

# Fragmented Remains: A Case for Social Memory vs. Violence

Jason Rasmussen

*This paper addresses the purposeful disarticulation and fragmentation of human skeletal remains as a form of burial practice. These burials date from the Paleolithic to the Neolithic periods in Central Europe and Britain and are occasionally associated with cave sites. The most famous of these burials was recovered from the site of Herxheim, Germany; Controversial interpretation has argued that the site represents evidence for ritual cannibalism and widespread interpersonal violence. However, it is equally plausible that these burial practices are a part of a systematic belief system of ritualized destruction of the body as part of a sacred act carried out to insure a proper funeral. It is argued here that several instances of supposedly violent acts are in reality the result of defleshing and disarticulative ritual associated with death and burial. Through a review of disarticulated and fragmented skeletal remains found at multiple sites in Europe; contemporaneous with the site of Herxheim, this paper compares purposeful ritual destruction of the body to episodes of violence. This includes an analysis of both human remains and accompanying material culture at the sites of Grotto Scaloria, Italy and Gough's Cave, England as well as others in the late Paleolithic and Neolithic (12,000 to 4950 B.C.E.).*

## Introduction

Death is complicated. While that statement is a trite platitude, it is also very true. The issue of death, what causes it, what comes after it, and how human beings react to it has been the origin of many famous works in human history. There are a host of questions regarding the conceptualization of death that are extremely important, and without question these conceptions affected the behavioral patterns of ancient peoples. However, they are beyond the scope of this paper. Rather, this paper is concerned with the complexity of what people do to a body once it is dead.

Across Neolithic Europe there were a wide range of actions that past societies took part in regarding the deceased members of their society. Traditional inhumations, cremations, single or collective graves and burial within the home are just a few examples of burial practice during this period. This paper suggests the possibility of purposeful fragmentation and intentional defleshing of human remains prior to burial as a form of funerary ritual across the Old World during the Paleolithic and Neolithic as opposed to popular cannibalism theories that have been suggested within the literature.<sup>1</sup>

## The Argument for Violence

Fragmentary remains discovered in archaeological contexts from the Neolithic period in Europe are often assumed to be associated with violent encounters between warring groups. These assumptions are presented as an action performed by the dominant groups over the bodies of their slain victims, and some authors have gone so far as to suggest that such acts of domination featured cannibalism.<sup>2</sup> These arguments are for skeletal fragmentation as an active process by humans instead of passive events resulting from taphonomic situations.<sup>3</sup> This explanation was not always the default interpretation of European

Neolithic death and burial. Prior to the 1990s, Neolithic Europe was painted as a place of peace and relative egalitarian cooperation.<sup>4</sup> However the discovery of the site of Talheim in Germany almost single handedly altered this perception of Neolithic in Europe forever.<sup>5</sup>

The site of Talheim dates to the later Linear-Band-Culture (LBK) period from approximately 5060-4670 B.C.E.<sup>6</sup> Pottery fragments of LBK styles featuring scored bands with line patterns, long houses with southwest facing entrances, and ground stone axes are all typological features found in other communities of the LBK where more firm dates are possible.<sup>7</sup> What makes Talheim unique is the presence of a mass grave with evidence for perimortem trauma, trauma that occurred at the time of death. Within the burial there were thirty-four individuals, including adult males, elderly men and women, and non-adults.<sup>8</sup> Evidence for blunt force trauma to the back of the skull was identified on several individuals, with others featuring injuries consistent with projectile trauma, several of which still had arrows embedded in their bones. All were deposited into a single large grave (3 m x 1.5 m).<sup>9</sup> It should be noted that none of these individuals were fragmented before burial, instead they were deposited as complete bodies into the mass grave immediately after death.<sup>10</sup> Ancient DNA studies of the thirty-four individuals in the mass grave show that they were genetically related, supporting the idea that this act of violence was a targeted attack on a defined kinship group or community.<sup>11</sup> Possible motives for the attack range from the capture of women, the raiding for loot, and to hunter-gathers looking to force LBK populations out of their territory.<sup>12</sup> Motives for the attack at Talheim remain unclear largely due to the fact that we are not certain who attacked in the first place.<sup>13</sup> We know violence between small groups did occur from time to time, more than simple interpersonal violence between paired single individuals. Since the discovery

of Talheim more massacre sites, with clear evidence of a single traumatic event producing multiple simultaneous casualties, have been unearthed, such as Schletz, Austria.<sup>14</sup> Cases of burial with projectile points in the Greek islands<sup>15</sup> and a number of healed signs of violence in skeletons from Britain have also been found.<sup>16</sup> All of which show that we cannot interpret Talheim as an isolated incident. Violence was a fact of life, which does not mean that multiple traumatic deaths like that of Talheim were the norm. It also does not mean that burials featuring fragmentation are necessarily evidence of systematic violence between groups.

