MAGICAL, MUNDANE OR MARGINAL?

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Structured deposition in the Linearbandkeramik — is there something to talk about?

Daniela Hofmann

Abstract

Telling apart instances of "ritual" versus "profane" deposition has been a central problem in several European archaeological traditions. In the UK, particularly but not exclusively for the Neolithic, the term "structured deposition" provides an opportunity to transcend this unhelpful duality, but has sometimes been too strongly weighted towards the exceptional. Continental scholars have recognised the same terminological difficulty, but have often been reluctant to directly address how more unusual deposits can provide insights into past worldviews. This has also been the case for the Linearbandkeramik culture. This brief introduction summarises the papers of the volume with a view to establishing a tentative "depositional logical", outlining similarities and differences between various contexts of practice — burials, enclosures, settlement sites and natural places — as a basis for further targeted investigation. Deliberate destruction, particularly of pottery, emerges as a practice linking several spheres of activity and can be opposed to the deposition of complete items. Through such acts, otherwise mundane objects could become part of ritualised action. Questions for future research are then outlined, focusing in particular on the wider historical context of LBK depositional traditions within the Neolithic sequence, and on possible reasons for differential practices within the LBK itself.

Keywords: *Linearbandkeramik; structured deposition; depositional practice; spheres of action*

> *Unsere Kenntnis von den neolithischen Depots ist noch äußerst lückenhaft.*
> *(Bremer 1925, 362, quoted in Frauendorf 1940, 38)*

This volume is the outcome of a Workshop on *Structured deposition in the Linearbandkeramik*, organised by myself and Rengert Elburg at Hamburg University on the 27th and 28th of May 2016 and generously supported by the Fritz Thyssen Stiftung[1]. It took its starting point from the increasing discovery of what seemed like deliberately placed deposits in contexts of the Linearbandkeramik culture (LBK, c. 5500–4900 cal BC; Figure 1), which had previously not been well known for this kind of evidence. This included the placement of complete and still usable tools in the ground, occasionally arranged in striking formations

1 The German Title was "*Ritual und Kult: Strukturierte Deponierungen in der Linearbandkeramik*", Az. 30.16.0.053AA.

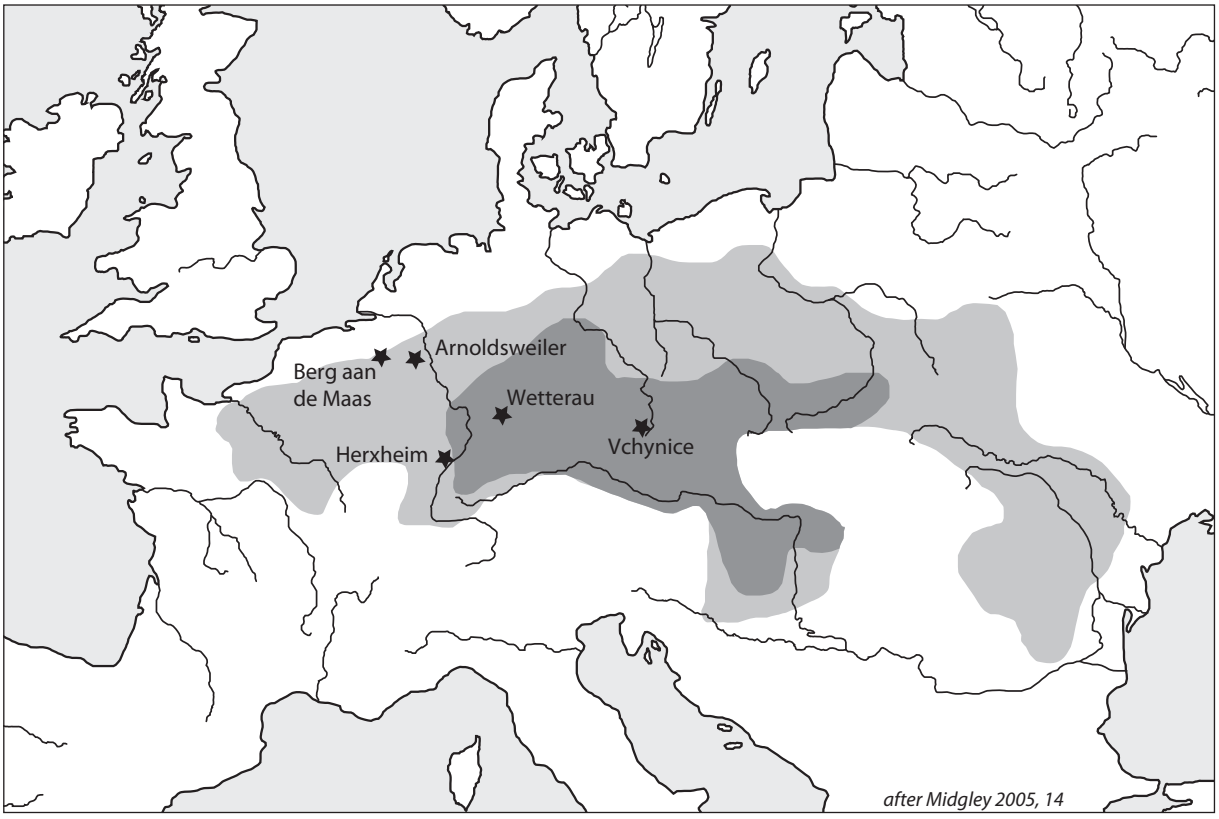

Figure 1. Map of LBK distribution with main case study areas covered in the different chapters (base map after Midgley 2005).

(*e.g.* grinding stones, Hamon 2008), as well as the deposition of complete items in the abandonment layers of features such as wells (Elburg 2011) or the destruction of immense material wealth and its discard in enclosure ditches, most famously at Herxheim (see Zeeb-Lanz 2016).

This is the kind of behaviour that archaeologists generally interpret as ritual[2], or more particularly, as "structured deposition" — although the relationship between the two terms is fraught. In what follows, I very briefly summarise the discussion surrounding structured deposition as a concept, drawing out how it informed the rationale of the workshop. Then, using the papers in this volume as my starting point, I provide a short overview of the relevant LBK evidence, speculating also why these topics have so far played a relatively marginal role and drawing out some avenues for further research suggested by the data assembled here.

2 It has been pointed out many times that the definition of a separate ritual sphere clearly delimited from the profane is inappropriate for prehistoric contexts (Bradley 2017, 46–7; Brück 1999a; Gramsch and Meier 2013; Michaels 2003). Nevertheless, there is now also widespread recognition of a sliding scale of formality and ritualisation (Bell 1992, 90; Bradley 2005). At one end of the continuum are normative, often public performances invoking a supernatural entity and/or bringing about a change in status of participants. At the other extreme are largely unreflected actions which are still indirectly guided by notions of appropriateness and of the nature of existence. In between lies a range of gradations, more or less archaeologically visible. While sharp boundaries and clear definitions are hence not possible, this does not mean that the whole spectrum can be lumped together without loss of information.

There's deposition and then there's deposition… The outline of a problem

Depositional practices in the LBK have been discussed from a number of perspectives, and include investigations on refuse disposal patterns as well as instances of more formalised deposits. In the Anglophone literature, both kinds of practices can be discussed under the term of "structured deposition", which is why it formed a convenient starting point for our workshop. However, during the long and varied history of the term (ably summarised by Garrow 2012), this also caused problems of definition.

When they first defined "structured deposition" in their 1984 article, Richards and Thomas focused on artefact patterning in the South Ring of Durrington Walls. They were working with fragmentary material that had been secondarily incorporated into the postholes and the amount of artefacts they were able to include in their study was rather low. On this basis, the authors proposed that the distribution of flint tools and pottery was not random inside the monument, but followed a structured spatial pattern, based on repeated action. The finds context within a henge meant that repetitive practice in this case could be an indication for ritual activity (Garrow 2012, 86–90, see also Bradley, this volume).

Subsequently, the term's popularity increased and it was also applied to groups of objects laid down together in a careful or non-random manner or which seemed unusual in some way, with a tendency to assume a "ritual" explanation for all such patterns (*e.g.* Harris 2005; Pryor 1998; Whittle *et al.* 1999, 355–7 for the British Neolithic; see Garrow 2012, 86–104 for an overall discussion and examples from other periods). In the longer term, this had the effect of shutting down rather than opening up interpretation, as "structured deposition" in itself came to be seen as a complete explanation (Garrow 2012, 107). There were also critical voices, most notably Hill's (1995) study of discard practices in the British Iron Age, in which he strongly questioned the equation of "structure" with "ritual". After all, even waste relating to everyday activities can be deposited in structured ways, reproducing patterns of association, as Moore (1982) noted for the Kenyan Marakwet. While based on notions of appropriateness and ultimately worldviews, this kind of deposition is not "ritual" in the sense of invoking the supernatural.

But if "structured deposition" began to include a rather wide range of practices, it also often excluded others, for instance burials. In as far as items are carefully selected for inclusion and deposited in the ground, often without the intention of later retrieval and in a choreographed manner, funerary evidence forms a subsection of structured deposits and its inclusion may open new avenues for comparison. Indeed, where a comparison was attempted in later studies (*e.g.* Chapman 2000; Fontijn 2007; Lamdin-Whymark 2008; Wentink 2006) this helped to more sharply define the selection processes for other kinds of deposits. In addition, hoarding — the deposition mainly of Bronze Age and Iron Age metalwork — was generally not included under the umbrella term (see Garrow 2012, 97–8), although many of the problems dealt with there were similar to those faced by research into structured deposition.

Hoards are mostly seen as deliberately deposited, and by extension carefully selected. Over the past few decades, the controversy here lay mainly in deciding whether the motivation for a given deposit was "ritual", for instance a sacrifice of some kind, or "profane" — a stash of tradeable goods or similar. The main criteria employed were the degree of care evident in the deposit, the selection of

items and their patterning: was the same action repeated many times and did it involve similar kinds of objects (*e.g.* K. Becker 2013; Bradley 1998; 2017; Colpe 1970; Hansen 2013; Torbrügge 1985)? Much also hinged on whether the items would have been irretrievable once deposited, making a ritual activity more likely, although recovery may still not have been the intention even where this was technically possible (Bradley 1998, xviii–xix; Geisslinger 1984).

In addition, because both "structured deposition" and "hoards" only ever concerned a subset of depositional practices, it remained hard to explore the applicability of any pattern in other kinds of settings. Yet such wider contextualisation is inevitable, even for understanding any one aspect of deposition. "Ritualisation" (Bell 1992, 90), whereby everyday items and actions can come to be formalised and drawn upon with the intent to carry additional significance, creates connections between different sets of practices and leaves us with a slippery slope of terminological uncertainty. There are distinctions within the field, but few clear boundaries, and ultimately all depositional practices must be viewed together (see also Joyce and Pollard 2010).

This is increasingly being recognised. As Chadwick (2012, 284-5) concisely summarises for the Romano-British period, "depositional practices were *all* influenced to a greater or lesser degree by social and cosmological beliefs", so that we cannot stop at identifying just the more obviously placed deposits. As archaeologists, we have been "markedly less successful in identifying the small-scale, informal ritual practices that probably existed in the past, and also in assessing how everyday patterns of deposition were affected by wider understandings of landscape, materiality and cosmology" (Chadwick 2012, 295). This would involve the integration of mundane items encountered on a daily basis, for instance during technological, building or subsistence activities. Consequently, any labelling of kinds of deposits is unhelpful; the focus should be on the performance rather than on the outcome of depositional acts, recounted in the form of contextual biographies (Chadwick 2012, 303). Similarly, for Bradley (2017, 49–50), tracing the biographies of individual items in a deposit holds the key to further interpretation, as does closer attention to the specifics of depositional contexts. After all, this explains why artefacts of the same kind ended up being treated so differently when it came to the end of their use lives (see also Bradley, this volume).

Similar terminological and theoretical arguments have also been pursued in Continental archaeology. For instance, for nineteenth and early/mid-twentieth century German and Danish scholars, one point of contention was the identification of "sacrifices", a problem particularly but not only concerning metalwork hoards (*e.g.* Baetke 1934; Colpe 1970; Mogk 1909). Partly in dialogue with linguistics and religious studies, this led to various attempts at categorising such "sacrifices", for instance depending on the intention behind them (atonement, thanks, invocation), on the way the offering was made (buried, burnt, destroyed) or on what was being offered (objects, animals, people) (for a summary, see Beilke-Voigt 2007, 19–26). While some of these aspects are difficult to address archaeologically, this provides different possible avenues to characterise deposits by their performative characteristics, as well as their content, which have remained underexplored since.

Here, too, recognising the "unusual" nature of a given deposit was the first important analytical step. In the words of Eggers (1959, 267), one must make

a distinction between positive selection — items deliberately placed in the ground, including hoards and burials — and negative selection, *i.e.* the things people simply did not take with them when they left. This harks back to a longer discussion in German-speaking historical disciplines in which *Überreste* (residues; sources left behind without intention) were contrasted to *Traditionen* (traditions; sources left with the aim of communicating something to posterity), with a given item potentially falling into both of these categories simultaneously (*e.g.* Kirn and Leuschner 1972, 29; summarised in Eggert 2008, 44–8). In general, deposits like hoards were seen to fall into one or the other group, depending on whether they were temporary caches or ritually motivated, a discussion paralleling that in the UK (see Eggert 2008, 78–83 for an introduction). Again, whether a hoard was potentially retrievable or not was, and often still is, seen as the key characteristic (*e.g.* Eggert 2008, 81). In a landmark article, Colpe (1970, 34–7; see also Stjernquist 1970, 79) lists criteria for the identification of deliberate deposits. These include selection (are the same kinds of things deposited many times in a recurrent practice, or are particularly rare or precious things chosen), as well as the place and modalities of deposition (destruction, retrievability) and the fact that such activity is "ritualised" and occurs repeatedly, although he acknowledges that no clearly formulated belief is necessary. The identification by Bergmann (1970, 13) of possibly deliberately placed single finds as "a kind of one-piece hoard" also shows that the boundaries of this phenomenon were always recognised as difficult to define (see also Eggert 2008, 78–83).

In her review of the discussion concerning "sacrifices" as a subset of deliberate deposit, Ines Beilke-Voigt (2007, 30) correspondingly concludes that different kinds of ritualised actions can leave very similar traces in the archaeological record and there is no clear boundary between sacred and mundane. Following Stjernquist (1963) and others, she classifies any deliberate deposit that is neither refuse nor a burial as an "intentional deposition", even if the final assemblage is the cumulative result of many different depositional acts. Only in a second step should one attempt to separate profane/functional and ritual/ideological reasons, with the latter being an acceptable explanation only if the former can definitely be excluded.

This enforced duality, which leaves ritualisation as a last interpretative resort when everything else has been discounted, is certainly a weak point in Beilke-Voigt's approach, and neatly opposed to the interpretive preferences of most British scholars. In spite of these different choices, however, there are commonalities in the two research traditions. In both cases, dividing ritual and profane was identified as a difficult and ultimately flawed undertaking, and scholars subsequently struggled with the creation of a terminology that was at once meaningful and not immediately interpretatively loaded. While a continuum of formality does seem to apply to many prehistoric and later situations — including the LBK, as this volume shows — exploring these varied practices requires a vocabulary that helps us speak about them in the present (Garrow 2012, 105). Even if present-day categories may not be coeval with past ones, they still form a necessary starting point in framing a question. As such, the biographies of individual items or contexts must be aggregated into larger sets if we are to use them as more than individual, idiosyncratic examples. An initial distinction may be between "odd deposits" (Garrow 2012, 94; a term borrowed from Brück 1999b, 152

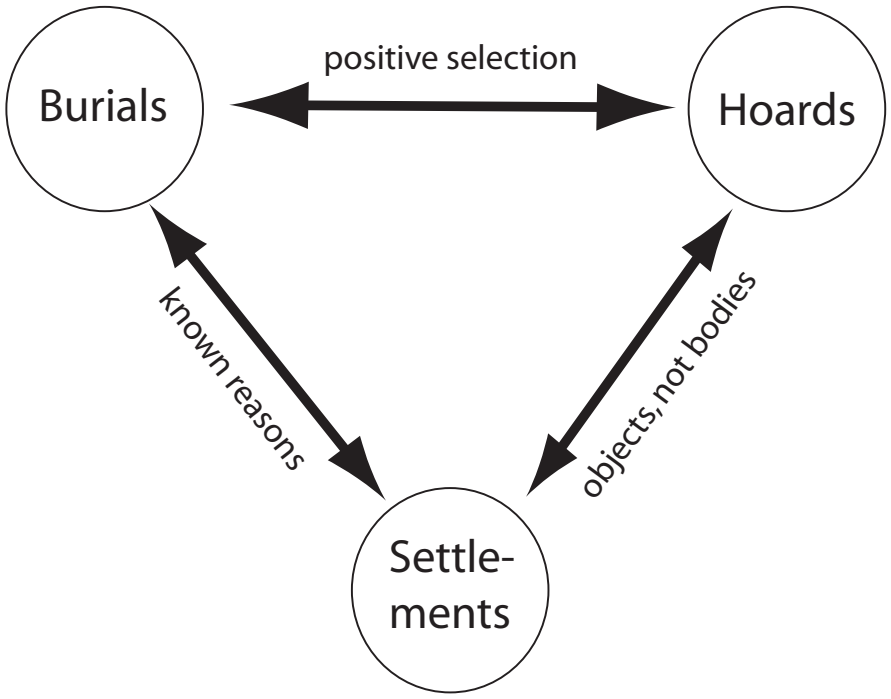

Figure 2. Citational field based on Eggers (1959). Arrows show how the respective contexts are linked to each other.

and denoting placements that seem deliberate and out of the ordinary[3]) from material culture patterning, built up over several episodes of practice. Yet it is also clear that ideally, different aspects of depositional practice should be studied together.

One could even argue that a three-way comparison between placed deposits, burial and patterned discard would provide a good starting point for identifying any underlying links that could form the core of a given set of depositional practices, more or less consciously articulated in different settings. Again following Eggers (1959, 267), burials and hoards comprise items which are deliberately selected, but only in the case of burials can we suggest why. We can also be reasonably certain that most of what we find on settlement sites is discarded material, certainly in cases where abandonment is not catastrophic. One could expand these reflections by adding that hoards and settlements are linked to each other by their absence of human remains, thus creating a triangular citational field (Figure 2), our common-sense starting point that we can now explore further.

Such kinds of comparisons require a particularly well-investigated case study in which a wide range of depositional practices has actually been documented. At one level, the LBK provides just such a case, and is hence an opportunity to explore commonalities and contrasts between different aspects of depositional practice. This was one of the aims of the Hamburg workshop. We wanted to include as many depositional behaviours as possible, with a representative sample of locations (cemeteries, settlements, enclosures, the wider landscape) and kinds of material (pottery, stone tools, animal and human bone, figurines,

3 Among them are included: complete objects, sets of objects, and items that seem carefully arranged; particular places (such as ditch terminals, corners or entrances) seem particularly marked out in her Later Bronze Age case study (Brück 1999b, 152). Others have found different solutions; Swenson (2015, 335–7) refers to this kind of phenomenon as "bundled deposits" or "performatively marked" ones. For Hamerow (2012, 130–40), they are "placed deposits". There is evidently a recognisable practice in many past situations that must be termed in some way to allow for discussion.

grinding tools). We also explicitly sought to include depositional events of varying degrees of formality in order to identify whether recurrent patterns (*i.e.* a kind of "structure") existed. Were certain kinds of items strongly associated with specific locations or modalities of disposal? Were some spheres of life more frequently drawn upon and others excluded? Ideally, we also hoped to address possible local and regional differences or changes over time to show the dynamic character of depositional events and to study how they could have been related to other kinds of changes taking place in LBK society or to aspects such as the longevity or size of a given settlement site, for example.

Yet this broadly contextual approach makes high demands on the quality of the data, and it soon became clear that not all these ambitious goals could be achieved at this first meeting. The main problem is the patchy and scattered reporting of potential instances, probably largely due to a lack of awareness. The more striking examples, such as deposits involving human remains or larger groups of the same objects, are more likely to be noted in publications, but even so considerable effort still needs to be invested to collate a more comprehensive list. Possible deposits consisting of different kinds of items have fared worse, and reporting is often not sufficient to decide on the degree of formality, if any, that was involved. For example, complete objects from a feature may be listed, but it is rarely commented whether they were deposited in close association, and drawings or photographs may not be provided (this is not unique to the LBK, see *e.g.* Haynes 2013, 12; Merrifield 1987, 3)[4]. The second aim of the workshop was hence to draw attention to these practices with a view to providing the foundations for further exploring their significance in this early farming society.

The Linearbandkeramik as a case study

While the LBK is generally thought to be one of the best-studied prehistoric cultures, even by global standards, the possible ritualisation of everyday activities and contexts, and the role of depositional practices within this, have rarely formed a focus of research. Discussion of "ritual" has so far remained largely confined to a few clearly delimited topics such as burial customs and anthropomorphic figurines, while the possible patterning inherent in routine discard practices around the house is discussed separately. However, judging from other examples, one might expect depositional practices to be more closely connected to each other.

This relative lack of interest is partly due to the nature of the evidence. Compared, for example, to the wall art, burials and animal remains at Çatalhöyük in Anatolia, which have inspired studies exploring the links between depositional practices and worldview (*e.g.* Carter *et al.* 2015; Nakamura and Pels 2014), the LBK looks rather unexciting. In Britain, the rich evidence for depositional practices at monuments also encouraged a view of the Neolithic as more than simply an economic phenomenon, but is unlike anything so far documented for the LBK. Research history also has a role to play here. Many fundamental concepts concerning LBK settlement structure, social organisation and economy were developed in the 1970s and 1980s on the basis of a mass of data created in the course of large-scale excavations. For instance, the yard model of house replacement and settlement organisation was drawn up to understand the

4 For an early example of good practice, including a photograph, plan, description of the objects and even cutting-edge phosphate analysis, see Frauendorf 1940.

development and layout of entire LBK landscapes excavated in advance of open-cast lignite mining in the Rhineland (see Zimmermann 2012 for a recent summary). These concepts are so foundational that they still form the backbone of LBK research today, whether one wants to nuance (Fröhlich 2017) or challenge them (Rück 2007). Similarly large-scale excavations in, for example, the Dutch Graetheide area (Modderman 1970), Bylany in the Czech Republic (Pavlů 2000) and the French Aisne valley (Ilett 2012) focused above all on settlements and have resulted in such long-lived research priorities as LBK house typology, household composition and the existence of communal buildings, or economic diversity between contemporary households and its social implications.

These preoccupations provided a strong framework for classifying and evaluating the enormous amounts of data pouring in and they remain vital to this day. Yet this also meant that researchers concentrated their energy on the common-sense questions of dating, housing and economy. This did involve characterising depositional practices and pits (*e.g.* Boelicke 1988a; Drew 1988), but mainly from a taphonomic point of view (more recently, see *e.g.* Petrasch and Stäuble 2016; Stäuble and Wolfram 2012). These concerns were far removed from evidently "ritual" behaviour such as burial evidence and the production of clay figurines, which were easily bracketed off as separate spheres of life. That a common worldview may underpin both these spheres was not a point that was often raised (but see *e.g.* Whittle 2012). But as the papers in this volume show, and as is briefly outlined below, depositional practice could be one way to forge linkages between these domains.

Burial

Burials have seen sustained scholarly interest, but few studies have made use of the detail concerning depositional processes in and around the grave. Alongside cremations and inhumations on cemeteries, the LBK dead could be interred singly or in small groups at settlement sites. Still, not everyone appears to be represented in these burial communities, and so additional ways of disposal must have existed, perhaps in natural places or after intensive fragmentation (Hofmann and Orschiedt 2015; Jeunesse 1997; Pechtl and Hofmann 2013; Veit 1996). The main concern has been whether burials reflect the structure of living society, for example in terms of socio-economic status, gender relations or age groups (*e.g.* Jeunesse 1997; 119–27; Röder 1998; Siemoneit 1997). This has been particularly fruitful where it has been paired with palaeopathological and bioarchaeological work (*e.g.* Bentley *et al*. 2012). At a larger scale, regional burial customs have been used to argue for the deliberate creation of boundaries between adjacent areas, particularly in Alsace (*e.g.* Bickle *et al*. 2013; Jeunesse 1995), while chronologically a global trend towards increasing hierarchisation has been claimed (*e.g.* Gronenborn 2016; Gronenborn *et al*. 2018). Settlement burials have played a more marginal role in this discussion (see Hofmann and Bickle 2011 for an overview), while the presence of disarticulated human remains is often linked to a lower-status group or a crisis phenomenon (*e.g.* Zeeb-Lanz 2009). The varied degrees of formalisation, from carefully placed complete bodies positioned according to shared norms to the apparently casual discard of isolated bones, and the likely corresponding variability in audiences, remain an interpretative challenge.

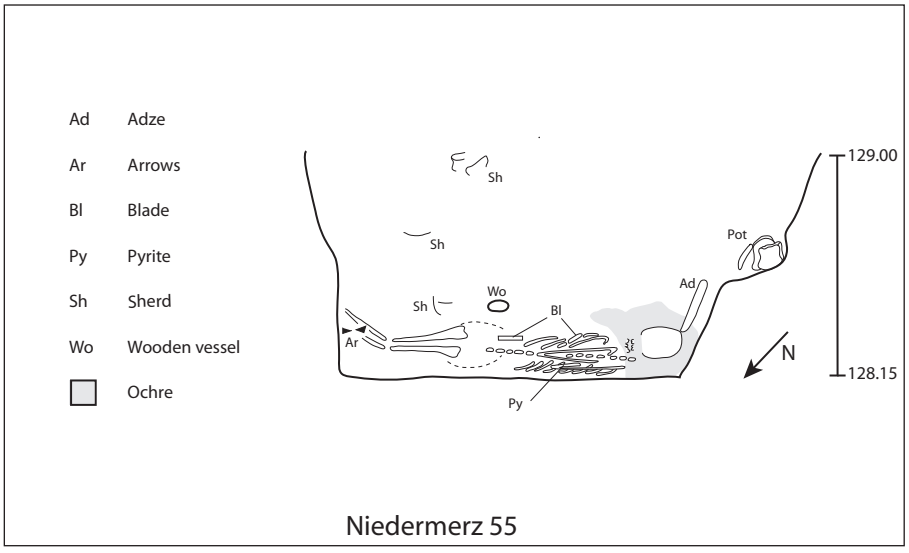

Figure 3. Grave 55 at Niedermerz, Rhineland, showing objects above the level of the skeleton (after Dorn-Ihmig 1983, 154).

The performative aspects of grave rites have been touched upon more rarely (*e.g.* Hofmann 2015; Hofmann and Bickle 2011; Wilhelm-Schramm 2009). These accounts have stressed the open-ended nature of the burial rite, which militates against an all too strict separation of norm and deviance. This included the possibility of extended interference with the dead human body, as in the *niche-et-banquette* burials of the Paris Basin (Thévenet 2004) and the presence of disarticulated human remains more widely (*e.g.* Nieszery 1995, 23–5). There is also a variety of depositional practices in and around the grave, such as in the so-called "cenotaphs" (though see Lenneis 2015, 74–6 for a critical review of the term), grave-shaped pits without human remains which can include items such as pottery and animal bone. In addition, objects were sometimes deposited higher in the grave fill, above the level of the skeleton (*e.g.* Hofmann 2009, 227–8; 2015) (Figure 3). In this volume, Robin Peters and Nadia Balkowski, also drawing on Eggers, show that some (but not all) objects from grave fills were unlikely to be the residue of casual discard or of settlement activities, with smashed pottery in particular potentially relating to additional ritual steps. Such performative elaboration of funerary rites emphasises that these were times of negotiation, introducing an element of open-endedness. Also, the material vocabulary inherent in such additional deposits, notably the deliberate smashing of pottery, is encountered in other contexts, such as enclosures and settlement sites.

Enclosures

In contrast to the more monumental versions which later exist in western, northern and central Europe, most LBK ditched enclosures lack clear indicators of unusual depositional activities. Early studies (Boelicke 1988b, 414) succeeded at most in identifying, for instance, an elevated proportion of grinders compared to settlement pits at Langweiler 8. Some sites — such as Asparn in Lower Austria — had evidently been attacked (Teschler-Nicola *et al.* 1996), but more frequently, enclosures are seen as meeting places, perhaps commemorating former plazas or other communally used areas of settlement sites (*e.g.* Whittle 1996, 174–6; 2003, 99). Enclosures could also have served as community status indicators, given the labour and know-how necessary for their creation (*e.g.* Pechtl 2009). This has even

been seen as a kind of costly signalling mitigating scalar stress in periods when the population was reaching carrying capacity (Shennan 2019, 102).

The few enclosures with exceptional depositional events, generally involving human remains, have become widely debated, but are generally treated as isolated special cases[5]. This includes Menneville in the Aisne valley, where child burials were deposited in conjunction with animal bone and later commemorated by the placement of cattle bucrania (Farruggia *et al.* 1996). At Herxheim meanwhile, hundreds of disarticulated and at least partly cannibalised human individuals were deposited in conjunction with rich material culture inventories. These were for the most part not carefully placed, but dumped in thick spreads (termed "concentrations"), with the exception of clusters of skull calottes (see Haack, this volume). It is precisely this disordered state of the material which has guided the focus away from the ritual itself and towards a narrative of conflict and crisis. The presence of so many isotopically non-local individuals (Turck *et al.* 2012) also suggests that delimiting a community, of whatever form, may have been one important component. Yet whatever the reasons behind the events at Herxheim, they still drew on existing notions of appropriateness of expression, as outlined by Fabian Haack in this volume. Herxheim was exceptional in scale, but not necessarily in the individual activities represented here. The fragmentation of material, most notably pottery, is a recurring practice across contexts. At Herxheim, the deposited spreads also include animal bones, smashed grinders, concentrations of bone tools, and other things besides, and these too are implicated in practices elsewhere, as indeed are human skeletal remains.

Enclosures were thus not built specifically for depositional events in most cases, but could form the centre of large-scale activities of consumption. This begs the question of whether such practices, occasionally drawn upon for public displays, were also familiar from more routine contexts.

The settlement space and beyond

The discussion of depositional patterns has been most concerted in the LBK settlement space, where it has centred on the question of preferential discard of materials around particular parts of buildings. Ever since Boelicke (1988a) first suggested that particular parts of the longhouse, or at least of the space around it, may have been associated with different activities (Figure 4), such as flint knapping or pottery use, debate has raged as to the representativity of the material from loam pits in particular (see *e.g.* Květina and Řídký 2016; Last 1998; Stäuble and Wolfram 2012). The issue is far from trivial, as these items are routinely used in assessing the economic strategies of a building's inhabitants, and occasionally also their social status (*e.g.* Hachem 2000; Lenneis 2010; Van de Velde 1990). Methodologically, distinguishing patterned discard from other processes is demanding, but in this volume Jaroslav Řídký and colleagues have taken up the challenge with a view to reconstructing events at the Stichbandkeramik enclosure at Vchynice in the Czech Republic. Although this is chronologically somewhat later than the other studies in the volume, the careful analysis of several different finds categories shows how much can be gained from a sustained combined study.

For LBK houses, it seems that patterning in the surrounding pits can often be recognised in spite of taphonomic processes, but as Penny Bickle shows in

5 Vrable (Furholt *et al.* 2014) and Dillingen (Dietrich and Kociumaka 2001) are not yet sufficiently published to decide on the nature of the human remains there.

her contribution, the matter may not be as easy as simply "reading off" a precise activity. Rather, she suggests that decay may have been a central metaphor across several areas of LBK existence, from the — sometimes managed — decomposition of corpses to the decommissioning of houses and the filling of pits. This could go some way in explaining the relative lack of clearly placed foundation or abandonment deposits in most LBK buildings, in spite of the central role houses evidently played in LBK life. While there are associations especially of child burials and houses in the Paris Basin (Hofmann and Bickle 2011), and a few buildings may have been burnt down deliberately (Hofmann and Lenneis 2017), we are certainly not seeing a wealth of evidence comparable to Çatalhöyük, for example. Rather than being necessarily marked by directed depositional events, the LBK house was perhaps positioned through relations with its forebears (Lüning 2005a) and according to shared orientations (*e.g.* Bradley 2001; Mattheußer 1991; Whittle 2012), and then entextured through daily practice and its residues. In this sense, deposition may be important and desired, but would only be "structured" in the sense of patterning rather than of careful placement.

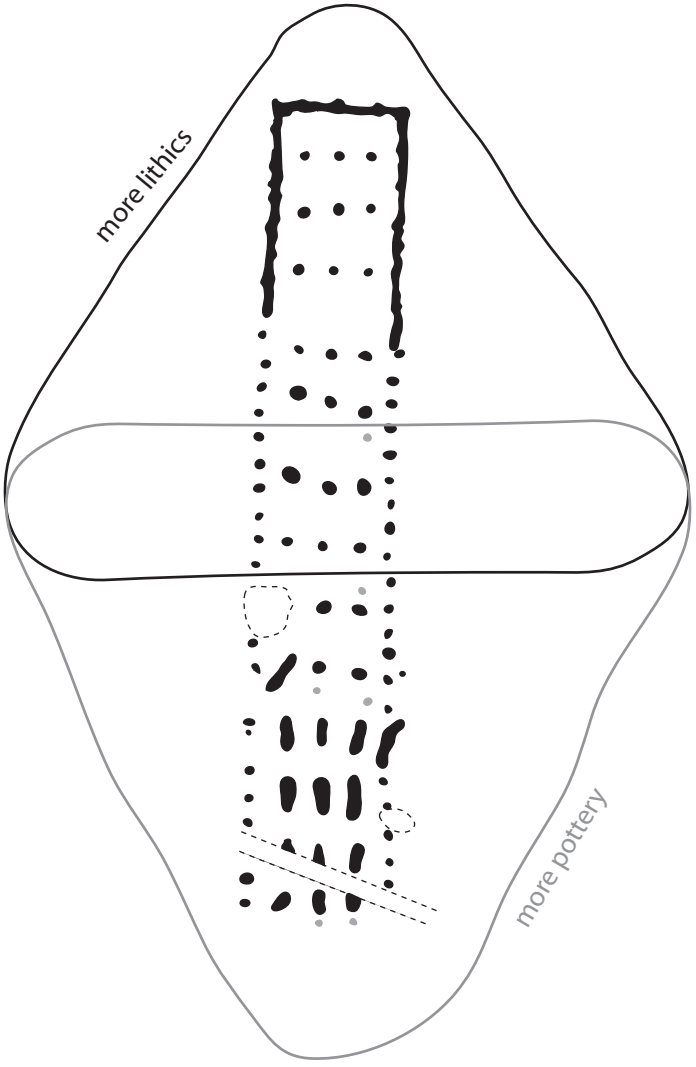

Figure 4. Patterned activities around LBK longhouses at Langweiler 8, as suggested in the 1980s (after Boelicke 1988a, 349 fig. 398; longhouse plan after Brink-Kloke 1992, 58).

However, there are indications that the settlement space also saw other kinds of depositional practices, and this is where there is most need for further sustained research. The most frequent of these are probably the "suspiciously rich pits" identified by Johanna Ritter-Burkert in the Wetterau, her case study for this volume. These are features that contain a large proportion of the artefacts excavated at a given site — indeed some have more artefacts than soil in their fills — and can also include more unusual items. They have been identified outside Hessen (*e.g.* pit 45 at Chambly, Boucneau *et al.* 1996; the loam pit of house 55 at Rosheim, Jeunesse 1991; pit 36 at Esbeck, Richter and Schwarz-Mackensen 2015, 29; pits at Barleben, Lies 1963; 1965), but have not yet been systematically collected or compared. Yet this would be necessary to decide whether such assemblages could be the residue of specific activities that were concentrated in time and required selected material culture. Communal feasts spring to mind, potentially making these deposits a kind of "ceremonial trash" (Haynes 2013, 7; Walker 1995). Alternatively, some deposits may relate to episodes of communal production, as suggested in this volume by Luc Amkreutz and Ivo van Wijk. Overall, one is left wondering whether the assemblage at Herxheim, if it did not include human remains, would look similar, and whether the roots of the unusual practices there thus lie in quite widespread activities. Taking a cue from the Near East, where new sorts of communal rituals were developed to hold early agricultural communities together in spite of inherent tendencies at factionalism (Flannery and Marcus 2012, 110–52), it would also be interesting to know whether there were variations regarding the chronological span of LBK deposits, or the size of sites at which they occur, and how this fits with processes of aggregation and dispersal.

While suspiciously rich pits stand out in terms of patterning, in other instances of deposition complete items were deliberately placed in the ground. This is for instance known from wells, ably summarised by Elburg (2011). Elsewhere, groups of the same kinds of artefacts were deposited complete and sometimes in deliberate arrangements, most notably grinders (Hamon 2005; 2008). Caroline Hamon takes this topic up again here, drawing out the significance of "everyday" tools such as grinders in the lives of LBK households and of the women who most likely used them. In contrast, my own paper branches out to consider a wider range of single-category and mixed-category deposits, in which pottery generally plays a significant role. The identification of such instances is problematic, most likely resulting in considerable under-reporting. Also, there is as yet little patterning that would suggest specific occasions for these events. Nevertheless, while fragmentation of vessels continues to play an important role alongside the deposition of whole items, and human bone is sometimes represented, the range of material included differs from grave good assemblages recovered at cemeteries.

Deposits in settlements are likely not the full story, as places in the landscape were significant to LBK people and could be marked out through deposits. Although Valde-Nowak and Kienlin (2002) are rightly critical of the idea that any polished stone tool discovered away from main settlement areas is necessarily the result of "ritual" deposition, these tools — alongside the ubiquitous broken pottery — are also increasingly recovered from places such as springs and rock stacks (*e.g.* Bürger 2008; Seregély 2009), or other locations in the landscape. As Amkreutz and Van Wijk note in their contribution, the edges of the domestic space may have been particularly marked out, perhaps again defining the boundaries of a community, and we can only speculate that fields and gardens would also have attracted a variety of deposits.

Figurines

If evidence for "structured deposition" in both senses of the term is hence increasing, one kind of artefact seems curiously excluded: clay figurines. Figurines are perhaps the only item of LBK material culture almost unquestioningly linked with ritual action, although they too have suffered from a largely negative comparison with the richer corpus from south-east Europe. Nevertheless, discussion has widened considerably in the last ten years or so, thanks also to the comprehensive catalogue made available by Valeska Becker (2011), who drew out the spatial and chronological characteristics of the material and defined a range of recurrent types. For instance, it has been argued that such figures may represent known ancestors (Lüning 2005b) or that they may transgress imposed boundaries between human, animal and object (*e.g.* Hofmann 2014). Yet there has so far been little comment on the characteristics of figurine deposition.

