surface of the juvenile mandible, alongside the removal of thigh musculature and disarticulation of the remains.<sup>49</sup> The bones also show signs of being smashed and split, which is argued to be a key indicator for the extraction of marrow. Other evidence was also identified through similar post-discard polish (a result of handling of the remains) on both the hominin and faunal assemblages, possibly an indication that the cave site continued to be occupied post-butcherly.<sup>50</sup>

### ***Analysis of El Sidrón***

The third site to match seven out of the eleven criteria for cannibalism is El Sidrón, a Mousterian site in Northern Spain that consists of a network of caves. The individuals recovered from El Sidrón have not only been studied in hopes of furthering our understanding of Neanderthal behaviour, but, due to the levels of preservation, they have also been the basis of genetic studies. Genetics can potentially provide information regarding certain behaviours, such as a groups migration and groups mingling or merging

together to ensure genetic diversity during reproduction. This then calls into question what impact these interactions may have had on cannibalistic activity, and whether Neanderthals with more fluid social groupings would have continued to cannibalise each other.<sup>51</sup>

To date a total of 12 individuals have been recovered from the Galería del Osario, which can be translated as the ‘tunnel of the bones’. Approximately 1,800 fragments showing evidence of modifications have been recovered and interpreted as the results of the exploitation of meat, marrow and brain. The remains were disarticulated and displayed numerous cut-marks on the jawbones and the infants’ skulls. The remains also showed evidence of being pounded and smashed with great force with the use of stone tools, due to prominent breakages to the long bones and skulls.<sup>52</sup> The overall evidence for cannibalism included cut-marks, percussion pits, conchoidal scars, brain exposure, bone breakage and adhering flakes.<sup>53</sup> However, it was not possible to draw parallels between the modifications of the Neanderthal bones and the faunal remains due to the latter being scarce. Despite the absence of this criterion, the evidence of bone breakage and the removal of the crania-mandibular, in order to extract the ‘nutritious’ brain and marrow, is consistent with nutritional cannibalism.<sup>54</sup> Analysis of the bones and teeth showed that they were reasonable healthy, although there are signs of growth disturbances during early and late childhood on a large proportion of the recovered teeth.<sup>55</sup> These disturbances may have been caused by malnutrition, further supporting the hypothesis that the acts of cannibalism were carried out due to prolonged periods of starvation.<sup>56</sup>

### **Interpreting Neanderthal cannibalism**

Overall, only the final two sites are widely accepted as evidence of Neanderthal cannibalism, despite the post-mortem modifications present at other sites. Both Moula-Guercy and El Sidrón share similarities regarding the required criteria: the recovered skeletal remains at these sites had undergone similar post-mortem processes and have consequently become widely accepted as sites of cannibalism despite the differing environmental influences that these two groups of Neanderthals would have encountered. These cases of cannibalism are believed to have been nutritional- or starvation-based actions. As discussed previously, through analysis of the teeth from the El Sidrón individuals, alongside the environment outside of the cave, it has been argued that the cannibalism was a result of periods of starvation and a lack of resources. However, this hypothesis is less probable at Moula-Guercy, as evidence of an abundance of natural resources was recorded at the site. As a result it can be suggested that the social context of this cannibalism was not a result of dietary stress, but rather it occurred for another reason, which may have had a spiritual basis or it might simply have been seen as another source of food.

In spite of the current consensus for these two Neanderthal sites, it is possible that interpretations favouring cannibalism may be refuted in favour of defleshing, similar to the Krapina evidence. Such an argument would be based on the ambiguity between the evidence of defleshing and cannibalism, and the fact that the lack of a comprehensive account of the data means that, as yet, the interpretations of the Moula-Guercy site are still preliminary.<sup>57</sup> However, this shift in interpretation from cannibalism to defleshing may again be a reflection of our attempt to impose modern moral values onto Neanderthal behaviour.

The arguments that cannibalism was an act carried out against another social group, or that it could have been linked to environmental or ecological changes that may have contributed to a ‘random’ cannibalistic act, should also be considered in conjunction with the archaeological evidence. Interestingly, Neanderthal cannibalism does not appear to occur within the Near East, where the most prominent mortuary treatment is burial. It has

been suggested that both Neanderthals and anatomically-modern humans who were occupying Europe at this time had little to no contact with one another, or potentially even their own hominin group. In contrast, in the Near East the archaeological evidence for both Neanderthals and early modern humans is very similar, indicating that they lived closer to one another. These regional differences in mortuary treatment raise questions about why cannibalism appears to have only occurred within Europe. This disparity may be a result of mortuary treatments not surviving within the archaeological record, due to the different levels of preservation between areas, or even that the practice of cannibalism (or other mortuary rights) may have been favoured within different regions. Despite this, cannibalism may simply have been carried out as an act of aggression, a notion that should not be ignored even when trying to find a deeper meaning to our closest extinct relatives.

### **Contextualizing Neanderthal Cannibalism**

When considering other behavioural traits of early hominins, aspects of archaeology, primatology and ethnography can be combined in order to identify the range of possible explanations for these behaviours. Therefore it is beneficial to use all three approaches when considering the range and extent of cannibalistic behaviour amongst early hominins, including using observations of modern non-human primates as a comparative tool. As numerous people regard the evidence of modified remains as, at best, ambiguous proof of cannibalism, the prominent consensus is that there are a range of other possibilities which would be more viable.<sup>58</sup> This perspective could be argued as being largely influenced by the difficulty in identifying cannibalism within the archaeological record, and particularly difficulty of providing the possible reasoning behind it.

