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Diskussionen

New perspectives on deliberate fragmentation and bodily mobility

By John Chapman, Bisserka Gaydarska and Tina Jakob

Introduction

If anything characterises archaeological evidence, it is its fragmentary nature. Be it fragments of a pot, a house or a cemetary (a single grave), they ultimately lead to the reconstruction of a part of our past. It is no surprise, then, that, for a very long time, fragments constituted "rubbish" in archaeology, probably because of the unhelpful commonplace that archaeology is concerned with the rubbish of past generations. This perspective drastically curtailed the potential of archaeologists to construct interesting narratives based on fragments, which were fit only for disposal. Nonetheless, the efforts to deal with fragments continued.

The new research perspective of deliberate fragmentation emerged in the late 1990s (for a brief history, Chapman 2022). From the outset, a key part of fragmentation methodology was re-fitting. The re-fitting studies collected in John Chapman's "Fragmentation in archaeology" (Chapman 2000) supported the notions of deliberate fragmentation and fragment curation, as well as the practical use of fragments after the break, including children's play with fragments. This stage of the research can be summarised in what was termed the 'Fragmentation Premise' – namely that "objects were regularly deliberately fragmented and the resulting fragments were often re-used in an extended use-life 'after the break'" (Chapman / Gaydarska 2007, 2; 8–10; 18). It is revealing that, despite significant attention to the fragmentation of human remains in the burial process in the 2000 book (Chapman 2000, 134–179), human bones were not included in the Premise in the subsequent fragmentation volume in 2007. Nonetheless, conceptualisation of the fragmentation of objects and human bones treated the two very different materials as homologous *(Fig. 1a)*.

This research direction was addressed in two studies of mortuary remains in the Balkan Mesolithic, Neolithic and Chalcolithic (Chapman 2010; Chapman et al. 2013), in which J. Chapman and his colleagues emphasised the repeated occurrence of the fragmentation of the deceased's body into parts that were then stored, curated, moved, further transformed and ultimately buried. Rosalind Wallduck (2013, 15–17) noted that burial of partial bodies was a much more complex mortuary process than the one-stage burial of single, complete bodies. In parallel to what was the 'normal' burial of individual, articulated bodies as single burials in a separate burial pit, Balkan and Carpathian communities practised five forms of 'deviant' burials, involving fragmentation and partial removal of bone fragments; addition of bones from another skeleton to a burial; removal of complete bones from a burial; the creation of a hybrid body through bone re-combination from two different bodies; and substitution of human bones by replacement with artefacts.

However, the use of the identity triangle as a framework for thinking about basic human relations to objects and places *(Fig. 1b)* reminds us of a fundamental incompleteness in fragmentation theory, which has recently been addressed (Chapman 2022; Chapman / Gaydarska 2022; Chapman et al. in press) through the integration of landscape fragmentation into the research framework. We propose to modify the Fragmentation Premise as follows:

Places, human bodies and objects were regularly deliberately fragmented and the resulting fragments were often re-used in an extended use-life 'after the break'.

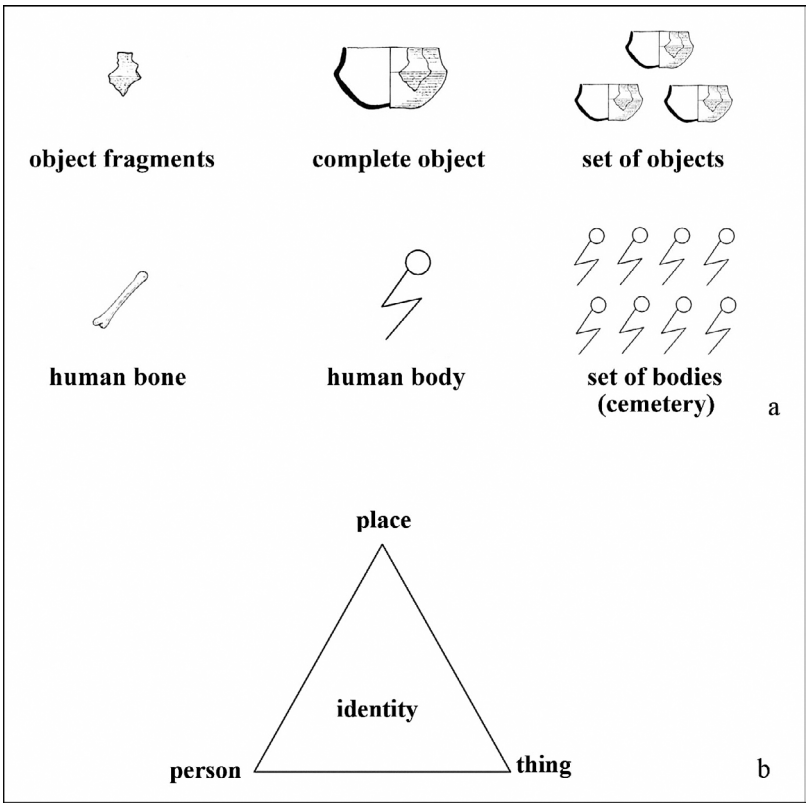

Fig. 1. a Relationship between parts, wholes and sets for objects and human bones. – b Identity triangle.

The fragmentation of place is therefore the origin-metaphor for the general process of relating in the world – viz., enchainment. It is the link between a place and an open-ended series of other places that marks out enchainment as central to the creation and maintenance of social life. An approach focused on the itineraries of bodies and objects provides a holistic means of re-integrating places, persons and objects. In other words, the incorporation of the fragmentation of place is essential for an integrated theory of fragmentation, with its variety of operational chains – reductive, additive, and transformative *(Fig. 2)*. But of equal significance are the human bodies which were not solely buried in an articulated complete manner but often fragmented to form different, partial but more dividually dynamic bodies[1].

In this article, we wish to consider the processes whereby human bodies are fragmented and moved around sites and even around the landscape. We consider examples of well-documented bodily mobility in European prehistory *(Fig. 3)* as an introduction to a proposed re-interpretation of the remarkable *Linearbandkeramik* (LBK) site of Herxheim, Rhineland-Palatinate (DE), where excavations have uncovered the deposition of thousands of incomplete human and animal bones, sherds, and stone tools (Zeeb-Lanz 2016; Zeeb-Lanz 2019a). It is our primary aim to explain the principal Herxheim puzzle that has so far defeated attempts to understand the source of the human remains.

[1] The term 'dividual' refers to an entity whose identity is composed of all the relations which that entity shares with other persons, places and bodies (Chapman 2000, 14–16).

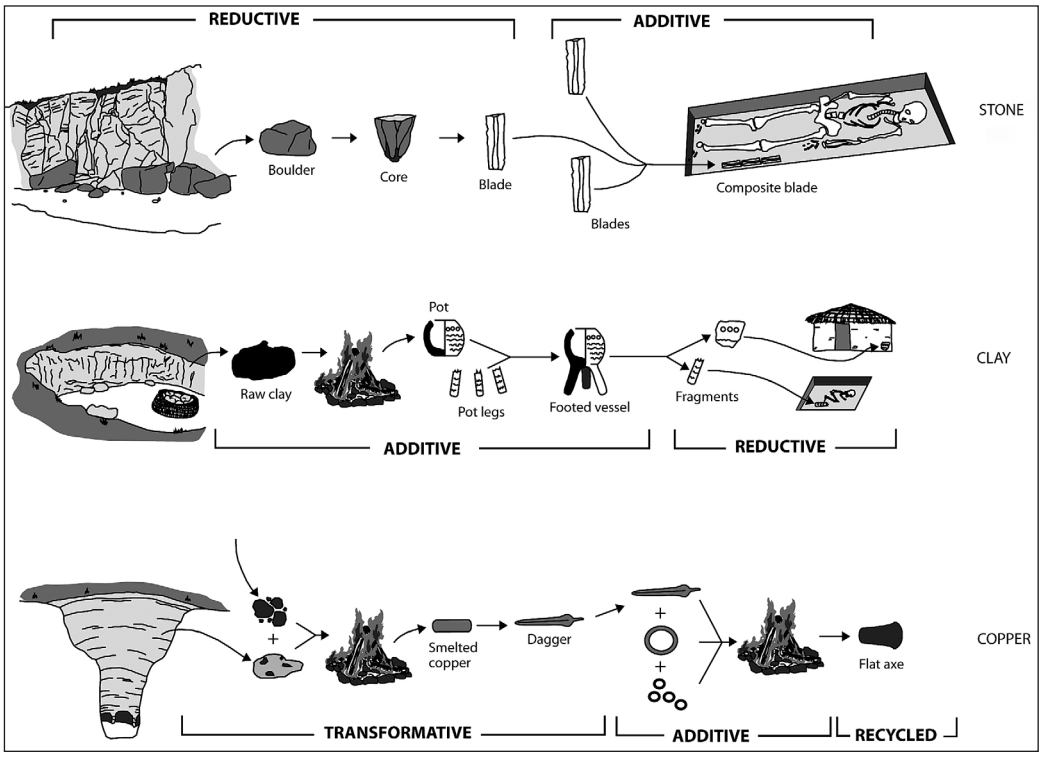

Fig. 2. Operational chain for object production: reductive, additive, transformative, recycled.

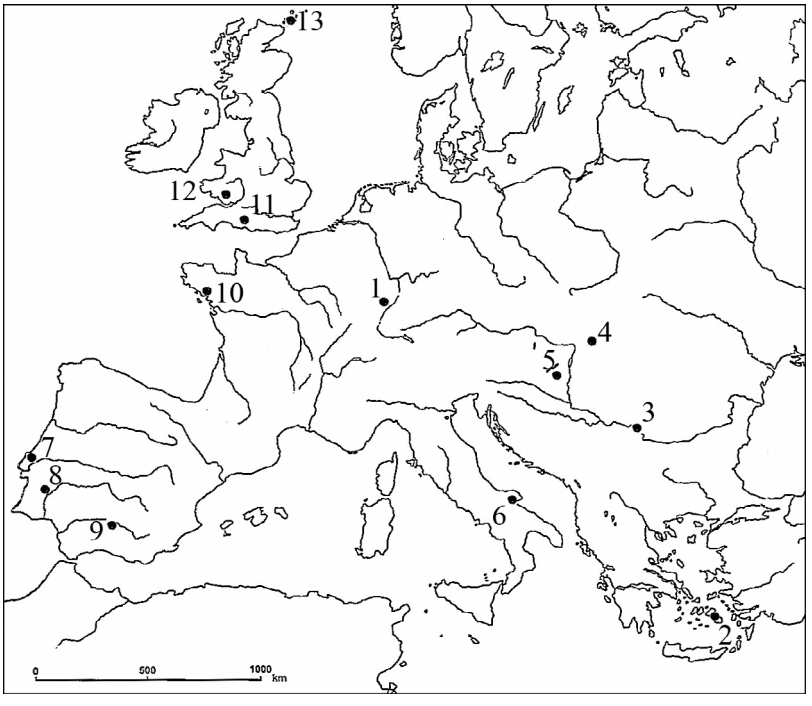

Fig. 3. Sites mentioned in the text: 1 Herxheim; 2 Kavos, Keros; 3 Lepenski Vir (Iron Gates Mesolithic); 4 Polgár-Csőszhalom; 5 Alsónyék; 6 Grotta Scaloria; 7 Bom Santo cave; 8 Perdigões; 9 Marroquíes; 10 Breton megaliths; 11 Hambledon Hill; 12 Southeast Welsh long cairns; 13 Orcadian megaliths.