#### The Bioarchaeology of Intentional Fragmentation

The assumption that violence is the sole reason for fragmented remains limits the scope interpretation to one theory. This theory would state that the fragmented remains belong to groups of 'others' or 'outsiders' in direct conflict with the community doing the fragmentation. This includes the Neolithic sites of Herxheim, Germany (5300-4950 B.C.E.) where massive amounts of human remains have been found in pits/ditches around a habitation area.<sup>17</sup> These remains have been significantly fractured and show evidence of burning.<sup>18</sup> Boulestin and Coupey have gone so far as to propose that these remains were the result of systematic violence and cannibalism by the people of Herxheim on the surrounding communities as a show of dominant force.<sup>19</sup> The crux of their argument lies in the fact that many of the bones show signs of butchery and processing that go beyond the minimum number of cuts or scrapings necessary to remove any lingering tissue from the bone.<sup>20</sup> They present this data in a cumulative pattern of cut marks across all of the skulls at Herxheim.<sup>21</sup> There is a distinctive pattern of cuts along the sagittal margin along the anterior, superior, and posterior surfaces of the skull, but underneath there are relatively few cut marks. This is strange considering

this is where there are significant muscle attachments, vascular formations, and respiratory organs would be located.<sup>22</sup> If these cut marks were solely to remove flesh one would expect to see more cutting at those locations instead of along the crown of the skull, which is covered primarily by the scalp and not muscle tissue. Dittmar and Mitchell in 2015 discussed surgical marks left on bone in the modern removal of flesh by medical students. These results differ greatly from the markings presented at Herxheim. To explain this difference Boulestin and Coupey suggest instead that such marks are to de-humanize the victims and destroy who they are as individuals as a means of domination.<sup>23</sup>

Several of these skulls also appear to have been used for periods of time in a cultural or ritual context as 'skull cups' which appear in a great number of cases.<sup>24</sup> Similar cups have been found at the site of Gough's Cave, England which dates to roughly 12,700 B.C.E., over 5,000 years older than the remains found at Herxheim or other LBK sites.<sup>25</sup> These cups are the result of deliberate fracturing of the skull along the frontal, temporal, and occipital bones to separate the skull cap intact, so it can be used as a vessel. The cups which were made in the site of Gough's Cave, England follow a similar pattern of construction as those Herxheim.<sup>26</sup> If compared to the remains from Herxheim as presented by Boulestin and Coupey's 2015 we can see a similar pattern was followed to produce these 'vessels'. In both sites violence and cannibalism are cited as the motivation behind the creation of this type of artifact. This means that the assumption linking the behavior separated by thousands of years to a single motivation. That the creation of skull-cups and their use could only be a dominative or negative function of society. Some have taken this line of thought to a Malthusian extreme by stating that such acts were the result of "Crises Management" as ancient populations tried to adapt to the rapid change resulting from climate change

of the last ice age as cultures struggled to cope with the change.<sup>27</sup> Such explanations are expressed by Bauer et al. in the belief of sacrifice as the “destruction of precious things—the most precious being a human life”.<sup>28</sup> This argument assumes that the people of Herxheim or Gough’s Cave share our modern Western Judeo-Christian perception that human bodies are sacred or need to be preserved intact to convey memory or respect to the individual in life.

