Cannibalism in the late Linearbandkeramik? A critical review of cannibalism at the Herxheim site, mass violence, and its meaning in archaeology

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1 Introduction

1.1 Herxheim: the site

The Herxheim site was discovered in the 1980s by surface prospection. It is located in the south of Rhineland-Palatanite, Germany, in the region known as the *Pfalz*, in the town of Herxheim. Three excavation campaigns have taken place, in 1996-1999, 2005-2008, and in 2010. The first excavation of 1996-1999 was a rescue operation directed by Annemarie Häußer. The second excavation of 2005-2008 was a planned excavation "intended to complement the earlier data and provide further details." It was carried out by the project group *Siedlung und Grubenanlage des linearbandkeramischen Fundplatzes Herxheim* (Settlement and pit deposits of the Linear Pottery Culture site at Herxheim), consisting of an international team directed by Andrea Zeeb-Lanz. In 2010, a small section of an inner ditch was excavated for a program on *National Geographic* (Boulestin & Coupey, 2015, p. 1; Zeeb-Lanz et al., 2009).

The Herxheim site was in use between c. 5300 and 4950 BCE. During the first excavation campaign directed by Annemarie Häußer, it quickly became apparent that this was an unusual site. An elaborate pseudo-ditch system was excavated, which only seemed a ditch at first glance while actually consisting of many overlapping pits, dug out, partially refilled and dug out again over the centuries. Inside this symbolic boundary were only a few pits, which were heavily affected by erosion. According to Boulestin & Coupey (2015), the site played a ceremonial role during its earlier use. At the end of this period, during the late Linearbandkeramik, the function of the site seems to have changed. The pit enclosure became home to a mass grave – the remains of at least 450 humans were discovered here. Some estimations suggest a total of c. 1350 persons to be buried at Herxheim. Whatever the exact numbers, it is clear that extensive treatment of the human remains took place after death. A majority of the bodies was butchered, roasted, defleshed, their bones broken and deposited in the pits. The discovery of a pit full of "skull cups" spoke wildly to the imagination (Boulestin & Coupey, 2015; Zeeb-Lanz et al., 2009). However, different researchers have interpreted the site in fundamentally different ways. Bruno Boulestin and Anne-Sophie Coupey (2015) interpret the human remains as the victims of mass violence and human cannibalism (Boulestin & Coupey, 2015). Jörg Orschiedt and Miriam Noël Haidle (2012), on the other hand, explain the human remains as being part of a "complex death ritual." They describe a large ceremony in which members of different LBK settlements came together, possibly bringing the dead from their communities, after which they participated in a complex ritual with extensive treatment of the bodies. The persons buried at Herxheim were, in their view, neither victims of violence nor of cannibalism (Orschiedt & Haidle, 2012).

1.2 Outline

In this thesis, I will attempt to look at the site data of Herxheim, compare the views of different researchers, and draw a conclusion from this – namely that human cannibalism did take place at Herxheim during the late Linearbandkeramik. I will be basing much of the archaeological research in this thesis on the 2015 publication by the French archaeologists Bruno Boulestin and Anne-Sophie Coupey, titled *Cannibalism in the Linear Pottery Culture: The Human Remains from Herxheim*. Apart from this, I will be using the work *The LBK settlement with pit enclosure at Herxheim near Landau (Palatinate): First results* by Andrea Zeeb-Lanz et al. (2009); as well as the book chapter *Violence against the living, violence against the dead on the human remains from Herxheim, Germany: evidence of a crisis and mass cannibalism?* by Jörg Orschiedt and Miriam Noël Haidle (2012). I will be using numerous other papers as well, mostly by the same authors.

This brings me to my research question: What evidence for cannibalism is there at the Herxheim site? The research question and its answer can be elaborated on by three different sub questions:

- What do the different researchers say about the mass grave at Herxheim?
- On which evidence are these theories based?
- If cannibalism did take place, as what type of cannibalism can the evidence be classified?
- What are the implications of designating an archaeological site and society as “cannibalistic”?

In this thesis, I have introduced the Herxheim site and summarized the earlier research. I have introduced the research question and sub questions on which this thesis will be based. In chapter 2, I will discuss the archaeological theoretical framework: I will describe the early and late phases of the Linearbandkeramik, common LBK burial customs, as well as gender and biological sex and research thereon. I will take a deeper look at the existing research on Herxheim, then discuss five other LBK mass grave sites. Next, I will examine strategies on how to recognize human cannibalism in the archaeological record. I will be using White’s (1992) and McCraw’s (2011) five osteological characteristics of human cannibalism: cut marks, fractures of the long bones, burning and/or pot polish, missing vertebrae, and hammerstone abrasion. In chapter 3, I will summarize the site data. I will describe the site, the inhumation pits and the human remains. Of the remains, I will discuss the osteological evidence, statistics thereon, as well as the biological sex and gender of the persons. I will conclude that there are strong indicators for cannibalism: above all, a fracturing of the long bones and marrow-rich elements; an abundance of cut marks on the bones; an underrepresentation of the vertebrae in the assemblage; and the presence of chew marks on the marrow-rich foot and hand bones. Burning, pot polish and hammerstone abrasion is attested for as well. In chapter 4 I will analyze the site data – I will give an interpretation of the site and a theoretical analysis. Next, I will compare

the Herxheim site to two historical cases of cannibalism – the Holodomor in 1932-1933 Ukraine, and the Guanxi Massacre during the Cultural Revolution in Guanxi, China. In chapter 5, theories about genocide and mass violence will be discussed. I will take a look at academic literature and research on cannibalism, genocide and mass violence. I will discuss sociological theories about genocide and mass violence, as well as theories on framing. Next, I will write about gendered sexual violence. Lastly, I will examine the postcolonial frame: How racism and imperialism have influenced the conception of "the cannibal" in our minds. Finally, I will give a conclusion. I will summarize my findings, repeat my interpretation from a postcolonial perspective, after which I will give suggestions for further research.

2 Theoretical framework: archaeology

2.1 The Linearbandkeramik

The Linearbandkeramik (LBK) or Linear Pottery Culture is an archaeological culture, which is named after its characteristic style of pottery with incised linear decorations. Between c. 5600 and 4900 BCE, the culture spread across central Europe, originating from western Hungary, and spreading over only three centuries as far as the Netherlands and Belgium in the west. A second expansion went eastwards into Poland until the Dnieper. It has long been debated whether the LBK expansion occurred through migration or through adaptation of LBK culture by preexisting Mesolithic societies; however, a colonization model seems likely (Kipfer, 2021; Meyer et al., 2018; Scarre, 2018, p. 404).

The colonizing people of the LBK were the first farmers in central and western Europe, often living next to areas with Mesolithic hunter-gatherer societies. Fertile loess soils were preferred by the farmers. Their settlements were organized in hamlets of 25 to 30 people, living in wooden longhouses. They herded cattle, and cultivated cereals and legumes on small fields in the forest, using slash-and-burn agricultural techniques (Scarre, 2018, p. 404-405). Strontium isotope analysis of human remains indicate a pattern of farmer-forager relations, in which persons that had grown up in areas inhabited by hunter-gatherers, lived out their adult lives in LBK settlements. These persons were most often female sexed skeletons. This situation can indicate a system of exogamy, in which hunter-gatherer women – voluntarily or involuntarily – were partnered with farmer-colonizer men and went to live in LBK hamlets (Bentley, 2007).

2.1.1 The early phases

The earlier LBK phases seem to have been relatively peaceful. Communities were small, with settlements dispersed along the river valleys, consisting of only a couple of longhouses each. A remarkable uniformity in house building, agricultural techniques, material culture, and other cultural practices can be observed between the settlements across the entire LBK area (Fontijn, 2021; Sommer, 2001). Indeed, these settlements seemed to have been in frequent contact with one another – indicating not just a material, but also a social uniformity. Long-distance exchange networks facilitated the circulation of certain materials, such as amphibolite adzes and Mediterranean *Spondylus* shells (Bakels, 1987; Fontijn, 2021). It seems that intergroup conflicts were frequently solved through part of the group breaking off, moving away, and starting their own settlement some kilometers away. This

process might have been an attractive way to attain higher social status. More importantly, the strategy seemed to have avoided violent conflict (Fontijn, 2021; Hofmann, 2020).

2.1.2 The late phases

The late phase of the Linearbandkeramik culture is marked by a wider disintegration. This late phase encompasses roughly two centuries, from c. 5100 to 4900 BCE (Farrugia, 2002; Meyer et al., 2018). Some regions where LBK communities had lived for centuries were abandoned, such as Dutch Limburg. Other areas, that seemed to have been avoided in earlier times because of low soil fertility, were (re-)populated (Amkreutz & van de Velde, 2017). The long-distance contact networks between LBK settlements started to contract (Amkreutz & van de Velde, 2017; Fontijn, 2021). Various mass grave sites are excavated from this period, all exhibiting a high level of violence (see section 2.3). Jean-Paul Farruggia's research on late LBK pottery and adze seriation, as well as social evidence from cemeteries, indicates a disintegration of the late LBK culture. The LBK-wide, almost universal pottery style of the earlier phases, developed into multiple regional pottery styles across Europe (Farruggia, 2002, p. 95). Alain Beyneix (2007) writes about a period of collective violence during the late LBK, which he describes as being caused by several factors: territorial disputes, economic motivations to forcibly seize wealth or valuable objects, raids and razzias, as well as the prestige of a group or chief victorious in conflict. However, he does not see the violence as evidence of full-out warfare (Beyneix, 2007, p. 80).

Detlef Gronenborn (1999) also describes this process of re-settlement into less fertile areas: "When no more land could be colonized expansion began into formerly less favored regions" (Gronenborn, 1999, p. 188). Furthermore, he lists malnutrition, ecological crises as a result of farming, and population increase as possible causes for the apparent crisis in the late LBK (Gronenborn, 1999).

2.1.3 Linearbandkeramik burial customs

Most of the known Linearbandkeramik graves are inhumation graves, often organized in cemeteries (Trautmann, 2006, p. 60). About 45%-60% of the individuals per cemetery are found in graves furnished with (preserved) grave goods. Bodies are usually crouched and lying on the left side, with the predominant orientation being with the head to the east, and the body to the west (Fritsch et al. 2008/2011; Meyer et al., 2014, p. 309-311; Trautmann, 2006, p. 60-61). While most LBK graves are found in cemeteries, burials in settlement areas are common as well (Trautmann, 2006, p. 60-61). Fig. 1 shows two typical graves of adult males from Sachsen-Anhalt, Germany. Grave A is dated to the middle LBK period, grave B to the early LBK period (Fritsch et al., 2008/2011, p. 112, 162, 194). Fig. 2 shows a typical grave of an adult woman, from Bavaria, Germany.

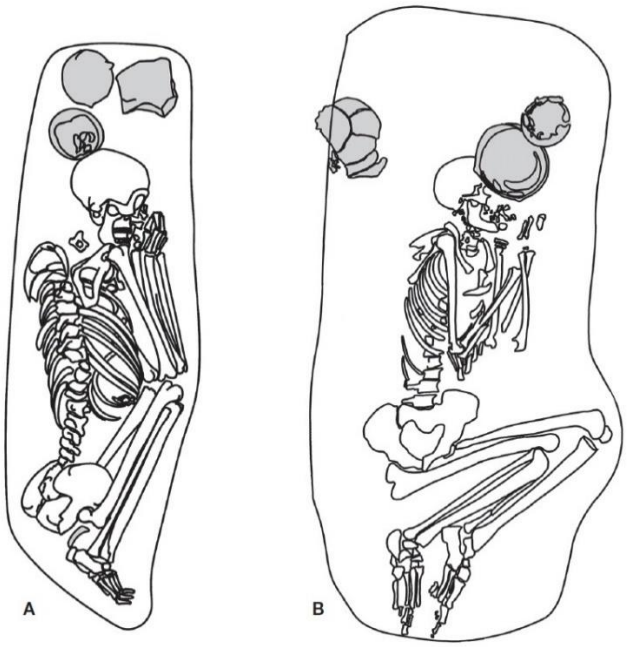

Figure 1: Two 'standard' LBK inhumations of adult males from Sachsen-Anhalt, Germany. A: Cemetery burial from Derenburg (feature 596), dated to the middle LBK period. B: Settlement burial from Halberstadt (feature 999), dated to the early LBK period. Although the burial location is different, both graves appear overall very similar. Copyright: Landesamt für Archäologie und Denkmalpflege Sachsen-Anhalt. *From: Fritsch et al., 2008/2011, p. 112, 162, 194; Meyer et al., 2014, p. 310.*

Figure 2: The 'standard' burial rite of the LBK, left-crouched, oriented east–west and with a set of grave goods. Burial 60, from Aiterhofen-Ödmühle (Bavaria, Germany; adult female, 40–50 years). Copyright: Bayer. Landesamt für Denkmalpflege, Regensburg. From: Bickle, 2019, p. 205.

2.1.4 Gender in the Linearbandkeramik

Sex is a classification of human bodies according to perceived anatomical and biological differences. Gender, meanwhile, consists of the social categories that are partly informed by these different sexed bodies, and partly informed by other psychological and social factors (Müller-Scheeßel, 2019, p. 134-135). The research into gender (as opposed to sex) during the Linearbandkeramik has long been neglected. However, the topic has been garnering attention in the last decades, mostly by female archaeologists. Much of the previous research does not reflect on conceptions of gender in the past, but instead assumes a modern interpretation of gender roles. Biological sex and gender are often equated without critical thought. Indeed, much of the contemporary archaeological research still sees the gender division as too binary – which is not necessarily reflected in the actual physical remains (Bickle, 2019; Müller-Scheeßel, 2019, p. 147-148). The physical sex of persons did not seem to be the main factor for assigning a specific social status to a person – other categories such as kinship ties, status and age often seemed to be more important. Indeed, many individuals found do not seem to fit into any binary gender categories at all (Müller-Scheeßel, 2019).