As shown by V. Becker (2011, 96–100), the overwhelming majority of figurines is found in a fragmentary state, and this is most likely not the result of accidental breakage. Figurines thus fit into the emerging picture of destruction as an important element of LBK ritual action, also evidenced in some burial rites. This even inspired some authors to see a connection between the intentional breakage of figurines and the disarticulation of some human bodies (Höckmann 1985; Hofmann 2005), although this may have been uncritically applied (Zeeb-Lanz 2019). But since deliberate breakage of material culture is also a feature of depositional events at settlement sites and enclosures, it seems all the more strange that figurines are practically never chosen to either accompany the dead or to feature in the more formal deposits encountered elsewhere (although an anthropomorphic vessel from the well at Kückhoven is interpreted as deliberately placed; Lehmann 2004, 64). Partly, their small size may preclude them from being effective visual media for large, public settings. However, we may also be seeing the delineation of separate spheres of depositional activity. If a shared performative logic opposed the deposition and subsequent slow decay of whole items and bodies to their destruction and disorderly discard, then not all items may be equally suitable for all contexts, and this may eventually allow for some further categorisation. This is an issue that will need much more detailed study on a broad statistical basis.

Summarising the trends

Overall, then, in spite of the variation in analytical scale and topics, the papers as a set also speak to several of the overarching themes concerning depositional practices and their characterisation. The first challenge are the definitional and terminological problems associated with describing more or less formal deposits and even ritual occasions. Accordingly, the term structured deposition remains ambiguously employed throughout the volume and can refer for example to a depositional event resulting from a particular activity (as in Bickle's contribution) or to deliberately arranged items of material culture (as in my paper). It was decided not to enforce a strict terminological scheme, as we are at an exploratory stage and the relative merit of different solutions is still subject to discussion. Yet several authors — among them Hamon, as well as Amkreutz and Van Wijk — point out that a distinction between ritual and profane is not always warranted even for evidently placed deposits. Instead, location, the selection of items, the frequency and timing of such

practices and the size of audience may provide a good basis for further attempts at classification. Peters and Balkowski, as well as Řídký and co-authors, illustrate the methodological steps that should become standard practice if we are serious about reconstructing the complexities of depositional practice and about constantly reviewing our analytical categories. This is necessary for identifying the variety of processes that can go into the creation of superficially similar deposits.

In line with many other prehistoric case studies, the contributions collected here reveal the range in formality in LBK deposition, from selected items deposited whole as grave goods, via complete and arranged objects at settlement sites (and in some of the so-called "cenotaphs") to what is perhaps best termed unusually rich collections deposited without particular care (the suspiciously rich pits, assemblages like Herxheim) and ending with patterns relating to a general sense of appropriateness which was rarely consciously articulated, as in Bickle's aesthetic of decay. Location, retrievability, the rule-bound nature of the selection, the frequency of repetition and the effort or resources that went into these activities were also highly varied.

With the current state of research, it is difficult to provide an authoritative picture. It is clear that the original scheme based on Eggers, which distinguished burials, hoards and settlement discard, can now be expanded in several ways. On the one hand, the certainties which were seen to link the different poles in Figure 2 have been dissolved: it is no longer clear that we know the kinds of processes behind discard activity on settlements, nor is human bone confined strictly to burial contexts, for example. But on the other hand, new perspectives are opened up by focusing on the specific practices enacted in all of these locations, and for deposits across the whole span of formality. Some activities, notably the smashing of pottery, seem to be crucial across the spectrum. However, there are also possible distinctions between, on the one hand, deposits on settlement sites and rich spreads of material, which are rather varied and can also contain grinding stones, and on the other grave inventories and deposits in the landscape, where grinding tools are rare or absent and polished stone tools come much more to the fore. Disarticulated human remains are also spread across multiple locations, from settlement sites and enclosures, to their perhaps casual incorporation into grave fills. The exclusion of clay figurines from much of this depositional activity remains puzzling and deserves to be revisited (Figure 5). Clearly, the wholeness of living people and objects in use could be transformed in two ways: through decay and through deliberate destruction. Which of these was more appropriate was a mutable choice, and lends itself to subversion.

In sum, settlements, burial grounds, enclosures and landscapes, which we often discuss separately in our accounts, were cross-cut by shared logics of deposition. These involved ritualisation to varying degrees, revealing an interconnected world in which the mundane could sometimes serve in more formalised situations. The fact that so many of the artefacts involved were also part of the everyday life of people probably provided one of the main sources for their power. They were familiar, but could still be used to define belonging and separation, send the dead on their journey and communicate with supernatural entities. All this is part and parcel of the material vocabulary through which these early farmers existed in the world, and through which they made sense of daily life, of social relations, of new situations and of potential crisis scenarios.

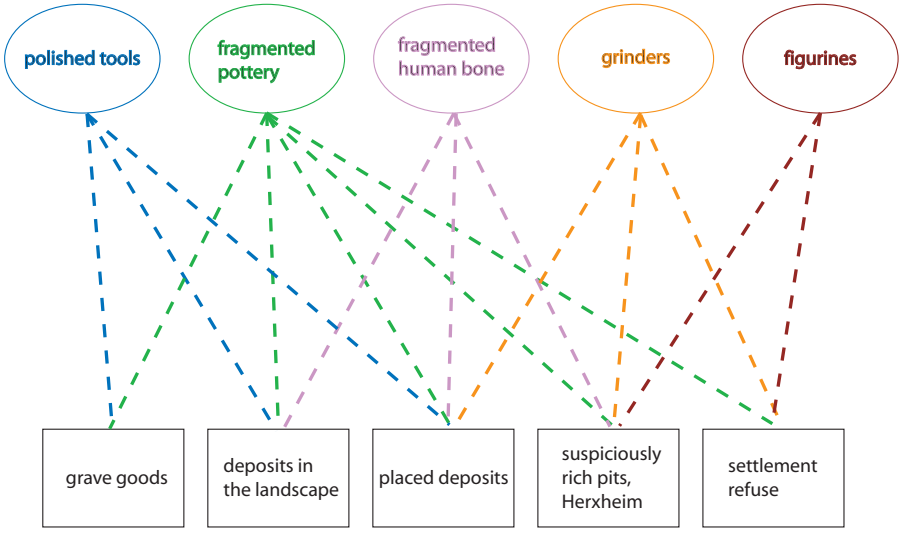

Figure 5. Schematic links between domains of depositional practice. The lines refer not to presence or absence in an absolute sense, but to my initial impressions of where particular items are more frequently found. This should be subject to revision.

Perhaps the aspect most in need of further sustained study is what all this tells us about LBK society and worldview. In her contribution, Hamon makes the point that deposits in settlement contexts, quite in contrast to the interpretation so far advanced for hoards of polished tools, may be largely connected with maintaining community. She draws out the importance of grinders especially for the provision of food. If suspiciously rich pits are connected with feasts, then they are also community-strengthening actions. In contrast, in my own paper I stress the potentially more varied motivations for depositional episodes, investigating the usefulness of "magic" as an interpretation that provides a counterpoint to dominant practices, but can include more antisocial elements. The demarcation of boundaries, the creation of an inside and an outside sometimes at the expense of others, must also be considered as a possible motivation, for example for some of the Dutch deposits at the edges of settlement sites or, most clearly, at Herxheim. It would also be interesting to know whether there is a distinction in the intensity of deposition between sites of different sizes, and whether "central places" of some kind can be identified (for an initial discussion, see *e.g.* Kneipp 2001; Petrasch 2003; Pieler 2010, 195). Were such acts most necessary where larger communities needed to be held together?

Hamon also suggests that grinding stone deposits and hoards of polished stone tools may both be part of a wider phenomenon during which the domestic arena becomes ritually more strongly charged at the expense of funerary practices. This is an interesting suggestion for the Paris Basin, where large LBK burial grounds never existed, and now deserves to be investigated in other LBK regions. Was there, over time, a shift in the intensity in which different kinds of depositional practices were pursued, and how can this be tied in to other elements of social practice? Recently, Jeunesse (2017) has suggested that from the Middle Neolithic onwards, a long-term dialectic existed between the deposition of rich material culture in graves and the frequency of hoards, in particular of weapons. This is a stimulating idea (see also Torbrügge 1971), but only encompasses a restricted range of depositional contexts and should now be expanded by the inclusion of other practices. For the LBK in particular, we now must ask how the focus of depositional intensity may have shifted between settlement sites, cemeteries and enclosures, and how this can tie in with the differential valorisation of these social arenas with the transition to

the post-LBK world. For this, too, much more data must first be collected and, as argued by Richard Bradley (this volume), we are unlikely to ever appreciate the full significance of depositional acts without also integrating the biographies of the houses, settlements and other locations at which items were placed.

Just like the subsequent transformations of LBK depositional practice are worthy of further note, so are its roots. In a series of articles, Makkay (1975; 1978; 1983) already drew attention to the importance in particular of grinding tool deposits in the south-east European Neolithic, as well as to the presence of traces of burning and smashed pottery in such pits. Perhaps LBK practices were drawing on much longer-term traditions, with which they could now be usefully compared. Chapman (2000) has also collected a range of evidence for structured deposition across south-east Europe, including carefully placed deposits of complete items, exceptionally finds-rich pits and even burials. All of these contexts are linked to a general preference for living among the material remains of previous generations, often manifest in thick cultural layers. As pit deposits may be most frequent at sites without cemeteries or extensive vertical stratigraphies, they could be an alternative way for engaging with the deep past (Chapman 2000, 81–2). This could also be an interesting starting point for a comparative study of such deposits across the LBK, as would the compraison with Mesolithic practices suggested in Bradley's contribution.

Yet to achieve these aims, it is first and foremost necessary to establish depositional practice as a legitimate field for further enquiry, and to become more confident in reporting possible instances of ritualisation. For this, we not only need greater awareness, but also a significant investment of time in collecting and synthesising possible examples, as well as follow-up studies on the conditions and biographies of the items involved (as achieved *e.g.* by Wentink and van Gijn 2008 for the Netherlands). The Hamburg workshop could only be a first step in this direction. In addition, several participants could not hand in written papers for a variety of reasons. I would like to thank Rose-Marie Arbogast for her insights into animal depositions (Arbogast 2013); Ingo Bürger for his thoughts on deposition of material at striking natural places (Bürger 2008); Maciej Dębiec and Thomas Saile for their presentation of material in the Ukraine, including the deposition of elaborately decorated pottery (Bardeskiy *et al*. 2017; Saile *et al*. 2018); Rengert Elburg for his summary on items deposited in wells (Elburg 2011); Christian Jeunesse for his reflections on the significance of polished tool hoards (Jeunesse 2017) and Jens Lüning for his suggestions concerning spatial patterning in the placement of LBK figurine fragments, as well as for leading a stimulating final discussion. In spite of these gaps, however, it is hoped that the papers collected here will cement the central role of depositional practices for our understanding of LBK life and inspire many new projects to help reassess our provisional interpretations.

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Isn't it strange? Grinding tool deposits and deposition in the north-western LBK

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Abstract

Among the emblematic objects found in Linearbandkeramik deposits, querns carry several levels of highly symbolic significance in relation to agricultural and household lifestyle. The first discoveries of Neolithic quern hoards in western Europe were made in LBK contexts in Belgium at the beginning of the twentieth century. Since then, about 20 LBK quern hoards have been discovered, almost exclusively in the north-western part of the LBK territory, in a region located between the Seine and Meuse rivers. The detailed analysis of their localisation and organisation highlights common codified practices. The technological analysis of the grinding tools reveals complex stages of selection. These lead us to propose and discuss several interpretations for such deposits.

Keywords: *querns; deposits; codified practices; agriculture; Paris Basin; Linearbandkeramik*

Introduction

All archaeologists have probably been perplexed, at least once in their career, when in the course of excavation they came across evidence of a deliberate, unique and time-limited act of object deposition. Funerary deposits clearly fall into this category of feature, but so also do so-called non-funerary "structured deposits", *i.e.* caches and hoards. These practices correspond to deliberate and intentional acts of object burial where items are extracted from their current life cycle and not intended to be retrieved (see *e.g.* Bradley 1998; Chapman 2010; Fontijn 2002). The main difficulty for archaeologists lies in clarifying and demonstrating the intrinsic significance of these practices, which are sometimes highly meaningful from a ritual and symbolic point of view.

Such practices generally involve some of the most emblematic innovations of European pre- and protohistory: flint tools for the Palaeolithic (*e.g.* Angevin *et al.* 2009; Peresani 2006), stone axes for the Neolithic (Jeunesse 1998; Pétrequin *et al.* 2012; Van Gijn 2010; Wentink and Van Gijn 2008) and metal swords and axes for the Bronze Age (Fontijn 2002; Needham 1988). The selection of such meaningful objects, in addition to their deliberate burial, gives a particular symbolic value to these deposits, all the more so since they are also generally associated with funerary practices.

Consequently, scholars rapidly focused on the high cultural and symbolic significance of these practices for prehistoric societies. The interpretation of such

practices varies between researchers, depending on the theoretical framework adopted. Interpretations, therefore, range from craftsmen's hoards, which form an integral part of a full cycle of economic production, to highly ritual acts which form part of an array of symbolic practices, and also include all intermediate hypotheses. In fact, all of these practices can be gathered under the heading of social practices, the meaning of which is worth exploring.

Among the emblematic objects found in deposits, querns carry several levels of highly symbolic significance especially for the Early Neolithic period. Firstly, they symbolise the growing role of cereal consumption in the daily diet of the first farmers: along with sickle blades and other agriculture-related tools, the quern is, in fact, one of the principal forms of material evidence for cereal preparation prior to consumption. Thus, grinding tools are highly emblematic of transformations in the technical system that emerge at the beginning of the "Neo-lithic": they attest to the diversification of stone tool production techniques through the use of polishing and pecking, and to the intensification of their use in a broader range of activities. Finally, querns are strongly associated with the domestic realm as their use is directly interconnected with the daily tasks that structure the organisation of the domestic sphere, particularly within the female domain. Due to these mutually non-exclusive, complex and multiple levels of meaning, querns are apt to be integrated in varied cultural and symbolic expressions, including structured deposition practices.

The first discoveries of Neolithic quern hoards in western Europe were made in LBK contexts in Belgium at the beginning of the twentieth century (De Puydt 1902; Hamal-Nandrin *et al.* 1936). Since then, about 20 LBK quern hoards have been discovered, almost exclusively in the north-western part of the LBK territory, in a region located between the Seine and Meuse rivers. The material culture and objects associated with these hoards allow them to be attributed to the LBK and BVSG (Blicquy/Villeneuve-Saint-Germain) cultures, a time period spanning between approximately 5200 and 4650 cal BC (Figure 1). For the most part, these grinding tool hoards have been discovered on settlement sites, directly associated with houses or with isolated refuse pits. By combining a detailed analysis of the configuration of these hoards and a detailed techno-functional analysis of the 89 grinding tools contained within them, it seems possible to propose a better characterisation and interpretation of this hoarding phenomenon in relation to settlement organisation and funerary practices.

Status and significance of querns from an ethnographic perspective

Used for everyday activities, grinding tools could be seen as mundane utilitarian objects. Their role in the domestic realm is sometimes considered to be limited to various food preparation tasks, and more precisely to the routine tasks of de-husking and grinding cereals. However, ethnographic descriptions highlight great variety in the status and significance attached to grinding tools in terms of their use context, either domestic or collective, their role in food preparation and finally their social meaning in relation to the sharing of tasks. In this sense, querns can be considered as highly meaningful implements with multiple levels of significance.

First, the use of querns in many societies is intrinsically linked to their users' role as food suppliers. In many agricultural societies, for example, querns and

grinders are called "mothers" and "children" (*e.g.* Hamon and Le Gall 2013). They are also deliberately broken in the event of disease outbreaks or epidemics. They are transported by nomadic populations as a basic component of the cooking toolkit (*e.g.* Gast 1968).

Secondly, they play a particular role in the organisation of domestic activities. Given that the complete processing of cereals requires several hours of work per day, and that the weight of querns means that they are not very mobile within the domestic space, cereal grinding must be considered a highly structuring activity within the domestic area (Roux 1985; Searcy 2011). In many examples, daily domestic activities revolve around food processing. In spatial terms, tasks are organised around the cooking area (fireplace, grinding and pounding tools). In some contexts, however, grinding tools are at the disposal of the community for communal use and are therefore governed by another framework of social relationships between the users (family, neighbourhood, clan rules). The context of quern use therefore has a significant impact on where and how querns are stored. For example, restricted ownership of querns would encourage storage away from the collective food preparation area, whereas a more collective management would favour storage near collective areas (Hamon and Le Gall 2013).

Thirdly, the use of querns for grinding activities is strongly related to the sharing of tasks between men and women (David 1998; Katz 2003). In most societies, grinding activities are exclusively women's work. Only in very particular contexts do we find men taking charge of this activity. This is the case in some nomadic societies, among men who travel large distances from their villages or for men with a specific social status within the community (single or widower, old men, etc.; Roux 1985).

Finally, querns have an important role in transmission practices between generations among sedentary populations (Gelbert 2005). The use of querns in itself requires a long apprenticeship of several years, which implies transmission of a certain know-how, in most cases from mothers to daughters (Hayden 1987). The long use life of grinding tools, which can span several decades, confers a particular status on these querns. In addition, they are often seen as personal property. For all of these reasons, querns are an important element in marriage dowries in many agricultural societies and are an important component of the rules governing the transmission of inheritances (*e.g.* Hamon and Le Gall 2013; Searcy 2011).

Given all of these levels of symbolic, social and cultural meanings, querns can be seen to be anything but mundane functional objects. Each of these different levels can be explored in order to discuss the wide variety of interpretations for quern deposits and to answer a fundamental question: were grinding tools stored or hoarded for later retrieval as an "open deposit", or were they definitively buried as a sealed offering to mark occasions of great importance in the social life and memory of LBK communities?

Grinding tool deposits: what does the term mean?

Grinding tool deposits: the data

To date, 20 grinding tool hoards have been discovered on 13 sites, together with a few other discoveries whose deposition status is unclear (Chapon-Seraing: Destexhe-Jamotte 1951; Villejuif: Giraud 1943). They are

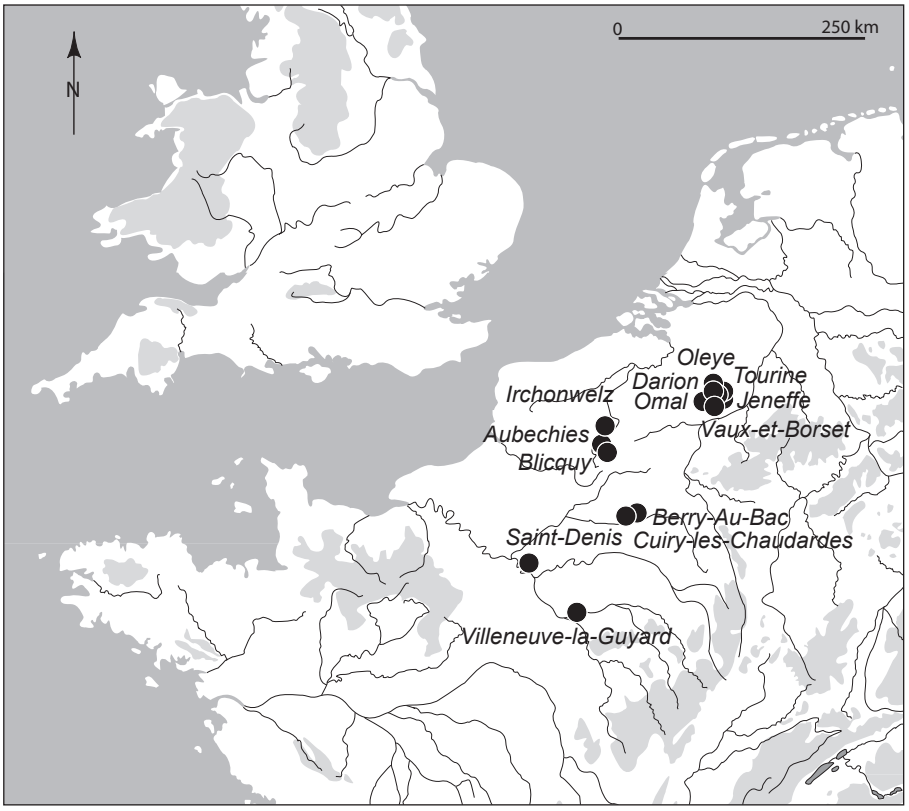


Figure 1. Location map of deposits in the Paris Basin, Hainaut and Hesbaye.

found in a region delimited by the Seine to the south and the Meuse to the north-east (Figure 1). Six are located in the Seine and Aisne valleys within the Paris Basin (Allard *et al.* 1995; Hamon 2005; 2006; Hamon and Samzun 2004a; Ilett and Hachem 2001; Prestreau 1992), three in Hainaut (Constantin *et al.* 1978; Hamon 2008a) and six in Hesbaye (Cahen and Van Berg 1979; Caspar and Burnez-Lanotte 1994; De Puydt 1902; Hamal Nandrin *et al.* 1936; Jadin 2003). Eleven of these deposits have been found in LBK contexts, while nine others cover the complete sequence of the BVSG. LBK and BVSG deposits are represented in both regions (Paris Basin and Meuse area). Some of the sites, especially in the Hainaut area, have yielded several deposits from one or more individual houses (Irchonwelz and Aubechies in Hainaut, Berry-au-Bac in the Paris Basin). The following section presents a critical overview of the data summarised in Table 1, and of the main observations already presented in previous syntheses on the topic (Jadin 2003; Hamon 2008a; 2008b). Surprisingly, since these latter publications, no new discoveries of grinding tool hoards have been recorded within the Seine–Meuse area.

Location and organisation of the deposits

While grinding stone hoards are not present in every house or in every village, all grinding tool hoards found in LBK and BVSG contexts are directly associated with living and household areas and follow three different configurations. Firstly, grinding tool hoards have been found in refuse pits alongside houses, following two different configurations: 1) where tools are placed and arranged in the fill of the lateral loam pits, the deposit may have taken place in the continuum of refuse accumulation (Figure 2); 2) where tools are placed in a recut part of the lateral pit

Site	Culture	Structure number	Pit type	Stratigraphic position	Arrangement of tools	Position of tools	Numbers of querns	Numbers of grinders	Numbers of hammerstones (cited)	Reference
Tourine	LBK ?	undet.	undet.	undet.	next to each other	undetermined	1	1		Anonymous 1892; De Puydt 1902
Darion	BVSG	89047		recut	next to each other	facing downwards	3	2	1	Jadin 2003
Oleye	LBK	-	ditch terminal	bse of ditch		on the side	2			Jadin 2003
Vaux-et-Borset	BVSG	VGI-89-082		base	undetermined	undetermined	3	3		Caspar and Burnez-Lanotte 1994
Jeneffe	LBK ?	zone K		middle part of pit fill		one in use position	6			
Omal	LBK ?	pit or fireplace 4	undet.	middle part of pit fill	undetermined	undetermined	2	2		Hamal Nandrin et al. 1936
Aubechies	LBK	10	pit group		next to each other	use position	3	2		Constantin et al. 1978; Hamon 2008a
Aubechies	LBK	38	lateral pit	upper part of pit fill	isolated	use position	2			Constantin et al. 1978; Hamon 2008a
Aubechies	LBK	150 (33)	recut	upper part of pit fill	undetermined	undetermined	1			Constantin et al. 1978; 1991; Hamon 2008a
Blicquy	BVSG	30	lateral pit	upper part of pit fill	next to each other	2 querns facing downwards and one in use position	3			Constantin et al. 1978; 1991; Hamon 2008a
Irchonwelz	BVSG	1	lateral pit	upper part of pit fill	undetermined	undetermined	3	3		Constantin et al. 1978; Hamon 2008a
Irchonwelz	BVSG	2	lateral pit	upper part of pit fill	next to each other	facing downwards	2	1		Constantin et al. 1978; Hamon 2008a
Irchonwelz	BVSG	3	lateral pit	middle part of pit fill	stacked	facing downwards	4	4		Constantin et al. 1978; Hamon 2008a
Irchonwelz	BVSG	7	lateral pit	middle part of pit fill	next to each other	facing downwards	1	1		Constantin et al. 1978; Hamon 2008a
Irchonwelz	BVSG	9	lateral pit	base of pit	stacked	querns in use position and grinders to the side facing downwards	3	3		Constantin et al. 1978; Hamon 2008a
Saint Denis	Late BVSG	1	isolated pit	middle part of pit fill	in a circle	facing downwards	5	2	3	Hamon and Samzun 2004a; 2004b
Berry-au-Bac	RFBS	598	isolated pit in rear part of house	middle part of pit fill	in a circle	facing downwards	3	4		Allard et al. 1996; Hamon 2005
Berry-au-Bac	RFBS	641	isolated pit in rear part of house	middle part of pit fill	in a circle	facing downwards	3	2		Allard et al. 1996; Hamon 2006
Villeneuve-la-Guyard	Early BVSG	248	isolated pit	undet.	in a circle		3	3	1	Prestreau 1992
Cuiry-les-Chaudardes	RFBS	382	lateral pit	undet.	none		1	2		Ilett and Hachem 2001

Table 1. Description of the location, organisation and composition of the deposits. RFBS = Rubané Final du Bassin de la Seine.

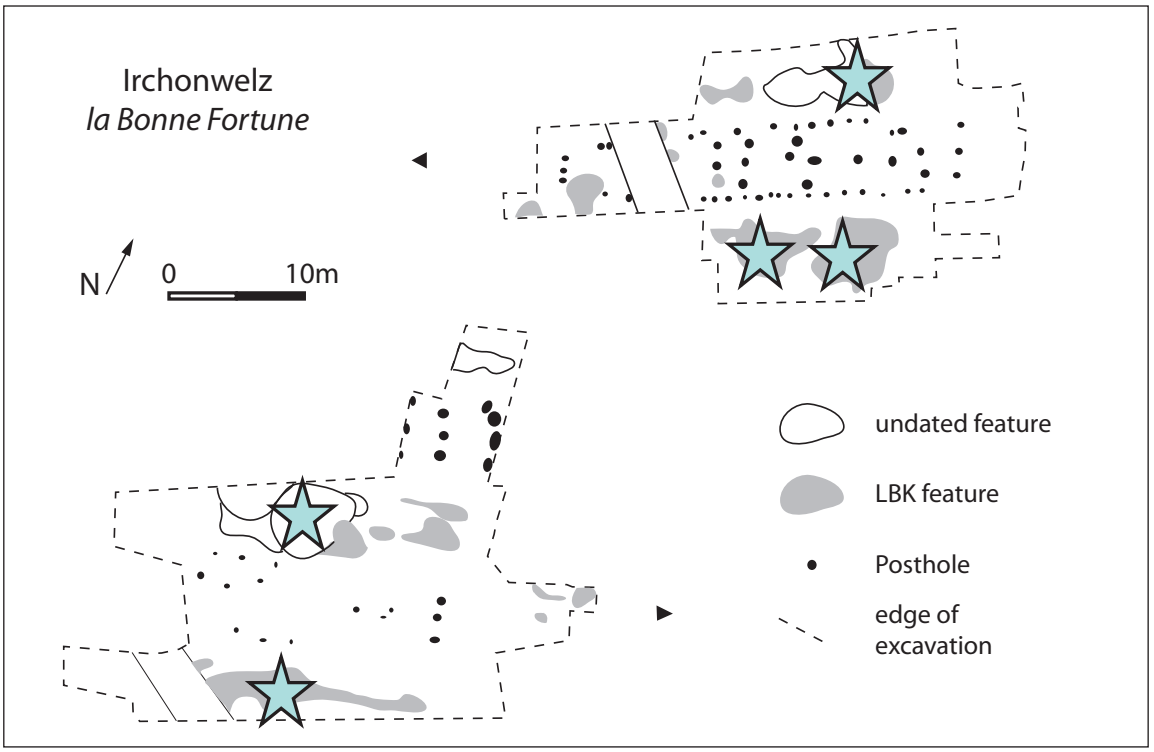


Figure 2. Distribution of deposits (stars) in the domestic space: the example of Irchonwelz, la Bonne Fortune (after Constantin et al. 1978).

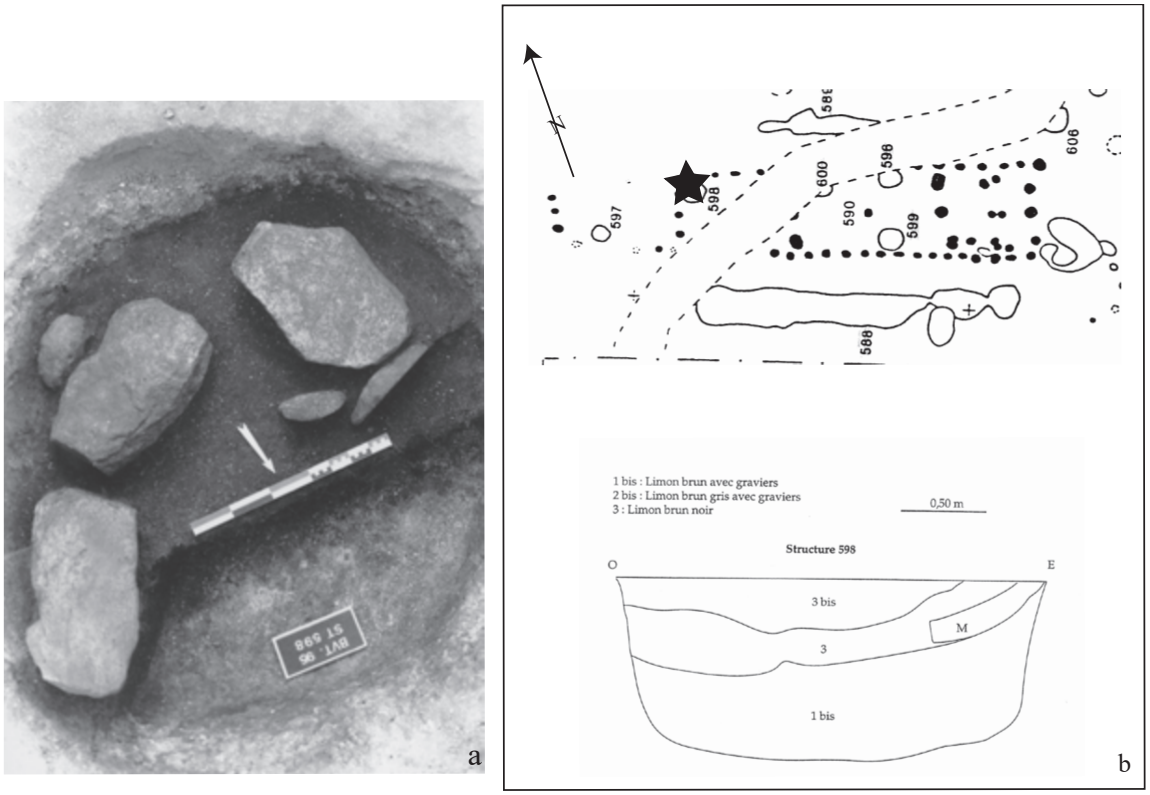


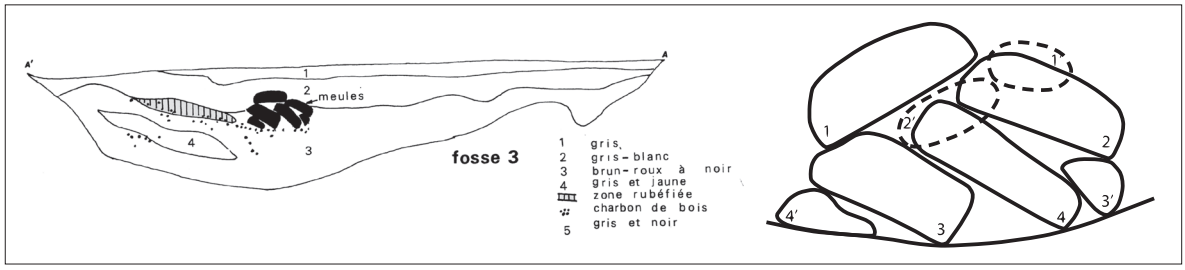
Figure 3. Distribution of deposits inside the domestic space: the example of Berry-au-Bac, le Chemin de la Pêcherie (after Allard et al. 1996; photo: Era 12 du CNRS).

fill, they may correspond to a later phase of the life of the pit, either related to the functioning of the house or after its abandonment.

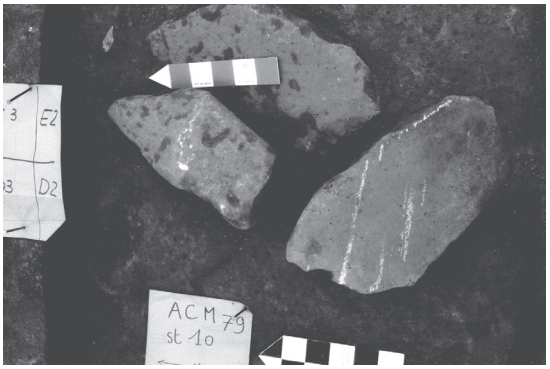
Secondly, grinding tools were deposited in isolated pits, located within settlements but a little away from the main domestic area. The most relevant example is that from St Denis, which was found in an area lacking evidence for actual houses but which contains a rich assemblage of waste material that is compatible with household waste. In this case, it seems that the pits were not dug especially to receive the deposit but, rather, were used for the disposal of waste. Thirdly, some deposits have been found in circular pits dug in the rear portion of houses; this is for instance the case for both deposits at Berry-au-Bac (Figure 3). The location in this particular part of the house clearly raises the possibility of designated storage areas.

These different deposit locations do not seem to follow a clear chronological or regional pattern. However, a clear difference can be observed between the respective practices in the Paris Basin and Hainaut. While there is never more than one grindstone deposit per house in the Paris Basin, two to three deposits can be found alongside the houses in Hainaut, sometimes with multiple deposits occurring in the same lateral pit. In fact, the rules governing the placing of a deposit relative to an inhabited or abandoned house do not appear to be the same for both areas.

In rare cases, grinding tools have been deposited in a position of use, their active surface facing upwards, but more generally they were deposited in a classic storage position with their active surface facing downwards. This suggests that particular care was taken to protect the working surface from any alteration or damage. Furthermore, the arrangement of the tools clearly indicates that all of the tools were deposited in a single, short episode without any further retrieval or new deposition of tools. We can identify two different arrangements of tools within deposits: 1) lower grinding stones are put next to each other or on top of one another in order to build a "pile" under which their associated handstones lie (Figure 4); 2) lower grinding stones are arranged in a circle at the centre of which were placed their associated grinders and several hammerstones (eight out of 14 deposits) (Figure 5).



a



b

c

Figure 4. Arrangement of grinding tools in piles: a. Irchonwelz, la Bonne Fortune; b. Aubechies Coron Maton; c. Blicquy, la Couture du couvent (after Constantin et al. 1978).

Figure 5. The Saint-Denis, Rue du Landy deposit (after Hamon and Samzun 2004a; 2004b; photos: S. Durand, Inrap).

The first arrangement seems the most frequent in Hainaut and Hesbaye, while the second seems typical of the Paris Basin (four out of six deposits).

To sum up, the arrangement of grinding tools within deposits highlights a desire to protect, store and preserve entire tools; this seems to be guiding a deliberate, organised and even codified act of deposition. A regional, rather than chronological, dichotomy can be observed in the positioning and organisation of the grinding tools within each deposit. In the Paris Basin, no more than one deposit has been found per house. They are placed in lateral refuse pits, isolated pits or at the back of houses, and more frequently display a circle-like arrangement of the individual tools. In Hainaut, up to three deposits can be found in a single house. They are mainly deposited in lateral refuse pits and the grinding tools are more likely to be deposited next to each other or in piles. The partial descriptions of the deposits from Hesbaye (especially for the older discoveries) do not allow

us to categorise this area into one group or another, except in so far as no "circular" arrangements of tools have been recorded there. In fact, while no real chronological differences seems to have existed between LBK and BVSG grinding tool deposits, two different regional "ways of doing things" or even "traditions" can be distinguished: one in the Paris Basin and the other in Hainaut and Hesbaye.

Composition and selection of the grinding tools

A closer look at the detailed technological and functional analysis of the grinding tools allows a better understanding of the selection criteria used prior to their deposition. Between three and six lower grinding stones are generally deposited together with their associated grinders. Grinding implements were always deposited as complete sets, meaning that the lower and upper parts were deposited together. In several cases, hammerstones used for rejuvenation of grinding tools have also been deposited. These observations confirm the deposition of complete sets of grinding tools as if they were intended for further future functional or symbolic use.

In contrast to classic settlement refuse contexts, all grinding tools found in deposits are complete, which means that they were deposited in the earth directly after their extraction from their normal use cycle and context. It is also worth noting that grinding tools were not especially made for deposition, as they all bear traces of use and no roughouts have been found. In a way, grinding tool deposits can be considered as the exact opposite of the deliberate breakage practices that have been revealed on some LBK settlements (Hamon 2006; Verbaas and Van Gijn 2009), as their arrangement in the pits seems, at least to some extent, to preserve the tools in fully usable condition.

More surprisingly, most of the grinding tools found in hoards show technical specificities. If a selection was made from among everyday grinding tools, it has clearly focused on particular tools, as demonstrated by a brief overview of the characteristics of a series of deposits whose tools have been studied from a technological perspective.

An Early LBK deposit (st. 598) at Berry-au-Bac consisted of three querns and four grinders (Hamon 2005). The querns weigh between 16 and 20 kg and have been shaped by removing flakes from blocks extracted from quarzitic sandstone layers; their active surfaces show strongly concave profiles and peripheral polishing attests to intensive use. The grinders are relatively small in size and limited in thickness (less than 6 cm), have a convex active surface and all display smoothing due to use on their dorsal surface.

In the LBK and BVSG deposits from Hainaut (Blicquy, Aubechies, Irchonwelz; see Hamon 2008a) querns are all made of quarzitic sandstone slabs, which explains their angular shapes. In the LBK deposits querns and grinders are of overlapping type, while in the BVSG deposits they are of short type (narrower than their associated quern). The querns are between 36 and 53 cm long and less than 12 cm thick. They bear evidence of moderately intensive use, but several querns show clear evidence of reshaping or repecking, more rarely observable on tools from refuse contexts. On the three sites, several querns show quite deep impact traces attesting to vigorous pecking and there are several cases of reshaping of the sides and ends of the quern. In fact, most of the querns found in these deposits show evidence of recent rejuvenation or reshaping.

The five querns making up a Late BVSG deposit from Saint-Denis (Hamon and Samzun 2004b) are also all made out of thick quarzitic sandstone blocks;

Figure 6. The Saint-Denis, Rue du Landy grinding tools and their technical specificities (after Hamon and Samzun 2004a; 2004b; photos: C. Hamon).

their coarse shaping by flaking explains their angular morphology. They have average lengths of between 42 and 48 cm and are up to 13 cm thick. In one case, the quern reaches a length of some 60 cm with a weight of 36 kg. Each of the querns corresponds to a particular stage of use and management. Some show a very short duration of use with very pronounced pecking. In contrast, others show very long durations of use: the concavity of some active surfaces is very pronounced and they have very prominent edges. Some show several successive stages and motions of use, and finally some were manufactured from fragments of formerly larger querns (Figure 6).

