

KINSHIP CHRONICLES: UNRAVELING NEANDERTHAL VIOLENCE AND BODY RITUALS

¹Emily R. Mitchell, ²Jonathan A. Reynolds and Olivia M. Sanchez³

Article Info

Keywords: Neanderthals, Funerary Practices, Pretreatment, Mortuary Treatments, Commemorative Behaviors

DOI

10.5281/zenodo.10567409

Abstract

This study delves into the intricate practices surrounding the treatment of the deceased across various human groups, with a particular focus on Neanderthal funerary systems. Funerary customs universally involve pretreatment, initial mortuary procedures, and final mortuary treatments, coupled with commemorative behaviors. Drawing on insights from Sutton (2021), this research seeks to explore these practices within Neanderthal communities, where the understanding of pretreatment practices is notably limited. While specific instances, such as the care of elderly or disabled individuals like Shanidar 1, offer glimpses into potential pretreatment practices, much remains unknown.

The investigation delves into the broader context of Neanderthal funerary rituals, shedding light on the preparation of the dying, mortuary treatments ranging from washing to potential mummification, and the ultimate act of burial. Moreover, the study considers commemorative behaviors, including rituals, offerings, or shrines, that may have played a role in Neanderthal communities.

As Neanderthal groups are characterized by a scarcity of information regarding pretreatment practices, the research aims to address this gap by examining existing evidence and drawing connections to potential cultural and social aspects. The inclusion of cases like Shanidar 1 provides a starting point for understanding how Neanderthal communities approached the care of vulnerable individuals during the end-of-life phase.

By comprehensively exploring Neanderthal funerary systems, this study contributes to the broader understanding of human cultural practices related to death and commemoration. The findings are expected to offer insights into the complexities of Neanderthal social structures and provide a foundation for further research into the cultural dimensions of prehistoric communities.

^{1,2,3}Department of Anthropology, University of San Diego

INTRODUCTION

All human groups deal with their dead in some manner. Such funerary systems typically include some sort of pretreatment (e.g., preparing the dying for death), an initial mortuary treatment to prepare the body (e.g., from washing to mummification) for a final mortuary treatment (e.g., burial), plus various commemorative behaviors (e.g., rituals, offerings, or shrines) (Sutton 2021). For Neanderthal groups, virtually nothing is known about pretreatment practices, although care of elderly or disabled individuals such as Shanidar 1 (Trinkaus 1983; Trinkaus and Villotte 2017; also see Steiner 2017:257), may qualify.

Similarly, very little is understood about Neanderthal commemorative behaviors. In a few cases, some materials, such as animal remains and stone tools, might have been included with individuals as grave goods (Steiner 2017:255), suggestive of ritual behavior. Further, it seems that people were repeatedly placed in the same (presumably significant) areas within sites (Steiner 2017:255) and Pettit (2002) suggested the possibility that some burial sites themselves may have been important social locations.

More is known about Neanderthal mortuary practices, primarily final dispositions. More than 200 Neanderthal individuals have been identified, a number of which appear to have been deliberately and meaningfully (apart from sanitary purposes) buried (Trinkaus 1995; Pettitt 2002, 2011; Churchill 2014:361-362; Rendu et al. 2014; Steiner 2017; Balzeau et al. 2020; but see Dibble et al. 2015). Most burials appear to have been single interments (no cremations have been reported) (Steiner 2017:257). The remains range from essentially complete and articulated skeletons (e.g., La Chapelle-aux-Saints 1; Boule 1911), to the scattered but relatively intact disarticulated remains of specific individuals (e.g., Feldhofer 1; Schmitz et al. 2002), to a few isolated fragments (e.g., at Denisova Cave; Krause et al. 2007).

Finally, highly fragmented, scattered, and apparently modified Neanderthal remains have been documented at a small number of sites in Europe. The apparent modifications include cut, scraping, and percussion marks, fragmentation, and burning. In many cases, it appears that the fragmentary human materials exhibit the same patterns of modification as processed game animals. In addition, many of the fragmented human bones were found in the same deposits as the discarded animal remains.

A number of ideas have been offered to explain these patterns. Natural taphonomic processes such as soil pressure, bioturbation, animal gnawing, carnivore scavenging, and soil disturbances by later people have been suggested (e.g., Camarós et al. 2017). However, it seems clear that the bodies from these sites were processed by being purposefully defleshed, disarticulated, and fragmented.

A common cultural explanation is the processing of the body for either nutritional or ritual cannibalism (Ullrich 2004, 2005, 2006; Yustos and de los Terreros 2015; Saladié and Rodríguez-Hidalgo 2017; Defleur and Desclaux 2019; but see Slimak and Nicholson 2020; Defleuret al. 2020), possibly with the remains disposed of with the other food refuse. Another possibility is the compassionate preparation of the body for a disarticulated interment (Russell 1987a; Le Mort 1989; Frayer et al. 2006; Garralda 2009). Other practices that might result in a similar signature (e.g., Pickering 1989; Ullrich 2004) include the preparation of the body for an unusual final disposition, such as that afforded the Chinchorro of Peru and Chile (Aufderheide et al. 1993) or the Tibetan Sky burial (e.g., Malville 2005). Another possibility is manipulation of the body without “any precise intentionality” (Garralda et al. 2005:195).

Finally, the observed patterns might be the result of violence committed by other Neanderthal groups and/or anatomically modern humans (AMH) (Gat 1999; also see Hortolà and Martínez-Navarro 2013). Once people were killed, their bodies may have been subjected to any number of unsympathetic mortuary treatments, even including cannibalism. Bodies might also have been processed in an effort to “erase” them from the cultural

landscape, as has been proposed to explain similar patterns of human skeletal remains in the American Southwest (Martin 2015; also see Martin 2016; Osterholtz 2012, 2016; Osterholtz and Martin 2017).

In this study, the demographic profiles of the recovered remains at the Neanderthal sites where modified human remains have been recovered were compiled. In most cases, the data are consistent with small integrated social units, that is, families. Analysis of mtDNA at several of the sites suggest close genetic relationships between some of the individuals, also supportive of the idea of family units.

These patterns lead to the suggestion that the highly fragmented and modified Neanderthal remains at many of these sites were not the result of regular and sympathetic mortuary treatment of individuals that accrued through time but of sudden and extreme violence directed against specific family groups by competing Neanderthal social units; that is, family annihilation. The motivations for these events is unclear, but may be related to factors (e.g., climate change; cf. Defleur and Desclaux 2019) resulting in competition for resources (e.g., food, territory, or occupation locales), as a mechanism for social control, or possibly even criminal behavior.

THE SITES

A total of nine sites with modified and fragmented remains of Neanderthal individuals have been documented, all within Western and Central Europe (Figure 1, Table 1). These sites date between 130 and 40 kya. Of course, there are both earlier and later sites with similar evidence, most of which have been generally interpreted as reflecting cannibalism (e.g., Carbonell et al. 2010; Saladié and Rodríguez-Hidalgo 2017).

KRAPINA, CROATIA

The Krapina site is located on the northern Croatia (see Figure 1). It was excavated more than a century ago (Gorjanović-Kramberger 1909; Ullrich 1978, 1989) and is believed to date to about 130 kya (MIS-5e). More than 900 fragments of human bone identified as Neanderthal were recovered and represent about 23 individuals of both sexes and all age classes (Trinkaus 1995:126; also see Trinkaus 1975, 1985; Wolpoff 1979; Wolpoff and Caspari 2006).

Analyses of the Krapina remains show that many of the fragments have cut marks and percussion pits, had been purposefully fragmented, and that some had been burned (Ullrich 2005, 2006; White and Toth 2007:292; Orschiedt 2008; but see Frayer et al. 2020). In addition, hominin tooth marks were discovered on a few of the fragments (White and Toth 2007:294), and one specimen (a femur shaft fragment) was apparently used as a retouching tool (Patou-Mathis 1997; Rougier et al. 2016). The fragmented human remains were found mixed with faunal remains of game animals (Ullrich 2004).