Inter-site re-fits and bodily mobility

It is trivial to suggest that people moved between sites and across their landscapes in ways both simple and complex (Montgomery 2010; chapters in Fernández-Götz et al. 2023). Radiogenic and stable isotopic research has shown the places and geologically distinctive landscapes where dead people were born, often long distances from where they were buried (Bentley 2006; Smits et al. 2013; Laffoon et al. 2017). These narratives have often been confirmed by large-scale aDNA studies (Olalde et al. 2018; Mathieson et al. 2018). Equally, massive, long-term research effort has been expended on determining the links between objects made of specific raw materials and their sources (Pétrequin et al. 2017; Gehlen et al. 2022; Muntoni et al. 2022). The combination of these two approaches has yielded many insights into the networks relating people, places and objects in the past (Jones 2012; Leary 2014). The addition of a fragmentation perspective to these approaches has not been without its methodological issues (Chapman / Gaydarska 2007, 81–85), but we can now confirm the identification of fragments of the same object deposited on two or more different sites from a wide range of time-places, including Upper Palaeolithic and Mesolithic lithics, Bronze Age swords, and Roman pottery as well as large decorated stones placed in different megalithic tombs in the Breton Neolithic and Californian chert linking a quarry and a workshop in the Chuckwallah valley over 63 km (Singer 1984; Chapman / Gaydarska 2007, 106–111). The large-scale re-fitting operation in the Kavos Project, Cyclades (GR), was able to demonstrate the movement of thousands of marble figurine fragments to a special pilgrimage centre on Kavos by showing the total absence of on-site re-fits for the deposited fragments and therefore thousands of 'orphan' fragments (Renfrew 2015; Renfrew et al. 2013; Renfrew et al. 2015). The petrographic identification of the pottery sources for a sample of the fragments showed they mostly originated from within the Keros Triangle of Naxos, Amorgos and Ios (all GR; Renfrew 2015, 94 fig. 7,20).

However, when the fragmentation perspective shifts to human remains, new questions arise. First, it is much harder to identify re-fits between fragments of human (or animal) bone, even within an on-site study (Smith / Brickley 2009, chapter 4; Rosell et al. 2019; Morin et al. 2021). Secondly, isotopic studies of tooth enamel are ideally required to demonstrate that the place of origin was different from the place where the deceased was buried (Bentley 2006; Frei / Price 2012; Coffin et al. 2022). Nonetheless, a growing group of studies has identified the presence of buried individuals who grew up outside the local settlement catchment or, even more appositely, the re-burial of body parts from non-local individuals (Brück / Booth 2022). These studies offer support for the alternative mobility scenario for the Herxheim site – a notion based upon a division of bodies for transport.

With the benefit of minimal reference to isotopic analysis (Montgomery et al. 2000), Martin King (2003) has identified the widespread dispersal of human skeletal material across the landscape in both the Mesolithic and Neolithic periods in the UK, suggesting that, at a gross level, this was a "fall-out from a dispersed, mobile occupation system" (King 2003, 199). As part of this pattern, King identified a large number of cases of the deliberate selection of particular skeletal categories by their presence or absence (e. g. Orcadian tombs and the Hambledon Hill complex: King 2003, 102). While the lack of isotopic information prevented King from specifying the spatial range of human skeletal mobility, more recent studies have confirmed his basic thesis. An example is Samantha Neil's study of the strontium isotopic characteristics of disarticulated, highly fragmentary human remains from two Welsh Early Neolithic sites, which shows contrasting results from the two chamber tombs, with the Penywyrlod individuals mostly 'local' and the Ty Isaf individuals mostly 'non-local' (Neil 2022). The bioarchaeological study showed how the commingled remains

from different individuals were the "result of re-arrangements from a pool of already disarticulated bones" (Wysocki 2022, 174).

In a study focussing on the Iron Gates Mesolithic and Neolithic, Wallduck (2013) has demonstrated similar bodily mobility through the identification of many partial burials, noting that they often comprised far more complex *chaînes opératoires* than single, complete individual burials. Later studies of the Gorge showed a more complex mobility pattern, with Camille de Becdelièvre et al. (2020) using a combination of other researchers' strontium isotopic data and aDNA data to identify some locals who grew up in the gorge possessing Anatolian genomic ancestry, while one non-local from another region had a Mesolithic genomic ancestry similar to that of many Iron Gates Mesolithic individuals. These results underline the key role of Lepenski Vir (RS; 6150–5500 cal BC) as a congregation site for both high-status hunter-gatherers and farmers (Radovanović 1996), with grouped burials of locals and non-locals reinforcing new social relations (de Becdelièvre et al. 2020).

Moving to the Mediterranean zone, Antonio Faustino Carvalho et al.'s (2019) study of the excavations of concentrations of partial skeletons in two chambers at the Middle Neolithic Bom Santo cave in Portugal (3800–3400 cal BC) has shown how the cave formed part of a widespread, complex mortuary network linked by a chain of funerary practices, including primary deposition, exhumation, transportation and secondary deposition of parts of skeletons in the cave. This network distributed the mortuary process across the landscape in a series of different cemeteries, which were all linked to the Bom Santo cave. Comparable mortuary complexes with secondary burials of complete or partial bodies are known from the LBK and Later Neolithic from the Jungfernhöhle near Tiefenellern (Seregély 2012) and from Bronze Age Germany (e. g., the Lichtensteinhöhle, Lower Saxony: Schilz 2006).

Recent isotopic studies have focussed on those buried at an Italian Neolithic cave of comparable significance to Bom Santo – the late 6th millennium cal BC Grotta Scaloria in Southeast Italy (Elster et al. 2016). Here, in the Upper Cave, a small assemblage of highly fragmented, commingled bones including adult males, adult females and juveniles showed both a wide variety of dietary nitrogen isotopic values (Tafuri et al. 2016a, 137) and strontium isotopic values suggesting the population derived from a plurality of geological and social catchments (Tafuri et al. 2016b). These findings were interpreted to indicate the use of Grotta Scaloria not simply as a burial site for a local community but rather a gathering place for people living in the entire Gargano-Tavoliere region. The partial correlation between strontium values of 'non-locals' and particular body parts (e. g. femora) may indicate that "bodies from "non-local" places were brought to the cave as selected parts" (Tafuri et al. 2016a, 142).

Two isotopic studies of the burials at large enclosures found in Portugal dating to the Late Neolithic and Chalcolithic show contrasting results about the distances travelled to the final resting places. In a study of teeth from 115 different individuals buried over a period of 200 years (26th–25th centuries cal BC) at the enclosure of Marroquíes, only 8 % proved to be non-locals (Díaz-Zorita Bonilla et al. 2018). As the research group observed, "the social life of the body did not end with death but acquired a new ontological status, transforming the deceased individual into a new kind of being who retains both agency and a capacity for action" (Díaz-Zorita Bonilla et al. 2020, 347).

By contrast, the results of the isotopic study of the fragmented remains of 69 Neolithic and Chalcolithic persons from Perdigões showed that a quarter came from beyond the local geologies characterising a 20 km radius of the enclosure (Valera et al. 2020). António Carlos Valera et al.

maintain that discussions of mobility should include assessments of the nature of the site and its social role, given the contrasting finding that all the individuals analysed from the megalithic tombs near Perdigões came from local catchments.

A final comparative study concerns the congregation site of Alsónyék in Western Hungary (Bánffy et al. 2016; Gaydarska / Chapman 2022). One of the longest-living places in European prehistory, with occupations lasting from the Early Neolithic Starčevo group, with a periodic gap, to the late Lengyel period (58th century cal BC–43rd century cal BC), Alsónyék reached the apogee of its mortuary activities in the Lengyel period, in the 46th and 45th centuries cal BC, with a modelled mortuary peak c. 4730 cal BC (Bayliss et al. 2016). Consistent with the usual assumptions of Neolithic lifeways, the research team estimated a large population in the Lengyel period coeval with the vast mortuary deposition. However, reconstruction of the local palaeo-environment (Depaermentier et al. 2020) indicated a rather low land-use potential which would in no way have been capable of sustaining such a large population. Our radical alternative to the 'normal' picture of permanent Neolithic settlement involved moving complete bodies of deceased people from neighbouring Lengyel sites to Alsónyék to explicate the high number of burials. Although the site burials have not been published in full, there is no indication as yet (Osztás et al. 2016) of the transport of partially dismembered human bodies to what we consider as a mortuary congregation centre. Our alternative implies the transport of complete human bodies to Alsónyék over distances of up to 20 km.

All of these studies share the same results of a widespread dispersion and movement of human remains across a variety of European landscapes, with Bom Santo and Grotta Scaloria showing the movement of fragmented bodies. While accepting that there will be a variety of different funeral ritual pathways, it is important to give proper consideration of the possibility of the movement of parts of human bodies across the landscape to special places.

There are two stages in the methodology to distinguish the mobility of human bodies or their parts: (1) the demonstration that fragmentary or complete bodies were buried at some distance from their place of childhood residence, thus enabling the differentiation of 'locals' from 'non-locals' (e. g. Welsh long cairns, Bom Santo, Grotta Scaloria, Marroquíes, Perdigões, Alsónyék and the Lichtensteinhöhle); and (2) the demonstration that fragmentary or complete human bodies were moved to their place of burial from a non-local settlement rather than simply moving to near their place of burial for the last 10–20 years of their lives (e. g. Grotta Scaloria, Alsónyék).

In the remainder of this paper, our aim is to investigate the two stages of the human body mobility scenario in the case of the Herxheim enclosure. After all, it has already been well established by the Herxheim team's research that a mobility model can account for the exotic pottery and stone tools which were brought by some means to Herxheim. So why not extend this notion to human body parts?

The Herxheim enclosure

The Herxheim enclosure is one of the most extraordinary sites in prehistoric Europe, with a massive series of heavily fragmented deposits of human and animal bones, pottery, lithics, and single finds, placed for the most part in two incomplete ditch circuits in the latest LBK phase, some time in the last century of the 6th millennium cal BC (Zeeb-Lanz et al. 2007; Zeeb-Lanz 2016; 2019a).