The number of individuals found at these sites are one of the major points that the authors of these papers make to suggest that violence was at work in these communities. For the site of Herxheim the minimum number of individuals (MNI) is at least 104. This includes all age groups of males and females as of the 2005-2010 excavations.<sup>29</sup> These remains were found in ditches which surrounded the habitation area of Herxheim after they had been heavily fragmented using stone tools, fire, and possibly even human chewing. The term “butchery marks” are used throughout their discussion of these remains due to their comparison to animal bones which come from known cooking/processing context and that show evidence of cutting to remove flesh for consumption purposes. These actions become standardized through the repeated process of cleaning an animal and preparing it for a meal, becoming ingrained in human behavior specific to the methodology of that community. Boulestin and Coupey present the idea that the defleshing process of human remains at Herxheim was violent and sadistic. They present this information in single image of their 2015 work where all cut marks across a spectrum of several individuals are layered on the image of a single skull. These images give the impression that the remains were savagely processed in the extreme to support their interpretation of cannibalism or otherwise generally negative role such actions would have represented in past societies.

This type of interpretation is common

when discussing fragmentary remains. Similar arguments have been made for fragmentation of human remains in the Paleolithic and beyond by Paul Pettitt in his book *The Paleolithic Origins of Human Burial*.<sup>30</sup> In this work he links the act of fragmentation to what he terms ‘the Cronos Compulsion’. He defines this as an instinctual or primal urge to “dismember, injure or consume parts of the bodies of one’s conspecifics”.<sup>31</sup> He admits that this term comes from the classical Greek myth of the Titan Cronos who consumed his children whole before they could overthrow him as the chief deity. Yet Pettitt does not discuss the inherent negative connotations such a name has or how linking the myth to the practice of fragmentation or cannibalism portrays it as an act of domination or fear; one which ultimately seeks to destroy or erase individuals from existence.<sup>32</sup> Also, by calling it a ‘compulsion’ he limits the ritual or cultural significance of fragmentation to some form of mental defect or savage holdover from when people were not yet separated from animals.

#### Defleshing and Fracturing of Bodies as Memory

By solely focusing on the violence of the defleshing process and jumping to the conclusion of cannibalism these interpretations limit the scope of complexity of past cultures and the post-mortem treatment of the deceased. The same can be said by only looking at the act of fragmentation or ritualized destruction as an inherently negative action revolving around the need to dominate or degrade those which it has been performed on, which is a very modern and Western concept of these issues. Issues of cannibalism and violence should also be viewed within the context of the American Southwest in Cowboy Wash.<sup>33</sup> Prior to work by Dongoske et al. the American Southwest was viewed in a similar way to the case of Neolithic Europe as presented here.<sup>34</sup> Their work looks at how the cultural acts of dismemberment

and consumption of human flesh can exist outside the contexts of violence and domination, instead as aspects of a complex set of beliefs designed to remember and celebrate the dead.<sup>35</sup> This is a different form of social memory than the modern world is used to.

The act of preservation in special locations such as libraries, museums and universities is the only way many in the modern world know how to maintain the memory of time, people, places or things in such a rapidly changing world.<sup>36</sup> But some cultures feel that 'selective memory or selective forgetting' is more important to the continuation of their cultural identities and that by 'losing' or forgetting certain aspects of one's past they free up their future to change or allows for them to actively change their history through manipulation of past events in the retelling of the tale.<sup>37</sup> Some communities, such as the modern Mapuche of Chile, see the destruction of objects which were personal belongings to powerful individuals like shamans as a means of dispersing the power or essence of that individual back into the cosmos so they can return in another form generations later.<sup>38</sup> These personal items such as jewelry, clothing, ritual drums, and headdresses are often seen as extensions of the deceased's physical body and thus must be destroyed to free the essence.<sup>39</sup> The Mapuche also practice selective forgetting and actively avoiding discussing the deceased individual for the purpose of letting the transgressions of the individual in life fade from memory so only positive associations can be made in future telling of their story, and to prevent ghosts of the dead from coming back to haunt the living.<sup>40</sup> While such similar practices are currently impossible to detect for Neolithic sites like Herxheim due to their intangible nature, they cannot be completely dismissed out of hand. But what we can observe is that the fragmentation of remains was not a one-time activity, and instead represented a repetitive action over long periods of time which appear to have some standardizations

or 'rules' much like the acts of selective forgetting and the destruction of items of personal connection.

