NEW PERSPECTIVES ON DELIBERATE FRAGMENTATION

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Introduction

If anything characterises archaeological evidence, it is their fragmentary nature. Whether it is a fragment of a pot, a fragment of a house or a part of a graveyard (a single grave), it ultimately leads to the reconstruction of a fragment 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. However, this did not stop them from exploring archaeological fragments.

The new research perspective of deliberate fragmentation emerged in the late 1990s.[1] From the outset, a key part of fragmentation methodology was re-fitting. The re-fitting studies collected in John Chapman's "Fragmentation in archaeology"[2] 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'*.[3] It is revealing that, despite significant attention to the fragmentation of human remains in the burial process in the 2000 book,[4] human bones were not included in the Premise in

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[1] For a brief history of fragmentation studies, see John Chapman, "The fragmentation of place: towards an integrated theory of fragmentation." To appear in *Grygiel and Bogucki Festschrift*, Eds. Michał Grygiel and Peter J. Obst (in press).

[2] John Chapman, *Fragmentation in archaeology* (London: Routledge, 2000).

[3] John Chapman and Bisserka Gaydarska, *Parts and wholes* (Oxford: Oxbow Books, 2007), 2, 8-10, 18.

[4] Chapman, *Fragmentation*, 134-179.

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the subsequent fragmentation volume.[5] Nonetheless, conceptualisation of the fragmentation of objects and human bones treated the two very different materials as homologous (Fig. 1a).

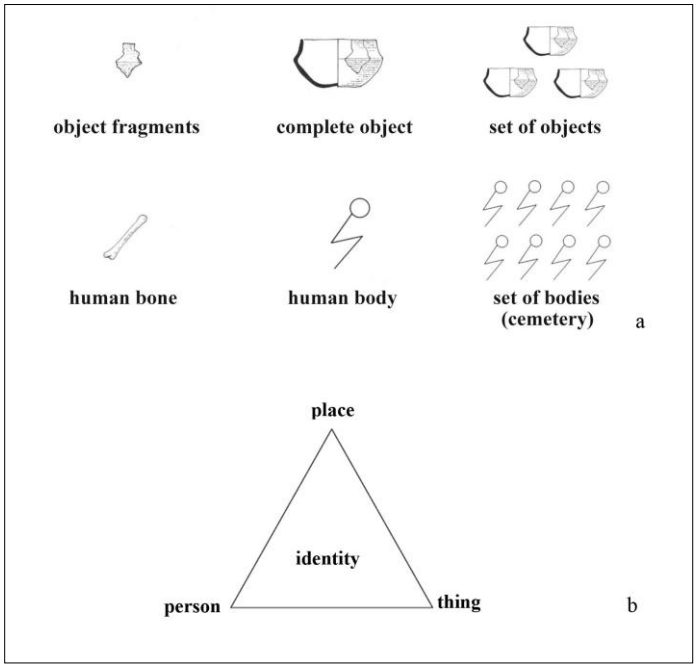

Fig. 1. a) The relationship between fragments, whole entities and sets (adapted after Chapman, *Fragmentation*, fig.1.4); b) The identity triangle as a framework for thinking about basic human relations to objects and places.

This research direction was addressed in two studies of mortuary remains in the Balkan Mesolithic, Neolithic and Chalcolithic,[6] in which 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. Wallduck[7] noted that burial

[5] Chapman and Gaydarsa, *Parts and wholes*.

[6] John Chapman, "Deviant' burials in the Neolithic and Chalcolithic of Central and South Eastern Europe," in *Body parts and bodies whole,* Eds. Katharina Rebay-Salisbury, Marie Louise Stig Sørensen, and Jessica Hughes (Oxford: Oxbow Books, 2010), 30–45; John Chapman, Rosalind Wallduck, and Sevi Triantaphyllou, "Disarticulated Human Bone Disposal During the Mesolithic, Neolithic and Chalcolithic in the Balkans and Greece," in *Annales Universitatis Apulensis*. Series Historica 18, II (2014): 11–46.

[7] Chapman et al., "Disarticulated," 39-42.

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 artifacts.

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 is addressed in the first part of this paper by the integration of landscape fragmentation into the research framework. In the subsequent parts of the article, we consider how fragmentation worked in the past through a discussion of three of the most remarkable re-fitting experiments ever completed in prehistoric Europe. The understanding gained from consideration of the deliberate fragmentation of an anthropomorphic face-pot from Öcsöd, Hungary and the marble figurines and vessels from Kavos on Keros, Greece is built on to illuminate the remarkable deposition of thousands of incomplete human and animal bones, sherds and stone tool remains at the LBK site of Herxheim, Germany. The use of these three sites is not intended as a direct comparison but as an indication of similar depositional practices occurring at different scales. We start with a small example of one single site (Öcsöd), scale up to the ritual centre of Kavos and extend the analysis even further to the major ritual centre of Herxheim. We have chosen sites where different materials were used to show how fragmentation practices worked with a great variety of materials at different scales.

Landscape fragmentation

The principal weakness of current fragmentation theory is that it lacks a grounding in places. Each of the settlements, quarries, mines and ancestral sites of the wider landscape has its own story to tell about the production sequence of the 'resources' which formed one attraction for that place. However, the 'stickiness' of objects[8] – their ability to form relational bonds to places, people

[8] Ian Hodder, *Entangled. An Archaeology of the Relationships between Humans and Things* (Chichester: Wiley & Sons, 2012).

and other objects – meant that it was not only the physical aspects of a place that was moved across the landscape but also the values and associations of the place as well. Richard Bradley[9] suggested that finished products from unusual locations were not only 'artefacts with a history of their own' but also 'pieces of places' which carried their places of origin across the landscape to their places of use and eventual deposition. This is a perfect summary of the first life-stage of objects in general, which involved the fragmentation of the landscape in order to retrieve the 'raw material' for the making of 'complete' objects from increasingly incomplete places. A complementary idea is the general principle enunciated by C. Gosden[10] that 'values attached to materials and to place are mutually referential and supportive.'

It could be objected that the place of origin of a raw material is NOT an artificial object, like a hand-axe and, therefore, places could not be fragmented in a similar way to an object. However, place emerges at the same time as it is fragmented – when the 'raw material' is removed. For C. Conneller,[11] instead of form imposed on shapeless matter by human design, form arises out of the technological act, through the interaction of person and material. The same is true of place, which is characterized in multiple ways until the one specific characteristic that is of present interest is identified. Just as A. Leroi-Gourhan[12] stated that the technological process was 'a dialogue between the maker and the material employed', so place emerged as a dialogue between its material characteristics and the needs of those dwelling or visiting there.

It is this re-characterisation of places in the landscape that enables us to discuss the fragmentation of particular places in the landscape in a manner which is more than simply a metaphor for overall fragmentation. In this way, the collection of timber, stones, clay or metal ores was the first stage in the operational chain of object production.

[9] Richard Bradley, *An archaeology of natural places* (London: Routledge, 2000), 88.

[10] Chris Gosden, "Afterword," in *Materialitas. Working stone, carving identity,* Eds. Blaze O'Connor, Gabriel Cooney, and John Chapman. (Oxford: Oxbow Books, 2009) [Prehistoric Society Research. Paper 3], 181-184.

[11] Chantal Conneller, *An archaeology of materials. Substantial transformations in early prehistoric Europe* (London: Routledge, 2011), 25.

[12] André Leroi-Gourhan, *Le geste et la parole. I. Technique et langue* (Paris: Albin Michel, 1964).

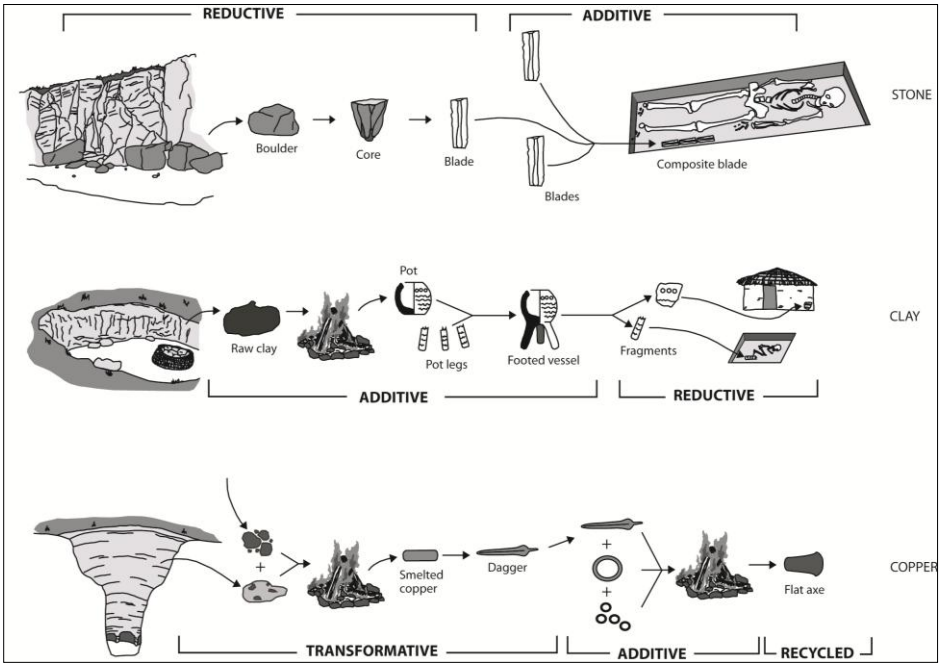

Fig. 2. Operational chain for object production:
reductive, additive, transformative, recycled.

In the case of stones, several pathways were open to the collector: the two most obvious pathways were (a) reductive – the production of smaller tools from a larger raw material; and (b) additive – the creation of a larger monument from individual stones. As we shall see, both operational chains could be followed by a fragmentation chain. Clay tended to lead in the sole direction of an additive sequence, while metal ores defined yet a third chain – towards smelting or melting and/or casting, with the potential for later re-combination. Each of these operational chains, too, was often followed by a fragmentation chain (Fig. 2).