Trinkaus (1995:126, Table 1; also see Wolpoff 1979:Table 2; Bocquet-Appel and Arsuaga 1999:Table 1) calculated a total NMI of 23 individuals at Krapina with a demographic profile (see Table 1) of seven adults, 10 adolescents, four juveniles, and two infants, with both sexes being represented (Estabrook 2007). It was hypothesized that the remains reflected two or more events of simultaneous deaths (Bocquet-Appel and Arsuaga 1999), perhaps due to a demographic crisis from severe environmental fluctuation (e.g., Defleur and Desclaux 2019) although the possibility of mass killings was also considered (Bocquet-Appel and Arsuaga 1999:335).

The interpretation of the Krapina remains is varied. Some researchers view the alterations to be the result of natural processes (Trinkaus 1985; Orschiedt 2008; Russell 1987b). Others view them as anthropogenic. Patou-Mathis (1997) and White and Toth (2007) believe that the materials reflect nutritional cannibalism. Russell (1987a; also see Ullrich 2004, 2005; Frayer et al. 2006) suggested that the trauma on the bone was more consistent with the preparation of bodies for secondary burials rather than cannibalism, although ritual cannibalism was possible (Frayer et al. 2020). Estabrook and Frayer (2013) noted that some of the traumas had healed, suggestive of ongoing interpersonal violence (also see Zollikofer et al. 2002; Beier et al. 2018). The presence of eagle talons suggested ritual activities (Frayer et al. 2020).

MOULA-GUERCY (AKA ABRI MOULA), FRANCE

The Moula-Guercy site is located in the Rhone River Valley of southern France (see Figure 1). The site was excavated several times, most recently in the 1990s (e.g., Defleur et al. 1993a, 1993b, 1999), and dates to roughly 120 kya (MIS-5e) (Willmes et al. 2016). Approximately 120 fragments of bone from seven Neanderthal individuals were recovered.

Many of the pieces exhibited cut marks, percussion pits, and fragmentation, suggestive of defleshing and dismemberment (Defleur et al. 1999; Valensi et al. 2012; Willmes et al. 2016; Defleur and Desclaux 2019). The human remains appear to have been processed in the same manner as the other large animals at the site, although there was a greater number of cut marks on the human materials (Valensi et al. 2012), and they were discarded along with faunal remains of game animals (Defleur et al. 1999).

The demographic profile (see Table 1) includes one mature adult male, one young adult female aged ≈ 18 to 21.0 years, one adolescent female aged ≈ 15 -16 years, an adolescent aged $\approx 10/11$ years, and two children (aged $\approx 4/5$ and $\approx 7/8$ years) (Defleur et al. 1999; Mersey et al. 2013a, 2013b; Richards et al. 2021). Defleur and Desclaux (2019:122) argued that the ages of the individuals fit within the natural mortality profiles for hunter-gatherers and so were likely natural deaths. However, the demographic profile is also consistent with a single social unit (family?) with simultaneous deaths.

The remains from Moula-Guercy are commonly interpreted as reflecting ritual or nutritional cannibalism (Defleur et al. 1993a, 1993b, 1999; Valensi et al. 2012; Willmes 2016; Defleur and Desclaux 2019). Defleur and Desclaux (2019; also see Defleur et al. 2020) argued that the change in climate during the Last Interglacial (MIS-5e) resulted in a decline in available resources and a collapse in Neanderthal populations, resulting in a rise in endocannibalism for nutritional reasons.

COMBE-GRENAL, FRANCE

The Combe-Grenal site is located in south-central France (see Figure 1) and has been excavated several times, the latest being in the 1960s. There are some 60 levels attributed to the Neanderthal occupation and the remains from Level 60 date to about 130 kya (MIS-5e). Most of the Neanderthal human remains were found in Level 25, dated between 65 and 75 kya.

In Level 25, the human remains consisted primarily of cranial and dental elements but included some post cranial materials, with the hand and foot bones being the only intact elements (Garraalda et al. 2005:191). There was no evidence of deliberate burial and the human bone was found in the rear of the cave associated with discarded tools and faunal remains of game animals (Garraalda et al. 2005:191).

Five of the fragments exhibited cut marks (Garraalda and Vandermeersch 2000; Gómez-Olivencia et al. 2013), some of which were identified as having been made by stone tools (Garraalda et al. 2005:191). No clear consensus regarding the interpretation of the cut marks has been reached (Garraalda and Vandermeersch 2000; Garraalda et al. 2005; Gómez-Olivencia et al. 2013) although Le Mort (1989) believed they reflected defleshing and dismemberment.

At least seven individuals (see Table 1) are represented in the human remains (Garraalda and Vandermeersch 2000; Gómez-Olivencia et al. 2013; also see Trinkaus 1995: Table 1). These include perhaps three adults (some younger than about 40 and some older), two adolescents (aged ≈ 12 and 14-15 years), and two children (aged ≈ 7 years). Not all of the individuals could be identified to age class and none were identified to sex. In spite of these limitations, the demographic profile is consistent with a family social unit.

LES PRADELLES (AKA MARILLAC-LE-FRANC), FRANCE

The Les Pradelles site is located along the Lignon River in south-central France (see Figure 1). Excavations at the site began in the 1960s and continue to the present. The site has been interpreted as a small, perhaps

specialized, reindeer hunting camp (Costamagno et al. 2006, 2018), dated to about 60 kya (MIS-4/3) (Maureille et al. 2007:Table 5; also see Garralda et al. 2014, 2019; Frouin et al. 2017a; Maureille et al. 2017). Approximately 100 Neanderthal skeletal specimens have been recovered, primarily in Levels 9 and 10 in the lower portion of the deposit and many of the fragments are cranial (Mussini et al. 2011).

Observed anthropogenic alterations include cut and scraping marks, percussion pits, and fragmentation. More than 35 percent of the cranial fragments (Mussini 2011; Maureille et al. 2017) and 57 percent of the long bones showed alterations (Mussini 2011). Examination of some of the cut marks by SEM showed clear traces of having been made by stone tools (Garralda et al. 2005).

The human remains appear to have been discarded with the faunal remains of game animals (Garralda et al. 2014; Maureille et al. 2017) and one of the human bones was apparently used to retouch stone tools (Rougier et al. 2016). There may have also been some scavenger activity at the site as evinced by the presence of some partially digested human teeth (classified as such due to acidic erosion on the specimens; Maureille et al. 2017).

A total of seven individuals have been identified at the site (see Table 1): three adults, two juveniles, and two infants (Maureille et al. 2007; Garralda et al. 2014). This demographic profile is again consistent with a family social unit. The modified human remains from the site exhibit evidence of defleshing, disarticulation, and long bone fragmentation and appear to have been discarded with refuse. These patterns are commonly interpreted as reflecting cannibalism (Garralda et al. 2005, 2014; Maureille et al. 2007; Mussini, 2011; Yustos and de los Terreros 2015; Maureille et al. 2017).

LA QUINA, FRANCE

The La Quina rock shelter is located in southwest France (see Figure 1). Excavations at the site occurred between 1905 and 1998 and a significant Neanderthal occupation was documented (Verna et al. 2010; Verna and d'Errico 2011).

The complete (with no anthropogenic modifications) skeleton of an adult was found, as were an additional 53 fragmentary human specimens, all associated with Neanderthals (Frouin et al. 2017b). The site was dated to between 55 and 65 kya (Frouin et al. 2017b). Anthropogenic modifications were noted on three human cranial fragments. Two specimens exhibited cut marks, scraping marks, and percussion pits, all suggestive of defleshing (Verna and d'Errico 2011). The third specimen exhibited modifications consistent with its use as a retouching tool (Rougier et al. 2016). The remains have been interpreted as possibly reflecting cannibalism (Verna and d'Errico 2011; Frouin et al. 2017b).