The number of individuals found at Herxheim suggests that such actions occurred over successive events. Along with the standardization of cut marks shown already in this paper, this notion shows that the processing of individuals conformed to preconceived notions of how to perform the task which may have been present at Gough's Cave during the Paleolithic. Such sites are not limited to Herxheim, Gough's Cave, or Scaloria Cave. The examples presented in this work are just a sampling of sites which contain remains which were burned, fragmented, or show some signs of cut marks. The reason these examples were chosen for discussion was because they represent collections which were created over successive events in different areas of Europe.

Scaloria Cave (Grotta Scaloria in Italian) was originally discovered during the expansion of water-sewage lines into underground aquifers by Dottore Quintio in 1931.<sup>41</sup> Since that discovery the cave systems of Scaloria, neighboring Occhiopinto caves, which are connected to the surrounding area, have been studied by several generations of archeologists, including the famed Marija Gimbutas from the 1970s to the 80s.<sup>42</sup> Scaloria is one of the best dated Neolithic sites in Italy due to its long history of study. Thirty-two radiocarbon dates have been obtained showing that there were at least four major periods of activity for the cave use and the surrounding area.<sup>43</sup> Scaloria is an extremely complicated site comprising a habitation area outside the cave, multiple chambered cave systems which have collapsed since their use during the Neolithic, a water cult in the Lower Chamber, and a collective burial of highly fragmented human remains located in the Upper Chamber. The earliest date links to the 12th millennium B.C.E., suggesting that the cave was used by hunter-gathers as

shelter during the last Glaciation.<sup>44</sup> Ritual deposition of bodies in the Upper Chamber appears to have started around 5200 B.C.E., prior to the establishment of a water cult in the Lower Chamber.<sup>45</sup> Unlike Herxheim, ritual deposition has long been seen as the purpose for the fragmentation of remains at Scaloria, not warfare or cannibalism.<sup>46</sup>

For years the remains of the Upper Chamber were essentially ignored due to the original excavators believing them to be representative of only a few individuals, whose burial was disturbed and crushed during a cave-in.<sup>47</sup> From the 1% of the Upper Chamber which has been systematically excavated, approximately 22 to 31 individuals have been recovered and analyzed.<sup>48</sup> The remains of these individuals, like those at Herxheim, are extremely fragmented through the use of intentional cutting with stone tools and fire while the body was still fresh.<sup>49</sup> These are the same type of markings found at Herxheim and often many of the same locations on each element. The population of Scaloria covers both male and female, young and old, with the exception of neo-natal remains, with a relatively high number of juvenile remains suggesting that there could have been a very high child mortality rate in Neolithic Italy.<sup>50</sup> In terms of overall health within this burial population, there are no signs of major pathological conditions. Cribra Orbitalia, often considered a sign of non-specific stress, healed ante-mortem fracture and infection were relatively uncommon.<sup>51</sup>

The remains were placed into pits inside the cave, close to the natural entrance to the cave during the Neolithic, and were scattered across the floor.<sup>52</sup> John Robb notes that at least five distinct patterns of burial were practiced at Scaloria ranging from the placement of individual elements, full skeletons which have been actively defleshed, and fractured with and without grave goods (many also fractured at time of burial) and classical secondary burial treatment.<sup>53</sup> Different methods appear to

be associated with certain time periods of the depositions, but more study is needed to confirm this because the sample only comes from 1% of the Upper Chamber's total excavation area.<sup>54</sup>

#### Comparing Herxheim and Scaloria

Unfortunately, these two sites use different standards of recording their data, but comparison between the data suggests similar elements were cut prior to deposition across both sites.<sup>55</sup> The cranium, mandible, scapula, and long bones are the elements most often and more heavily processed. As discussed earlier, many of the cuts on the crania at Herxheim were most likely for the shaping of skull cups, a type of modification not seen at Scaloria. These elements of the body are also the most heavily represented in both sites along with loose vertebrae.