Several conclusions can be drawn from this brief overview of the characteristics of a representative sample of deposited grinding tools. Firstly, deposits can bring together tools of similar morphological characteristics (as in Hainaut) or, on the contrary, of very different morphological types, raw materials, and cycles of use (as in Saint-Denis). In Irchonwelz, the querns are all made out of quadrangular slabs with a trapezoidal morphology and are associated with loaf-shaped, short grinders (Constantin *et al.* 1978). In Saint-Denis, each of the five querns recovered corresponds to a specific morphological type: a thick quadrangular flat quern, a flat trapezoidal thin slab, a concave quern with distal and proximal edges and a thin slab that was used with a circular motion (Hamon and Samzun 2004b, fig. 4). Secondly, the deposited grinding tools are of large size: tools of this size are rarely found in domestic refuse pits, but this is probably because querns in refuse pits

tend to be greatly fragmented (particularly in the case of large examples). Finally, most of these grinding tools show evidence for either long use lives or complex life cycles. This evidence can take many forms, for instance a high degree of concavity (Figure 6), extensive intense use wear, or a high level of morphological distortion. A large proportion of these tools show traces of fresh, and sometimes incomplete, repecking of their active surface. In other cases, complex stages of reshaping of the ends and sides have been revealed (Figure 6). In addition, several implements reveal complex stages of use, with multiple active surfaces on opposite sides or overlapping each other, or multiple functions attested by use-wear analysis. As an example, in Saint-Denis one of the thin slabs shows three successive stages of use, the last active surface was clearly used with a circular motion to grind animal matter as indicated by use-wear analysis (Hamon and Samzun 2004b). In fact, the selection of the tools being deposited is clearly related to their normal life cycle, as they directly reflect the coexistence of different types of querns and different stages in their use. This configuration highlights their close connection with domestic contexts.

"Structured deposits" versus hoards: towards a definition of grinding tool deposits

In the light of these observations, we must ask ourselves: what are these hoards and how can we interpret them? On the basis of the data recovered, several hypotheses can be discounted while others deserve greater attention.

Because of their specific characteristics, these structured deposits are clearly distinct from fortuitous deposits and simple accumulations of objects: they do not constitute concentrations of waste material or simple accumulations of waste in refuse areas, nor do they represent straightforward abandonment of tools. Their primary deposition, their codified organisation, their repetitive pattern, as well as the exclusion of any other deposited material apart from grinding tools, would, in our opinion, exclude a simple act of abandonment or the disposal of waste material.

More difficult to interpret is the deposition of a single quern and grinder together in a pit. In most cases it is difficult to determine if this is a deposit or refuse. Do these finds reflect occasional disposal in refuse pits or do they reflect more structured deposition practices? Such cases are difficult to interpret, particularly when several examples are found within pits related to one single house, or to several houses in the same village (see for example Bosquet *et al.* 1997; Praud *et al.* 2010).

Because of the particular organisation of the tools within the deposits, and the respect paid to a series of rules governing their configuration, they can be defined as codified acts of deposition. The homogeneity of the elements composing the deposits and their exclusive nature (consisting only of grinding tool sets) reinforce this interpretation. The nature of this codified act deserves closer examination. The lack of roughouts or waste arising from shaping stages definitely excludes the possibility that we are dealing with quern production areas. On the contrary, the deposition of complete grinding sets in a usable state, sometimes with evidence for a long and complex life, clearly links them to their full life cycle. Their very long use lives, and the investment required for the procurement of the raw material and their shaping, make grinding tools precious equipment from an economic perspective. Consequently, their burial and extraction from the normal economic cycle is anything but insignificant. But depending on the intentions behind their deposition, the interpretation of this act can vary significantly.

If we consider that grinding tools were deposited temporarily, with the intention of retrieving them at a later date, they can be interpreted as open structured deposits, such as caches or storage places for tools. This interpretation could be supported by the diversity of types and also by the protective position in which the tools were deposited, which suggests that they were destined to be used again. Following this hypothesis, the act of deposition could be interpreted as a simple stage in the long use life of querns. However, the placing of some of these deposits in the bottom or middle layer of the fill of refuse pits tends to contradict this interpretation.

If we take the view that these deposits were definitive, with a more ritual connotation, they could be interpreted as hoards. This hypothesis is supported by the deliberate and codified nature of the act of deposition, which follows established rules. Furthermore, these rules were repeated, respected and reproduced over a large geographical area and chronological timespan, suggesting the existence of some kind of "tradition". Following this hypothesis, the grinding tools would have been extracted from their life cycle and buried in the earth in a sacrificial act. This act of deposition would have been a single and meaningful moment, a specific event in the life of a group, a household or a village. The close association between these deposits and domestic contexts may, therefore, express a collective act with a deep resonance within the community.

Interpretation hypotheses

By virtue of their discovery contexts and their intrinsic characteristics, grinding tool deposits raise questions regarding the schematic dichotomy between domestic and ritual, profane and sacred. This is also why proposing an ultimate interpretation for these practices is challenging, if not to say impossible, given the present state of research.

A miller's house or a craftsman's store?

Initial interpretations of these practices clearly focused on two different hypotheses relating to the status of houses and their inhabitants. They can be summarised as follows: were those engaged in the practice of deposition quern producers or quern users? This question has important implications for the way we generally interpret these deposits, either in relation to their production sequence or to their use life.

After the discoveries of the Hesbaye grinding tool deposits, De Puydt and his colleagues (1911) interpreted these structures as storage places associated with a living area. This was taken to indicate the presence of a "miller's house" in which tools were stored directly adjacent to the living area. However, the absence of deposits in most houses, and their high numbers in others, somewhat contradicts this hypothesis. Such organisation of cereal preparation, with one "miller" in charge of the flour production for a part, or all, of the village would imply that these kinds of deposits should be relatively frequent and identical from one village to another. However, this is not the scenario suggested by the archaeological data.

The discovery of the deposits in Hainaut gave rise to new interpretations by C. Constantin and his colleagues (1978), who saw these deposits as temporary caches indicating the existence of a craft workshop associated with the houses. Following close study of the technical properties of the grinding tools deposited (Hamon 2008b), this hypothesis is still worthy of consideration. If we can directly exclude the existence of a shaping area, based on the lack of shaping waste and

roughouts, the particularly long duration and complex stages of use of the deposited grinding tools could fit with the idea of the deposit being related to a craft workshop engaged in the maintenance and rejuvenation of grinding tools. Following this hypothesis, the deposits would be seen as temporary reserves or storage areas from which grinding tools could be retrieved at a later stage. The function of the deposits could be diverse: storage of grinding tools to be retrieved for further rejuvenation or reuse, or burial of querns in order to modify the properties of the sandstone (humidification and softening) so as to facilitate reshaping. These hypotheses would be compatible with the occasional and random pattern of these deposits and the apparent lack of systematisation of these practices within the domestic area. As an indirect consequence, this hypothesis would imply that at least one craftsman/miller per village, or perhaps per household, would have taken charge of the management of the grinding tools for part of the community, as already proposed through the detailed analysis of the distribution of shaping waste within the domestic area of Cuiry-lès-Chaudardes (Hamon 2006). It would also suggest that the status of that specialist was more or less attached to the house he or she was working in. However, the frequency of non-retrieved grinding tools raises questions, as does their rapid covering by new waste and refuse layers when located mid-depth in lateral pits. If these were temporary caches or storage places, why were these tools abandoned so frequently, even though the houses were still inhabited for a certain time after their deposition? The absence of clear answers prompts us to explore other hypotheses that take into account the definitive nature of the burial.

A foundation or abandonment ritual?

The close link between grinding tool deposits and domestic spaces raises the possibility that they relate to house foundation or abandonment rituals. In the Neolithic of continental Europe we have very little evidence for foundation deposits. Only a handful of examples of single grinding tools, deliberately placed face downwards in very specific locations, such as at the base of walls or at the bottom of pits, have been interpreted as foundation rituals (*e.g.* Graefe *et al.* 2009).

In the case of structured grinding tool deposits, the archaeological facts do not reveal any particular pattern in the choice of the sites and houses where deposits have been found: these houses correspond neither to the earliest nor the most recent sites in the region, nor to pioneer houses nor to particularly long-term or short-term occupations. It is therefore difficult to associate the deposition of grinding tools with the settlement of a new community in a new area or with the building of a new house within a village.

Such a practice would relate the offering of a quern, as a symbol of food preparation and one of the basic components of the household, to cereal-based food wealth. But the deposits have generally been found at mid-depth in pit fills, suggesting that they were not deposited when the house began to function. In addition, the long duration and complex stages of quern use seem rather incompatible with a foundation ritual, unless we consider that they were brought from another house or village to be buried at the moment of the construction of a new house. Similarly, the deposition of querns at mid-depth in pits does not appear to be compatible with an abandonment ritual: by definition such a ritual would have occurred at the very end of the occupation of a house and the deposits would therefore only occur in the uppermost levels of the pit fill.

However, the deliberate burial of querns extracted from their life cycle could correspond to other practices. In ethnographic contexts, the practice of quern burial is observed in two different cases. Firstly, following episodes of disease or epidemics within a household or a village, all grinding tools may be buried for sanitary reasons. However, their burial is generally accompanied by acts of destruction and breakage which have some degree of ritual meaning. Secondly, on the death of their owner grinding tools can be transmitted to a descendant (daughter, niece) or buried in the earth as an offering or to accompany the dead woman in the afterlife.

It has to be said that the hypotheses of foundation or abandonment rituals, while seductive, are not very satisfactory as they do not accurately reflect the archaeological reality of quern deposits.

Symbolic offerings by and for the community?

Coming back to the fundamentals, the deposition of several grinding tools together might point us towards the idea of a collective act. Although it remains difficult to prove archaeologically, this act must have been highly significant for a certain part of the community: part or all of the inhabitants, at the scale of a household, village or larger area. In this sense, deposition can be considered as a basic social practice whose actors represent the community or are mandated by the community to carry out the deposition.

The deposition of grinding tools in the earth may have functioned as a materialisation of the specific status of the house with which they are associated. It may be connected to its inhabitants, such as a specific clan, a village chief or a religious authority. It could also be interpreted as a women's house: countless ethnographic examples indicate that grinding activities are highly emblematic of the women's sphere and of the sharing of tasks within agro-pastoral communities. We could envisage the existence of a collective building for women's meetings, which would combine the maintenance of social ties and the practice of highly connoted activities in terms of gender. But deposition could also be an expression of the collective status of a building, whose function may have involved food procurement or processing (cereal harvesting events, collective meal preparation and cereal grinding) for part or all of the village community.

However, such deposits may also be the material expression of an exceptional social or ritual event within one house in the village, directly related to the different levels of grinding tool symbolism. This may have involved ceremonies or religious practices relating to food security and agricultural wealth. The act of burying in the earth has multiple meanings: it can represent the world of the dead, but also the fundamental source of food procurement especially within agricultural communities. In this sense, the burying of querns could be interpreted as a votive offering to invoke the "forces" of life, wealth and fecundity of the "mother earth" to ensure the community's food supplies and cohesion.

The burying of domestic grinding tools could also be interpreted as a commemorative event, linked to the former inhabitants of the house. This would be compatible with the placing of such deposits directly within the domestic waste in the lateral pits and also with the temporality of these deposits, which occur either during the occupation of the house (deposit at half-depth in the pit fill) or after its abandonment (recutting of pits). In this hypothesis, grinding tools can be interpreted as offerings for the protection of the house. They would symbolise

the memory of the household, the female elders and the agricultural way of life of LBK people through the act of invoking the ancestors. In this sense, the sacrifice and offering, through burial, of durable domestic equipment may have marked an occasion of great importance in the social life and memory of LBK communities.

Considering grinding tool deposits as offerings for the community implies that even domestic and everyday implements were vested with high symbolic value. This symbolic value does not seem to be attached to "exotic raw materials invested with a large amount of skills and know-how" (Van Gijn 2010, 211). In this sense, they cannot be associated with any kind of prestige, personal status or rank. Behind these deposits, everyday labour is elevated to the rank of a major and structuring activity essential for the survival, cohesion and long life of the community. Finally, regardless of their significance, we can certainly identify these depositional acts as highly significant practices for part or all of the community at a village scale. The relative rarity of this practice, as well as its temporal continuity and geographical spread, confirm its role within LBK society. Along with other symbolic practices, the deposition of grinding tools appears to have been an important event as well as an important medium for ensuring the transmission and reproducibility of LBK social ties and rules.

The expression of a cultural tradition?

A thorough examination of the geographical and chronological distribution of deposits of LBK grinding tools highlights the close connection between this phenomenon and the north-western margins of LBK expansion. As pointed out by I. Jadin (2003, 458), very few similar deposits are recorded in central and eastern Europe.

This distribution area corresponds to the very last stages of the LBK expansion to the west, but also to the main area of the BVSG development. In fact, the phenomenon seems to be concentrated in an area between the Seine to the south and the Meuse to the north-east. To the north, it appears that no deposits have been found in the Netherlands (Modderman 1970; Verbaas 2014). To the east, the Rhine constitutes the eastern limit of the phenomenon. Finally, at the southernmost and westernmost limits of the area, this phenomenon appears to be absent in Late LBK and BSVG contexts to the south of the Yonne, in central France, Normandy and Brittany

Given this distribution, it is tempting to relate the phenomenon of grinding tool deposits to the manifestation of a "margin effect" stemming from the redefinition of a specific identity or the existence of regional groups in this area. This would be supported by at least two observations. First, we have already highlighted two different traditions within the grinding tool deposits from the Paris Basin on the one hand and the Hainaut/Hesbaye area on the other. This would confirm the cultural value of these deposits as a vector of regional traditions. Secondly, the distribution area of grinding tool deposits corresponds, more or less, to an area that sees a major shift in funerary practices. In contrast to central and eastern Europe, where large cemeteries have been found, the dead in this area are buried in the vicinity of the houses, in the fill of lateral pits. On the margins of the LBK territory, this major shift in funerary practices might express a wish to link the dead more closely to the household or to the village area, stemming perhaps from a desire to protect their burial place. The correlation between the development of grinding tool hoards and the shift towards locating burials in areas close to dwellings could reflect a common symbolic significance for both phenomena.

These two practices may express a refocusing on the domestic sphere supported by the whole community, perhaps in a desire to express and defend their sedentary way of life and the social organisation of their villages on a western frontier that was subject to many new external influences. Hence, the act of burying individuals or equipment could be an expression of commemoration, directed at the ancestors, and could even be seen as a certain form of conservatism.

In any case, the appearance of grinding tool deposits in a marginal area of the LBK territory, an area also marked by a change in funerary practices, is probably not a coincidence. In fact, in contrast to the practice of polished adze and quern deposition in the burials of central Europe and the Rhine, these categories of tools are completely absent from the LBK grave good assemblages of the Paris Basin. One could suggest that the phenomenon of grinding tool deposition constitutes the direct expression of a transfer of symbolic significance from the funerary domain to that of domestic ritual. A change of paradigm in burial customs would thus have directly generated a renewal in the field of non-funerary ritual practices.

Within the LBK, the practice of depositing objects is not limited to grinding stone tools. The Late LBK at the beginning of the fifth millennium BC sees the development of several categories of deposition, especially the deposition of adzes. Close examination of these deposits in an area from the Danube to the Rhine (Jeunesse 1998) highlights several characteristics: adzes are generally deposited without any other categories of objects and are closely related to the settlement area. The adzes composing the deposits have been extracted from their ordinary life cycle. They correspond to different typological types, are of limited dimensions and have been used prior to deposition. For these reasons, they cannot be seen as prestige objects, unlike objects deposited in funerary contexts. In fact, the selection of adzes for deposition follows the same guidelines as the selection of querns. This would suggest that Late LBK deposits shared a similar and common significance throughout the LBK territory, with a strong link to the inhabited space. Some authors relate this phenomenon to the emergence of a true "*Hortsitte*" or "hoard custom" at the end of the LBK, and to the establishment of a clear distinction between funerary deposits and settlement deposits. They also consider stone tool deposits as evidence for the existence of complex and stratified social structures from the beginning of the Neolithic (Jeunesse 1998; Lichardus-Itten 1991).

Conclusion

While no definitive interpretation can be proposed for the phenomenon of grinding tool deposition, the close and detailed examination of available examples highlights their importance within the community at multiple levels. These practices, which are closely linked to the realm of the living, fall into the category of "community deposits buried in knowledge of and for the benefit of society at large and useful for keeping personal aggrandisement in check" (Chapman 2010, 112).

Finally, what are these deposits? Relying on the facts, these deposits are composed of complete sets of intensively used grinding tools, extracted from their current life cycle and deposited in a storage and protective position. When did the deposits take place? These deposits occurred during the use life of the house but also of the objects, which do not seem to be intended for later retrieval. Who was doing the depositing? These deposits were made by a group of individuals by and for the community, who

extracted the tools from their sphere of use, which was highly connoted in terms of gender, relationship to the domestic sphere and food abundance.

Deposits were placed in the vicinity of buildings, directly associated with the waste and living areas, and thus closely linked to the domestic sphere. They follow a series of established rules which seem to have been respected over quite a large area and timespan. The practice occurred in a particular area, at the north-western margin of the Late LBK territory, between the Seine and Meuse rivers. It is part of a number of major shifts within Late LBK cultural traditions and symbolic practices, such as the burial of the dead in the vicinity of dwellings and the abandonment of cemeteries.

As such, grinding tool hoards can be interpreted in terms of a strong attachment to regional traditions, inherited from ancestors, and commemorated important occasions in the social life and memory of Neolithic communities. Far from being an insignificant phenomenon, there is much evidence for the structuring role played by grinding tool deposits within the ritual practices and the building of the cultural identity of the Late LBK people who had settled the north-western margins of Europe.

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Tracing LBK ritual traditions: the depositions at Herxheim and their origins

Fabian Haack

Abstract

Ditched enclosures play an important role in the settlement pattern from the beginnings of the Linearbandkeramik. These monumental earthworks have been interpreted in different ways, with recent publications focusing on social and ritual aspects and emphasising the collective character of the construction itself as a part of enclosure function. The increasing number of enclosures towards the end of the LBK is in some cases directly connected to the deposition of human bodies, which show a wide range of multiple manipulations. Both the enclosures and the human remains feed into a general discussion concerning a fundamental and to some extent violent crisis at the turn to the Middle Neolithic, at least in some parts of the LBK. One of the key sites in this context is the double-ditched enclosure and settlement of Herxheim (Rhineland-Palatinate, Germany) with its numerous depositions comprising the skeletal remains of over 500 people, alongside intentionally destroyed pottery and stone implements. The site is so far unique in terms of the size and number of the deposits, the intensive manipulation of the human bodies, including dismemberment, defleshing and fragmentation, and the standardised production of skull caps. The detailed examination of the complex ditch construction and the fill formation processes, including the distribution and stratigraphic position of the finds concentrations, suggests a rather short time frame for the building and use of the entire ditched enclosure. The activities in Herxheim were interpreted as human sacrifice or cannibalism, both supposedly strongly ritualised. Besides these scenarios, the question of any pre-existing traditions for these kinds of ritual behaviour is fundamental for a better understanding of the site and the wider context at the end of LBK.

Keywords: *Linearbandkeramik (LBK); enclosures; ritual deposition; fragmentation; human remains*

Introduction

The site of Herxheim "Gewerbegebiet West" (Rhineland Palatinate, Germany) is situated in the kind of location which is typical for the Linearbandkeramik (LBK): on a loess plateau between the two small streams Klingenbach in the south and Schambach in the east, in a central position on the western side of the Rhine delta between Karlsruhe in the south and Ludwigshafen/Mannheim in the north (Haack 2016b, 21). The site has become particularly well known due to the deposits of human remains, skull calottes and pottery. Especially the interpretation

of the human skeletal remains has dominated the discussions surrounding Herxheim ever since its discovery in the mid-1990s (Zeeb-Lanz and Haack 2016a, 8). However, the context in which the finds concentrations have been viewed has changed drastically and repeatedly over the course of further excavations and the subsequent analyses (Haack 2016a, 12–7, 25–31; Zeeb-Lanz and Haack 2016a).

This is also reflected in the increasing — and increasingly confusing — publication output. Now that research has been completed, summary and overview articles are still being produced which repeat largely preliminary and/or unpublished results discussed from varying points of view. Their interpretations of the site oscillate between the poles of human sacrifice — cannibalism — unusual burial rituals (Zeeb-Lanz 2014; 2017a; 2017b; 2018). As a result, current literature discussing the end of the LBK and the crisis scenarios that have been proposed for this transition generally describes Herxheim in a rather circumspect manner and tends to avoid a definite stance on the interpretation of the site (*e.g.* Becker 2014; Denaire *et al.* 2017; Schefzik 2015; Van de Velde and Amkreutz 2017).

Currently, the only definitive publications concern, first, the human remains of the second excavation campaign (2005–2008), in which the kind of detailed treatment one would wish for this kind of site is applied to only a small subsection of the material (Boulestin and Coupey 2015), and second, the architecture and infilling processes of almost the entire enclosure, including also a summary description of parts of the finds material from the ditches (Haack 2016a; 2016b; Zeeb-Lanz 2016).

The numerous finds concentrations of fragmented human remains, smashed pottery and intentionally broken stone tools are evidently the remains of ritual activities carried out on site and are therefore interpreted as "ritual refuse" (Haack 2016b, 115; Zeeb-Lanz 2016; Zeeb-Lanz and Haack 2016b). The concentrations are mainly located in a trapezoidal enclosure of two parallel ditches surrounding an area of c. 4.5 ha. The inner ditch contained most of the material and is also deeper and wider than the outer ditch. The ditched enclosure surrounds a settlement used from the Earlier to the Latest LBK, but some features were also uncovered outside the enclosed area or were cut during the digging of the ditches. Both ditches can be dated into the Latest LBK phase, around 5050/5000 cal BC, by pottery chronology and radiocarbon dating (Haack 2016a, 34–5).

The preservation of the internal features is rather poor. Postholes have not been preserved in areas of higher ground, so that one can postulate a loss of at least 1 m of soil to erosion. However, this is less of a problem for the ditches, as on the plateau (at its current extent) the concentrations were found in the deeper sections of the ditches; they have therefore not been affected by erosion and are completely preserved.

Some features in the interior of the enclosure also contained such concentrations, or only the large sherds with well-preserved surfaces which are typical for concentrations. Alongside decorations in the local Palatinate style, other regional styles of the Late LBK are also represented (Haack 2016a, 23–4; Jeunesse *et al.* 2009). In addition, alongside such pottery two features also contained several skull calottes and complete skulls. Their finds material thus fulfils all the relevant criteria which are also typical for concentrations from the ditches. Therefore, the extent and qualitative composition of the concentrations which were once buried in features in the interior can no longer be assessed today, but the resulting emphasis on the ditch circuits when discussing the ritual activities need not correspond to past reality. This is further indicated by the fact that the inner ditch

harbours markedly more concentrations than the outer; in the area excavated during the second campaign, for instance, the ratio was 11:1 (Haack 2016b, 115).

The main aims of this paper are to summarise the results concerning the architecture and infilling processes of the Herxheim enclosure, as discussed in greater depth in a PhD dissertation finished in late 2014, to present the composition of the concentrations from the point of view of a broader discussion concerning "structured deposits", and to draw out their relevance for the processes of cultural transformation which took place at the end of the LBK. Given that the interior of the enclosure has not yet been published, the following analysis mainly concentrates on the situation as revealed in the ditch circuits.

The Herxheim site: enclosure, deposits and finds

Although the concentrations of human bone, pottery and other elements of Early Neolithic material culture are integral for the interpretation of Herxheim, it remains rather difficult to accurately describe them and to delimit them within the fills of the two ditches. While the concentrations share striking parallels in composition and in the modalities of deposition, they are also clearly different in terms of their spatial extent, the amount of material deposited and the number of different material categories which are represented (Boulestin and Coupey 2015, 19, fig. 14; Haack 2016b, 114–5, tab. 2; Zeeb-Lanz 2016; Zeeb-Lanz *et al.* 2007). Looking only at the amount of material, there is an enormous degree of variation both in the distribution of the different kinds of items and in the numbers of fragments of each material. Recurrent patterns can be identified, but only ever apply to a subsection of the concentrations and are highly variable. For instance, one typical element are the skull calottes, which are present in large numbers overall and were produced according to a standardised pattern. However, they are far from being present in every concentration, nor is their distribution within the fills of the enclosure ditches limited to concentrations. As already mentioned with reference to pits in the interior, the same is true for the number of pottery vessels and the regional styles that are represented. In addition, there are numerous smaller clusters of finds which are spatially less extensive and have a lower finds density than "actual" concentrations, but which have very similar material (human bone fragments, large sherds of pottery) and which chronologically and functionally belong into the same context of activity (Haack 2016b, 79, plate 110.2, 83, plate 112.2). In general, all concentrations beg the question whether we are faced with intentionally deposited material or with "refuse" which reached the ditches in conjunction with the soil used to fill them.

In order to answer these questions, it is of crucial importance to describe in more detail the characteristics and the constructional features of the enclosure itself as the container of these deposits, as well as the fill mechanisms and in a second step also the kinds and characteristics of the finds material (more detail on all these aspects is provided in Haack 2016b).

The ditched enclosure

The enclosure consists of an inner and outer ditch which run largely parallel to each other (Figure 1). In the south-east, the outer ditch is completely absent, the inner shows an extensive gap. A sondage excavated in an adjacent area to the north-east succeeded in revealing one of the ditches, probably the inner one. Both ditches

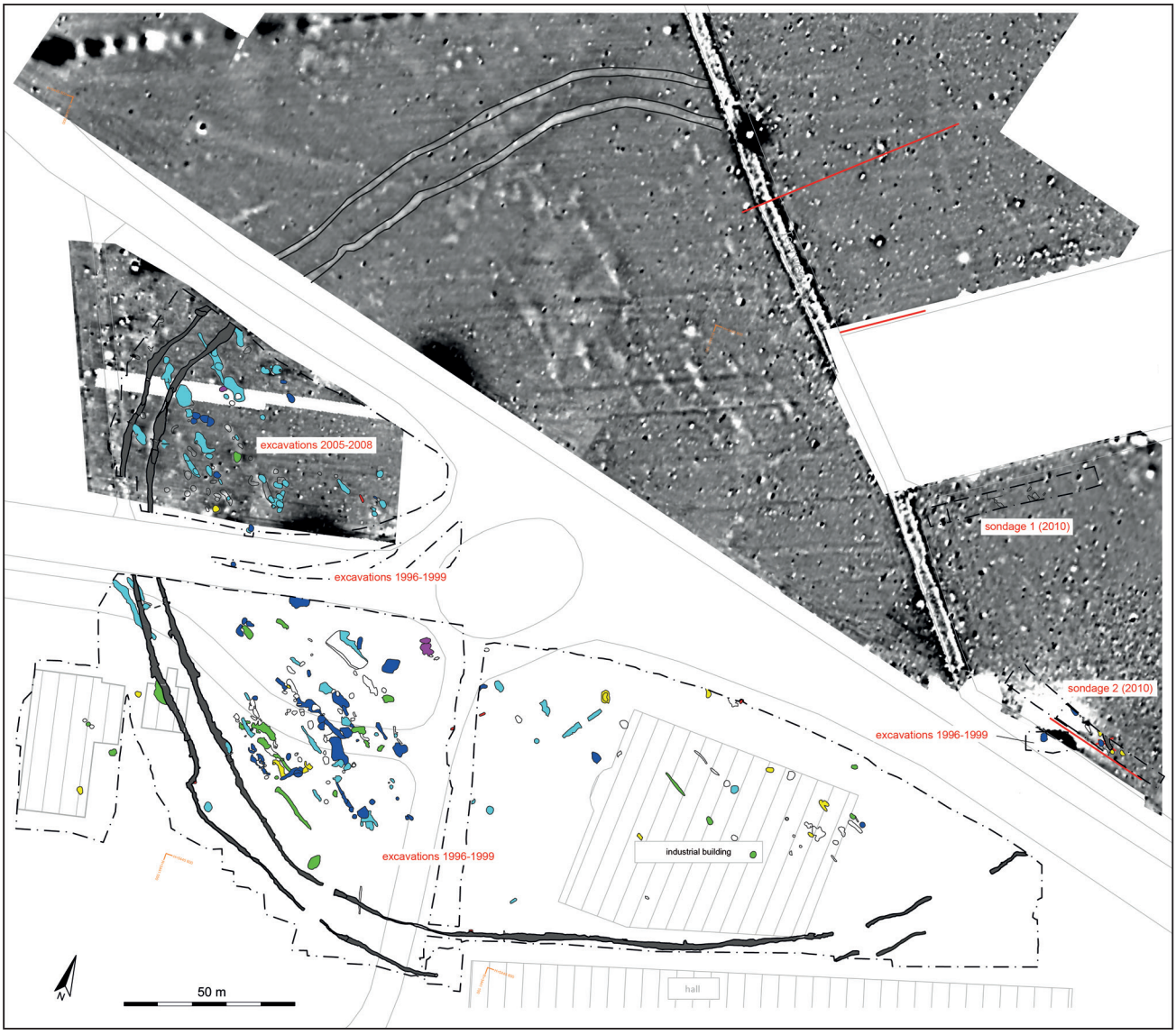

Figure 1. Plan of Herxheim showing the ditched enclosure, the settlement features and the results of the geomagnetic survey (GDKE Speyer, F. Haack).

were absent in a trench located 45 m further north and were also not found in the multiple rows of soil cores taken in the area immediately to the north. Geophysical surveys in the north-west have clearly revealed the enclosure, which however ends abruptly at an agricultural access road. Although this track does definitely not correspond with the original end of the ditch rings, the two excavated trenches clearly demonstrate that the ditch circuits were never completely closed.

The ditches were not all excavated as continuous linear features with consistent profiles, but as smaller ditch segments or long pits between 2 and 4 m in length. In many cases, these individually excavated features differ in width, depth and sometimes in orientation or in a slightly curved course and can be separated from each other (Figure 2). In cross-section, the shape of the long pits varies between more or less V-shaped to box-shaped and overall shows a high degree of variation (Figure 3). In a few instances, the shape can even change from V-shaped at one narrow end to U-shaped at the other end of the same long pit, thus adapting its shape to the immediately adjacent long pits on either side. These different long

pits, sometimes dug immediately adjacent to each other and sometimes evidently excavated in an alternating pattern, then together formed continuous, ditch-like structures. On average, these are less wide and deep in the outer compared to the inner ditch. Both ditch circuits consist of several sections or segments composed of a varying number of long pits. These ditch segments have very different lengths between 7.5 and 39 m. However, of the 21 segments making up the inner and outer ditch, only seven could be completely investigated; they consist of between two and 14 individual long pits.

This construction procedure may seem complicated at first, but was probably advantageous in terms of organising the work. Experiments conducted by F. Broes and D. Bosquet (2007; 2011) have shown that a ditch segment 5 m long, 3 m

Figure 2. Part of the outer ditch at Herxheim consisting of different long pits. The picture shows the situation about 1.60 m below the stripped site surface (GDKE Speyer, F. Haack).

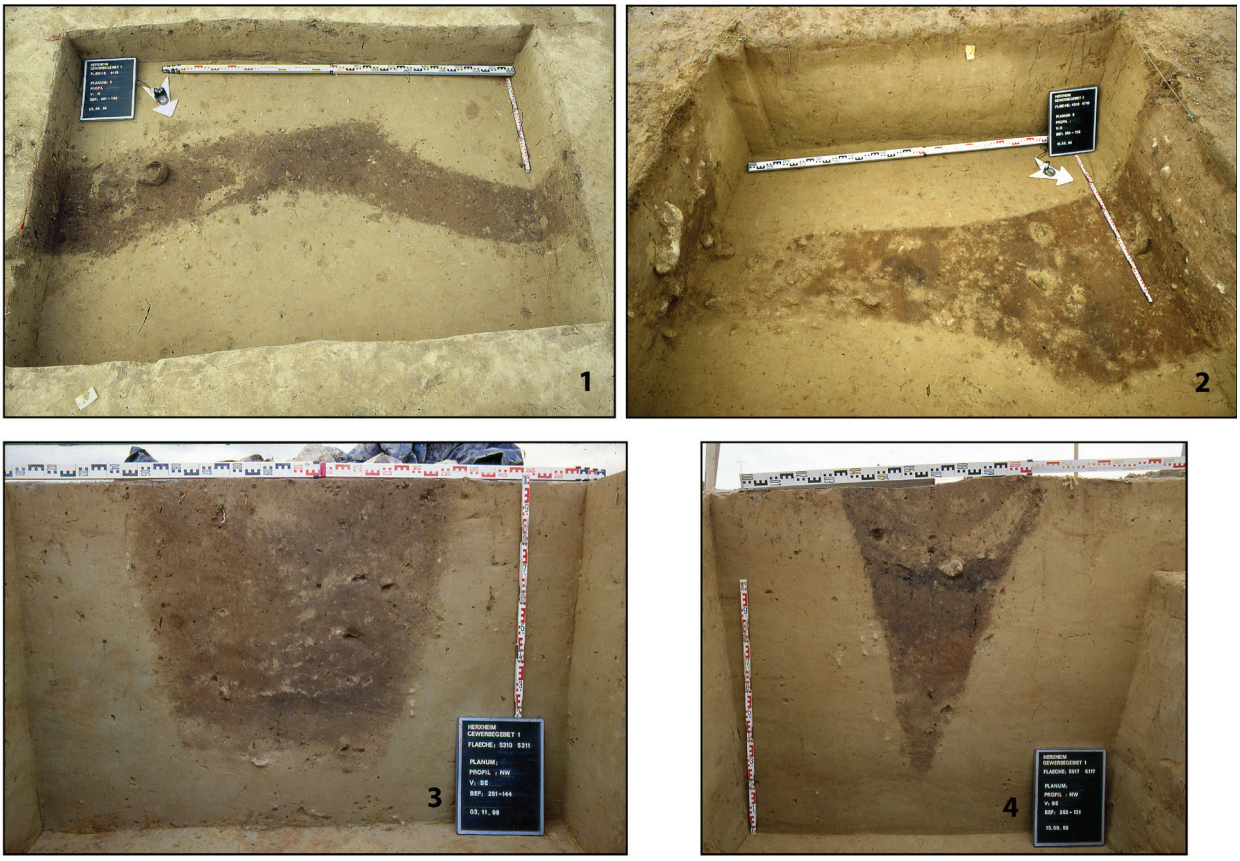

Figure 3. Herxheim. Different shapes of (overlapping) long pits in plan (1, 2) and in section (3, 4) (GDKE Speyer, Annemarie Häußer and F. Haack).

wide and 2 m deep can be excavated by a small group in one day (27 person working hours) using reconstructed Early Neolithic tools and a kind of "terracing technique", whereby steps are left in the long sides and cut away before completion. The optimal size of a work party is three to four individuals. The individual long pits as the smallest constructional unit of the two ditches could each be excavated with relatively little effort in terms of people and time involved. Even though such work estimates for prehistoric populations are generally difficult and although the picture is further complicated by erosion, the very different sizes of the long pits and the unclear situation of the enclosure in the eastern part, which was not fully investigated, overall this results in a surprisingly short possible construction estimate for Herxheim of just 30 days with a workforce of 50 (Haack 2016a, 347–52).

Where new ditch segments were excavated, in some cases the terminals of earlier and already infilled long pits at the ends of previous segments were dug away, and these recuts, reaching up to the modern surface, mark the beginning of a new set of long pits. In contrast, within the individual ditch segments there are no recuts. There is only one case in which a stratigraphic overlap could be recorded for the lowermost 20 cm of the basal fill (Haack 2016b, 39). This kind of basal fill, consisting of virtually finds-free, sterile soil, was probably simply left at the bases of pits or formed immediately after they were initially dug through sedimentation from the sides or the ground surface. Given that the bases of long pits are only 20–30 cm wide or less, comparatively little material is needed. These

basal fills do not provide an indication that the individual long pits were open for a longer period of time, as shown by the lack of traces of erosion at the sides and bases of the long pits (Haack 2016b, 114). Even where the pits were dug into the glacial red sand below the loess cover, which dries out very fast, there are no indicators for erosion processes. Overall, this supports the idea that the lower parts of the ditch segments were infilled very quickly. This view is also corroborated by the fact that finely banded, layered fills, which could indicate greater amounts of precipitation, are present in only few cases. The individual ditch segments were therefore probably all open right down to the base. Additional evidence is provided by the distribution of sherd refits within the basal fills, crossing the boundaries of adjacent features (Haack 2016b, 111, plate 80.1).

Infill processes and concentrations

In many cases, the definite spatial separation of concentrations is problematic. This is mainly due to the fact that the finds were not deposited in specially excavated pits or depressions within the two ditches, but on the varied relief that existed at that particular point in time within segments already partially filled in to different degrees. Therefore, the optimal technique to adequately record this complex situation is to investigate a set of closely spaced horizontal areas, over as great an extent as possible, and to take great care in documenting both the finds and the different fill layers (Haack 2016b, 27–30).

A further reason making the separation of concentrations difficult is that finds were also recovered in the fills above and below the concentrations and that in addition there are many cases in which different concentrations overlap each other. In many such instances, these concentrations are separated by a layer of soil, but frequently they also lie directly on top of each other, at least over parts of their extent. Furthermore, the material was deposited mixed with soil onto a very irregular base, sloping more or less markedly along its longitudinal axis and from the sides towards the centre. The finds layer is hence not spread horizontally or in secondary features created specifically for deposition, but slopes towards one side or the other from different levels within the ditch segments, in some cases it even slopes in both directions from higher, plinth-like heaps of soil.

In many concentrations, the deepest finds are right in the basal areas, while the topmost parts of concentrations higher up in the fill begin just below the stripped site surface, at least in the trenches which lie on what is now the plateau. Overall then, the concentrations are distributed from the trench surface, directly below the ploughsoil, right down to the base of the individual ditch segments. The larger concentrations extend over a length of up to 5 m, with a difference in elevation of up to 2 m between the two ends. In some cases, the less heavily fragmented and hence larger finds, such as calottes, vessel fragments or whole animal bones, came to lie in scoop-like depressions, which may have been secondarily dug into the already accumulated fills (Haack 2016b, 114–5). In the concentrations which slope more steeply, the recurrent pattern is that smaller finds are distributed across the slope, while larger fragments cluster in the lowermost reaches. In these cases, the finds mixed with soil were seemingly deposited as a kind of "scatter" or spread onto the existing fill relief of the enclosure ditch at different points and from plinth-like heaps of soil at different levels. After this process, at least some of the calottes, which in some cases lay directly adjacent to or stacked inside each other, were more or less carefully arranged in groups (Figure 4).