Two key questions follow from this line of thinking: to what extent did the removal of raw materials from a specific place constitute the 'fragmentation of place?'; and how far is it reasonable to talk about this kind of 'fragmentation' in the same breath as the fragmentation of human bodies or artifacts?

The movement of lithics from a single place to several different places for processing and use created enchained links between the network of places which embodied walking, the creation and following of pathways and a significant part of group *habitus*. There is no difference in principle between

the removal of one lithic nodule from a place and the excavation of a large stone for placement into a megalithic stone row at Carnac[13] or the removal of a block of salt from the Tuz Gölü.[14] The longest currently known long-distance re-fit in the world was found in the Chuckwallah Valley in California, where three chert flakes with a distinctive yellow colour were re-fitted to a chert cobble in a quarry site 63 km from the use-site.[15] The modified place remained but in a slightly more fragmented state after each visit. A place is created in part by the social practices carried out there and its links with other places. An important aspect of this is repetition, which anchored people in the local or regional tradition.[16] A place is at once both natural and cultural (i.e., artificially created by humans), with fragmentation playing a not insignificant role in the networks of that place.

But how can we compare the fragmentation of a diffuse topographical locale where any single breakage removed perhaps 1% or less of the total mass of material with the deliberate fragmentation of a shell ring into three parts, with each part deposited in a different place?[17] If the importance of a place regarded as a raw material source is shown by the *repeated* fragmentation of tiny parts of that place, this hardly compares with the lack of evidence for repeated breakage of objects or human bodies.

The answer to the latter question lies in the nature of relational links – of enchainment processes. Just as the sherd that once formed part of the complete vessel exemplifies *synecdoche* – the symbolic representation of the whole by the part – so the flint nodule removed from the place of geological origin performed *synecdoche* not only for persons visiting the place and extracting the module, but also for those who had never visited the place but used a knapped version of the nodule as a tool at another place. The notion of 'presencing' is fundamental to objects, whether complete or fragmentary, whether taken from the earth or broken off a hitherto complete object. It is

[13] Emmanuel Mens, "Re-fitting megaliths in western France," in *Antiquity* 82 (2008): 25–36.

[14] Burcin Erdoğu, Mihriban Özbaşaran, Rabia Erdoğu, and John Chapman, "Prehistoric salt exploitation in Tuz Gölü, Central Anatolia: preliminary investigations," in *Anatolia Antiqua* XI (2003): 11–19.

[15] Christopher A. Singer, "The 63-kilometer fit," in *Prehistoric Quarries and Lithic Production*, Eds. Jonathon E. Ericson and Barbara A. Purdy (Cambridge: Cambridge University Press, 1984), 35-48.

[16] Lucy Shaw Evangelista and António Carlos Valera, "Segmenting and depositing: the manipulation of the human body in ditched enclosures seen from Perdigões," in *Fragmentation and depositions in pre- and proto-historic Portugal*, Ed. António Carlos Valera (Lisbon: Núcleo de Investigação arqueológica, 2019), 47-70.

[17] Chapman and Gaydarska, *Parts and wholes*, 170.

through the intertwined processes of enchainment and *synecdoche* that we can make a direct comparison between the fragmentation of objects and the fragmentation of places.

Even if the reader is convinced by the answers to these questions, they are still entitled to ask: "What has place-fragmentation ever done for us?"[18] The answer to this question depends on the extent of commitment to the object biography approach[19] or its alternative of itineraries.[20] The vivid metaphor of the birth (or production) of an object, its life (its use-life, with attendant traces of use-wear), its death (whether by destruction, breakage during use or deposition) and its re-birth as another object makes us appreciate the agency of an object as well as valuing the connections the object made during the various stages of its life. Even though there are many studies of what we term 'place-fragmentation' in which the authors do not link the provenancing studies to biographies or narratives of itineraries,[21] the point which these authors miss is that the origins of objects are very frequently related to the fragmentation of place. It would be impossible to trace an even partial itinerary of an object without taking its origin into account. This means that an integrated theory of fragmentation depends upon the inclusion of the fragmentation of place. We now turn to the three re-fitting studies which have extended the perspectives of fragmentation research (Fig. 3).

Re-fitting the Öcsöd face-pot

The low Late Neolithic mound of Öcsöd – Kovashalom[22] is located in the Körös valley in the Alföld Plain of Eastern Hungary. In one of the early

[18] With apologies to Monty Python's *Life of Brian.*

[19] Igor Kopytoff, "The cultural biography of things: commoditization as process," in *The social life of things*, Ed. Arjun Appadurai (Cambridge: Cambridge University Press, 1986), 64-91.

[20] Hans-Peter Hahn and Hadas Weiss, *Mobility, meaning and the transformations of things* (Oxford; Oxbow Books, 2013).

[21] Several examples are discussed at length in Chapman, "Fragmentation of place".

[22] Pál Raczky, Magdalena Seleanu, Gábor Rózsa, Csilla Siklódi, Gábor Kalla, Boldizsár Csornay, Hargita Oravecz, Magdolna Vicze, Eszter Bánffy, Sándor Bökönyi, and Péter Somogyi, "Öcsöd-Kováshalom. The intensive topographical and archaeological investigation of a Late Neolithic site. Preliminary report," in *Mitteilungen des Archäologischen Instituts der Ungarischen Akademie der Wissenschaften* 14 (1985): 251-278; Pál Raczky, "Öcsöd-Kováshalom. A settlement of the Tisza culture," in *The Late Neolithic in the Tisza region*, Ed. Pál Raczky (Budapest–Szolnok: Szolnok County Museum, 1987), 61-83; Pál Raczky, András Füzesi, and Alexandra Anders, "Domestic and Symbolic Activities on a Tell-Like Settlement at Öcsöd-Kováshalom in the Tisza Region," in *The Image of Divinity in the Neolithic and Eneolithic: Ways of Communication* (Suceava: Karl A. Romstorfer, 2018), 117-140.

field trials of Hungarian processualism, the site was subject to fieldwalking and excavation in the 1980s, with eight settlement nuclei defined by surface artefact clusters in a 21-ha area.

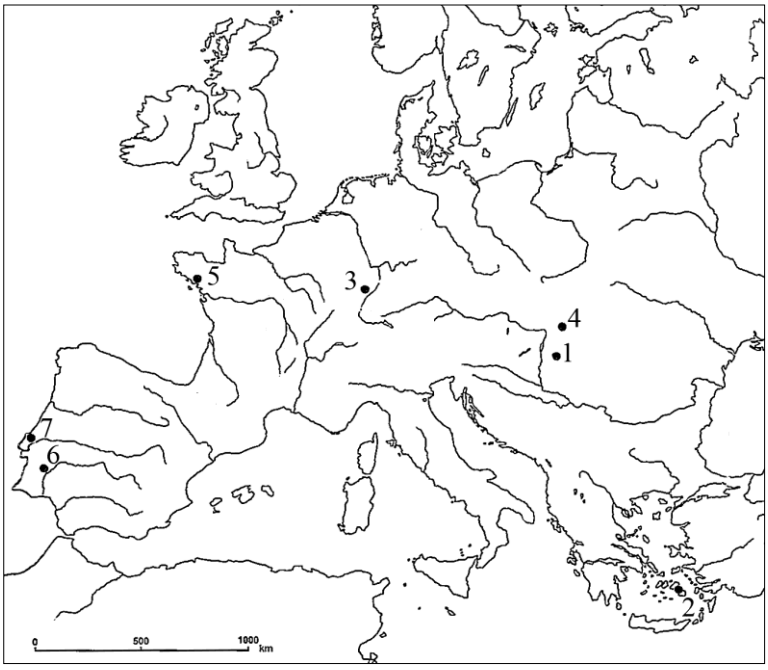

Fig. 3. Map of the sites used as case-studies: 1. Öcsöd-Kováshalom; 2. Kavos on Keros; 3. Herxheim.

The 1.30 – 1.80-m stratigraphy showed two phases in an occupation lasting just over 200 years (5200 cal BC to 4980 cal BC) – an early Tisza Öcsöd A and a middle Tisza Öcsöd B. Recent geophysical investigations showed the site was much larger than previously thought, with three concentric ditches 250m, 400m and 500m from the centre of the tell. Raczky et al. have recently re-interpreted the site as a centre of congregation rather than only a settlement[23] (Fig. 4).

In both phases, the site has a suite of concentric activity areas, with an inner house area, flanked by pit zones and burial areas. This marks a more structured space in comparison with the earlier Alföld Linear Pottery phase. Two special ceramic deposits were placed in an open area near the three houses

[23] Raczky et al., "Domestic and symbolic."

of Phase A, probably marking the end of Phase A and preceding the re-organisation of settlement in Phase B but not being disturbed by Phase B building activity.

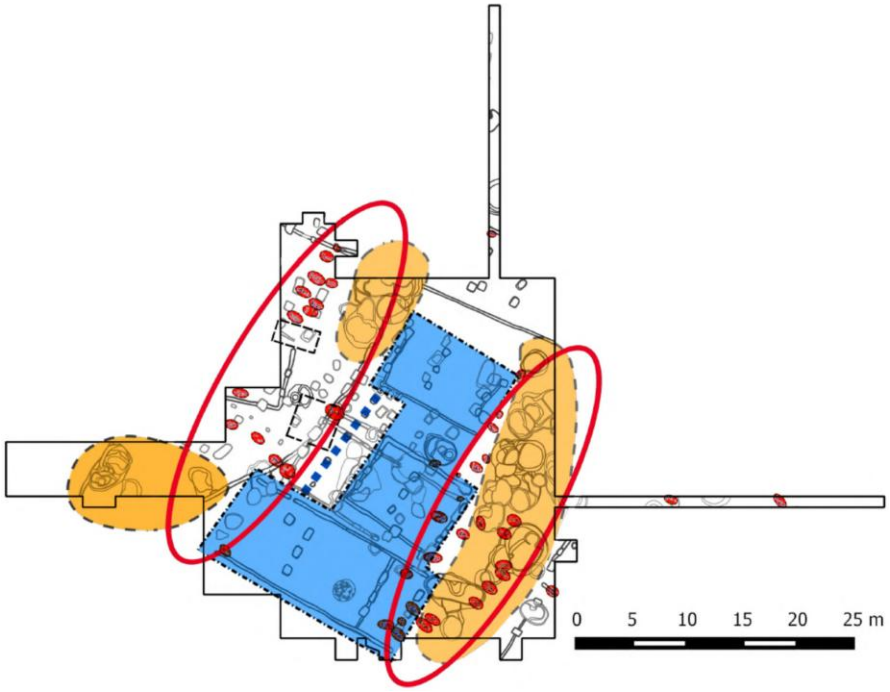

Fig. 4. Plan of the main excavated area from Öcsöd-Kováshalom, showing the spatial segments of the house zone (blue), the pit zones (yellow) and the burial clusters (red). After Raczky et al., "Domestic and symbolic," fig. 6.