Boulestin and Coupey argue that such cut marks represent the cutting of meat from bone in order to consume it.<sup>56</sup> On the other hand, at Scaloria, Knusel<sup>57</sup> and Robb<sup>58</sup> conclude that the marks are in line with known practices of secondary burial like those found in the Near East where bodies are cleaned of the remaining flesh before burial in a final location, and/or the ritual processing of bodies while they are still fresh in the form of long and complex funerary practice.<sup>59</sup> The placement of these cut marks are often associated with major muscle and ligament attachment sites, which would require human action in order to clean the bones. The cranium and mandible have a large number of such attachments due to the presence of muscles of the back/neck needed for chewing/speaking, which could be why these elements in both sites have the largest number of cuts and other modifications on their surfaces.<sup>60</sup> Often such cut marks on humans are compared to animal remains which have clearly been processed for human consumption. Butchery practices become standardized within communities and cultures as people perform the task over and over for a specific purpose.<sup>61</sup> This

is often cited as evidence of cannibalism due to the fact that human bones have been processed like animals, but rarely do they discuss the fact that the skeletal/muscular system of mammals share many of the same elements and attachments due to similar needs of locomotion and structural support. Paleolithic-Neolithic populations still relied heavily on game animals, and it is not out of the realm of possibility that the knowledge to properly clean an animal for consumption would be widely known in these communities, and that such knowledge might be transferred to human remains in a funerary context. However, to further establish this assumption we would need to know about ancient populations' perceptions of the body, especially if these communities have similar cosmologies to South American hunter-gather tribes in which we see familial relationships in nature.<sup>62</sup>

### Conclusion

Systematic violence, like fractures on fresh vs dry bones, leaves its own fingerprint on human remains.<sup>63</sup> Warfare and conflict create certain types of marks such as substantial breaks in bones, cut wounds from hand axes, or blunt force trauma like that seen at Talheim. Some evidence for these kinds of markings are found at Herxheim and Scaloria in the remains, but much of it appears to be older trauma occurring many years prior to death which had healed.<sup>64</sup> If Herxheim was the site of mass executions for the sake of domination we would expect to find clear evidence of violence as the direct cause of death, similar to human remains found in Mesoamerica.<sup>65</sup> For the majority of remains at both Herxheim and Scaloria the cause of death appears to have been natural, or at least not violent in a way that would leave marks on the skeletons.

Strontium studies of the two sites are remarkably similar. The remains from both sites do not come just from the site itself, but from other communities from

the surrounding villages and towns. The individuals buried at Scaloria are from a large region surrounding the Tavoliere plain.<sup>66</sup> Many of these individuals from farther away are only represented by a single skeletal element such as a long bone (or fragments of it) with no matches biologically to the rest of the samples.<sup>67</sup> The frequency of cut marks on the bones for those outside the local region are significantly fewer, suggesting that they were not processed while fresh.<sup>68</sup> Robb has suggested that this is because these remains come from villages farther out and that a more traditional secondary burial practice was used, thus not requiring the cutting. Elements of those remains were then transported to Scaloria for the purpose of being comingled with other remains in some form of enchainment.<sup>69</sup> The preliminary strontium test at Herxheim shows similar situations where individuals from further away than the surrounding areas were brought to Herxheim. The bones of 'foreigners' in the pits/ditches are mixed in with more local individuals.<sup>70</sup> The Herxheim remains are often found with intentionally smashed pottery, which often corresponds to strontium studies of the surrounding communities.<sup>71</sup>

Boulestin and company, as discussed above, believe that such evidence points to the shipment of humans to Herxheim for the purpose of execution and ultimately cannibalization as a show of domination. But as pointed out, there is a distinct lack of perimortem trauma in the remains of Herxheim to support a systematic violent end for these individuals. This factor, coupled with the fact that local and not local individuals are processed in the same way and disposed of collectively, show that it is highly unlikely that acts of domination are at play here. Instead, a situation like that suggested by Robb for Scaloria is more likely, meaning that the site of Herxheim was a focal point for the caching of the dead as some form of collective identity and that the fragmentation is part of rituals

designed to ‘free’ the essence or personality of the living from the bones, similar to the examples discussed above from South America.

Similar arguments have been made for remains found in the New World at Cowboy Wash.<sup>72</sup> This work looks at how sensationalized remains were traditionally viewed as signs of cannibalism based on the contact reports of Tanio by Columbus and his crew without any consideration to the ethnographic data of how cannibalism both ritual and symbolic actually functions in pre-contact societies. Instead Dongoske and coauthors argue that, similar to what has been argued here, the purpose for such actions was not ‘violence’, but actions that promote continuation and interconnectivity of the community. It is time that similar approaches are used to examine Neolithic populations of Europe.