However, some difference in treatment of the different gender categories seems to have been present. Male and female sexed bodies, notably, often seem to receive different types of grave goods (Hachem, 2018; Fritsch et al., 2008/2011). At LBK sites in the Paris basin in France, Lamys Hachem has observed grave goods made of red deer bones being associated with female sexed bodies (Hachem, 2018). At excavations in Saxony-Anhalt, Germany, grave goods made of Mediterranean *Spondylus* shells are associated with a specific subset of adult women – perhaps they can be interpreted as a group of higher social status. Polished adzes, here, seem to be associated with adult men of all statuses – they might have been significant as a coming-of-age symbol. A smaller group of certain male children, perhaps elites, also received the adzes as grave goods (Fritsch et al., 2008/2011, p. 47, 91).

Penny Bickle (2019) suggests that male sexed bodies show less variation in funeral treatment than female sexed bodies during the LBK. "The differences seen across the grave good assemblages and treatments suggest that people were more free to be creative with the creation of female-sexed individuals' graves than for male" (Bickle, 2019, p. 214). In the LBK in general and the late LBK in specific, biological sex, gender and the intersection between the two are an aspect which seems to have been crucial in the social fabric of society. Indeed, the violence present during the LBK seems to have been heavily gendered (see sections 2.3 and 3.2.2).

2.2 The research on Herxheim

As mentioned before, there are numerous different theories as to what exactly transpired at the Herxheim site during its final period. Boulestin and Coupey (2015) interpret the human remains as the victims of mass violence and human cannibalism:

> This type of cannibalism belongs to the exocannibalism category, and as a consequence is related to armed violence. This is proved by the demographic composition of the population, on the one hand, which testifies to a mortality crisis and can by no means be associated with a natural mortality profile, and by strontium analyses, on the other hand, which attest to various and mostly nonlocal origins for these individuals (Boulestin & Coupey, 2015, p. 125).

These nonlocal persons, based on analysis of the skeletal remains, seemed to have been from farmer societies, from multiple locales up to c. 300 km away. The authors go on to describe two possible patterns through which the people could have been transported to Herxheim. One pattern is one of Herxheim locals carrying out raids into other settlements, and bringing back captives to Herxheim – the other pattern involves individuals from other areas travelling to Herxheim, and bringing captives along with them. Both patterns then lead to the same result: a ritual of mass murder, butchering,

cannibalism and deposition of the remains. The excavated site, in this theory, would have served the function of a political and religious center (Boulestin & Coupey, 2015, p. 125-126; Boulestin et al., 2009). The ceramic material from Herxheim associated with the human remains is very homogenous chronologically, indicating a period shorter than 50 years in which the deposition events took place. Interestingly, there is a large variety in regional ceramic styles attested for, spanning a supply area of 2000 to 3000 km^2 wide. This large supply area indicates a significant amount of long-distance exchange (Boulestin & Coupey, 2015, p. 127).

In contrast to these interpretations, Jörg Orschiedt and Miriam Noël Haidle (2012) describe the Herxheim site as a "complex death ritual." They do not see a violent conflict as the origin of the marks on the skeletal remains. They make this interpretation based on the osteological evidence – according to them, almost no traces of trauma are present on the bones. While there is evidence of the defleshing and disarticulation of the skeletal remains, they believe there is no evidence to suggest mass murder or human cannibalism taking place. Of the supposed human chewing marks on the bones mentioned by Boulestin et al. (2009), Orschiedt and Haidle say that there is no definitive strategy to distinguish these from bite marks by other animals. The authors interpret the defleshing and disarticulation of the human remains as a death ritual similar to those in other Neolithic sites (Orschiedt & Haidle, 2012, p. 121-122, 135-136). They give the following conclusion:

> In our opinion, it is impossible to develop the idea of a ritual mass cannibalism scenario on this basis. In general, the consumption of human meat cannot be proved by disarticulation and dismembering activities. How likely can it be that spongy bones were chewed and marrow extracted if the reason for cannibalistic actions is not survival? (Orschiedt & Haidle, 2012, p. 137)

Andrea Zeeb-Lanz et al. (2009) make a similar interpretation. They describe an extra regional ritual, in which delegates from various Neolithic settlements gather at Herxheim. These delegates bring with them long or recently deceased relatives. In a process of (possibly secondary) burial, the remains are treated extensively. New pits are dug along the pit enclosure, fires are lit and used in the rituals. Bones are smashed and fragmented on the spot; the skulls are fashioned into the "cups." Valuable pottery and grinding stones are smashed as well. All the material is then deposited together in the pits. This interpretation, significantly, sees the ritual at Herxheim not as part of a violent conflict, but as a peaceful death ritual in which members of various regional groups come together. This is especially interesting considering the supposed regionalization and breakdown of long-distance contacts happening during the end of the Linearbandkeramik (Zeeb-Lanz et al., 2009, p. 214).

2.3 Other Linearbandkeramik massacre sites

Herxheim is not the only known mass grave site from the Linearbandkeramik culture. Indeed, especially the late LBK has become well known for its seemingly violent nature – something many archaeologists have written about. However, none of these other sites display quite the same set of circumstances as Herxheim.

Talheim is a late LBK massacre site located in southern Germany, dating between c. 4800-4900 BCE. The remains of 34 individuals were found, with their remains showing evidence of blunt and sharp force trauma. It seems to be the population of a small hamlet, with a number of kinship groups identified. All age groups and sexes are represented – except the local subset of the adult women, which is missing (Bentley et al., 2008; Wahl & Trautmann, 2012).

The Schletz/Asparn site, in lower Austria, is another late LBK massacre site, roughly contemporary with Talheim. A defensive ditch system was excavated, in which the bodies of 67 individuals were deposited. All skulls show evidence of multiple peri-mortem traumas. Probable gnawing by animals to the bones indicates a longer period in which the remains were uncovered. Again, the young female age group is lacking – indicating abduction (Teschler-Nicola, 2012).

The Esztergalyhorvati site in north western Hungary shows mixed skeletal remains of 25 to 30 mostly male individuals deposited in a pit. Some skulls showed trauma. The upper layer of the pit indicated burning (Lichter, 2001 in Farruggia, 2002, p. 59). The Schöneck-Kilianstädten site in Germany, shows a gruesome situation – at least 26 individuals are buried in a mass grave. They show blunt force and arrow injuries. The lower limbs were systematically broken. The abundance of the injuries indicate mutilation and torture of the individuals. Again, the young female age group is missing (Meyer et al., 2015). The Halberstadt site in central Germany, again, shows an almost exclusively male and non-local population. The individuals were found in a mass grave, all killed by targeted blows to the back of the head, indicating systematic executions (Meyer et al., 2018).

The defining characteristics of these 5 massacre sites can be summarized as follows:

- Blunt force trauma, often to the head, as the cause of death of the victims
- The victims are given no proper burials – the bodies are deposited in mass graves, or left in the open
- The adult female age groups are missing in almost all sites – indicating a systematic, gendered practice of abduction and probable gendered sexual violence
- Sometimes, the entire population of a settlement seems to have been targeted, with victims across all age and sex groups. Sometimes, mostly adult males seem to have been targeted.

In many historical examples of genocide and mass violence, “the violence went in different directions and targeted diverse groups” (Gerlach, 2006, p. 458). This is a tendency also seen in other LBK massacre sites – the human remains of the victims are from diverse geographical backgrounds (local and non-local), age groups, and sexes.

A common strategy seen in cases of genocide is that of targeting the adult male population (men of “fighting age”), in order to diminish the population of a community, and prevent new generations from being born. In the long term, this causes the community to die out. Similar strategies can be observed in contemporary examples; for example the massacre of Srebrenica (Srebrenica: Genocide in eight acts, n.d.; Vukušić, 2018) or the early days of the Holocaust (Lozowick, 1989). This targeted killing of adult men is also seen in the LBK sites of Halberstadt and Esztergalyhorvati.

What is interesting about the Herxheim site, is that the killings that took place are markedly different from those sites described above. Some things are similar, in particular the deposition of the bodies in a large mass grave. However, the differences lie in the apparent selection of the victims and the post-mortem treatment of the bodies. It is most likely that members of multiple communities were massacred; indeed, Boulestin and Coupey (2015) estimate up to 1350 persons being killed at the site. Furthermore, the human remains were treated extensively after death. The bodies were first roasted over an open fire, then butchered, dismembered using knives and adzes, and opened from the back so that the spines could be removed. The bodies were defleshed, the skulls were skinned and cleaned, the craniums fractured to produce “skull cups” (fig. 3). Certain bones were crushed or broken to extract marrow (Boulestin & Coupey, 2015, p. 115). This extensive post-mortem treatment differs markedly from the other known LBK massacre sites.

Figure 3: Collection of skull caps in deposit K (concentration 16), from the Herxheim site. Photo by F. Haack. From: Boulestin & Coupey, 2015, p. 25.

2.4 Recognizing cannibalism in the archaeological record

Firsthand anthropological and historical sources of cannibalism are unfortunately seriously lacking – "many, if not most, historical sources on cannibalism are inadequate or inaccurate" (White, 1992, p. 17). Following this, any relevant evidence used in this work must necessarily come from the archaeological record. The historical examples described in chapter 5 serve as illustrations of what violent situations of the past may have looked like.

The book *Prehistoric Cannibalism at Mancos 5MTUMR-2346* by Tim D. White (1992) gives a good overview of recognizing cannibalism in the archaeological record. White defines human cannibalism as "the conspecific consumption of human tissue," with conspecific meaning 'of the same species' (White, 1992, p. 9).

Four criteria are described by Villa et al. in the paper *Cannibalism in the Neolithic* (Villa et al., 1986 in White, 1992, p. 9):

1. Similar butchering techniques in human and animal remains. Thus frequency, location, and type of verified cut marks and chop marks on human and animal bones must be similar, but we should allow for anatomical differences between humans and animals;

2. Similar patterns of long bone breakage that might facilitate marrow extraction;
3. Identical patterns of postprocessing discard of human and animal remains;
4. Evidence of cooking; if present, such evidence should indicate comparable treatment of human and animal remains.

This reasoning relies on an established practice of comparing human remains to faunal remains, as well as the butchering techniques present in the latter.

> When the tissue is removed and/or prepared, the embedded bones often retain characteristic signatures of this processing in the form of scrapemarks, cutmarks, and burning. Furthermore, bones envelop tissues, including fatty marrow, with considerable nutritional value. The removal of these tissues from the bones by percussion leads to diagnostic patterns of bone damage. […] For archaeological bone, when damage patterns caused by human efforts to prepare and remove tissues reflect a functional exploitation of the body and its elements that is consistent with the extraction of nutrition, the argument for cannibalism is made (White, 1992, p. 10-11).

A caveat to the approach described above lies in its comparison to contextual faunal butchering techniques – many sites will have no or lacking faunal remains with evidence of butchering. Therefore, using only the comparative approach will lead to a serious underestimation of cannibalism in the past (White, 1992). Moreover, in many cases, faunal and human remains might have been butchered in different ways if their treatment served different social functions. A situation can be envisioned in which animals were butchered for nutrition, while humans were butchered in a funerary context. For this reason, in this paper, I will not be using White's work alone – I will also be using the honors thesis by Kimberly McCraw: *Why Cannibalism? Determining the type of cannibalism and the resulting implications of culture based on variation in human bone assemblages* (McCraw, 2011). She gives a list of taphonomic characteristics that can indicate cannibalism:

> Bone modifications such as fragmentation, internal vault release, inner conchoidal scars, crushing, percussion pits, adhering flakes, peeling, cut marks, chop marks, polishing, intentional scraping, percussion striae, rodent gnawing, carnivore damage and burning are all among the suggested 17 observations. The likelihood of human involvement greatly increases when a percussion stone or anvil was the cause of the bone modification (McCraw, 2011, p. 6-7).

The sites of tendon or muscle attachments and joints are the most likely to exhibit tool marks, burning or crushing – these are the sites that are targeted when dismembering a body. However, marks in these spots must be accompanied by other indications of cannibalism, such as breaking of the long bones or evidence of cooking (McCraw, 2011).

Another indication of cannibalism, according to McCraw, is a relatively low count of vertebrae left at a site. Researchers are unsure what process lies behind this – a susceptibility of vertebrae to erosion and weathering may explain the phenomenon. A relatively low count of vertebrae is common at many mass graves with high violence – "the lack of any evidence for even the most basic of burials is also an important indicator of possible cannibalism" (McCraw, 2011, p. 8). Indeed, a lack of burial might be expected at many mass graves with high violence, whether cannibalism was present there or not.