Deposit L1 contained the fragmented remains of two unusual vessels – a large storage-jar with a face-decoration and a small rectangular spouted vessel. Raczky et al.'s interpretation that these vessels were both connected with alcoholic beverages used in communal feasting, with the drink stored in the face-pot and filtered through the rectangular vessel for pouring into drinking-cups. A third, equally incomplete special vessel was a second face-pot found in Deposit L2, near House 5, but with only 12 sherds remaining. The main focus of Raczky et al.'s analysis – and the analysis here - was the first face-pot, which was originally 72cm in height and decorated with metopic incised decoration, including a set of four stylised human shapes on the belly (Fig. 5a). A total of 20 heavily burnt, re-fitting large sherds from this face-pot was found in Deposit L1 but a further 66 smaller sherds from the same vessel had been dispersed across much of the site (Fig. 5b).

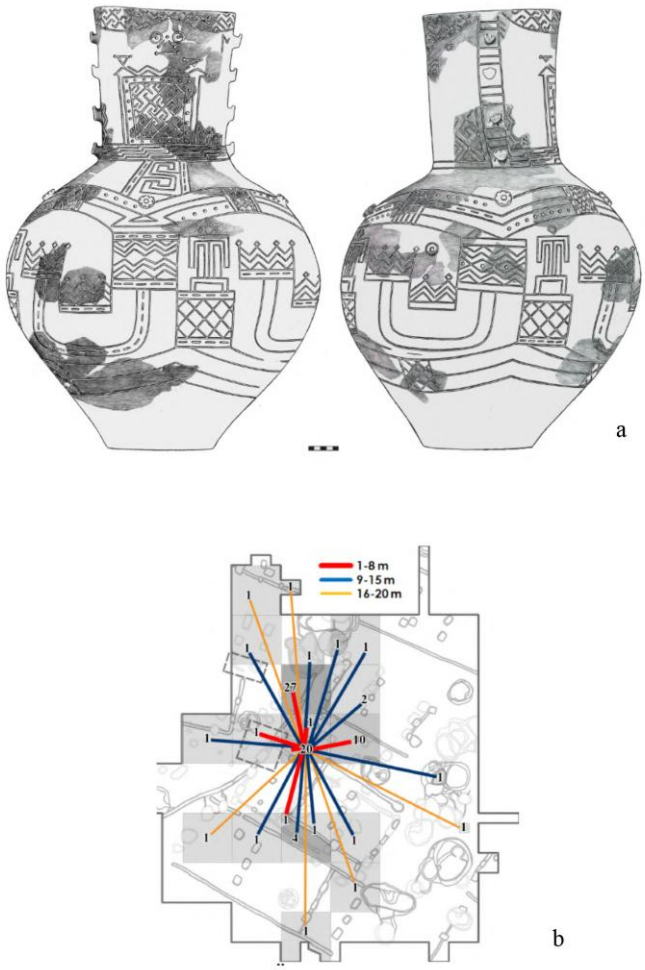

Fig. 5. a) Reconstruction of the face pot from the ceramic deposit in Location 1, Öcsöd-Kováshalom tell-like site (after Raczky et al., "Domestic and symbolic," fig. 8); b) Spatial distribution and number of the re-fitted fragments of the face pot found in the ceramic deposit in Location 1 on the tell-like settlement from Öcsöd-Kováshalom (after Raczky et al., "Domestic and symbolic," fig. 12).

Raczky et al. interprets this as the extension of a ritual act of communal deposition to a wider zone of the settlement core, linking three households in the making of a statement about the community's spatial world. The lives of the

three special vessels had all been brought to an end by deliberate fragmentation. Raczky et al. also presents the results of the spatial analysis of the 49 burials and other bone deposits at Öcsöd (Fig. 6).

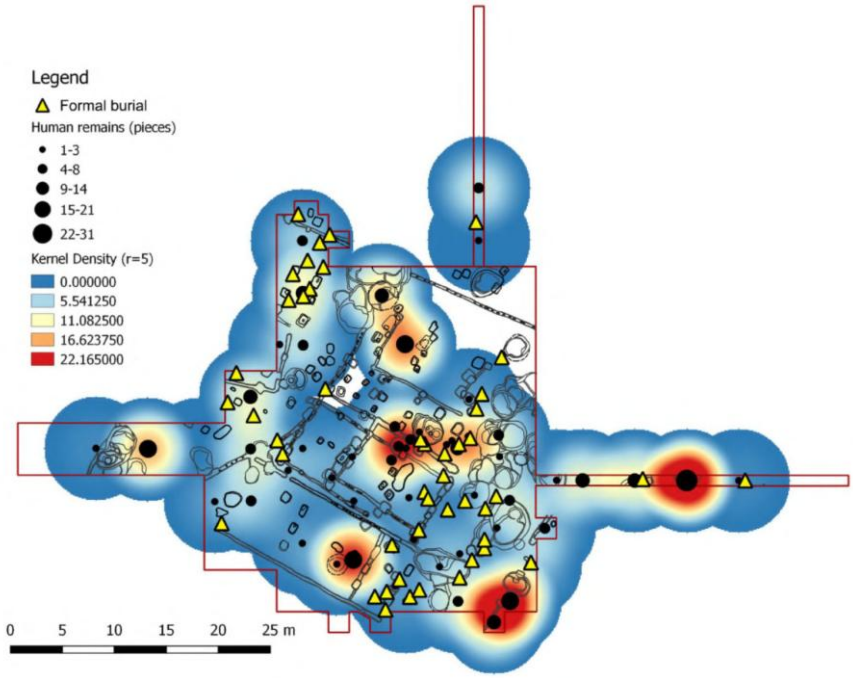

Fig. 6. Formal burials and human remains in a probably secondary position excavated in the main area of the Öcsöd-Kováshalom tell-like settlement. Spatial distribution of the human remains shown on a weighted heat map (radius: 5 m). The human remains were associated with settlement features and spatial units (black dots). After Raczky et al., "Domestic and symbolic," fig. 17.

A detailed analysis of the distribution of the face-pot sherds and the mortuary deposits within the inner settlement plan brings to light some interesting conclusions. These figures show a preference for the House zone in terms of findspots, but a preference for the Liminal zone for the number of re-fitting sherds (including Deposit L1). Looking at these patterns in more detail, although enchained links between Deposit L1 and the burnt houses were established through sherd deposition, this worked for Houses 4,5 and 10 only and not for House 7. However, only single re-fitting sherds were placed in each of Houses 4 and 5, with two sherds placed in House 10. Single re-fitting sherds

were placed in each of four pit-complexes, with two more sherds near two other pits. Only one re-fitting sherd was placed in the settlement's 'outer' ditch, as if to relate the settlement core to its perimeter. It will be interesting to see if future excavation of the three newly discovered outer ditches will reveal the deposition of further re-fitting sherds. It is worth emphasising that the largest number of re-fitting sherds was deposited in open spaces in the settlement core. Presumably, there was a close relationship between the Öcsöd houses and the spaces near to them.

The other interesting question concerns the relationship between mortuary deposits and re-fitting sherd deposits. This question is complicated by the chronology of the burials; here a simple spatial analysis is used without finer chronological differentiation. Two-thirds of the re-fitting sherd findspots were unrelated to mortuary deposits, while only one of the five site bone concentrations was located near a sherd findspot, with three burials and four bone groups near re-fitting sherds. While this does not show a mutually exclusive pattern, there is little sign of a correlation between mortuary and re-fitting sherd deposits.

What the face-pot fragmentation and re-fitting study shows is the importance of enchainment to the formation of local, site identities. The deposition of a sherd whose fabric and decoration would have been readily recognisable to the Öcsöd inhabitants presented a clear statement of relations between households and an important feasting deposit. Such small-scale, local enchainment deepened the relations between the houses in Öcsöd Phase A just before a major change in settlement planning. Mortuary practices appear not to have been closely integrated into this enchainment.

The transportation of marble figurine fragments to Kavos, Keros, Greece

The largest-scale re-fitting exercise in Aegean prehistory was recently carried out in the context of the Cambridge Kavos Project.[24] The focus of the

[24] Colin Renfrew, "Evidence for ritual breakage in the Cycladic Early Bronze Age. The Special Deposit South at Kavos on Keros," in *Thravsma: Contextualising the intentional destruction of objects in the Bronze Age Aegean and Cyprus*, Eds. Kate Harrell and Jan Driessen (Louvain: Presses Universitaires de Louvain, 2015), 81-98; Colin Renfrew, Olga Philaniotou, Neil Brodie, Giorgos Gavalas, and Michael J. Boyd (Eds.), *The Sanctuary on Keros and the origins of Aegean ritual practice: the excavations of 2006-2008, Vol. 1: The settlement at Dhaskalio* (Cambridge: MacDonald Institute, 2013); Colin Renfrew, Olga Philaniotou, Neil Brodie, Giorgos Gavalas, and Michael J. Boyd (Eds.), *The Sanctuary on Keros and the origins of Aegean ritual practice: the excavations of 2006-2008, Vol. 2: Kavos and the Special Deposits* (Cambridge: MacDonald Institute, 2015).

instigations was the small island of Keros and the adjoining islet of Dhaskalio, both of which exhibited intensive 3rd millennium BC activities in the Early Cycladic II period. There was a settlement on Dhaskalio, while on Keros at the site of Kavos there was an intensive deposition of fragmentary objects, mostly pottery, marble figurines and vessels, dated between 2750 – 2400/2300 BC (Fig. 7). Two Special Deposits were investigated at Kavos – the North site, which had been badly looted, resulting in rescue excavations, and the South site, with systematic excavations in 2006 – 8. The South site measured c. 35m x 30m and was located on ground sloping down to the sea. No human or animal bones were found during the excavation, indicating that the site was not a place of burial or settlement. The only evidence for local on-site production was the flaking of obsidian blades.[25]

Three separate re-fitting operations were tried for Kavos – for pottery,[26] marble vessels[27] and marble figurines.[28] The total of 53,639 sherds from domestic ceramic vessels included approximately half the total as feature sherds. Only two restorable vessels were found which arrived as complete at Kavos. For the most part of the assemblage, "it was brought to Kavos in fragmentary form."[29] A total of 2,236 fragments of stone vessels – mostly of marble and limestone – was found, with not a single vessel re-fitted to completeness. Most of the fragments formed less than 25% of the circumference. Only one re-fit covered more than 8m across the site.[30] Gavalas notes that "even when they were deposited in one area, they were often found in different layers, as if they had not been discarded in a single event."[31]

However, the re-fitting studies were not completed, as Brodie admits that there was too much material to search for joins between the Special Deposit North 1960s excavations and the recent Special Deposit South excavations.