In addition to the complete adult skeleton, 53 other human specimens were found. These specimens represent at least four adult or subadult individuals plus one juvenile (see Table 1) (Trinkaus 1995:Table 1; Verna et al. 2010). The current data are not sufficient to define the nature of any social unit represented but are not inconsistent with a family unit.

EL SIDRÓN, SPAIN

The El Sidrón site is located near the coast in northern Spain (see Figure 1). More than 2,500 Neanderthal skeletal specimens have been recovered from the site (Rosas et al. 2017), dated to about 49 kya (Ríos et al. 2019; also see Wood et al. 2013a; de Torres et al. 2010). All portions of the skeleton have been recovered, including teeth, cranial, and post-cranial remains, as well as hand and foot bones (Rosas et al. 2012).

Approximately 30 percent of the recovered remains exhibit evidence of cut marks, percussion pits, and fragmentation. Some of the bone had also been flaked. Most of the alterations were found on the adult remains and most frequently on long bones. These alterations suggest that the individuals were defleshed, disarticulated, and fragmented (Rosas et al. 2006, 2012, 2013).

At least thirteen individuals have been identified (Rosas et al. 2013:Table 2; Rosas et al. 2017:1282), including three adult males (one mature and two young), four adult females (three mature and one young), three adolescent males (one aged $\approx 11/12$ years and two of undetermined age), two juvenile males (aged $\approx 9/10$ and $\approx 7/8$ years), and one infant of undetermined sex (aged $\approx 2/3$ years). The demographic suggested a family unit of some sort.

An analysis of the DNA from the individuals determined that the three adult males belong to the same mtDNA lineage while three adult females each had a different mtDNA lineage (Lalueza-Fox et al. 2005, 2011:50; Dean et al. 2013; Rosas et al. 2017; Ríos et al. 2019). This suggests that the adult males were all related and that the adult females had different familial origins, essentially an exogamous patrilocal “marriage” pattern. Further, the $\approx 7/8$ year old juvenile male (individual J1) was “tentatively identified as the child of adult female 4 and the older sibling of infant 1” indicating that all of the individuals belonged “to a single Neanderthal group” (Rosas et al. 2017:1282) constituting “a closely related kin group” (Ríos et al. 2019:1). These relationships also suggest that the individuals “represent all or part of a contemporaneous social group of Neanderthals, who died at around the same time” (Lalueza-Fox et al. 2011:50).

The pattern of anthropogenic alterations suggested to Rosas et al. (2006; also see Wood et al. 2013a) that cannibalism was likely practiced. In any event, there is demographic and genetic evidence that this group of remains reflects a family of Neanderthals that were killed at the same time and whose bodies were then processed.

ZAFARRAYA, SPAIN

Zafarraya is located on the southern coast of Spain near Gibraltar (see Figure 1). The site was investigated beginning in 1981 (Barroso-Ruiz and Hublin 1994; Hublin et al. 1995; Barroso-Ruiz 2003) and the Neanderthal materials there date to ≈ 46 kya (Wood et al. 2013b; Michel et al. 2013). A small number ($N = 10$) of Neanderthal skeletal remains were found in the lower levels, primarily in one location associated with a hearth (Hublin et al. 1995:934).

All of the human bone was fragmented, some had cut marks, and some of those were burned (Yustos and de los Terreros 2015:39). Several of the fragments were found within the hearth feature. There may have been some postdepositional scavenger damage (Barroso-Ruiz and Hublin 1994). Yustos and de los Terreros (2015:43) argued that the cut mark type and location suggested skinning, disarticulation, defleshing, and evisceration, and further suggested they reflected cannibalism (Yustos and de los Terreros 2015:43). The Neanderthal remains recovered from the site represented nine individuals; seven adults and two infants of undetermined sex (Barroso-Ruiz and de Lumley 2006). This is broadly consistent with a family group.

VINDIJA CAVE, CROATIA

Vindija Cave is located in the northwestern part of Croatia (see Figure 1). The site was discovered in 1928 and excavated until 1986 (Malez and Ullrich 1982; Ahern 1998; Patou-Mathis 2018). About 70 fragments of Neanderthal bone, along with Mousterian artifacts, have been recovered from Layer G. The skeletal remains date earlier than about 44 kya (Devièse et al. 2017; also see Hublin 2017).

Abundant faunal remains, almost exclusively cave bear (*Ursus spelaeus*) but including some ungulates, were found. Some of the bone had been trampled, eroded, and/or gnawed on by scavengers (Malez and Ullrich 1982). None of the cave bear remains had been modified by humans but a few of the ungulate bones showed signs of butchering (Patou-Mathis 2018).

Cut marks, percussion pits, and spiral fractures were noted on about 10 percent of the human bones (Patou-Mathis 2018). Some of the postcranial bones were broken in ways that Patou-Mathis (2018) thought were consistent with disarticulation and defleshing. None of the human bone was burned and most was found in the same deposits as the other materials.

The demographic profile of the human remains is enigmatic. Wolpoff et al. (1981) identified an MNI of at least seven, with five adults and two possible juveniles with two of the seven suggested to be female and one to be male. Ahern (1998) later recognized an MNI of six; two as adults (one young and one old), four of unknown age, and none identified to sex. Most recently, genetic studies revealed the presence of at least one female (Vi-33.19; Prüfer et al. 2017).

Studies conducted on the DNA of the remains from Vindija Cave. Gansauge and Meyer (2014; also see Green et al. 2008) reported that specimens Vi-33.19 (a female) and Vi-33.16 were related while Devèse et al. (2017) reported that specimen Vi-207 was related to Vi-33.25 and that Vi-28 was related to Vi-33.17. Prüfer et al. (2017) found that Vi-33.16, Vi-33.25, and Vi-33.26 were closely (in time) related to Vi-33.19. Finally Hajdinjak et al. (2018) reported that the mtDNA from specimens Vi-33.16, Vi-33.17, Vi-33.19, Vi-33.25, and Vi-33.26 share sufficient alleles to suggest they are broadly contemporaneous. In sum, the DNA data suggest close familial relationships between some of the individuals, possibly living at the same time.

The human remains Vindija Cave have been interpreted as reflecting cannibalism (White 2001; Patou-Mathis 2018). This conclusion was based on the presence of the cut marks and their similarity to the remains from Krapina (Patou-Mathis 2018).

GROTTE DE GOYET, BELGIUM

The Goyet site is a large cave system located above the Samson River in central Belgium (see Figure 1). The site was investigated beginning in the late 1800s and contains Upper Paleolithic and later materials plus a Neanderthal occupation (Toussaint 2006) that dates between 41 and 45 kya (Rougier et al. 2016).

A total of 96 specimens identified as Neanderthal (Rougier et al. 2016:2) has been reported. The remains are highly fragmented and exhibit cut marks, percussive marks, green bone fractures, some possible scraping marks, and some evidence of burning (Rougier et al. 2016:3). The modifications are primarily on femurs and tibias, presumably those with the highest nutritional values. The same pattern of defleshing was seen on the horse and reindeer remains from the site (Rougier et al. 2016:5). Some of the human bone was apparently used to retouch stone tools (Rougier et al. 2016).

Four adults/adolescents and one infant (the latter represented by a single tooth) could be identified from the highly fragmented remains (Rougier et al. 2016:2) (see Table 1) but data on specific ages or sex are lacking. As much of the Middle Paleolithic deposits at the site remains unexcavated, it is probable that additional individuals are present. DNA studies (Rougier et al. 2016) confirmed the Neanderthal lineage but comparison of the samples to determine whether there are any familial relationships is not yet complete (Hélène Rougier, personal communication 2021). Thus, no assessment of the nature of any social groups at the site is yet possible.