The five standard taphonomic criteria according to McCraw (2011, p. 12-23) are:

- **Cut marks**
    - V-shaped notches across the external surface of the bone. Small irregularities indicate human tools instead of for example carnivore teeth. A large part of the cut marks on long bones would be expected at the proximal and distal ends of the shaft, and on other areas of large muscle attachments. The majority of the cut marks can be expected on the ribs, vertebrae, clavicle, and scapula.
- **Fractures**
    - Indicative of marrow extraction. Key is to determine whether bones were intentionally fractured or whether carnivores, weathering, etc. was responsible. The crushing of marrow rich bones (finger bones, long arm and leg bones) can indicate a need for nutrition – i.e. a survival type cannibalism.
- **Burning**
    - Can be difficult to determine. Moderate burn evidence (as opposed to more thorough) can be indicative of cooking (versus cremation). Pot polish (White, 1992) can point to continual stirring in a cooking pot – the fractured bone ends can appear shiny and polished. Fracturing of the bone before burning can indicate marrow removal and/or pot cooking. A variation in burn patterns can indicate a presence of meat on the bones at the moment of cooking – another characteristic of pot cooking. Burning before fracturing of the bone can indicate roast cooking – again, the fracturing serves to remove marrow from the bone.
- **Missing vertebrae**
    - A low count of vertebrae is common at mass graves with high violence.
- **Hammerstone abrasion**
    - The use of human tools to carry out defleshing or butchering is obviously a strong indicator that it was done intentionally. It may also be present in non-cannibalism funerary rituals.

These are the criteria that I will be using in this paper, together with contextual information from the site (such as manner of deposition). These phenomena described above can, individually, not definitively be attributed to have cannibalism as their cause – however, if multiple of them are present, the likelihood of cannibalism grows significantly. In section 3.2.1 of this paper, the osteological evidence of the Herxheim site is analyzed in detail.

Apart from these taphonomic criteria, biochemical characteristics are the only physical evidence that can determine with certainty whether cannibalism has taken place. For a comprehensive overview of these characteristics, see McCraw (2011, p. 23). The biochemical circumstances in which the practice of human cannibalism can be proved beyond doubt are unfortunately rare in the archaeological record. Since these do not apply to the Herxheim site either, I will not discuss this line of evidence further.

3 Site data

3.1 Inhumation pits

The structures that are excavated at Herxheim indicate a village inhabited between c. 5300 and 4950 BCE – from the early phase to the last phase of the Linear Pottery Culture. Two parallel trapezoidal structures are visible. They may seem like ditches at first instance but do in fact consist of numerous overlapping pits that vary in size and depth and were dug over the course of multiple centuries (fig. 4). These pits were dug along a predetermined path and remained open for an unspecified amount of time. Some of the pits were artificially refilled, while others were dug out later – the site was thus at no time fully encircled by the structures. This type of pseudo-ditch is encountered frequently at other LBK sites (Boulestin & Coupey, 2015; Zeeb-Lanz et al., 2009, p. 205). Boulestin and Coupey (2015) interpret these structures as a symbolic boundary for a central settlement area, which was also used for ceremonies. The interior of the boundary has been largely destroyed by erosion (Boulestin & Coupey, 2015, p. 2).

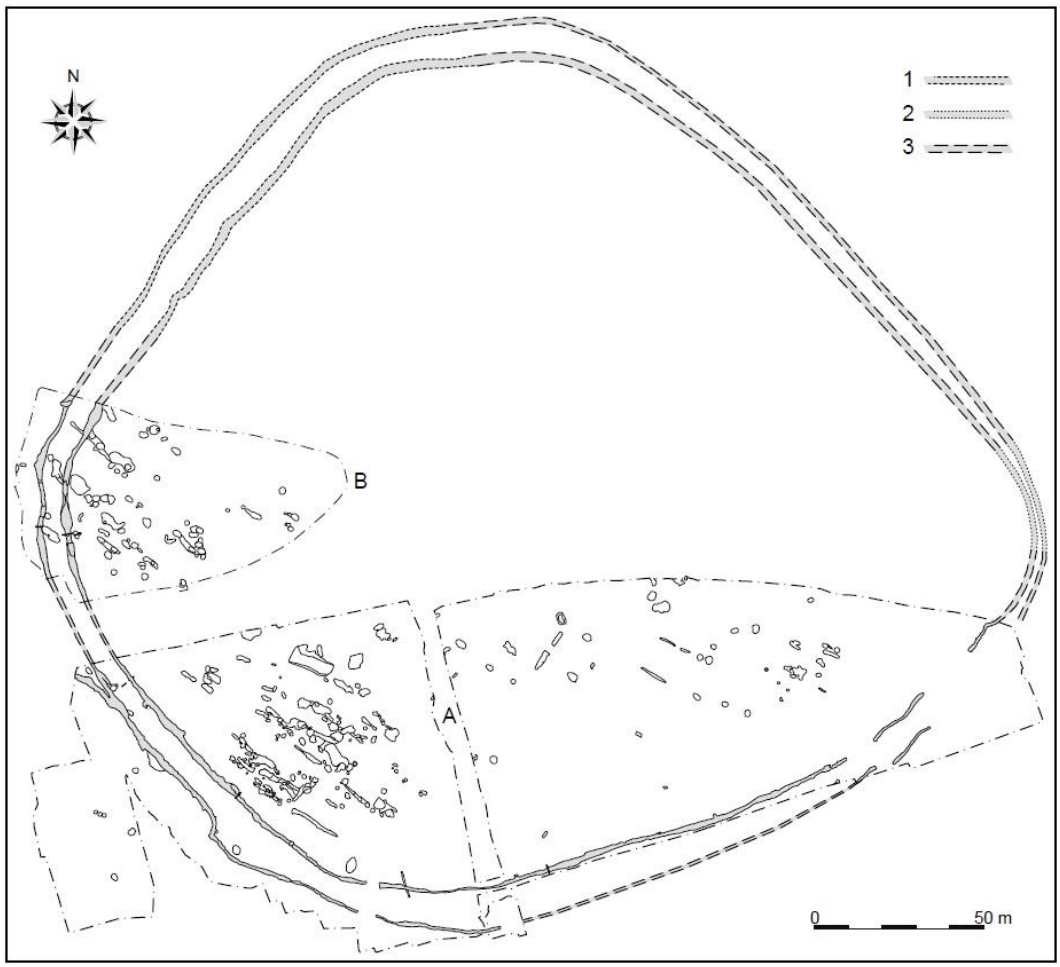

Figure 4: General plan of the excavation at Herxheim. 1. Ditch system as seen by geophysical prospection; 2. Ditch system as revealed through test trenches; 3. Reconstruction of the ditch system; A. Excavation area 1996-1999; B. excavation area 2005-2008; original CAD by F. Haack. After: Boulestin & Coupey, 2015, p. 2.

3.2 Osteological evidence

In the pits of which the enclose consists, 15,552 human remains have been excavated. 93.5% of these remains were recovered in the inner ditch (fig. 5). The deposits in the outer ditch and within the enclosure were in general smaller, but more likely to contain a large amount of cranial remains. All the human remains from the pits exhibit the same way of treating the body (Boulestin & Coupey, 2015, p. 6, 19-22).

Figure 5: A typical concentration (K9) of human bone fragments, pottery sherds, and other material at Herxheim. Note the clusters of skull calottes in the center. Photo: F. Haack, GDKE Rheinland-Pfalz. Image from Zeeb-Lanz & Haack, 2016, p. 256.

In the majority of concentrations, the bones are heavily fragmented. This is especially true of the concentrations in the inner ditch. These fragmented bone concentrations seem to be butchered. Many fragments are missing in the area excavated between 2005-2010. Heavy erosion on the site, as well as not all the ditches being excavated, may serve as possible explanations. Two concentrations contain bone parts which are unfragmented and unbutchered – deposits B in the inner ditch and R in the enclosure (Boulestin & Coupey, 2015, p. 18).

The amount of the butchered remains varies considerably between deposits. This variation is likely rooted in variation in the *chaîne opératoire*, such as in the number of victims or the manner of

deposition. No specific rules could be discerned that account for this variability, which can mean either that no such rules existed, or more likely that we are unable to understand their complexity. Based on the refits of bone fragments in deposit F, the deposits can be divided in 5 sections. The deposition seems to have occurred in multiple separate episodes of processing that were relatively close in time. The separate deposition events seem to be related along the longitudinal axis (Boulestin & Coupey, 2015, p. 19-23).

The nature of deposition and the rapidness of refilling the pits both suggest the pits with human remains being ritual waste. The rapid deposition of the bones could have happened as the last phase of the ritual, or after the ritual itself. The presence of the skull caps (fig. 3), too, points to a ritual with certain rules. Indeed, the skull cups were found to be preferentially deposited compared to other bones, which shows a preference for depositing these (Boulestin & Coupey, 2015, p. 25, 38).

Five osteological indicators for cannibalism according to McCraw (2011) and White (1992) are cut marks, fractures, burning and/or pot polish, a low amount of vertebrae, and hammerstone abrasion. I will summarize the findings in the Herxheim 2005-2010 excavation according to these criteria below.

Fractures and missing vertebrae

According to the osteological analysis conducted and described by Bruno Boulestin and Sophie Coupey (2015), certain anomalies in the available material suggest human cannibalism having taken place at Herxheim:

1. Anomalies related to butchering techniques, which indicate a removal of the spine. These are the destruction of the transverse processes of the vertebrae, as well as the dorsal ends of the ribs. This process is very similar to those seen in animal butchering;
2. Anomalies related to bone marrow extraction – namely the fracturing of the long bones, as well as the underrepresentation of elements rich in spongy bone: the coxal bone, sternum, patella, talus, calcaneus, vertebral bodies and extremities of the large long bones and clavicle (see section 3.2.3);
3. Anomalies connected to consumption of human bodies – chew marks on the marrow-rich metacarpals, metatarsals, and phalanges can be recognized. These chew marks form a direct indication of cannibalism (Boulestin & Coupey, 2015, p. 48).

I would argue for the same conclusion that Boulestin and Coupey come to: namely that these anomalies in the material record can only be explained by human cannibalism having taken place. A possible alternative interpretation of scavenging by predators would not explain the parallels between

human and animal butchering techniques. Moreover, the preferential destruction of bones by fat content disproves this explanation (Boulestin & Coupey, 2015). The theory of Orschiedt and Haidle (2012) also seems much less likely. Especially the targeting of marrow-rich bones, as well as the chew marks on the finger and toe bones cannot, in my opinion, be explained by a noncannibalistic funerary ritual.

Burning, pot polish and hammerstone abrasion

Of the total of 15,552 specimens, only 557 feature evidence of burning. While this is relatively low compared to American sites associated with cannibalism (see White, 1992), it seems that European sites associated with cannibalism more often do not have a high percentage of burned bone material (Boulestin & Coupey, 2015, p. 65). Further analysis of the burned bone is needed. However, it is probable that the whole bodies, while still including the skulls, were roasted over an open fire prior to being defleshed. The burn marks on the bones are comparable with those on animal bones that received the open-fire treatment (Boulestin & Coupey, 2015, p. 79).

Pot polish occurs on three bone fragments in the Herxheim assemblage. One of these is a shaft fragment of an adult femur, which has been modified into a tool. It has been shaped on one side, featuring polish; on the other side, a caulked facet indicates hammerstone abrasion. The two other fragments are of a metatarsal and a metacarpal, and could not be refit; they feature a sawed edge with polish from the tool used in a sawing motion (Boulestin & Coupey, 2015, p. 64-65).

Cut marks

Cut marks of varying length are especially prominent on the craniums (fig. 7). They are always of sagittal orientation (from the forehead, over the head, down to the neck) – cut marks of this type are consistent with skinning or scalping the head. This is a very common pattern at sites associated with human cannibalism. The technique is also found in animal butchery, where it leaves similar marks (Boulestin & Coupey, 2015, p. 79; White, 1992). Cut marks along the rest of the skull are mainly aimed at muscle attachment sites – these would have served to remove the flesh and expose the underlying bone (Boulestin & Coupey, p. 80-81; Zeeb-Lanz et al., 2009, p. 206).

Cutmarks of the free vertebrae are present on some vertebrae and seem to relate to the removal of the spine. They are mostly present on the vertebral arch. Moreover, cut marks on the dorsal halves of the ribs are common; again relating to the removal of the spine (fig. 6). Scrape marks on the external

and internal surfaces of the ribs are present, as well (Boulestin & Coupey, 2015, p. 89). The famous Mancos site, also associated with cannibalism, bears identical butchery marks (White, 1992). Scapulae bear butchery marks, too, on the portions closest to the arms. This probably served both to remove the flesh in this area, as well as to disarticulate the shoulder joint. Finally, the long bones feature many cut and scrape marks. For a detailed overview see Boulestin & Coupey (2015, p. 88-100). See also section 3.2.2.

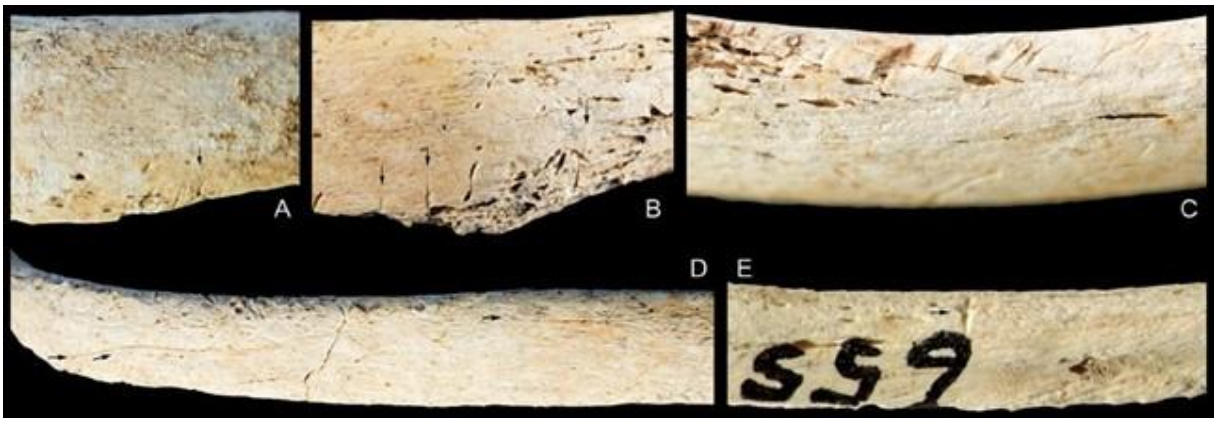

Figure 6: Examples of butchery marks on the ribs. Image from Boulestin & Coupey, 2015, p. 89.