The use of ethnographic studies, particularly those carried out in environments that are more similar to what Neanderthals and anatomically-modern humans would have experienced, has contributed to the western understanding of the diversity of cultures and behaviours in the modern world. This, in turn, has allowed for a more open-minded approach to the interpretations of the past. A notable example of this can be seen through the alteration of our view of cannibalism from being a purely barbaric activity, to one that may hold a significant meaning to the practitioners.<sup>59</sup> Therefore, should a term with less negative connotations be used instead, decreasing the associated stigma from the term 'cannibalism' and the negative portrayal of these indigenous populations? It is these negative connotations that have influenced the appearance and social context of cannibalism amongst Neanderthals, with modern bias towards the topic influencing archaeological interpretations and acceptance.<sup>60</sup> Such bias has been particularly prominent amongst the scientific community, this has been exacerbated by the difficulty in conclusively arguing that cannibalism occurred at a site the topic being sensationalised within the media. Thus, interpretations that are considered to be more 'serious' tend to be favoured. Additionally, the perception of cannibalism (even just as an initial 'gut reaction') contradicts the developing view of Neanderthals as beings capable of care and compassion.<sup>61</sup> The idea that cannibalism is only carried out by those with a lack of 'morals' was influential when cannibalism was attributed to several sites and, subsequently considered to be part of Neanderthal behaviour.<sup>62</sup> It has taken several years for Neanderthals to be considered as similar to us and, as a result, many are reluctant to attribute cannibalism and the associated stigma to this species. However, as ethnographic studies have shown, cannibalism can be a mortuary rite that is carried out in a way to honour the deceased.<sup>63</sup> Consequently it is important that interpretations of cannibalism are incorporated into discussions in a way that does not conjure up images of barbaric savages. Knowledge of the various reasons behind cannibalism should be made available in order to

understand its social context, allowing for the possible acceptance of cannibalism as a mortuary rite without the stigma.

Furthermore, through the incorporation of other disciplines (such as ethnography and primatology) and the uncovering of new archaeological evidence a reinterpretation of Neanderthals has occurred. Consequently, the change in the perception of Neanderthals (both within academia and by the public) and the range of behaviours that they may have had, allows for a review of the evidence of cannibalism to be undertaken. Since the original interpretations of suspected sites of Neanderthal cannibalism, attitudes towards Neanderthals and their capabilities has shifted, particularly with the wide acceptance that Neanderthals were capable of at least some degree of symbolic thought.<sup>64</sup> Consequently, new interpretations have arisen regarding Neanderthal mortuary activities, with the suggestion that these may have been precursors to modern methods of coping with grief.<sup>65</sup> The archaeological evidence implies that cannibalism was, potentially, present for a longer period of time than intentional burial practices, and that Neanderthals may not have viewed it as a taboo, but rather as a part of everyday life.

Accordingly, when taking these shifts in perspective into account, in order to obtain a more cohesive understanding of the appearance and social context of cannibalism among Neanderthals, the archaeological evidence needs to be constantly reviewed as more evidence is unearthed, or as incorrectly classified material is discovered and corrected.<sup>66</sup> In addition to this, it would be beneficial to use the archaeological evidence in conjunction with primatology and ethnographic studies in order to gain new perspectives and to eliminate potential bias in regards to the funerary activities that may have been practiced by early hominins. By taking this approach we could potentially develop a basis for understanding cannibalistic behaviour, how it developed, and how it may have varied geographically and temporally.

### **Implications of Cannibalistic Activity**

It has been suggested that inadequate responses to sudden climate fluctuations, changes in the availability of resources and even the spread of infectious diseases were potential causes of the extinction of Neanderthals.<sup>67</sup> These phenomena have also been interpreted as contributing to cannibalism, which in turn may have eventually played a part in the demise of the Neanderthals. It has therefore been suggested that cannibalism itself should also be included as a potential cause of Neanderthal extinction.<sup>68</sup> However, this is a relatively new hypothesis, and one that requires the study of a larger sample size in order to ascertain its validity.

It has recently been argued that pathologies such as Creutzfeldt-Jakob, a form of transmissible spongiform encephalopathies (TSE), which are often associated with modern-day cannibalism, may have been present within some Neanderthal groups.<sup>69</sup> This disease could have affected both those who may have practiced and those who came into contact with infected tools. This type of disease does not leave an impact on the skeletal remains and, as a result, the impact it may have had on individuals is based on modern-day examples and observations of susceptible primates. These pathologies are characterised by rapidly progressive neurological disorders, which are seen in diseases such as dementia; they impact the ability to engage in day-to-day life and eventually become fatal.<sup>70</sup> TSEs cause unique changes in brain tissue, although these are unobservable until autopsy, and, as the brain is a soft tissue, they do not survive in the archaeological record, except in extreme cases.<sup>71</sup> TSEs have been identified amongst modern populations, and common chimpanzees also known to be susceptible; subsequently it has been argued that it is possible that a similar pathology may have been present in prehistoric populations. These pathologies have long incubation periods; therefore infected individuals may not show

symptoms for a prolonged period of time.<sup>72</sup> This may have a significant impact on whether cannibalism and illnesses were connected, and may also increase the spread of TSEs as the infected individual is unaware that they are unwell. The spread of the infectious prions (infectious, misformed proteins) are also now known to be carried on medical instruments; in some cases even after they have been sterilised.<sup>73</sup> Therefore, it has also been suggested that stone tools may have played a role in the spread of TSEs amongst Neanderthal groups, even to non-practitioners of cannibalism, through sharing of these tools or individuals coming across them after they had been discarded.<sup>74</sup> Subsequently, even if cannibalism was not widespread, it is possible that TSEs could have spread beyond practitioners of cannibalism

The hypothesis regarding the role TSEs may have played in the decline of Neanderthal populations has been advocated by Simon Underdown.<sup>75</sup> When added to other pressures, such as Neanderthal co-existence with early modern humans and climate change, TSEs could potentially have contributed to their extinction.<sup>76</sup> As a result, the presence of such pathologies may have caused a reduction in the Neanderthal population size, which would have made them more vulnerable to situations which they otherwise may have been able to survive.<sup>77</sup> Underdown's argument for the possible role of TSEs amongst Neanderthal populations in many respects is oversimplified for such a complex issue during a complex period of our evolution. The evidence of co-existence with anatomically modern humans and the impact that cannibalism and the spread of TSEs (or similar infectious diseases) may have had on their population is not addressed. Moreover, the archaeological evidence suggests that Neanderthals were not the only practitioners of cannibalism: both anatomically modern humans and earlier hominins as far back as *Homo erectus* are believed to have carried out this activity to varying extents.<sup>78</sup> Indeed, this behaviour may go back even further into our evolutionary past, but the skeletal evidence available is limited due to the amount of time that has passed, preservation conditions and as such there is not yet enough evidence to formulate a strong argument for this. Nevertheless, it is clear that Underdown's hypothesis does not take the broader implications of his argument on other hominins into account.