The excavation of the Herxheim enclosure took place in two four-year operations – 1996–1999 (the 'rescue' excavation) and 2005–2008 (the 'research' excavation) (Zeeb-Lanz / Haack 2016). The Herxheim enclosure is double-ditched but incomplete, forming a trapezoidal shape of almost

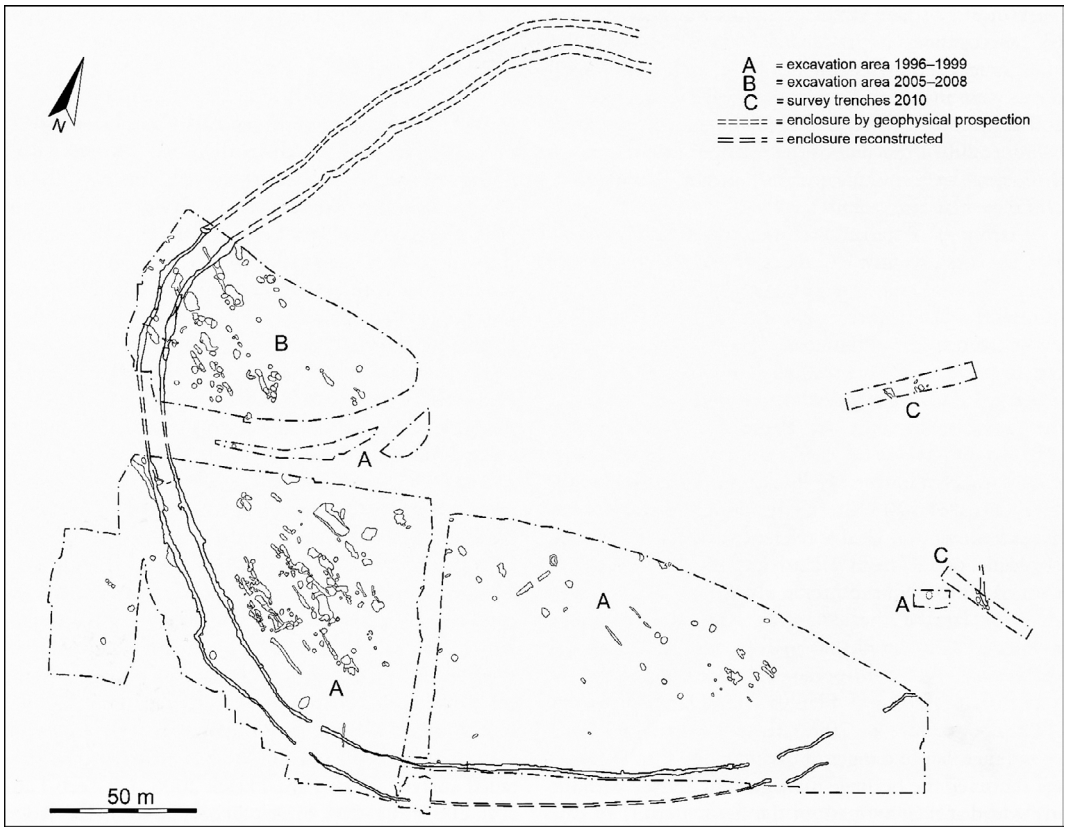

Fig. 4. Herxheim. Plan of enclosure showing location of excavations: A rescue excavation; B research excavation; C survey trenches.

6 ha (c. 270 m [north–south] x 220 m [east–west]) *(Fig. 4)*. Long segments of ditch were missing on the east side and it is possible that only the inner ditch was present in the south-east part of the site (Zeeb-Lanz 2019b, 429). Much erosion has truncated the LBK living surface and much of the upper portions of the pits and ditches (Haack 2016a, esp. 22–23). Pottery from Phases II–V of the Palatinate LBK sequence has been found on site but the main activity – termed 'the ritual phase' and including the digging of the ditches – dated to the latest LBK Phase V, with secondary incorporation of what we would term 'ancestral' material (viz. Phases III and IV pottery) in the bottom of some ditch segments. Settlement material inside the inner ditch included house remains and cut features (usually pits), mostly from Phase V. The basic architectural unit was the 'long pit' (Zeeb-Lanz 2019b, 428), with sequences of long pits comprising the inner and outer ditches. There were very few re-cuts of the ditch fill, leading Fabian Haack (2016a, 113–115) to reject Christian Jeunesse's (2011) claim that Herxheim fitted the 'Rosheim' model of a pseudo-ditched enclosure acting as a long-term ritual centre for secondary burials lasting for centuries. Instead, Andrea Zeeb-Lanz favours a series of long pits each dug and utilised over a short period of time, with finds concentrations often covering the length of several long pits (Zeeb-Lanz 2019b, 428). While Anthony Denaire suggests that the remains of each ritual 'event' were placed in a midden and then thrown into the nearest long pit (Denaire 2019, 38), A. Zeeb-Lanz proposes the variant that piles of ritually fragmented material were kept temporarily near the open parts of the ditches, with the unintentional commingling of fragments through deposition in the ditches (Zeeb-Lanz 2019b,

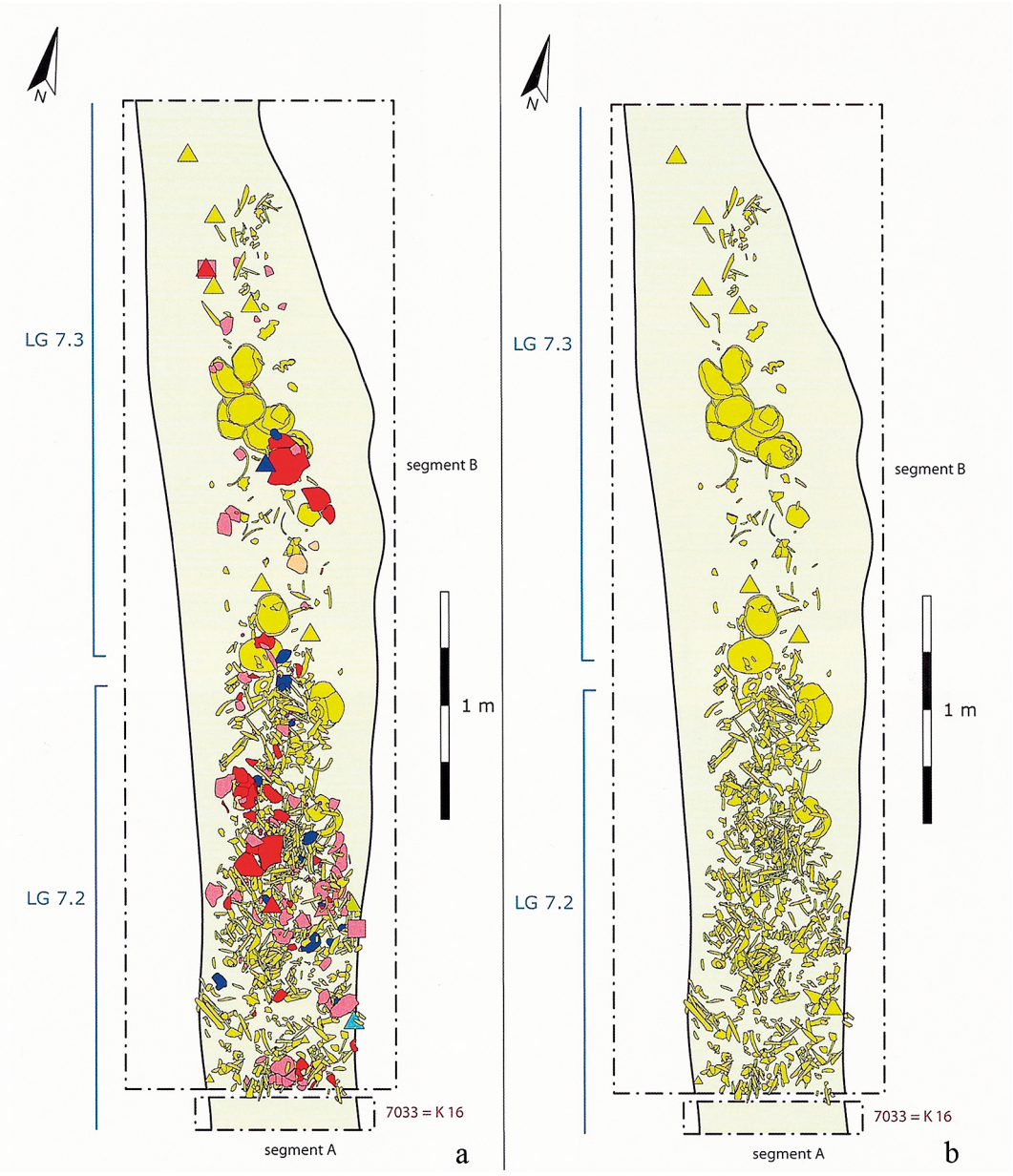

Fig. 5. Herxheim. Detail of two plans of Long Pits LG 7.2 and 7.3, inner ditch ring, showing finds horizons 5–19, at depths of 132.00–130.51 m ASL.

466). A major recurrent feature of both ditches was the presence of 'finds concentrations' which were normally a mixture of predominantly earth interspersed with some finds (Zeeb-Lanz et al. 2007, 266). Occasionally, as in concentration K16, a 1.50 m-thick concentration of finds (depths 132.00–130.512 m ASL) contained mostly earth *(Fig. 5)* (Haack 2016b, pl. 66). Tightly packed finds clusters occurred rarely and, even then, not across the whole of a concentration (e. g. clusters were found in only part of Concentration K 9/18) (Haack 2016a, 69–74). The discovery of finds in the earth above these concentrations has been thought to mean that the finds were deposited with earth as the final stage of the ritual, with no intention of placing all of the finds in concentra-

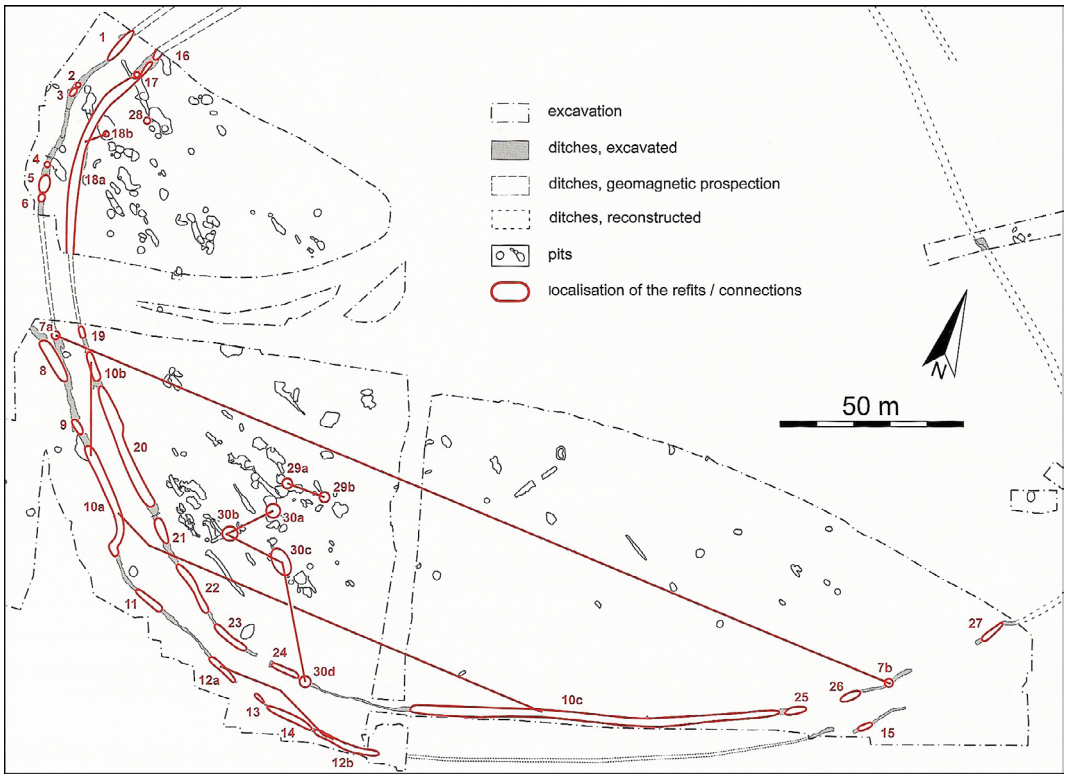

Fig. 6. Herxheim. Concentrations of reassembled sherds and long-distance sherd re-fits.

tions (Haack 2016a, 74). Anthony Denaire has noted that the major clusters of sherd re-fits correlate well with the human bone concentrations *(Fig. 6)* (Denaire 2019, 34).