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[25] Colin Renfrew, "The Special Deposit South as a ritual deposit," in Renfrew et al., *Sanctuary on Keros*, Vol. 2, 381-396.

[26] Colin Renfrew, "The Special Deposit South."

[27] Neil Brodie, "Appendix 13A. Joins analysis of the stone vessel assemblages," in Renfrew et al., *Sanctuary on Keros*, Vol. 2, 391-392; Georgos Gavalas, "The stone vessels," in Renfrew et al., *Sanctuary on Keros*, Vol. 2, 259-354.

[28] Dimitris Tambakopoulos, Yiannis Maniatis, Peggy Sotirakopoulou, and Colin Renfrew, "Appendix 13B. Figurine joins from the Special Deposit South," in Renfrew et al., *Sanctuary on Keros*, Vol. 2, 392-396.

[29] Colin Renfrew, "The Special Deposit South," 383.

[30] Brodie, "Appendix 13A," Fig. 13.1.

[31] Gavalas, "The stone vessels," 338.

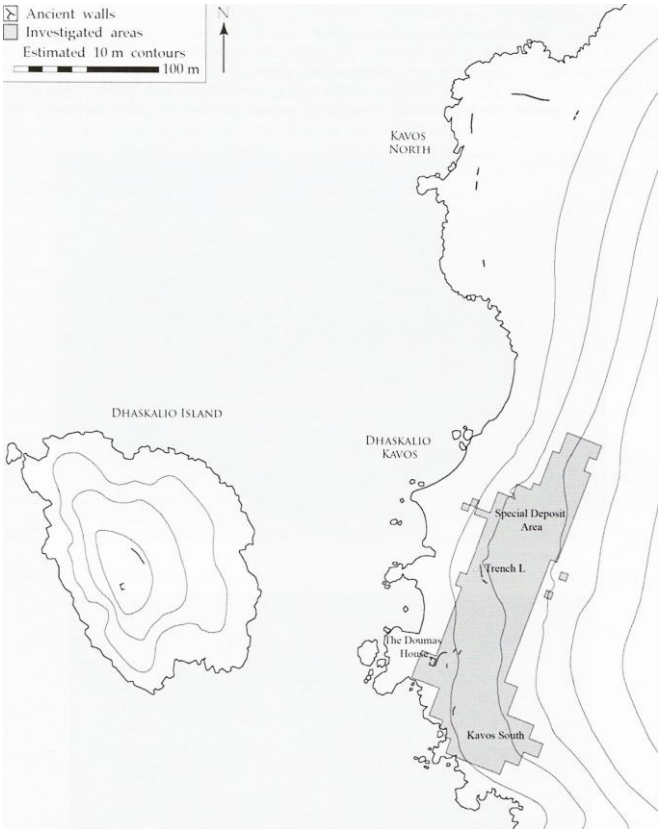

Fig. 7. The position of the Kavos on Keros site facing the small island of Dhaskalio (After Renfrew et al., *The settlement at Dhaskalio*, fig. 5.1.).

There were, however, no re-fits between the Special Deposit South area and the 1987 excavations in the North deposit. A similar picture was found with the 553 fragments of mostly marble figurines. Seventy-two re-fits were found, with five cases of five joining fragments, seven cases of four joining fragments, ten cases of three joining fragments and 60 cases of two joining fragments. This left the maximum number of fragmentary figurines as 511 items. Six of the 72 re-fits spanned more than 8m of the site, with a maximum distance of 15.7m, or half of the site.[32] No re-fits were found between the figurine fragments of the North and South Special Deposits, and no Folded-Arm Figurine (FAF) fragments were found at the Dhaskalio settlement. Moreover, there were no re-fits between the South and the North site or between the South site and the few FAF and marble bowl fragments found on the island survey.

[32] Tambakopoulos et al., "Figurine joins," Fig. 13.2.

Fig. 8. Fragments of a fragmented Cycladic marble statuette
(After Renfrew et al., *Kavos and the Special Deposits*, the back cover).

On the basis of the re-fitting operations, Renfrew concluded that the figurines had been deliberately fragmented before they reached Keros (Fig. 8). There was no evidence for the transport of complete marble bowls and figurines to Kavos, followed by local fragmentation.[33] Renfrew[34] reconstructed a complex operational chain for the FAFs, which he termed 'a cascade of contexts': (1) primary production on another island; (2) use in ritual display in settlements as complete objects; (3) deliberate breakage, with the fragmentation leading to a 'new life' for the figurines; (4) selection of some FAF fragments for deposition in Early Cycladic cemeteries and settlements but, more frequently, for collection with other objects in a container for the maritime 'pilgrimage' to Keros; (5) deposition at Kavos of fragments of ceramic and marble vessels and FAF fragments.

[33] Renfrew, "The Special Deposit South," 387.
[34] Renfrew, "Evidence for ritual breakage."

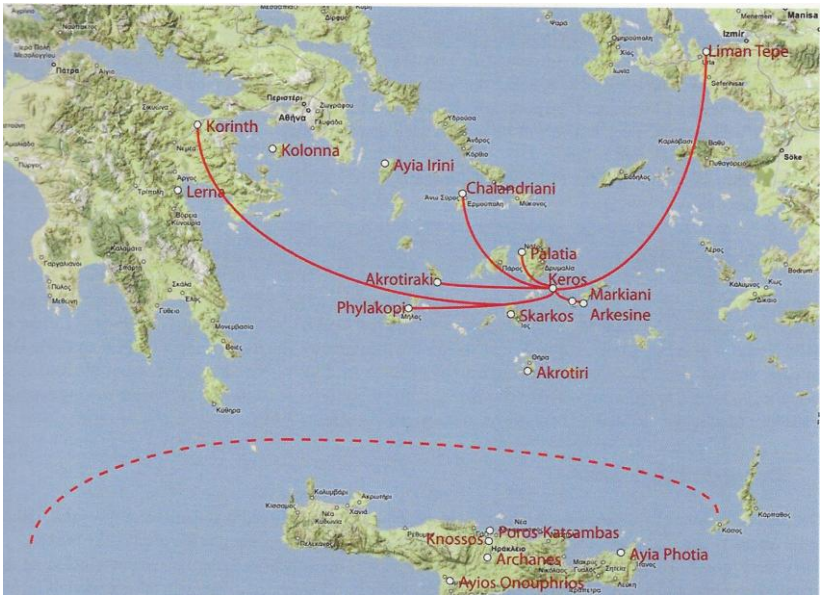

Fig. 9. Maritime interaction routes of the Early Bronze Age Aegean connecting key Cycladic, Anatolian, Cretan, and mainland Greek sites.[35]

The scale of the ritual network connected Kavos to a further nine Cycladic islands through ceramic petrographic analysis as well as to Corinth on the mainland (Fig. 9), with the marble for FAFs and vessels coming from Naxos and possibly also Ios and Syros. This network covered some 350km (Corinth – Izmir) but did not appear to include Minoan Crete.

The pilgrimage to Kavos was clearly a systematic, repeated practice carried out over several centuries (2750 – 2400/2300 cal BC), with enchainment of figurine fragments between Kavos and what we may term the Home Communities where the figurines originated and were used before fragmentation. Repetition was central to the creation of a traditional of ritual practice centred on Kavos, which excluded mortuary behaviour. Such pilgrimages also demonstrate conclusively the significance of fragment curation, which can be recognised at two or possibly even three stages of the process: the Home Community, where the totality of FAF, marble and ceramic vessel fragments would have been kept until a small number was selected for

[35] Carl Knappett and Irene Nikolakopoulou, "Inside Out? Materiality and Connectivity in the Aegean Archipelago," in *The Cambridge Prehistory of the Bronze and Iron Age Mediterranean*, Eds. Arthur Bernard Knapp and Peter van Dommelen (Cambridge, Cambridge University Press, 2014), fig. 2.1.

transportation to Kavos; curation during the pilgrimage; and possible curation at Kavos before ultimate deposition in the places for special deposits. Whatever the details of the ritual practices enacted at Kavos, the symbolism of *synecdoche* was central to the establishment of the identities of the ritual participants in relation to the pilgrimage centre and their own Home Communities. Just as Evangelista & Valera characterized the depositional process for the Portuguese Copper Age enclosure of Perdigões[36] as 'human bones in enclosures built the strength of each enclosure,' so stone figurine and vessel fragments, as well as ceramic fragments, built the strength of each special deposit at Kavos.

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.[37]

The excavation of the Herxheim enclosure took place in two four-year operations – 1996–1999 (the 'rescue' excavation) and 2005–2008 (the 'research' excavation).[38] The Herxheim enclosure is double-ditched but incomplete, forming a trapezoidal shape of almost 6ha [c. 270m (North – South) x 220m (East – West)] (Fig. 10). 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

[36] Evangelista and Valera, "Segmenting and depositing," 64.