The potential evidence of cannibalism, despite a lack of consensus by the scientific community and the limited range of the hypothesis, should not be disregarded completely until a larger sample and range of hominins are also considered.<sup>79</sup> It would be interesting to see whether it would be possible to identify the presence of TSEs through genetic studies, as, until there is physical evidence on which this hypothesis can be addressed, it will remain an area of speculation.<sup>80</sup> If cannibalism was part of Neanderthal mortuary activities, as the archaeological evidence suggests, the possible effects of prolonged cannibalistic activity should be investigated. This would allow for further interpretations regarding Neanderthal behaviour to be developed, and potentially identify whether TSEs (or other diseases) had a role in their extinction.

## Conclusions

The investigation of cannibalism among Neanderthals remains an area that requires further study. This can be assisted by the establishment of criteria for objectively identifying cannibalism in prehistoric contexts, which can then assist in better understanding Neanderthal behaviour. The use of these criteria in relation to the Neanderthal sites addressed above, has confirmed the likelihood of cannibalistic activities at Moula-Guercy and El Sidrón. It also brings the Krapina site to the forefront of the argument for or against cannibalism once more, due to the amount of criteria met and the similarities of evidence it shares with the two accepted sites. Thus the development of the criteria for evaluating

cannibalism at archaeological sites can provide valuable insights into the evidence that has been unearthed at these locations.

The analysis provided above shows the way in which the examination of Neanderthal cannibalism would provide greater insights into their populations and behaviours. First, cannibalism within the archaeological record also brings into question the effect that diseases such as TSEs may have had on population sizes, and thus the impact that these diseases would have had on the development of species. Secondly, if Neanderthals were living in isolated groups their behaviour, their understanding of the consumption of a member of their own species and motivation to commit cannibalism may have varied from group to group. As a result their social interactions and decline in population size may have been regionally based. If this was the case amongst Neanderthal populations, the criteria for cannibalism would need to have a degree of flexibility in order to take these regional differences into consideration.

Overall, the criteria have created the groundwork for researching the complex behavioural trait of cannibalism. To see if these criteria can be used across the prehistoric archaeological record (i.e. other hominins) to establish the existence of cannibalistic activities, a larger sample size would be required. Further study would also be required to establish whether acts of defleshing were precursors to cannibalistic activities, or performed as part of other mortuary activities. The locations of cut marks and other striations could be analysed to see whether certain areas of the deceased bodies were the focus of these activities. However, the social context and implications of cannibalism among our ancestors is an area that is still largely unexplored. Although the criteria for cannibalism go some way to aiding the study and interpretation of this behaviour within the archaeological record, there is scope, with the aid of primatology and ethnography, to develop our understanding of the appearance, social context and implications of cannibalism.

## Notes

<sup>1</sup> James P. Noonan, 'Neanderthal Genomics and The Evolution of Modern Humans' in *Genome Research*, 20:5 (2010), 547-553.

<sup>2</sup> Noonan, 'Neanderthal Genomics', p. 547.

<sup>3</sup> Shirley Lindenbaun, 'Thinking About Cannibalism' in *Annual Review of Anthropology*, 33 (2004), 475-498, (pp.477-478); Mark Landler, 'Eating people is wrong! But is it homicide? Court to rule.' *N. Y. Times*. [Online] 26 December 2003. Available at: <http://www.nytimes.com/2003/12/26/world/kassel-journal-eating-people-is-wrong-but-is-it-homicide-court-to-rule.html> [Accessed: 06/04/2013].

<sup>4</sup> Barak Kushner, 'Cannibalizing Japanese Media: The Case of Issei Sagawa' in *Journal of Popular Culture*, 31:3 (1997), 55-68.

<sup>5</sup> Lindenbaun, 'Thinking About Cannibalism', pp.477-478.

<sup>6</sup> Lindenbaum, 'Thinking About Cannibalism', p.478; Kushner, 'Cannibalizing Japanese Media'.55-68.

<sup>7</sup> Lindenbaum, 'Thinking About Cannibalism', p.478; Charlie LeDuff, 'Jury decides hospitalized killer can go free', in *N. Y. Times*. [Online] 21 April 1999. Available at: <http://www.nytimes.com/1999/04/22/nyregion/jury-decides-hospitalized-killer-in-cannibalism-case-can-go-free.html> [Accessed: 08/04/2013].

<sup>8</sup> Alexander Abad-Santos, 'North Koreans Reportedly Turn to Cannibalism due to "Hidden Famine"', in *The Atlantic Wire*. [Online] 28 January 2013. Available at:

<http://www.theatlanticwire.com/global/2013/01/north-koreans-reportedly-turn-cannibalism-due-hidden-famine/61467/> [Accessed 06/04/2012]; Rob Williams, 'North Korea cannibalism fears amid claims starving people forced to desperate measures', in *The Independent*. [Online] 28 January 2013. Available at: <http://www.independent.co.uk/news/world/asia/north-korean-cannibalism-fears-amid-claims-starving-people-forced-to-desperate-measures-8468781.html> [Accessed: 01/02/2013].

<sup>9</sup> Abad-Santos, 'North Koreans Reportedly Turn to Cannibalism due to "Hidden Famine"'; LeDuff, 'Jury decides hospitalized killer can go free'; Kushner, 'Cannibalizing Japanese Media', pp.55-68.

<sup>10</sup> Mike Parker Pearson, *The Archaeology of Death and Burial* (5<sup>th</sup> edn) (Texas: A&M University Press, 2008), p.53; Lindenbaum, 'Thinking About Cannibalism', p.478; Landler, 'Eating people is wrong!'; Peggy Reeves Sanday, *Divine Hunger: Cannibalism as a Cultural System*. (New York: Cambridge University Press, 1986).

<sup>11</sup> Lindenbaum, 'Thinking About Cannibalism', pp.475-498.

<sup>12</sup> Friedemann Schrenk and Stephanie Miller, *The Neanderthal* (London and New York: Routledge, 2005), (p.12); Antonio Rosas, Cayetana Martínez-Maza, Markus Bastir, Antonio García-Taberner, Carles Lalueza-Fox, Rosa Huguet, José Eugenio Ortiz, Ramón Julia, Vicente Soler, Trinidad de Torres, Enrique Martínez, Juan Carlos Canaveras, Sergio Sánchez-Moral, Soledad Cuezva, Javier Lario, David Santamaria, Marco de la Rasilla and Javier Fortea, 'Paleobiology and Comparative Morphology of a Late Neanderthal Sample from El Sidron, Asturias, Spain' in *Proceedings of the National Academy of Sciences*, 103 (2006), 19266-19271 (p.19269).