The most striking biosocial remains were the human skeletal remains, most of which were deposited in the inner and outer ditches (Boulestin / Coupey 2015; Bauer 2019). The human bones derive from persons of all ages but with an under-representation of children younger than five years and an over-representation of juveniles and young adults (Boulestin / Coupey 2015). However, this observed age representation might be caused by osteological and taphonomic factors rather than representing the 'true' demographic picture. The bodies suffered from dismemberment soon after death and then the smashing of their bones. Despite re-fitting efforts with 1891 bone fragments from eight slots in the rescue excavations (slots 282-100 to 282-107), it has never been possible to re-fit a single complete long bone from these slots (Bauer 2019, 11). Without a more comprehensive re-fitting programme, it is hard to answer the question of the location of the missing fragments – whether off-site or on-site, on the surface of the enclosure or in as yet unexcavated parts of the ditches (Zeeb-Lanz / Haack 2020). Special treatment was afforded to cranial material, with the production of calottes (skull-caps) and – in a few limited cases – their deposition in groups. Both Bruno Boulestin / Anne-Sophie Coupey and Silja Bauer have recognised the overwhelming predominance of peri-mortem butchery and the fragmentation of 'fresh' bone – bone with the flesh still in place – through cut marks, fracture lines, and fracture profiles over the relatively few cases of post-mortem processing of 'dry' bones (Bauer 2019, 5). All analysts have also noted the low number of burnt human bone fragments, at c. 3–3.6 %, with the burning often appearing on fractures, so post-dating the break (Boulestin / Coupey 2015, 65; Bauer 2019, 16). A major disagreement

within the Herxheim team concerns the treatment of the human remains, with B. Boulestin et al. (2009) arguing for mass cannibalism and Zeeb-Lanz rehearsing lengthy and compelling arguments against this interpretation (Zeeb-Lanz 2019b, 449–454). The alternative that Zeeb-Lanz proposes is the mass sacrifice of human captives at Herxheim following raids on other villages (Zeeb-Lanz 2019b, 457–463).

The Herxheim pottery assemblage has not yet been studied in full but discussion of the ceramics has occurred regularly in the project publications (Haack 2016a, 15–118; Denaire 2019, 25–40; Mecking 2019, 41–54). The assemblage comprised an estimated 15 000 sherds, with over 50 % produced in the local Palatinate style. Petrographic analysis has been conducted on over 100 sherds, including 25 imported and 19 possibly imported sherds (Mecking 2019). There was considerable variability in the pastes of sherds 'local' to Herxheim. On the assumption that all the 'exotic' sherds were made in the area where their style was used, the surprisingly high total of 37 different pastes for the 45 sherds indicates not only that the imports came from many different regions but from multiple sites within those regions *(Fig. 7a*; Mecking 2019, 51–53).

The highly fragmented faunal assemblage of over 15 000 fragments deriving from the ditches and the settlement features shows all the characteristics of butchering waste (Arbogast 2019), suggesting the intensive exploitation of the carcasses and bones for food – meat (Gillis 2019), marrow, and grease (Johnson 2019) as well as leather, sinews, and hair. Overall, the wild animal remains in the ditch assemblages were similar to those in the settlement assemblage, with limited selection of carcass elements. Slaughter and butchery of domestic animals took place in the same areas, except for the deposition of clustered dog remains in the inner ditch, where bone re-fits of 90 bones derived from eight individuals, with remains from a further two to four dogs present (Janssens et al. 2019). There was both more burning and greater fragmentation of animal bones in the settlement in comparison with the ditch assemblages. The animal bones from the ditches were more mineralised than those from the settlement, either because they had been curated before deposition or because these were 'ancestral' bones from earlier pits cut by the Latest LBK ditches (Johnson 2019).

The lithic remains can be divided into chipped stone, polished stone, colouring items, and ground stone (Schimmelpfennig 2019). The chipped stone showed the tool spectrum of a 'normal' settlement assemblage (Schimmelpfennig 2019, 102) except for the off-site 'destruction' of many sickle blades which were subsequently brought into the enclosure as splintered pieces. The majority of chipped stone items was deposited in the inner ditch, with fewer in the settlement features and even fewer in the outer ditch. Most of the items were of Upper Cretaceous flint from at least 200 km away, with a small number of Jurassic cherts from the south (no more than 300 km away) and a few Bartonian flints from much further east. These inter-regional imports were considered as important and coming from many directions *(Fig. 7a*; Schimmelpfennig 2019, 91). Lower-quality local *Muschelkalk* cherts would have been available 15–20 km from Herxheim.

The polished stone fragments derived from shoe-last adzes, with several re-fits and signs of both intentional fragmentation and thus deliberate destruction. The depositional structure was the same as for the chipped stone. Sources for the amphibolites included the Bohemian Jizera Mountains, 550 km away, while pelite-quartz came from the Vosges Mountains, 190 km away.

All of the larger pieces of sandstone were manuports – unworked objects not local to the site, which had therefore been brought onto the site – mostly of Bunter sandstone, which was either local, from 15 km away, or from the Vosges Mountains. Most of the ground stone came from settlement features, less from the inner ditch and least from the outer ditch, with very varied quantities of ground stone in the concentrations. A small proportion of ground stone pieces comprised complete

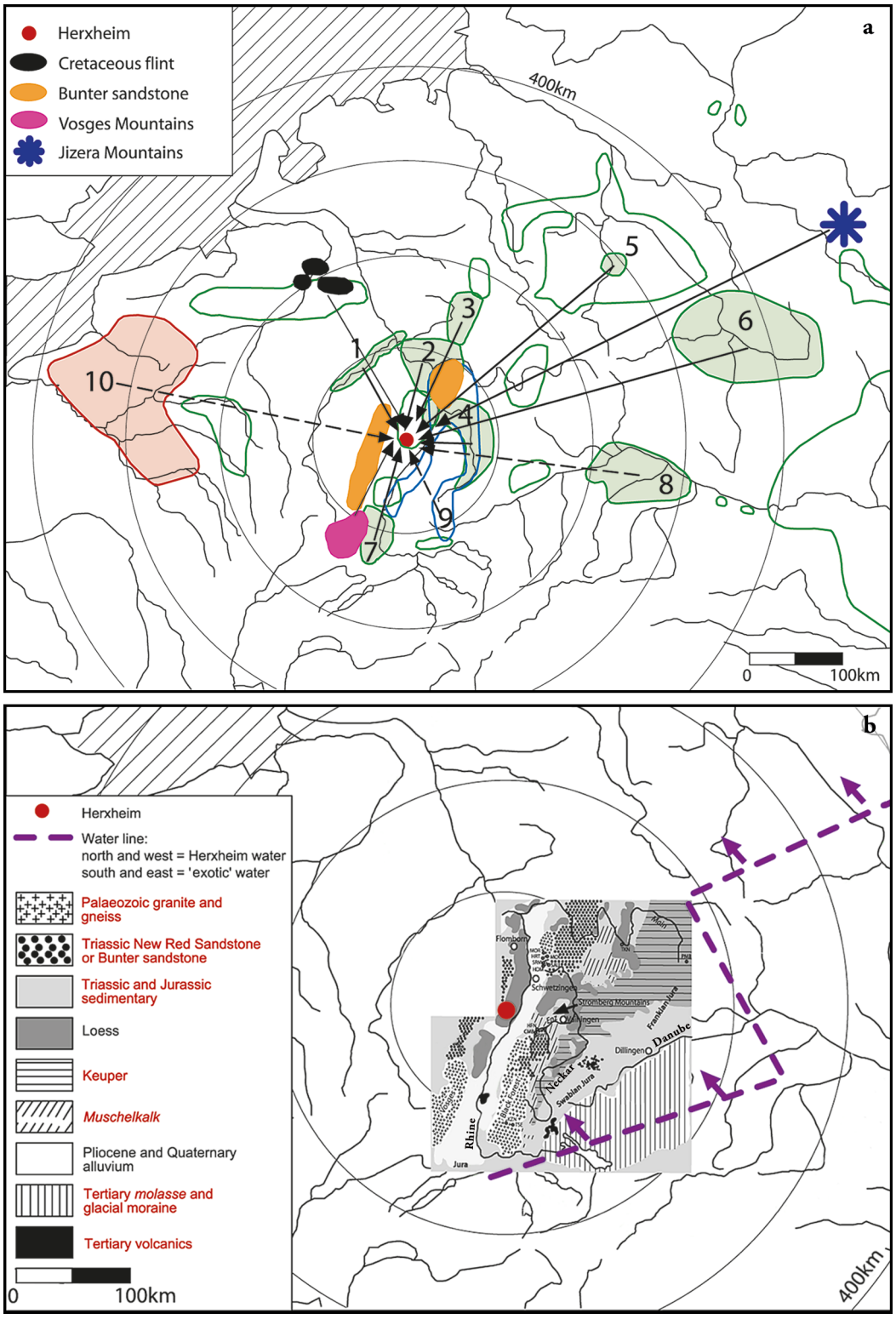

Fig. 7. a Sources of lithic and ceramic materials found deposited at Herxheim: lithics – in key: ceramic styles: 1 Rhine-Moselle; 2 Rhine-Main; 3 Northern Hesse; 4 Neckar; 5 Elster-Saale; 6 Bohemia (Šarka); 7 Upper Alsace; 8 Bavaria; 9 Hinkelstein area; 10 Blicquy. – b Water sources based upon $\delta^{18}OH_{20}$ values.

objects – grinders and saddle querns. Many querns had been made brittle by being placed in fires and intentionally smashed afterwards (Zeeb-Lanz 2019b, 436).

Dirk Schimmelpfennig emphasises the dual, complementary aspects of stone – as an integral part of everyday life and as an important part of ritual. He suggests that the fragmentation of stone items – often through burning – was precisely because of its importance in everyday practices of building, maintenance activities and subsistence (Schimmelpfennig 2019, 130–131).