Rougier et al. (2016:6) concluded that the Goyet site contains “the first unambiguous evidence of Neanderthal cannibalism” and that the individuals were “butchered” with “their exploitation as food sources [being] the most parsimonious explanation” (Rougier et al. 2016:6). It was further concluded that the perpetrators were probably other Neanderthals since AMH are not known in that area at that time (Rougier et al. 2016:6).

DISCUSSION

There are numerous sites that contain Neanderthal skeletal remains but only a few that contain highly fragmented remains with apparent anthropogenic modifications. In these few cases, it seems evident that the remains were modified by humans but the reasons for such modifications remain unclear. It is commonly suspected that cannibalism, either nutritional or ritual, may have occurred. Others consider the possibility of some sort of specialized mortuary treatment. Unfortunately, there is currently no direct evidence to support any specific reason(s) for these patterns of anthropogenic modifications. The comparative rarity of these body modifications suggest they were not the most commonly practiced mortuary treatment.

An examination of the demographic profiles at the sites in question (see Table 1) consistently shows the presence of adults, children, and infants, suggesting the possibility that the human remains at the sites in question reflect distinct social units, such as families. Analyses of DNA at two of the sites indicate close biological relationships between some of the individuals. At El Sidrón, the adult males were related to each other while the adult females were not, suggestive of an exogamous system. In addition, one of the infants was identified as the child of one of the adult females. At Vindija Cave, close genetic relationships were noted between several of the individuals. It would further seem, given the available data on age, sex, and genetic relationships, that these families may have died at the same time. If the deaths of entire family units were synchronous, it seems most likely that violence was involved, although one cannot discount the possibility of some disease (Sullivan et al. 2017). But why would entire families be killed?

Mass killings would be consistent with nutritional cannibalism, as has been commonly proposed. It is also possible that cannibalism for food was not the goal but that people were killed for some other reason, with their bodies being processed as part of some mortuary treatment, perhaps even including ritual cannibalism.

If outsiders killed the families, they may have done so for some economic or military reason. In either case, they may have processed the “enemy” bodies in ways to denigrate them and exert power over them in the afterlife (Duncan 2005:211-212). Such treatment may have also included some level of cannibalism. If members of their own general society killed them, it may have been due to an effort to exert social control over the larger group (other families) through intimidation. The mortuary treatment afforded the dead may have been designed to terrify and demoralize others.

Similar patterns of anthropogenic modified bodies are known in the American Southwest, often interpreted as cannibalism (White 1992; Turner and Turner 1999). However, Martin (2015; also see Martin 2016; Osterholtz 2012, 2016; Osterholtz and Martin 2017) suggested that the patterns of anthropogenic modified human remains were the result of acts of extreme violence, performances designed to “erase” the victims from the landscape, cement alliances with other groups, or to gain status. While the prehistoric societies of the American Southwest and Western Europe are very different, similar motivations may have existed.

This model requires that we ask how one group of Neanderthals would have regarded other Neanderthal groups. It is typical that groups in conflict “dehumanize” each other so as to justify their killing so it would not be unreasonable to believe that the same was true between distinct Neanderthal groups, perhaps with each seeing the other as not “human” (e.g., Hortolà and Martínez-Navarro 2013). A similar argument has been made in respect to cannibalism in the prehistoric American Southwest (e.g., Palkovich 2012:114–115).

CONCLUSION

It is recognized that this model is speculative, secured by few data, and contains a number of “if, then” propositions. As such, it is very much like all of the other ideas that address the issue of the modified Neanderthal remains. Of course, further excavations at these sites could reveal additional individuals that may alter the demographic patterns noted herein and additional DNA data would be informative. In sum, the purpose of this paper is not to evaluate the merit of cannibalism, mortuary patterns, natural processes, and the like, but to call attention to the possibility that discrete social units, families, may have been the victims of violence. Such an insight may better inform future research into this fascinating phenomenon.

REFERENCES

- Ahern, James Chapin McLaughlin 1998 *Late Pleistocene Frontals of the HrvatskoZagorje: An Analysis of Intrapopulation Variation among South Central European Neandertals*. Unpublished Ph.D. dissertation, University of Michigan, Ann Arbor.

- Aufderheide, Arthur C., Iván Muñoz, and Bernardo Arriaza 1993 Seven Chinchorro Mummies and the Prehistory of Northern Chile. *American Journal of Physical Anthropology* 91(2):189-201.
- Balzeau, Antoine, Alain Turq, Sahra Talamo, Camille Daujeard, Guillaume Guérin, Frido Welker, Isabelle Crevecoeur, Helen Fewlass, Jean-Jacques Hublin, Christelle Lahaye, Bruno Maureille, Matthias Meyer, Catherine Schwab, and Asier Gómez-Olivencia 2020 Pluridisciplinary Evidence for Burial for the La Ferrassie 8 Neandertal Child. *Scientific Reports* 10(1):1-10.
- Barroso-Ruiz, Cecilio (ed.) 2003 *El Pleistoceno Superior de la Cueva del Boquete de Zafarraya*. Junta de Andalucía, Consejería de Cultura, Sevilla.
- Barroso-Ruiz, Cecilio, and Henry de Lumley 2006 *La Grotte du Boquete de Zafarraya, Málaga, Andalousie*, 3 volumes. Junta de Andalucía, Consejería de Cultura, Sevilla.
- Barroso-Ruiz, Cecilio, and Jean-Jacques Hublin 1994 The Late Neanderthal Site of Zafarraya (Andalucía, España). In *Gibraltar during the Quaternary*, edited by J. Rodríguez Vida, F. Díaz del Olmo, C. Finlayson, and F. Giles Pacheco, pp. 61-70. AEQUA Monografías No. 2.
- Beier, Judith, Nils Anthes, Joachim Wahl, and Katerina Harvati 2018 Similar Cranial Trauma Prevalence among Neanderthals and Upper Palaeolithic Modern Humans. *Nature* 563(7733):686–690.
- Bocquet-Appel, Jean-Pierre, and Juan-Luis Arsuaga 1999 Age Distributions of Hominid Samples at Atapuerca (SH) and Krapina Could Indicate Accumulation by Catastrophe. *Journal of Archaeological Science* 26(3):327-338.
- Boule, Marcelin 1911 L'homme Fossile de La Chapelle-aux-Saints. *Annales de Paléontologie* 6:111-172.
- Camarós, Edgard, Marián Cueto, Jordi Rosell, J. C. Díez, Ruth Blasco, Corinne Duhig, Andreas Darlas, K. Harvati, J. Jordá, L. Montes, V. Villaverde, and F. Rivals 2017 Hunted or Scavenged Neanderthals? Taphonomic Approach to Hominin Fossils with Carnivore Damage. *International Journal of Osteoarchaeology* 27(4):606-620.
- Carbonell, Eudald, Isabel Cáceres, Marina Lozano, Palmira Saladié, Jordi Rosell, Carlos Lorenzo, Josep Vallverdú, Rosa Huguet, Antoni Canals, and José María Bermúdez de Castro 2010 Cultural Cannibalism as a Paleoeconomic System in the European Lower Pleistocene: The Case of Level TD6 of Gran Dolina (Sierra de Atapuerca, Burgos, Spain). *Current Anthropology* 51(4):539-549.
- Churchill, Steven E. 2014 *Thin on the Ground: Neandertal Biology, Archeology, and Ecology*. John Wiley & Sons, Inc., Ames, Iowa.
- Costamagno, Sandrine, Meignen Liliane, Cédric Beauval, Bernard Vandermeersch, and Bruno Maureille 2006 Les
- Pradelles (Marillac-le-Franc, France): A Mousterian Reindeer Hunting Camp? *Journal of Anthropological Archaeology* 25(4):466–484