---

Endnotes:

- 1 See Villa et al. 1986; Brothwell 1961; Boulestin et al. 2009; Kansa et al. 2009 and Carbonell et al. 2010 for arguments for cannibalism in Neolithic Europe.
- 2 Villa et al. 1986; Brothwell 1961; Boulestin et al. 2009; Kansa et al. 2009; Carbonell et al. 2010.
- 3 Pokines and Symes 2013 discusses fragmentation of human bone from natural processes such as weathering and soil chemistry.
- 4 Armit 2011, 51.
- 5 Armit 2011, 51.
- 6 Wahl and Trautmann 2012, 78.
- 7 Dolukhanov et al. 2005.
- 8 Wahl and Trautmann 2012, 98-99.
- 9 Price, Wahl, and Bentley 2008, 264.
- 10 Wahl and Trautmann 2012, 77.
- 11 Bentley 2007.
- 12 Wahl and Trautmann 2012, 99.
- 13 See Wahl and Trautmann 2012, 99 for a summary of possible motives for Talheim.
- 14 Teschler-Nicola et al. 1999.
- 15 Papanastasiou 2012.
- 16 Schulting 2012.
- 17 Boulestin et al. 2009, 969.
- 18 Boulestin et al. 2009, 971-973.
- 19 Boulestin and Coupey 2015, 115-133.
- 20 Boulestin and Coupey 2015, 79- 100.
- 21 Boulestin and Coupey 2015, 81- 83.
- 22 Sampson, Montgomery, and Henryson 1991, 141-155.
- 23 Boulestin and Coupey 2015, 125-126.
- 24 Boulestin and Coupey 2015, 84.
- 25 Bello et al. 2011, 2.
- 26 Bello et al. 2011, 5 for Gough’s Cave and Boulestin; Coupey 2015, 83 for Herxheim.
- 27 Bauer et al. 2016, 171-195.
- 28 Bauer et al. 2016, 185.
- 29 Boulestin and Coupey 2015, 101.
- 30 Pettitt 2011.
- 31 Pettitt 2011, 9.
- 32 Pettitt 2011, 9.
- 33 Dongoske et al. 2000.
- 34 See White 2014 and Martin 2016 for arguments for violence and cannibalism in the American South-West.
- 35 Dongoske et al. 2000, 180-182.
- 36 Scantros-Ganero 2012, 52.
- 37 Scantros-Ganero 2012, 52-53.
- 38 Bacigalupo 2015, 200-225.
- 39 Bacigalupo 2015, 220.
- 40 Bacigalupo 2015, 220-225.
- 41 Elster et al. 2016, xxiii.
- 42 Elster et al 2016, xxiii.
- 43 Robb 2016, 46.
- 44 Robb 2016, 47.
- 45 Robb 2016, 47.
- 46 Knusel 2016, 147-148.
- 47 Elster 2016, 19.
- 48 Robb 2014, 41.

49 Knusel et al. 2016, 145.  
 50 Robb 2014, 41 and Knusel 2016, 124.  
 51 Knusel 2016, 126-128.  
 52 Elster 2017, 18.  
 53 Robb 2014, 41-42.  
 54 Robb 2014, 41-42.  
 55 See Boulestin and Coupey 2015, 63 for stats on Herxheim cut-marks; Knusel, Robb, and Talfur 2017, 166 for Scaloria Cave.  
 56 2016, 70-76.  
 57 Knusel et al. 2016.  
 58 Robb et al. 2014.  
 59 Villa and Mahieu 1991; Kuijt 2009.  
 60 Boulestin and Coupey 2015; Elster et al. 2016.  
 61 Bello et al. 2016, 731-739.  
 62 Kohn 2012.  
 63 Outram 2005; Knusel 2005.  
 64 Orshiedt and Haidle 2012, 129-132.  
 65 Berryman 2008.  
 66 Tafuri et al. 2016, 1054.  
 67 Robb 2014, 29.  
 68 Robb 2014, 49.  
 69 Robb 2014, 49.  
 70 Boulestin and Coupey 2016, 126-128.  
 71 Turck et al. 2012, 158.  
 72 Dongoske et al. 2000.