<sup>13</sup> Victoria Gill, 'Ancient site reveals signs of mass cannibalism', in *BBC News: Science & Environment* [Online] 06 December 2009. Available at: <http://news.bbc.co.uk/1/hi/sci/tech/8394802.stm> [accessed: 29 March 2013].

<sup>14</sup> Noonan, 'Neanderthal Genomics', pp.547-553.

<sup>15</sup> Parker Pearson, *The Archaeology of Death and Burial*, p. 53.

<sup>16</sup> Parker Pearson, *The Archaeology of Death and Burial*, p. 53.

<sup>17</sup> Criterion 11: *Fragment end-polishing (deriving from cooking in a coarse ceramic pot)* from the list of criteria used by archaeologists to assess the possibility of cannibalism was not relevant to the analysis of the Neanderthal remains, and was therefore replaced with *comparable to faunal processing (at the site)*.

<sup>18</sup> With further study I would develop the criteria for cannibalism further, and replace *many missing vertebrae* with *'fragmentary remains'*.

<sup>19</sup> Sources for the data in the table: Cole, 'Consuming Passions'; Dalton, Rex, 'Palaeoanthropology: Decoding Our Cousins' in *Nature*, 442 (2006), 238-240; Defleur, Alban, Tim White, Patricia Valensi, Ludovic Slimak & Évelyne Crégut-Bonnoure, 'Neanderthal Cannibalism at Moula-Guercy, Ardèche, France' in *Science*, 286:5437 (1999), 128-131; Frayer, David W., Jörg Orschiedt, Jill Cook, Mary D. Russell and Jakov Radović, 'Krapina 3: Cut Marks and Ritual Behavior?' in *Periodicum Biologorum*, 108:4 (2006), 519-524; Jordan, Paul, 'Neanderthal: Neanderthal Man and the Story of Human Origins' (Sutton Publishing, 2001); Paul Pettitt, *The Palaeolithic Origins of Human Burial* (London; New York: Routledge Taylor and Francis Group, 2011); Rawlinson, Katie. 'Cannibalism: An Investigation into Neanderthal Behaviour' [Unpublished: Dissertation]. York: University of York (2013); Russell, Mary D. and Françoise LeMort 'Cutmarks on the Engis 2 Calvaria?' in *American Journal of Physical Anthropology*, 69 (1986), 317-323; Russell, Mary D., 'Mortuary Practices at the Krapina Neanderthal Site' in *American Journal of Physical Anthropology*, 72 (1987), 381-397; Smith, Fred H., Erik Trinkhaus, Paul B. Pettitt, Ivor Karavanić & Maja Paunović 'Direct Radiocarbon Dates for Vindija G1 and Velika Pećina Late Pleistocene Hominid Remains' in *Proceedings of the National Academy of Sciences*, 96:22 (1999), 12281-12286; Stiner, Mary C., 'The Faunal Remains from Grotta Guattari: A Taphonomic Perspective' in *Current Anthropology*, 32:2 (1991), 103-117; Stringer, Chris, 'The Origin of Our Species' (London: Penguin Books, 2011); Trinkhaus, Erik, 'Cannibalism and Burial at Krapina' in *Journal of Human Evolution*, 14 (1985), 203-216, (p. 212); Wolpoff, Milford H., Fred H. Smith, Mirko Malez, Jakov Radović & Darko Rukavina, 'Upper Pleistocene Human Remains from Vindija Cave, Croatia, Yugoslavia' in *American Journal of Physical Anthropology*, 54 (1981), 499-545; White, Tim D., 'Once were Cannibals' in *Scientific America*, 285:2 (2001), 58-65; White, Tim D. and Nicholas Toth, 'Engis: Preparation Damage, Not Ancient Cutmarks' in *American Journal of Physical Anthropology*, 78:3 (1989), 361-367; White, Tim D., Nicholas Toth, Philip G. Chase, G. A. Clark, Nicholas J. Conrad, Jill Cook, F. d'Errico, Randolph E. Donahue, Robert H. Gargett, Giacomo Giacobini, Anne Pike-Tay and A. Turner, 'The Question of Ritual Cannibalism at Grotta Guattari' in *Current Anthropology*, 32 (1991), 118-138.

<sup>20</sup> Parker Pearson, *The Archaeology of Death and Burial*, p. 53.

<sup>21</sup> James Cole, 'Consuming Passions: Reviewing the Evidence for Cannibalism within the Prehistoric Archaeological Record' in *Assemblage: The Sheffield Graduate Journal of Archaeology*, 9 (2006) <http://www.assemblage.group.shef.ac.uk/issue9/cole.html> [accessed: 10 November 2012].

<sup>22</sup> Paul Pettitt, 'Religion and Ritual in the Lower and Middle Palaeolithic' in *The Oxford Handbook of the Archaeology of Ritual and Religion*, ed. by Timothy Insoll (Oxford: Oxford University Press, 2011), p. 338.

<sup>23</sup> Penny A. Spikins, Holly Rutherford and Andy Needham, 'From Hominity to Humanity: Compassion from the Earliest Archaic to Modern Humans' in *Time and Mind*, 3:3 (2010), 303-325; Jane M. Renfrew, 'Neanderthal Symbolic Behaviour?', in *Becoming Human: Innovation in Prehistoric Material and Spiritual Culture*, ed. by Colin Renfrew and Iain Morley, (Cambridge: Cambridge University Press, 2009); Brunetto Chiarelli, 'The Extinction of Neanderthals: a Possible Hypothesis' in *Human Evolution* 21 (2006), 259-262;

Glenn C. Conroy, *Reconstructing Human Origins: a Modern Synthesis* (New York: W. W. Norton and Co Inc, 1997), p.436; George Constable, *The Neanderthals* (New York: Time-Life Books, 1973), p.104.

<sup>24</sup> Parker Pearson, *The Archaeology of Death and Burial*, p. 53.; White *et al.*, 'The Question of Ritual Cannibalism at Grotta Guattari'; Anna Behrensmeyer, Kathleen Gordon and Glenn Yanagi, 'Trampling as a Cause of Bone Surface Damage and Pseudo-Cut Marks' in *Nature*, 319 (1986), 768-771; Lewis R. Binford, *Bones: Ancient Men and Modern Myths* (New York: Academic Press, 1981).