- Costamago, Sandrine, Laurence Bourguignon, Marie-Cecile Soulier, Liliane Meignen, Cedric Beauval, William Rendu, CelimeneMussini, Alan Mann, and Bruno Mauriella 2018 Bone Retouchers and Site Function in the Quina Mousterian: the Case of Les Pradelles (Marillac-Le-France, France). In *The Origins of the Bone Tool Technologies*, edited by Jarod M. Hutson, Alejandro García-Moreno, Elisabeth S. Noack, Elaine Turner, AritzaVillaluenga, and Sabine Gaudzinski-Windheuser, pp. 165–195. Propylaeum, Heidelberg.
- Dean, M. C., Antonio Rosas, AlmudenaEstalrrich, Antonio García-Tabernero, Rosa Huguet, Carles Lalueza-Fox, Markus Bastir, and Marco de la Rasilla 2013 Longstanding Dental Pathology in Neandertals from El Sidrón (Asturias, Spain) with a Probable Familial Basis. *Journal of Human Evolution* 64(6):678-686.
- Defleur, Alban, and Emmanuel Desclaux 2019 Impact of the Last Interglacial Climate Change on Ecosystems and Neanderthals Behavior at Baume Moula-Guercy, Ardèche, France. *Journal of Archaeological Science* 104:114-124.
- Defleur, Alban, Olivier Dutour, Hélène Valladas, and Bernard Vandermeersch 1993b Cannibals among the Neanderthals? *Nature* 362(6417):214.
- Defleur, Alban R., Emmanuel Desclaux, Rebecca S. Jabbour, and Gary D. Richards 2020 The Eemian: Global Warming, Ecosystem Upheaval, Demographic Collapse and Cannibalism at Moula-Guercy. A Reply to Slimak and Nicholson (2020). *Journal of Archaeological Science* 117:105113.
- Defleur, Alban, Olivier Dutour, Hélène Valladas, Jean Combier, and Bernard Vandermeersch 1993a Discovery of Mousterian Human Remains in AbriMoula (Soyons, Ardeche). *ComptesRendus de L Academie des Sciences Serie II* 316(7):1005-1010.
- Defleur, Alban, Tim D. White, Patricia Valensi, LudovicSlimak, and ÉvelyneCrégut-Bonnoure 1999 Neanderthal Cannibalism at Moula-Guercy, Ardèche, France. *Science* 286(5437):128-131.
- de Torres, T., J. E. Ortiz, R. Grün, Stephen Eggins, Hélène Valladas, Norbert Mercier, N. Tisnérat_Laborde, R. Juliá,
- V. Soler, E. Martínez, S. Sánchez_Moral, J. C. Cañaveras, J. Lario, E. Badal, C. Lalueza_Fox, A. Rosas, D. Santamaría, M. de la Rasilla, and J. Fortea. 2010 Dating of the Hominid (*Homo neanderthalensis*) Remains Accumulation from El Sidron Cave (Pilona, Asturias, North Spain): An Example of a Multi-Methodological Approach to the Dating of Upper Pleistocene Sites. *Archaeometry* 52(4):680-705.
- Devièsea, Thibaut, Ivor Karavanić, Daniel Comeskey, Cara Kubiak, Petra Korlević, MatejaHajdinjak, SinišaRadović, Noemi Procopio, Michael Buckley, Svante Pääbo, and Tom Higham 2017 Direct Dating of Neanderthal Remains from the Site of Vindija Cave and Implications for the Middle to Upper Paleolithic Transition. *Proceedings of the National Academy of Sciences* 114(40):10606-10611.
- Dibble, Harold L., Vera Aldeias, Paul Goldberg, Shannon P. McPherron, Dennis Sandgathe, and Teresa E. Steele 2015 A Critical Look at Evidence from La Chapelle-aux-Saints Supporting an Intentional Neandertal Burial. *Journal of Archaeological Science* 53:649-657.

- Duncan, William N. 2005 Understanding Veneration and Violation in the Archaeological Record. In *Interacting with the Dead: Perspectives on Mortuary Archaeology for the New Millennium*, edited by Gordon F. M. Rakita, Jane E. Buikstra, Lane A. Beck, and Sloan R. Williams, pp. 207-227. University Press of Florida, Gainesville, Florida.
- Estabrook, Virginia Hutton 2007 Is Trauma at Krapina Like All Other Neandertal Trauma? A Statistical Comparison of Trauma Patterns in Neandertal Skeletal Remains. *Periodicum Biologorum* 109(4):393-400.
- Estabrook, Virginia Hutton, and David W. Frayer 2013 Trauma in the Krapina Neandertals: Violence in the Middle Palaeolithic? In *The Routledge Handbook of the Bioarchaeology of Human Conflict*, edited by Christopher Knüsel and Martin Smith, pp. 113-135. Routledge, London.
- Frayer, David W., Jörg Orschiedt, Jill Cook, Mary Doria Russell, and Jakov Radovčić 2006 Krapina 3: Cut Marks and Ritual Behavior?. *Periodicum Biologorum* 108(3):519-524.
- Frayer, David W., Jakov Radovčić, and Davorka Radovčić 2020 Krapina and the Case for Neandertal Symbolic Behavior. *Current Anthropology* 61(6):713-731.
- Frouin, Marine, Christelle Lahaye, Hélène Valladas, Thomas Higham, André Debénath, Anne Delagnes, and Norbert Mercier 2017b Dating the Middle Paleolithic Deposits of La Quina Amont (Charente, France) Using Luminescence Methods. *Journal of Human Evolution* 109:30-45.
- Frouin, Marine, Christelle Lahaye, Norbert Mercier, Pierre Guibert, Isabelle Couchoud, Jean-Pierre Texier, Aurélien Royer, Sandrine Costamagno, Cédric Beauval, Laurence Bourguignon, Liliane Meignen, Jean-Guillaume Bordes, Guillaume Seguin, Hervé Bocherens, François Lacrampe-Cuyaubère, Xavier Muth, Eva-Maria Geigl,
- Rainer Grün, María Dolores Garralda, Bernard Vandermeersch, Alan E. Mann, and Bruno Maureille 2017a Chronology of the Mousterian Site of the Quina des Pradelles type (Marillac-le-Franc, Charente, France). *PALEO: Revue d'archéologie Préhistorique* 28:117-136.
- Gansauge, Marie-Theres, and Matthias Meyer 2014 Selective Enrichment of Damaged DNA Molecules for Ancient Genome Sequencing. *Genome Research* 24(9):1543-1549.
- Garralda, María Dolores 2009 Neanderthals and Corpse Handling. *Estudios de Antropología Biológica* 14(2):601-628.
- Garralda, María Dolores, and Bernard Vandermeersch 2000 The Neanderthals from the Combe-Grenal Cave (Domme, Dordogne, France). *PALEO: Revue d'archéologie Préhistorique* 12:213-259.
- Garralda, María Dolores, G. Giacobini, and Bernard Vandermeersch 2005 Neanderthal Cutmarks: Combe-Grenal and Marillac (France). A SEM Analysis. *Anthropologie* 43:189-197.