[37] Andrea Zeeb-Lanz, Fabian Haack, Rose-Marie Arbogast, Miriam Noël Haidle, Christian Jeunesse, Jörg Orschiedt, and Dirk Schimmelpfennig, "Außergewöhnliche Deponierungen der Bandkeramik – die Grubenanlage von Herxheim," in *Germania* 85 (2007): 199-274; Andrea Zeeb-Lanz, Rose-Marie Arbogast, Silja Bauer, Bruno Boulesin, Anthony Denaire, Fabian Haack, Christian Jeunesse, Dirk Schimmelpfennig, and Rouven Turck, "Human sacrifices as 'crisis management'? The case of the Early Neolithic site of Herxheim, Palatinate, Germany," in *Diversity of Sacrifice. Form and Function of Sacrificial Practices in the Ancient Word and Beyond*, Ed. Carrie Ann Murray (New York: Sunny Press, 2016) [The Institute for European and Mediterranean Archaeology Distinguished Monograph Series], 171-189; Andrea Zeeb-Lanz (Ed.), *Ritualised destruction in the Early Neolithic – the exceptional site of Herxheim (Palatinate, Germany)*. Volume 1 (Speyer: Direktion Landesarchäologie, Aussenstelle Speyer, 2016); Andrea Zeeb-Lanz (Ed.), *Ritualised destruction in the Early Neolithic – the exceptional site of Herxheim (Palatinate, Germany)*. Volume 2 (Speyer: Direktion Landesarchäologie, Aussenstelle Speyer, 2019).

[38] Andrea Zeeb-Lanz and Fabian Haack, "History of research at Herxheim – an 'interpretative thriller'," in Zeeb-Lanz, *Ritualised destruction 1*, 1–13.

the site.[39] Much erosion has truncated the LBK living surface and much of the upper portions of the pits and ditches[40]. Pottery from Phases II – V of the Palatinate LBK sequence has been found on site (termed the 'village' phase), but the main activity was the 'ritual phase', including the digging of the ditches. This was 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.

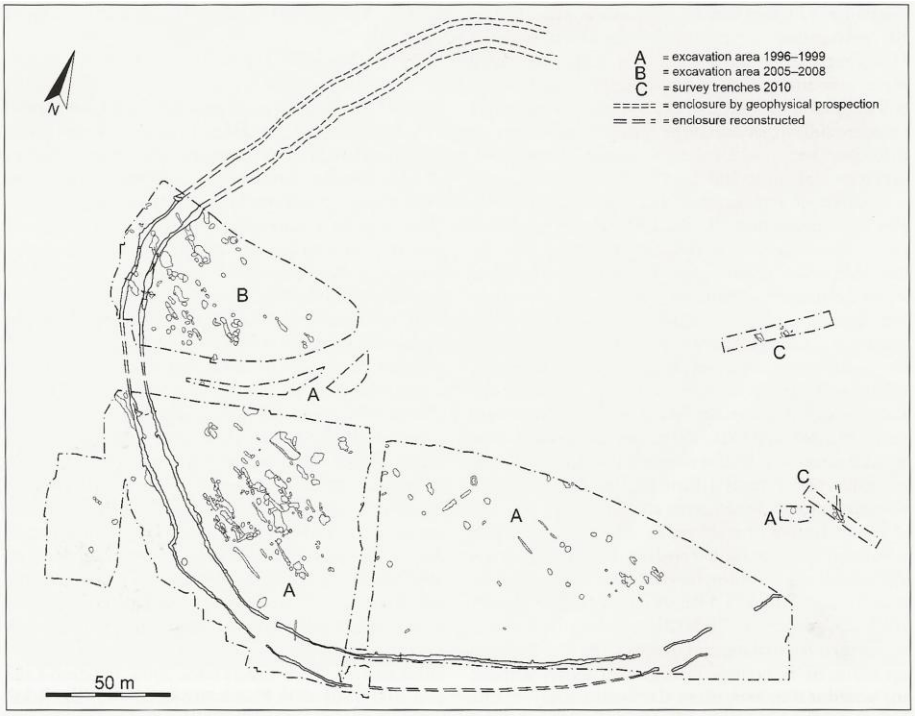

Fig. 10. Herxheim. Plan of enclosure showing location of excavations: (A) rescue excavation; (B) research excavation; (C) survey trenches. (After Zeeb-Lanz and Haack, "History of research at Herxheim," fig. 2).

The site was created through sequences of long pits comprising the inner and outer ditches. There were very few re-cuts of the ditch fill, leading

[39] Andrea Zeeb-Lanz, "The Herxheim ritual enclosure – a synthesis of results and interpretative approaches," in Zeeb-Lanz, *Ritualised destruction 2*, 429.

[40] Fabian Haack, "The early Neolithic ditched enclosure of Herxheim – architecture, fill formation processes and service life," in Zeeb-Lanz, *Ritualised destruction 1*, 22–23.

Haack[41] to reject Jeunesse's[42] characterisation of Herxheim as a pseudo-ditched enclosure acting as a long-term ritual centre for secondary burials lasting for centuries. Instead, Zeeb-Lanz favours an interpretation as 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.[43] While Denaire suggests that the remains of each ritual 'event' were placed in a midden and then thrown into the nearest long pit,[44] 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.[45]

A major recurrent feature of both ditches was the presence of 'finds concentrations' which were normally a mixture of predominantly earth with some finds[46] (Fig. 11). 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 concentrations.[47] Denaire has noted that the major clusters of sherd re-fits correlate well with the human bone concentrations[48] (Fig. 12).

The most striking biosocial remains were the human bone remains, most of which were deposited in the inner and outer ditches.[49] The human bones derive from persons of all ages but with an under-representation of children younger than 5 years and an over-representation of juveniles and young adults.[50] The bodies suffered from dismemberment soon after death and

[41] Haack, "The early Neolithic ditched," 113-115.

[42] Christian Jeunesse, "Enceintes à fossé discontinu et enceintes à pseudo-fossé dans le Néolithique d'Europe central et occidentale," in *Nécropoles et enceintes danubiennes du Ve millénaire dans le Nord-East de la France et la Sud-Ouest de l'Allemagne. Rhin, Meuse, Moselle*, Eds. Anthony Denaire, Christian Jeunesse, and Philippe LeFranc (Strasbourg: Université de Strasbourg, 2011), 31-72.

[43] Haack, "The early Neolithic ditched," Pl. 68, 81 & 84.

[44] Anthony Denaire, "Pottery re-fits and connections from Herxheim," in Zeeb-Lanz, *Ritualised destruction 2*, 38. However, this sensible suggestion ignores the inter-contextual re-fits which he has done so much to identify.

[45] Zeeb-Lanz, "The Herxheim ritual enclosure," 466.

[46] Zeeb-Lanz et al., "Außergewöhnliche Deponierungen," 266.

[47] Fabian Haack, "Early Neolithic," 64.

[48] Denaire, "Pottery re-fits," 34.

[49] Bruno Boulestin and Anne-Sophie Coupey, *Cannibalism in the Linear Pottery Culture at Herxheim* (Oxford: Archaeopress Archaeology, 2015); Silja Bauer, "Human bones from the research excavation 1996-1999. Examination of selected material (excavation slots 282-100 to 282-107)" in Zeeb-Lanz, *Ritualised destruction 2*, 3-24.

[50] Zeeb-Lanz, "The Herxheim ritual enclosure," 431.

then the smashing of their bones. Despite re-fitting efforts with 1,891 bone fragments from 8 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.[51]

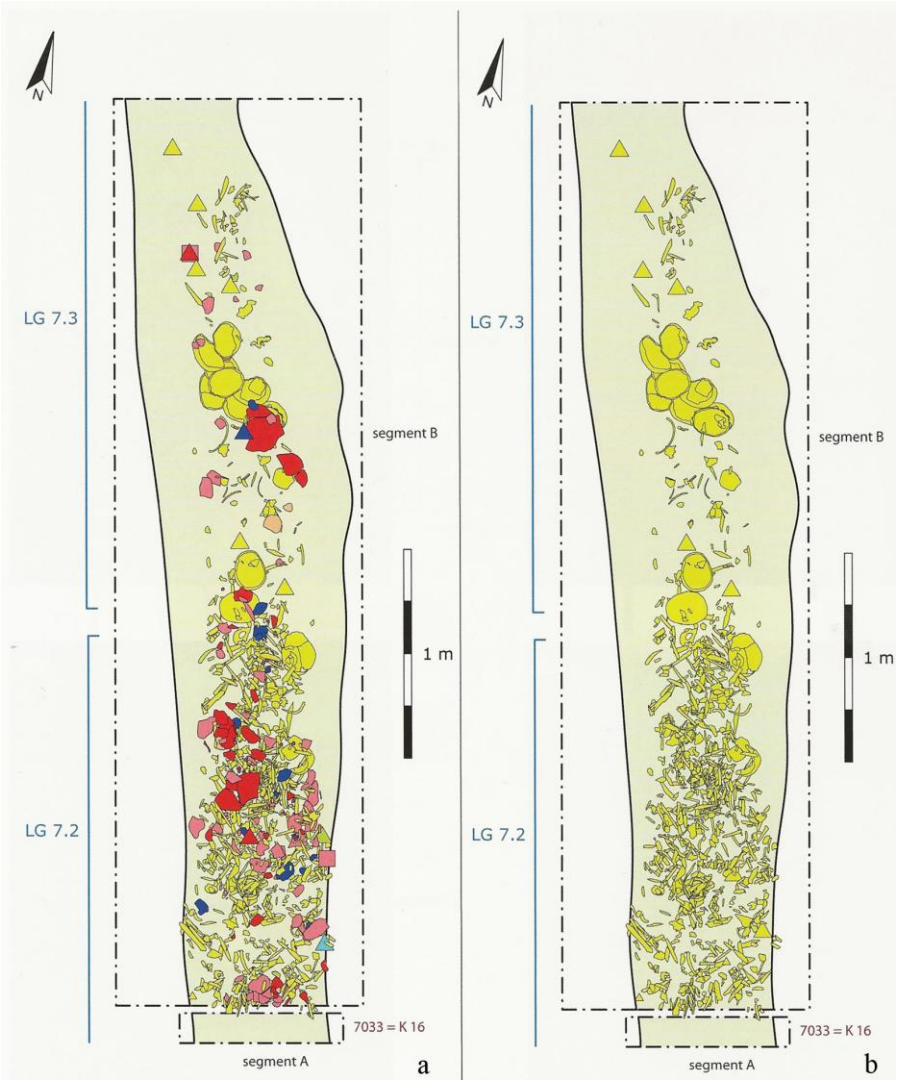

Fig. 11: Herxheim. Inner ditch ring, finds concentration K 16: a) Planum 5 with finds horizons 5–19; b) Planum 5 of the inner ditch horizon (After Haack, "The early Neolithic ditched," Pl. 66).