Works Cited:

- Armit, I. 2011. "Violence and society in the deep human past." *The British Journal of Criminology* 51(3):499-517.
- Bacigalupo, A. M. 2016. *Thunder shaman: Making history with Mapuche spirits in Chile and Patagonia*. Austin: University of Texas Press.
- Bauer, S., B. Boulestin, A.-S. Coupey, A. Denaire, F. Haack, C. Jeunesse, D. Schimmelpfennig, and R. Turck. 2016. "Human Sacrifices as 'Crisis Management'?" In *Diversity of Sacrifice: Form and Function of Sacrificial Practices in the Ancient World and Beyond*, edited by C.A. Murray, 171-190. Albany: State University of New York Press.
- Bello, S. M., S.A. Parfitt, and C.B. Stringer. 2011. "Earliest directly-dated human skull-cups." *PLoS One* 6(2):e17026.
- Bello, S. M., R. Wallduck, V. Dimitrijević, I. Živaljević, and C.B. Stringer. 2016. "Cannibalism versus funerary defleshing and disarticulation after a period of decay: comparisons of bone modifications from four prehistoric sites." *American Journal of Physical Anthropology* 161(4):722-743.
- Boulestin, B., A. Zeeb-Lanz, C. Jeunesse, F. Haack, R.-M. Arbogast, and A. Denaire. 2009. "Mass cannibalism in the linear pottery culture at Herxheim (Palatinate, Germany)." *Antiquity* 83(322):968-982.
- Boulestin, B., and A.-S. Coupey. 2015. *Cannibalism in the Linear Pottery Culture: The Human Remains from Herxheim*. USA: Archaeopress Publishing LTD.
- Brothwell, D.R. 1961. "Cannibalism in early Britain." *Antiquity* 35(140):304-307.
- Carbonell, E., I. Cáceres, M. Lozano, P. Saladié, J. Rosell, C. Lorenzo, J. Vallverdú, R. Huguet, A. Canals, and J.M. Bermúdez de Castro, eds. 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.
- Dittmar, J.M., and P.D. Mitchell. 2015. "A new method for identifying and differentiating human dissection and autopsy in archaeological human skeletal remains." *Journal of Archaeological Science Reports* 3:73-79.
- Dolukhanov, P., A. Shukurov, D. Gronenborn, D. Sokoloff, V. Timofeev, and G. Zaitseva. 2005. "The chronology of Neolithic dispersal in Central and Eastern Europe." *Journal of Archaeological Science* 32(10):1441-1458.
- Dongoske, K.E., D.L. Martin, and T.J. Ferguson. 2000.