- Garralda, María Dolores, Bruno Maureille, and Bernard Vandermeersch 2014 Neanderthal Infant and Adult Infracranial Remains from Marillac (Charente, France). *American Journal of Physical Anthropology* 155(1):99-113.
- Garralda, María Dolores, Bruno Maureille, Adeline Le Cabec, Gregorio Oxilia, Stefano Benazzi, Matthew M. Skinner, Jean-Jacques Hublin, and Bernard Vandermeersch 2019 The Neanderthal Teeth from Marillac (Charente, Southwestern France): Morphology, Comparisons and Paleobiology. *Journal of Human Evolution* 138:102683.
- Gat, Azar 1999 Social Organization, Group Conflict and the Demise of Neanderthals. *Mankind Quarterly* 39(4):437454.
- Gómez-Olivencia, Asier, María Dolores Garralda, Bernard Vandermeersch, Stéphane Madelaine, Juan-Luis Arsuaga, and Bruno Maureille 2013 Two Newly Identified Mousterian Human Rib Fragments from Combe-Grenal (Domme, France). *PALEO: Revue d'archéologie Préhistorique* 24:229-234.
- Gorjanović-Kramberger, K. 1909 Der Urmensch von Krapina-Kannibale. Anzeiger der 4. *Versammlung der tschechischen Naturforscher und Ärzte*, Prague.
- Green, Richard E., Anna-Sapfo Malaspinas, Johannes Krause, Adrian W. Briggs, Philip L.F. Johnson, Caroline Uhler, Matthias Meyer, Jeffrey M. Good, Tomislav Maricic, Udo Stenzel, Kay Prüfer, Michael Siebauer, Hernán A. Burbano, Michael Ronan, Jonathan M. Rothberg, Michael Egholm, Pavao Rudan, Dejana Brajković, Željko Kućan, Ivan Gušić, Mårten Wikström, Liisa Laakkonen, Janet Kelso, Montgomery Slatkin, and
- Svante Pääbo 2008 A Complete Neandertal Mitochondrial Genome Sequence Determined by High Throughput Sequencing. *Cell* 134(3):416-426.
- Hajdinjak, Mateja; Qiaomei Fu, Alexander Hübner, Martin Petr, Fabrizio Mafessoni, Steffi Grote, Pontus Skoglund, Vagheesh Narasimham, Hélène Rougier, Isabelle Crevecoeur, Patrick Semal, Marie Soressi, Sahrá Talamo, Jean-Jacques Hublin, Ivan Gušić, Željko Kućan, Pavao Rudan, Liubov V. Golovanova, Vladimir B. Doronichev, Cosimo Posth, Johannes Krause, Petra Korlević, Sarah Nagel, Birgit Nickel, Montgomery Slatkin, Nick Patterson, David Reich, Kay Prüfer, Matthias Meyer, Svante Pääbo, and Janet Kelso 2018 Reconstructing the Genetic History of Late Neanderthals. *Nature* 555(7698):652–656.
- Hortolà, Policarp, and Bienvenido Martínez-Navarro 2013 The Quaternary Megafaunal Extinction and the Fate of Neanderthals: An Integrative Working Hypothesis. *Quaternary International* 295:69-72.
- Hublin, Jean-Jacques 2017 The Last Neanderthal. *Proceedings of the National Academy of Sciences* 114(40):10520-10522.
- Hublin, Jean-Jacques, Cecilio Barroso-Ruiz, Francisca Medina Lara, Michel Fontugne, and Jean-Louis Reyss 1995 The Mousterian Site of Zafarraya (Andalucía, Spain): Dating and Implications on the Paleolithic Peopling Processes of Western Europe. *C. R. Academy of Sciences, Paris* 321:931–937.

- Krause, Johannes, Ludovic Orlando, David Serre, Bence Viola, Kay Prüfer, Michael P. Richards, Jean-Jacques Hublin, Catherine Hänni, Anatoly P. Derevianko, and Svante Pääbo 2007 Neanderthals in Central Asia and Siberia. *Nature* 449(7164):902-904.
- Lalueza-Fox, Carles, María Lourdes Sampietro, David Caramelli, Yvonne Puder, Martina Lari, Francesc Calafell, Cayetana Martínez-Maza, Markus Bastir, Javier Fortea, Marco de la Rasilla, Jaume Bertranpetit, and Antonio Rosas 2005 Neandertal Evolutionary Genetics: Mitochondrial DNA Data from the Iberian Peninsula. *Molecular Biology and Evolution* 22(4):1077-1081.
- Lalueza-Fox, Carles, Antonio Rosas, Almudena Estalrich, Elena Gigli, Paula F. Campos, Antonio García-Tabernero, Samuel García-Vargas, Federico Sánchez-Quinto, Oscar Ramírez, Sergi Civit, Markus Bastir, Rosa Huguet, David Santamaría, M. Thomas P. Gilbert, Eske Willerslev, and Marco de la Rasilla 2011 Genetic Evidence for Patrilocal Mating Behavior among Neandertal Groups. *Proceedings of the National Academy of Sciences* 108(1):250253.
- Le Mort, Françoise 1989 Traces de Décharnement sur les Ossements Néandertaliens de Combe-Grenal (Dordogne). *Bulletin de la Société Préhistorique Française* 86(3):79-87.
- Malez, Mirko, and Herbert Ullrich 1982 Neurepaläanthropologische Untersuchungen am material aus der Höhle Vindija (Kroatien, Jugoslawien). *Palaeontologia Jugoslavica* 29:1–44.
- Malville, Nancy J. 2005 Mortuary Practices and Ritual Use of Human Bone in Tibet. In *Interacting with the Dead: Perspectives on Mortuary Archaeology for the New Millennium*, edited by Gordon F. M. Rakita, Jane E. Buikstra, Lane A. Beck, and Sloan R. Williams, pp. 190-206. University Press of Florida, Gainesville, Florida.
- Martin, Debra L. 2015 Excavating for Truths: Forensic Anthropology and Bioarchaeology as Ways of Making Meaning from Skeletal Evidence. In *Disturbing Bodies: Perspectives on Forensic Anthropology*, edited by Zoë Crossland and Rosemary A. Joyce, pp. 157–168. School for Advanced Research Press, Santa Fe, New Mexico.
- Martin, Debra L. 2016 Hard Times in Dry Lands: Making Meaning of Violence in the Ancient Southwest. *Journal of Anthropological Research* 72(1):1-23.
- Maureille, Bruno, Sandrine Costamagno, Cédric Beauval, Alan E. Mann, María Dolores Garralda, Célimène Mussini,
- Véronique Laroulandie, William Rendu, Aurélien Royer, Guillaume Seguin, and Bernard Vandermeersch 2017 The Challenges of Identifying Partially Digested Human Teeth: First Description of Neandertal Remains from the Mousterian Site of Marillac (Marillac-le-Franc, Charente, France) and Implications for Palaeoanthropological Research. *PALEO: Revue d'archéologie Préhistorique* 28:201-212.