The huge quantity of material has formed the basis for one of the most ambitious re-fitting exercises in the last decades, for which the researchers should be congratulated. The re-fitting operations included several thousand human bone fragments from the rescue excavations out of the total sample of 75 000, over 15 000 sherds and an undefined number of lithic items out of a total sample of 6000. Some 356 physical re-fits have been made of sherds, with over 2000 additional 'connections' (probable re-fits without a physical connection; Denaire 2019, 27–32; *Fig. 6*). The majority of re-fits occurred between pottery within the same ditch segment but inter-cluster re-fits were made, as well as ditch-to-inner pit re-fits and long-distance re-fits up to 245 m (Haack 2016a, 47–77; Denaire 2019, 32–35), although it is important to note that several concentrations (5, 7 and 28) had no inter-cluster re-fits at all (Denaire 2019, 33). Human bone re-fits have also been demonstrated though not on the same scale as pottery refits, with re-fits between the ditch and the inner settlement pits as well as within and between concentrations and between ditches (Haack 2016a, 62–63). D. Schimmelpfennig (2019, 96) confirms that only 2 % of the chipped stone assemblage of c. 6000 items could be re-fitted, without giving specific details of the locations. He also confirms deliberate fragmentation of polished stone tools in a small assemblage of 55 fragments, with 11 fragments re-fitted to five axes (Schimmelpfennig 2019, 105). But the intentional fragmentation of ground stone querns, often using fire, is much more widespread, with 110 querns re-fitted from 271 fragments, including inter-ditch re-fits but no re-fits between ditches and inner settlement pits (Schimmelpfennig 2019, 119). The overall picture from the re-fitting studies shows a richly interconnected set of contexts showing the materialisation of enchained relations through fragment deposition.

Analyses of aDNA, strontium and oxygen in teeth, together with carbon / nitrogen isotopes of human bone provided surprising results (Turck 2019). While the aDNA analysis showed that all the analysed bones and teeth were indistinguishable from the standard Early Neolithic signal from central Europe, the strontium isotopic analysis showed that 90 % of the sample, at least in their early years, were non-local to Herxheim, deriving from at least four other areas: 20 lowland individuals from three regions: nine local to Herxheim, the others from non-Herxheim loess or *Muschelkalk* areas; 13 individuals from *Keuper* or *Buntsandstein* areas, hills, or low mountain ranges; and 40 individuals from low mountain ranges (*Buntsandstein* and granite or slate; *Fig. 7b*). Such a conclusion is not contradicted by the oxygen isotopic analysis of varied, often non-local water sources and the carbon / nitrogen isotopic analyses of varied diets (cf. Budd et al. 2000). This has posed the greatest dilemma for the interpretation of Herxheim, since neither coeval upland nor coeval lowland sites are currently known. Yet the aDNA of the 'upland' individuals with isotopic strontium results (a minimum of 22 individuals) shows that they were as much part of the typical early farming genomic signal as the lowland individuals. The most significant issue thus remains how such a large group of fragmented bones from an estimated 1000 people (Turck 2019), of whom an estimated 900 were non-locals, came to be deposited at Herxheim.

It is difficult to summarise the Herxheim findings without oversimplifying what is clearly an enormously complex sequence of operations. There is an underlying tension in the project team publications between the significance of random behaviour at the site in contrast to the systematic,

regular, rule-bound practices which may be expected to govern such a complex operation. We shall not dwell on this contrast since we believe that variability is inevitable, given the different ways that various participating groups drew on the basic rules pertinent to the Herxheim enclosure, which necessarily included both 'normal' settlement practices and 'extraordinary' ritual practices.

The current interpretation of the Herxheim findings is most comprehensively presented in Zeeb-Lanz's concluding synthesis of the project's second monograph (Zeeb-Lanz 2019b), which draws on insights from other researchers (Gramsch 2012; Hofmann 2012). For Zeeb-Lanz, Herxheim possessed the widest range of ritual practices in the latest LBK, with other regions connected to Herxheim through an inter-regional alliance based on traditional lineage ties. The primary aim of the Herxheim ceremonial feasting and rituals was to strengthen and deepen such ties. The Herxheim rituals were less about "violence against humans and objects" than "ritually charged transformations of humans and objects using physical force" (Zeeb-Lanz 2019b, 463). What this meant was that "the destruction of precious artefacts (to which we may add 'precious persons') represented a leading theme throughout the Herxheim scenario as a whole" (Zeeb-Lanz 2019b, 454). Zeeb-Lanz admits that the identity of the victims of this violence is still a mystery but insists that they came from a different ethnic group from the Herxheim residents and were either unfree serfs (slaves) or captives, brought to Herxheim by farming groups from the inter-regional alliance. These slaves / captives were 'processed' in a multi-stage sequence at Herxheim: (1) intentional killing; (2) dismemberment of their bodies; (3) removal of muscle tissue; (4) smashing of all bones except for the cranial material; (5) burning of some of the bones; and (6) final deposition in the ditches and, more rarely, in the settlement features. The artefacts were also 'processed' through various operational chains, all of which concluded in deposition as the final stage of the ritual process.

Now that we have summarised the key elements of the Herxheim publications, it is time to apply to Herxheim the insights derived from other examples of mobility (see above, *pp. 4–6*) to open up an interpretative space for an alternative narrative for the Herxheim site.

Source criticism at Herxheim

The key insight from landscape fragmentation is the way that other landscapes are enchained to places by the materials derived from the sources and used and deposited in other places. We have shown how the vast majority of the Herxheim stone assemblage, as well as an estimated quarter of the pottery assemblage, derived from landscape fragmentation of rock outcrops and clay sources in numerous different zones *(Fig. 7a)*. This means that we can demonstrate enchainment of the Herxheim residents with an exchange network of other LBK groups reaching in all directions, often up to 200 km and sometimes more. The importance of Zeeb-Lanz's inter-regional network lies in the contrast between the ways that enchainment works over long distances (exchange of sherds) as well as over short distances (inter-long-pit re-fits at Herxheim), using the principle of *synecdoche* – the part representing the whole (Chapman 2000, 67).

Andy Jones (2012, 19–20) has reminded us that enchainment is the basis for the creation and maintenance of all social relations. In the context of dismembered human bones, the placement of one fragment of a person's body in a long pit with sherds from the Elster-Saale region linked the person to the vessel (e. g. in the inner ditch in slot 282-139), just as a second bone fragment placed in another long pit with sherds from the Rhine-Main region (e. g. in the inner ditch in slot 282-12) indicates the use of biosocial material (bones and sherds) to proclaim specific relationships at the time of a spectacular performance in a central place. The choice of a specific long pit for deposition was also an enchainment of biosocial material to the group or groups that excavated that ditch

segment. In this reading, the most disputable idea in the Herxheim reports is the claim that the fragmented remains were "nothing more than the refuse of the rituals". It is ironic that this misleading claim was made by the specialist who re-fitted the pottery (Denaire 2019, 39). Just because earth, sherds, stone tools, human bones and animal bones were mixed together does not mean that there was no intentionality towards those combinations. Fragments are never only refuse but always enchain other relations, even if, in this case, we can rarely answer the fragmenterist's question: "where are the missing fragments?" Enchained relations expressed through biosocial remains can provide a general explanation of many detailed questions raised for Herxheim, such as the excavation team's puzzlement over fragmented bone deposits in settlement pits, which would have related the deceased to the local residents (Zeeb-Lanz 2019b, 457). But its greatest relevance is to the big questions of Herxheim – the overall motive for such large-scale fragmentation and deposition. While the excavation team has properly concentrated on the details of the depositional sequences, we wish to present here general patterns based upon a different approach.

If there is a single criticism of the published Herxheim interpretation, it is that sherd or bone re-fits have been used to support a chronological link in deposition without, or very rarely, taking into account the possibility of fragment curation. Thus, re-fits in both layers of concentration K16 are interpreted to mean that both layers were deposited at the same time (Haack 2016a, 49), while Zeeb-Lanz (2019b, 448) claims that long-distance re-fits mean that ditch segments far apart were open at the same time. In this instance, we are not making a direct comparison of other sites (e. g. Kavos in the Cyclades: Chapman et al. in press) with Herxheim but, rather, highlighting possible social practices attested at other sites which could be investigated at Herxheim.

The evidence for sherd curation at Herxheim comes from three sources – sherd surfaces, different life-histories and object itineraries, and the evidence for vessel fragmentation. The observation of spalling on many sherds, including on one sherd of the longest sherd re-fit (Denaire 2019, 35), has indicated exposure to the elements, even if for no more than one winter (Denaire 2019, 38). However, Zeeb-Lanz (2019b) objects that the variety of sediments in which the sherds were deposited could also have produced spalling. The issue remains for further scientific study. Another sign of the temporal scale of events is the important observation, not pursued by Denaire (2019, 27), that fragments from the same vessel had experienced different later life-histories after the break. We have examined this question in all of our re-fitting experiments (Chapman / Gaydarska 2007, Chapters 3; 6; 7) and have demonstrated that it takes time for different life-histories to develop and this time often involves fragment curation. The important observation that many of the sherds have fresh breaks, showing fragmentation occurred shortly before deposition, neither supports nor denies the notion of pottery curation. Turning to human bone curation, the rarity of carnivore gnawing marks on the human bone fragments is not necessarily only a sign of rapid burial but could also indicate burial at a depth or curation of the body in a place inaccessible to scavengers such as dogs. As we shall see, the possibility of bone and sherd curation is an important factor at Herxheim. We now turn to a possible sequence of operations explaining Herxheim's major dilemma.

An alternative narrative for Herxheim

In the relational approach to persons which underlies fragmentation research, the persons in the Herxheim network were both individuals with specific identities restricted to themselves (e. g. she was a daughter of Johannes and Brigitte[2]) and also dividuals, whose relations with all the other persons, places and objects to whom they were linked contributed to their identities. This aspect of

[2] Not their real names!

dividuality was particularly important when objects were fragmented and re-used 'after the break', as in the case of the Hamangia figurines whose new fragmented identities created a change of gender (Chapman / Gaydarska 2007, 33–70). But the Herxheim story forces us to confront the uncomfortable truth that the different parts of dismembered human bodies also took on this dividual aspect of their former identity, with smashed bones enchained to other smashed bones and other parts of the once-unified, now-fragmented body. How does this principle help us to write a different Herxheim narrative? Our answer transcends the insights of Jörg Orschiedt and Miriam Noël Haidle (2006; 2012, 133), who proposed that the individuals were buried elsewhere, dug up again, and moved to Herxheim where their bones were subject to further manipulation and deposition. In any case, this sequence is opposed by Rouven Turck (2019), who proposed that people gathered at Herxheim before their deaths, but he has not explained this idea in any more detail. We do not invoke the practice of secondary burial but, rather, a staged sequence of bodily manipulation that stretched spatially far beyond the Herxheim enclosure itself.