<sup>25</sup> White *et al.*, 'The Question of Ritual Cannibalism at Grotta Guattari', p. 130.

<sup>26</sup> White *et al.*, 'The Question of Ritual Cannibalism at Grotta Guattari', p. 130.

<sup>27</sup> Tim D. White and Nicholas Toth, 'Cannibals at Klasies?' in *Sagittarius*, 2:2 (1986), 6-9; White *et al.*, 'The Question of Ritual Cannibalism at Grotta Guattari', p. 130.

<sup>28</sup> White *et al.*, 'The Question of Ritual Cannibalism at Grotta Guattari', p. 130.

<sup>29</sup> Mary C. Stiner, 'The Faunal Remains from Grotta Guattari' (p.116); Mary C. Stiner, 'Comparative Ecology and Taphonomy of Spotted Hyenas, Humans, and Wolves In Pleistocene Italy' in *Revue de Paléobiologie, Genève*, 23:2 (2004), 771-785, (p. 772-773).

<sup>30</sup> Stiner, 'The Faunal Remains from Grotta Guattari', p. 103.

<sup>31</sup> Frayer *et al.*, 'Krapina 3', p.523-524.

<sup>32</sup> Mary D. Russell and Françoise LeMort 'Cutmarks on the Engis 2 Calvaria?', p.317.

<sup>33</sup> Chad M. A. Tutt, 'Cannibalism Among Fossil Hominids: Is There Archaeological Evidence?' in *Totem: The University of Western Ontario Journal of Anthropology*, 11:1 (2003), Available at: <http://ir.lib.uwo.ca/totem/vol11/iss1/17>

<sup>34</sup> Paul Pettitt, *The Palaeolithic Origins of Human Burial*, p. 94; Mary D. Russell, 'Mortuary Practices at the Krapina Neandertal Site'.

<sup>35</sup> Glenn C. Conroy, *Reconstructing Human Origins: A Modern Synthesis* (2<sup>nd</sup> edition) (New York: W. W. Norton and Co Inc, 2005), (p.544).

<sup>36</sup> Conroy, *Reconstructing Human Origins*, (2<sup>nd</sup> ed.) p.544-545.

<sup>37</sup> Conroy, *Reconstructing Human Origins*, p.436; Renfrew, 'Neanderthal symbolic behaviour?'

<sup>38</sup> Pettitt, *The Palaeolithic Origins of Human Burial*, p. 95; Marylène Patou-Mathis, 'Analyses taphonomiques et paleo ethnographique du materiel osseux de Krapina (Croatie): nouvelles données sur la faune et les restes humaines' in *Préhistoire Européenne*, 10 (1997), 36-90, (p.76).

<sup>39</sup> Renfrew, 'Neanderthal Symbolic Behaviour?', p.54; Constable, *The Neanderthals*, p.104.

<sup>40</sup> Conroy, *Reconstructing Human Origins*, p.436.

<sup>41</sup> Trinkaus, 'Cannibalism and Burial at Krapina', p. 212.

<sup>42</sup> Conroy, *Reconstructing Human Origins*, (2<sup>nd</sup> ed.) p.545.

<sup>43</sup> Russell, 'Mortuary Practices at the Krapina Neandertal Site', p. 385.

<sup>44</sup> Trinkaus, 'Cannibalism and Burial at Krapina', p.213.

<sup>45</sup> Russell, 'Mortuary Practices at the Krapina Neandertal Site', pp. 381-397; Pettitt, *The Palaeolithic Origins of Human Burial*, p. 95.

<sup>46</sup> Alban Defleur, Tim White, Patricia Valensi, Ludovic Slimak and Évelyne Crégut-Bonnoure, 'Neanderthal Cannibalism at Moula-Guercy, Ardèche, France' in *Science*, 286:5437 (1999), 128-131, (p.129).

<sup>47</sup> Cole, 'Consuming Passions'; Defleur, 'Neanderthal Cannibalism at Moula-Guercy', pp.130-131.

<sup>48</sup> Pettitt, *The Palaeolithic Origins of Human Burial*, p.94.

<sup>49</sup> Pettitt, *The Palaeolithic Origins of Human Burial*, p.94.

<sup>50</sup> Defleur *et al.*, 'Neanderthal Cannibalism at Moula-Guercy'.

<sup>51</sup> Carles Lalueza-Fox, Antonio Rosas, Almudena Estalrich, Elena Gigli, Paula F. Campos, Antonio García-Taberner, Samuel García-Vargas, Federico Sánchez-Quinto, Oscar Ramírez, Sergi Cívot, Markus Bastir, Rosa Huguet, David Santamaría, M. Thomas. P. Gilbert, Eske Willerslev and Marco de la Rasilla, 'Genetic Evidence for Patrilocal Mating Behaviour Among Neandertal Groups' in *Proceedings of the National Academy of Sciences of the United States of America*, 108:1 (2011), 250-253, (p.250).

<sup>52</sup> Rosas *et al.*, 'Paleobiology and Comparative Morphology', p.19269.

<sup>53</sup> Rosas *et al.*, 'Paleobiology and Comparative Morphology', p. 19269; Palmira Saladié, Rosa Huguet, Antonio. Rodríguez-Hidalgo, Isabel Cáceres, Montserrat Esteban-Nadal, Juan. Luis Arsuaga, José. María Bermúdez de Castro and Eudald Carbonell, 'Intergroup Cannibalism in the European Early Pleistocene: The Range Expansion and Imbalance of Power Hypotheses' in *Journal of Human Evolution*, 63 (2012), 682-695.

<sup>54</sup> Chris Stringer, *The Origin of Our Species* (London: Penguin Books, 2012), p. 85; Rosas *et al.*, 'Paleobiology and Comparative Morphology', p. 19268.

<sup>55</sup> Rosas *et al.*, 'Paleobiology and Comparative Morphology', p. 19268.

<sup>56</sup> Rosas *et al.*, 'Paleobiology and Comparative Morphology', p. 19268.

<sup>57</sup> Pettitt, *The Palaeolithic Origins of Human Burial*, p. 94.

<sup>58</sup> Schrenk and Müller, *The Neanderthal*, p.87.