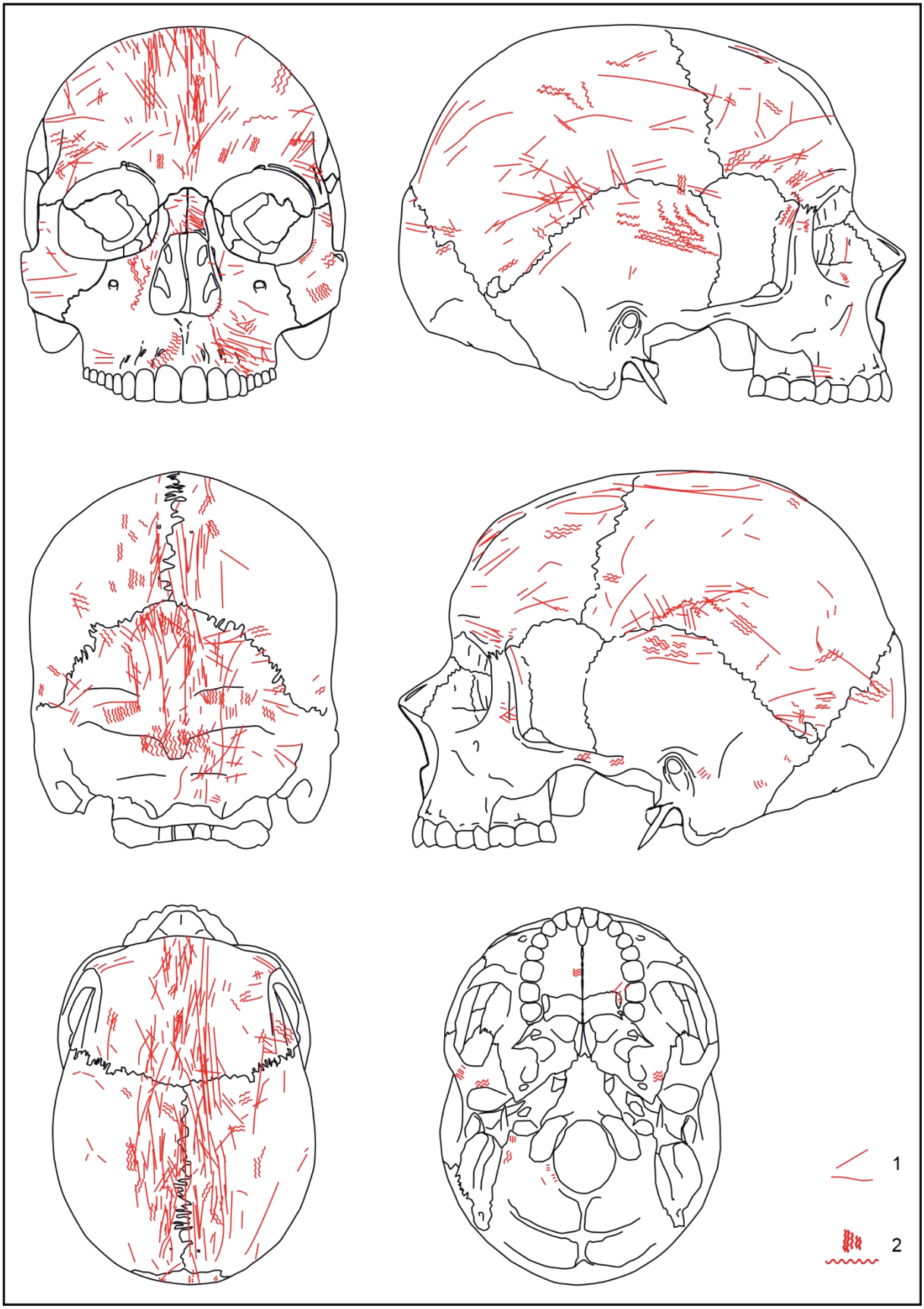

Figure 7: Cumulative pattern of butchery marks on craniums from deposits C and F. Image from Boulestin & Coupey, 2015, p. 81.

4 Analysis

4.1 Statistics

For a detailed overview of the statistics on osteological material of the Herxheim excavations, see Boulestin and Coupey (2015, p. 29-48).

In table 1, the quantification of the human bone assemblage from the 2005-2010 excavation can be seen. In the next few sections, statistics on the osteological material related to human cannibalism will be detailed.

Removal of the spine

As can be seen from table 2, in the majority of the adult free vertebrae, the transverse processes are destroyed. Especially the thoracic vertebrae are relevant here; these are attached to the ribs. In a spine removal process, one would expect most of the thoracic vertebrae to be destroyed. Indeed, according to the Boulestin and Coupey (2015) data from the 2005-2010 excavation, 99.6% from the number of identified specimens (NISP) and 99.9% of the total mass of the thoracic vertebrae lack transverse processes.

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Analysis

Table 1: Values of the quantification units for the human assemblage from the 2005-2010 excavations. Adu.: adults or individuals of adult size; Juv.: juveniles, except perinates and neonates; Per.: perinates and neonates; NISP: number of identified specimens (taxonomically and anatomically). The elements not listed in the table are not represented in the assemblage. Table from: Boulestin & Coupey, 2015, p. 30.

Element	Number of specimens				Mass in grams				%NISP Adu.	%mass Adu.	%NISP Juv.	%mass Juv.	%NISP total
	Adu.	Juv.	Per.	Adu. or Juv.	Adu.	Juv.	Per.	Adu. or Juv.					
Cranium	1155	193	44	257	26049.2	5632.7	61.9	289.4	16.0%	44.8%	13.4%	49.0%	15.4%
Mandible	160	25	1	4	2221.3	305.1	0.6	5.5	2.2%	3.8%	1.7%	2.7%	1.8%
Isolated teeth	121	37	0	4	111.9	31.9	0.0	1.4	1.7%	0.2%	2.6%	0.3%	1.5%
Hyoid	5	0	0	0	0.8	0	0	0	0.1%	0.0%	0.0%	0.0%	0.0%
Vertebral column	846	195	2	76	1772.8	345.0	1.5	35.5	11.7%	3.0%	13.6%	3.0%	10.4%
Free vertebrae	768	189	2	76	1591.0	326.4	1.5	35.5	10.6%	2.7%	13.1%	2.8%	9.7%
Cervical	164	79	0	4	365.9	121.4	0.0	2.5	2.3%	0.6%	5.5%	1.1%	2.3%
Thoracic	251	77	2	2	537.5	135.0	1.5	0.8	3.5%	0.9%	5.4%	1.2%	3.1%
Lumbar	161	27	0	0	523.0	67.4	0.0	0.0	2.2%	0.9%	1.9%	0.6%	1.8%
Indeterminate	192	6	0	70	164.6	2.6	0.0	32.2	2.7%	0.3%	0.4%	0.0%	2.5%
Sacrum/Coccyx	67	5	0	0	175.0	18.3	0.0	0.0	0.9%	0.3%	0.3%	0.2%	0.7%
Ind. vertebra	11	1	0	0	6.8	0.3	0.0	0.0	0.2%	0.0%	0.1%	0.0%	0.1%
Ribs	704	366	14	1478	2322.8	728.3	4.9	618.5	9.8%	4.0%	25.4%	6.3%	23.9%
Sternum	6	0	0	0	10.7	0.0	0.0	0.0	0.1%	0.0%	0.0%	0.0%	0.1%
Scapula	210	32	1	43	1221.8	311.9	1.5	26.0	2.9%	2.1%	2.2%	2.7%	2.7%
Clavicle	53	32	2	2	327.1	111.6	1.1	3.1	0.7%	0.6%	2.2%	1.0%	0.8%
Humerus	483	69	0	1	2614.5	500.1	0.0	0.3	6.7%	4.5%	4.8%	4.3%	5.2%
Radius	170	36	0	13	823.8	154.3	0.0	24.4	2.4%	1.4%	2.5%	1.3%	2.0%
Ulna	161	37	2	12	1062.8	158.5	1.3	37.1	2.2%	1.8%	2.6%	1.4%	2.0%
Carpals	56	7	0	0	59.4	4.2	0.0	0.0	0.8%	0.1%	0.5%	0.0%	0.6%
Metacarpals	157	13	0	0	281.3	19.8	0.0	0.0	2.2%	0.5%	0.9%	0.2%	1.6%
Hand phalanges	229	37	1	3	247.7	16.7	0.1	1.1	3.2%	0.4%	2.6%	0.1%	2.5%
Os coxae	498	49	0	69	2631.3	841.2	0.0	99.0	6.9%	4.5%	3.4%	7.3%	5.7%
Femur	782	108	4	8	8354.3	1367.7	3.1	30.4	10.8%	14.4%	7.5%	11.9%	8.4%
Patella	22	5	0	0	129.3	17.0	0.0	0.0	0.3%	0.2%	0.3%	0.1%	0.2%
Tibia	642	82	0	22	5140.8	581.7	0.0	107.8	8.9%	8.8%	5.7%	5.1%	7.0%
Fibula	261	36	2	6	1177.2	221.0	0.6	16.7	3.6%	2.0%	2.5%	1.9%	2.8%
Tarsals	172	19	0	0	1024.2	71.7	0.0	0.0	2.4%	1.8%	1.3%	0.6%	1.8%
Metatarsals	203	35	2	3	470.2	63.5	0.3	2.4	2.8%	0.8%	2.4%	0.6%	2.3%
Foot phalanges	97	23	0	0	112.2	12.8	0.0	0.0	1.3%	0.2%	1.6%	0.1%	1.1%
Sesamoid	19	3	0	0	6.8	0.3	0.0	0.0	0.3%	0.0%	0.2%	0.0%	0.2%
Indeterminate	1093	163	0	3569	1672.2	143.2	0.0	2466.4	-	-	-	-	-
TOTAL 1	8305	1602	75	5570	59846.4	11640.2	76.9	3765.0	100.0%	100.0%	100.0%	100.0%	100.0%

TOTAL 2	15552	75328.5	-	-	-	-	-

Table 2: Representation of the different morphotypes of adult free vertebrae. N: number of identified specimens (NISP); m: mass in g. For the lumbar vertebrae, the morphotype takes into account the costal process. Table adapted from: Boulestin & Coupey, 2015, p. 47.

Morphotype	Cervical		Thoracic		Lumbar		Indeterminate	
	N	m	N	m	N	m	N	m
Whole vertebra	14	77.3			3	53.1		
Body or part of body only	6	14.1			2	5.8	13	13.8
Body or part of body with a part of posterior portion	11	38.9	11	31.9	5	28.3		
Posterior portion without any process	92	160.0	202	418.0	139	420.4	149	132.4
Posterior portion with spinous process only	6	12.5	35	84.2	6	11.7	5	6.8
Posterior portion with one transverse process only	1	1.0	1	2.9	2	1.3		
Post. portion with one transverse and spinous processes	1	2.0						
Total	**131**	**3058**	**249**	**5370**	**157**	**5206**	**167**	**1530**
Percentage of total with destroyed transverse processes	87.8%	97.4%	99.6%	99.9%	96.8%	99%	-	-

In table 3, the different morphotypes from the adult ribs are represented. In a spine removal situation, one would expect the neck and head of the rib, and possibly the tubercle as well, to be destroyed. Indeed, of the bone material in the 2005-2010 excavation, 96.4% of the NISP and 99.7% of the total mass having destroyed or missing dorsal extremities.

Table 3: Representation of the different morphotypes of adult ribs. N: number of identified specimens (NISP); m: mass in g. Table adapted from: Boulestin & Coupey, 2015, p. 48.

Morphotype	N	m
Whole rib	1	5.6
Part of shaft only	599	1850.4
Part of shaft with tubercle	80	396.0
Part of shaft with tubercle, neck and head	7	47.8
Head, neck and tubercle only	12	17.3
Head only	5	5.7
Total	**704**	**23228**
Percentage of total with dorsal end destroyed	96.4%	99.7%

4

Analysis

Bone marrow extraction

One indication of bone marrow extraction is the fracturing of the long bones – the humerus, radius, ulna, tibia, fibula and femur. In table 4, the data from the Boulestin and Coupey (2015) excavation are summarized. A majority of the long bones are indeed fragmented. Only in the case of the ulnae is a minority of the total mass fragmented; of the NSIP, 74% is fragmented.

Table 4: Representation of the different morphotypes of adult large long bones and clavicle. N: number of identified specimens (NISP); m: mass in g. Table adapted from: Boulestin & Coupey, 2015, p. 42.