[51] Bauer, "Human bones," 11.

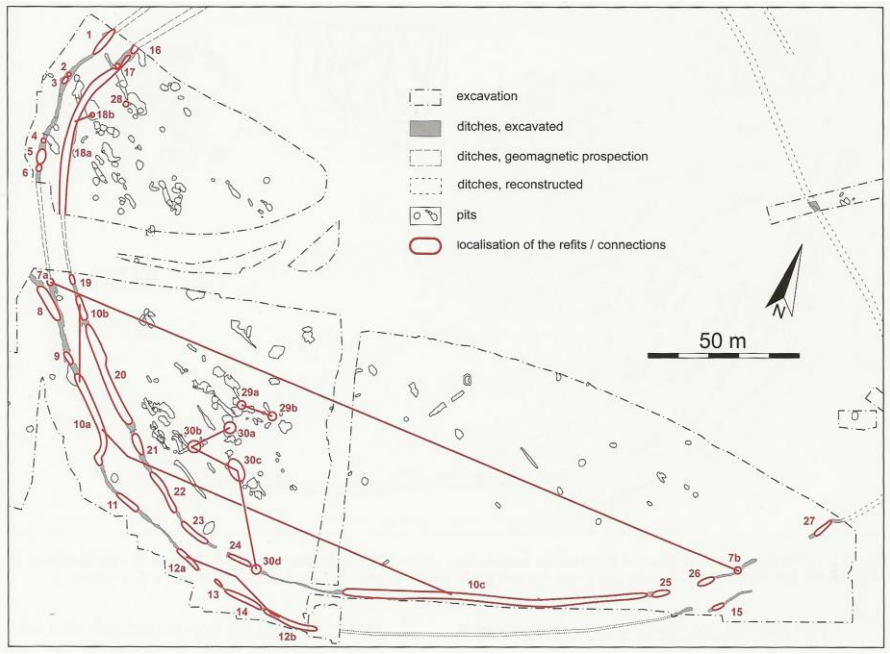

Fig. 12. Plan of the pit enclosure and the excavated settlement areas from Herxheim, showing the concentrations of reassembled sherds and long-distance sherd re-fits (After Denaire, "Pottery re-fits," fig. 10).

Without an even 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.[52] Special treatment was afforded to cranial material, with the production of calottes (skull-caps) and their occasional deposition in groups. Both Boulestin, Coupey, and Bauer have recognised the overwhelming predominance of peri-mortem butchery and the fragmentation of 'fresh' bone[53] through cut marks, fracture lines and fracture profiles over the relatively few post-mortem processing of 'dry' bones. 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.[54]

[52] E.g., on the surface of the enclosure or in as yet unexcavated parts of the ditches: Andrea Zeeb-Lanz and Fabian Haack, "Ritual und Gewalt in Herxheim (Pfalz)," in *12. Mitteldeutscher Archäologentag: Rituelle Gewalt – Rituale der Gewalt / Ritual Violence – Rituals of Violence* (Halle/Saale: Tagungen des Landesmuseums für Vorgeschichte Halle, 2020) [Band 22/I], 181-196.
[53] 'Fresh' bone is taken to mean that the flesh was still on the bone when the cut mark was made to remove the flesh: Bauer, "Human bones," 5.
[54] Boulestin and Coupey, "Cannibalism", 65; Bauer, "Human bones," 16.

The Herxheim pottery assemblage has not yet been studied in full.[55] 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.[56] 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[57] (Fig. 13).

The highly fragmented faunal assemblage deriving from the ditches and the settlement features shows all the characteristics of butchering waste.[58] 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 between eight to twelve individuals.[59]

The lithic remains can be divided into chipped stone, polished stone, colouring items and ground stone.[60] The chipped stone showed the tool spectrum of a 'normal' settlement assemblage.[61] The majority of chipped stone items was deposited in the inner ditch. Although *Muschelkalk* cherts would have been available 15 – 20 km from Herxheim, most of the items were of Upper Cretaceous flint from at least 200km away, with a small number of Jurassic cherts from the South (no more than 300km away) and a few Bartonian flints from much further East.

[55] Haack, "The early Neolithic ditched;" Denaire, "Pottery re-fits;" Oliver Mecking, "Clay analysis of the pottery from Herxheim," in Zeeb-Lanz, *Ritualised destruction 2*, 41–54.
[56] Mecking, "Clay analysis."
[57] Mecking, "Clay analysis," 51 - 53.
[58] Arbogast, "Faunal assemblages," 144.
[59] Luc A. Janssens, Rose-Marie Arbogast and Andrea Zeeb-Lanz, 'Dogs of the final Bandkeramik at Herxheim: re-fitting and pathology," in Zeeb-Lanz, *Ritualised destruction 2*, 233-246.
[60] Dirk Schimmelpfennig, „The lithic material from Herxheim with special emphasis on the 2005–2008 excavations and the latest LBK phase (the 'ritual phase' at Herxheim)," in Zeeb-Lanz, *Ritualised destruction 2*, 81-138.
[61] Ibid.,102.

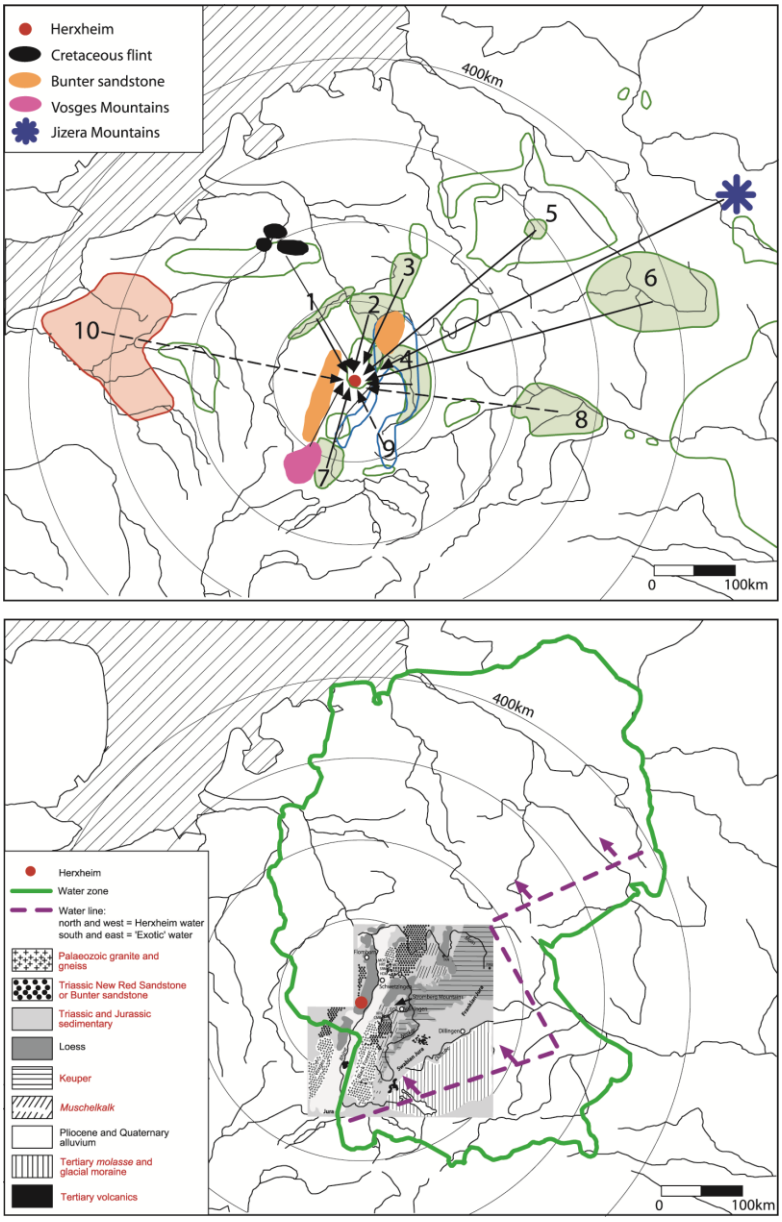

Fig. 13. Up. Regions of provenance for vessels with non-local decoration styles and sources of lithic at Herxheim: 1. Rhine-Moselle; 2. Rhine-Main; 3. Northern Hesse; 4. Neckar; 5. Elster-Saale; 6. Bohemia (Šarka); 7. Upper Alsace; 8. Bavaria; 9. Hinkelstein area; 10. Blicquy (After Zeeb-Lanz, "The Herxheim ritual enclosure," fig. 6); Down. Water sources based upon $\delta^{18}OH_{20}$ values (After Turck, "Where did the Herxheim," fig. 56).

These inter-regional imports were considered as important and coming from many directions[62] (Fig. 13).

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,[63] 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 objects – grinders and saddle querns. Many querns had been made brittle by being placed in fires and intentionally smashed afterwards.[64] Schimmelpfennig emphasizes 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.[65]

The huge quantity of material has formed the basis for one of the most ambitious (and praiseworthy) re-fitting exercises in the last decades. 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 6,000.[66] Analyses of aDNA, strontium and oxygen in teeth, together with carbon / nitrogen isotopes of human bone provided surprising results.[67] The strontium isotopic analysis showed that 90% of the sample, at least in their early years, were non-local to

[62] Ibid., 91.

[63] A 'manuport' is an unworked object not local to the site, which has therefore been brought onto the site.