Figure 4. Lowest part of one of the concentrations at Herxheim with six calottes, human bone fragments and a large sherd (GDKE Speyer, F. Haack).

We can hence assume that only parts of the concentrations were deposited in the ditches directly from the former ground surface, and that in addition the ditches were actively walked in and some selected items of the ritual refuse within the soil matrix were deliberately re-arranged to some degree.

Immediately after deposition, the concentrations were covered with more soil, which also contained further finds, in some cases in appreciable quantities. While fragment size is markedly smaller, in some cases single calottes were included, as well as animal bones and large pottery sherds. There are numerous refits between material from the concentrations and from the fills above them, connecting these two depositional units and ultimately clearly showing that both can be functionally associated with the ritual activities. Indeed, the boundary between the matrix in which the concentrations are embedded and the fill above are often diffuse. However, the covering of the concentrations with soil is not even or continuous, so that some deposits come to lie directly on concentrations accumulated previously, as already mentioned above.

The example of a section of the inner ditch, c. 12 m in length, shows how tightly the different depositional units and concentrations were related to each other (Figure 5). Two larger concentrations and a secondarily dug slit-shaped pit, as well as the respective deposits below and above these units, can be linked by a total of twelve refits of sherds and fragmented human bone (Haack 2016b, 51–65).

Taking into account these frequent and close links between the different depositional units, the distribution of the concentrations and the lack of erosion along the sides and at the bases of the long pits, it is highly plausible that at least the individual ditch segments were all open simultaneously and were filled in at the same time, albeit irregularly. For this reason, the time span between the excavation of the individual loam pits of a ditch segment and the deposition and covering of the concentrations must have been very short. On the other hand, there are indications that there is some temporal depth in the erection and infilling of the enclosure as a whole. In addition, the distribution

Figure 5. Herxheim. Upper part of two concentrations, sloping to the north and south respectively, with slit-shaped pit in the centre. All features are connected by pottery and human bone refits (GDKE Speyer, F. Haack).

of refitting pottery sherds and bone fragments generally concerns deposits and fills located close to each other, although it must be pointed out that for the material published up to now, extensive refitting of the human bone material beyond the limits of the immediate depositional units was only attempted to a limited extent (Boulestin and Coupey 2015, 4). Furthermore, there are directly adjacent or in some cases directly superimposed concentrations for which there were no identifiable refits and which are evidently the result of different events. On the other hand, the recuts of some ditch segments and the small-scale recuts shown in some places, as well as the digging of slit-shaped pits into already infilled parts of the ditch, also evidences a certain temporal depth. Finally, the outer ditch contained far fewer concentrations or finds, which could indicate that enclosure construction had already begun prior to the start of the ritual activity.

Overall, the emerging picture is one of rapid excavation and infilling of the entire enclosure system, but especially of individual ditch segments. According to the pottery, construction and infilling are limited to the latest phase of the LBK, but given the history of construction and use just described, the time span involved must have been considerably shorter than the 50 years which current chronological models allow for this phase (Zeeb-Lanz *et al.* 2016).

Finds and concentrations

The finds material from the concentrations mainly consists of human skeletal remains, pottery vessels and stone tools, such as chipped stone artefacts, adze blades and grinding stones or their rubbers. Personal ornaments, animal bones and tools made from bone, antler and teeth also play a certain role.

I have already drawn attention to the considerable differences in the composition of the concentrations, both within and between different finds categories. It is therefore problematic to identify a common pattern applicable to all deposits and which aims at a quantitative comparison of finds between concentrations or at clarifying the relationship between different finds categories (such as skull calottes compared to decorated pottery) within individual concentrations. Apparently, such constellations played no role in the ritual sequences which led to the deposition of the finds in the enclosure ditches. Rather, the central connecting element appears to have been the violent destruction of items of material culture and especially of human bodies (Zeeb-Lanz and Haack 2016b; Zeeb-Lanz *et al.* 2016, 184–6).

Alongside the skeletal remains, large sherds of decorated vessels and of undecorated coarse ware are very typical elements of the concentrations. Smaller vessels are often completely preserved, but knobs and other plastic applications were apparently chipped off as a kind of pars pro toto symbolic destruction (Zeeb-Lanz *et al.* 2009, 214). Many so-called LBK regional styles, which become ever more distinct throughout the course of the Bandkeramik, are represented among the decorated vessels. In Herxheim, decorative styles associated with Bohemia, the Elster–Saale area, northern Hessen, the Moselle area, the Main region, the Neckar area, possibly Alsace and the Blicquy group of the Paris Basin are represented (Zeeb-Lanz *et al.* 2016, 178, fig. 9.7) (Figure 6). To this must be added the numerically largest group, the vessels decorated in the Palatinate regional style. Their frequency and distribution within the concentrations are equally heterogeneous and no recurring combinations could be identified. Once again, it must be pointed out that some pits in the interior of the enclosure also contained pottery identical in its decorative styles and degree of fragmentation, but these features did not always contain human remains. For instance, the only vessel with clear links to Lower Bavaria came from a pit in which several other regional styles were also represented by fragmented vessels (Haack 2016a, 23–4).

Both decorated and undecorated vessels were destroyed in equal measure, but the largest sherds were often deposited in the lower reaches of the concentrations, comparable to the calottes, and some were certainly deliberately deposited in a similar manner. The presence of secondarily burnt and unburnt sherds of the same vessel is a clear indication for the destruction of pottery directly on site (Zeeb-Lanz *et al.* 2009, 214, fig. 13). Establishing the origin of the vessels decorated in the different regional styles still requires an in-depth interpretation of the chemical analysis of clay compositions, as well as a detailed comparison of the decoration with material from the supposed areas of origin, but irrespective of these data the careful production of these items indicates that they were ostentatiously made specifically for use in the ritual activities (Zeeb-Lanz *et al.* 2013; 2016).

However, the central element of the concentrations in the enclosure ditches are the human skeletal remains (Figure 7). The vast majority come from human bodies which were dismembered and defleshed immediately after death, with the bones subsequently smashed. However, there are also some concentrations with complete

Figure 6. Two reconstructed pottery vessels from Herxheim decorated in the Elster–Saale regional style (typical for Saxony-Anhalt) (GDKE Speyer, F. Haack).

bones and even partially articulated skeletal elements (Boulestin and Coupey 2015, 18, fig. 13; Boulestin *et al.* 2009; Haack 2009; Zeeb-Lanz 2016; Zeeb-Lanz *et al.* 2007). Yet the vast majority of the human remains show great similarity to the remains of butchered animals, even if direct evidence for a correspondence in the degree of dismemberment and fragmentation has not yet been attempted for Herxheim itself and the degree of fragmentation for the human bones seems extremely high (Johnson 2017, 368). In any case, the fragmentation of the human bodies took place a very short time after the death of these individuals. This is indicated by the frequent traces of manipulation on the bones and by breakage patterns typical for perimortem fragmentation. The remaining anatomical connections for parts of the spine and other skeletal elements indicate that soft tissue was sometimes still present at the time of deposition, thus showing that the bodies were dismembered in the immediate surroundings of the enclosure ditches (Boulestin and Coupey 2015, 15, figs 10, 26).

The reasons for this treatment of human remains, and in particular the question whether we are faced with cannibalism, human sacrifice or secondary burial, have been and still are intensively and controversially discussed (Boulestin and Coupey 2015; Haack 2016a; Orschiedt and Haidle 2012; Zeeb-Lanz and Haack 2016a; 2016b; Zeeb-Lanz *et al.* 2016). There is agreement concerning the ritual context in which the dismemberment of humans and the deposition of their remains in open pits and ditches within the enclosure must have taken place, as well as the aspect of violence which is manifested in this treatment of deceased individuals.

Partly, this interpretation relies on the 300 skull calottes, several of which are often found in concentrations but are not necessarily present in each one. The relatively elaborate production of these items, from scalping and removal of soft tissue to the chipping away of the lower parts of the skull and the facial area along the hat brim line, has already been described several times and does not accord well with a strategy focused solely on the economic exploitation of the postcranial parts of the human bodies, as described by B. Boulestin and S. Coupey (2015) in their exocannibalism hypothesis (see also Orschiedt and Haidle 2012).

Figure 7. Herxheim. Typical spread of calottes, human bone fragments, pottery sherds and a cattle horn core in one of the concentrations. The concentration slopes slightly in a longitudinal direction and straddles two different long pits (GDKE Speyer, F. Haack).

A further important characteristic of the concentrations, both in terms of the skeletal remains and of the pottery, is the incompleteness of the material. In none of the concentrations was it possible to completely reconstruct a fragmented vessel, nor are there enough cranial or postcranial skeletal elements to completely reconstruct whole bones, let alone complete individuals. As described above, there are indeed numerous refits of both sherds and bone fragments, particularly within, but also between different concentrations, and between concentrations and the fills above or below them; nevertheless, both the vessels and the human skeletons are only ever partially preserved.

Many of the fragments that must originally have been present are now missing; this, and the many refits to material from outside the concentrations, clearly show that it cannot have been the aim to actually deposit the entire material generated during ritual activities in the form of concentrations. Rather, considerable amounts of material must have remained on the surface, from where some then got into the fills in a secondary process, both into the concentrations and into the layers below, between and above them (Haack 2016b, 114–5). In addition, some finds come from earlier pits cut during the construction of the enclosure. They were later apparently admixed with the ritual refuse on the ground surface, and items from both sources were redeposited together, and with the soil matrix, into the fills of the ditch segments and thereby also into the concentrations (Haack 2016b, 35, 94). In this sense, the deposition of part of the material was rather random and the selection in itself was not a central aspect of these depositional episodes.

Stone tools also fit into the pattern described for human remains and pottery, although their numbers are overall much lower (Zeeb-Lanz 2016; Zeeb-Lanz *et al.* 2007; 2009). The lithics comprise decommissioned chipped stone tools, adze blades and grinding and rubbing stones made from sandstone. The adzes and

sandstone artefacts are also found in a fragmented state, which especially in the case of the latter demanded the use of considerable force. Apparently, the hefty lower parts of grinders were first heated in a fire before they could be smashed. A particularly eloquent example is that of a sandstone grinder of which eleven pieces were recovered from around a causeway in the south-western part of the enclosure (Haack 2016b, 93, 104–5, plate 131.2, plans 4, 6). The fragments were found in both the inner ditch (from the two opposite sides of the entrance) and the outer ditch (only on one side of the entrance) and all came from different stratigraphic units. Splintered pieces made from intact flint tools are also very frequent; evidently, the artefacts were rendered deliberately unusable.

Many of the animal bones are parts of the extremities of wild and domesticated animals, but there is also regular butchery waste which probably reached the concentrations accidentally as part of a secondary process (Arbogast 2009). In contrast, the accumulations of horn cores and bucrania in some concentrations can certainly be assigned to a ritual context (Johnson 2017, 377). This could also apply to the relatively large numbers of dog remains from the enclosure. Frequently, these are jaw fragments only, but there are also postcranial elements; in addition, both sets of bones exhibit considerable traces of manipulation. However, only few of them were recovered directly from concentrations, while many were found in other ditch fills. Overall, then, the animal bones paint a heterogeneous picture. Comparing the material from settlement pits to the assemblage from the enclosure, there are no real differences in numbers or composition, excepting the few special occasions mentioned above (Johnson 2017, 370–1).

Further finds categories repeatedly recovered from concentrations are objects of personal adornment, as well as bone, antler and boar tusk artefacts. The ornaments are mostly pendants or beads made from shell, limestone, bone, antler and animal or human teeth, which probably formed parts of necklaces or were sown onto clothing (Haack 2016a, 79–80; Rähle *et al.* 2019; Zeeb-Lanz *et al.* 2009, 209–11). The individual pieces are more or less complete, but in any case they were definitely not deliberately destroyed — this could at most have happened to the necklaces or garments themselves. Similarly, no deliberate decommissioning can be observed for the tools made on bone, antler and teeth. A few of these items do recurrently turn up in concentrations, but they were also found in other fills within the enclosures and in the internal pits (Haack 2008; 2012; 2013). The degree of fragmentation of the items from concentrations is no greater than for the artefacts from other fills or settlement pits. Indeed, it is not always clear whether these pieces reached the concentrations as remains of ritual activities or rather secondarily. For some characteristic pieces, such as an antler mattock and a tool made on a human tibia, some ritual connection can at least be suggested (Haack 2016a, plates 122.4, 125.3).

In addition, both animal bones and bone tools were sometimes placed in deliberate deposits which rather appear like small hoards. For instance, 20 carnivore mandibles (fox, marten, polecat, wildcat) were deposited together, as were four fragile bone needles forming a set (Figure 8). Both assemblages were probably deposited in an organic bag or satchel and were placed at different points within the ditch fills, but outside the actual concentrations (Haack 2013; Zeeb-Lanz *et al.* 2013, 407, fig. 24).

Figure 8. Herxheim. Deposit of four bone needles in the inner ditch; detailed photograph on the right (GDKE Speyer, F. Haack).

Summary Herxheim

The different indicators for a very short construction span and use of the enclosure show that the ditches are for the most part directly connected to the ritual activities which resulted in their infill and in the deposition of the concentrations. The overlaps between ditch segments document a certain temporal depth, but their low number means that overall, each of the ditch circuits was probably excavated in a short, consecutive period. While the outer ditch generally has less material and fewer concentrations than the inner ditch, it is still highly probable that the entire circuit was constructed in the Latest LBK. Only part of the material was discarded in the ditches, the remainder apparently stayed above ground and in some cases was secondarily deposited in the ditch. It is impossible to estimate how much material from pits within the enclosure was also associated with the ritual activities.

The humans whose remains were found in the concentrations were dismembered immediately after their death and at the site itself, as evidenced by the numerous traces of manipulation, the clearly perimortem fragmentation patterns of the bones, the numerous refits between bone fragments and the occasionally preserved anatomical connections. The special treatment of the dead, which shows more than a passing similarity to the butchery of animal carcasses, was probably the central element of the rituals carried out at Herxheim. This probably also encompassed the killing of these individuals — at least, this is suggested by the distribution of the different age classes. All age groups from neonates to senile individuals are represented, but the low mortality rate for children under five years of age and the

comparatively high mortality rate of children and juveniles between five and 20 are all atypical for a "normal" mortality curve (Boulestin and Coupey 2015, 109–11). However, the same pattern could also have been caused by an epidemic. After all, recent biomolecular work has been able to trace a predecessor of the plague virus as far back as the Final Neolithic, while tuberculosis is known from Hungary at least since the beginning of the fifth millennium BC (Andrade-Valtueña *et al.* 2017; Denaire *et al.* 2017, 1141; Hershkovitz *et al.* 2015; Masson *et al.* 2015).

Altogether, the elaborate pottery, possibly produced especially for the ritual activities, as well as the decommissioned chipped stone tools, adzes, grinders and rubbers, create an overall picture strongly dominated by the use of violent force. This aspect of violent destruction, the killing of human individuals and the way in which the remains of these actions were incorporated into the two ditches can best be described as the deposition of ritual refuse, or ritual discard. Deposition in the ditches and the intentional placement of some calottes and large pottery sherds played a fixed role in the ritual proceedings, as also suggested by the recurrent pattern of the concentrations.

Nevertheless, these are not burials or graves (unless one would like to use these terms for any kind of treatment of the deceased, as long as some intentionality is evident), as the key social aspect of mourning and leave-taking — a central element needed for the survivors to come to terms with death — is highly implausible for Herxheim, where strong links with destruction and violence are foregrounded instead (Haack 2016a, 30–1; Zeeb-Lanz and Haack 2016b; Weiss-Krejci 2011). From the point of view of the persons carrying out the rituals at Herxheim, the killed individuals were quite clearly not members of one's own social group but remained excluded and in this sense were "outsiders" to whom one did not have any emotional link. This is also supported by the strontium isotope results, which remain difficult to interpret but differ very strongly from the values so far measured on skeletons from burial grounds, as well as from the regional isotopic signature of the Rhine valley. The Sr values rather suggest an origin in other regions with a strongly radiogenic geological background, such as the Mittelelbe-Saale area or various low mountain ranges (Knipper *et al.* 2016; Turck *et al.* 2012; 2019).

Traditions

For Herxheim in general, and for the proclaimed interpretation of cannibalism in particular, what is generally stressed is the strongly ritual character of the activities carried out here and which ultimately culminated in the deposition of the human remains and the selected and largely deliberately destroyed objects (Boulestin *et al.* 2009; Zeeb-Lanz and Haack 2016b). The overall framework for these activities could have comprised profane as well as ritual contexts, as one could for example suppose in the context of "feasting", where different aspects such as the exchange of goods, the resolution and forging of social roles and relations, celebrating/eating and ritual sequences important for social cohesion may have intersected. Nevertheless, at Herxheim the ritual aspect certainly played the central role (Dietler and Hayden 1995; Gramsch 2012). Yet as unique as the site in its entirety may seem, it is unlikely that "there should be no comparable traditions for such kinds of activities in the Bandkeramik" (Zeeb-Lanz 2017a, 118; own translation). Especially in the case of rituals, which consist of traditional

and repeated acts, it is a fundamental prerequisite that they should build upon reference points such as long-established patterns and sequences.

Contexts with human remains

These traditions cannot really be found in burial rites, even though the overlap between the treatment of the dead and the possible motivations for it may be greater than has been supposed hitherto; we must look for them elsewhere (Hofmann 2015). Certainly, our first parallel should be contexts in which human remains have been deposited in an unusual manner, often connected with indications of violence. Sites such as Asparn/Schletz (Lower Austria), Talheim (Baden-Württemberg, Germany), Kilianstädten (Hessen, Germany), Wiederstedt (Saxony-Anhalt, Germany), Tiefenellern (Bavaria, Germany), Menneville (Aisne, France) or Zauschwitz (Saxony, Germany) have already been repeatedly and extensively discussed and interpreted from different points of view (Meyer *et al.* 2004; 2015; Teschler-Nicola 2012; Wahl and Trautmann 2012; Zeeb-Lanz and Haack 2016b).

The settlement pit from Halberstadt (Saxony-Anhalt), discovered in 2013, also fits into this group of sites. The traumata on the skulls of nine of the human individuals match the pattern of deliberate killing observable in a similar way at Talheim and Kilianstädten (Meyer *et al*. 2018). What is new is the pattern of age and sex distribution, as in this case almost exclusively males between the ages of 16 and 40 were represented.

The human remains from the Jungfernhöhle cave near Tiefenellern (Bavaria) have also been newly reinvestigated and recently published (Boulestin 2017). The cave appears to have been used as a primary burial area, and the previous interpretations centred on secondary burial or even cannibalism (Kunkel 1955; Orschiedt 1999) can be rejected. Overall, there are the remains of 13 adults and 36 children and juveniles, with the available ^{14}C dates falling mostly, but not exclusively into the LBK (the Mesolithic and the Late Neolithic are also represented). Some of the long bones and skull fragments exhibit modifications which are apparently due to the deliberate cleaning of the bones.

A recent re-examination of the human skeletal remains from Menneville (Aisne) has shown that the infilling of some of the ditch segments was remarkably complex, but that this applies also to some internal features (Thevenet 2017). Overall, primary and secondary burials of complete and partial skeletons are attested, some of which also show traces of manipulation and most of which are associated with animal bone. Alongside deposits interpreted as regular burials, the complete skeletons of several children apparently thrown into the ditch segments are interpreted as sacrifices.

Yet even taking these most recent results into account, none of these sites exhibit the central characteristics typical of Herxheim, be this in terms of the sheer number of individuals involved, the way the bodies were dismembered or the manner in which the different skeletal elements were fragmented[1]. The main parallel between

1 A pit containing four skull calottes shaped in a very similar manner to those of Herxheim and also exhibiting cut marks indicative of defleshing has been found at Niederpöring (Bavaria). A publication is being prepared by G. Grupe, F. Immler and J. Pechtl. At least in relation to the manipulation of the skulls, this is the first clear parallel to the situation in Herxheim. I thank J. Pechtl for drawing my attention to this find.

these other sites and Herxheim is the violence, particularly the way it is expressed at Talheim, Schletz, Kilianstädten and Halberstadt with their multiple victims.

In contrast, what has been less focused on is the question of tradition in the architecture and infilling of the ditches or in terms of other features showing similarities in the deposition of finds material, most particularly pottery. Alongside the by now impressive range of LBK wells, such similar behaviours seem particularly focused on natural landmarks, distinctive rock formations, caves and extraordinary settlement pits.

Enclosures

The possibilities for a thorough analysis of the by now more than 100 LBK ditched enclosures are still restricted due to the very different stages of investigation and publication (for more details on this topic, see Haack 2016a, 261–358, plate 120; tab. 8 shows the situation in 2014, when 98 enclosures were known)[2]. Only some of the enclosures are well enough investigated through excavation or geophysical prospection to allow a confident reconstruction of their shape. Among them, a trapezoidal shape is particularly frequent. Alongside Herxheim itself, 28 other sites — that is 70% of the cases for which this information is available — follow this outline. The remaining 12 enclosures are more or less oval or rectangular.

The commonalities between Herxheim and the other LBK enclosures are, however, not limited to shape. Of the 14 examples for which enough detail is published (Germany: Langweiler 9, Langweiler 8, Langweiler 3, Weisweiler 36, Weisweiler 17, Erkelenz-Kückhoven, Frimmersdorf 16, Köln-Lindenthal, Stephansposching; Netherlands: Beek; Belgium: Waremme-Longchamps, Darion; France: Menneville, Rosheim), six definitely used long pits as architectural elements for the creation of longer ditch sections. This is a sizeable percentage, given that the recognition of this pattern makes considerable demands on excavation and recording. The same method of construction is also likely for the remaining eight examples, and in no case is there positive evidence for the existence of a ditch that was excavated in one go and remained open for a substantial period of time. This latter scenario is, however, suggested for the Early LBK enclosures of Eitzum (Lower Saxony, Germany) and Asparn-Schletz. The enclosure at Stephansposching shows that the construction method of separate long pits was already being practised in the Middle LBK.

Enclosures of several ditch circuits, such as Herxheim, are common, and the different ditches are not necessarily parallel to each other, as for instance at Heilbronn-Klingenberg (Baden-Württemberg). This is an indication that they were most likely not contemporary. Only three of the known LBK enclosures were definitely complete circuits, meaning that they entirely enclose an internal area with the exception of clearly delimited entrances. In several other cases it is very likely that the ditches were never completely closed, just as at Herxheim. In any case, for most of these examples the oft-quoted explanation that gaps in the circuits have been caused by differential erosion is unconvincing when the local topography is taken into account.

In a large proportion of the enclosures the internal area did indeed contain features, although it is difficult to provide definite evidence that this use is contemporary with the existence of the ditch circuits. Criteria such as stratigraphic relationships, relative dating via pottery or kinks in the layout of some ditches,

2 The enclosure at Eythra most likley dates to the Middle Neolithic (Schiepziger Gruppe), personal comment Harald Stäuble 11.10.2019.

which may indicate that existing constructions were respected, all have their problems, and mostly a clear assessment concerning the relationship between a settlement and its enclosure is not possible.

Given the information currently available, details regarding infilling processes can only rarely be discerned, and if available concern only small parts of the site. In general, the excavators distinguish natural infill near the base of the ditches, covered by anthropogenic fills connected to the deposition of refuse. These latter can be repeatedly interrupted by sterile loess layers, most likely the result of collapse of the ditch sides or of material washed in from the ground surface. In only a few cases is a largely natural sedimentation process proposed, but even then there are repeated dumps of refuse. As the longitudinal profiles that were documented are rather short in most cases, there are only isolated instances where it is possible to reconstruct the individual layers across their entire extent.

Overall, 16 enclosures — including Herxheim — have yielded human remains and some of these have already been introduced above (Schletz, Kilianstädten, Menneville). The other 12 examples were either secondarily used as a burial ground (*e.g.* Vaihingen, Baden-Württemberg) or have yielded individual instances of single skeletal elements and/or complete individuals, which in many cases cannot be interpreted further given insufficient recording or publication. In the case of Langweiler 8 (North Rhine-Westphalia, Germany), a comparison of the pottery from the enclosure with that of the settlement has shown that the ditches of the earthwork contained fewer decorated vessels which were, however, less fragmented. This difference can most likely be explained by taphonomic rather than functional factors. More or less complete pots recovered from enclosure ditches, and which could indicate deliberate deposition, are no more frequent than on settlement sites (Haack 2016a, 340–5).

A finds category often discussed in the context of earthworks are grinding stones, which also play an important role at Herxheim. However, it is only at the enclosures of Langweiler 8 and Heilbronn-Neckargartach that there is a clearly elevated percentage of grinders compared to settlement features. Grinding stones were also retrieved from Belgian enclosures, where they are often found at the bases of ditches or in their terminals. In spite of all this heterogeneity, the evidence thus indicates that the use of many enclosures was closely connected to the social and ritual preoccupations of the adjacent settlement communities (Haack 2016a, 345–6).

In the Rhineland, estimates for the duration of enclosure use are generally given as one house generation, that is to say 25 years. For the Belgian sites, a maximum of 30 years is suggested, but use could have spanned as little as 15 years (Keeley and Cahen 1989, 170; Stehli 1994, 182; Zimmermann 2012, 16). These are of course only estimates derived from a rather shaky correlation with settlement traces in the interior, themselves dated via their pottery assemblage. There are no definite arguments against a scenario in which the actual use and partial refilling of the ditches could have taken up an even shorter span of time.

Currently, interpretations of Early to Late Neolithic enclosures increasingly emphasise their social impact and the community-building potential — a reading which explicitly includes the digging of the ditches themselves — for the inhabitants of the associated settlement sites; defensive aspects are neglected or explicitly excluded (*e.g.* Andersen 2017; Geschwinde and Raetzel-Fabian 2009; Jeunesse 2011a). In addition, there is no evidence for banks from any of the LBK

enclosures and the sediment removed during the digging of the ditches would hardly have been enough to provide a serious obstacle.

Wells

A context which is particularly interesting from the point of view of pottery deposits are LBK wells. The well from Altscherbitz (Saxony) is a particularly clear example, as it contained a total of 24 vessels, all completely preserved or almost completely reconstructable, alongside further sherds (Elburg 2011; 2013; Herbig *et al.* 2012/2013, 269, fig. 33). The vessels were all recovered from the lower sections of the fill, but are definitely not associated with the period of the well's use. Instead, they were retrieved from layers above the base and are distributed over a depth of 2 m. In addition, the stratigraphy indicates the existence of several episodes of infill. It is therefore clear that the pottery was intentionally deposited. Furthermore, the same contexts have yielded several very carefully worked bone tools, some of them decorated, as well as adze blades and organic containers. None of these show any signs of deliberate damage or decommissioning.

The pottery from the well shaft at Erkelenz-Kückhoven (North Rhine-Westphalia) is interpreted in the same way (Elburg 2011; Lehmann 2004). Further vessels may also have been deposited in the wells at Mannheim-Straßenheim (Baden-Württemberg), Zipsendorf (Thuringia) and Rehmsdorf (Saxony) (Einicke 1998). In contrast to Herxheim, the majority of these vessels are completely preserved, even if they were recovered in a fragmented state. Apparently, the deliberate destruction of objects before deposition was not important in the case of disused wells. Yet an aspect that connects wells and enclosures is their communal building and use, which at least in the cases listed here also encompasses a ritual use in the form of deliberate deposits after the wells were decommissioned.

Caves and rock formations

In the uplands of the Franconian Alb (Bavaria) are at least three further sites for which the deliberate deposition of pottery in a ritual context has been proven. The conspicuous rock formation of the "Hohler Stein" near Schwabthal has been connected to the intentional destruction of pottery, probably due to a particular significance which this rock formation at the edge of the Alb plateau held for the inhabitants of the nearby settlement (Hendel 2012) (Figure 9). More than 40 fragmented vessels dated to the Latest LBK were found near the base of the rock, while further sherds were recovered from its plateau. Most likely, at least some of the vessels were already destroyed on the summit and then deposited at the base of this dolomite block. A comparable situation, but interpreted as the deposition of complete vessels, has been excavated at the "Motzenstein" in direct vicinity to the "Hohler Stein" site (Bürger 2008).

The situation of the Jungfernhöhle cave near Tiefenellern, from which human remains have been recovered, is somewhat more complex. Alongside the skeletal remains, many well-preserved and often exceptionally richly decorated vessels of the Latest LBK were unearthed (Kunkel 1955) (Figure 10). The pottery apparently reached the cave in an already fragmented state and was deposited there together with other finds. Among these, the most notable are completely preserved, spatula-like bone tools. This tool type has been connected to pottery production and could suggest that at least some of these ostentatiously decorated

Figure 9. The "Hohler Stein" near Schwabthal on the Franconian Alb (Bavaria) (F. Haack).

Figure 10. Restored and reconstructed pottery vessels form the Jungfernhöhle cave (Bavaria) (F. Haack).

pots were made in the direct surroundings of the Jungfernhöhle, before being destroyed and deposited inside the cave (Haack 2012).

Settlements

It is far more difficult to find comparisons among settlement features with finds assemblages that differ from those of "normal" pits used for refuse disposal. The distinction is methodologically problematic in principle, as one first has to develop clear criteria for a comparison of this kind, and given the large number of excavated

and published LBK sites, this has not as yet been attempted. However, some features, especially those containing human remains, have been singled out in earlier literature. This includes the sites, already discussed above, of Halberstadt, Menneville, Talheim, Wiederstedt and Zauschwitz. To this can be added two pits from Vaihingen which also contained human skeletal remains, apparently including a skull calotte and a mandible, but which have not as yet been published in any detail (Krause 2011, 12).

The existence of comparable settlement pits without human skeletal remains at Herxheim has already been mentioned. Indeed, at Herxheim a settlement pit has produced one of the largest assemblages of the site in terms of the number of vessel units and the number of regional pottery styles which are represented; in these respects, it even trumps the ceramic material generally recovered from concentrations in the enclosure (Haack 2016a, 23–4). In addition, particularly finds-rich settlement pits are regularly uncovered, for instance in the case of the pit from Maastricht-Klinkers in Dutch Limburg with an assemblage that is truly exceptional in the regional context, both in terms of size and of composition (Van Wijk *et al.* 2014, 240; see also Amkreutz and Van Wijk, this volume). Features of this kind, with very similar material characteristics, have also been recovered from the Wetterau (Hessen) (Ritter-Burkert, this volume).

Anthropomorphic and zoomorphic figurines are a further finds category that only occurs on settlement sites and such items are often argued to be deliberately fragmented as part of ritual activities (Becker 2011; Hofmann 2014). Hardly any of the roughly 250 anthropomorphic LBK figurines, which are not limited to the latest phase of this culture, but occur since the Earliest LBK, were found complete. The fragments do not show any indication that they were specially treated during deposition; rather, virtually all of them seem to have been discarded as part of general settlement waste. Such figurines have also been found at Herxheim, two of them within the enclosure ditches, but without showing a direct relationship to any of the concentrations (Zeeb-Lanz 2013).

Comparing contexts

Alongside the violence against humans and human bodies, which does find some parallels on other LBK sites, albeit in a distinctly different form, parallels between Herxheim and other LBK sites are most clearly evident in the treatment and deposition of pottery, which apparently was part of deeply rooted LBK traditions. Clay figurines are another finds category which were virtually guaranteed a deliberate destruction, followed by discard in settlement contexts, even though "this did not happen in the course of large gatherings or at special places" (Hofmann 2014, 53).

The architectural structures connected to these episodes of deposition are a further important aspect. Enclosures are definitely communal building projects whose main functions most likely comprised communication, as well as the negotiation and cementing of social relationships. How important this concern was in Early Neolithic society is shown by the large number of enclosures now known, which continues to increase due to new discoveries. Similar considerations also apply to wells, another kind of communally erected and used monument. They are functionally connected to the supply of water, and it was most likely because of this association that they were often secondarily drawn into ritual contexts. A similar suggestion can be made for the Jungfernhöhle, the Motzenstein and the Hohler Stein, which could have

served as communally used special places for the LBK settlements in their immediate surroundings (Bürger 2008; Hendel 2012; Pross 2017).

Discussion and conclusion

The significance of the Herxheim enclosure and the resulting interpretations are closely connected to a narrative of a putative crisis at the end of the LBK culture. This has been endlessly repeated and modified in scholarly publications to the extent that it has taken on the characteristics of a topos (Gronenborn *et al*. 2014; Jeunesse 2011b; Link 2014a; Meyer *et al.* 2014; Spatz 1998; Van de Velde and Amkreutz 2017; Zeeb-Lanz 2009; Zeeb-Lanz and Haack 2016b). The causes for this crisis, as well as its precise nature and its trajectory, are still seen very differently and range from catastrophic, climatically induced economic collapse to downfall scenarios rooted in the social and cultural organisation of Early Neolithic societies and their dissolution. The role of violence in these processes is also seen in strongly divergent ways.

In contrast, there is by now a consensus that by the end of the Early Neolithic, we can no longer assume a culturally homogeneous grouping over the entire extent of the LBK, not even one in which regional distinctiveness and diverging networks existed, but were still subsumed under a primary, overarching cultural identity of some kind (Hofmann *et al.* 2016; Pechtl 2016). Instead, we are faced with regional groupings which had deliberately begun to differentiate and separate themselves from their neighbours. While their genesis is intimately connected to the extent of the LBK in central Europe, their identity is also partly defined by their relationships with other Early Neolithic groupings, such as La Hoguette, Begleitkeramik or Blicquy, or indeed with newly developing Middle Neolithic units such as the Stichbandkeramik/SBK (Hofmann 2016a; Link 2014b; Van Dosslare *et al.* 2016).

The construction of earthworks could have been a reaction to this increasing diversification and the changing social networks, given that such monuments were explicitly aimed at fostering community cohesion, as well as negotiating social changes and realigning existing relationships. It is in this context that Herxheim can best be understood, especially given the association with ritual activities. Indeed, the site of Göbekli Tepe (Turkey), transitional between the Epipalaeolithic and Neolithic, has been interpreted in the same way, although, following the lead of Dietler and Herbich (1995), the focus has so far rather been on the potential for mobilising a large workforce through feasting (Dietrich *et al.* 2012). The situation at Göbekli Tepe shows how central such communally organised activities had always been for prehistoric societies, as well as highlighting the amount of effort invested in their perpetuation.

In spite of all this, the nature and significance of the events at Herxheim and their position regarding the discussion of the end of the LBK are still hard to grasp. This is due to the singularity of the site as a whole. There are clear strands of traditions for specific aspects of these activities, notably violence, the deposition of pottery and the role of communal building projects, but nevertheless the large number of human casualties, butchered like animals, as well as the vast amounts of pottery, stone and other objects underscore the exceptional nature of the site. That 500, or perhaps as many as 1000 people were killed over a very short time span is highly significant, as this would have been a very large number in terms of the reconstructed population density of the time (Zeeb-Lanz *et al.* 2016,

182; Zimmermann *et al.* 2009). This problem is compounded by the very short duration over which the Herxheim enclosure was used. Furthermore, it is still far from clear who the human victims of this violence actually were.

Boulestin und Coupey (2015) have proposed ritually motivated exocannibalism and have postulated repeated military campaigns spanning large parts of the LBK distribution and taking place over a longer time span. In contrast, Zeeb-Lanz *et al.* (2016) rather favour a reading of ritual sacrifice aimed at enlisting the help of "higher powers" in coping with the changing environmental and social conditions, thus ultimately putting forward a religious explanation. Both possibilities remain unsatisfying. While there are certain elements which are anthropogenic constants, and which therefore find more or less numerous parallels across human (pre-) history, these are rather the symptoms which were enacted to help overcome an existential crisis, and they do not reveal the underlying motivations. In addition, the interpretation as cannibalistic rites is virtually exclusively based on an analysis of the human bones, divorced from the current results regarding the wider archaeological interpretation of Herxheim; a situation which unfortunately also applies to sites such as Schletz[3] and Talheim (Hofmann 2016b; Zeeb-Lanz and Haack 2016b).

The considerable importance accorded to this site in the context of a community in the throes of rapid change is partly due to its inter-regional connections, in turn implying that the perpetrators and/or victims of these events came from a wider catchment area. This assessment is largely based on the dimensions of the site and the amount of finds material on the one hand, and on the pottery decoration on the other hand, which indicates that an area of several hundred kilometres radius could have been involved. In contrast, the contemporary pattern of settlement in the Palatinate and adjacent regions remains largely unclear, although this information is vital for understanding Herxheim. So far, no or hardly any other settlements dating to this phase have been recognised in the Palatinate and the adjacent Neckar confluence area, although this could at least partly be related to methodological problems in differentiating the later and latest phases of the LBK (Fetsch 2012; Gerling 2012; Haack 2016a, 21–5; Häussler 2013; Jeunesse *et al.* 2009; Lindig 2002). This wider regional context would actually be crucial for situating and interpreting a site as central to the LBK discussion as Herxheim. This would ideally also include the transition to the following Middle Neolithic, as the debate surrounding the end of the LBK has recently been reinvigorated thanks to an unexpected new aspect which is particularly influential for our understanding of the transition between Early and Middle Neolithic in the Upper Rhine area. According to new research, LBK settlement there appears to have ended as early as 5050 cal BC, followed — at least in Lower Alsace — by a settlement hiatus of several decades or even centuries before the appearance of subsequent Middle Neolithic groupings such as Hinkelstein and Early Großgartach (Denaire *et al.* 2017). In a spatially more restricted area, a clear drop in settlement density can already be recognised for the latest LBK phase[4].

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3 A project led by Franz Pieler and Maria Teschler-Nicola including an enhanced anthropological study and a detailed examination of the enclosure and the settlement features of the site started in spring 2019 and will undoubtedly deliver new results.

4 As a note of caution, it must be pointed out that pits of the latest LBK phase (phase V) have not been directly dated, so that their relation to the preceding phase IVb cannot really be assessed. However, pottery decoration indicates a clear stylistic break between the two phases, so that, in analogy with Herxheim, these could be vessels produced for exceptional occasions, rather than indicating some kind of chronological development (Denaire *et al.* 2017, 1103–4, 1107).

From this point of view, the question whether the Herxheim dead could not after all be the victims of an epidemic gains new relevance. Given the progress recently achieved in this field, we can look forward to similar results becoming available for the LBK in due course.