The Herxheim researchers' attitudes to secondary burial rests on a questionable interpretation of peri-mortem cut marks on, and dismemberment of, the bones. In our view, very little evidence has been published that demonstrates conclusively that the people whose bones were deposited at Herxheim in the 'ritual' phase of the site also died at Herxheim. The exceptions were the few complete skeletons buried in the enclosure; even the few examples of articulated bones in the ditches could have been brought to the site. Furthermore, Zeeb-Lanz's interpretation does not explain the large number of individuals (an estimated 1000 individuals) whose body parts were deposited at Herxheim. Zeeb-Lanz shows how there was only one Latest LBK hamlet outside the enclosure that was coeval with the ritual deposition: thus, most body parts came from outsiders who were not dwelling at Herxheim. The issue of an incomplete settlement record in both the lowlands and the uplands near Herxheim is troubling, although current revisions to the chronology of the Latest LBK settlement pattern are ongoing (pers. comm. Zeeb-Lanz). Just as there are currently no other known coeval lowland sites, there are no known upland sites – a symmetrical absence which merits further discussion. As Daniela Hofmann (2020a, 231) concludes, "in addition to more or less standard agricultural sites which just happen to be at higher elevations, there must have been other communities in upland areas who have so far remained largely archaeologically invisible, and who perhaps set different economic priorities".

Two of the most challenging results of fragmentation research since 2000 concern the certainty of inter-site re-fitting, whether at the landscape scale of moving parts of decorated stone blocks between megaliths in Neolithic Brittany (Chapman / Gaydarska 2007, 106–107), or the high probability of fragment-based exchange, as seen, for example, at the Polgár-Csőszhalom tell in Hungary (Chapman 2000, 64). The central paradox for Herxheim is the linkage of over three-quarters of the dismembered bodies to the hilly areas and low mountain zone lying a minimum of 20–25 km away to the east or west, or at least 75 km away to the North *(Fig. 7a)*. Even if these sites have not yet been identified in the field, there is no reason to dispute the findings of the strontium and oxygen isotopic analyses. We shall make the assumption that there was a network of small, permanent, upland LBK settlements – we'll call them 'Home Communities' – who maintained their position in the inter-regional Herxheim network through the provision of exchange goods, services and marriage partners. At a certain point (see below, *pp. 20–21*, for a discussion of the origins of the ritual practice at Herxheim), the community living at Herxheim – for the sake of argument, we'll call them the 'Herxheim Guardians' – began a ritual intensification, inviting 'Home Communities' from a wide range of mostly lowland regions to contribute to the expanded rituals by spending a period of time – perhaps two weeks to a month *per annum* – at Herxheim, bringing animals to the feasting season, socialising, exchanging material valuables, dig-

ging a long pit, depositing sherds, stones and bones, and then re-filling the long pit. At another key changing point, the decision was made to bring parts of the dead ancestors of specific 'Home Communities' – those who had died since the last feasting season – to Herxheim to contribute their own ancestral enchained links between Herxheim and the Home Community. This new practice involved a three-stage treatment of the newly-dead: curation of the newly-dead bodies until close to the time of the feasting season; dismemberment into several large pieces in preparation for travel to Herxheim; and additional, more intensified fragmentation of the bones at Herxheim *(Fig. 8)*. Although they were sometimes identical, there was no necessary link between those 'Home Communities' bringing vessels to Herxheim and those 'Home Communities' who brought their own ancestral remains to the enclosure. In terms of the dismemberment of deceased humans, it may not be coincidental that animal carcasses at Herxheim were quartered into more easily treated pieces (Arbogast 2019, 162).

The bioarchaeological data demonstrate that the bodies were mostly 'fresh' when they were dismembered. There is little evidence for any difference between peri-mortem dissection performed six months after death or six days after death and the peri-mortem interval can potentially last indefinitely (Symes et al. 2012). Although differences between dry and fresh bone fractures patterns can be identified, the exact timing of bone transitioning to dry bone fracture characteristics is not well understood. Data from experimental forensic studies, using pig or deer bone, have recorded different intervals, with a significant overlap of dry and fresh bone fracture patterns. Local climate and burial condition are the most important determining factors (Green / Schultz 2017). A study of pig bones in eastern Ontario, Canada (Janjua / Rogers 2018) determined that bones remained fresh for as long as nine months. In addition, dry and fresh bone fracture characteristics of pig bones from Missouri, USA, were maintained for up to 141 days (Wieberg / Wescott 2008). In frozen conditions or submerged environments, bone can retain moisture and would therefore present fresh fracture patterns for considerable periods of time (Galloway et al. 2014). A focussed analysis of a sub-sample of bones, using microscopy to evaluate bioerosion, could potentially provide information about pre-depositional treatment of human remains (as in, e. g., Booth 2016).

In the upland settlements, the cold winter months would have aided preservation of the newly-dead bodies and curation of several months would have been possible until the onset of warmer weather and enhanced body odours. It is also possible that 'Home Communities' partly de-fleshed the bodies of their newly-dead, thus removing the olfactory objection. In any case, the more intensive dismemberment of the body parts and the smashing of individual bones would have taken place at Herxheim.

There are three variables in a Herxheim bodily mobility model: the number of annual Herxheim festive seasons; the total number of persons whose remains were deposited at Herxheim; and the number of upland 'Home Communities' contributing their ancestors to the enclosure.

Bayesian modelling of the AMS dates for the Herxheim enclosure is hindered by the existence of a plateau on the calibration curve (Hajdas 2019), rendering all dates between 5200 and 5080 cal BC more or less indistinguishable. The only Latest LBK Phase V site with a large number of AMS dates is Herxheim and it is generally considered that the LBK Phase V is poorly dated (Denaire et al. 2017). Equally, the paucity of AMS dates from the earliest phase of the regional Middle Neolithic (the Hinkelstein I phase) means that it is currently hard to date the end of the regional LBK. By comparison, there is a time-span of c. 200 years between the end of LBK Phase IV 5100–5040 cal BC) and the start of the Hinkelstein II group (4835–4745 cal BC) in Lower Alsace, which could partly be filled by LBK Phase V – coeval with Herxheim. In the absence of sufficient AMS dates, a reasonable duration for LBK Phase V is 100 years, of which Herxheim could make up no more

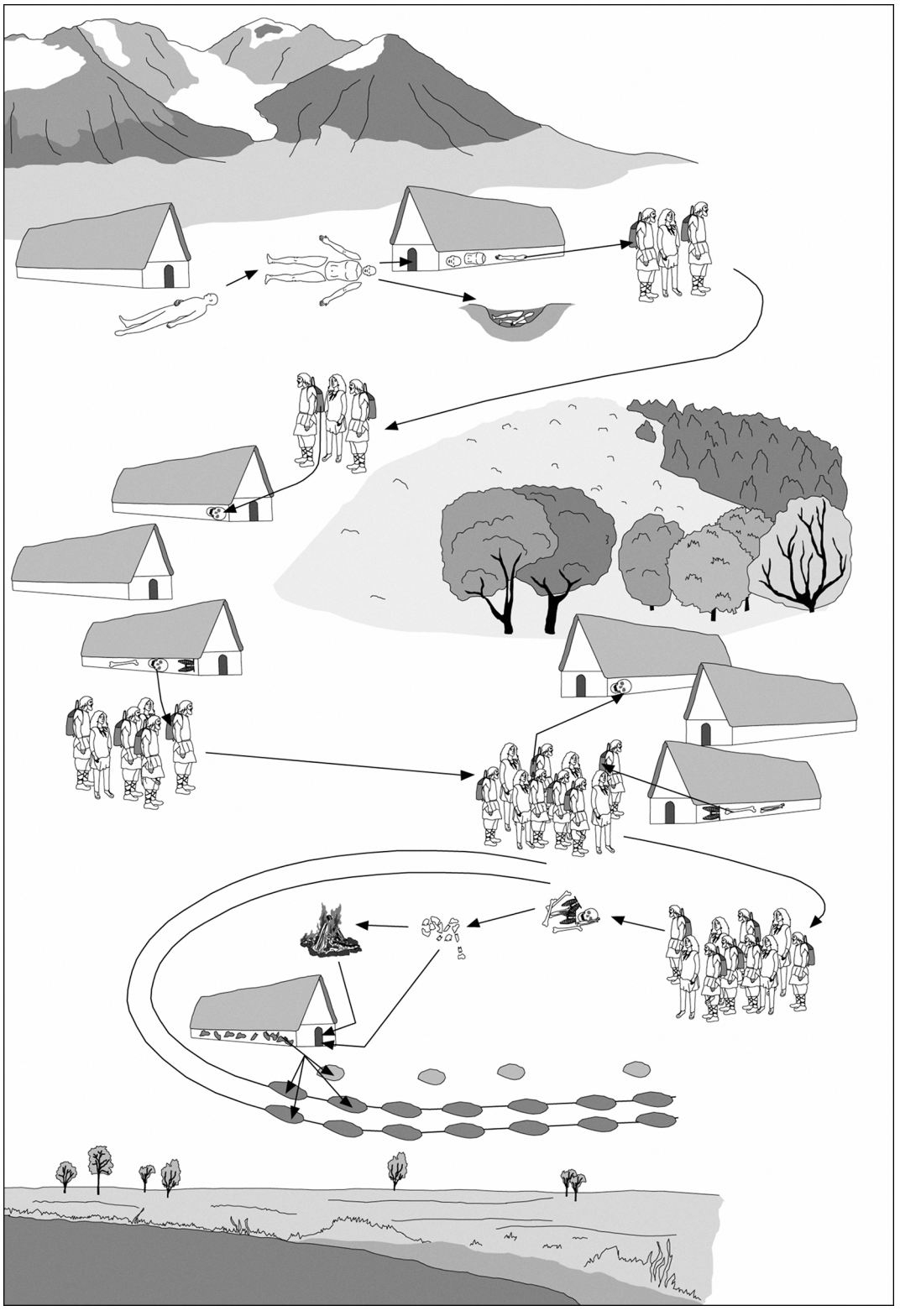

Fig. 8. Bodily mobility model for the Herxheim enclosure.

than half – for example, up to 50 years (Riedhammer 2019). Karin Riedhammer's (2019, 289) suggestion of a "relatively short-term set of events, perhaps spanning no more than 50 calendar years" is not based upon her Bayesian modelling but on Zeeb-Lanz et al.'s (2016) published views. In general, these insights fit poorly with Zeeb-Lanz's revised proposal of a much shorter duration for the Herxheim 'ritual' phase – "a narrow temporal window for the activities as a whole" – based upon a period of three, five or ten years centred on c. 5050 cal BC or 5030 cal BC (Zeeb-Lanz 2019b, 439, 448).

Peter Demján and Peter Pavúk (2020) have developed a new method for the statistical evaluation of the clustering of AMS dates. The application of this method to the two sets of Herxheim dates – the 15 dates used by Irka Hajdas (2019) and all of the 26 dates quoted by I. Hajdas and K. Riedhammer (Riedhammer 2019) – produced different results. Testing the dates for normality (i. e. whether they are normally distributed around a single mean value) yielded a negative result for the larger dataset, meaning that the dates probably originate from two or more events. For the smaller dataset, normality could not be rejected, which may support the single-event hypothesis. Bayesian chronological models based on the most likely clustering into nine events for the larger and six events for the smaller dataset (assuming it was not a single event) show estimated time-spans of 64–261 years and 6–233 years respectively. Thus, it does not seem likely that the deaths of the buried individuals occurred over a time-span shorter than five years and it was more likely 50 or more years. Additional AMS dates would be required to estimate the number of events in the optimal clustering of dates.