Morphotype	Humerus		Radius		Ulna		Femur		Tibia		Fibula	
	N	m	N	m	N	m	N	m	N	m	N	m
Whole element	1	70.4	2	57.1	2	74.4	1	357.4	2	339.3		
Whole shaft with all or part of an epiphysis			2	35.4	3	110.3	1	185.7	1	123.8	1	45.5
Fragment of shaft with all or part of an epiphysis	18	368.5	12	144.4	26	377.3	6	101.8	13	346.6	9	105.5
Fragment of epiphysis only	24	140.2	11	15.8	11	41.0	40	207.7	50	154.4	8	16.3
Femoral neck with all or part of the head							11	456.3				
Whole shaft only			5	114.5			1	130.1	1	100.4	5	122.6
Fragment of shaft only	440	2035.4	138	456.6	119	459.8	659	6552.5	575	4076.3	238	887.3
Femoral neck (all or part)							63	362.8				
Total fragments with at least one epiphyseal portion	**43**	**5791**	**27**	**2527**	**42**	**603**	**59**	**13089**	**66**	**9641**	**18**	**1673**
Total fragments without epiphysis	**440**	**20354**	**143**	**5711**	**119**	**4598**	**723**	**70454**	**576**	**41767**	**243**	**10099**
Grand total	**483**	**26145**	**170**	**8238**	**161**	**10628**	**782**	**83543**	**642**	**51408**	**261**	**11772**
Percentage of total fragments	91%	78%	84%	69%	74%	43%	93%	84%	90%	81%	93%	86%

without epiphysis												

Another indication of bone marrow extraction is the underrepresentation in the total assemblage of elements rich in spongy bone: the coxal bone (os coxae), sternum, patella, talus, calcaneus, vertebral bodies and extremities of the large long bones and clavicle. In table 1, the NISP and mass of the human bone assemblage of Herxheim is represented. In fig. 8, a comparison of the Herxheim assemblage (excluding the perinates and neonates) with three different, more representational assemblages can be seen. The talus and calcaneus are both included in the tarsals. It makes it clear that the elements rich in spongy bone are underrepresented at Herxheim. Some of this underrepresentation is likely due to post-depositional processes and loss upon excavation – namely the underrepresentation of the phalanges, carpals and distal tarsals. However, the underrepresentation of the vertebral column, sternum, coxal bone, talus, calcaneus, metacarpals and metatarsals are strong indicators of human cannibalism – this underrepresentation cannot be explained by post-depositional processes alone (Boulestin & Coupey, 2015, p. 40).

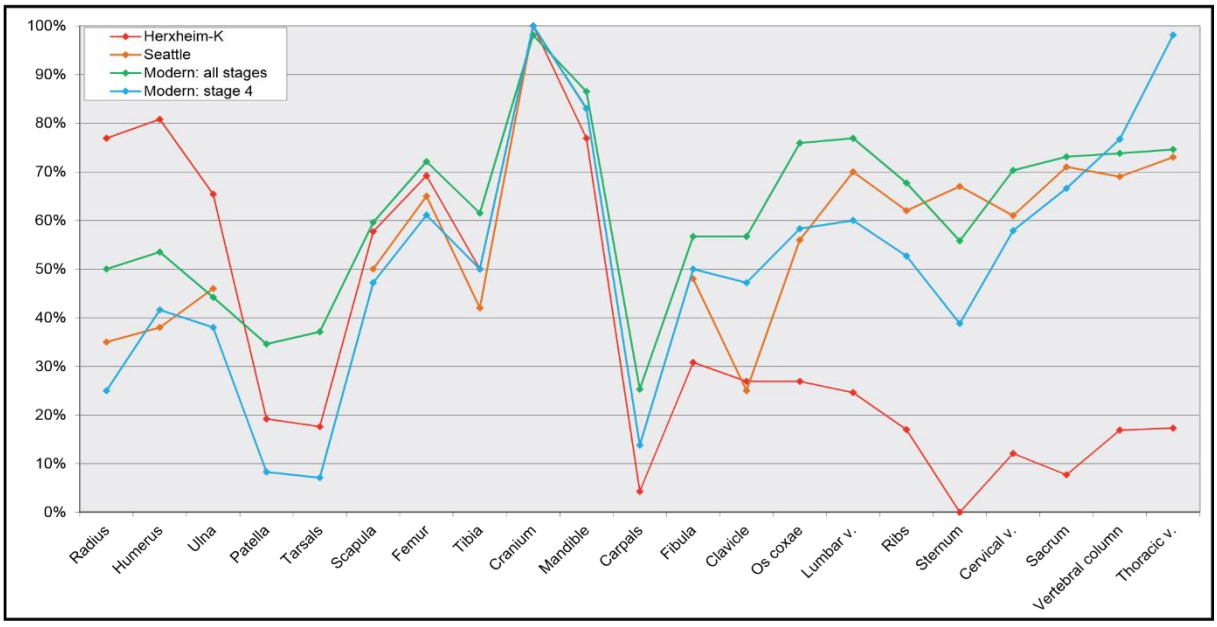

Figure 8: Comparison of the representation of the skeleton elements in PR for the adults, between deposit K and some scavenged assemblages. Seattle: after Haglund et al., 1988, fig. 2; modern assemblages: after Haglund, 1991, tab. 7.1 and 7.3. Image from Boulestin & Coupey, 2015, p. 37.

Chew marks

This is probably one of the strongest markers of cannibalism there is in the archaeological record. Especially the fragmentation and/or destruction of the proximal phalanges, and above all, the

metacarpals or metatarsals is an indicator of cannibalism – these are the most marrow-rich parts of the hand and foot bones (Boulestin & Coupey, 2015; McCraw, 2011; White, 1992). As can be seen in table 5, this is the case at the Herxheim assemblage too. Of the metacarpals, 89% of NISP and 98% of total mass are fragmented; of the foot metatarsals, this is 94% of NISP and 98% of total mass. Of the proximal hand phalanges, the fragmentation is 85% of NISP and 98% of total mass. Of the proximal foot phalanges, this is 37% of NISP and 92% of total mass. The metacarpals, metatarsals and proximal phalanges are more often fragmented or destroyed than the middle and distal phalanges. The marrow-rich hand and foot bones were preferentially destroyed – a strong indicator of human cannibalism.

Table 5: Representation of the different morphotypes of adult metacarpals, metatarsals and phalanges. MTC: metacarpals; MTT: metatarsals; PHP: proximal hand phalanges; MHP: middle hand phalanges; DHP: distal hand phalanges; PFP: proximal foot phalanges; MFP: middle foot phalanges; DFP: distal foot phalanges. N: number of identified specimens (NISP); m: mass in g. Four unclassifiable fragments of metatarsals were not taken into account. Table adapted from Boulestin & Coupey, 2015, p. 44.

	N	m	N	m	N	m	N	m	N	m	N	m	N	m	N	m
Morphotype	**MTC**		**MTT**		**PHP**		**MHP**		**DHP**		**PFP**		**MFP**		**DFP**	
Whole element	17	66.6	12	81.4	21	43.2	33	41.7	22	9.5	49	82.6	10	3.5	6	5.3
Whole body	46	100.5	15	38.1	7	9.8	3	3.8			4	2.0				
Fragment of body	68	63.5	89	96.8	34	20.1	5	2.1			3	1.4				
Body + base	8	24.8	45	167.9	8	9.0	4	3.1			2	1.4				
Body + head	8	20.0	8	26.6	60	88.8	17	9.6	2	0.6	16	9.6			1	0.1
Base only	10	5.9	21	41.7	3	2.4					3	3.8				
Head only			9	14.9	4	2.9					1	0.6	1	0.1		
Total	**157**	**2813**	**199**	**4674**	**137**	**1762**	**62**	**603**	**24**	**101**	**78**	**1014**	**11**	**36**	**7**	**54**
	89%	98%	94%	98%	85%	98%	47%	93%	8%	91%	37%	92%	9%	90%	14%	90%

4.2 Sex & age at death

In the Boulestin and Coupey (2015) publication on the 2005-2010 excavation, for reasons of accuracy, the researchers only used the os coxae to determine the biological sex of the human remains. Since out of an estimated between 1000 and 1400 individuals lie buried at Herxheim, only eleven coxal bones of ten individuals were well preserved enough to determine sex (Boulestin & Coupey, 2015, p. 102-104), no significant statements can be made about the biological sex distribution in the mass graves.

4

Analysis

This is an unfortunate situation as many of the other late LBK mass graves show a lack of adult female populations.

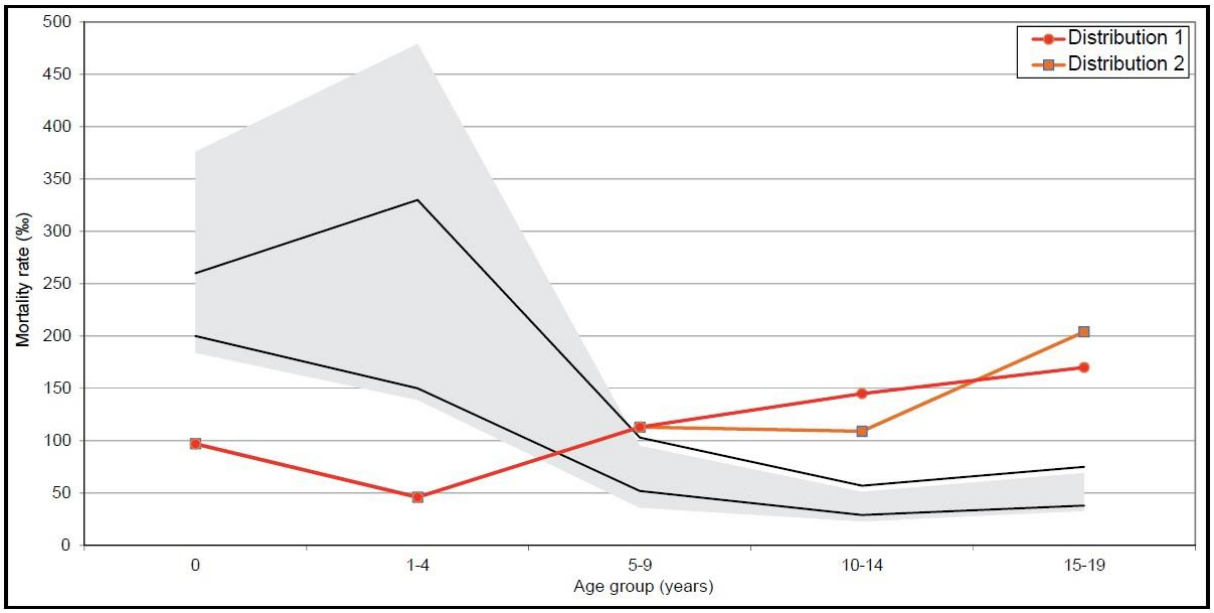

Figure 9: Curves of mortality rates of the non-adult subjects for the best two distributions of age at death, compared with reference tables. The grey area corresponds to the range defined by the entries e0 = 20 years and e0 = 40 years of Ledermann's (1969, in Boulestin & Coupey, 2015) tables. The black limits correspond to the entries JI = 0.089 and JI = 0.197 of Séguy and Buchet's (2011, in Boulestin & Coupey, 2015) pre-industrial standard tables. The raw rates have been multiplied by one thousand. Image from Boulestin & Coupey, 2015, p. 110.

The distribution of the age at death at the Herxheim site gives us more information. The site data show a self-contradictory pattern in the mortality rate of the neonate and juvenile population (fig. 9). The neonates and 1-4 age group are underrepresented in the data; while the 5-9, 10-14 and 15-19 age groups are overrepresented compared to mortality distributions with natural patterns. This overrepresentation of juveniles and young adults is something seen in sites with mass graves from, for example, epidemic or mass violence victims (Boulestin & Coupey, 2015, p. 110). The pattern at Herxheim suggests an unnatural cause of death (Zeeb-Lanz & Haack 2016)

4.3 Interpretation of the site

McCraw (2011) describes five characteristics of cannibalism in archaeology:

1. Cut marks
2. Fractures
3. Burning and/or pot polish

4

Analysis

4. Missing vertebrae
5. Hammerstone abrasion (McCraw, 2011, p. 12-23)

All five of these characteristics are present at the Herxheim mass grave. Cut marks on and fracturing of the bones are abundant; burning is attested for especially on the skulls; pot polish is seen in three instances. A significant underrepresentation of the free vertebrae is a strong indicator of cannibalism. Finally, hammerstone abrasion is found in one specimen. The presence of these five criteria, when seen together with the chew marks on the hand and foot bones, make a strong case for the occurrence of cannibalism indeed. Moreover, the deposition of the human remains in a mass grave, the lack of a proper burial as seen in other LBK sites, and the preferential treatment and deposition of the skull cups, all point to a violent and unusual funeral ritual.

When compared to the other late LBK massacre sites as described above, Herxheim stands out both by its size and by its treatment of the human remains. Like at Herxheim, the other sites feature either mass graves or bodies left out in the open, as well as sometimes a targeted killing of an entire population. However, at Herxheim the bodies have received extensive post-mortem treatment which is not seen at any other known LBK site. The cause of death of the individuals is not apparent from the bone assemblage. Moreover, it is unknown whether the adult female population is missing or not – the biological sex of most of the individuals has not been determined. Most importantly, the processing of the bodies in the form of roasting, defleshing, disarticulating, fracturing of the bones and finally the consumption is not seen at any other known site.

4.4 Other cases of cannibalism & genocide to compare site to

It may be difficult to imagine how an episode of cannibalism can come to be. The historical examples described below serve as illustrations of what such episodes in prehistory may have looked like. While in both cases undisputed evidence of cannibalism is very difficult to find, many later witness accounts are available.