- <sup>59</sup> Cole, 'Consuming Passions'.
- <sup>60</sup> Schrenk and Müller, *The Neanderthal*, pp. 12 and 87.
- <sup>61</sup> Spikins *et al.*, 'From Hominity to Humanity', pp.303-325.
- <sup>62</sup> Schrenk and Müller, *The Neanderthal*, pp. 12 and 87.
- <sup>63</sup> Conklin, 'Consuming Images', p.75.
- <sup>64</sup> Steven Mithen, 'The Cognition of *Homo neanderthalensis* and *H. sapiens*: Does the Use of Pigment Necessarily Imply Symbolic Thought?' in *Dynamics of Learning in Neanderthals and Modern Humans, Vol. 2. Replacement of Neanderthals by Modern Humans Series*, ed. by Takeru Akazawa, Naomichi Ogihara, Hiroki C. Tanabe and Hideaki Terashima, (Japan: Springer, 2014), 7-16; Eugène Morin and Véronique Laroulandie, 'Presumed Symbolic Use of Diurnal Raptors by Neanderthals' in *PLoS One*, 7:3 (2012), 1-5.
- <sup>65</sup> Conklin, 'Consuming Passions'.
- <sup>66</sup> Pauline Colombert, Priscilla Bayle, Isabelle Crevecoer, Jean-Georges Ferrié and Bruno Maureille 'New Mousterian neonates from the south-west of France' in *PESHE*, 1 (2012), 57; Christoph P. E. Zollikofer and Marcia S. Ponce de León 'The Evolution of Human Ontogenies' in *Seminars in Cell and Development Biology* 21, (2010), 441-452.
- <sup>67</sup> Abigail Hackett and Robin Dennell, 'Neanderthals as Fiction in Archaeological Narrative' in *Antiquity*, 77:298 (2003), 816-827, (p. 826).
- <sup>68</sup> Simon Underdown, 'A Potential Role for Transmissible Spongiform Encephalopathies in Neanderthal Extinction' in *Medical Hypotheses*, 71 (2008), 4-7.
- <sup>69</sup> Chiarelli, 'The Extinction of Neanderthals', pp. 259-262; Underdown, 'A Potential Role for Transmissible Spongiform Encephalopathies', pp.4-7.
- <sup>70</sup> Centres for Disease Control and Prevention (CDC), 'CJD (Creutzfeldt-Jakob Disease, Classic)' [Online] 23<sup>rd</sup> August 2010. Available at: [http://www.cdc.gov/ncidod/dvrd/cjd/qa\\_cjd\\_infection\\_control.htm](http://www.cdc.gov/ncidod/dvrd/cjd/qa_cjd_infection_control.htm) [accessed: 30 October 2014]; National Institute of Neurological Disorders and Stroke (NIH) 'Creutzfeldt-Jakob Disease Fact Sheet' [Online] 22<sup>nd</sup> May 2014. Available at: [http://www.ninds.nih.gov/disorders/cjd/detail\\_cjd.htm](http://www.ninds.nih.gov/disorders/cjd/detail_cjd.htm) [accessed: 30 October 2014].
- <sup>71</sup> NIH, Creutzfeldt-Jakob Disease Fact Sheet.
- <sup>72</sup> CDC, Creutzfeldt-Jakob Disease; NIH, Creutzfeldt-Jakob Disease Fact Sheet.
- <sup>73</sup> CDC, Creutzfeldt-Jakob Disease.
- <sup>74</sup> Underdown, 'A Potential Role for Transmissible Spongiform Encephalopathies', p.4.
- <sup>75</sup> Underdown, 'A Potential Role for Transmissible Spongiform Encephalopathies', pp.4-7.
- <sup>76</sup> Underdown, 'A Potential Role for Transmissible Spongiform Encephalopathies', pp.4-7.
- <sup>77</sup> Underdown, 'A Potential Role for Transmissible Spongiform Encephalopathies', pp.4-7.
- <sup>78</sup> Travis Rayne Pickering, Tim D. White and Nicholas Toth, 'Brief Communication: Cutmarks on a Plio-Pleistocene Hominid from Sterkfontein, South Africa' in *American Journal of Physical Anthropology*, 111:4 (2000), 579-584; Tim D. White, *Prehistoric Cannibalism at Mancos 5MTUMR-2346*. (Princeton: Princeton University Press, 1992); Tim D. White, 'Cut Marks on the Bodo Cranium: A Case of Prehistoric Defleshing' in *American Journal of Physical Anthropology*, 69 (1986), 503-509; Franze Weidenreich, 'Six Lectures on *Sinanthropus Pekinensis* and Related Problems' in *Journal of the Geological Society of China*, 19 (1939), 49-63.
- <sup>79</sup> Julien Riel-Salvatore, 'Mad Neanderthal disease? Some Comments on "A Potential Role for Transmissible Spongiform Encephalopathies in Neanderthal Extinction"' in *Medical Hypotheses*, 71:3 (2008), 473-474.
- <sup>80</sup> Riel-Salvatore, 'Mad Neanderthal disease?', pp.473-474.

**Cover Image:** "Neanderthals - Artist's rendition of Earth approximately 60,000 years ago"  
**Thumbnail:** "Neanderthals in St Michael's Cave – Gibraltar"

\*\*\*\*\*

### Bibliography

Abad-Santos, Alexander. 'North Koreans Reportedly Turn to Cannibalism due to 'Hidden Famine'', in *The Atlantic Wire*. [Online] 28 January 2013. Available at: <http://www.theatlanticwire.com/global/2013/01/north-koreans-reportedly-turn-cannibalism-due-hidden-famine/61467/> [Accessed 06/04/2012]

---

Behrensmeyer, Anna; Gordon, Kathleen and Yanagi, Glenn. 'Trampling as a Cause of Bone Surface Damage and Pseudo-Cut Marks' in *Nature*, 319 (1986), 768-771.

Binford, Lewis R. *Bones: Ancient Men and Modern Myths*, (New York: Academic Press, 1981).

Centres for Disease Control and Prevention (CDC), 'CJD (Creutzfeldt-Jakob Disease, Classic)' [Online] 23<sup>rd</sup> August 2010. Available at: <[http://www.cdc.gov/ncidod/dvrd/cjd/qa\\_cjd\\_infection\\_control.htm](http://www.cdc.gov/ncidod/dvrd/cjd/qa_cjd_infection_control.htm)> [accessed: 30 October 2014]

Chiarelli, Brunetto. 'The Extinction of Neanderthals: a Possible Hypothesis' in *Human Evolution* 21(2006), 259-262

Conklin, B. A. (1997) 'Consuming Images: Representations of Cannibalism on the Amazonian Frontier' in *Anthropological Quarterly* 70 (2), 68-78.