The number of persons whose remains were deposited at Herxheim rests on a large sample of human bones which has not yet been completely studied. Many of the issues derive from the fact that three groups of people have analysed the remains (Orschiedt / Haidle 2012; Boulestin / Coupey 2015; Bauer 2019). The first two groups of researchers have made strong criticisms of each other's work, while Bauer – the Master's student of J. Orschiedt – comes to broadly similar conclusions as Boulestin and A.-S. Coupey (2015). However, Boulestin and Coupey are correct in saying that there is no published quantification or analysis of the remains studied by J. Orschiedt and M. N. Haidle.

It is thus not surprising that the estimates for the minimum number of individuals (MNI) show considerable discrepancies and each estimate has been critiqued. The Boulestin and Coupey estimate of 104, based upon cranial fragments in the research excavation, has been extrapolated to a value of 1300–1400 for the whole site. The MNI of 1000 for the whole site is the estimate used by R. Turck (2019); for the sake of modelling, we shall use Turck's estimate.

The number of upland communities from which human bones could have been transported is as difficult to substantiate as the number of coeval lowland communities. The methodologies for the production of the South Palatinate LBK settlement pattern is not known, but we suspect that it is not based upon widespread intensive, systematic fieldwalking. The chronological basis for the claim that Herxheim is the only occupied LBK Phase V site (for Latest LBK sites near Herxheim see Zeeb-Lanz 2019b, figs 2; 4) is currently undergoing revision (pers. comm. A. Zeeb-Lanz). Current data show that there is only Herxheim in the south at the latest LBK and three or four settlements in the north of the Palatinate (near Kirchheimbolanden, Donnersbergkreis, DE) which date to the Latest LBK. However, following the regional style of the pottery, the northern communities have no ties with the southern Palatinate as they belong to another style group from which not a single sherd has been found in Herxheim. Zeeb-Lanz's (2019b) figure 4 shows distinctly that, in the latest LBK, there is only the enclosure and a single homestead (one house, excavated during the rescue excavation) which obviously has direct ties to the rituals and may even belong to the Herxheim community, as the house is just 450 m outside the enclosure. There are currently no other known

Variable	Model 1	Model 2	Model 3	Model 4
Duration (years)	10	20	50	75
Estimated MNI	1,000	1,000	1,000	1,000
Estimated MNI, upland bodies	730	730	730	730
Estimated MNI, lowland bodies	270	270	270	270
No. of body part sets p.a., upland HCs	73	37	14	10
No. of body part sets p.a., lowland HCs	27	14	5	4
No. of sets x upland sites (Version 1)	10 sets x 7 sites	5 sets x 7 sites	3 sets x 5 sites	3 sets x 3 sites
No. of sets x upland sites (Version 2)	6 sets x 12 sites	3 sets x 12 sites	2 sets x 7 sites	1 set x 10 sites
No. of sets x lowland sites (Version 1)	5 sets x 6 sites	5 sets x 3 sites	6 sets x 1 site	4 sets x 1 site
No. of sets x lowland sites (Version 2)	2 sets x 13 sites	1 set x 14 sites	1 set x 5 sites	1 set x 4 sites

Tab. 1. Four bodily mobility models for the Herxheim enclosure (key: HCs – Home Communities; Versions – alternative values for each model).

nearby lowland communities at the time of the rituals. We have equally poor knowledge of upland settlement patterns, since forested areas and widespread pasture have reduced the possibility of ploughzone archaeology to a minimum (as in the Zemplén Mountains of Northeast Hungary: Chapman et al. 2010).

These evidential gaps mean that it is imperative to create four models *(Tab. 1)* to provide the opportunity to examine as wide as possible a range of durations for Herxheim.

These relatively modest numbers suggest that both upland and lowland 'Home Communities' would have been able to produce sets of body parts on a scale compatible with the Herxheim human bone deposition for each of the four models, covering over ten to 75 years. The inverse relationship between duration and depositional intensity means that the maximum modelled number of sites in Model 1 reached 13 sites or, alternatively, the highest number of newly-dead reached ten per Home Community. Extending the temporal range of the ritual phase means a concomitant reduction in the number of sites or number of newly-dead, with values of 14 body-part sets for the model with the longest duration (75 years), deriving from between one and ten sites.

The range of estimated body-part deposition in the four models covers 14 *per annum* (75 years) to 100 *per annum* (ten years). It is worth noting the extraordinarily high rate of deposition at Herxheim in comparison with other large cemeteries in European prehistory. At the Varna I cemetery (BG), an estimated rate of one–two or two burials *per annum* was calculated for the 310 burials over a modelled duration of c. 150 years, while a higher rate of 12–24 *per annum* was modelled for the smaller Varna 3 cemetery (Gaydarska et al. 2021). At Durankulak (BG), Bayesian modelling of the AMS dates showed a duration of 800 years for a total of 1200 burials, or three burials every two years (Honch et al. 2013). The standard version of the 50-year peak of Lengyel burials at Alsónyék produced modelled mortuary rates of 60 burials *per annum* (4725–4700 cal BC) and over 50 burials *per annum* (4700–4675 cal BC) (Bánffy et al. 2016; but see above, *p. 6*, for criticism of this model). Acceptance of the shortest duration of ten years for the use of the Herxheim enclosure means double the rate of bodily deposition than at the fastest rate of burial claimed elsewhere in European prehistory.

The likelihood of the radical incompleteness of the vast majority of the human bones deposited at Herxheim is echoed in the incompleteness of most of the bodies. This raises four possible answers to the question: "Where are the missing parts?" First, we cannot exclude that missing parts may have been deposited in the so far unexcavated parts of the site. If this were to be true, the distance between parts of the same bone indicates quite clearly a degree of intentionality in the bone dispersion and deposition. Secondly, the central point about *synecdoche* is that not all of the ancestral body was brought to Herxheim but parts of that body were retained in the Home Community to symbolise the local significance of the newly-dead person and their enchained links to Herxheim. Thirdly, part of the ancestral body may have been taken from the Home Community but a fragment of that part was exchanged with a less remote settlement *en route* to Herxheim. And, fourthly, the body parts of the ancestor may have been brought to Herxheim but a fragment of those parts may have been exchanged with other 'Home Communities' during the festive season for removal to *their* Home Community. Similar scenarios may be proposed to explain why so few objects could be reconstructed to completeness at Herxheim. The important point to remember is that none of these scenarios requires a complex rationale over and above the notion of bodily dividuality and *synecdoche* – the potential to sub-divide the ancestral body to enchain the ancestor (and the living) to other persons or communities.

We suggest that the transport of parts of between one and ten bodies was feasible for upland communities, even if they had to travel for 100 km to Herxheim *(Fig. 8)*. One of the authors (Chapman 2020, 316) has proposed that the time taken to walk from a source site to a consumer site should be doubled to add 'social time' – the interactions with other communities *en route*. It is possible that communities *en route* may have joined the 'mourners' from the most remote Home Community in their common journey to the central place to form local 'processions'. If this merging of mourning groups became part of an annual movement to the lowlands, it is possible to see the emergence of something not so divorced from a series of pilgrimage routes to Herxheim (for a very different form of prehistoric pilgrimage, see the Pilgrimage Model for the Trypillia megasite of Nebelivka, UA: Chapman / Gaydarska 2019).

Origins and endings

We are very aware that the most difficult parts of explaining a complex, unique site such as Herxheim are why the ritual practices began and why they ended. It is interesting to note that neither topic has been a strong focus of research for the Herxheim research team in the last decade, with certain exceptions (Zeeb-Lanz 2009; Zeeb-Lanz et al. 2016; Zeeb-Lanz 2019b, 463–464). We can only suggest some hints at these end-points.

The origins of a central place are often connected to the history of that place, in the sense that a long-lived place builds up a cumulative place-value greater than that of a small, short-lived place (e. g. Lepenski Vir, Balkan tells, Minoan towns, and Stonehenge: Chapman 2016). The history of Herxheim at the end of LBK Phase IV comprised the longest history of any of the LBK Palatinate sites, with settlement evidence for dwelling in Phases II, III and IV. It was therefore a sign of the importance of ancestral links to establish a central place at Herxheim. This decision will have been made within a wider debate on whether to create a central place at all and, if so, where it should be located. There was a major change in settlement patterns at the Phase IV / V transition in the Palatinate, as in other LBK regions (Pechtl 2020), defined by settlement contraction and / or concentration in the lowlands and settlement expansion into the uplands, at least as far as is documented by the Herxheim strontium evidence. This view is also supported by the analysis of drinking water

and by the isotopic dietary evidence, with a wider range of C and N values than those indicating a predominantly cereal-based diet (Turck 2019, 379–381; 386–388) – i. e. a more pastoralist diet consistent with upland dwelling. This re-working of the settlement network could imply diametrically opposed views: an increased need for lowland–upland integration, especially if the novel environment and climate proved challenging to upland dwelling; or an upland expansion to rid the new 'Home Communities' of the undesirable political influence of an emergent lowland centre. In either case, these changes in network dynamics meant changes to traditional exchange relations, especially for the procurement of chipped stone, ground stone, axes and pottery. An emergent lowland centre such as Herxheim could well have been predicated on improved exchange networks, with seasonal meetings creating new opportunities for exchange, personal contacts and perhaps marriage. In these new socio-political conditions, ancestral relations and access to exotic goods were mutually reinforcing and would have strengthened the position of Herxheim as a central place. It would be at a later stage that the consolidation of the new upland sites would have led to more balanced relations with Herxheim, eventually leading to regular upland–lowland visits, the re-establishment of traditional lineage relations betokening shared ancestors, and the consolidation of enchained relations through the upland communities' most venerated objects – their own ancestors of a variety of ages. Any individual of whatever age whose body was dismembered in preparation for the visit to Herxheim had clearly been accorded a certain status as an 'ancestor-to-be' in an upland Home Community.

The 10-year, 20-year, 50-year or 75-year period of annual Herxheim festive seasons would have increased the renown of the Herxheim Guardians as the organisers of a key performance in the Palatinate LBK's social calendar. The community of Guardians did not need to be very large – just a group of 20 persons living in one or two long-houses near an enclosure-to-be. The long-houses would have also acted as storage areas for festival food and drink, as well as any curated objects or relics waiting for an active role in the next festival. The Guardians would have lived for eleven months of the year as many other, smaller LBK villages had lived. But, for the one-month festive season, the Guardians took on a key role in ritual co-ordination and food supply for the festival. They would have collected sufficient tools for the digging of the long pits and amassed food for all of the participants. They would have marked out the locations of the first few long-pits in each of the two ditch segments, ready for the digging of the pits by the early arrivals. Once the ritual season had started, special skills among the Guardians would have been required for the deliberate fragmentation of the large quantities of human bones, animal bones, pottery and stonework brought onto the site or already present. A certain level of planning was required for the performances which contributed so vividly to the overall impression of the festive season, based as it was on fire, singing, dancing, story-telling, sex and violence. In addition, the labour of those visitors to Herxheim would have supplemented the work of the Herxheim Guardians.