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Odds and end(ing)s. Aspects of deposition and ritual behaviour in the Linearbandkeramik of the Low Countries

Luc Amkreutz and Ivo van Wijk

Abstract

The earliest Neolithic in the Low Countries and in particular the LBK culture have mainly been studied from a settlement perspective. Little research has focused on aspects of structured deposition and their implications, although this is a phenomenon strongly rooted in the Neolithic. Here we present an overview of potential cases of structured deposition in the Dutch LBK. Although organic remains are largely missing from this region for this time period, the inclusion of particular qualitative and quantitative aspects of objects or groupings of objects, their location and properties in relation to domestic and economic activities and well-known LBK traditions and their particular setting in the landscape allow for the determination of Bandkeramik depositions. Within this "geographical approach" we argue for the combination of evidence regarding selection, location and performance. For the LKB of the Low Countries we identify different traditions of deposition existing side by side, taking place both within settlements, on their margins, in the surrounding fields and even farther away. Such a qualitative analysis of patterning may, in the absence of organic remains, provide a useful, much-needed window on these least known aspects of LBK society.

Keywords: *structured deposition; taskscape; Linearbandkeramik; Limburg; Low Countries*

Introduction

Structured depositions have long been a major line of research in later prehistory. The seminal work of scholars such as Richard Bradley (1998) and David Fontijn (2002; 2019) has provided an important basis for ever more detailed patterning of deposits and offerings of mainly weapons and other metal objects dating to the Bronze and Iron Age in large parts of central and northern Europe. These investigations, in combination with an increased knowledge of geographical information and useful anthropological perspectives (*e.g.* Helms 1988; 2010), have enabled us to anchor and explain deposition patterning. In the Low Countries, rivers and peat areas, also including cultic and settlement sites, have provided ample opportunity to test and predict these models (*e.g.* Van den Broeke 2005). For earlier prehistory, in particular the Neolithic, much less effort has gone into analysing and interpreting evidence of structured deposition. Partially this is a research bias. Metalwork is often dredged from rivers and streams at particular sites and more prone to be recognised. Moreover, much Neolithic research has been aimed at settlement

locations. While this may not always be the location where structured deposition is generally believed to have taken place, preservation conditions in these areas are also often not favourable, preventing insight into ceramic or organic deposition and leaving only lithics as a relevant category. Nevertheless, for the north of the Netherlands and the TRB culture in particular the deposition of hoards of axes has recently been recognised (Wentink and Van Gijn 2008; Wentink *et al.* 2011), while earlier Neolithic and later finds from extensive peat bogs in the northern Netherlands have been analysed (*e.g.* Van den Broeke 2005; Van der Sanden 1990; 2005), as well as pot and other depositions in the context of Swifterbant, Hazendonk and Vlaardingen communities (Louwe Kooijmans 2010; 2011; Peeters 2007; Raemaekers 2002/2003). While (structured) deposition may also occur earlier in time, for instance during the Mesolithic, it is commonly accepted that the advent or development of farming and the associated aspects of sedentism, territoriality, landscape development and ownership were important stimuli for its increase and significance from the Neolithic onwards. As such it is remarkable that the earliest Neolithic in the Low Countries, the Linearbandkeramik, has so far seen little to no research into structured deposition. In this contribution we will address that issue. Our contribution is primarily aimed at providing an overview of (what may be) examples of structured deposition in the Dutch LBK. Subsequently we will provide a brief analysis of the existing diversity in practices and how these may be explained.

The Linearbandkeramik and its research history in the Netherlands

The LBK in the Low Countries is usually dated to the Flomborn expansion phase of the LBK, starting at c. 5250 cal BC (Gronenborn 1999; 2007; Van Wijk *et al.* 2014) *i.e.* Modderman (1970) phase Ib and onwards. The Aldenhovener Platte and adjacent sites in Belgium were occupied around the same time (Amkreutz 2016; Louwe Kooijmans 2007a). In the Netherlands occupation focused on the fertile loess terraces of the Meuse and its tributaries, either east on the Graetheide plateau, or west around Maastricht. Apart from numerous settlements, some of which — such as Elsloo — comprise over 100 houses spanning several generations and several centuries, at least three locations with burials were documented, of which the Elsloo cemetery with 113 graves (dating to phase IIc–IId) is the largest. For this contribution it is furthermore of importance that the settlement clusters expanded until phase IIb and into IIc. This has been documented for the adjacent Aldenhovener Platte as well (Bakels 1982; Claßen 2011). It is argued that the number of settlements in the Graetheide area and Maastricht cluster could simply have outgrown carrying capacity and tipped the balance of its geographical and social territory, forcing part of the occupants to move into less favourable or at least less traditional locations (Bakels 1982). Indicative of this may be the "signs of stress" witnessed at the end of the LBK, which, apart from settling in less favourable locations, also include a drop in households, the development of defensive structures (enclosures), differences in pottery decoration, increased use of local raw materials and changes in lithic procurement and distribution (Amkreutz *et al.* 2012; Van Wijk *et al.* 2014). Eventually this leads to a sudden collapse of the LBK in Dutch Limburg, and comparable shifts and changes in the adjacent regions (Amkreutz 2016). Also in other parts of the LBK world

it is evident that its end and development into post-Danubian groups, such as Großgartach and Blicquy-VSG coincides with stress, important socio-economic changes and (ritual) violence, as at Talheim, Asparn-Schletz and Herxheim (Zeeb-Lanz and Haack 2016).

While the brief synopsis above may only serve as a concise background to the LBK occupation of our study area, it does highlight the existence of an early pioneering phase, a subsequent infilling and expansion of the settlement cells that existed and finally a period of stress and collapse. Arguably, and of course in relation to their geomorphological location, these developments form an important backdrop against which to discuss our evidence for structured deposition.

Another point of attention is the character of scientific research into the LBK in the Netherlands. After initial discoveries in the 1920s and 1930s, LBK research really took off with the investigations led by Modderman between the 1950s and 1970s (Modderman 1970). The excavation of important sites such as Sittard, Stein, Geleen and Elsloo provided the interpretational foundations for studying LBK house and pottery typology, settlement structure and chronology in all of north-western Europe. Subsequent studies into the ecological, economic and social aspects of LBK lifeways and resource procurement added further dimensions (see Bakels 1978; 1982; De Grooth 1994; 2011; Van de Velde 1979). This provided a profound basis characterising both the uniformity and diversity in LBK occupation in this area (Modderman 1988), although it was mainly based on the four large sites on the Graetheide plateau. Basically one could say that while Modderman provided the foundations, the subsequent generation built the house, created the roof and divided the rooms. They were busy getting a grip on the LBK and building a context, but in a way the structures erected never became "peopled". From the 1980s onwards, attention to the Dutch LBK waned in favour of other research topics and new, larger and better preserved LBK settlements were discovered, mainly on the Aldenhovener Platte and further south (Van Wijk *et al*. 2014).

Recently and in the light of contract archaeology a large research project granted by the Dutch organisation for scientific research (NWO), the Odyssey project, reinvigorated LBK research in the Netherlands by synthesising and analysing most of the other older LBK investigations, while at the same time new evidence from contract archaeology was able to add a new perspective on the "well-known" LBK (Amkreutz *et al*. 2012; Van Wijk *et al*. 2014). It is only in this renewed and expanded framework of attention that the evidence and theoretical climate exist that enable us to look beyond more "classical" themes of LBK research and include socio-cosmological aspects such as structured deposition.

A brief comment on burial

Before focusing on the evidence for structured deposition we briefly want to address burial. As indicated above there are three known burial sites for the LBK in the Netherlands, of which Elsloo is the largest and best known (Modderman 1970). As argued by Van de Velde (1997) and others, the number of burials is but a small percentage of the occupants of the LBK settlements in Dutch Limburg, indicating that many deceased were disposed of in alternative ways. However, when we look at the characteristics of burial at Elsloo (Van de Velde 1979; 1995) and other LBK cemeteries such as the better preserved Arnoldsweiler (*e.g.* Ungerath 2014), then it is clear that while there is an important degree of diversity, there are also trends

that point to rules governing body position, orientation and grave goods. This is especially the case when compared to contemporaneous and later traditions of non-megalithic burial in the wetland communities of the Lower Rhine Area, where there is little structure and diversity is almost the rule (Louwe Kooijmans 2007b). These trends fall into a wider pattern in which many aspects of LBK life appear to have been governed by distinct rules and traditions (Sommer 2001), including settlement location and development, orientation and structure of the houses, structure of the yard, raw material procurement, pottery production and so on.

The point to be made here is that the observed uniformity suggests the existence of distinct social rules and a shared worldview which facilitated interaction and exchange within networks over large distances (*e.g.* Bickle and Whittle 2013; Gronenborn 1999, 187; Sommer 2001, 257). Over time the aforementioned changes occurring in the wider LBK distribution area point to breaks with these regulated and uniform patterns. Initially they may only have been recognised in pottery decoration (Pavúk 2005; Pechtl 2015) but they later on also comprised other aspects of LBK society, including networks, territorial access and raw material distribution (Bickle and Whittle 2013; Bogaard *et al.* 2011; Zimmermann 1995), working towards the development of increasingly regionally oriented communities. While *sensu lato* burial and cemeteries could formally be positioned as structured depositions and we have to acknowledge, as was the case for instance at Arnoldsweiler (see Ungerath 2014), that there are many practices supplementing the "regular" burial ritual, we will not treat them in detail here. They merely serve to point out the likelihood that very strict rules existed which may have governed elements of socio-symbolic behaviour in the LBK, including structured depositions, as well as the fact that in this respect, too, the Later LBK may have witnessed a loosening of this system. It is possible that deposition, depending on time and context, may be part of a conservative and rule-bound LBK tradition and at other times a reaction to the changes taking place. Before returning to these points, the main part of this contribution will now focus on a presentation of potential examples of structured deposition in the LBK of the Netherlands.

Depositions in the LBK of the Netherlands: an overview

Over the past 30 years a number of LBK finds in Dutch Limburg, of which most were only recently identified, have been presented as potential structured depositions (Figure 1). This indicates that a renewed and targeted analysis of the older excavation data may yield yet more examples. At the same time the overall number of potential depositions identified so far is limited, preventing any conclusive detection of patterning. This is related to the fact that the focus was initially drawn to scarce "exotic" objects within the LBK repertoire instead of the combination of artefacts within a special context. The lack of bone preservation obviously also has a huge impact in terms of identifying deposition practices. A single find or assemblage of finds in a pit is less puzzled over when no bones are visible in the same context. Nevertheless, while for some examples the character of an intentional structured deposit with distinct socio-symbolic character is evident, for others this remains less clear.

As a first and basic ordering we have categorised the examples into depositions in pits within settlements, depositions taking place outside settlements but in their direct vicinity, and depositions that were documented further afield, outside the LBK habitation areas.

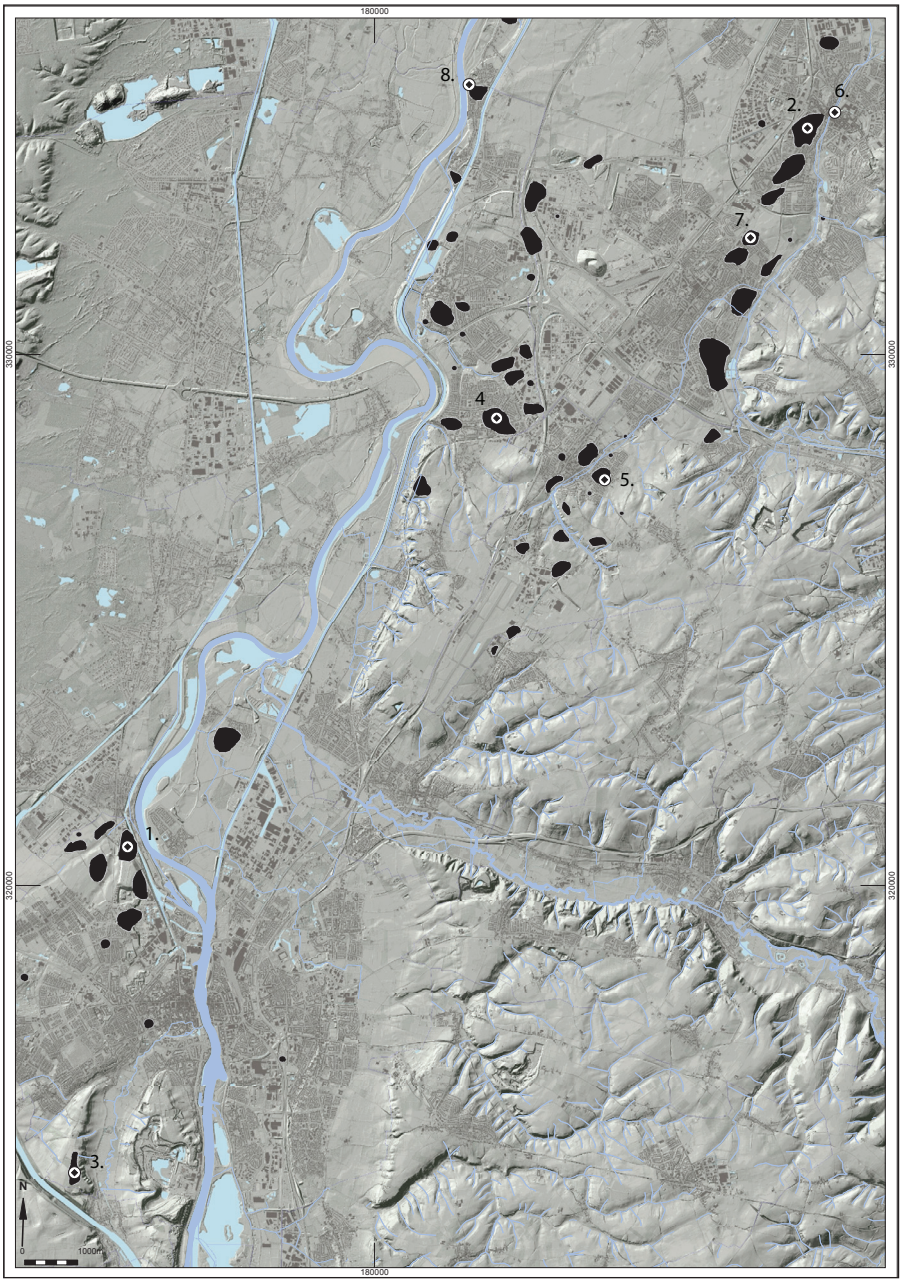


Figure 1. Map of the LBK occupation of southern Limburg with the sites mentioned in the text.
1. Maastricht-Klinkers;
2. Sittard-Mgr Claessenstraat;
3. Maastricht-Cannerberg;
4. Elsloo-Koolweg;
5. Beek-Kerkeveld;
6. Sittard-Ligne;
7. Geleen-Janskamperveld;
8. Stein cemetery.

Buried depositions in LBK settlements

This category involves a number of examples of depositions that took place in pits within the LBK settlement context. As such the activities surrounding these depositions and their eventual state can likely be understood as public and non-secretive. This does not reflect upon the activities surrounding their treatment before deposition. In fact there are many ethnographic examples known, for instance in Papua New Guinea, where certain celebrations and rituals are only witnessed by parts of the community such as the men, women or adolescents (Diamond 2012; Hampton 1999; Knauft 1993). The presence of depositions in refuse or other pits in the settlement, however, does indicate that this may have been witnessed or encountered by all inhabitants.

Collecting and breaking at Maastricht-Klinkers, pit 1h

A first but striking example of a deposition in a pit which seems to go beyond "regular" waste deposition is witnessed at Maastricht-Klinkers (Theunissen 1990a; 1990b; Van Wijk *et al.* 2014). During a rescue excavation the remnants of an LBK settlement composed of at least four to seven yards and numerous pits were documented. One pit (pit "1h") stood out from the rest in terms of the relatively high number of finds (3754 finds; 46 kg) and the composition of the pottery assemblage. The bowl-shaped oval pit measured roughly 4 x 5 m and was about 120 cm deep. It contained three different layers of which the top and bottom layer yielded a lot of finds and the middle layer (20 cm thick) was more or less without any finds. The large size of the pit is not unusual in an LBK context, but is quite large in comparison to other pits found in Dutch LBK settlements. In total, 2404 sherds were recovered from pit 1h, of which almost half (1101 sherds) were decorated. The composition of the find assemblage is more or less as usual compared to other sites. There was an abundance of flint (1222 fragments, of which 994 modified pieces) and in lesser quantities stone (38 fragments), burnt daub, charred bone and charcoal. The lithic assemblage includes flint from various sources (Lanaye, Banholt, Rullen, Valkenburg, Hesbaye, Zevenwegen) as well as a quern and even a blade of Wommersom quartzite. The flint assemblage resembles other pits in terms of composition, as it includes mostly flakes (60 %) and to a lesser extent blades (23 %) and tools (10 %). In other words, a relatively normal lithic spectrum, but in large amounts. The stone assemblage consists almost completely of tools (mostly grinding and whetstones, but also three pieces of ochre with polishing facets).

It is the decorated pottery that really stood out (Ploegaert 1991; Theunissen 1990a; 1990b; De Warrimont 2003). The pottery assemblage consisted of at least 291 decorated but fragmented pots. Despite a large quantity of "normal" LBK ware, there was also a notable amount of pottery in shapes and decoration styles which are not common for LBK sites in the Meuse area (Figure 2). Most striking is a pot which is entirely covered with warts and has a double neck. Similar pots are known from the eastern part of the LBK distribution around Thuringia or Moravia. Other examples are an all-over decorated beaker and a small pot decorated in a fashion more common in central Germany. Also puzzling is a pot where a square has been sawn out. It is peculiar that the "local" decorated pottery is exclusively decorated with multi-tined spatulae and dates to Modderman phase IIc, whereas the "exotic" decorated pottery only has single-tined spatula impressions and dates to the older Modderman phase IIb. Several other pits also contain examples of "exotic" pottery which indicate a strong relation towards the east.

The interpretation of the deposition practices which went on in and around pit 1h is challenging. A first thought was that these were the remains of a kind of potlatch-like ritual where "special" artefacts were deposited during two single events, based on the layering of the pit (Van Wijk *et al.* 2014). But the composition of the assemblage as a whole and its relation to other pits suggests that one of the main significant differences is the large quantity of finds, as other pits yielded "exotic" pots as well. While one could argue that settlement refuse is also represented, its character stands out. First of all, the pit is situated at a particular place, at the limits of the settlement, next to a cliff and drop in the landscape towards the Meuse valley floor. Second, the number of pots indicates that this is not the normal refuse of a typical LBK household but at least includes multiple households. This is also the

Figure 2. Examples of "exotic" pottery found in pit 1h at Maastricht-Klinkers (drawing: P. Ploegaert; photos: P. van de Velde).

case for the number of flint and stone tools. It therefore represents a communal activity which took place in and around a very large pit (large enough to park your car in). The dense packing of the layers furthermore suggests that the finds were deposited during two single short-term events which took place some time apart, given the finds-free layer in between. We can only guess as to why and how this deposition took place, but we have large quantities of deliberately broken pottery, often of non-local character, at two very restricted moments in time.

Another pit, pit 1z, is supposed to have contained the same kind of assemblage in comparable quantities. However, most of the contents of this pit were unfortunately distributed among a large number of different private collectors.

A pointy pit at Sittard-Mgr. Claessenstraat

Another large pit (Van Wijk 2001) situated in the extensive settlement of Sittard-Mgr. Claessenstraat (Modderman 1959) drew attention because of its size and unusual contents. The pit (pit 147) is located on the north-eastern limits of the excavated part of the settlement. It measured 11 x 7 m on the surface and had a maximum depth of 1.10 m. It initially consisted of several (presumably silo) pits, the primary fill of which contained some few finds. On a later occasion a large pit (pit 147) was dug right through this group. A small ditch, which is part of a larger system of ditches and encloses parts of the settlement, eventually cut through the large pit. The decorated pottery from pit 147 dates the pit to Modderman phase IIa/IIb. The surrounding pits are dated earlier.

Our interest lies with the large pit, which cuts the others. The stratigraphy of this pit suggests an initial slow infilling. Then a 30–40 cm thick dark layer with many finds (n = 1536) was encountered. This layer is topped off by a thick, almost finds-free top layer, either a backfill or a natural fill of the pit. Special attention was paid to the middle part of the find-rich layer, as most finds were retrieved from this part. At the edge of this concentration of finds a large lump of clay was found.

The composition of the assemblage was remarkable. It included a piece of ochre, three adzes, 13 fragments of grinding stones, 1215 fragments of pottery and 619 pieces of flint, including the astonishing number of 35 arrowheads. The latter are strikingly diverse and are made of different types of flint, mostly Rijckholt, but also Rullen, Valkenburg and Hesbaye flint. Some are still unfinished, others burnt, and typologically there are those with a symmetrical shape, left- or right-winged examples and points with a straight base (Figure 3). The diversity of the assemblage shows that this is not the work of one single knapper. It can also be ruled out that these arrowheads belonged to a bundle of arrows which was deposited. The arrowheads were found scattered throughout the layer over an area of c. 2 x 2 m.

Although the assemblage may easily be interpreted as typical settlement waste dumped in a pit, we believe it is not. The main reason for this is the large amount of arrowheads, which stands out in comparison to other large LBK sites. The entire settlement of Elsloo-Koolweg (Modderman 1970; Van Wijk and Porreij-Lyklema 2015) yielded a total of 154 arrowheads, at Geleen-Janskamperveld (Van de Velde 2007a) 74 were found, at Maastricht-Cannerberg (Van Wijk 2016) only eight. At the settlement of Sittard-Mgr. Claessenstraat (Modderman 1959; Van Wijk 2001) 69 arrowheads are known altogether, of which over half come from pit 147. The diversity within the assemblage, such as different types of arrowheads, the occurrence of unfinished pieces and the burnt fragments clearly suggest that various inventories were deposited here. It is unclear whether this should be regarded as a single event where arrowheads were deposited or if it was a continuous deposition over a longer period of time. The variety of the assemblages indicates that the deposition would have involved a number of participants. Again, the shape and dimensions of the pit exceed the average pit found in LBK settlements. The feature has many similarities with the already mentioned peculiar pit 1h from Maastricht-Klinkers, which suggests that the deposition goes beyond regular domestic waste patterns (Bosquet 2013; Bosquet *et al.* 2008; Gomart *et al.* 2015; Hachem 1997). The deposition of a lump of clay, which is a rare find, can also be seen in this light. Another example is known from Urmond-Centraal Laboratorium (Van Wijk *et al.* 2014), where a lump of clay was found in one of the features.

Still, we also have to bear in mind that the artefacts present within the pits will not always be representative of or represent the activity (structured or symbolic deposition) which took place in and around the pits (Boelicke *et al*. 1988; Hachem 2000; Stäuble 2013). Social interactions or particularly domestic behaviour are part of a complex process which most of the time is passed over or disregarded during the analysis of archaeological complexes. It is therefore important to bear in mind that refuse in pits may correspond to activities outside, as well as inside the house and often in a distorted manner, for instance when refuse was intentionally removed and deposited into a pit (Pavlů 2013, 166).

Maastricht-Cannerberg: a special knapping episode

A good example of special waste management within a settlement stems from Maastricht-Cannerberg (Van Wijk 2016). During excavation, five so-called flint working pits or lithic atelier pits were found. These yielded great quantities of flint (360 kg), far exceeding standard LBK pits. Three features (pits 2080, 2210 and 2454) were excavated and have, apart from their size and find assemblage, considerable similarities concerning the composition of the flint assemblage and the way in which the flint was deposited.

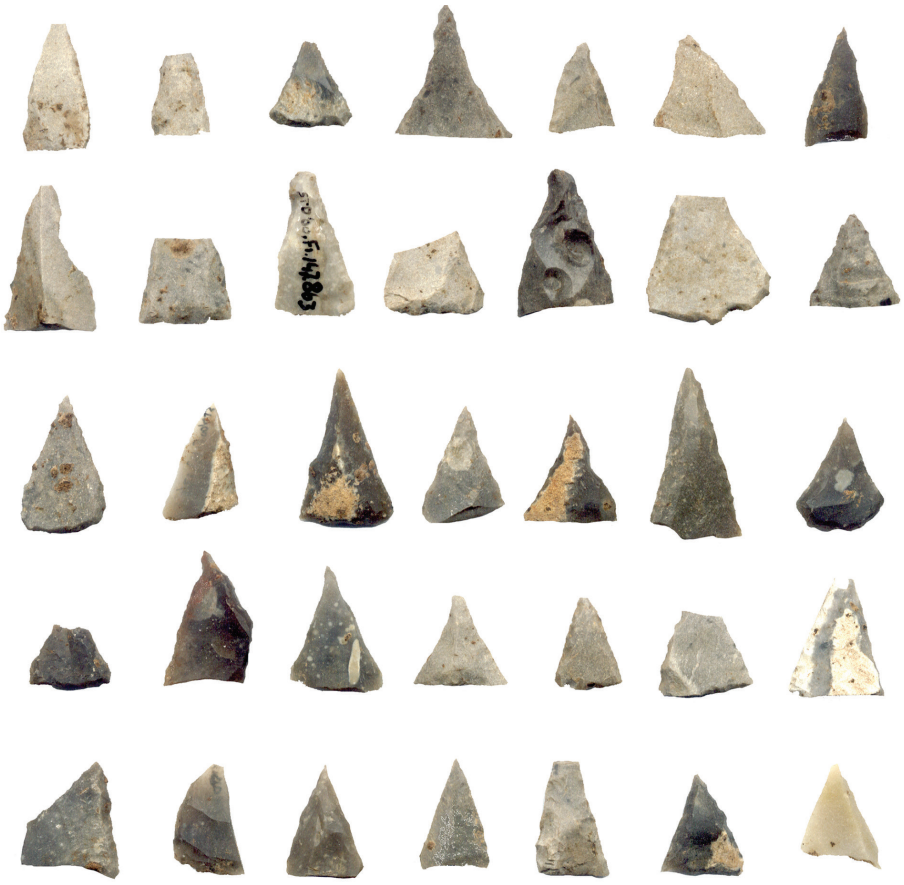


Figure 3. Selection of the arrowheads from Sittard-Mgr. Claessenstraat (photo: I. van Wijk).

Pit 2080 is part of a pit complex and has a distinct top layer which yielded the most finds (Figure 4). The pit measures 6.7 x 8.5 m and reached 1.9 m below the surface. The primary fill is homogenous, containing finds like pottery, flint and stone. Originally the pit consisted of a series of kettle or silo pits. On top of the homogeneous fill, a dark brown top fill was present which primarily contained flint, but also some pottery, burnt bone and ochre fragments. The presence of only one single decorated pottery sherd makes a chronological attribution impossible.

Pit 2210 is a comparable but slightly smaller pit complex (5.5 x 6.1 m) with a depth of 96 cm. Again, the pit complex consisted of different kettle or silo pits. The bottom of the top layer yielded the majority of finds, especially flint but also pottery, burnt bone and stone. This pit dates to phase IIb.

Pit 2454 was located directly south of a type 2 house and is considered part of this house's yard. It differs considerably from pits 2080 and 2210 in terms of size and fills. The pit is oval in shape, measures 1 x 1.5 m and is 74 cm deep. Because of its kettle shape the pit was originally considered to be a silo pit. Its layered fill structure suggests rapid infilling in various stages. Not long after the pit was used, or re-dug, a layer c. 20 cm thick was formed by large numbers of flints together with some pottery and stone fragments. After this deposition the pit gradually filled in with loess and settlement debris. The pottery dates this pit to phase IId.

Apart from size and find spectrum, all three pits share considerable similarities regarding the composition of the flint assemblage and the way in which the flint was deposited. Firstly, the analysis of the flint showed that almost every aspect of flint production was represented, from the first stages of flint knapping to the

end stage of the process, which resulted in the production of blades (Figure 5). Furthermore, the entire assemblage is composed of Rijckholt flint. It is evident that the flint from these working pits was not intended for local domestic use. Although the locally available Rijckholt flint was primarily deposited in these flint pits, relatively large quantities of Rullen and Hesbaye fine grey flint were brought into the settlement and were found in other pits on the same yard. The great amount of Rijckholt flint within the five refuse pits discussed here resembles the blade production workshops from Verlaine-Petit Paradis (Burnez-Lanotte and Allard 2003) and Darion-Colia (Cahen *et al.* 1990, 130; Keeley and Cahen 1989, 162–3) located in the Belgian Hesbaye, c. 40 km to the south-west of the Cannerberg. In the Hesbaye, too, the pits were not randomly distributed throughout the settlement, but positioned in its northern part, away from the yards. The surplus production of fine Hesbaye flint at these sites served a supra-regional exchange network, with settlements located in the heart of the flint-bearing region of Hesbaye producing high-quality blades that were distributed up to 150 km away (Allard 2007; Allard and Burnez-Lanotte 2008, 37–8). The flint working pits within the Cannerberg settlement may have served a similar purpose and the Cannerberg community may have played an important role in social and economic distribution networks, comparable to Hesbaye sites like Verlaine-Petit Paradis, Darion-Colia, Dommartin, Magarny, Bois Blanc, Haneffe and Donceel (Allard 2005, 218; Frébutte and Marchal 1998, 146; Golitko 2010, 186).

The flint layers of the Cannerberg pits were so dense that hardly any soil was present between the many fragments. This dense fill suggests a very rapid deposition. Strikingly, just as the aforementioned pits from Klinkers and Sittard, two of the three Cannerberg depositions were formed after a pit complex fell into disuse. Also, nearly all the pits were located at the edge of the wards or at least outside a yard. It can be concluded that the flint was not only intentionally and rapidly deposited, but also that these pits were intentionally positioned at the edge of the domestic space. This should be regarded as a deliberate action by the inhabitants or by one or more flint knappers, or both. It is intriguing to consider what kind of event happened before these pits were filled: an ordinary clean-up from an ordinary knapping event seems out of the question. Rather, this points to a massive communal activity at the pit, or the result of an activity which was dumped in the pit. We believe this was a highly managed event taking place within a short time span and likely with distinct ritual and social connotations regarding place, time and execution.

A rocky bottom at Maastricht-Cannerberg and Elsloo-Koolweg

Depositions of larger or smaller numbers of objects are archaeologically poorly visible when situated outside the settlement. Hardly any excavations take place there. Yet inside the settlements, evidence is also not clear-cut. In order to recognise deposition practices, taphonomy and site formation processes are crucial (Ilett and Coudart 1982) when interpreting the manner in which a pit was filled, as are practices of reuse of pits or house sites (Pavlů 2013, 166). This is perhaps easier when a single object is deposited or cast away in refuse pits, although identification outside the regular domestic sphere is not easy. Three examples are presented here.

At Maastricht-Cannerberg (Van Wijk 2016) an oval pit (pit 1980) with a depth of 120 cm was excavated. The top layers contained many finds (c. 2100). The pit was

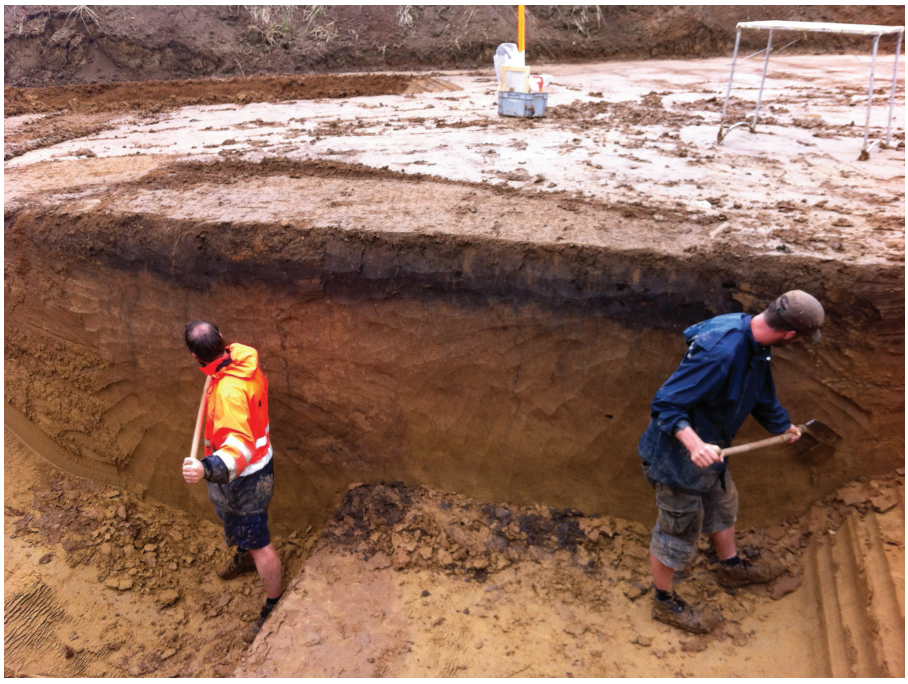


Figure 4. Maastricht-Cannerberg. At the top of the section the layer with the large concentration of flint of the knapping episode in pit 2080 is visible (photo: I. van Wijk).

Figure 5. An overview of the flint from pit 2080 at Maastricht-Cannerberg (photo I. van Wijk).

therefore interpreted as a refuse pit, probably belonging to one or two households. The bottom part of the pit was almost completely without finds. However, a very large stone was placed at the very base of the pit. As there are no clear functional indications why this was done and the stone more or less marked the beginning of the use-life of the pit, it is plausible to assume this may have been a deliberate deposition.

At Elsloo-Koolweg (Van Wijk and Porrij-Lyklema 2015) another large stone, covered with ochre, was found at the base of a large pit (pit 246). The pit contained several layers of burnt daub and charcoal on top of a layer of burnt pebbles (Figure 6). It was therefore thought that the pit was used as a fireplace or that remnants of an oven were deposited in the pit. Again the stone seemed to be an isolated deposition which later became covered with soil and refuse.

Figure 6. (above) Pit 246 at Elsloo-Koolweg and the stone covered with ochre (photo I. van Wijk).

Figure 7. The large ochre-covered quern from Beek-Kerkeveld (Lohof and Wyns 2009, fig. 44).

At Beek-Kerkeveld (Lohof and Wyns 2009) a large ochre-covered quern (Figure 7) was deposited in a ditch (pit 52). The ditch consisted of two distinct layers which suggest gradual infilling. Interestingly, the pit is part of the earliest stage of an enclosure. The ditch is without any further finds, which suggests that the quern was deliberately deposited.

Although these pits differ in terms of shape and fill patterning, the deposition of a large stone in a central position at the base of the pits suggests a deliberate action before the pits were filled. The stones appear to have been used as anvils and/or grinding stones, yet they were certainly not broken and were deposited before they were worn out. There were no additional indications for why they may have been discarded. The ochre-covered stones from Beek and Elsloo may also relate to the more familiar phenomenon of the deposition of ochre-covered querns and quern fragments (Hamon 2004; 2009; this volume; Van Gijn and Verbaas 2009). However, as no use-wear traces were found on the 30 kg stone from Elsloo it can be ruled out that it was used as a quern. Importantly, the lack of use-wear traces does not mean that the stone was not used at all. Its use-life may have been short or may not have left any traces. In view of their contexts, the position of these stones may perhaps relate more to the primary use of the pits as loam or silo pits than to their final use as refuse pits. They invite us to rethink waste management and perhaps the more ritual connotations of common or domestic

social practices. Examples of large stone hoard depositions are spread all over Bandkeramik Europe (Benes *et al*. 2015). Grinding stone depositions are known from settlements in Goseck, Germany (Bertemes and Northe 2010) and the Paris Basin and Hainaut region in Belgium (Hamon 2008), while semi-finished grinding stones were found at Holubice, Prague-west district and Praha-Liboc in the Czech Republic (Kovačiková and Daněček 2008). Especially the hoards from the Paris Basin and Hainaut region are interesting, as they were linked with domestic areas and were given a symbolic value. The stone hoards, however, are not always related to a specific house and also appear isolated in pits, as was the case for the pits from Beek, Elsloo and Maastricht.

Figurine deposition at Sittard and Geleen

A final example of deposition within a settlement context is that of figurines found in a number of refuse pits. In total, the number of figurines from Dutch LBK sites is three. A first one was documented by Beckers and Beckers (1940, 53, 122) at Stein "hut 2" (in fact a rubbish pit, probably belonging to a house). Modderman (1959, 97, 100) discovered a second one in a pit at the LBK settlement of Sittard. It probably consists of the left thigh of a standing figurine (pers. comm. J. Lüning) (Figure 8). The most recent discovery was that of two fragments of a ceramic figure at the settlement of Geleen-Janskamperveld. It was smashed and according to Van de Velde (2007b, 135) the inhabitants of house H20 dumped it into a loam pit.

Much has been written on the making, function and role of these figurines or idols (*e.g.* Becker 2011; Hofmann 2005; Lüning 2005a; 2005b). Van de Velde (2007, 136) correctly questions the use of the term idol, as it implies a religious use. In any case, what can be said (see also Van de Velde 2007 and references) is that these figurines are always broken, often with evidence of this having been done on purpose. They are found in settlement waste and not in graves and they are extremely rare (for instance three from c. 70 known LBK sites in the Netherlands). They are more often found in central Europe and many date to the Earliest LBK, making the Dutch examples rather young and rather peripheral.

Due to their limited number, little can be said on their use. Their rarity and eventual fragmentation by breaking or smashing point to an element of performance, similar to the exotic pottery smashed at Maastricht-Klinkers or the flint knapping at Maastricht-Cannerberg. It remains unclear, however, whether this should be seen in the context of an entire village, or even a larger regional community, gathered for the occasion. Alternatively, one could envisage use and breakage within a household setting, or even at an individual level. That figurines ended up in refuse pits poses yet a further problem of interpretation. This could be seen as a transition to the category of "normal" settlement waste, but at the same time may have been meaningful. The rubbish pit may have been the scene of ritual and breakage, or it may have been the designated and only location where this figurine should end up. In any case, it is telling that apart from exotic pottery, supposed "founding" deposits of querns or other stones and, as attested elsewhere, human remains, figurines also appear among the waste content of LBK pits. If anything, this cautions against an all too straightforward interpretation of LBK pits as mere rubbish dumps and argues that they should be treated as a more integral part of the social landscape of an LBK site.

Figure 8. The figurine from the Sittard settlement (photo: Rijksmuseum van Oudheden).

Depositions in the margin

Here we present two examples of depositions that took place, not in the settlement itself, but outside of it, at the edge of the habitation area. In both cases the settlement is close by, yet the position and character of both examples may point to different types of activities taking place in these locations in comparison to the settlement proper. Although one can argue to what extent such a binary opposition is valid, this is also at the edge of the inhabited and constructed domestic world and the "wild" and perhaps dangerous natural world (see for instance Whittle 1997), or as Hodder (1990) once put it, the *domus* and the *agrios*. This in turn may have affected the composition of the group or individuals present during or prior to deposition as performers or witnesses. While the location and scale of both examples argues in favour of smaller groups being present, probably below the village level, this cannot be further substantiated at this point. Also, in both cases there may very well be a non-ritual, or non-symbolic explanation as well.