- Maureille, Bruno, Alan Mann, Cédric Beauval, Jean-Guillaume Bordes, Laurence Bourguignon, Sandrine Costamagno, Isabelle Couchoud, F. Lacrampe-Guyauvère, V. Laroulandie, J.-C. Marquet, L. Meignen, P.-J. Texier, and Bernard Vandermeersch 2007 Le gisement moustérien des Pradelles (Marillac-le-Franc, Charente): passé, présent, futur. *XXVI Congrès Préhistorique de France*, pp. 249-261. Congrès du Centenaire, Société Préhistorique Française, Avignon-Bonnieux, France.
- Mersey, Ben, Rebecca S. Jabbour, Kyle Brudvik, Alban Defleur 2013a Neanderthal Hand and Foot Remains from Moula-Guercy, Ardèche, France. *American Journal of Physical Anthropology* 152(4):516-529.
- Mersey, Ben, Kyle Brudvik, Michael T. Black, and Alban Defleur 2013b Neanderthal Axial and Appendicular Remains from Moula-Guercy, Ardèche, France. *American Journal of Physical Anthropology* 152(4):530-542.
- Michel, Véronique, Doriane Delanghe-Sabatier, Edouard Bard, and Cecilio Barroso-Ruiz 2013 U-series, ESR and 14C Studies of the Fossil Remains from the Mousterian Levels of Zafarraya Cave (Spain): A Revised Chronology of Neandertal Presence. *Quaternary Geochronology* 15:20-33.
- Mussini, Célimène 2011 *Les restes humains moustériens des Pradelles (Marillac-le-Franc, Charente, France): étude morphométrique et réflexions sur un aspect comportemental des Néandertaliens*. Unpublished Ph.D. dissertation, University of Bordeaux, France.
- Mussini, Célimène, Alan Mann, Maria Dolores Garralda, and Bruno Maureille 2011 On One Neandertal Occipital of Les Pradelles (Marillac-le-Franc, Charente, France): A Preliminary Morphometric Study. *Comptes Rendus Palevol* 10(7):589-595.
- Orschiedt, J. 2008 Der Fall Krapina—neue Ergebnisse zur Frage von Kannibalismus beim Neandertaler. *Quartär* 55:63-81.
- Osterholtz, Anna J. 2012 The Social Role of Hobbling and Torture: Violence in the Prehistoric Southwest. *International Journal of Paleopathology* 2(2-3):148-155.
- Osterholtz, Anna J. 2016 Patterned Processing and Performance Violence. In *Theoretical Approaches to Analysis and Interpretation of Commingled Human Remains*, edited by Anna J. Osterholtz, pp. 125-138. Springer, Switzerland.
- Osterholtz, Anna J., and Debra L. Martin 2017 The Poetics of Annihilation: On the Presence of Women and Children at Massacre Sites in the Ancient Southwest. In *Bioarchaeology of Women and Children in Times of War*, edited by Caryn E. Tegtmeier and Debra L. Martin, pp. 111-128. Springer, Switzerland.
- Ortiz de Montellano, Bernard R. 1978 Aztec Cannibalism: An Ecological Necessity? *Science* 200(4342):611-617.
- Palkovich, Ann M. 2012 Community Violence and Everyday Life: Death at Arroyo Hondo. In *The Bioarchaeology of Violence*, edited by Debra L. Martin, Ryan P. Harrod, and Ventura R. Pérez, pp. 111-120. University Press of Florida, Gainesville, Florida.

- Patou-Mathis, Marylène 1997 Taphonomical and Palethnographical Analysis of the Bone Material from Krapina (Croatia): New Data on the Faunal and Human Remains. *Préhistoire Européenne* 10:63-90.
- Patou-Mathis, Marylène, Ivor Karavanić, and Fred H. Smith 2018 The Evidence from Vindija Cave (Croatia) Reveals Diversity of Neandertal Behaviour in Europe. *Quaternary International* 494:314–26.
- Pettitt, Paul B. 2002 The Neanderthal Dead: Exploring Mortuary Variability in Middle Palaeolithic Eurasia. *Before Farming* 1(1):1–26.
- Pettitt, Paul B. 2011 *The Palaeolithic Origins of Human Burial*. Routledge, New York.
- Pickering, Michael P. 1989 Food for Thought: An Alternative to “Cannibalism in the Neolithic.” *Australian Archaeology* 28(1):35-39.
- Prüfer, Kay, Cesare De Filippo, Steffi Grote, Fabrizio Mafessoni, Petra Korlević, Mateja Hajdinjak, Benjamin Vernot, Laurits Skov, Pingsun Hsieh, Stéphane Peyrégne, David Reher, Charlotte Hopfe, Sarah Nagel, Tomislav Maricic, Qiaomei Fu, Christoph Theunert, Rebekah Rogers, Pontus Skoglund, Manjusha Chintalapati, Michael Dannemann, Bradley J. Nelson, Felix M. Key, Pavao Rudan, Željko Kućan, Ivan Gušić, Liubov V. Golovanova, Vladimir B. Doronichev, Nick Patterson, David Reich, Evan E. Eichler,
- Montgomery Slatkin, Mikkel H. Schierup, Aida M. Andrés, Janet Kelso, Matthias Meyer, and Svante Pääbo 2017 A High-Coverage Neandertal Genome from Vindija Cave in Croatia. *Science* 358(6363):655-658.
- Rendu, William, Cédric Beauval, Isabelle Crevecoeur, Priscilla Bayle, Antoine Balzeau, Thierry Bismuth, Laurence Bourguignon, Géraldine Delfour, Jean-Philippe Faivre, François Lacrampe-Cuyaubère, Carlotta Tavormina, Dominique Todisco, Alain Turq, and Bruno Maureille 2014 Evidence Supporting an Intentional Neandertal Burial at La Chapelle-aux-Saints. *Proceedings of the National Academy of Sciences* 111(1):81-86.
- Richards, Gary D., Gaspard Guipert, Rebecca S. Jabbour, and Alban R. Defleur 2021 Neanderthal Cranial Remains from Baume Moula Guercy (Soyons, Ardèche, France). *American Journal of Physical Anthropology* 175(1):201-226.
- Ríos, Luis, Tracy L. Kivell, Carles Lalueza-Fox, Almudena Estalrich, Antonio García-Tabernero, Rosa Huguet, Yuliet Quintino, Marco de la Rasilla, and Antonio Rosas 2019 Skeletal Anomalies in the Neandertal Family of El Sidrón (Spain) Support A Role of Inbreeding in Neandertal Extinction. *Scientific Reports* 9(1):1-11.
- Rosas, Antonio, Almudena Estalrich, Samuel García-Vargas, Antonio García-Tabernero, Rosa Huguet, Carles Lalueza-Fox, and Marco de la Rasilla 2013 Identification of Neandertal Individuals in Fragmentary Fossil Assemblages by Means of Tooth Associations: The Case of El Sidrón (Asturias, Spain). *Comptes Rendus Palevol* 12(5):279-291.

- Rosas, Antonio, AlmudenaEstalrrich, Antonio García-Tabernero, Markus Bastir, Samuel García-Vargas, Andrea Sánchez-Meseguer, Carles Lalueza-Fox, Elena F. Kranioti, and Javier Fortea 2012 The Neandertals from El Sidrón (Asturias, Spain). Updating of a New Sample. *Anthropologie* 116(1):57-76.
- Rosas, Antonio, Luis Ríos, AlmudenaEstalrrich, Helen Liversidge, Antonio García-Tabernero, Rosa Huguet, Hugo Cardoso, Markus Bastir, Carles Lalueza-Fox, Marco de la Rasilla, and Christopher Dean 2017 The Growth Pattern of Neandertals, Reconstructed from a Juvenile Skeleton from El Sidrón (Spain). *Science* 357(6357):1282–1287.
- Rosas, Antonio, Cayetana Martínez-Maza, Markus Bastir, Antonio García-Tabernero, Carles Lalueza-Fox, Rosa Huguet, José Eugenio Ortiz, Ramón Julià, Vicente Soler, Trinidad de Torres, Enrique Martínez, Juan Carlos Cañaveras, Sergio Sánchez-Moral, Soledad Cuezva, Javier Lario, David Santamaría, Marco de la Rasilla, and Javier Fortea 2006 Paleobiology and Comparative Morphology of a Late Neandertal Sample from El Sidrón, Asturias, Spain. *Proceedings of the National Academy of Sciences* 103(51):19266-19271.
- Rougier, Hélène, Isabelle Crevecoeur, Cédric Beauval, Cosimo Posth, Damien Flas, Christoph Wißing, Anja Furtwängler, Mietje Germonpré, Asier Gómez-Olivencia, Patrick Semal, Johannes van der Plicht, HervéBocherens, and Johannes Krause 2016 Neandertal Cannibalism and Neandertal Bones used as Tools in Northern Europe. *Scientific Reports* 6(1):1-11.
- Russell, Mary D. 1987a Mortuary Practices at the Krapina Neandertal Site. *American Journal of Physical Anthropology* 72(3):381-397.
- Russell, Mary D. 1987b Bone Breakage in the Krapina Hominid Collection. *American Journal of Physical Anthropology* 72(3):373-379.
- Saladié, Palmira, and Antonio Rodríguez-Hidalgo 2017 Archaeological Evidence for Cannibalism in Prehistoric Western Europe: From *Homo antecessor* to the Bronze Age. *Journal of Archaeological Method and Theory* 24(4):1034-1071.
- Schmitz, Ralf W., David Serre, Georges Bonani, Susanne Feine, Felix Hillgruber, Heike Krainitzki, Svante Pääbo, and Fred H. Smith 2002 The Neandertal Type Site Revisited: Interdisciplinary Investigations of Skeletal Remains from the Neander Valley, Germany. *Proceedings of the National Academy of Sciences* 99(20):13342-13347.
- Slimak, Ludovic, and Christopher Nicholson 2020 Cannibals in the Forest: AComment on Defleur and Desclaux (2019). *Journal of Archaeological Science* 117:105034.
- Stiner, Mary C. 2017 Love and Death in the Stone Age: What Constitutes First Evidence of Mortuary Treatment of the Human Body? *Biological Theory* 12(4):248-261.
- Sullivan, Alexis P., Marc de Manuel, Tomas Marques-Bonet, and George H. Perry 2017 An Evolutionary Medicine Perspective on Neandertal Extinction. *Journal of Human Evolution* 108:62-71.