Stories about survival cannibalism are widespread in our society. An infamous historical example happened during 1932-1933 in eastern and central Ukraine. The *Holodomor* was a widespread famine after the collectivization of farms under Soviet policies. Some scholars believe that the famine was deliberately planned by Joseph Stalin and the USSR to eliminate the independence-minded Ukrainian peasantry and intelligentsia (Bertelsen, 2018). The famine left c. 3.5 to 5 million dead (Gorbunova & Klymchuk, 2020). Many accounts can be found of families eating their starved children or of peasants

murdering their weaker neighbors and eating them. Allegedly, there was a large black market of human meat operating during these times (Snyder, 2010, p. 61-62).

The cannibalism episodes during the Guanxi Massacre tell a different story. During the Cultural Revolution from 1966 to 1976, Mao Zedong and the Chinese Communist Party (CCP) launched a massive operation to eliminate leftover capitalist and traditionalist elements from society. The violence that followed left c. 1.1 – 1.6 million dead, next to tens of millions of victims of state persecutions. Some of the worst of the violence happened in the massacres in the autonomous region of Guangxi in South China (Walder, 2014).

Yang Su (2006) describes the Guangxi Massacre as being a result of a caste system based on class, in which rich peasants and their children were targeted by militia and mobs, seemingly according to the party's "class-elimination policy." The violence escalated in July 1968, initiated and organized by local-level governments, especially in rural areas. The violence was carried out by governmental authorities, militia members, and many volunteers (Yang, 2006).

In numerous interviews with Song Yongyi, he has described the occurrence of human cannibalism during the massacres (C.K. (*Radio Free Asia*), 2016; van der Made, 2016).

> In the bloodiest suppressions of the rival mass faction led by provincial and local government leaders in Guangxi Province, the victims were not only beaten to death but sometimes even their flesh, hearts and livers were brutally consumed by the killers. At least 10 to 20 thousand members of militias and mobs participated in the cannibalization waves across the province. During this period, cannibalism became a trend widely diffused over ten counties, and resulted in a total of 300-400 victims (Yongyi, 2011, p. 10; Wu, 2003, as cited in Yongyi, 2011).

Zheng Yi describes the cannibalistic episodes in great detail in his 1993 work *Hong Se Ji Nian Bei* (translated into English as *The Scarlet Memorial* by T.P. Sym). This book is controversial – many of its critics accuse Zheng of exaggerating the systematic nature of the cannibalism episodes. However, it is clear that cannibalism did happen during this period (Schreiber, 2014). For his work, Zheng conducted interviews with survivors, perpetrators and victims' families in 1986, 18 years after the massacres. He describes a gruesomely violent situation, which over the course of less than 6 months developed from relatively isolated incidents of cannibalism among widespread massacres, into large-scale public

consumption episodes carried out by large mobs. At the time, there was no famine in Guangxi. Rather, the cannibalism seems to have been of a ritualized nature. Members of a land-owning caste were targeted by militias and mobs – their internal organs, genitals or slices of their flesh were divided among the perpetrators, with the better pieces going to militia leaders (Zheng, 1996).

5 Interdisciplinary perspectives on cannibalism and violence

5.1 Cannibalism

A lot of literature is available on the topic of human cannibalism, mostly in the disciplines of history and anthropology. White defines human cannibalism as "the conspecific consumption of human tissue" (White, 1992, p. 9), as talked about earlier in this thesis. There are many historical and anthropological examples of cannibalism attested for – however, many of these situations suffer from a lack of documented first-hand evidence. Indeed, some have gone so far as to say there is no evidence for human cannibalism at all (Arens, 1979, in Brady, 1982; White, 1992, p. 17; see section 5.3).

Much of the literature divides human cannibalism into different categories, based on the actors (who is eating whom), the intent, the circumstances, and the scale of the event. White (1992) recognizes 3 types of cannibalism: funerary cannibalism (cannibalism of deceased persons, usually within-group members in an affectionate context), survival cannibalism (starvation induced), and gastronomic cannibalism (nonfunerary under nonstarvation conditions). Significantly, White excludes ritual cannibalism from his categories (White, 1992, p. 12-13).

Shirley Lindenbaum gives a good overview in her work *Thinking about cannibalism* (2004). The basic distinction she makes is that between endocannibalism and exocannibalism. Endocannibalism is cannibalism within the community, often in a funerary context, which serves a function of group renewal. Exocannibalism is the practice of eating persons outside the community – it is almost always a part of warfare or an act of aggression. Apart from these two types, she describes multiple others: Survival cannibalism (where humans resort to cannibalism out of a severe famine or food shortage); cannibalism as psychopathy (carried out by individuals); medicinal cannibalism (such as the trade in powdered albino bones); auto-cannibalism (an individual eating a part of themselves); sacrificial cannibalism (such as during the alleged human sacrifice rituals carried out by the Aztecs); and innocent cannibalism (wherein the individual is unaware that they are eating human flesh) (Lindenbaum, 2004, p. 476-479).

Lynn Flinn, Christy Turner and Alan Brew (1976) recognize four different categories of human cannibalism. Ritual cannibalism includes the consumption of deceased relatives (in-group), as well as the consumption of slaves, captives or sacrificial victims killed for the purpose specifically. It may include beliefs of conferring the virtues or qualities of the deceased onto the living. Revenge cannibalism is done as retaliation for a perceived wrongdoing by the victim's group. Gustatory cannibalism, which is relatively rare, consists of the consumption of human flesh as a preferred food item. Finally, survival cannibalism is seen is starvation circumstances (Flinn et al., 1976, p. 308).

For this thesis, I will be using a combination of 2 definitions of human cannibalism: the division in *endocannibalism* (funerary) versus *exocannibalism* (warfare/act of aggression) as described by Lindenbaum (2004); as well as the fourfold definition by Flinn et al. (1976): ritual, revenge, gustatory and survival cannibalism (Flinn et al., 1976).

There are two examples that illustrate the ritual type of cannibalism well: the Aztec model of waging warfare with the intent to capture persons alive – who were then transported to the capital, sacrificed to the rain or snake gods, after which the bodies were allegedly consumed at a feast. A problem with this well-known story is that its only contemporary descriptions are all by Spanish chroniclers, mostly priests. The Spanish were colonizing the Valley of Mexico through conquest and had a marked interest in justifying their violence against the native Nahuatl-speaking populations. Indeed, the only three known indigenous texts on Aztec cannibalism date from the period during and after the Spanish conquest and describe it as a shocking and abhorrent occurrence (Isaac, 2005).

The other example is that of the ritual cannibalism that was a part of the Guangxi massacres, in 1967 and 1968, during the Cultural Revolution in China (see section 4.2.2). This episode of cannibalism was not survival cannibalism, although it did take place during a period of violent conflict. Instead, the stress on society, political persecutions by the national government, and targeted killings of land-owning peasants orchestrated by local governments, created a situation in which the symbolic consumption of human beings was carried out on a large scale (Yongyi, 2011).

For the Herxheim case, exocannibalism (as an act of agression) and ritual cannibalism seem applicable concepts. Boulestin and Coupey argue for a case of exocannibalism as a part of warfare (Boulestin & Coupey, 2015, p. 125). I would, however, take this one step further and argue for a combination of exocannibalism and ritual cannibalism – the two categories do not have to exclude one another. Indeed, parallels can be drawn with historical cases, in particular the 1968 Guangxi massacre during the Chinese Cultural Revolution (see section 4.2). In this case, the violence and cannibalism erupted during a period of intense stress on society. However, this violence was not a result of lack of food – indeed, certain vulnerable population groups within an existing caste system were targeted for a multitude of reasons (C.K. (*Radio Free Asia*), 2016; van der Made, 2016; Wikipedia, n.d. b; Yongyi, 2011, p. 10; Zheng, 1996). The cannibalism in particular can both be described as exo- and endocannibalism during a period of warfare, as well as ritual cannibalism. On the surface, the Guangxi case bears similarities to the Herxheim site.

5.2 Theories about genocide and mass violence

5.2.1 Sociological theories and framing

Much has been written in academia on the underlying principles of violent conflict. In this section, I will introduce a few concepts from sociology and framing theory, that might help explain the processes of mass violence in the past.

Jolle Demmers writes in her work *Theories of violent conflict: an introduction* (2012) that: "War is normal: it is not an aberration. It is not a breakdown of social structures led by deviant leaders. War is a social institution that is reproduced through discourses, which confer legitimacy on it" (Demmers, 2012, p. 117). While she mainly writes about contemporary conflicts and discourse analysis thereof, her work is still relevant to the study of prehistory. Classifying certain groups as being of a different "race" or "ethnicity" is a social construct – however, that does not make the classification any less real. As soon as a different group is categorized as "other", this otherization can justify violence. Violence against a group, in any society, needs to be explained and justified through certain narratives or stories. These narratives, in turn, increase the level of otherization. "Discourses on othering and belonging are integral to war, up to the point that "we" are intrinsic to an understanding of what "we" fear" (Campbell, 1998 in Demmers, 2012, p. 127). Indeed, it is this conception of "us" versus the fearsome "other" that is integral to any conflict (Demmers, 2012, p. 117, 127). This must have been true in prehistory just as much as it is today. The categorization of people into different ethnic groups may have been based on a multitude of social and cultural characteristics. As archaeologists, we must remember that these characteristics may no longer be visible to us in the material record.

Violence is a concept that must be both imagined and performed. In the past as well as today, the *idea* of violence is essential to the eventual act. The violence needs to be legitimized, in order to be carried out in a socially justifiable manner (Schröder & Schmidt, 2001, p. 9). Here Collective Action Frames come into play – "action-oriented sets of beliefs and meanings", connected to and drawing from existing ideologies and group dynamics, that seek to legitimize certain actions through constructed meanings. These collective action frames are used to legitimize violent discourse and mass violent action, and can be reinforced by any number of public actors (Benford & Snow, 2000, p. 614).

These theories, again, are applicable to violent conflict in prehistory. While we may not have a lot of physical evidence as to the social processes and ideological beliefs people would have held in the past, there are certain proxies that may leave a trace in the archaeological record. Bettina Schmidt and Ingo Schröder (2001) write about Violent Imaginaries. These are certain cultural models of appropriate violence that are socially acceptable to carry out. Characteristic elements of these models include a "us vs. them" dichotomy, in which the principle of totality is applied to all aspects; the identification of

"our" side with the well-being of every individual. The moral superiority of "our" side is not affected by the outcome of the conflict (Vukušić, 2021; Schröder & Schmidt, 2001). These Violent Imaginaries are developed through the perceived historicity of contemporary conflicts – how unfairly one's own group has been treated in the past. This historicity is represented through narratives, inscriptions and performances (Schröder & Schmidt, 2001, p. 8-9). Narratives will not be visible in the material record, and inscriptions during prehistory are by definition limited to paintings and decorations. However, performances may in certain cases leave an archaeological trace. Schröder and Schmidt write the following: "…performative representations of violent confrontations are public rituals in which antagonistic relationships are staged and prototypical images of violence enacted" (Schröder & Schmidt, 2001, p. 10). In prehistory, one could imagine the symbolic destruction of objects such as pottery or weapons, which might then be deposited (such as happened during the European Bronze Age; see Fontijn, 2021). Another possibility is the reenactment of a violent conflict that happened in the past, in which captives or animals might even be killed (compare the battle reenactments and execution of criminals in the Roman Colosseum in the 1st century CE (Beacham, 2021); see also the historical and contemporary American Civil War reenactment events (Wikipedia, n.d. a)). A common contemporary type of performance, the military parade, might be more difficult to recognize in the archaeological record. However, we do know of some military parades of the past, because they were pictured in paintings and reliefs (such as the Roman triumphal parades – see fig. 10). It might be useful for archaeologists studying violent conflict to look for traces of such public performances.

There are certain characteristics to the various late Linearbandkeramik mass grave sites that might be interpreted as an occurrence of ethnic cleansing or genocide. In section 2.3 I have discussed three practices that are seen in historical events of ethnic cleansing: the selective killing of the adult male population, the killing of an entire population of a settlement, and the abduction of or targeted sexual violence against adult females. The problem with defining an ethnic cleansing event as a genocide specifically, is that an *intent* of eradication needs to be proven. If the label "genocide" is applied to any case of mass murder, its political and judicial meaning may be diluted (Gerlach, 2006, p. 465).

Gerlach's theory of extremely violent societies may be useful here as an alternative concept:

> …various population groups become victims of massive physical violence, in which, together with state organs, diverse social groups participate for a multitude of reasons. In other words, there are four characteristics—various victim groups, broad participation, multi-causality, and a great amount of physical violence (Gerlach, 2006, p. 460).

However, for this theory to be of any practical use in archaeology, there must be some indication what the reasons were for groups to participate in the violence. Since the concept of extremely violent societies depends on there being a multitude of reasons and social groups (both as the perpetrators and the victims) being present, there are only rare occasions in prehistory where this can be accounted for. In the Linearbandkeramik specifically, a variety of victim groups is undoubtedly present. However, both broad participation among the perpetrators, as well as multi-causality, are almost impossible to prove in a prehistoric context.

Figure 10: A relief on a Roman triumphal arch: Titus' triumphal procession depicted on the Arch of Titus, showing the loot captured from Jerusalem in 81 CE. From: Wikipedia, n.d. d, https://en.wikipedia.org/wiki/Triumphal_arch.

5.2.2 Gendered sexual violence

As seen in section 2.3, sexual violence (in particular against female bodies) is a practice inherently linked to mass violence (Brownmiller, 1975/1993, p. 31-32; Ferguson, 2021, p. 120). Many historical examples can be found: from the millions of women and children raped by SS and Wehrmacht soldiers during the invasion of the Soviet Union (Brownmiller, 1975/1993; Mühlhäuser, 2017), to the rape of Ukrainian women by Russian soldiers in the recent invasion of Ukraine (Gall, 2022). Rape in times of conflict can be seen as a weapon against a collective. The rapes of individual members of a group “are not merely individual acts directed against a particular victim but also highly collective acts that target

bodies of women as representatives of a collective body, its social fabric and respectability" (Mühlhäuser, 2017, p. 369). Indeed, in the past, gendered violence and gendered sexual violence must have played a crucial role in conflict situations (see for example Hitchcock, 2017).