[64] Zeeb-Lanz, "The Herxheim ritual enclosure," 436.

[65] Schimmelpfennig, "The lithic remains," 130–131.

[66] In addition to these finds, there was a large faunal assemblage of slightly under 15,000 bone fragments, not as heavily fragmented as the human bones, which were not re-fitted: Rose-Marie Arbogast, "Analysis of the faunal assemblages of the LBK site of Herxheim: the larger mammals," in Zeeb-Lanz, *Ritualised destruction 2*, 139-232.

[67] Rouven Turck, "Where did the Herxheim dead come from? Isotope analyses of human individuals from the find concentrations in the ditches," in Zeeb-Lanz, *Ritualised destruction 2*, 313-421.

Herxheim, deriving from at least two lowland areas (11 individuals from non-Herxheim loess or *Muschelkalk* areas) and several upland 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). 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. 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 did such a large group of fragmented bones from an estimated 1,000 people,[68] of whom an estimated 730 were non-locals, come to be deposited at Herxheim?

The current interpretation of the Herxheim findings is most comprehensively presented by Andrea Zeeb-Lanz,[69] drawing on insights from other researchers.[70] 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.'[71] 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.'[72] 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

[68] Turck, "Where did the Herxheim."

[69] Zeeb-Lanz, "The Herxheim ritual enclosure."

[70] Alexander Gramsch, "Prestige durch rituelle Handlungen – *cui bono*?," in *Ansehenssache. Formen von Prestige in Kulturen des Altertums*, Eds. Birgit Christiansen and Ulrich Thaler (München: Herbert Utz, 2012), 355-384; Daniela Hofmann, "Bodies, houses and status in the Western Linearbandkeramik," in *Beyond elites. Alternatives to hierarchical systems in modelling social formations*, Eds. Tobias L. Kienlin and Andreas Zimmermann (Bonn: Rudolf Habelt, 2012), 183-196.

[71] Zeeb-Lanz, "The Herxheim ritual enclosure," 463.

[72] Ibid., 454.

'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 artifacts 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 the earlier part of this paper concerning landscape fragmentation, the Öcsöd face-pot and the Kavos figurine fragmentation and transportation. We shall use these insights to open up an interpretative space for an alternative narrative for the Herxheim site.

An alternative narrative for Herxheim

The key insight from landscape fragmentation is the way that other landscapes are enchained to the places by the materials derived from the sources and used and deposited in other places.[73] 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. 13). 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 200km and sometimes more. The importance of Zeeb-Lanz' inter-regional network lies in the way that enchainment worked along a continuous spatial scale, from the very local inter-long-pit refits at Herxheim) to the inter-regional (lithic and pottery exchange). Andy Jones[74] 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,[75] just as a second bone fragment placed in another long pit with sherds from the Rhein-Main region[76] 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

[73] See above, 47-51.

[74] Andy Jones, *Prehistoric materialities. Becoming material in prehistoric Britain and Ireland* (Oxford: Oxford University Press, 2012), 19-20.

[75] E.g, in the inner ditch in slot 282-139.

[76] E.g, in the inner ditch in slot 282-12.

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.'[77] 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.

Enchained relations expressed through biosocial remains can provide a general explanation of many detailed questions raised for Herxheim, such as the excavations team's puzzlement over fragmented bone deposits in settlement pits, which would have related the deceased to the local residents.[78] 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.

The Kavos case study underlines the significance of curation in object biographies.

The evidence for sherd curation at Herxheim comes from three sources – sherd surfaces, different life-histories and the evidence for vessel fragmentation. The observation of spalling on many sherds, including on one sherd of the longest sherd re-fit,[79] has indicated exposure to the elements, even if for not more than one winter.[80] Another sign of the temporal scale of events is the important observation, not pursued by Denaire,[81] is 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.[82] 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 burial at a depth making the body inaccessible to dogs or curation of the body in a place inaccessible to dogs. As we shall see, the possibility of bone and sherd

[77] It is ironic that this misleading claim was made by the specialist who re-fitted the pottery: Denaire, "Pottery re-fits," 39.

[78] Zeeb-Lanz, "The Herxheim ritual enclosure," 457.

[79] Denaire, "Pottery re-fits," 35.

[80] Denaire, "Pottery re-fits," 38. However, Zeeb-Lanz objects that the variety of sediments in which the sherds were deposited could also have produced spalling. The issue remains for further scientific study.

[81] Denaire, "Pottery re-fits," 27.

[82] Chapman and Gaydarska, *Parts and wholes,* Chapters 3, 6 & 7.

curation is an important factor at Herxheim and beyond. We now turn to a possible sequence of operations explaining Herxheim's major dilemma.

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[83]) but also dividuals, whose relations with all other persons, places and objects contributed to their identities. This aspect of dividuality was particularly important when objects were fragmented and re-used 'after the break'.[84] 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 Orschiedt and Haidle[85] 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 Turck, who proposed that people gathered at Herxheim before their deaths, but he has not explained this idea in any more detail.[86] We do not invoke the practice of secondary burial but, rather, a staged sequence of bodily manipulation that stretched spatially far beyond than the Herxheim enclosure itself.

The Herxheim researchers' attitudes to secondary burial rests on a dubious interpretation of peri-mortem cut marks on, and dismemberment of, the bones, which we would question. 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

[83] Not their real names!

[84] E.g., in the case of the fragmentation of Hamangia figurines, whose new fragmented identities created a change of gender: Chapman and Gaydarska, *Parts and wholes*, 53-70.

[85] Jörg Orschiedt and Miriam Noël Haidle, "Violence against the living, violence against the dead on the human remains from Herxheim, Germany. Evidence of a crisis and mass cannibalism?," in *Sticks, Stones, and Broken Bones: Neolithic Violence in a European Perspective,* Eds. Rick Schulting and Linda Fibiger (Oxford: Oxford University Press, 2012), 121-137. See also: Jörg Orschiedt and Miriam Noël Haidle, "The LBK Enclosure at Herxheim: Theatre of War or Ritual Centre? References from Osteoarchaeological Investigations," in *Journal of Conflict Archaeology* 2, 1 (2006): 153-167.

[86] Turck, "Where did the Herxheim."

the site. Furthermore, Zeeb-Lanz' interpretation does not explain the large number of individuals (an estimated 1,000 + inviduals) whose body parts were deposited at Herxheim. Zeeb-Lanz shows how there was only one Latest LBK hamlet outside the enclosure that was contemporary 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: just as there are no other coeval lowland sites,[87] there are no known upland sites. As Hofmann 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.'[88]

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,[89] or the high probability of fragment-based exchange, as seen, for example, at the Polgár - Csőszhalom tell in Hungary.[90] 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. 13). Even if these sites have not yet been identified in the field, there is no reason to dispute the findings of the strontium isotope analysis. 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,[91] 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,

[87] A current debate on the settlement chronology of LBK Phase 5 may change this conclusion (p.c., A. Zeeb-Lanz).

[88] Daniela Hofmann, "Not going anywhere? Migration as a social practice in the early Neolithic Linearbandkeramik," in *Quaternary International* 560-561 (2020): 228-239.

[89] Chapman and Gaydarska, *Parts and wholes*, 106-107.

[90] Chapman, *Fragmentation*, 64.

[91] For a discussion of the reasons for the origins of the ritual phase at Herxheim, see below, 74-76.

digging a long pit, depositing sherds, stones and bones, and then re-filling the long pit.

In another key development, the decision was made to bring parts of the dead ancestors of specific home communities to Herxheim to materialise 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. 14).

The physical anthropological data is clear 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. 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.[92] A study of pig bones in eastern Ontario, Canada[93] 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.[94] In frozen conditions or submerged environments, bone can retain moisture and would therefore present fresh fracture patterns for considerable periods of time[95]. A focussed analysis of a sub-sample of bones,

[92] Ashley E. Green and John J. Schultz, "An examination of the Transition of Fracture Characteristics in Long Bones from Fresh to Dry in Central Florida: Evaluating the Timing of Injury (Report)," in *Journal of Forensic Science* 62, 2 (2017): 282-291.

[93] Martyna A. Janjua and Tracy L. Rogers, "Bone weathering patterns of metatarsal v. femur and the postmortem interval in Southern Ontario," in *Forensic Science International* 178 (2018): 16–23.

[94] Danielle A. M. Wieberg and Daniel J. Wescott, "Estimating the time of long bone fractures: correlation between postmortem interval, bone moisture content, and blunt force trauma fracture characteristics," in *Journal of Forensic Science* 53, 5 (2008): 1028–1034.

[95] Alison Galloway, Lauren Zephro and Vicki L. Wedel, "Diagnostic Criteria for the Determination of Timing and Fracture Mechanism," in *Broken bones: Anthropological Analysis of Blunt Force Trauma,* Eds. Alison Galloway and Vicki L. Wedel (Springfield IL: Charles C. Thomas, 2014), 47-58.

using microscopy to evaluate bioerosion, could potentially provide information about pre-depositional treatment of human remains.[96]