Cole, James. 'Consuming Passions: Reviewing the Evidence for Cannibalism within the Prehistoric Archaeological Record' in *Assemblage: The Sheffield Graduate Journal of Archaeology*, 9 (2006). <http://www.assemblage.group.shef.ac.uk/issue9/cole.html> [accessed: 10 November 2012].

Colombert, Pauline; Bayle, Priscilla; Crevecoer, Isabelle; Ferrié, Jean-Georges and Maureille, Bruno. 'New Mousterian neonates from the south-west of France' in *PESHE*, 1 (2012), 57.

Conroy, Glenn C. *Reconstructing Human Origins: A Modern Synthesis* (2<sup>nd</sup> edition) (New York: W. W. Norton and Co Inc, 2005).

Constable, George. *The Neanderthals*, (New York: Time-Life Books, 1973).

Dalton, Rex, 'Palaeoanthropology: Decoding our cousins' in *Nature*, 442 (2006), 238-240.

Defleur, Alban; White, Tim; Valensi, Patricia; Slimak, Ludovic and Crégut-Bonnoure, Évelyne. 'Neanderthal cannibalism at Moula-Guercy, Ardèche, France' in *Science*, 286 (1999), 128-131.

Freyer, David. W.; Orschiedt, Jörg.; Cook, Jill.; Russell, Mary. Doria. and Radovčić, Jakov. 'Krapina 3: Cut Marks and Ritual Behavior?' in *Periodicum Biologorum*, 108:4 (2006), 519-524.

Gill, Victoria. 'Ancient site reveals signs of mass cannibalism', in BBC News: Science and Environment [Online] 06 December 2009. Available at: <http://news.bbc.co.uk/1/hi/sci/tech/8394802.stm> [accessed: 29 March 2013].

Hackett, Abigail. and Dennell, Robin. 'Neanderthals as Fiction in Archaeological Narrative' in *Antiquity*, 77:298 (2003), 816-827.

Jordan, Paul, *Neanderthal: Neanderthal Man and the Story of Human Origins* (Sutton Publishing, 2001).

Kushner, Barak. 'Cannibalizing Japanese Media: The Case of Issei Sagawa' in *Journal of Popular Culture*, 31:3 (1997), 55-68.

Lalueza-Fox, Carles; Rosas, Antonio; Estalrich, Almudena; Gigli, Elena; Campos, Paula. F.; García-Tabernero, Antonio; García-Vargas, Samuel; Sánchez-Quinto, Federico; Ramírez, Oscar; Civit, Sergi; Bastir, Markus; Hugué, Rosa; Santamaría, David; Gilbert, M. Thomas. P.; Willerslev, Eske and de la Rasilla, Marco. 'Genetic evidence for patrilocal mating behaviour among Neanderthal groups', in *Proceedings of the National Academy of Sciences of the United States of America*, 108:1 (2011), 250-253.

Landler, Mark. 'Eating people is wrong! But is it homicide? Court to rule.' *N. Y. Times*. [Online] 26 December 2003. Available at: <http://www.nytimes.com/2003/12/26/world/kassel-journal-eating-people-is-wrong-but-is-it-homicide-court-to-rule.html> [Accessed: 06/04/2013]

- 
- LeDuff, Charlie. 'Jury decides hospitalized killer can go free', in N. Y. Times. [Online] 21 April 1999. Available at: <http://www.nytimes.com/1999/04/22/nyregion/jury-decides-hospitalized-killer-in-cannibalism-case-can-go-free.html> [Accessed: 08/04/2013].
- Lindenbaun, Shirley. 'Thinking about cannibalism' in *Annual Review of Anthropology*, 33 (2004), 475-498
- Mithen, Steven. 'The Cognition of *Homo neanderthalensis* and *H. sapiens*: Does the Use of Pigment Necessarily Imply Symbolic Thought?' in *Dynamics of Learning in Neanderthals and Modern Humans, Vol. 2. Replacement of Neanderthals by Modern Humans Series*, ed. by Takeru Akazawa, Naomichi Ogihara, Hiroki C. Tanabe and Hideaki Terashima, (Japan: Springer, 2014), pp. 7-16.
- Morin, Eugène and Laroulandie, Véronique. 'Presumed Symbolic Use of Diurnal Raptors by Neanderthals' in *PLoS One*, 7:3 (2012), 1-5.
- National Institute of Neurological Disorders and Stroke (NIH). 'Creutzfeldt-Jakob Disease Fact Sheet' [Online] 22<sup>nd</sup> May 2014. Available at: <[http://www.ninds.nih.gov/disorders/cjd/detail\\_cjd.htm](http://www.ninds.nih.gov/disorders/cjd/detail_cjd.htm)> [accessed: 30 October 2014]
- Noonan, J. P. (2010) 'Neanderthal Genomics and the Evolution of Modern Humans' in *Genome Research* 20:5, 547-553.
- Parker Pearson, Mike, *The Archaeology of Death and Burial*, (5th edition), (Texas: A&M University Press, 2008).
- Patou-Mathis, Marylène. 'Analyses taphonomiques et paleo ethnographique du materiel osseux de Krapina (Croatie): nouvelles données sur la faune et les restes humaines' in *Préhistoire Européenne*, 10 (1997), 36-90.
- Pettitt, Paul. *The Palaeolithic Origins of Human Burial*, (London; New York: Routledge, 2011).
- Pettitt, Paul. 'Religion and Ritual in the Lower and Middle Palaeolithic' in *The Oxford Handbook of the Archaeology of Ritual and Religion*, ed. by Timothy Insoll (2011), pp. 329-343.
- Pickering, Travis Rayne; White, Tim D. and Toth, Nicholas. 'Brief Communication: Cutmarks on a Plio-Pleistocene Hominid from Sterkfontein, South Africa' in *American Journal of Physical Anthropology*, 111:4 (2000), 579-584.
- Rawlinson, Katie. 'Cannibalism: An Investigation into Neanderthal Behaviour' [Unpublished: Dissertation]. York: University of York (2013).
- Renfrew, Jane. M. 'Neanderthal symbolic behaviour?' in *Becoming Human: Innovation in Prehistoric Material and Spiritual Culture*, ed. by Colin Renfrew and Iain Morley, (Cambridge: Cambridge University Press, 2009), pp. 50-60.
- Riel-Salvatore, Julien. 'Mad Neanderthal disease? Some comments on "A potential role for Transmissible Spongiform Encephalopathies in Neanderthal extinction"' in *Medical Hypotheses*, 71:3 (2008), 473-474.
- Rosas, Antonio; Martinez-Maza, Cayetana; Bastir, Markus; Garcia-Taberner, Antonio; Lalueza-Fox, Carles; Hugué, Rosa; Ortiz, José Eugenio; Julia, Ramón; Soler, Vicente; de Torres, Trinidad; Martínez, Enrique; Canaveras, Juan Carlos; Sanchez-Moral, Sergio; Cuezva, Soledad; Lario, Javier; Santamaria, David; de la Rasilla, Marco and Fortea, Javier. 'Paleobiology and comparative morphology of a late Neanderthal sample from El Sidron, Asturias, Spain', in *Proceedings of the National Academy of Sciences*, 103 (2006), 19266-19271.
- Russell, Mary. Doria. 'Mortuary practices at the Krapina Neanderthal site' in *American Journal of Physical Anthropology*, 72 (1987), 381-397.
- Russell, Mary. Doria and LeMort, Françoise. 'Cut marks on the Engis 2 Calvaria?' in *American Journal of Physical Anthropology*, 69 (1986), 317-323.