- “Critique of the claim of cannibalism at Cowboy Wash.” *American Antiquity* 65(1):179-190.
- Elster, E.S. 2017. “Grotta Scaloria: An Archaeological History.” In *The Archaeology of Grotta Scaloria: Ritual in Neolithic Southeast Italy*, edited by E. S. Elster, E. Isetti, J. Robb, and A. Traverso, 1–14. Monumenta Archaeologica 38. Los Angeles: Cotsen Institute of Archaeology Press.
- Isetti, Eugenia. 2017. “Discovery and Exploration of the Cave, 1931-2013.” In *The Archaeology of Grotta Scaloria: Ritual in Neolithic Southeast Italy*, edited by E.S. Elster, E.Isetti, J. Robb, and A. Traverso, 15–40. Monumenta Archaeologica 38. Los Angeles: Cotsen Institute of Archaeology Press.
- Kansa, S.W., S.C. Gauld, S. Campbell, and E. Carter. 2009. “Whose bones are those? Preliminary comparative analysis of fragmented human and animal bones in the “Death Pit” at Domuztepe, a Late Neolithic settlement in Southeastern Turkey.” *Anthropozoologica* 44(1):159-172.
- Kohn, E. 2007. “Animal masters and the ecological embedding of history among the Ávila Runa of Ecuador.” In *Time and memory in indigenous Amazonia: anthropological perspectives*, edited by C. Fausto and M. Heckenberger, 106-129. Gainesville: University Press of Florida.
- Kuijt, I., M. Özdoğan, and M. Parker Pearson. 2009. “Neolithic Skull Removal: Enemies, Ancestors, and Memory [with Comments].” *Paléorient* 35(1):117-127.
- Knüsel, C.J. 2005. “The physical evidence of warfare-subtle stigmata.” In *Warfare/violence and slavery in prehistory: Proceedings of a prehistoric society conference at Sheffield University*, edited by M. Parker Pearson, I. J. Thorpe, 49-65. Oxford: Archaeopress.
- Martin, D.L. 2016. “Hard times in dry lands: Making meaning of violence in the ancient southwest.” *Journal of Anthropological Research* 72(1):1-23.
- Outram, A.K., C.J. Knüsel, S. Knight, and A.F. Harding. 2005. “Understanding complex fragmented assemblages of human and animal remains: a fully integrated approach.” *Journal of Archaeological Science* 32(12):1699-1710.
- Orschiedt, J., and M.N. Haidle. 2012. “Violence against the living, violence against the dead on the human remains from Herxheim, Germany. Evidence of a crisis and mass cannibalism.” In *Sticks, Stones, and Broken Bones: Neolithic Violence in a European Perspective*, edited by R.J. Schulting and L. Fibiger, 121-138. Oxford: Oxford University Press.
- Pettitt, P. 2011. *The Paleolithic Origins of Human Burial*. London and New York: Routledge.
- Pokines, J.T., and J.E. Baker. 2013. “Effects of burial environment on osseous remains.” In *Manual of Forensic Taphonomy*, edited by J. Pokines, and S.A. Symes, 73-114. New York: CRC Press, New York.
- Price, T. D., and J. Wahl. 2008. “Isotopic Evidence for Mobility and Group Organization among Neolithic Farmers at Talheim, Germany, 5000 BC.” *European Journal of Archaeology* 9(2-3):259–84.
- Price, T.D., C. Knipper, G. Grupe, and V. Smrcka. 2004. “Strontium isotopes and prehistoric human migration: the Bell Beaker period in central Europe.” *European Journal of Archaeology* 7(1):9-40.
- Robb, J. 2016. “What can we really say about skeletal part representation, MNI and funerary ritual? A simulation approach.” *Journal of Archaeological Science Reports* 10:684-692.
- Robb, J., E.S. Elster, E. Isetti, C.J. Knüsel, M.A. Tafuri, and A. Traverso. 2015. “Cleaning the dead: Neolithic ritual processing of human bone at Scaloria Cave, Italy.” *Antiquity* 89(343):39-54.
- Sampson, H.W., J.L. Montgomery, and G.L. Henryson. (1991). *Atlas of the human skull*. College Station: Texas A&M University Press.
- Tafuri, M.A., P.D. Fullagar, T.C. O’Connell, M.G. Belcastro, P. Iacumin, C. Conati Barbaro, R. Sanseverino, and J. Robb. 2016. “Life and Death in Neolithic Southeastern Italy: The Strontium Isotopic Evidence.” *International Journal of Osteoarchaeology* 26(6):1045-1057.
- Teschler-Nicola, M., F. Gerold, M. Bujatti-Narbeshuber, T. Prohaska, C. Latkoczy, G. Stingeder, and M. Watkins. 1999. “Evidence of Genocide 7000 BP—Neolithic Paradigm and Geo-climatic.” *Coll. Antropology* 23(2):437-450.
- Turck, R., B. Kober, J. Kontny, F. Haack, and A. Zeeb-Lanz. 2012. ““Widely travelled people” at Herxheim? Sr isotopes as indicators of mobility.” In *Population Dynamics in Prehistory and Early History. New Approaches Using Stable Isotopes and Genetics*, edited by E. Kaiser, J. Burger, and W. Schier, 149-164. Berlin: De Gruyter.
- Villa, P., C. Bouville, J. Courtin, D. Helmer, E. Mahieu, P. Shipman, G. Belluomini, and M. Branca. 1986. “Cannibalism in the Neolithic.” *Science* 233(4762):431-437.
- Villa, P., and E. Mahieu. 1991. “Breakage patterns of human long bones.” *Journal of Human Evolution* 21(1):27-48.
- Wahl, J., and I. Trautmann. 2012. “The Neolithic Massacre at Talheim: A Pivotal Find in Conflict

Archaeology. In *Sticks, Stones, and Broken Bones: Neolithic Violence in a European Perspective*, edited by R.J. Schulting and L. Fibiger, 77–1100. Oxford: Oxford University Press.

White, T.D. 2014. *Prehistoric cannibalism at Mancos 5MTUMR-2346*. Princeton, NJ: Princeton University Press.