In relation to the mass violence sites of the late Linearbandkeramik, not many researchers have written about the sexual violence that must have taken place. The absence of adult females in some of the mass graves is an indication of a widespread practice of mass rape. This gendered targeting of female bodies is a crucial topic to discuss in academic research. Unfortunately, the Herxheim mass graves have not yielded a significant amount of data on the sex of the bodies. Therefore, it has so far not been possible to determine a distribution of sex in the human remains. It would be an interesting for further research – to establish whether Herxheim is similar to the other LBK mass grave sites in a lack of adult females or whether the adult female population is included in the victims.

5.3 The cannibal: Postcolonial frame – racism and barbarism

In 1978, Edward Said published his foundational work *Orientalism*. In it, he used the term "the Other" to describe the western view of the "Orient" as a feminine, mysterious, violent and sexualized Other, which is contrasted with a rational, masculine, intelligent and civilized West (Said, 1978/2003). This perceived Other influences, consciously or subconsciously, a wide array of literature and academic research. Archaeology is no exception to this.

Historically, the ideological function of cannibalism in writing is one of exclusion. Through this exclusion, writers have justified western imperialism and colonialism. Indeed, accusations of cannibalism have most often been made against marginalized groups from the global South, undermining their "political, social or economic power" (Guest, 2001, p. 2). These writings, often anthropological or historical in nature, are founded on the idea of a perceived Other as described by Said (1978/2003). Through designating a community "cannibalistic", a strong narrative of the Self versus the Other is created (Guest, 2001). The "savage" Other, the cannibal, needs to be reined in, ruled over, educated, and protected against itself by a "civilized," rational and European Self, who is only trying to do good. Of course, this line of thought is seen in all kinds of colonizer-colonized relationships. It has been written about in the 1950s by Frantz Fanon, a Martiniquan psychiatrist and political philosopher. The dichotomy between the Self and the Other is axiologically fixed in discourse, in which the two entities are diametrically opposed to one another, as a "chain of naturalized antitheses" (Parry, 2004, p. 14). The White, the Self, the Western European, is the "Sovereign Law"; the Black, the Other, the Eastern colonized subject is its transgression (Fanon, 1961/2004; Parry, 2004, p. 14). The function of this created dichotomy is clear – for one to exert control over the other. As

Edward Said put it: “The relationship between Occident and Orient is a relationship of power [and] of domination” (Said, 1994, p. 133).

This function of domination and power is repeated in academic literature on cannibalism. Gina Kolata (1986) writes that calling other people cannibals is "perhaps the ultimate derogatory comment" (Kolata, 1986, p. 1500). Indeed, the accusation effectively strips groups of their social power – it was made by colonizers to justify their predatory behavior over colonized people (Lindenbaum, 2004, p. 476). In 1979, William Arens went so far as to say first-hand evidence of actual cannibalism does not exist – that only rumors and accusations by outside groups can be found:

> The most certain thing to be said is that all cultures, subcultures, religions, sects, secret societies and every other possible human association have been labeled anthropophagic by someone. In this light, the contemporary, though neglected, anthropological problem emerges more clearly. The idea of "others" as cannibals, rather than the act, is the universal phenomenon (Arens, 1979, in White, 1992, p. 15-16).

However, according to Brady (1982), this statement should not be taken in a literal manner, but is instead an indication of the strength of beliefs in earlier writings on cannibalism:

> It should be remembered that Arens's book is less an attempt to set the record straight on cannibalism (where it does or does not occur and why) than it is an indictment of anthropology for swallowing such tales whole and parading them around in the literature as facts when most of the evidence turns out on close inspection to be unsubstantiated impressions, rumors, innuendo, ethnocentrism, plagiarism, and so forth (Brady, 1982, p. 601).

Indeed, I would argue that there are certainly some cases of cannibalism known to archaeologists. Tim White’s research at Mancos (1992) is one such example. White is of the opinion, when it comes to researching cannibalism, that a Western bias can be avoided so that objective research can be carried out (White, 1992, p. 8) – however, I would argue that human bias cannot ever be avoided, especially in such a sensitive topic as cannibalism.

As an example of the Eurocentric mindset in contemporary research, *An Intellectual History of Cannibalism* by Cătălin Avramescu paints the cannibal as a non-western, savage “Other” (Avramescu, 2009). This is problematic because, through the trope of “the cannibal”, Avramescu reinforces the colonial view of non-western societies as savage, dangerous and barbarous. When this view is projected onto prehistoric societies, it can limit our understanding of the past – prehistoric humans are seen as savage and barbarous, instead of as the nuanced and intelligent humans that they must have been. It clouds our understanding of how these societies worked. We must be careful not to

understand these cultures as a monolithic, dangerous Other. Much of the research on Herxheim which does not see the site as cannibalistic, may have been influenced by this form of orientalism. Indeed, when one sees cannibalism as something inherently barbaric and Other, as antithetical to a European self-image, this might present a bias when looking at a prehistoric European society – one might hesitate to acknowledge cannibalism out of a subconscious fear of branding a European society as barbaric.

As another example of stereotyping of cannibalism, Dutch readers may be familiar with the themepark of *De Efteling*, geared towards children, which from 1988 until 2021 featured an infamous carnival attraction called *Monsieur Cannibale* (fig. 10). The attraction featured racist depictions of Black people cooking humans in large pots (De Efteling, n.d.; Wikipedia, n.d. c).

Figure 11: The former attraction Monsieur Cannibale in De Efteling. Figure from: Boris Raczynski, Gutschein Zeitung, 24 June 2021.

6 Conclusion

The research question and sub questions posed at the beginning of this thesis are as follows:

- What evidence for cannibalism is there at the Herxheim site?
- What do the different researchers say about the mass grave at Herxheim?
- On which evidence are these theories based?
- If cannibalism did take place, as what type of cannibalism can the evidence be classified?
- What are the implications of designating an archaeological site and society as "cannibalistic"?

These questions have been answered in the different chapters of this thesis. The evidence for cannibalism at the Herxheim site is osteological, taken from the book on the 2005-2010 excavation by Boulestin and Coupey (2015). They interpret Herxheim as a site where human cannibalism did take place, in a form of exocannibalism as a part of warfare. They use extensive osteological evidence to support this conclusion. Orschiedt and Haidle (2012) do not see Herxheim as indicative of cannibalism – rather, they interpret it as a "complex death ritual." They believe that the individuals in the grave are predeceased group members of different LBK settlements, who were brought to Herxheim for an elaborate funerary ritual. Zeeb-Lanz et al. (2009) believe the same thing; that Herxheim indicates a peaceful extra regional ritual.

Using the five characteristics of cannibalism in the archaeological record by White (1992) and McCraw (2011), a strong case for cannibalism at Herxheim can be made. The best indicators are an extensive fracturing of the long bones and marrow-rich elements; the underrepresentation of free vertebrae, and especially their transverse processes; an abundance of cut marks in a pattern that is similar to both LBK faunal butchering techniques and other sites associated with cannibalism; as well as chew marks on the marrow-rich parts of the foot and hand bones. Moreover, evidence of burning is present on a number of bones, especially the skulls. Pot polish is present in three specimens – one of these also shows evidence of hammerstone abrasion.

The post-mortem treatment of the bodies seems to not be part of a funeral rite for in-group family or clan members. Rather, the individuals seem to be victims of an episode of violence. This is attested for in their seemingly careless deposition in large mass graves, which stands in clear opposition to the usual LBK practice of personalized inhumations accompanied by grave gifts. Moreover, the treatment of a number of skulls at Herxheim is telling of an unusual ritual practice. The bodies of the victims were roasted on an open fire, their heads separated from the bodies, defleshed to expose the open bone – the craniums were then shaped into skull cups. Finally, these cups were deposited separately. This

practice indicates a ritual with certain "rules," even if we do not know those rules today. There is no evidence for starvation conditions at the Herxheim site. All these factors together indicate a case of ritual cannibalism combined with exocannibalism as an act of aggression.

From a sociological perspective, violence and warfare are a part of everyday life. Societies divide themselves into different social or ethnic groups based on various criteria – this creates a dichotomy of "us vs. them." The "other" is stereotyped as strange and dangerous. In times of stress, mass violence can break out against members of a perceived other (Demmers, 2012). This violence is justified through Collective Action Frames: "action-oriented sets of beliefs and meanings." These meanings serve to legitimize the violence drawing from existing ideologies (Benford & Snow, 2000). Violent Imaginaries are models of socially acceptable violence – they rely on an "us vs. them" dichotomy and a perceived moral superiority of "our" group (Schröder & Schmidt, 2001). Such cultural beliefs, ideologies and models must have been present in prehistory, for example in public performances of conflict and violence.

An interpretation of ethnic cleansing or even genocide could be made for multiple of the late LBK mass grave sites. However, a problem with genocide is establishing an intent of eradication – in archaeology, this is almost impossible. Nonetheless, multiple indications of ethnic cleansing events can be seen in the existing research. At numerous late LBK sites, the entire population is found massacred excluding the adult female individuals – one can assume a pattern here of abduction and gendered sexual violence. Indeed, sexual violence is very common in mass violence and ethnic cleansing events. It serves as a weapon against the group as a whole. Unfortunately, lacking data at Herxheim of biological sex of the victims proves it impossible to establish a useful sex distribution for the site.

Based on Said's *Orientalism* (1978/2003), one can see a bias in our society in which the "civilized and rational" West is opposed to a "mysterious, emotional and dangerous" East. This concept comes back in much of the existing literature on cannibalism. Colonizing European nations have often accused marginalized groups in the global South of cannibalism. These accusations serve as a justification for colonialism and imperialism. When a group is labeled as cannibalistic they are designated as a dangerous "Other" which needs to be controlled and educated. This might explain why many archaeologists are so hesitant to identify the occurrence of cannibalism at archaeological sites. Doing so would mean to acknowledge a "barbarous" past which is not consistent with the self-image of many Europeans.

For further research on the topic of cannibalism at Herxheim, I have two suggestions. The first would be to try to establish the biological sex of more of the excavated individuals in the mass grave. This

might establish a sex distribution, which would be interesting to compare to the other late LBK mass grave sites. The second suggestion would be to execute a strontium isotope analysis of the dental material at Herxheim – this might establish more clearly where exactly the individuals would have come from.

Abstract

This thesis looks at the late Linearbandkeramik site of Herxheim, southern Germany, dated to c. 5300 – 4950 BCE. At the site, 15,552 bone fragments of c. 1350 individuals have been deposited in a ring enclosure of overlapping pits. The heavily fragmented bone assemblage is interpreted as the remains of multiple human cannibalism episodes in a period of less than 50 years. Some researchers have interpreted the site as a peaceful funerary ritual. However, this thesis argues for the occurrence of cannibalism based on the osteological evidence. The fracturing of the long bones and marrow-rich elements, the underrepresentation of free vertebrae, the presence of cut marks that are consistent with faunal butchering techniques and other sites associated with cannibalism, as well as the presence of chew marks on hand and foot bones are given as indicators for cannibalism. Herxheim is interpreted as a combination of exocannibalism and ritual cannibalism. A postcolonial interpretation of a "civilized" Self as opposed to a "barbarous" Other can explain why cannibalism in archaeology remains controversial.

Reference list

Amkreutz, L., & van de Velde, P. (2017). A world ends: the demise of the northwestern Bandkeramik. *Exerpta Archaeologica Leidensia II: Analecta Praehistorica Leidensia, 47*, 19–36.

Avramescu, C. (2009). *An Intellectual History of Cannibalism* (A. I. Blyth, Trans.). Princeton University Press. (Original work published 2003)

Bakels, C. C. (1987). On the Adzes of the Northwestern Linearbandkeramik. *Analecta Praehistorica Leidensia, 20*, 53–87.

Beacham, R. (2021). Theatre of Cruelty: Games of the Flavian Emperors. In A. Futrell & T. F. Scanlon (Eds.), *The Oxford handbook: sport and spectacle in the ancient world* (pp. 156–167). Oxford University Press USA.

Benford, R. D., & Snow, D. A. (2000). Framing Processes and Social Movements: An Overview and Assessment. *Annual Review of Sociology*, *26*, 611–639.

Bentley, R. A., Wahl, J., Price, T. D., & Atkinson, T. C. (2008). Isotopic signatures and hereditary traits: snapshot of a Neolithic community in Germany. *Antiquity, 82*, 290–304. https://doi.org/10.1017/S0003598X00096812

Bertelsen, O. (2018). "Hyphenated" Identities during the Holodomor: Women and Cannibalism. In E. Bemporad & J. W. Warren (Eds.), *Women and Genocide: Survivors, Victims, Perpetrators* (pp. 77–96). Indiana University Press.

Beyneix, A. (2007). Réflexions sur les débuts de la guerre au Néolithique en Europe occidentale. *L'anthropologie, 111*, 79–95. https://doi.org/10.1016/j.anthro.2006.12.017

Bickle, P. (2019). Thinking Gender Differently: New Approaches to Identity Difference in the Central European Neolithic*. Cambridge Archaeological Journal, 30*(2), 201–218. https://doi.org/10.1017/S0959774319000453

Boulestin, B., Zeeb-Lanz, A., Jeunesse, C., Haack, F., Arbogast, R.-M., & Denaire, A. (2009). Mass cannibalism in the Linear Pottery Culture at Herxheim (Palatinate, Germany). *Antiquity, 83*, 968–982.