Sittard-Ligne: pottery deposition in a wet context

The first clear example comes from two separate excavation campaigns carried out between 2006 and 2014 (Ruijters *et al*. 2016) that took place at the northern edge of the settlement of Sittard-Mgr. Claessenstraat (Modderman 1959; Van Wijk 2001). Both trenches were situated on the former banks of the Geleenbeek, which forms the eastern border of the Graetheide settlement cluster. It is the first Dutch site where Bandkeramik remains were found in and next to the former stream and its banks. Little remained, however, because of subsequent erosion and deposition of sediments by the Geleenbeek in the Bronze and Iron Ages, the Roman period and Medieval times. The stream cut through, but also covered the Neolithic gully and river deposits. This demonstrates that the area can be classified as highly dynamic. The Geleenbeek here enters a low-lying area before joining the Meuse, losing large quantities of sediment, which led to many avulsions.

Apart from many finds of other periods, LBK material was also discovered. The 2006 and 2008 campaigns yielded many pottery fragments, including Limburg pottery (Ruijters *et al.* 2016). This pottery was broken and left behind on the banks and became scattered over a large area before it was finally covered by sediment. The 2013–2014 campaign also yielded numerous LBK finds, of which many should be regarded as secondary deposits because of a regeneration of the Geleenbeek after the LBK. Overall there appears to be a palimpsest situation, hampering a clear attribution of the finds. Especially eye-catching, however, were two complete LBK pots (Drenth 2016; Ruijters *et al.* 2016) (Figure 9). They were found on top of each other and apparently deposited along, or perhaps within an active bed of the Geleenbeek. They were not placed in a pit, but on the ground surface or in the water and quickly became covered with sediment. One burnished bottle is undecorated, but has several lugs. It was placed on top of a decorated vessel which, based on its decoration, is dated to Modderman's phase IIa or IIb.

The Bandkeramik assemblage included many flint tools as well as an adze, fragments of querns and animal bones, which point to a functional use of the area. The proximity of the Mgr. Claessenstraat settlement indicates that we are probably dealing with one of the rare off-site locations in the proximity of a village where people went to fetch water or to skin and butcher animals and so on. This is substantiated by the presence of many coarse ware pots and the dispersal of pottery fragments. As such, the area should firstly be regarded as a waste area. Still, the two pots standing upright appear to have been deliberately abandoned or deposited in a wet environment. Although a functional explanation similar to the rest of the material cannot be ruled out, it is a known tradition to make depositions in wells, as in the Altscherbitz LBK well near Leipzig (Tegel *et al.* 2012). Also, since the majority of the assemblage was fragmented, we believe that a ritual explanation should be considered.

Stein cemetery: burying adzes

The second example involves the deposition of a number of adzes (Bakels and Hendrix 1999). In 1982 a couple of municipal workers were digging a grave at the Roman Catholic cemetery of Stein. While doing so they discovered a concentration of adzes. Initially they divided the adzes among themselves, but

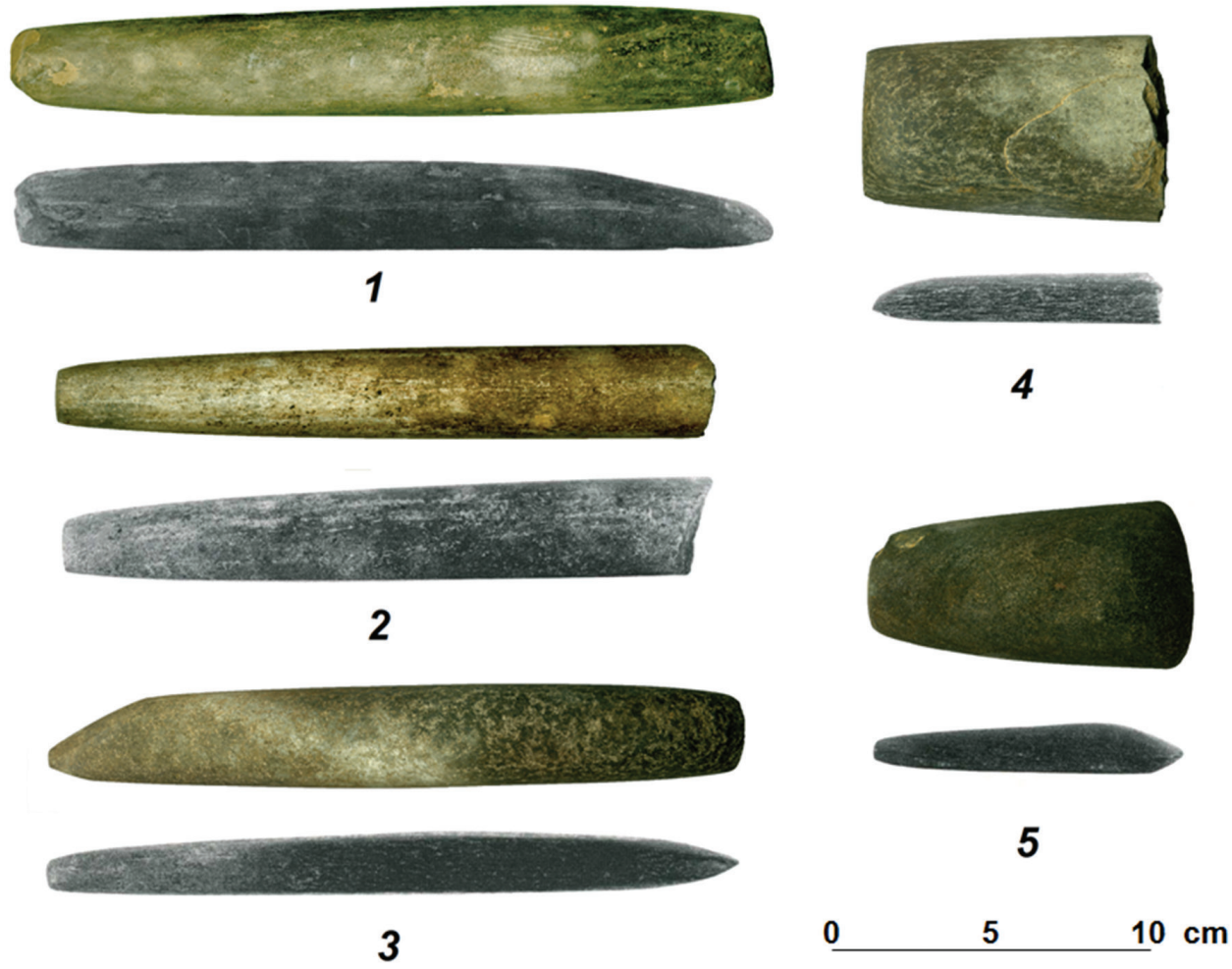
Figure 9. The two vessels found at Sittard-Ligne (Ruijters et al. 2016, fig. 7.22).

later one of them sold them to the archaeological museum at Stein. Three high and two flat adzes were documented, but there may have been more (Figure 10). The adzes were situated at a depth of 1.2 m, but since soil had been artificially brought into the cemetery in recent years they may have been buried less deeply, or even not at all. According to one of the diggers no evidence could be seen of any pit, but one can wonder to what extent a pit in the clean loess, which was closed up quickly with the same material, would be visible to the untrained eye. As to the position, it was reported that the high adzes were placed flat on the ground in a parallel position and that the flat adzes were lying next to this. All were oriented in the same direction as the burial pit, lying on their flat sides and with the cutting edge pointing in a north-easterly direction. When taking into account the adzes themselves, these stand out from the regular items found in settlement waste or LBK burials. What is remarkable is their size. The three high adzes are the largest ever found in the Netherlands, with the longest complete piece measuring 22.5 cm, a damaged one at 25 cm and a broken one with a remaining neck at 21.2 cm. These were huge and impressive adzes. Also, all were made of amphibolite or actinolite-hornblende-schist (Bakels 1987). Since they are all slightly different, one may wonder whether they came from the same quarry (Bakels and Hendrix 1999). Although smaller adzes of this raw material are regularly found amongst settlement waste and in graves, this kind of rock still represents an exotic resource from a source in eastern central Europe. A final aspect to be taken into account is the location of the site of deposition. It is situated right at the edge of the loess-covered middle terrace at a distance of 30 m to a steep drop of 34 m to the lower terrace and with (potentially) a magnificent view over the Meuse valley. Similar to the position of the pit at Maastricht-Cannerberg, a position at the top of a slope seems to have been of importance here. While the location itself was not within a settlement proper, isolated finds in combination with the known LBK settlements in the area indicate that a settlement must have been present in the direct vicinity, probably to the south.

The question is: what are we looking at? Compared to the distribution of isolated adzes (mostly these are beyond the loess), the Stein find is maybe not that special. Yet, compared to the distribution of hoard finds it is. It is a hoard in the far west and its content is considerable in terms of the number of items (Bakels and Hendrix 1999; compare for example Quitta 1955). Yet the question remains whether we are dealing with a trade depot, a cache for use in the field or indeed a structured ritual deposit. While the original publication by Bakels and Hendrix (1999) does not choose between these options, it does emphasise the value of the raw material and argues that a ritual sacrifice would remove this value from society and active use. We, however, think that this is the most likely choice. The most important arguments are that there was no pit, or one that was closed fairly quickly and perhaps without marker, and that the positioning of the items deliberately pointed them all in the same direction. Furthermore, the location was in a prominent position. While this does not argue against the presence of a field or soon-to-be-cut forest it is remarkable that the hoard was deposited in a topographically distinctive location in the landscape. The position of the adzes indicates that were are not dealing with hafted implements, but with pristine adze blades. One would rather expect such a large grouping that resulted from trade or exchange to be present within the village. Finally and most convincingly, the composition of the group points to the presence of very large and impressive

adzes from a well-known, yet exotic source. The presence of categories of normal tools or weapons that were used every day and a specific category of ritual finds has been well documented for the Neolithic and subsequent metal ages. A tell-tale example is the work by Pétrequin and Pétrequin (2016) on the jadeite axes from the Italian Monte Viso area. In the third millennium BC, this exotic green stone was distributed as far as the coasts of Scotland and Ireland. Furthermore, the large stone axes in particular are often in pristine condition and were deposited in specific locations in the landscape. For the Funnel Beaker culture, similar patterns have been documented in the Netherlands (Wentink and Van Gijn 2008; Wentink *et al*. 2011). In particular for the well-documented hoards of the subsequent Bronze Age, the importance of exotic materials on the one hand (Fontijn 2008a; 2008b; 2019) and the role of extraordinarily large or supersized weapons on the other (Fontijn 2002) is well accepted. There is, we think, currently no reason to rule out these same preferences for the Early Neolithic.

Figure 10. The adzes found at Stein (photo: W. Hendrix).



Deposition at large: isolated finds outside the LBK occupation area

A final category we wish to mention here are LBK finds outside the main LBK settlement areas. In particular, this involves the wide distribution of adzes, LBK flint and pottery. Numerous examples can be given and have been documented (Louwe Kooijmans 1998; Van der Graaf 1987). Since they are often found on the surface during surveys, little is known about their context. Some have been found in the loess area, sometimes in relation to lithic extraction points (Amkreutz *et al.* 2009, 17–8). A recent example comes from the Riesenberg near Cadier en Keer, where LBK finds were documented south of the settlement areas (Van Wijk *et al*. 2018). These can be interpreted as off-site activities within the home range (cf. Bakels 1978). Others are known from the coversand area. Those in a zone approximately 20 km from the LBK settlement clusters have been interpreted as resulting from cattle herding or other expeditions (Amkreutz *et al*. 2009; Louwe Kooijmans 1998), while finds recovered beyond that have been interpreted as resulting from exchange with hunter-gatherers (Verhart 2000). The presence of an LBK arrowhead at the Mesolithic site of Hardinxveld-Polderweg (Louwe Kooijmans 2003) is a case in point. Nevertheless, the absence of a distinct context in most cases severely hampers their interpretation and the identification of the actors involved, whether they were LBK farmers, hunter-gatherers or the makers of La Hoguette pottery (Amkreutz 2010, 542). There is, however, no reason to assume that structured deposition for socio-symbolic reasons was absent in this area. One possible example is the Bandkeramik pot dredged from the Meuse near Asselt in the coversand area (Luys 1990). At the site of Kessel-Eik-Keuperheide (Modderman 1974) flint was found alongside the sherds of at least three different Early Neolithic Limburg ware vessels, amongst which was a large bowl with a diameter of 45 cm (Modderman 1974, 6). This site was also at a slightly elevated location in the vicinity of a wetter area. Some of the pottery was found in a shallow depression. Both at Asselt and Kessel-Eik pottery (either LBK or associated Limburg ware) is present at a distance of 40 km (Asselt) to 50 km (Kessel-Eik) from the LBK settlement areas where it may have been produced. Both locations are also in close proximity to the valley of the Meuse and in the case of Asselt the pottery was found during dredging activities (and hence may have been deposited in a wet context). It may be argued that transporting pottery this far outside of the known settlement area points to considerable investment that may go beyond any economic or functional requirement. Whether we should therefore still see this as traces of an expedition or as exchange remains to be debated. At the same time, a ritually motivated deposition, either of a valuable exchange commodity or of a familiar and meaningful object from the homeland, is another possible explanation. In any case, explaining their presence without useful contextual information remains difficult. These finds also underline that whatever may have motivated Bandkeramik activities outside the immediate habitation area, these activities themselves could also have encompassed ritual behaviour and depositions.

Discussion: interpreting structured deposition in the LBK of the Low Countries

In this article we have discussed a number of potential cases of structured deposition in the Linearbandkeramik of the Low Countries. As argued earlier, the number of cases presented should warrant against over-interpretation at this stage. While for some instances the symbolic character of deposition appears unequivocal, such as the massive breaking and dumping of ceramics at Maastricht-Klinkers, other cases, such as the pottery in the stream valley at Sittard-Ligne, are individually less convincing. Other, more economic or functional motives may form a good explanation here as well. Also, as has been argued by several scholars both in view of ethnographic and archaeological contexts (*e.g.* Bird-David 1990; Bradley 2000; 2005; Fontijn 2007; Ingold 2000; Pétrequin and Pétrequin 2006), there is often no absolute distinction between ritualised or symbolic practices and functional behaviour. Both in place and practice aspects of both may merge to a smaller or larger degree. For instance, the many arrowheads found in the pit at Sittard may represent a highly symbolic deposition in a selected location, or the abandonment of useless arrows in a random pit, or in fact anything in between. This has repercussions for the larger discussion at hand. Defining "structured deposition" is problematic in this respect given the number of examples identified. "Structured" as indicating that there is patterning and regularity to the behaviour of deposition observed may equally apply to normal functional behaviour and this behaviour may in itself not be without ritual connotations. At the same time symbolic or ritual deposition need not be structured, but the limited evidence available would at this time prevent us from any distinct observation in that respect. While this may sound like a disclaimer it is meant to indicate that we should be aware that much remains unknown regarding Early Neolithic ritual behaviour in the Low Countries and that keeping an open mind is necessary, especially in areas where organic preservation is poor. At the same time there is more than enough evidence even within the study area that ritual or symbolic behaviour and deposition practices were a fundamental part of society and are variable in scale and character. While most examples for this are derived from the Bronze and Iron Ages (*e.g.* Fontijn 2002; 2008b; 2019), there is evidence that its roots should be sought in the Neolithic (Fontijn 2019; Wentink and Van Gijn 2008; Wentink *et al.* 2011). The fact that most early examples date to the Middle and Late Neolithic of the central and northern part of the Netherlands should rather be seen as indicative of the nature of archaeological preservation and existing research traditions than as emblematic for any absence earlier on. We therefore also hope that the current contribution may help in attracting wider attention for this topic and awareness when excavating.

Place, people and performance: reflections on selection, location, timing and impact

Taking into account the observations presented above, we will now treat the examples presented as stemming from structured deposition. It seemed worthwhile to check for any patterning or regularity in the depositional behaviour of the cases presented and whether this allows us to think of depositional categories. For purposes of identification we have chosen to break down the examples and discuss certain aspects of them.

Selection and treatment

A crucial first categorisation of what defines a structured deposit is whether there is any distinct selection and treatment of material. In the absence of comparable cases for our study area this is hard to say, but for the examples mentioned the non-random character in many cases points to other motives. In the literature on deposition (*e.g.* Bradley 1998; 2016; Fontijn 2002 and references; Fontijn 2008a; 2019) it is often the valuable and exotic items that are deposited. However, less noteworthy objects may also be treated in a particular way. Sometimes objects are purposefully destroyed or manipulated and at other times unused, pristine objects end up in specific contexts. For our case studies a very clear example is the deposition at Maastricht-Klinkers. The appearance of such a volume of exotic pottery from many geographical directions, in particular eastern Europe, ending up in the same place is unparalleled in the Dutch LBK. Moreover there is evidence that this pottery was purposefully destroyed in at least two episodes of breaking and deposition. The large knapping event at Cannerberg provides less evidence for selection, although it appears that exclusively flint of Rijckholt type was worked and that in the Late LBK there was increasingly a village-based focus, or maybe even access to particular flint sources (Van Wijk *et al*. 2014). Less circumstantial is the evidence for selection with respect to the adze deposit at Stein. Clearly both the raw material (amphibolite) and the size of the adzes were factors of importance. Size may also have been in play for the anvil and grinding stone on the pit bases at Elsloo and Sittard, while quantity may have been an issue for the large number of arrowheads deposited in Sittard. In any case it seems that for a number of the potentially structured deposits presented here there is convincing evidence for selection of material, whether these were exotic or exceptional items, or less conspicuously the regular domestic objects. In all cases the element of selection may also have been important in relation to the place of deposition.

Location

Regarding location or place we see that there is often a particular eccentric location that is of importance. First of all a number of depositions take place in the village itself or more specifically outside the domestic area and at the edge of the village. The act of deposition or its result may have been public. In the case of the pottery at Klinkers the concentration in one large pit and the two separate phases indicate that the location was specifically targeted. Its position at the edge of the village with a potentially commanding view of the Meuse valley is noteworthy. It is not too far-fetched to interpret this area as the potential traffic corridor and territorial boundary for these Early Neolithic communities, making the location meaningful. Another focus on place may have applied to the knapping episode at Cannerberg, where it appears that a pit, perhaps belonging to a specific house, yard or part of the settlement was the area for depositing knapping debris and perhaps for intensive knapping. The character of the pit even warrants the suggestion that it was dug for the purpose. Research at Verlaine-Petit Paradis and Darion-Colia also confirms the existence of place-bound episodes of lithic production (Allard 2007). These may have had both ritual and economic connotations. Also, the placement of large stones at the bases of (freshly?) dug large pits at Elsloo and Cannerberg points to place section. For the figurines or arrowheads in refuse pits this may be less evident, but their appearance in those pits may be associated with particular houses, their occupants and lineages.

Also, if time is added, in the case of the arrowheads that particular pit may have been targeted for deposition over an extended period of time.

Of a different nature are the depositions taking place outside the village, namely the complete pottery at Sittard-Ligne and the adze deposit at Stein. In those cases it is not the settlement proper where the deposition and perhaps the activities leading up to it took place, but a location at the edge of the village. In structuralist terms this represents a boundary between two worlds, perhaps dividing Hodder's (1990) *domus* and *agrios*, the wild and the domesticated world, the village and the bush, the world of the farmer and that of the hunter-gatherer. However, the choice to deposit may also be more nuanced and relate directly to the location itself. The position of the Ligne pots in a stream valley may have been important in itself. Water is known as the place where the world of the living may meet that of the gods and ancestors (*e.g.* Bradley 1998; Fontijn 2002; 2007; 2008a; 2008b; 2019). Similar motivations may have underlain the placement of the exceptional adzes at Stein, where the view over the Meuse valley at the edge of the middle terrace may have been meaningful, or at least the transition to that landscape zone. At the same time this could also have been the location of a field, or an area that would see investment in cultivation, encouraging the deposition of impressive versions of the crucial tools necessary for its realisation.

Furthermore, (storage) pit complexes were often targeted for the creation of new pits in which deposition could take place. It appears that such a choice is not coincidental. One could argue that there is a certain meaning attached to using the (abandoned) structures of (former) villages for making non-economic depositions.

Finally, for the finds further afield, the absence of context hampers interpretation. In any case their position at increasing distances from the inhabited LBK settlements points to an investment in bringing cultural elements of this world to these areas, some of which were clearly far beyond the loess. This means that if they indeed represent intentional deposits, their position in non-LBK territory (Amkreutz *et al.* 2009) may indeed be a distinct way of marking ones presence.

Performance and timing

Apart from selection and location, timing and performance are also factors to take into consideration. As archaeologists we should be aware of the fact that we deal with the materially preserved aftermath of the actions surrounding deposition. It may be the case that deposition itself was crucial to the actions or rituals involved or even the centre of these. It could also be the case that the eventual way or place for the items involved to enter the archaeological record was of little or no significance or that the items in themselves were of no or little intrinsic significance. The kinds of materials and their location do allow for some hypotheses. Collecting and smashing pottery at a fixed location at Klinkers was probably not very secretive. Of course, as has for instance been documented for Papua New Guinean societies (*e.g.* Knauft 1993), access to certain rituals or performances was prohibited for some groups in society, be they men, women, children etc., yet the awareness of something happening or the general knowledge of these things would be self-evident. One could assume that the activities involving pottery at Klinkers, or perhaps those surrounding knapping at Cannerberg, included or were open to a large part of the village community. As such one could suggest that the level of involvement in and performance for these activities could have been high and that

their timing was well-coordinated and significant. This appears different for other examples. For instance, the activities surrounding the deposition of large grinding stones in pits or the many arrowheads may have been less conspicuous. Perhaps these were family-based rituals, or small ritually rooted activities that took place at a certain moment in time, such as the digging of a pit or the construction of a house, the birth of a child or the death of a member of the community, a failed or a successful hunt etc. Such "smaller" examples may be much more "domestic" or "common" in nature. It would be worthwhile to further investigate these examples since they may be more frequent than we assume and an effort to document them may lead to recurrent patterning. This line of thought, however, applies less to the figurines. As argued above, their occurrence is very limited and they are often smashed. This argues in favour of a much rarer practice and hence a potentially more selective group involved as participants or witnesses. This could also already apply to their making and use, as well as their eventual deposition.

The activities taking place in the margin of settlements also allow for hypotheses on timing and performance. There is ample evidence for the association of certain objects with groups in society, for instance the stronger link that men appear to have with adzes and arrowheads (Van de Velde 1979), and extrapolating from this the activities surrounding these, and this may also have repercussions on deposition, which may be integrated with aspects of place and the activities performed there, or the taskscape as defined by Ingold (*e.g.* Ingold 2000). There are very distinct patterns of routines and practices in the landscape that in themselves are crucial to the fabric of a society (*e.g.* Whittle 2003). The rules and traditions surrounding many aspects of LBK society (*e.g.* Sommer 2001) seem to suggest that these also applied to the taskscape. While conjectural, one could assume a male presence surrounding the adze deposition at Stein, while pottery deposition at Ligne may have taken place in a female context.

A geographical structure

As has been stressed, the number of potential cases of structured deposition in the LBK of the Low Countries does not yet allow for a clear pattern to be documented. Nevertheless, we feel that the approach presented above is useful. By and large there is convincing evidence for selection of materials and place and for differences in timing and performance. Taken together these could eventually lead to the discovery of a geographical structure for deposition. The fact that we can take into account evidence of deposition within the settlement itself, in and amongst the debris of everyday Early Neolithic life, points to the interwovenness and occasionally public character of these acts of deposition and the rituals involved. The village itself seems the place of either very visible, action-packed rituals involving an audience and perhaps festivities, while at the same time bearing witness to smaller-scale, more domestic acts of deposition, or rare instances of very special depositions (from our perspective) of anthropomorphic figurines. For both we have seen convincing indications and it begs the question to what extent rituals were more or less ceremonial, or more or less domestic. Often it also appears that old complexes of pits were deliberately targeted for subsequent deposition activities. The margins of the village itself seem to have been locations that were often chosen. In this sense it is tempting to speak of "domestic depositions", especially with regard to the less conspicuous examples such as the grinding stones at the bases of the pits or the

many discarded arrowheads. Unfortunately this term may be inappropriate since we are still guessing at the level of meaning and purpose attached to these actions.

A different type of selection seems to be at play for the area at the edge of the village, or rather beyond the inhabited village proper: the locations of the fields, of water and eventually the pristine and enormous Atlantic forest. Here we should expect a selection of certain materials, but also of certain groups in society using and depositing these. One could argue that the degree and intensity of structured deposition is less regular and that the position in the landscape is highly significant. Depositions in these areas may have distinct characteristics that become informative on the various existing LBK taskscapes. They may also have territorial or liminal connotations. In this respect one aspect that needs further attention is whether, similar to later prehistoric deposition practices as documented from the Middle Neolithic onwards and in ethnographic contexts, there is evidence for deposition in or near watery places, such as rivers, streams, lakes or peaty areas (*e.g.* Fontijn 2002; 2008b; 2019). With respect to the depositions far outside the LBK settlement zone it is evident that the character of the objects and the groups involved in these expeditions are important factors. Furthermore, the deposition of artefacts from far away and relating to the settled LBK world may be a strong symbolic marking of the land and of the presence of relative newcomers, or for instance reference the physical or social networks enabling such ventures outside the home range.

While the robustness of this subdivision is currently based on too little examples of clear-cut practices of structured deposition, we feel that the incorporation of aspects of selection, location and performance within a geographical perspective will form an important contribution to understanding this aspect of LBK society, and indeed (prehistoric) deposition studies in general.

Conclusion

As argued by Fontijn (2008b; 2019) and others (*e.g.* Bradley 1998; 2016) there is a relationship between which objects were deposited where in the landscape by whom. It appears that a geographical approach to uncovering such a relationship may be fruitful in particular for the Early Neolithic LBK. An important factor in support of this is the documented character of LBK society and practice, which appears to be very structured, traditional and on the verge of dogmatic across large areas and for a long time (see Amkreutz 2016; Sommer 2001; Van de Velde and Amkreutz 2017). While this viewpoint can be nuanced it does support the idea that LBK depositions and the activities surrounding them will also often have had a very structured character and hence may yield archaeological patterning that allows more solid inferences than the ones we could give here. On the other hand, a critical note must be sounded as well. So far a lot of the evidence for the LBK and for deposition practices in particular is related to the settlement, or the zone directly adjacent to it. Historically LBK research in the Low Countries has focused mainly on these settlements (Van Wijk *et al.* 2014) and to a lesser extent on discovering LBK presence and activities outside of these. Moreover, the largely decalcified loess zone in the study area also narrows our perspective, since few or no organic remains are preserved. Nevertheless, we feel that the landscape approach and the densely inhabited and intensively documented settlement area of the LBK in the Low Countries do provide a solid basis for furthering our understanding of structured deposition at this time. If we adopt a wider geographical perspective

and critically document what actually may represent a structured deposit, then a more elaborate and denser pattern of convincing cases of structured deposition will appear. These eventually will help us to understand more of the ritual and symbolic aspects of LBK society which, as we feel, we are only just beginning to understand.

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LBK structured deposits as magical practices

Daniela Hofmann

Abstract

This paper provides the first overview of deliberately placed deposits in the Linearbandkeramik culture. The focus is on "structured" deposits, here seen as those which can be considered to have a ritualised component. After outlining criteria for their definition, the paper distinguishes between single-category deposits (*i.e.* those with only one kind of item, generally either polished tools, grinding stones, animal bone, chipped stone or pottery) and mixed-category deposits, which combine a variety of artefact types. Both are generally found on LBK settlement sites, but can also occur in the landscape. Their contents are analysed and compared to those of cemetery graves, pits containing fragmented human remains, and so-called "cenotaphs" (grave-like pits in cemetery sites which do not contain human bone). This reveals a separation of cemetery burials from the other contexts, with the former more directly focused on the presentation of individual identity (*e.g.* through ornaments) and the latter including a greater variety of items connected with daily activities, including food production. It is suggested that the use of such seemingly "mundane" items in ritualised contexts could be compatible with a reading as magical practices, given also the great variability of the corpus. Finally, the implications of this statement for LBK society are considered.

Keywords: *Linearbandkeramik; structured deposition; magic; social structure*

Introduction: the LBK and structured deposits

Over the last few years, evidence of structured deposition in the LBK has been mounting. Yet its characterisation and interpretation remain partial and have not been integrated in wider debates on this period. Partly, the connection of structured deposition with "ritual" practices, and the distrust concerning whether this is a useful category at all (*e.g.* Berggren and Nilsson Stutz 2010; Bradley 2005; Brück 1999), could be to blame, but the diversity of the phenomenon itself may also be an issue. In archaeology, it is now recognised that a separate sphere of "ritual" as opposed to "profane" action most likely does not reflect prehistoric reality, but that there are nevertheless practices which stand out from the everyday by virtue of their ritualisation — the creation, through a change in the character of practice, of a distinction to the usual or everyday (Bell 1992, 90). These non-ordinary practices fulfil a variety of functions, for instance to engender a change in state in the participants, to communicate with spiritual powers of some kind, or to maintain or challenge power structures. The identification of ritual in this sense, at least in archaeology, has often relied on its definition as a formalistic, traditional, invariant practice which is rule-governed, as well as necessitating

various other framing devices such as particular architecture (for a summary, see *e.g.* Fogelin 2008, 4–5; Michaels 2003, 4–5).

Yet in the LBK case, even where enclosures or other unusual architecture (*e.g.* Lüning 2009) provide potential framing devices, the discussion of ritual has remained a background concern, although the beginnings of a more sedentary, agricultural lifestyle and greater community size could correlate with changes in ritual practices. Flannery and Marcus (2012, 110–52) have for instance pointed out the importance of ritual buildings in keeping early Near Eastern agricultural communities together; here, such activities may have helped to diffuse the tensions inherent in social life once group size grew. Atkinson and Whitehouse (2011) argue that with the advent of sedentary communities, one may see a shift in the nature of ritual practices towards those which are aimed at binding a larger group together, but may help to cement power relations in the process (see also Whitehouse and Lanman 2014). As this can be associated with a more hierarchical social structure, the identification of novel ritual practices, potentially including structured deposition, in the LBK would be of interest.

On this score, LBK research has so far focused on collections of polished stone tools and of grinding stones. These have been interpreted in diametrically opposed ways. So-called hoards of polished stone tools were among the first structured deposits to be recognised (*e.g.* Quitta 1955; Vencl 1975). In a seminal 1998 paper, Jeunesse argued that their deposition at least from the turn of the sixth to the fifth millennium onwards was a key indicator for social complexity, breaking down the distinction between "Neolithic" and "Chalcolithic" societies. Such items were connected to the negotiation of power and hierarchy at a larger scale and in a public setting, although this may not yet be fully developed in the LBK. Collections of grinding stones, in contrast, can take the form of carefully placed deposits of complete tools (*e.g.* Hamon 2005; 2008), or of the less formal discard of fragments of deliberately smashed grinding stones, on occasion treated with red ochre after breakage (see Verbaas and van Gijn 2007 for an exemplary study). Interpretations have so far concentrated on how even such relatively mundane items, used in the domestic sphere, could be woven into personal biographies and how they could acquire a significance beyond a neutral tool, at least at an intimate, personal scale.

This already suggests that structured deposits may serve a wide range of purposes and be involved in very different kinds of discourses, affecting several areas of LBK social life. One main aim of this paper is therefore to characterise structured deposits further, as a basis for a fuller appreciation of their social role. I begin by charting the wide range of practices that could fall under the term of "structured deposition" in an LBK context — noting that this definition remains problematic in its details. Broadly, I consider as structured deposits those items which were deliberately placed during an activity whose prime aim was not routine refuse disposal (for a wider discussion on terminology, see the introduction to this volume). While showing certain similarities, these assemblages are even more diverse in detail than the comparison of polished tool and grinding stone deposits suggests. If anything, they can be most coherently defined in opposition to grave inventories (themselves another clear instance of deliberate selection and deposition of material). Overall, it is hard to pin down mutually exclusive "types" of deposits, but a tentative separation of single-category and mixed deposits is attempted here. Not all conform well to archaeological expectations regarding the nature of ritual evidence — namely, that it should be repetitive and relatively conservative. In the second half of the paper, I hence argue that we should also

consider a reading of these assemblages as the material residue of magic, which has implications for their potential role in creating or maintaining social relations.

How much structure do we need? Defining the corpus

It is now clear that the term "structured deposit" has in the past been overstretched to cover anything from deliberate arrangements to spatial patterning in refuse deposition. It thus remains for each individual study to clarify a working definition, which here centres on those deposits perceived as "unusual". This inevitably bears dangers of erroneous inclusion or exclusion: one could accidentally lump together phenomena which served very diverse ends in the past, while other practices could be left out because we have failed to spot the relevant characteristics. Yet however provisional and in need of revision it will turn out to be, a definition is a necessary starting point.

In what follows, examples have been included into an initial, indicative list of structured deposits where they fulfilled at least *two* of the following criteria:

- Complete objects — the items are not obviously damaged or broken and were discarded before coming to the end of their potential use life. One example is the deposition of complete vessels from several LBK wells, which were clearly not simply lost during the well's active use (Elburg 2011).
- Deliberate arrangements — the items are arranged in stacks, geometric formations or in an otherwise patterned way. A good example are the grinding stone deposits, in which the lower stone is often deposited upside down over its rubber, as at Irchonwelz, Belgium (Constantin *et al*. 1978).
- Repetition of items — several of the same kinds of items are deposited together, as for example in the seven-piece set of polished stone tools found on a terrace overlooking the Meuse at Stein-Berg aan de Maas, Netherlands (Bakels and Hendrix 1999).
- Repetition of constellations — the same sorts of object combinations are found repeatedly at the same site, indicating a tradition of practice (of variable duration). For instance, at the Austrian settlement of Franzhausen, there are at least two instances of storage pits with complete antler mattocks at their base (Neugebauer 1998).
- Unique objects — the deposited item is so unusual that very few or no other examples of it are otherwise known in the LBK. This criterion was rarely made use of, but was for instance applied to include the shell of a *Charonia nodifera*, a Mediterranean species described as a "shell trumpet", found filled with flint tools in a settlement pit at Ösel in Lower Saxony (Busch 1983; Niquet 1956; see cover image).

Further subjective choices have led to the inclusion of burials of whole animal carcasses or substantial articulated portions of animals, largely because they are unusual, although where they occur singly they do not otherwise fulfil the definition. In contrast, examples of "ritual refuse", for instance at the Herxheim enclosure, Palatinate (see Haack, this volume), or in the guise of the suspiciously rich pits discussed by Ritter-Burkert (this volume), have been excluded.

This definition also largely excludes any information on how the objects came to be buried, for instance whether a given feature was filled in quickly or over a considerable period of time. Such information is not consistently available. The mechanisms of LBK pit infilling are widely debated (*e.g.* Stäuble and Wolfram 2012), with stratigraphic information on heavily truncated sites often insufficient to address this question. At other times, such aspects are not reported. Although it

would be desirable to investigate this issue more thoroughly, it is thus beyond the remit of the present paper. Additional contextual information has, however, been collected where authors have mentioned elements such as sherd or pebble pavings, distinct ashy or burnt layers, deposition under stone slabs, or similar. Equally, where information was easily available, the spatial context of deposits in relation to houses, enclosures, wells or natural features such as pools, rivers and striking rock formations was noted. Such aspects were, however, not used as primary defining criteria in order to avoid imposing the expectations from other periods (*e.g.* deposition in "wet" contexts in the Bronze Age) onto the LBK situation.

A further potential problem with this definition is its equifinality. A simple collapsed storage pit with a few pots inside is classed as a structured deposit, just as are tools buried as protection from frost or for a variety of functional reasons, alongside deposits intended as gifts to supernatural entities[1]. This is not only an unavoidable consequence of having to use modern-day terminology to apprehend a radically different past situation, but also takes account of the fact that there was, in all likelihood, a continuum of depositional practices from more routine to more formalised (see the introduction to this volume), and that activities such as storage could in any case have been hedged about with protective rites (see below). While readers must thus decide for themselves whether they follow my interpretation in any given case, taken as a whole the spectrum of collected cases remains too varied and idiosyncratic to be wholly explained by strictly functional activities.

Still, the list of recorded cases remains incomplete. Partly, this is due to the level of reporting. Many mentions of complete objects give no detail of their location within features or their associations, and even fewer provide photographs or drawings documenting the situation *in situ*. Furthermore, most instances were extracted from excavation reports, as with the exception of polished tool deposits there are few or no compendia or synthetic publications (although note Kaflińska 2011). Due to my restricted linguistic capabilities, this led to the virtual exclusion of areas such as Bohemia, Moravia and Poland. For reasons of time, it was also impossible to systematically search through all the published data in the languages I do read, as often the necessary information can only be found in catalogue entries, appendices and so on, rendering the task very laborious. The data presented here are thus the tip of a much larger iceberg which would warrant more sustained attention in the future.

With these definitions and caveats in mind, 111 deposits could be identified as likely instances of structured deposition[2]. This excludes 40 cases which most probably fit the bill, but where gaps in reporting ultimately made it impossible to definitely include them. These were classed as potential cases. In the following sections, the likely cases are mentioned first, while the larger number in brackets includes the potential cases as well.

Characterising the evidence: kinds of deposits

Mapping (Figure 1) shows that structured deposits occur in all LBK regions which could be searched. In spite of the restrictions mentioned above, their distribution is thus wider than that of, for example, formal burial grounds. Looking at the composition of these depositional episodes, a first difference is between deposits which

1 I am particularly indebted to J. Pechtl for this point.

2 A full list of all the structured deposits included here, with further details and bibliography, can be downloaded from the author's Academia page (Appendix 1: https//uib.academia.edu/DanielaHofmann).

contain only one kind of artefact, generally in multiples, and deposits which contain several different kinds of objects. Among the former are the grinding stone deposits discussed by Hamon (2005; 2008) and the polished tool sets collected by Jeunesse (1998; 2017), but also most of the animal deposits. These single-category deposits had a greater chance of being perceived as unusual and have therefore received more attention. The second group, the mixed-category deposits, have not yet been discussed in a systematic manner, although some have previously been identified, for instance where they were uncovered in unusual landscape situations such as rock stacks (*e.g.* Bürger 2008; Falkenstein 2012; Mauer 1963; Seregély 2009).

Single-category deposits

Deposits containing only one kind of item make up 71 (103) of the 111 (150) examples. These include deposits of polished tools, grinding stones, chipped stone and pottery, as well as animal burials (Figure 2; Table 1).

A first glance at the distribution map already shows the heterogeneous nature of deposits in any given region. Overall, the predominance of grinding stone deposits in more westerly areas is clear; in turn, these regions have fewer polished stone deposits. With the current state of data collection, it is premature to define any further large-scale spatial patterning; instead, deposits are described according to their contents.