An important feature of the Herxheim ceremonies was the cumulative repetition of the rites. With each passing year, 'Home Communities' created stronger enchained links with the centre through the deposition of growing numbers of their newly-dead. These Communities also created increasingly vibrant links with other 'Home Communities' who visited the centre, making it increasingly difficult to resist the attractions of making the annual visit to Herxheim. In this way, the place-value of Herxheim grew at the same time as the strength of the tradition of participating in the Herxheim ceremonies. The identity of the central place became increasingly evident; Lucy Shaw Evangelista and A. C. Valera's (2019, 64) words seem particularly evocative for Herxheim: "human bones in enclosures built the strength of each enclosure".

One feature of the Herxheim ceremonies was the way that the 'Home Communities' retained power over detailed decisions on deposition. The choice of which fragment of a polished stone adze

for deposition in a long pit in the inner rather than the outer ditch and in which long pit to place fragments from the same decorated vessel *(Kumpf)* depended upon the enchained relations which each Home Community wished to create or maintain with other groups. There was the choice of which group to help with digging 'their' long pit or filling it in later. All of these decisions meant a complex chain of events which led to highly varied depositional results. We shall not readily understand the detailed choices made by each participating group but the overall dividual principles are clear enough. The two re-fitting Šárka sherds found 245 m apart in the inner and outer ditches (Denaire 2019, fig. 3) betokened a relationship that people from that distant area wished to create with another group. When the time came to go back home after the festive season, the 'Home Communities' would have kept some exotics to maintain their connections with the new contacts they had made at Herxheim.

The causes of a slowdown in the Herxheim performances included falling frequencies of exotic goods, and an increase in disputes, both of which could have prompted a decrease in the number of upland participants. While the dispute level is hard to estimate, an increase in the proportion of ditch segments without any deposited finds may indicate a downturn. Any decrease in the intensity of deposition may have been perceived as a decline in performance – a less impressive spectacle compared to the good old days. Serious disputes leading to homicides would certainly have led to problems – assassinations did wonders for the stay-at-home faction. For the participation of an upland settlement in the Herxheim festive season was not necessarily a straightforward decision. The curation of the newly-dead, their partial dismemberment and the long journey transporting their remains to the lowlands would have led to resistance from some members of the community. Any increase in problems at Herxheim could have led to the strengthening of these factions.

These are some of the issues for any group seeking to maintain a long-term ritual centre. One additional factor which could have created a tipping-point in favour of moving away from Herxheim was the creation of a rival, or simply another, central place (in a comparative example, the abandonment of the Nebelivka centre may well have been related to the founding of two relatively close 'rival' centres – Taljanki and Majdanetske, both UA: Gaydarska 2020). Any negative aspects of the Herxheim festive season over its entire history could have been exploited by the Guardians of a new centre, leading to further issues for the Herxheim community. There was no doubt of the potential at the Herxheim site to increase the number of long pits on the eastern side, leading to an extension of both ditch circuits. Even though ditch segments were infilled soon after deposits had been made, there would have been physical traces of the lines of the ditches, reinforced as they were with the cultural memory of the intensive rituals. The fact that extensions to the ditches did not happen may not relate to an original planning decision on the form of the enclosure but rather the dwindling interest in the ritual centre. The possibility of the future discovery of sites with similar complex mobility remains for further discussion.

In summary, the possibility of a greater upland contribution to Herxheim may be considered as our relational response to the central dilemma of the Herxheim site – the absence of upland settlement evidence in the Latest LBK when the strontium isotopic signals indicate an upland origin for three-quarters of the persons whose bones were deposited at Herxheim. The partible LBK body (Zeeb-Lanz 2019c; Hofmann 2020a) suggests a way out of this dilemma, in which parts of the newly-dead from upland settlements were brought to Herxheim for further dismemberment and smashing of their bones prior to deposition. The principle of *synecdoche* was widely utilised to enchain human bones, sherds and fragmentary stonework in the complex depositional practices of this key site. Hofmann's case for widespread, if not ubiquitous, mobility within the entire duration of the LBK (Hofmann 2020a) fits well with this proposed explanation of the Herxheim phenomenon.

Conclusions

In this article, we consider the fragmentation of all of the three poles of the identity triangle – persons, places and objects. Without the incorporation of places and bodies, the Fragmentation Premise remains damagingly incomplete. Conversely, the integration of bodies and places into fragmentation research provides a rich opportunity to address some major conundra in European prehistory.

The alternative model for Herxheim which we present is based upon principles and practices well-known to fragmentation research – enchainment, *synecdoche*, presencing, and curation. All of these provide ways to explain small-scale inter-household practices just as well as unusually large concentrations of fragmented remains and at a variety of spatial scales, from intra-ditch to wide-ranging exchange networks. The most important concerns enchainment, which operates at the on-site level in several ways, relating fragments of deposited objects or humans to each other, to other fragments of the same object or person, to other objects and humans deposited nearby at the same time and to the people who dug the ditch segment where the deposition occurred. The principle of *synecdoche*, or *pars pro toto*, provides a dynamic logic for fragmentation, in that the parts which are broken and removed, to whatever place / time, remain linked to the other fragment. *Synecdoche* is a powerful expression of the effect of presencing, which brings or keeps absent fragments of objects or persons in relation with another part of the same object or person. The process of object or human bone curation differs from the other three notions in that it assures temporal continuity between an initial act of breakage and the deposition or removal of (some of) the resulting fragments. Curation gives a sense of planning in the operational chain of deposition. Our claim is that we have demonstrated the important role of all four notions in the proposed explanation of the Herxheim deposits. The Herxheim Team has produced compelling evidence of intra-site re-fits, especially of decorated sherds, while *synecdoche* and presencing are embodied in the many fragments of ceramic and lithic objects from a wide range of different sources, up to and beyond 200 km. Sherd curation is evident at Herxheim from wear traces, separate biographies 'after the break' and high frequencies of missing object or body parts, while body curation is fundamental to the alternative explanation.

The central, as yet unexplained, issue at Herxheim is the attribution of the body parts of an estimated 900 persons to upland 'Home Communities' even though no, or very few, sites are known from nearby uplands. The proposed bodily mobility model makes the assumption of an upland–lowland settlement network, with the curation of the newly-dead in upland and lowland 'Home Communities' until the season of the annual Herxheim festival, at which point parts of the newly-dead's bodies were moved to Herxheim for further treatment and ultimate deposition. Four models of bodily mobility are presented to cope with data uncertainties surrounding the duration of the Herxheim deposition, the number of persons represented in the deposits and the number of upland and lowland sites contributing to that deposition. P. Demján and P. Pavúk's new method for a statistical evaluation of the clustering of AMS dates shows a longer duration of > 50 years to be more likely than a shorter duration of < five years but the model allows a range of durations, from ten years to 75 years. While the number of people represented is taken, *pace* Turck, as 1000, the number of contributing sites varies up to a maximum value of 13 sites. There is an inverse relation between the deposition of body parts and the duration of the deposition, with outlying ranges of 14 body parts *per annum* over 75 years to 100 body parts *per annum* over ten years. All of these estimates are well within the range of possibilities for small-scale lowland-upland LBK networks.

We suggest that the choice of Herxheim for a regional, if not inter-regional, congregation place is related to two factors – the cumulative place-value which derived from the longest LBK occupa-

tion in the region prior to the construction of the enclosure and the new opportunities for exchange offered by the site once chosen. Repetition of the same routes to Herxheim would have led to a formalisation of the movement into 'processions', in turn formalising the ritual practices at Herxheim into a form of pilgrimage. The importance of seasonal or annual repetition built the special deposits through growing place-value and expanding cultural memory, creating a deeper attachment to the history of this place. Decreasing exchange and the creation of an alternative (difficult to identify in the declining settlement network) congregation centre could have played a role in the decline of the Herxheim centre.

While bodily mobility is widespread in European prehistory, this practice has not been frequently invoked in the LBK, with its current total of over 3000 known burials, often in small groups in settlements and cemeteries. The alternative Herxheim model which we propose is ultimately grounded on two bodily practices – bodily dividuality and bodily *synecdoche*. Herxheim shows the massive effects of these two initially simple practices when worked through in a consistent, cumulative, and concentrated manner.

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Herxheim unchained: a reply to Chapman et al.

By Andrea Zeeb-Lanz and Alexander Gramsch

Following the publication of three important books about Herxheim in recent years (Boulestin / Coupey 2015; Zeeb-Lanz 2016; 2019a), the discussion of the function and interpretation of this enigmatic Early Neolithic site has significantly died down. It is therefore very welcome that John Chapman, Bisserka Gaydarska, and Tina Jakob have undertaken a new attempt at deciphering the complex scenario at Herxheim. Based on their previous research on fragmentation and enchainment as a social mechanism in prehistory and recent debates on mobility of both living and dead bodies, they take up the notion of the "division of dead bodies for transport" *(Chapman / Gaydarska / Jakob p. 168)* to create a sequence of actions resulting in the archaeological and anthropological findings from Herxheim that is challenging, stimulating, and good food for thought.

The new narrative can perhaps be boiled down as follows: people from contemporary – though still undiscovered – *Linearbandkeramik* (LBK) sites (so-called 'Home Communities') chose body parts of their deceased, which they had been curating up until the "festival season" at Herxheim, and then carried them to Herxheim. Along the way, they probably stopped at other yet undiscov-

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References of figures

Fig. 1: J. Chapman / B. Gaydarska / T. Jakob. – *Fig. 2:* re-drawn by L. Woodard from authors' multiple sources. – *Fig. 3:* B. Gaydarska. – *Fig. 4:* Zeeb-Lanz / Haack 2016, fig. 2. – *Fig. 5:* Haack 2016a, pl. 66. – *Fig. 6:* Denaire 2019, fig. 10. – *Fig. 7a:* re-drawn by L. Woodard from Zeeb-Lanz 2019b, fig. 6. – *Fig. 7b:* re-drawn by L. Woodard from Turck 2019, fig. 56, modified by L. Hies (RGK). – *Fig. 8:* re-drawn by L. Woodard from original by J. Chapman, B. Gaydarska and T. Jakob. – *Fig. 9:* A. Häußer, GDKE Außenstelle Speyer. – *Fig. 10:* Haack 2016b, pl. 66,1; 67,2. – *Fig. 11:* Haack 2016b, pl. 71,3. – *Fig. 12:* A. Zeeb-Lanz, GDKE Außenstelle Speyer. – *Fig. 13:* Turck 2019, fig. 59. – *Fig. 14:* Turck 2019, fig. 51. – *Tab. 1:* J. Chapman / B. Gaydarska / T. Jakob, layout: L. Hies (RGK).