Boulestin, B., & Coupey, A.-S. (2015). *Cannibalism in the Linear Pottery Culture: The Human Remains from Herxheim*. Archaeopress.

Brady, I. (1982). Review: The Myth-Eating Man*. American Anthropologist, 84*(3), 595–611.

Brownmiller, S. (1993). *Against Our Will: Men, Women and Rape*. Fawcett Columbine. (Original work published 1975)

C.K. (2016). *Interview: "People Were Eaten by The Revolutionary Masses."* (L. Mudie, Trans.) Radio Free Asia, Mandarin Service. Retrieved March 17, 2022, from https://www.rfa.org/english/news/china/china-cultrev-04292016134149.html

De Efteling (n.d.). *Monsieur Cannibale + Draaiende Kookpotten*. Retrieved March 17, 2022, from https://www.efteling.com/nl/park/attracties/monsieur-cannibale

Demmers, J. (2012). *Theories of Violent Conflict: An Introduction*. Routledge.

Fanon, F. (2004). *The Wretched of the Earth* (R. Philcox, Trans.). Grove Press. (Original work published 1961)

Farrugia, J.-P. (2002). Une crise majeure de la civilisation du Néolithique Danubien des années 5100 avant notre ère. *Archeologické Rozhledy, 54*, 44–98.

Ferguson, R. B. (2021). Masculinity and War. *Current Anthropology, 62*(23), 112–124. https://doi.org/10.1086/711622

Flinn, L., Turner II, C. G., & Brew, A. (1976). Additional Evidence for Cannibalism in the Southwest: The Case of LA 4528. *American Antiquity, 41*(3), 308–318.

Fontijn, D. R. (2021). *"Give peace a chance:" On violence and warfare in prehistory and why it matters*. Drieënveertigste Kroonvoordracht, gehouden voor de Stichting Nederlands Museum voor Anthropologie en Praehistorie, Amsterdam. https://library.oapen.org/handle/20.500.12657/53280

Fritsch, B., Claßen, E., Müller, U., & Dresely, V. (2008/2011). Die linienbandkeramischen Gräberfelder von Derenburg "Meerenstieg II" und Halberstadt "Sonntagsfeld", Lkr. Harz. *Jahresschrift Für Mitteldeutsche Vorgeschichte, 92*, 25–229.

Gall, C. (2022, April 11). Bucha's Month of Terror. *The New York Times*. https://www.nytimes.com/interactive/2022/04/11/world/europe/bucha-terror.html

Gerlach, C. (2006). Extremely violent societies: an alternative to the concept of genocide. *Journal of Genocide Research, 8*(4), 455–471. https://doi.org/10.1080/14623520601056299

Gorbunova, V., & Klymchuk, V. (2020). The Psychological Consequences of the Holodomor in Ukraine. *East/West: Journal of Ukrainian Studies, 7*(2), 33–68.

Gronenborn, D. (1999). A Variation on a Basic Theme: The Transition to Farming in Southern Central Europe. *Journal of World Prehistory, 13*(2), 123–210.

Guest, K. (2001). Introduction: Cannibalism and the Boundaries of Identity. In K. Guest (Ed.), *Eating Their Words: Cannibalism and the Boundaries of Cultural Identity* (pp. 1–10). State University of New York Press.

Hachem, L. (2018). Animals in LBK society: Identity and gender markers. *Journal of Archaeological Science: Reports, 20*, 910–921. https://doi.org/10.1016/j.jasrep.2017.09.020

Haglund, W. D. (1991). *Applications of Taphonomic Models to Forensic Investigations*. Ph.D. thesis, University of Washington. Ann Arbor: UMI.

Haglund, W. D., Reay, D. T. and Swindler, D. R. (1988). Tooth Mark Artifacts and Survival of Bones in Animal Scavenged Human Skeletons. *Journal of Forensic Sciences, 33*, 985-997.

Hitchcock, L. (2017). Chapter 13: Gender and violence in archaeology: Final commentary. In U. Matić & B. Jensen (Eds.), *Archaeologies of Gender and Violence* (pp. 263–273). Oxbow Books.

Hofmann, D., Amkreutz, L., Haack, F., & van Wijk, I. (2016). Introduction: Diversity and Uniformity in LBK Studies. In Hofmann, D., Amkreutz, L., Haack, F., & van Wijk, I. (Eds.), *Interpreting Diversity in the Early Neolithic Linearbandkeramik and Beyond* (pp. 3-32). Cambridge Scholars Publishing.

Hofmann, D. (2020). Not going anywhere? Migration as a social practice in the early Neolithic Linearbandkeramik. *Quaternary International, 560–561*, 228–239. https://doi.org/10.1016/j.quaint.2020.04.002

Isaac, B. L. (2005). Aztec cannibalism: Nahua versus Spanish and mestizo accounts in the Valley of Mexico. *Ancient Mesoamerica, 16*, 1–10. https://doi.org/10.1017/S0956536105050030

Kipfer, B. A. (2021). *Encyclopedic Dictionary of Archaeology* (2nd edition). Springer. https://doi.org/doi.org/10.1007/978-3-030-58292-0

Kolata, G. (1986). Anthropologists Suggest Cannibalism Is a Myth. *Science, 232*(4757), 1497–1500. https://doi.org/10.1126/science.3715456

Lindenbaum, S. (2004). Thinking About Cannibalism. *Annual Review of Anthropology*, *33*(1), 475–498. https://doi.org/10.1146/annurev.anthro.33.070203.143758

Lozowick, Y. (1989). Rollbahn Mord: The early activities of Einsatzgruppe C. In M. R. Marrus (Ed.), *The "Final Solution": The Implementation of Mass Murder: Vol. II* (pp. 471–491). The Nazi Holocaust: Historical Articles of the Destruction of European Jews 3. Meckler.

Meyer, C., Lohr, C., Kürbis, O., Dresely, V., Haak, W., Adler, C. J., Gronenborn, D., & Alt, K. W. (2014). Mass Graves of the LBK: Patterns and Peculiarities. *Proceedings of the British Academy, 198*, 307–325.

Meyer, C., Lohr, C., Gronenborn, D., & Alt, K. W. (2015). The massacre mass grave of Schöneck-Kilianstädten reveals new insights into collective violence in Early Neolithic Central Europe. *PNAS, 112*(36), 11217–11222. https://doi.org/10.1073/pnas.1504365112

Meyer, C., Knipper, C., Nicklisch, N., Münster, A., Kürbis, O., Dresely, V., Meller, H., & Alt, K. W. (2018). Early Neolithic executions indicated by clustered cranial trauma in the mass grave of Halberstadt. *Nature Communications, 9*(2472), 1–11. https://doi.org/10.1038/s41467-018-04773-w

McCraw, K. (2011). *Why Cannibalism? Determining the type of cannibalism and the resulting implications of culture based on variation in human bone assemblages*. Honors thesis in the Department of Anthropology, University of Michigan.

Mühlhäusen, R. (2017). Reframing Sexual Violence as a Weapon and Strategy of War: The Case of the German Wehrmacht during the War and Genocide in the Soviet Union, 1941–1944. *Journal of the History of Sexuality, 26*(3), 366–401. https://doi.org/10.7560/JHS26302

Müller-Scheeßel, N. (2019). Gender in Linearbandkeramik Research: Traditional approaches and new avenues. In J. K. Koch & W. Kirleis (Eds.), *Gender transformations in prehistoric and archaic societies* (pp. 133-152). Sidestone Press.

Orschiedt, J., & Haidle, M. N. (2012). Violence against the living, violence against the dead on the human remains from Herxheim, Germany. Evidence of a crisis and mass cannibalism? In R. Schulting & L. Fibiger (Eds.), *Sticks, Stones & Broken Bones: Neolithic Violence in a European Perspective* (pp. 121–138). Oxford University Press.

Parry, B. (2004). *Postcolonial Studies: a Materialist Critique.* Routledge.

Raczynski, B. (2021). Efteling: "Monsieur Cannibale" erhält komplett neue Thematisierung. *Gutschein Zeitung*. https://gutschein-zeitung.de/efteling-monsieur-cannibale-erhaelt-komplett-neue-thematisierung/

Said, E. (1994). From *Orientalism*. In P. Williams & L. Chrisman (Eds.), *Colonial Discourse and Post-colonial Theory: A Reader* (pp. 132–149). Routledge.

Said, E.W. (2003). *Orientalism*. Penguin Books. (Original work published 1978)

Scarre, C. (2018). Holocene Europe. In C. Scarre (Ed.), *The Human Past: World Prehistory and the Development of Human Societies* (4th edition, pp. 388–428). Thames & Hudson.

Schreiber, H. E. (2014). Cannibalized Evidence: The Problem of Over-incorporation in Zheng Yi's Scarlet Memorial. *The Comparatist, 38*(1), 70–82. https://doi.org/10.1353/com.2014.0019

Schröder, I. W., & Schmidt, B. E. (2001). Introduction: Violent imaginaries and violent practices. In I. W. Schröder & B. E. Schmidt (Eds.), *Anthropology of Violence and Conflict* (pp. 1–24). Routledge.

Snyder, T. (2010). *Bloodlands Europe: Between Hitler and Stalin*. Basic Books.

Sommer, U. (2001). "Hear the instruction of thy father, and forsake not the law of thy mother": Change and persistence in the European early Neolithic*. Journal of Social Archaeology, 1*(2), 244–270.

Srebrenica: Genocide in Eight Acts (n.d.). *Prologue*. Retrieved April 7, 2022, from http://srebrenica.sense-agency.com/en/

Teschler-Nicola, M. (2012). The Early Neolithic site Asparn/Schletz (Lower Austria): Anthropological evidence of interpersonal violence. In R. Schulting & L. Fibiger (Eds.), *Sticks, Stones & Broken Bones: Neolithic Violence in a European Perspective* (pp. 101–120). Oxford University Press.

Trautmann, I. (2006). *The Significance of Cremations in Early Neolithic Communities in Central Europe.* Doctoral dissertation, Eberhard-Karls-Universität Tübingen.

van der Made, J. (2016). *Cannibalism in China 50 years on*. Radio France Internationale. https://www.rfi.fr/en/asia-pacific/20160522-cannibalism-china-publication-official-records-50-years-after-cultural-revolut

Vukušić, I. (2018). Nineteen Minutes of Horror: Insights from the Scorpions Execution Video. *Genocide Studies and Prevention: An International Journal, 12*(2), 35–53.

Vukušić, I. (2021). *Framing Violence: Analytical tools of frame analysis* [PowerPoint slides]. Utrecht University, Humanities Department.

Wahl, J., & Trautmann, I. (2012). The Neolithic massacre at Talheim: a pivotal find in conflict archaeology. In R. Schulting & L. Fibiger (Eds.), *Sticks, Stones & Broken Bones: Neolithic Violence in a European Perspective* (pp. 77–100). Oxford University Press.

Walder, A. G. (2014). Rebellion and Repression in China, 1966–1971. *Social Science History, 38*(3–4), 513–539. https://doi.org/10.1017/ssh.2015.23

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

Wikipedia (n.d. a). *American Civil War reenactment*. Retrieved April 13, 2022, from https://en.wikipedia.org/wiki/American_Civil_War_reenactment

Wikipedia (n.d. b). *Guangxi Massacre*. Retrieved March 17, 2022, from https://en.wikipedia.org/wiki/Guangxi_Massacre

Wikipedia (n.d. c). *Monsieur Cannibale*. Retrieved March 17, 2022, from https://nl.wikipedia.org/wiki/Monsieur_Cannibale

Wikipedia (n.d. d). *Triumphal arch*. Retrieved April 13, 2022, from https://en.wikipedia.org/wiki/Triumphal_arch

Yang, S. (2006). Mass Killings in the Cultural Revolution: Study of Three Provinces. In J. W. Esherick, P. G. Pickowicz, & G. W. Walder (Eds.), *The Chinese Cultural Revolution as History* (pp. 96–123). Stanford University Press.

Yongyi, S. (2011). *Chronology of Mass Killings during the Chinese Cultural Revolution (1966-1976).* Encyclopedia of Mass Violence & Sciences Po. http://www.netadvisor.org/wp-content/uploads/2016/01/2011-08-25-Chronology-of-Mass-Killings-during-the-Chinese-Cultural-Revolution-1966-1976-16pps.pdf

Zeeb-Lanz, A., Arbogast, R.-M., Haack, F., Haidle, M. N., Jeunesse, C., Orschiedt, J., Schimmelpfennig, D., & van Willigen, S. (2009). The LBK settlement with pit enclosure at Herxheim

near Landau (Palatinate). First results. In D. Hofmann & P. Bickle (Eds.), *Creating communities: New advances in central European Neolithic research* (pp. 202–219). Oxbow.

Zeeb-Lanz, A., & Haack, F. (2016). Diversity in Ritual Practice at the End of the LBK. In L. Amkreutz, F. Haack, D. Hofmann, & I. van Wijk (Eds.), *Something Out of the Ordinary. Interpreting Diversity in the Early Neolithic Linearbandkeramik and Beyond* (pp. 247–279). Cambridge Scholars Publishing.

Zheng, Y. (1996). *Scarlet Memorial: Tales of Cannibalism in Modern China* (T. P. Sym, Ed. and Trans.). Westview Press. (Original work published 1993)