Polished stone tools

The number of axe and adze hoards cited by different authors (*e.g.* Quitta 1955; Vencl 1975) is variable, and depends not just on the definition of "hoards/deposits" employed in a particular work, but also on how strictly the dating of the pieces is taken into account. As Jeunesse (1998, 36) explains, deposits of polished tools increase in frequency towards the end of the LBK; however, it is virtually impossible typologically to distinguish Late LBK polished tools from those of the immediate successor groupings. Jeunesse himself applies a strict framework, recognising only deposits found in settlement contexts as definitely LBK. His list is thus limited to the four instances known at the time, and he rightly points out that larger and more impressive items all come from graves, particularly from Alsace and Bavaria. In this sense, a true *Hortsitte*, or depositional tradition, would only be established in the Middle Neolithic, and in particular in its second half (Jeunesse 1998, 36, 41; 2011, 64). At that time, it can be considered an alternative way for the conspicuous consumption of wealth in a public setting, in a sense equivalent to deposition in burials (Jeunesse 2017).

However, the corpus of LBK polished tool deposits has since expanded, including for example the pieces from Berg aan de Maas cited above, or the axes deposited around the Motzenstein rock in Franconia (Bürger 2008). Indeed, the production of extremely long blades without hafting traces, and therefore of items most likely made for display, did begin in the final stages of the LBK (Weiner 2003), as did the fashioning of the elaborate double adzes with central perforations found in Late LBK contexts, including but not limited to graves (Czekaj-Zastawny 2004; Czekaj-Zastawny and Zastawny 2002). Accepting that such tools could also be deposited in the wider landscape from the LBK onwards would lead to the inclusion of many more examples. This is important because polished stone tools are already interpreted as potential status indicators in the LBK.

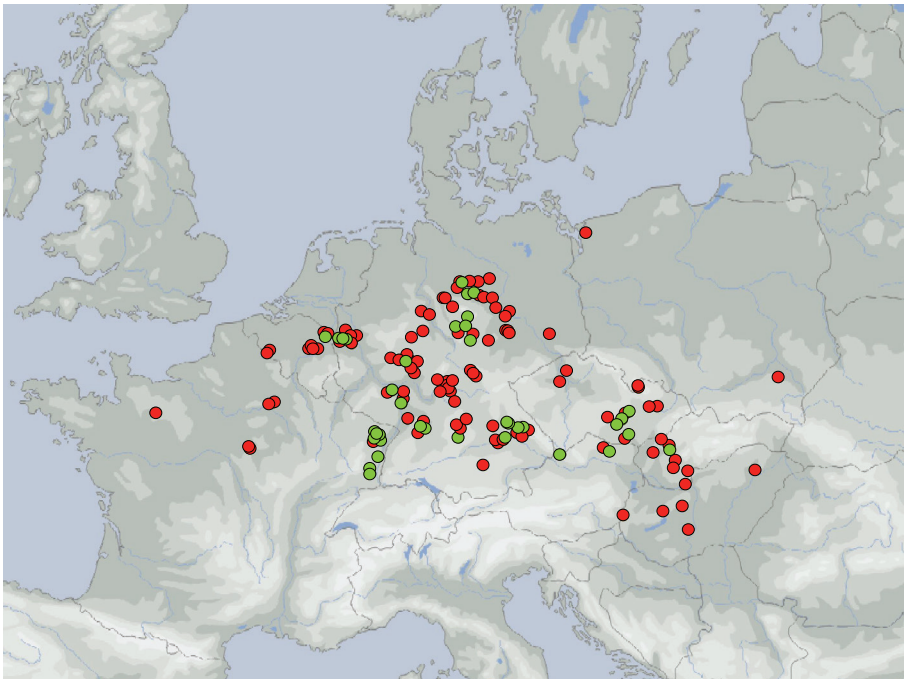

Figure 1. Map of structured deposits (red) as compared to cemeteries (green) (mapping: Florian Helmecke; base map drawn by Jane Mathews and supplied by John Robb).

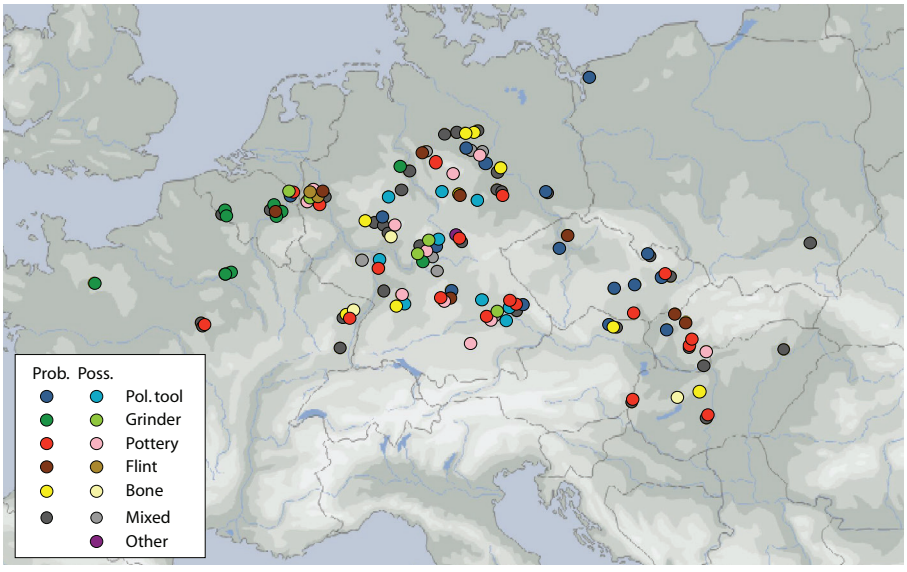

Figure 2. Distribution of single-category deposits (listed by artefact type) and mixed-category deposits (mapping: Florian Helmecke; base map drawn by Jane Mathews and supplied by John Robb).

Artefact type	Single-category deposits	Mixed-category deposits	Total
Polished stone tools	18 (27)	12 (13)	30 (40)
Grinding stones	14 (19)	14 (18)	28 (37)
Chipped stones	7 (9)	7 (8)	14 (17)
Pottery	14 (26)	36 (41)	50 (67)
Animal bone (unworked)	16 (18)	8 (8)	24 (26)
Bone tools	2 (3)	5 (6)	7 (9)
Other	0 (1)	19 (21)	19 (22)

Table 1. Occurrence of different kinds of items in the 71 (103) single-category and the 40 (47) mixed-category deposits. Higher numbers in brackets include uncertain deposits.

Polished tools in male graves have been linked to the expression of social status and inheritance rights. Isotopic evidence has suggested that males buried with polished stone items were more likely to have been born locally than those without (Bentley 2013; Hedges *et al*. 2013). This means that childhood origins influenced what kinds of objects were deposited in one's grave, indicating an ascribed status. In connection with a land use model proposed by Bogaard and others (2016), which links access to fields closest to the settlement with the higher status of some neighbourhood groups at Vaihingen (Baden-Württemberg), this has resulted in the proposition that in regions where they do occur in graves, polished stone tools were tokens of land ownership, symbolising access to vital economic resources. The deposition of particularly impressive stone axes or adzes in graves has also been interpreted as an early positive valuation of a warrior identity, connected to social tensions and violence at the LBK/Middle Neolithic transition (Jeunesse 2011, 66).

It is worth pointing out that the kind of status conveyed by polished tools was not particularly restricted; although the regional figures vary widely (an aspect clearly in need of further discussion), overall around 35% of adult males were buried with at least one such item[3]. In addition, it is debatable whether land ownership was the sole way of gaining economic prominence and status in LBK society (see *e.g.* Hofmann 2016). Yet the question remains whether the deliberate deposition of polished tools in sets can in some way be considered equivalent to placing them in graves, in particular in terms of expressing individual male status.

As polished tool deposits may be a transitional phenomenon, a generous dating bracket has been adopted here[4], and the list includes instances for which a date cannot be more precise than "Early or Middle Neolithic". Using this definition, there are 18 (27) single-category deposits consisting exclusively of polished tools. Several of these come from settlements. At Dachstein in Alsace, five items — some completely and some incompletely polished — were found close together near the top of a pit (Heintz 1973). At Dittenheim in Franconia, two axes and an adze over 20 cm in length were found resting on top of an LBK layer in a pit; Middle Neolithic material had then accumulated in higher strata (Nadler 2009).

However, axes and adzes are also recovered from landscape contexts, although contextual information is generally poor. Often, there is no clear feature in which these items could have been deposited (*e.g.* at Geroldshausen, Franconia; Rosenstock 1989/90). At Żalęcino in north-west Poland, two axes and a roughout were discovered under a stone slab, but it is unclear how this deposit relates to the LBK settlement traces elsewhere in the field (Quitta 1955, 42). In some cases, it is evident that there was no settlement immediately nearby. This applies to the deposit from Stein-Berg aan de Maas (Bakels and Hendrix 1999), described above, and to the adze and roughout from Gimritz in Saxony-Anhalt, both over 30 cm long and deposited side by side on a high plateau (Schmidt 1958/59). Some items were also dredged from rivers, for instance the Danube near Deggendorf, Bavaria

3 This is based on a database of 3327 LBK burials collected by the author. 540 individuals were definitely or potentially classed as males through osteological analysis; of these, 190 had at least one polished stone tool. In addition, 29 burials osteologically identified as female/possibly female (out of a total of 580) had a polished stone tool or tool fragment, while 244 individuals of undetermined sex were also buried with at least one polished tool. The majority of graves with polished tools (all bar 50) came from cemetery contexts.

4 This means that deposits containing perforated items (e.g. *Breitkeile*) have been excluded as most likely Middle Neolithic, with the exception of those containing types already known to have been perforated in the LBK (maceheads, double adzes; see Verhart 2012, 6–7, 12–4). Deposits with typologically undiagnostic pieces, and which could be either LBK or Middle Neolithic, have been retained.

(Powroznik 2014). Although in such cases it is impossible to exclude that pieces have eroded out of the riverbank, given the repeated choice of watery locations, such as former lakes and old oxbows, in the Middle Neolithic (*e.g.* Rosenstock 1989/90) a deliberate depositional choice is possible.

Could these collections of polished tools stand in as an alternative form of male status competition, analogous to graves? Graves with more than one polished stone tool are rare in the LBK; of the 190 males with polished tools (see footnote 3), only 25 have two or more items, with a maximum of four. The proportion remains similar if unsexed individuals are taken into account (244 individuals, of which 31 have more than one item, with a maximum of four). In addition, the graves with more than one polished tool are largely restricted to Alsace and to the cemetery of Aiterhofen in Bavaria, while the occurrence of polished tool deposits is much wider. In contrast, most deposits listed here consist of more than one piece, as this is necessary to fulfil the adopted definition of "structured deposit" in the first place[5]. The highest recorded number is seven. In addition, such deposits often include pieces in various stages of shaping, from roughout to finished product, providing an additional dimension absent from the grave finds.

A wider study comparing the lengths, state of finishing and other factors of polished tools in structured deposits and graves could give a clearer picture of similarities and differences, and should ideally also be paired with an overview of the frequency of polished stone tools in a given region (including in settlements). For the moment, the evidence from deposits does not seem to replicate the situation in graves in any direct way. Rather, the larger numbers of tools involved could point to a communal offering by a group of people as much as by an individual. This impression is heightened by the deposition in various contexts, both in settlements and in the landscape, which could suggest a variety of actors, audiences and indeed reasons. Also, while there are recurrent features of polished tool sets, depositional contexts, tool selection and treatment can vary, and no particularly strict or conservative tradition is as yet evident.

Grinding stones

Overall, 14 (19) deposits contain only grinding stones. These have mostly been reported from Belgium and the Paris Basin, where the practice continues into the succeeding Villeneuve-Saint-Germain culture, providing another chronologically transitional phenomenon (see Hamon 2008, with earlier literature). In contrast to collections of polished tools, grinding stone deposits have been linked with household activities from the outset, whether with the functional storage of grinding tools (Hamon 2005, 44) or, more recently, as connected to the life course of female members of the household (Hamon, this volume). In general, they are found in settlement pits, sometimes in loam pits next to houses, and consist of multiple instances of grinders, or grinder/rubber pairs, often placed with the grinding surface downwards or stacked on top of each other.

As these deposits are discussed extensively by Hamon in this volume, no further detail is necessary here. However, it is worth noting that the distribution of the practice does extend further eastwards. For instance, at Immenhausen in Hessen, three large concentrations of grinders and other polishing tools (rubbers, whetstones and so on)

5 This excludes possible one-piece deposits; however, distinguishing these from chance losses is virtually impossible.

were piled up in a restricted area within a larger feature, many of them showing traces of burning (Kneipp 2003, 367–71). At Daseburg in North-Rhine Westphalia, three grinders were stacked on top of each other at the base of a pit (H. Hoffmann 1938). Rather less securely, at Schwanfeld in Franconia deposits of broken grinding stones in pits are associated with both of the settlement burials excavated here: the grave of the adult male cuts an earlier grinder deposit, while the child's grave is cut by a pit containing broken grinders (Lüning 2011, 50–1).

Grinding stone deposits are interesting particularly because this tool category is so rarely found in cemetery graves. In addition, most of the "grinders" or "grinding stones" from funerary contexts are smaller grinding palettes used for the preparation of ochre colourant. In settlements however, it is often the everyday grinding tools which are the focus of attention. It is notable that a relatively repetitive tradition can be observed at a regional level in the Paris Basin and Belgium, including more codified depositional choreographies (upside-down grinders over rubbing stones etc.) which seem stricter than those observed for polished tools. Beyond this, there is a wider, less standardised fringe in which such deposits are less frequent, or grinders are combined with other items (see below).

Animal bone

Animal bone deposits can themselves be split into two sets: those containing only whole or partly articulated animal carcasses or parts thereof, of which there are 16 (18) instances, and those containing exclusively bone tools, which are much rarer with 2 (3) cases.

Beginning with the burials of animals and animal parts, complete piglets were recovered from settlement pits at Nieder-Mörlen (Schade-Lindig 2001), Vaihingen (Krause 2002) and Erfurt (Behm-Blancke 1964), all in Germany, and two piglets came from the fill stabilising the well shaft at Brodau, Saxony (Stäuble and Fröhlich 2006). There is hence a clear selection of species, at least in the examples recovered so far, which could conceivably be associated with the high natural mortality of piglets (*e.g.* von den Driesch and Gerstner 1993, 54). However, the choice of a well shaft seems a strange place for casual discard.

Species composition diversifies when partially articulated animal remains are taken into account. Alongside half a sheep/goat found in another pit at Vaihingen (Krause 2002) there are mainly cranial remains, such as the skull of a caprine deposited on a burnt layer in a posthole at Káloz, Hungary (Makkay 1986), and the numerous remains of cattle bucrania, some of them of aurochs, recovered from pits associated with seven different houses at Cuiry-lès-Chaudardes, Paris Basin (Hachem 2011, 263), as well as from the bases of several, otherwise sterile pits at Barleben, Saxony-Anhalt (Lies 1965, 13). At Dachstein, three scoops were dug into the base of a large pit, and a bucranium placed in each (Schneider 1980). A roe deer bucranium fashioned into a mask was also recovered at Eilsleben, Saxony-Anhalt, and has been paralleled with the much earlier British Mesolithic examples from Star Carr (Kaufmann 2010). In turn, mixed deposits of animal bone and other items (see below) often include small carnivores, notably dogs.

There are thus instances in which the repetition of the practice or — in the case of the deer mask — the exceptional nature of the artefacts make these likely

structured deposits, with locations such as wells serving as secondary indicators[6]. The composition of these deposits differs from animal remains in graves, recently collected by Arbogast (2013, 256–60). Here, food offerings (as opposed to bone tools or ornaments) include mainly the choicest meat-bearing parts of young pigs and caprines, *i.e.* shoulders and legs. These are rare and occur in only a few graves which are also otherwise richly furnished. Cattle are absent, although they dominate most LBK faunal assemblages from settlements (*e.g.* Knipper 2011, 29; Lüning 2000, 110), have been accorded a role as meat providers for feasts (Marciniak 2004, 133) and are later included as offerings in Middle Neolithic graves (*e.g.* Trebur, Spatz 1999, 185–8). There are also no animal cranial remains from LBK graves, with the exception of fox mandibles deposited with some individuals at Aiterhofen (Nieszery 1995, 200), probably as amulets. We thus see a split between, on the one hand, the provision of meat for some selected deceased and, on the other hand, the deposition in settlement contexts of either unbutchered animal carcasses of smaller and medium-sized mammals, or relatively meat-poor cranial remains, which can include cattle. At several sites, such as Cuiry-lès-Chaudardes, we can also identify the repetition of practices, but this does not hold throughout the LBK distribution.

Only a few deposits contain exclusively bone tools. At Franzhausen, Austria, an antler pick was found at the base of a storage pit, while another storage pit nearby contained two antler tools (again including a pick) and a grinding stone at its base (Neugebauer 1998). The Late LBK pit 100/81 at Eilsleben yielded a cache of six bone smoothening tools (Kaufmann 1986), an interesting parallel to a similar cache from Herxheim (see Haack, this volume). Again, the composition differs from funerary contexts, where the majority of bone tools are awls.

Pottery

Pottery is the most frequent item involved in instances of deposition, but it is relatively rare to find it on its own, with only 14 (26) instances. The low overall number and high proportion of uncertain cases are due to the ubiquity of this item and the many possible reasons for burying whole vessels, from storage or fermentation to mouse traps. The case for deposits which were not meant to be retrieved is clearest where pottery is found in larger concentrations away from settlement sites, especially in association with prominent natural features — that is to say, where secondary criteria such as location provide additional support for an identification. For instance, the Hohler Stein near Schwabthal, Franconia, is a 23 m long and 11 m high dolomite boulder with LBK sherds discovered all around it, as well as stuffed into a crevasse (Maurer 1963). Similarly, sherds of several LBK vessels were recovered in the Rhumequelle spring in Lower Saxony, one of the largest of the hundreds of karst springs in the area. Its water forms a pond into which items were thrown in several prehistoric periods, including the Neolithic (Grote 2000).

Within settlement sites, multiple complete pots have been retrieved from wells at Asparn-Schletz in Austria (Windl 1998), Zipsendorf in Saxony Anhalt (Einicke 1998) and Mannheim Wallstadt in Baden-Württemberg, where one complete pot was deposited at the base of the well and another 60 cm higher up in the infill (Antoni and Koch 2003). Similarly, seven pots, many of them virtually

6 However, as mentioned above, not all instances (notably the piglets) strictly speaking fulfil the formal criteria defined at the outset.

complete, were deposited 20 cm above the base of a large feature interpreted as a cistern at Wallerstein in Swabia (Lutz *et al.* 2014). Excavators also feel more confident in characterising a deposit as deliberately placed if it comes from a ditched enclosure, for instance the complete vessels recovered from the base of the ditch at Rosheim in Alsace (Jeunesse 1991, 83).

Other cases are more ambiguous. At Aiterhofen-Kirchfeld III in Lower Bavaria two vessels were found stacked inside each other in a pit; one is a miniature vessel with atypical decoration (Ludwig Husty, pers. comm.) (Figure 3). While stacking is otherwise rarely observed, there was nothing else to distinguish this feature. At Landshut-Sallmannsberg, also in Lower Bavaria, a complete upside-down coarse ware pot was retrieved from a band of charcoal in a storage pit. Although the upside-down placement is unusual, the storage pit could suggest a functional explanation. At least five other pits at this site contained bands of charcoal with either a sherd paving or the fragmented remains of a storage vessel (Brink-Kloke 1992, 257). In this frequency, this is an unusual and even suggestive finding, yet remains far from definite. Similar reflections apply to the three storage vessels found next to each other in a 1.8 m deep pit at Bergheim-Zievrich, Rhineland (Arora *et al.* 1979), and the four complete vessels from a pit at Bešeňov, Slovakia. For the latter, Cheben (2000, 65) suggests a possible grave context, but in spite of favourable preservation conditions no human bone was recovered in this feature.

Single, complete vessels were also found in immediate association with buildings, for instance in their wall trenches or near the base of loam pits. At Enkingen (Swabia), a complete upside-down *Kumpf* was recovered from a loam pit (Stäuble 2005, 77), at Štúrovo in Slovakia, a complete decorated bowl came from the wall trench of house 390 (Pavúk 1994, 50), and in a Flomborn-period loam pit at Murr (Upper Bavaria) the sherds of an extremely large vessel with goat horn decoration were identified (Neumair 1992). The fact that these are always single vessels and there is only ever one example of the practice per site does urge caution, and indeed all these instances are classed as uncertain here, although it is tempting to read them as "foundation deposits" left during the construction of the building.

In sum, vessels are easier to recognise as parts of structured deposits where they occur in combination with other items. Still, it is likely that many potential cases also simply go unreported because of the perceived profane nature of pottery and its deposition in a settlement context, which mean that "common-sense" explanations are more easily sought (and, admittedly, found). In detail, the range of practices is also wide. There are some possible micro-traditions, such as the repeated occurrence of vessel deposits at Sallmannsberg, but these are rare and overall variability is high.

Chipped stone

Flint, chert and similar materials are surprisingly rarely encountered as structured deposits, with only 7 (9) containing exclusively chipped stone items. It is therefore difficult to discern any patterning, especially since cases are widespread geographically. Examples include eight flint blades deposited in a post pipe of an already ruined building at Hollogne Douze Bonniers in Belgium (Jadin and Cahen 2003), three flint blades in the corner posthole of a Late LBK building at Köln-Lindenthal in North Rhine-Westphalia (Bernhardt 1986, 77; Buttler and Haberey 1936, 130–2), as well as clusters of unused items, for example the deposit of 11 exceptionally long blades of Arnhofen flint from Roztoky, Czech

Figure 3. Two complete vessels, stacked inside each other, from the Bavarian site of Aiterhofen-Kirchfeld III. Note the unusual decoration of the smaller vessel. Courtesy of Kreisarchäologie Straubing-Bogen.

Republic (Seraphim 2006). The situation is less certain where cores and roughouts are concerned, as these could be the remains of a cache of raw materials. However, the recently reported case of at least seven large cores, apparently buried in an organic container together with the material knapped from them (Nadler 2018), does suggest a non-utilitarian dimension.

Mixed deposits

Mixed deposits, *i.e.* those involving more than one kind of item, have so far gone largely unrecognised in the literature and have not been systematically collected or studied. They are mostly found in settlement pits, more rarely in direct association with houses (*e.g.* in loam pits, postholes, hearths or wall trenches), and only occasionally in wells or ditches. Away from settlement sites, the so-called "cenotaphs" (see below) may fall into the same category, and sometimes more than one kind of item was deposited at striking natural places (*e.g.* Bürger 2008).

Mixed deposits can consist of deliberately stacked or otherwise neatly arranged objects, most frequently pottery, grinding stones, polished stone tools and animal bone (see Table 1). There are also instances including flint, human bone, anthropomorphic and zoomorphic figurines, shells (both worked and unworked), limestone bead roughouts, loom weights and spindle whorls, unworked rocks and charred plant remains, albeit these kinds of things are attested in only one or a few cases each. Deposition events can be accompanied by additional activity, such as creating sherd pavings as a depositional surface, burning (distinct layers of ashy material or charcoal, rubefied pit sides and so on) or the use of ochre.

There are 40 (47) mixed deposits which contain between two and five categories of item. Pottery is a key artefact, being absent in only 5 (6) cases. Other items are less frequent: there are 14 (18) deposits which also include grinding stones, 12 (13) with polished stone, 8 with unworked animal bone, 7 (8) with chipped stone items and 5 (6) with bone tools. Among the 19 (21) deposits with other items, 5 contained figurine fragments and 3 (4) personal ornaments. There are few recurrent combinations. Pottery and grinders occur in the same deposit in 12 cases, of which seven are a pairing of only pottery and grinders. Their geographical distribution reaches as far as Hungary[7], further extending that of the single-category grinder deposits. Whole or partially articulated animal carcasses are also often found with

7 Where indeed there may be local predecessors for grinding stone deposits (Makkay 1978).

pottery. These include many small carnivores, such as the fox from the well at Rehmsdorf (Einicke 1998, 78), the complete dogs covered with sherd pavings at Hurbanovo, Slovakia (Ambros and Novotný 1953), and the dog from the so-called "cistern" at Ensisheim, Alsace, covered by vessels smashed *in situ* (Schweitzer 1978, 20–1). In deposits containing polished stone, there is almost always also pottery; flint is represented in four instances. In addition to pottery, grinders are paired with animal bones and bone tools in three cases each. But the overwhelming picture is one of diversity, making mixed deposits difficult to characterise.

The clearest cases are those where a patterned arrangement of complete objects is repeated several times. Thus at Barleben (Lies 1963) (Figure 4), three features were excavated in close spatial association. The central, square pit was very finds-rich, with the bones of cattle, sheep and pig alongside pottery, river shells and bone tools. As no careful placement of these objects is identifiable, this would qualify as a "suspiciously rich pit" *sensu* Ritter-Burkert (this volume)[8] — one of several on this site — were it not for the deposition, in the south-east corner, of a smashed grinder heaped over by the sherds of at least three vessels, one of them with anthropomorphic decoration. The round pit to the south contained a similar arrangement: a heavily used grinding stone was deposited, surface down, and covered with the sherds of a decorated *Kumpf*, some smeared with colourant. A pebble was placed nearby. The assemblage from the round pit to the north is almost identical: a fragmented grinding stone, deposited face down next to a pebble and some quartz pieces, was found beneath the sherds of a smashed decorated bottle. In both the round pits, the fills were otherwise finds-poor. In addition, Lies (1965) mentions several pits with cattle semi-bucrania at their bases, but otherwise devoid of finds. Although it remains impossible to reconstruct the overall time span covered by these depositional acts or their exact sequence, the deposits reference each other spatially and in choreography, so that they were most likely recalled and re-enacted. A specific constellation of activities and acts had shown itself to be effective in terms of its intended ends, and a micro-tradition was established.

A similar situation applies at Buchbrunn in Franconia (Figure 5), although the deposits are more varied. Most were found in pits within buildings. Pit 799, located in the exceptionally long and architecturally complex house 15, contained three distinct layers: a lowermost one rich in fine charcoal, a middle layer with larger charcoal pieces and numerous sherds, and a top layer with a complete vessel in the centre, several additional large sherds and a perforated double adze, broken into six pieces. Distinct charcoal bands were present throughout this fill and on the sides of the feature. For Kuhn (2012, 76), this assemblage is similar to what could be expected from a grave, where perforated double adzes are often referred to as prestige markers (see above). She therefore suggests that this deposit could represent a closing act connected to the abandonment or "death" of an exceptional building. Additional instances from the same site are less clear. A grinding stone fragment, a complete amphibolite adze, a bone arrowhead and more than 60 decorated sherds came from pit 205, located in house 20 (Kuhn 2012, 75–6). Although these items are less impressive, there are parallels to pit 799. Posthole 506 contained large conjoining fragments of a vessel, possibly left there after the abandonment of the building (Kuhn 2012, 22), while a complete grinding stone and sherds were

8 I.e. a pit containing a large proportion of a site's finds, generally in combination with some unusual items, but where the material does not appear to have been carefully placed in the ground and objects are mostly fragmented.

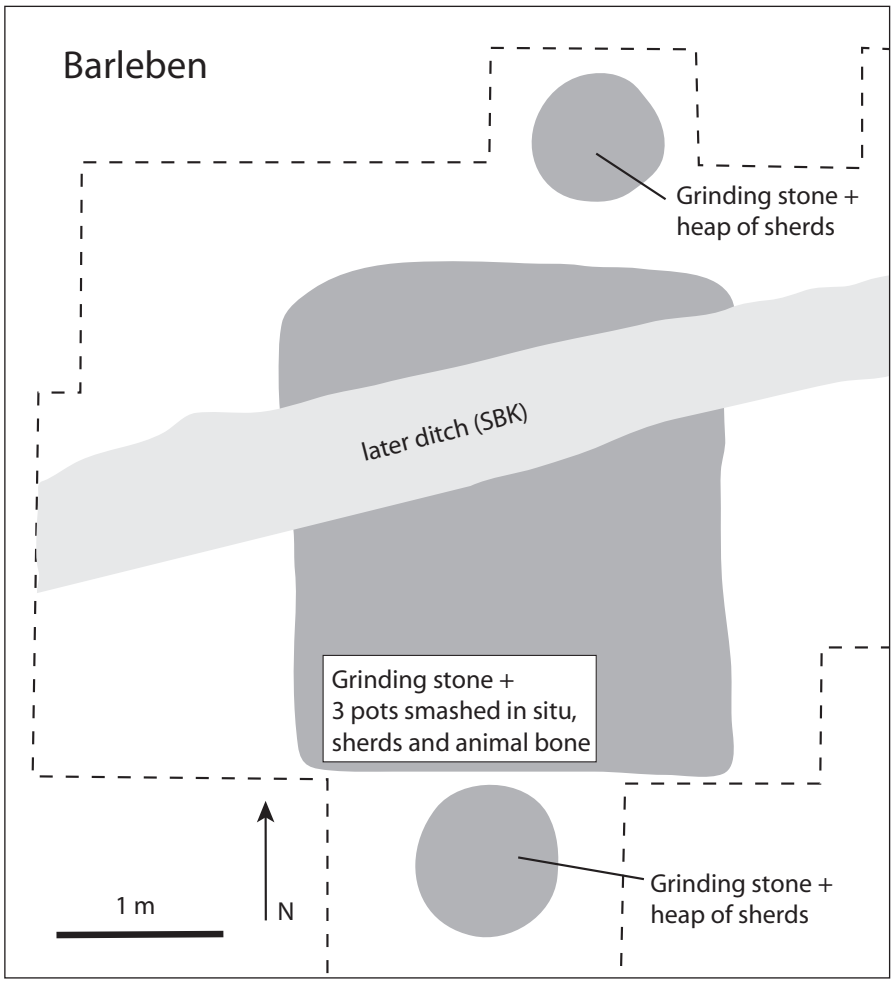

Figure 4. Location of structured deposits at Barleben (after Lies 1963, fig. 1).

recovered from pit 1261, located in house 9 — unfortunately, there is no detail on their arrangement (Kuhn 2012, 29). The latter two examples would hardly merit consideration, were it not for the already recognised instances elsewhere on the site, where pits inside houses or constructional elements were repeatedly singled out.

While Buchbrunn and Barleben are large sites with multiple depositional episodes, most mixed deposits occur singly and many are therefore less evident. At Adldorf-Kreuzäcker in Lower Bavaria, three amphibolite tools — a complete and probably hafted example, a half-finished piece and a roughout — were deposited in the loam pit of a house and partly covered with sherds (Husty 1999); Becker (2011, 105) mentions a figurine fragment among them. The composition of this deposit, comprising tools in several stages of production, recalls some of the single-category polished tool sets. At Esbeck in Lower Saxony, one posthole in a house's central Y-configuration contained four vessels and a polished stone adze, probably placed inside an organic container (Richter and Schwarz-Mackensen 2015, 57). At Landshut-Sallmannsberg, three grinders and a complete pot were deposited in posthole 111b, likely after the abandonment of the building (Brink-Kloke 1992, 249). A possible closing deposit for a domed oven was recorded at Mohelnice in the Czech Republic: on top of one of the 15 ovens documented at this location lay perforated corals, miniature pots and other miniature clay objects, interpreted as foodstuff votives, all covered with

sherds (Tichý 1961). Given the possible significance of ovens in the preparation of communal feasts (Pechtl 2008) we should not be surprised that they could be singled out for this kind of attention.

In addition, there are deposits which were deliberately placed, but do not seem to relate to communal installations and buildings. Among them are a set of limestone bead roughouts within a pot, found at Marolles-sur-Seine in the Paris Basin, for which the excavators suggest a craftsperson's cache (Augereau and Bonnardin 1998). Several instances of pottery from scoops or features inside buildings could reflect a storage function, for example the whole coarse ware vessel placed next to a grinder in an LBK house at Arnsbach, Hessen (Sangmeister 1983) or the two decorated pots placed into a separate scoop at the base of a pit in Bretten, Baden-Württemberg, which contained worked bone artefacts (Kraft 1971). In other instances finds have been interpreted as settlement burials without preserved skeletal remains, as in the case of a Flomborn period *Kumpf* found at Bernburg, Saxony-Anhalt, which contained two belt buckles, two armrings and 175 beads, all made from *Spondylus* (Behrens 1973, 32). Yet the placement of ornaments inside the vessel would be unusual in a burial, and the discovery of a *Spondylus* hoard (three armrings, ten beads and a pendant or buckle) inside a vessel at the Hungarian site of Szekszárt-Palánk-hegy (Siklósi 2004, 15) provides a closer parallel.

Other pits were prepared before deposition, but the boundary to exceptionally finds-rich pits is hard to draw. For instance, circular pits near the LBK ditch at Polgár-Ferenci-hát, Hungary, showed traces of burning; later, intentionally broken grinders with red ochre traces and unusual pottery, for instance a storage vessel with a face decoration, were deposited in them (Raczky and Anders 2012, 280). At Steinfurth-Hanberg, a Late LBK site in Hessen, a pit with vertical sides and a flat base was paved with burnt stone and small, secondarily burnt sherds. Its fill contained the remains of at least 120 pots (80% of which were decorated), two complete adzes and a third broken and resharpened example, as well as flint tools and several *Unio* shells (Kneipp 1998, 330). There is thus a sliding scale of formality in the actual arrangement of items. This also applies to two further kinds of deposits often discussed separately: so-called cenotaphs, and deposits with human remains.

Cenotaphs

Grave-shaped pits without human remains are occasionally documented on burial grounds, even when there are good preservation conditions. These have been labelled "cenotaphs", *i.e.* graves for persons who died elsewhere. In a recent discussion of such features from the Austrian cemetery at Kleinhadersdorf, Lenneis (2015, 74–6) rejects this term, as generally the objects are not arranged in the same way as grave goods. Preferring instead the use of "empty graves", she provides a recent list of such features and stresses how variable their contents are. In many cases, the material is highly fragmented, or the grave-shaped pits can be entirely empty. Thoroughly robbed-out graves (Farruggia 2002, 77) and multi-stage funerals (Nieszery 1995, 28) are generally suggested.

Looking in more detail at the composition of the material, the almost total absence of even small fragments of human bone makes the latter two explanations unlikely. The range of deposits and degrees of formality is rather in line with the mixed deposits from settlements discussed above. For instance, at Bruchstedt, Thuringia, one pit yielded a complete *Kumpf* with a complete bowl functioning

Figure 5. Location of structured deposits at Buchbrunn with detail of perforated double adze from pit 799 (from Kuhn 2012, fig. 3, plate 34. Drawing of adze: L. Holzner, Bayerisches Landesamt für Denkmalpflege).

as lid, the remains of a young pig with its bones broken open for marrow and a grinding stone with traces of red ochre (Kahlke 2004, 96–9). A whole pig shoulder associated with charcoal was retrieved at Niederdorla, Thuringia (Walther and Schwedler 1991, 206). Elsewhere, careful placement is not documented, but there are recurrent traces of activity. Traces of burning and animal bone were recovered from several features at Mulhouse-Est, Alsace (Schweitzer and Schweitzer 1977, 60–2), while circular pits lined with burnt pebbles and filled with charcoal- and ochre-rich sediment were dug next to graves at Chichery, Yonne (Pellet 1978). At Aiterhofen, sherds, animal bone, a complete pot and a few pieces of calcinated bone (the latter two now lost) were retrieved from various "grave-like" features, although here the partial overlap of cemetery and settlement traces complicates interpretation (Hanöffner and Siftar 2007, 45, 116).

Overall, then, the focus on animal bone and pottery, as well as burning, is rather in line with mixed deposits from settlements than with grave assemblages. Pits with sherd paving are known both from structured deposits and from settlement burials (*e.g.* at Otzing, see Pechtl *et al.* 2017, 180, 184). Potentially, "cenotaphs" are thus best characterised as structured deposits in a cemetery setting and could be traces of commemorative practices connected with the dead, varying from site to site in intensity and in the details of their composition.

Deposits containing human bone

Deposits containing human bone were collected in a separate list and initially labelled as "partial burials". However, a closer look at the range of examples suggests that burial of a person may not be the primary concern and that the presence of human bone need not be the most important factor in all cases. In other words, some could simply be mixed structured deposits also containing human bone, whilst in others the human bone took centre-stage — with no clearly marked boundary between the two[9].

Where human bone makes up the majority of the material deposited, a burial rite seems more likely. The Jungfernhöhle cave in Franconia (Kunkel 1955) with its disarticulated human remains is one example; indeed, it now seems that whole bodies were deposited there and decayed in situ (Boulestin 2017; Seregély 2012), albeit not in individual grave pits. The Herxheim enclosure with its "ritualised destruction" (Zeeb-Lanz 2016; see also Haack, this volume) also falls into this category. A considerable amount of material was destroyed, ranging from high-quality pottery and imported flint to selected animal remains and grinders. This was discarded in the enclosure ditches alongside the remains of many hundreds of individuals, partly cannibalised (Boulestin and Coupey 2015) and with some of the skulls turned into shaped calottes. In terms of the sheer volume of material and the effort expended in their violent destruction, the human remains were the main focus (Haack, this volume), but with the exception of calotte concentrations are closer to the "suspiciously rich" rather than the "structured" deposits.

Although Herxheim is unique, elements of the practices represented there are also found elsewhere in the LBK, for instance at enclosure sites. At Menneville in the Aisne valley, the complete or partial skeletons of 11 children in irregular positions were recovered in groups of two or three at the base of several ditch segments. The remains are generally placed on a charcoal layer with sherds and

9 For this reason, deposits containing human bone have been collected in a separate list, also available on the author's Academia page (Appendix 2).

animal bone. Sheep/goat is often present in the form of whole quarters and may constitute meat offerings to the deceased, while the more fragmented cattle bones are interpreted as feasting residue (Farruggia *et al*. 1996, 165). Each depositional episode was covered over quickly, but some were later marked by placing cattle bucrania higher in the fill (Farruggia *et al*. 1996, 168; Kirk 1998). The enclosure at Eilsleben also saw deposits of human remains, as well as several anthropomorphic figurine fragments and the roe deer mask. Alongside complete single and double inhumations, five calottes or other cranial remains were recovered from four pits, whilst two other features held articulated feet and another a stack of three articulated hands (Kaufmann 1989, 123–4). At the Late LBK enclosure of Schöneck-Kilianstädten, Hessen, several large sherds, a human mandible and a pig skull were deposited in a ditch terminal (Ramminger 2007).