---

Saladié, Palmira.; Huguet, Rosa.; Rodríguez-Hidalgo, Antonio.; Cáceres, Isabel.; Esteban-Nadal, Montserrat.; Arsuaga, Juan. Luis.; Bermúdez de Castro, José. María. and Carbonell, Eudald. 'Intergroup cannibalism in the European Early Pleistocene: The range expansion and imbalance of power hypotheses' in *Journal of Human Evolution*, 63 (2012), 682-695.

Sanday, Peggy Reeves. *Divine Hunger: Cannibalism as a Cultural System*. (New York: Cambridge University Press, 1986).

Schrenk, Friedemann and Miller, Stephanie, *The Neanderthal*, (Routledge: London and New York, 2005).

Smith, Fred H., Erik Trinkhaus, Paul B. Pettitt, Ivor Karavanić & Maja Paunović 'Direct radiocarbon dates for Vindija G1 and Velika Pećina Late Pleistocene hominid remains' in *Proceedings of the National Academy of Sciences*, 96:22 (1999), 12281-12286.

Spikins, Penny; Rutherford, Holly and Needham, Andy. 'From Hominity to Humanity: Compassion from the earliest archaic to modern humans' in *Time and Mind*, 3:3 (2010), 303-325.

Stiner, Mary. C., 'Comparative Ecology and Taphonomy of Spotted Hyenas, Humans, and Wolves in Pleistocene Italy' in *Revue de Paléobiologie, Genève*, 23:2 (2004), 771-785.

Stiner, Mary. C., 'The Faunal Remains from Grotta Guattari: A Taphonomic Perspective' in *Current Anthropology*, 32:2 (1991), p. 103-117.

Stringer, Chris. *The Origin of our Species*. (London: Penguin Books, 2011).

Trinkaus, Erik. 'Cannibalism and burial at Krapina' in *Journal of Human Evolution*, 14 (1985), 203-216.

Tutt, Chad M. A., 'Cannibalism among fossil Hominids: Is there archaeological evidence?' in *Totem: The University of Western Ontario Journal of Anthropology*, 11:1 (2003), Available at: <http://ir.lib.uwo.ca/totem/vol11/iss1/17>.

Underdown, Simon. 'A potential role for Transmissible Spongiform Encephalopathies in Neanderthal extinction', in *Medical Hypotheses*, 71 (2008), 4-7.

Weidenreich, Franz. 'Six lectures on *Sinanthropus pekinensis* and related problems' in *Journal of the Geological Society of China*, 19 (1939), 49-63.

White, Tim. D. 'Cut Marks on the Bodo Cranium: A Case of Prehistoric Defleshing' in *American Journal of Physical Anthropology*, 69 (1986), 503-509.

White, Tim D., 'Once were Cannibals' in *Scientific America*, 285:2 (2001), 58-65.

White, Tim. D. *Prehistoric Cannibalism at Mancos 5MTUMR-2346*. (Princeton: Princeton University Press, 1992).

White, Tim. D. and Nicholas Toth. 'Cannibals at Klasies?' in *Sagittarius*, 2:2 (1986), 6-9.

White, Tim D. and Nicholas Toth, 'Engis: Preparation Damage, Not Ancient Cutmarks' in *American Journal of Physical Anthropology*, 78:3 (1989), 361-367.

White, Tim. D., Toth, Nicholas.; Chase, Philip. G.; Clark, G. A.; Conrad, Nicholas. J.; Cook, Jill; d'Errico, F.; Donahue, Randolph. E.; Gargett, Robert. H.; Giacobini, Giacomo.; Pike-Tay, Anne. and Turner, A. 'The Question of Ritual Cannibalism at Grotta Guattari' in *Current Anthropology*, 32 (1991), 118-138.

Williams, Rob. 'North Korea cannibalism fears amid claims starving people forced to desperate measures', in *The Independent*. [Online] 28 January 2013. Available at: <http://www.independent.co.uk/news/world/asia/north-korean-cannibalism-fears-amid-claims-starving-people-forced-to-desperate-measures-8468781.html> [Accessed: 01/02/2013].

Wolpoff, Milford H., Fred H. Smith, Mirko Malez, Jakov Radovčić & Darko Rukavina, 'Upper Pleistocene Human Remains from Vindija Cave, Croatia, Yugoslavia' in *American Journal of Physical Anthropology*, 54 (1981), 499-545.

Zollikofer, Christoph P. E. and Ponce de León, Marcia S. 'The evolution of human ontogenies' in *Seminars in Cell and Development Biology* 21, (2010), 441-452.

\*\*\*\*\*

### **Biography**

**Katie Rawlinson** is undertaking an MSc in Early Prehistory at the University of York, UK. Her current research interests include the changing attitudes to death within early prehistory and how the study and incorporation of nonhuman primates and ethnographic studies may provide a basis on which to improve our understanding of the evolution of behaviour amongst *Homo sapiens*.