- Sutton, Mark Q. 2021 *Bioarchaeology: An Introduction to the Archaeology and Anthropology of the Dead*. Routledge, London.
- Toussaint, Michel 2006 1997-2005 Research in the Caves of Goyet (Gesves, Province of Namur, Belgium), Tongeren Neandertal Symposium Excursion, 19 September 2004. In *Neanderthals in Europe: Proceedings of the International Conference held in the Gallo-Roman Museum in Tongeren (September 17-19th 2004)*, edited by B. Demarsin and M. Otte, pp. 115-134. ATVATVCA 2, Publicaties van het Provinciaal Gallo-Romeins Museum Tongeren.
- Trinkaus, Erik 1975 The Neandertals from Krapina, Northern Yugoslavia: An Inventory of the Lower Limb Remains. *Zeitschrift für Morphologie und Anthropologie* 67:44-59.
- Trinkaus, Erik 1983 *The Shanidar Neandertals*. Academic Press, New York.
- Trinkaus, Erik 1985 Cannibalism and Burial at Krapina. *Journal of Human Evolution* 14(2):203-216.
- Trinkaus, Erik 1995 Neanderthal Mortality Patterns. *Journal of Archaeological Science* 22(1):121-142.
- Trinkaus, Erik, and Sébastien Villotte 2017 External Auditory Exostoses and Hearing Loss in the Shanidar 1 Neandertal. *PLoS One* 12(10):e0186684.
- Turner, Christy G. II, and Jacqueline A. Turner 1999 *Man Corn: Cannibalism and Violence in the Prehistoric American Southwest*. University of Utah Press, Salt Lake City, Utah.
- Ullrich, Herbert 1978 Kannibalismus und Leichenzerstückelung beim Neandertal von Krapina. In *Krapinski pračovi je k evoluciji hominida*, edited by M. Malez, pp. 293-318. Jugoslavenska akademija znanosti i umjetnosti, Zagreb.
- Ullrich, Herbert 1989 Neandertal Remains from Krapina and Vindija Mortuary Practices, Burials or Cannibalism? *Humanbiologie Budapest* 19:15-19.
- Ullrich, Herbert 2004 Patterns of Skeletal Representation, Manipulations on Human Corpses and Bones, Mortuary Practices and the Question of Cannibalism in the European Palaeolithic—An Anthropological Approach. *OPUS: Interdisciplinary Investigation in Archaeology* 3:24-40.
- Ullrich, Herbert 2005 Cannibalistic Rites within Mortuary Practices from the Paleolithic to Middle Ages in Europe. *Anthropologie* 43(2/3):249-261.
- Ullrich, Herbert 2006 Krapina-A Mortuary Practice Site with Cannibalistic Rites. *Periodicum Biologorum* 108(4):503-517.
- Valensi, Patricia, Evelyne Crégut-Bonnoure, and Alban Defleur 2012 Archaeozoological Data from the Mousterian

- Level from Moula-Guercy (Ardèche, France) Bearing Cannibalised Neanderthal Remains. *QuaternaryInternational* 252:48-55.
- Verna, Christine, and Francesco d'Errico 2011 The Earliest Evidence for the Use of Human Bone as a Tool. *Journal of Human Evolution* 60(2):145-157.
- Verna, Christine, Jean-Jacques Hublin, Andre' Debenath, Arthur Jelinek, and Bernard Vandermeersch 2010 Two New Hominin Cranial Fragments from the Mousterian Levels at La Quina (Charente, France). *Journal of Human Evolution* 58(3):273-278.
- White, Tim D. 1992 *Prehistoric Cannibalism at Mancos 5MTUMR-2346*. Princeton University Press, Princeton, New Jersey.
- White, Tim D. 2001 Once Were Cannibals. *Scientific American* 285(2):58-65.
- White, Tim D., and Nickolas Toth 2007 Carnivora and Carnivory: Assessing Hominid Toothmarks in Zooarchaeology. In *Breathing Life into Fossils: Taphonomic Studies in Honor of C. K. (Bob) Brain*, edited by Travis Rayne Pickering, Nicholas Toth, and Kathy Schick, pp. 281-296. Stone Age Institute Press, Gosport, Indiana.
- Willmes, Malte, Rainer Grün, Katerina Douka, Véronique Michel, Richard A. Armstrong, Alexa Benson, Evelyne Crégut-Bonnoure, Emmanuel Desclaux, Fang Fang, Leslie Kinsley, ThibaudSaosh, and Alban R. Defleur 2016 A Comprehensive Chronology of the Neanderthal Site Moula-Guercy, Ardèche, France. *Journal of Archaeological Science: Reports* 9:309-319.
- Wolpoff, Milford H. 1979 The Krapina Dental Remains. *American Journal of Physical Anthropology* 50(1):67-113.
- Wolpoff, Milford H., and Rachel Caspari 2006 Does Krapina Reflect Early Neandertal Paleodemography? *PeriodicumBiologorum* 108(4):425-432.
- Wolpoff Milford H., Fred H. Smith, MirkoMalez, JakovRadovčić, and DarkoRukavina 1981 Upper Pleistocene Human Remains from Vindija Cave, Croatia, Yugoslavia. *American Journal of Physical Anthropology* 54(4):499-545.
- Wood, Rachel E., Cecilio Barroso-Ruiz, Miguel Caparrós, Jesús F. Jordá Pardo, BertilaGalván Santos, and Thomas F. G. Higham 2013b Radiocarbon Dating Casts Doubt on the Late Chronology of the Middle to Upper Palaeolithic Transition in Southern Iberia. *Proceedings of the National Academy of Sciences* 110(8):2781-2786.
- Wood, Rachel E., Thomas F. G. Higham, Trinidad de Torres, Nadine Tisnérat-Laborde, Hélène Valladas, José E. Ortiz, Carles Lalueza-Fox, S. Sánchez-Moral, J. C. Cañaveras, Antonio Rosas, DavidSantamaría, and

Marcode la Rasilla 2013a A New Date for the Neanderthals from El Sidrón Cave (Asturias, northern Spain). *Archaeometry* 55(1):148-158.

Yustos, Marta, and José YravedraSainz de losTerroros 2015 Cannibalism in the Neanderthal World: An Exhaustive Revision. *Journal of Taphonomy* 13(1):33-52.

Zollikofer, Christoph P. E., Marcia S. Ponce De Leon, Bernard Vandermeersch, and François Lévêque 2002 Evidence for Interpersonal Violence in the St. Césaire Neanderthal. *Proceedings of the National Academy of Sciences* 99(9):6444-6448.