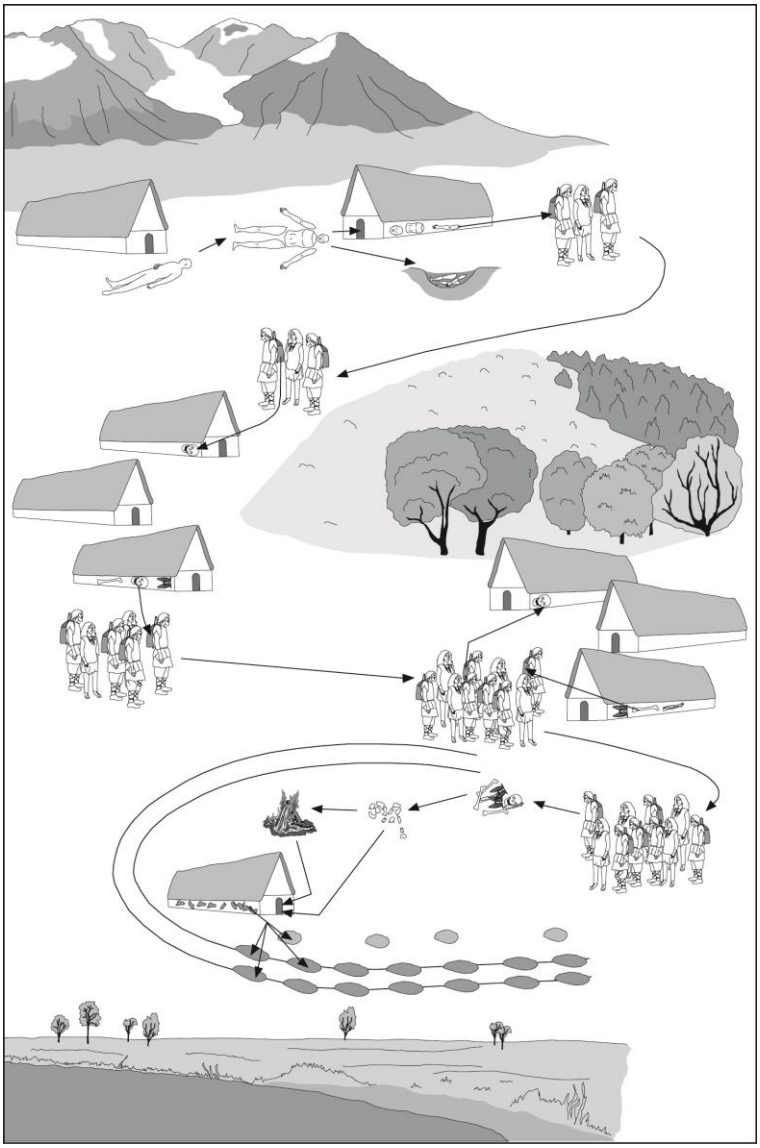

Fig. 14. Bodily mobility model for the Herxheim enclosure.

[96] Tom J. Booth, "An Investigation into the Relationship Between Funerary Treatment and Bacterial Bioerosion in European Archaeological Human Bone," in *Archaeometry* 58, 3 (2016): 484-499.

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.

This scenario is based upon a division of bodies for transport – in effect, a mobility scenario. This is by no means a novel idea in European prehistory.[97] It is already well established 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? Is it possible to model the human bone mobility scenario for 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,[98] rendering all dates between 5200 and 5080 cal BC more or less indistinguishable. 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 than half – for example, up to 50 years.[99] This reasoning fits poorly with Zeeb-Lanz' revised proposal of a much shorter duration for the Herxheim 'ritual' phase – "a narrow temporal window for the activities as a whole", centred on three, five or ten years, whether c. 5050 cal BC or 5030 cal BC.[100]

[97] Chapman et al., forthcoming, Germania discussion paper.

[98] Irka Hajdas, "Radiocarbon dating of human bones from Herxheim," in Zeeb-Lanz, *Ritualised destruction 2*, 277-283.

[99] Riedhammer's 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., "Human sacrifices" published views: Katrin Riedhammer, "The radiocarbon dates from Herxheim and their archaeological interpretation," in Zeeb-Lanz, *Ritualised destruction* 2, 289.

[100] Zeeb-Lanz, "The Herxheim ritual enclosure," 439, 448.

Peter Demján and Peter Pavúk[101] 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 Hajdas[102] and all of the 26 dates quoted by Hajdas and Riedhammer[103] 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 5 years and it was more likely 50 or more years.

The number of persons whose remains were deposited at Herxheim rests on a large sample of human bones which has not yet been completed studied. Much of the issues derive from the fact that three groups of people have analysed the remains – Orschiedt and Haidle,[104] Boulestin and Coupey[105] and, most recently, Bauer[106] and we shall take Turck's estimate of an MNI of 1,000 for the whole site as a first approximation.[107] 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 evidence for the claim that Herxheim is the only occupied LBK Phase V site[108] is weak. The reduced possibility of archaeological finds in an upland ploughzone because of forest and pasture cover equates to poor

[101] Peter Demján and Peter Pavúk, "Clustering of calibrated radiocarbon dates: Site-specific chronological sequences identified by dense radiocarbon sampling," in *Radiocarbon* DOI: https://doi.org/10.1017/RDC.2020.129.

[102] Hajdas, "Radiocarbon dating"; many dates were rejected because they were considered to be inaccurate outliers.

[103] Riedhammer, "The radiocarbon dates."

[104] Orschied and Haidle, "Violence."

[105] Bouleston and Coupey, "Cannibalism."

[106] Bauer, "Human bones."

[107] Turck, "Where did the Herxheim."

[108] For a distribution of Latest LBK lowland sites near Herxheim, see Zeeb-Lanz, "The Herxheim ritual enclosure," Figs. 2 and 4.

knowledge of upland settlement patterns.[109] These evidential gaps mean that it will be useful to create four models to cover a range of durations for Herxheim as wide as possible (Table 1).

Table 1 Four bodily mobility models for the Herxheim enclosure

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

Key: HCs – Home Communities; Versions – alternative values for each Model; MNI – minimum number of individuals.

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 10 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

[109] We have suffered from similar problems for the upland Zemplén Block 3 of the Upper Tisza Project: John Chapman, Mark Gillings, Robert Shiel, Enikő Magyari, Bisserka Gaydarska, and Chris Bond, *The Upper Tisza Project. Studies in Hungarian landscape archaeology. Book 3: Settlement patterns in the Zemplén Block* (Oxford: Archaeopress, 2010) [BAR International Series 2088].

newly-dead reached 10 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 10 sites.

The range of estimated body-part deposition in the four models covers 14 *per annum* (75 years) to 100 *per annum* (10 years). It is worth noting the extraordinarily high rate of deposition at Herxheim in comparison with other large cemeteries in European prehistory.[110] The highest rate of annual deposition comes from the 50-year peak of Lengyel burials at Alsónyék, with a modelled mortuary rate of 60 burials *per annum* (4725 – 4700 cal BC) and over 50 burials *per annum* (4700 – 4675 cal BC).[111] Acceptance of the shortest duration for the use of the Herxheim enclosure (at 10 years) means double the rate of bodily deposition than at Alsónyék.

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

[110] See discussion of burials *per annum* in Noah Honch, Thomas Higham, Bisserka Gaydarska, Henrieta Todorova, Vladimir Slavchev, Yordan Yordanov, Branimira Dimitrova, and John Chapman, "Pontic chronologies and diets: a scientific framework for understanding the Durankulak and Varna I cemeteries, Bulgaria," in *Interdisciplinaria Archaeologica Natural Sciences in Archaeology* 4, 2 (2013):147–162.

[111] Eszter Bánffy, Anett Osztás, Krisztián Oross, István Zalai-Gaál, Tibor Marton, Éva Ágnes Nyerges, Kitti Köhler, Alex Bayliss, Derek Hamilton and Alasdair Whittle, "The Alsónyék story: towards the prehistory of a persistent place," in *Bericht der Römisch-Germanisch Kommission* 94 (2013): 283-318.

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 100km to Herxheim. One of the authors (JCC) 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.[112] 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.[113]

In summary, the possibility of a greater upland contribution to Herxheim may be considered as a 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[114] 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[115] fits well with this proposed explanation of the Herxheim phenomenon.

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[112] John Chapman, *Forging identities in the prehistory of Old Europe. Dividuals, individuals and communities 7000 – 3000 BC* (Leiden, Sidestone Press), in press.

[113] For a very different form of prehistoric pilgrimage, see the Pilgrimage Model for the Trypillia megasite of Nebelivka: John Chapman and Bisserka Gaydarska, "The pilgrimage model for Trypillia mega-sites: the case of Nebelivka, Ukraine," in *Digging in the past of Old Europe. Studies in honor of Cristian Schuster at his 60th anniversary,* Eds. Valeriu Sîrbu and Alexandra Comşa (Brăila: Istros, 2019), 73-102.

[114] Hofmann, "Bodies, houses and status"; Andrea Zeeb-Lanz, "Anthropomorphic and theriomorphic figurine fragments and other small clay finds from the ritual enclosure of Herxheim," in Zeeb-Lanz, *Ritualised destruction 2*, 55-80.

[115] Daniela Hofmann, "Not going anywhere."

Conclusions

In this paper, 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[116] remains incomplete. We propose to modify it 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*.' 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 objects provides a holistic means of re-integrating places and objects. In other words, the incorporation of the fragmentation of place is essential for an integrated theory of fragmentation.

The dispersion of fragments of a large anthropomorphic face-pot at the Late Neolithic mound of Öcsöd was a local event that did not utilise the potential of distinctive decorated sherds to presence absent others, since everyone on the tell knew each other. Instead, the dispersion was part of a strategy to reinforce relations between a great site-wide feasting event and the houses of the participants in that feast – the reinforcement of cultural memory.

The movement of Early Bronze Age marble figurine and vessel fragments and sherds from Cycladic islands in pilgrimage to the ritual centre of Kavos for final deposition shows several features common with the LBK case of Herxheim. The complex operational chain of the marble figurines, which joined many places through a 'cascade of contexts', resembles the passage of fragments of the newly-dead from their Home Communities, via other communities, to their final resting-place at Herxheim. In both centres, the importance of curation is evident from wear traces, separate biographies 'after the break' and high frequencies of missing object or body parts. The importance of seasonal or annual repetition in both these centres built the special deposits through growing place-value and expanding cultural memory, creating a deeper attachment to the history of these places.

The central issue at Herxheim is the attribution of the body parts of an estimated 730 persons to upland home communities even though no, or very few, sites are known from nearby uplands. The proposed bodily mobility model, of which four versions are presented here, makes the assumption of an upland –

[116] See above, p. 45.

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. 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. While bodily mobility is widespread in European prehistory, this practice has not been frequently invoked in the LBK, with its current total of over 3,000 known burials, often in small groups in settlements and cemeteries.[117]

The three examples of re-fitting studies discussed in this paper form significant additions to the corpus of fragmentation research whose expansion continues to this day. In each case, the key principles of enchainment, synecdoche and presencing provide ways to explain small-scale inter-household practices just as well as unusually large concentrations of fragmented remains.

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[117] Hofmann, "Not going anywhere," 3.