Skull remains, including mandibles and calottes, also make up a large part of the human remains from settlement sites (already pointed out by E. Hoffmann 1971) and are sometimes placed centrally or elaborately treated. At Dneboh in the Czech Republic, a skull was deposited on a patch of red ochre, surrounded by a spread of sherds (Zápotocká 1998, 180). At Otzing, Lower Bavaria, pit B 34 included the skull of a juvenile, lacking the mandible and placed on its right side. Behind it, at right angles to the skull's sight axis, were a large antler tine and a polished axe; a deer vertebra was also recovered. A child skull with mandible was placed in another pit at Otzing, in association with two articulated cattle vertebrae (Pechtl *et al*. 2017, 189–90, 196–7). At Quedlinburg (Saxony-Anhalt), the skull and mandible of a child were put inside a bowl, covered by a large bottle-shaped vessel and buried near a hearth (Rienäcker 1978). At Bajč in Slovakia, 17 settlement pits contained cranial remains ranging from isolated mandibles to so-called "face masks", *i.e.* facial bones removed from the remainder of the cranium. These could be production waste from skull calottes, but were not marked out in any way. Only the one calotte from the site was accompanied by other items: its matching "face mask", a femur and a vessel (Cheben 2000, 91). Other examples of calotte deposition come from Hainburg-Teichtal and the Taborac, Lower Austria (Mossler 1949; Neugebauer 1981).

Occasionally, postcranial remains were also marked out. At Dresden-Mockritz (Saxony), an articulated human lower arm had been placed on a sherd paving alongside a complete grinding stone (Renno and de Vries 1997). It is unclear whether cut marks are present, but this practice could be seen either in the light of recent instances of the mutilation of captives (*e.g.* Meyer *et al*. 2015), or as evidence for medical practices, as shown by the successful amputation of a human lower arm attested at the VSG settlement of Buthiers-Boulancourt, Paris Basin (Buquet-Marcon *et al*. 2009).

These practices may form a kind of continuum with the disturbance of LBK graves in order to remove bones (*e.g.* Ittenheim, Alsace, Lefranc and Boës 2009; Štúrovo, Pavúk 1994, 96), the rearrangement and redeposition of settlement burials (*e.g.* Wiesbaden-Erbenheim, Hessen, Orschiedt 1999, 158–62) and the large number of isolated human bones from settlement contexts (*e.g.* E. Hoffmann 1971). Evidently, human remains circulated quite frequently, and when it came to their final deposition the boundary between reburial, structured deposit and discard is fluid. In this, too, there is a parallel to mixed structured deposits more generally. One can also observe a wide bracket of contexts, from the almost certainly large-scale and public gatherings at enclosure sites to the deposition of single remains under domestic hearths.

What makes a structured deposit in the LBK?

As a whole, the assemblages defined here as "structured deposits" are a heterogeneous category, with few hard and fast rules and a sliding scale of formality. At one end are those deposits associated with large-scale, public settings, as at enclosure sites, or where there is at least a strong tradition of repetitive practice, as for instance with grinding stone deposits in the western regions of the LBK. At the other end are single instances of deposition, often retrieved from settlement contexts, with varying artefact combinations and little recurrent patterning. Between these two poles one could class sites such as Buchbrunn or Barleben, where a local tradition of similar deposits was established. Outside the settlement, one can similarly distinguish repeated acts of deposition and destruction at striking natural features from more ad-hoc deposits, mainly of small collections of polished stone tools, at various points in the landscape. There is hence variation in both the size of audience (potentially as little as a single person) and the degree to which deposits were rule-bound and traditions transmitted. The reasons for these deposits were thus also most likely not the same.

What seems to unite all this diverse evidence most clearly is its distinctiveness from other kinds of practice, most notably grave goods assemblages from cemeteries. These make a good category for comparison because they are definitely items deliberately placed in the ground for a specific purpose, in this case to accompany the deceased. Looking at the overall patterning (Figure 6), pottery and polished stone are found in both contexts, but grinding stones and animal bone are far more frequent in the structured deposits, particularly given that the grinding stones from graves are generally not heavy cereal-processing equipment. In contrast, flint tools are far more frequent in graves, and personal ornaments are almost exclusively confined to that context. This pattern holds true both for the range of material culture chosen for single-category deposition and for the mixed deposits. There are also further, more subtle distinctions. For instance, pots in graves are mostly smaller-sized vessels, suitable for individual consumption or presentation, while structured deposits often also include larger vessels and storage containers. Also, the polished stone tools found in single-category deposits provide no straightforward correspondence to individual burials, as larger numbers of tools and items in various production stages are included in the former. The choice of species for animal bone deposits is similarly distinct, and there is a wider range of bone tools in the structured deposits. Overall, deposits seem to reference a greater variety of concerns, including food provision, while grave assemblages are unsurprisingly more focused on presenting an idealised picture of the deceased.

Deposits with human remains are problematic here, as it is not always clear whether burial (in the sense of the rite of passage) was the main intention. Even where human bone forms the choreographic focus, the remains may in some cases have been collected as substances with specific associations and qualities, rather than constituting a burial rite *sensu stricto*. This category more than any other, however, drives home the point that there are no clear boundaries or watertight definitions. In turn, structured deposits often include items more similar to suspiciously rich pits and related phenomena of conspicuous consumption, such as Herxheim — the distinction here is largely one of how carefully the material has been placed in the ground. Therefore, it seems justified to see all these kinds of deposits — graves, structured deposits and suspiciously rich pits — as tied

together in a network of similarities and references, but varying in formality, depositional location, audience size and the details of composition, and therefore also in the kinds of readings that were possible in the past.

In sum, the kind of behaviour here grouped together as structured deposition is characterised by heterogeneity and corresponds only vary partially to the kinds of expectations archaeologists generally formulate for the recognition of ritual practices, namely repetition, formalisation and specially marked out locations/architectural framing devices. There is some patterning, but it provides at most loose and elastic boundaries, allowing for variability and improvisation. This aligns the LBK evidence with an increasingly recognised set of depositional practices with a low level of formality and repetition, but which are still distinguishable from ordinary refuse. While these likely also include some stored items and caches, their overall characteristics correspond to what has been described as the material residue of magical practices (*e.g.* Chadwick 2012; 2015; Merrifield 1987; Parker and McKie 2018). Indeed, the concept of magic allows us to further blur the unhelpful boundary between functional and ritual. For this reason, it forms a fruitful starting point for a new reading of the LBK situation.

LBK magic

Magic in archaeology and social anthropology

The term "magic" has long been viewed with suspicion in archaeology (Merrifield 1987, 2) and is contentious in its precise definition in social anthropology. However, its introduction in this context implies a shift in focus towards the mutable and performative aspects of deposits and hence opens up new avenues for further research.

Early anthropologists defined magic in opposition to religion, either as a primitive kind of rationality (*e.g.* Frazer 1911), or as an individual and antisocial practice, directed to the fulfilment of private needs and therefore opposed to the public functions of religion (*e.g.* Durkheim 1915; Mauss 2001, 11; for a summary of research history see Sørensen 2007, 6–28; Stein and Stein 2011, 137–8; Tambiah 1990). In contrast to highly redundant public rituals, magic was also often characterised as practical and goal-oriented. It was, for instance, associated with activities such as agriculture, hunting, travelling or fishing (Malinowski 1935; Mauss 2001, 24), as well as serving to harm another (in sorcery) or indeed to protect from sorcery attacks (Stein and Stein 2011, 140–7; Stewart and Strathern 2004, 1–28). In contrast to religious rites, magical ones do not necessarily require the presence of spirits or deities, but take effect through the realignment of forces by the magical practitioner. This is achieved by controlling for factors such as time of day and location, but also by correctly assembling a multiplicity of substances (Mauss 2001, 55–67). Magic thus relies on the idea of the connectedness and wholeness of the world, so that manipulating one part can affect another. The perceived qualities of things and substances are crucial here (*e.g.* Bradley 2017, 148; Chadwick 2012; Greenwood 2009, 17, 40–2; Linn 2014, 149; Manning 2014a), alongside spells and gestures which remain archaeologically irretrievable (Tambiah 1990, 73–4). As Frazer already recognised, magic works through similarity (things that are alike can influence each other) and contagion (things that have been in contact retain power over each other afterwards; see *e.g.* Stein and Stein 2011, 138–9). Therefore, the objects employed can often be mundane.

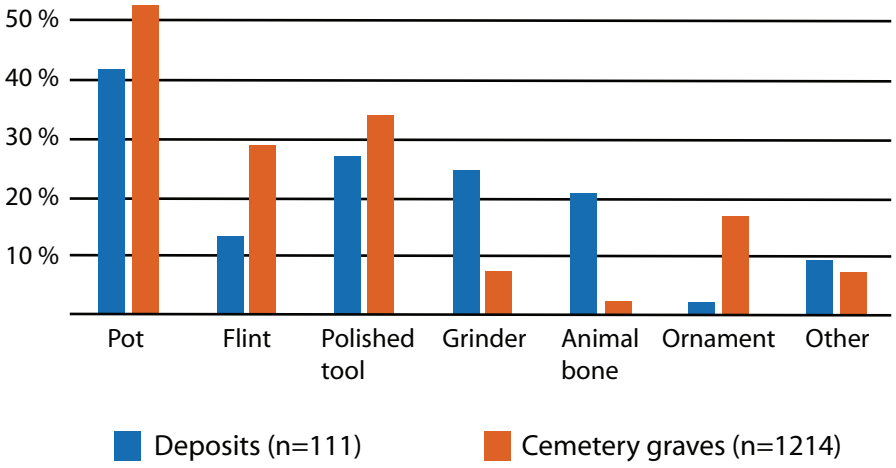

Figure 6. Comparison of assemblage composition of structured deposits (probable cases only) and furnished cemetery graves.

As with all binary divisions, dividing magic from religion (or indeed science, see Tambiah 1990, 105–10) is rarely clear-cut and increasingly contested (and Mauss 2001, 26–7 already recognised the messy middle ground). Rather, there is a range of formality and size of audience, with magic falling nearer the pole of single individuals or small groups working for very specific personal ends in more secluded settings. This can lead to greater variation in practices, although the degree of flexibility varies between societies. In the case of Trobriand garden magic, for instance, considerable importance is attached to the exact repetition of ritual sequences and spells, as well as the correct place, times and materials. This goes hand in hand with a lengthy apprenticeship for magicians (Malinowski 1935; Sørensen 2007, 180; Stein and Stein 2011, 142–5). In contrast, for the Azande, observed by Evans-Pritchard (1937), correct repetition is much less important. Magic is first and foremost based on the collection of powerful "medicine" (generally various plants) which must be compelled to become active through instructions. The key is that these instructions should be clear, enabling powers to be channelled correctly (Stein and Stein 2011, 145–6). In addition, because magic is mainly goal-oriented, many groups freely borrow magical practices from others, adding another layer of innovation (Augé 2014, 166; Sørensen 2007, 6).

While much magic has a strong verbal component in the shape of spells or invocations, one fundamental feature is to bring diverse substances with recognised powers together. These can then be deposited, but can also take the form of portable bundles. In the African case studies summarised by Graeber (2005), such bundles comprise a wide range of substances, such as the blood of people or animals, soil from graves, or unusual pebbles and feathers. These bundles are created to seal social contracts, and their power is said to punish infringements. Particularly powerful examples (those used to protect marketplaces or larger communities) may need to be periodically recharged through sacrifices and can accumulate histories and names of their own. However, there are also instances in which bundles (and their keepers) may be accused of sorcery and destroyed or killed.

In sum, in an archaeological worst-case scenario, magic could be carried out in any location (gardens, domestic structures) and use everyday items, precisely because of their intimate connection with certain activities or because they were touched by a given person. There need not be a high degree of regularity involved in such choices, nor need they always leave material traces (Augé 2014; Merrifield 1987, 184–6),

although the general principles of a society's ritual vocabulary, such as auspicious cardinal directions, may still be observed (Sørensen 2007, 179). As Merrifield (1987, 184–6) has pointed out, this means that magical practices are very hard to identify with any confidence archaeologically, especially if repetition and codification are seen as defining features of ritual practice. Single instances can therefore be readily dismissed and go unreported, making recognition elsewhere even less likely.

Increasingly, archaeologists are willing to discuss magical practices in spite of these problems. Magic is most confidently identified in early modern and medieval contexts, when a wide range of mundane items was deposited in domestic settings[10]. Sometimes quite sizeable assemblages of shoes, clothes, household pottery, bones, mummified cats, small metal or wooden objects, partly burnt logs and many other things were deposited in parts of the building deemed particularly vulnerable to attacks by witches, such as chimney stacks, wall cavities and thresholds. This is particularly well documented in Britain, Ireland and the USA, but has also been observed in central Europe (Beck 2016; Easton 2014, 15–6; Gordon 2015; Manning 2014b; Thier 1998, 87–9). Clothes and shoes were apparently selected because of their intimate association with particular individuals (*e.g.* Easton 2014, 26–7), but in the case of other objects, too, the mundane was considered apotropaic precisely because it harnessed powers marginalised by religious doctrine (Beck 2016, 527). In these cases, although the deposits in themselves are diverse, some items do feature repeatedly and the choice of location follows a recognisable logic, allowing an identification as a magic rite.

In a Neolithic context, similar arguments have been made for Çatalhöyük with regards to "bundlings" of material (Nakamura 2010; Nakamura and Pels 2014) discovered in house walls, as part of house abandonment episodes, and so on. These deposits comprise a wide range of items, mostly obsidian and other stone tools, neonatal human remains, animal bones and red ochre, which are interpreted as a counterbalance to more standardised and possibly more public ritual practices centred on clay objects and wall decorations. This "radical indeterminacy" (Nakamura 2010, 324), in which diverse materials could be juxtaposed in varying combinations, may have increased the perceived effectiveness of the bundles. Nakamura and Pels (2014) also point out that they are unlikely to have recognised all examples of magical practices — the interpretation as magical acts largely suggested itself in opposition to other categories, but remains slippery (Nakamura 2010, 304, 307).

The bundles of North American Plains groups also function through the association of specific substances, but are mobile and can be deposited in several contexts. Bundles are two or more objects wrapped together; they originate in a dream or vision and can relate either to individual biographical events (*e.g.* illnesses or journeys), to a specific function (curing, rain making) or to rituals central for the propagation of society (Pauketat 2013, 46). As a result, they can be deposited in different ways: either buried with their owners, cached in domestic settings or shrines, passed on to others, or partly replenished, with just some items removed at a given time (Zedeño 2008, 364–6; Pauketat 2013, 53–8). The power of the bundle comes from the association of the various substances within it — many associated with the natural world, such as minerals, plants, animal parts or rocks — but must also be activated through performing associated songs and liturgies or painting the

10 Medieval magic is of course not limited to the mundane; items perceived as strange and exceptional, including a range of archaeological artefacts, were also utilised (see e.g. Sachße 2008).

right designs. Bundle holders can be subjected to behavioural rules to ensure the benevolence of the bundle (Zedeño 2008, 364, 372–3). With the wide variety of objects involved, Zedeño (2008, 374–5) suggests that the best way of understanding bundles is to problematise the interaction between the fixed and the relational or biographical properties of the components. For instance, some items (spring water, paint, tobacco) have fixed powers which activate other components. Most animals and plants also have intrinsic properties, but these can be activated differently depending on the constellation. Other items come from more mundane contexts, but are important in the bundle for biographical reasons. Finally, some items derive their power mainly from their long biographies, for instance exotic goods.

Many more examples of similar practices could be mentioned, from Roman curse tablets to the use of human body parts in early modern medical cures, but the above already draw out a range of features which have also been recognised in the LBK material.

Is there LBK magic?

In all of the above examples, the common factor is the general indeterminacy and lack of strict coherence of the phenomenon, which is in fact best defined in opposition to more codified practices. In the LBK, the caching of various items together, without particularly standardised combinations but with recurring preferences, shows parallels with Çatalhöyük in particular. The focus on the house is less evident in the Bandkeramik, but this may at least partly be due to the substantial erosion —up to a metre or more — of the former walking surfaces. We will hence only ever recover the items buried in deeper sections of pits. However, that natural places are also represented recalls the more mobile Native American bundles. For the deposits in more public locations, such as enclosure ditches and wells, we could even suggest something akin to the African fetish — and thus at the borderline of magic — as a kind of incantation aimed at maintaining obligations for a wider group.

In terms of the objects represented, the LBK situation has parallels to several of the examples above. In all cases, a wide variety of things could be implicated in magical practices, including personal and everyday items. In the LBK, these are the main focus of depositional practices, with unusual natural artefacts — such as perhaps fossils or rare stones — far less represented. Imported Mediterranean shells are a rare exception, but could also have been valued as artefacts with remembered histories. While both wild and domesticated animals are represented, the spectrum remains restricted mainly to the smaller domesticates (including dogs), to raw materials such as antler, and to cattle bucrania, with only occasional exceptions (such as the fox from Rehmsdorf). While we are missing all organic components, such as any clothing, plants, feathers and so on, it seems that the majority of deposits hence concern the tools and preoccupations of daily life. Pottery and grinders are a definite focus of the corpus. Axes also stand out and are represented both in settlements and in the landscape, where they could relate to work in fields and forests or to raiding. Tasks that necessitated flint or bone tools are less frequently referenced. Overall, while variability remains key, certain activities are more consistently singled out. These are not in themselves unusual, but concern core aspects of existence, such as food production, storage, building and defence. In a way, magic tapped into the power of these very foundational aspects of life. Practices of deposition are hence very closely entwined in everyday

acts, to the extent that dividing deposition for "functional" reasons from that involving "ritual" elements may not only be methodologically impossible, but also not warranted. Magic pervaded the everyday, and was in turn fed by it.

In analogy to the parallels cited above, this could also be connected to other inherent qualities of these materials and objects. Red ochre and fire, which are occasionally documented in the LBK, may have served as activating substances. Many of the other items would not just have referenced activities in the abstract, but could have been intimately connected to particular individuals or groups: pots bearing the emblems, or quite literally the imprints, of their makers, grinding stones worn down by daily use, axes with their own specific history. Other items, perhaps the more unusual ones, would have reminded people of the circumstances connected to their acquisition. Whether human remains in any way referenced the identity of the deceased or were rather appreciated as a substance is so far impossible to say. Nevertheless, biographical, fixed and relational concerns were all present, as in the Native American bundles.

While there are thus broad outlines of a logic of deposition, not all deposits were made for the same reasons and with the same degree of circumspection. Some may indeed hardly be explicitly ritualised, while deposits in enclosures, where large numbers of people were potentially involved, may have had very different aims and consequences. Still, "magic" remains a good characterisation in particular for the smaller-scale deposits in and around houses and in the settlement space, and perhaps also for the so-called cenotaphs. As a term, it draws attention to the fact that not all ritualised activity at this time was straightforwardly public, repetitive, traditional and concerned with maintaining the status quo. Instead, there were spaces for idiosyncrasy and for the strategies of individuals and small groups, perhaps even for subversion. This encourages us to see structured deposits no longer as epiphenomenal and singular, but as part of a wider logic of deposition.

Where do we go from here? Structured deposits and LBK society

If this reading is accepted, there are several implications for LBK spiritual life more generally which also suggest avenues for further research. First of all, it would be interesting to think more closely about the timings of LBK structured deposition. Even allowing for problems of recognition, the frequency of structured deposits in the LBK remains low in relation to its duration and extent. Dating is currently not detailed enough for an in-depth analysis, but it is interesting that higher densities of deposits have been identified on some of the more longer-lasting or densely built-up sites, such as Buchbrunn, Otzing or Cuiry-lès-Chaudardes. These local (or, in the case of single-category grinding stone deposits, regional) traditions suggest an elevated rhythm. More work is necessary to establish whether this is merely an artefact of large-area excavation, but if the pattern is confirmed, this could be connected to the kinds of social tensions with which sedentary villages were riddled (*e.g.* Århem 2001; Bandy 2004) — fear of sorcery, or simply the feeling that there were more uncontrollable factors in social interaction which required a different kind of intervention to bring about a desired outcome, may have been rife in such circumstances.

Secondly, it is also interesting to note that both single-entity polished tool deposits and single-entity grinding stone deposits seem to increase in intensity at the transition between the Latest LBK and its Middle Neolithic successor cultures, continuing across the divide. If indeed this was connected to a (perceived or actual)

crisis (*e.g.* Gronenborn *et al*. 2017; Zeeb-Lanz 2009), then this could again be suggestive of different means that were employed to regain control over one's personal welfare. More detailed studies of various Middle Neolithic groups would be a first avenue for further research, in particular to also check whether the supposed religious dimension of this transition, which associates new burial rites with a strictly controlled new worldview (*e.g.* Spatz 2003), also influenced the more ad-hoc practices here characterised as magical.

A third interesting point are the possible magical practitioners themselves. This is highly speculative, as there is no clear association between these practices and specific individuals. However, it is clear that both artefacts with strongly male connotations (notably polished stone tools) and those with more likely female associations (food preparation artefacts, including grinders) were involved. Also, both domestic and landscape contexts were considered appropriate, with the former dominating. This suggests that magical practices may have been part of the repertoire of different social groups. While this potentially gendered aspect deserves further consideration, it is also possible that with the presence of multiple lineages per site, or even in the course of contacts with other ethnic groups (such as surviving foragers, see *e.g.* Hofmann 2015), some magical protection may have been considered necessary, or borrowing may have taken place.

Fourthly, the variation of deposits suggests that transmission of the necessary knowledge was not highly regulated or controlled. Conditions of infrequent repetition of rites tend to correlate with other features of a society, such as its institutionalised hierarchy. In a recent set of papers, Whitehouse (2002; see also Atkinson and Whitehouse 2011; Barth 1987; Whitehouse and Lanman 2014) has opposed two modes of ritual activity. In the doctrinal mode, transmission relies on repeated performances in large groups, often with clear verbal explication of central tenets. This can involve religious specialists and a concomitant hierarchy. In contrast, in the imaginistic mode, infrequent repetition is offset by intense emotional experiences for participants and also leads to variation in the detail of performances, with only a loose convergence around a few core aspects. The latter has particularly been applied to so-called rites of terror, in which novices in initiation rituals often undergo extreme psychological and physical challenges (Whitehouse and Lanman 2014), but it can be extended to cover ritual activity more generally (Barth 1987, 26–35). This mode provides no basis for pronounced hierarchies. Infrequent magical practices like those suggested for the LBK case would fall into this end of the spectrum.

According to Atkinson and Whitehouse (2011), the transition from hunting and gathering to farming should go hand in hand with a shift in focus away from the imaginistic to the doctrinal mode, although many societies combine elements of both (Whitehouse 2002, 294). In the LBK, we do indeed witness the appearance of more formalised ritual arenas, notably cemeteries and enclosures, but these retain a lot of local and regional variation. All this was apparently counterbalanced by a wider range of less public behaviours which were very idiosyncratic and where audiences may have been much smaller and activities more secretive. Such acts, resulting in the creation of many of the structured deposits as defined here, were less constrained by public scrutiny and could accommodate a wider variety of ends, not always socially sanctioned. The greater need to be sociable is thus matched by a need for more potentially antisocial behaviours — whether to bring about personal goals, or to actually engage in sorcery to harm another. Therefore,

there may not only have been social and political, but also magical checks in place which could counter any tendencies towards increased hierarchisation.

As a final point, the identification of structured deposits has implications for how we conceptualise LBK worldviews. It appears that, in line with the other examples for magical practices cited above, LBK people saw themselves as part of a fundamentally connected universe animated by powerful forces that needed to be controlled, enticed and directed. This was achieved by the creative recombination and juxtaposition of substances, with ritual emerging as a kind of activity particularly rich in the recombinations and relations it allows between all aspects of life and therefore crucial to how people orient themselves in their cosmos (Pauketat 2013, 184–90; Tambiah 1990, 136). This should caution us against seeing fields, houses and the wider environment as places of purely economic and common-sense activity, empty containers ready to be taken over and controlled in a planned fashion by a farming society obeying strict rules. Much more negotiation and uncertainty may have been involved, and our view of the LBK and of its contexts for daily interaction may need to be de-domesticated as a result.

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Grave goods, refuse or the remains of rituals? Differences in the assemblages from the LBK burials of Arnoldsweiler-Ellebach

Robin Peters and Nadia Balkowski

Abstract

The question whether an artefact in a burial is a grave good, an artefact intentionally buried with the dead, or was simply accidentally included, has been answered in very different ways by archaeologists. Often, the value one assigns to the object is a decisive factor. In this paper, we try to investigate the formation of burial assemblages from a more neutral starting point, although we are of course not claiming to be free from assumptions. As a working hypothesis we distinguish between the finds from the base of burial pits and those from the fills. While the former should be "structured" in the sense of Richards and Thomas (1984), or more specifically, should display intentionality or indicate a "positive selection" (Eggers 1959), the latter have often been ignored. We conclude that the possible interpretations for pottery and stone artefacts are different and that there is no single deposition scenario that suits all materials. In addition, finds from the fill and the base of burials should be accorded more analytical weight in the future.

Keywords: *Neolithic burials; funeral practices; grave finds; taphonomy; positive and negative selection*

Introduction

Archaeologists facing the question whether an artefact found in a burial is a grave good, an artefact intentionally buried with the dead or was simply accidentally included might be tempted to answer this question in terms of the value one assigns to the object. In this paper, we try to investigate the formation of burial assemblages from a more neutral starting point, although we are of course not claiming to be free from assumptions. As a working hypothesis we distinguish between the finds from the base of burial pits and those from the fills. While the former should be "structured" in the sense of Richards and Thomas (1984), or more specifically should display intentionality or indicate a "positive selection" (Eggers 1959), the latter have often been ignored. Using the cemetery site of Arnoldsweiler-Ellebach as an example, we have systematically compared pottery, stone tools and other finds categories from the bases and the fills of graves, trying to identify similarities and differences between these categories and between cemetery and settlement assemblages. This has revealed a rather complex picture which cannot be adequately

described using binary classifications such as structured/unstructured or intentional/unintentional. Instead, while the stone tools recovered from grave fills may indeed be accidentally incorporated knapping waste, the pottery from the same contexts may rather be the result of ritual activities at the graveside. To fully understand these multi-layered processes, it is important to take into account the performative aspects of the burial rite as a whole and to continue collecting detailed data even on apparently unimportant "fill goods". But first, we will briefly introduce the site of Arnoldsweiler-Ellebach, especially the cemetery.

The site

The site of Arnoldsweiler-Ellebach is situated in the loess region of the so-called Cologne Bay, approximately half-way between the modern cities of Cologne and Aachen. Today, the small Ellebach stream runs directly past the site, but this tributary of the river Rur is not thought to have been water-bearing in Bandkeramik times (Gerlach *et al.* 2011, 65). The well-known Aldenhovener Platte with its cluster of LBK sites, such as Langweiler 8, is about 15 km further west. In the immediate vicinity are the settlements of Merzenich-Morschenich (Gaitzsch and Janssens 2010) and Merzenich-Valdersweg (Cziesla *et al.* 2014).

Arnoldsweiler-Ellebach has been excavated in the years 2009 and 2010 as a rescue excavation in advance of the construction of a motorway. The excavation companies responsible, Wurzel GmbH and Ibeling Archäologie GbR, have already published an extensive overview of the great spectrum of features and finds from Arnoldsweiler, which range from the Palaeolithic to modern times (Cziesla and Ibeling 2014).

The LBK site of Arnoldsweiler-Ellebach comprises different sub-areas (Figure 1): there is an extensive settlement with more than 50 longhouses, four wooden wells and a large cemetery immediately next to the settlement. About 200 m to the east, an enclosure with several ditches and additional houses have been found.

Between 2014 and 2018, a research project under the direction of A. Zimmermann and R. Gerlach, funded by the German Research Foundation (DFG), was concerned with the detailed examination of the LBK features and finds. The project comprised two main parts: in addition to the pottery, N. Balkowski has worked on the settlement features such as houses and pits and on the water supply of Arnoldsweiler, while R. Peters was concerned with the lithic and ground stone material, the features from the cemetery and the enclosure. Besides addressing for instance the chronology and raw material supply of the site, Arnoldsweiler offers the opportunity to examine the relationship between the different sub-areas, which was a particular focus of the project.

Central to this paper is the cemetery with its 229 burials. The majority of the burials are inhumations, but there are seven cremations as well. The total number of buried individuals is difficult to gauge due to the partial preservation of human remains, but besides single inhumations there are at least two double burials and two burials with an inhumation and additional disarticulated bones. In addition to the burials there are other LBK features in the area of the burial ground, notably postholes and pits.

Due to acid soils, bone is usually not preserved at the six LBK cemeteries known so far between Rhine and Meuse (Dohrn-Ihmig 1983; Gaitzsch and Janssens 2010; Gaitzsch *et al.* 2012; Heinen 2005; Heller 2014; Modderman 1970; Richter 2011). Arnoldsweiler-Ellebach is the first site with slightly better

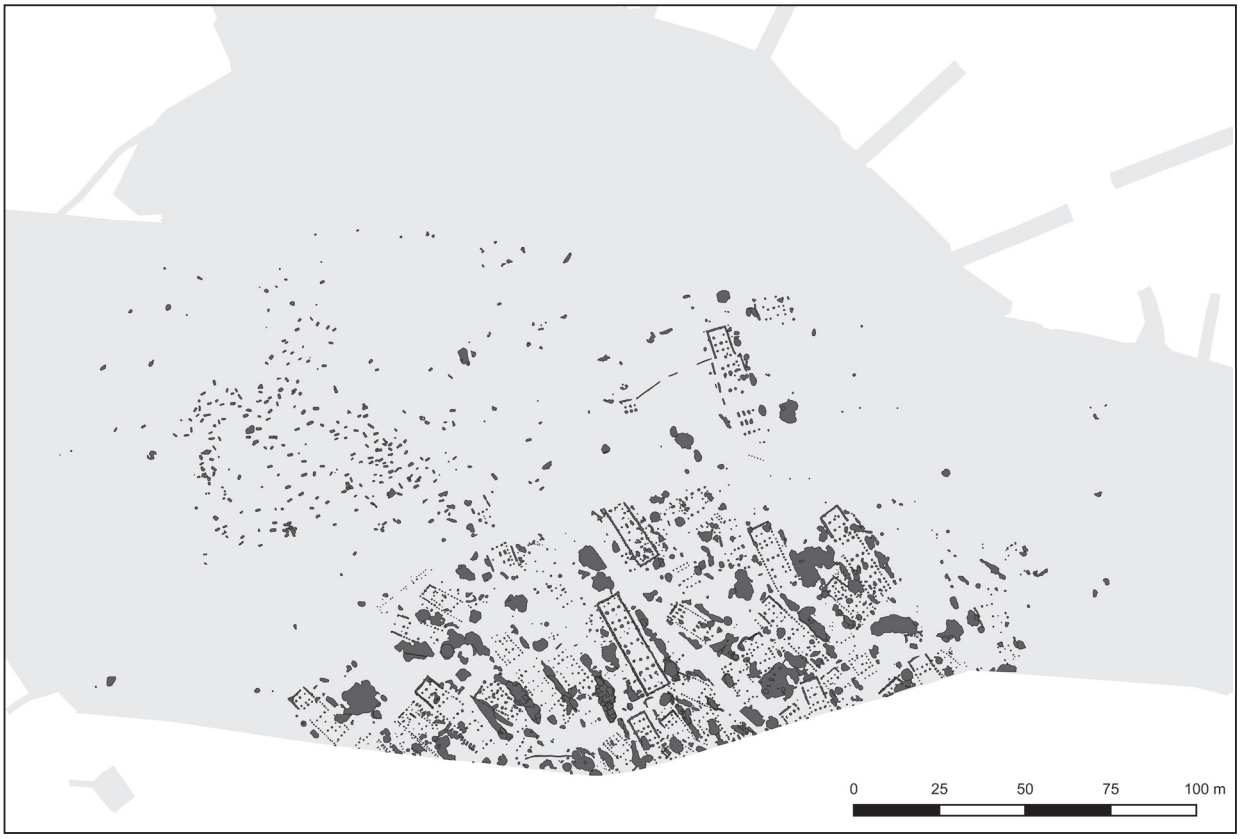

Figure 1. Partial plan of the excavated area (grey shading) with LBK features at the site of Arnoldsweiler-Ellebach. The cemetery is situated in the north-west of the site, immediately next to the settlement.

bone preservation. Therefore, for the first time there is an LBK burial ground in the Rhineland where it is possible to shed light on the age, sex and body position of a larger group of interred individuals.

In spite of the limitations imposed by a rescue excavation, the excavators were careful to distinguish between finds from the base of the inhumation pits and finds from the fill. This is why our approach is not to interpret all finds from the burials *a priori* as grave goods but to investigate the formation of these sub-assemblages. In addition, we wish to establish whether the pottery from the base as well as the pottery from the fill can be used for dating the burials (Balkowski 2014).

Theoretical framework

As a starting point we will outline two theoretical approaches to the overarching questions of intentionality and ritual. The first is the concept of positive and negative selection which is commonly used by German archaeologists and part of most archaeology curricula at German universities (Eggers 1959; Eggert 2008). The second is the notion of "structured deposition" which has gained huge popularity in Great Britain since the 1980s (Garrow 2012; Richards and Thomas 1984, 191; Thomas 1999, 80–5).

Already in the 1950s Eggers contemplated the "geistige Ursachen" (*i.e.* the mental causes) of, as he envisaged, the three major categories of prehistoric features, namely burials, hoards and settlements (Eggers 1959, 264–5). According to Eggers, finds from burials and hoards can be viewed as a "completely subjective

partial sample of the entirety of finds" (Eggers 1959, 265)[1].Therefore, finds from these two categories of features represent a positive selection, which "prehistoric people have deliberately chosen" (Eggers, 1959, 267)[2] from the once-present material culture. In settlements, on the other hand, "the selection is negative, because we are only given what people did not choose when they left their place of residence" (Eggers 1959, 267)[3]. Eggers' distinction between a selection for known reasons (burials, settlements) and unknown reasons (hoards) is less important for our problem. Although the rigorous separation between finds from burials and settlement finds and the notion that all settlement features are of a mundane origin are no longer appropriate, as shown by several papers in this volume, we still regard Eggers' concept as worth considering.

The term "structured deposition" was coined by the British archaeologists Colin Richards and Julian Thomas in a paper on Late Neolithic henge monuments in Wessex (Richards and Thomas 1984). Richards and Thomas investigated find distributions for patterns and regularities, "structure" in their own words. Their initial hypothesis was that repeating patterns in the find distribution point towards ritual activities: "the performance of ritual involves formalised repetitive actions which may be detected archaeologically through a highly structured mode of deposition" (Richards and Thomas 1984, 215).

The idea of "structured deposition" was very well received in British archaeology and has been applied to numerous other case studies. Garrow (2012) provides a very useful history and critical review of this term. His main criticism includes that the concept so far lacks a clear definition or a heuristic to recognise structured depositions. Furthermore, both find distributions and suspicious single finds ("odd deposits") are characterised as "structured" (Garrow 2012, 96, 105). Another important point of criticism is that features and finds are often viewed from a timeless, synchronic perspective, while source criticism and the study of site formation processes are neglected. Moreover, the question arises why only ritual activities should lead to regular distributions and patterning (Garrow 2012, 109). We also believe that it is problematic to interpret gradual differences in find compositions in terms of binary oppositions such as nature/culture, life/death and so on, as for instance Thomas (1999, fig. 4.9, 80–5) has done.

But all in all, there are some similarities between the British post-processual approach and Eggers' reflections. Fundamentally, both take a positive view towards the question whether identifying ritual activity is within the possibilities of archaeological inference. We think that the two parties would agree that in certain circumstances ritual activities might become visible through the investigation of find distributions and an intra-site analysis. Secondly, the underlying principle of both concepts seems to be the same — intentionality. While this notion is quite clear in Eggers' writings it is not so pronounced in the paper by Richards and Thomas. But expressions like "controlled", "deliberate" or "purposeful deposition" do also imply intentionality (Richards and Thomas 1984, 204, 214). However, the aim of this paper is not to redefine the concepts by Eggers or by Richards and Thomas, although we worry that the term "structured deposition" has become a catch-all category with little analytical

1 Original: "völlig subjektiven Ausschnitt aus dem Typenvorrat [anzusehen]" (Eggers 1959, 265). All translations in this text are by the authors.

2 "[die] der vorgeschichtliche Mensch bewußt ausgewählt hat" (Eggers 1959, 267).

3 "die Auslese [ist] negativ, weil uns nur das erhalten ist, was der Mensch beim Verlassen seines Wohnortes […] nicht ausgewählt hat" (Eggers 1959, 267).

strength, comparable to the term "ritual" criticised by Richards and Thomas in the 1980s (Richards and Thomas 1984, 189). Therefore, we aim at strengthening the analytical value of the concept by concentrating on the proxy level of the investigation and the question of how to identify a structured or positively selected deposit.

Turning to our case study, we will investigate the find distribution and composition of two assemblages, the finds from the burial fill and the finds made at the basal level of the graves. Scholars commonly interpret finds from the base of grave pits as grave goods, but sometimes the fill finds are also seen in the context of the burial (*e.g.* Nieszery 1995, 106). Our initial hypothesis is that the burial finds display strong patterning and regularity and are "structured" in the sense of Richards and Thomas (1984). Whether this holds true for the finds from the grave fill will be investigated by comparing this sub-assemblage to the settlement finds on the one hand and the finds from the basal level of the graves on the other. As far as we are aware, such a thorough investigation of the fill finds from LBK burials has not yet been attempted.

From these theoretical considerations, various possibilities of interpretation of the finds from the burial fills arise, of which we will examine three scenarios more closely. We will investigate whether finds from the grave fills are:

1. Grave goods placed intentionally in the burial (positive selection)
2. Settlement refuse or "noise" (negative selection)
3. Remains of rituals or activities at the graveside, either during the burial of an individual or as a kind of "ritual noise" with a greater temporal depth

Of course, these are idealised, schematic simplifications and it has to be borne in mind that we primarily consider not the individual find, but a kind of assemblage average.

Pottery

Concerning the pottery from graves, the typical interpretation depends on the position in the grave (base or fill) and the presumed context. For instance, complete vessels from the base are usually interpreted as a positive selection and may be seen in the context of food offerings. In accordance, Frirdich (2003, 555) understands vessels or parts of them only as grave goods if they were found at the base of the grave pit next to the buried person.

For the sherds from the fill, different interpretations exist. For example, Nieszery (1995, 121) argues that it is unknown whether these sherds are contemporaneous to the vessels that were found at the base of the grave. Similarly, it is believed that the sherds were deposited accidentally and may therefore represent a negative selection. Another idea concerning the sherds from the fill is that they originally belonged to whole vessels which were destroyed by erosion or intentionally (Nieszery 1995, 138–40). Sometimes, a ritual context is also discussed (Peschel 1992, 225–7). This means that there are different concepts regarding the interpretation of pottery from burials. Besides the already mentioned location in the grave, the practices of the mourners need to be considered to decide whether the pottery was put in the grave intentionally or ended up there accidentally.

While attempting to date the graves of the Arnoldsweiler cemetery (Balkowski 2014), the question arose whether only the pottery from the base of the grave can be used for this purpose, and if the commonly used interpretative scheme for pottery from burials can be applied to the finds from Arnoldsweiler. Several observations caused us to question this scheme, as will be shown by some of the aspects drawn out here. An analysis of the whole pottery assemblage from the site

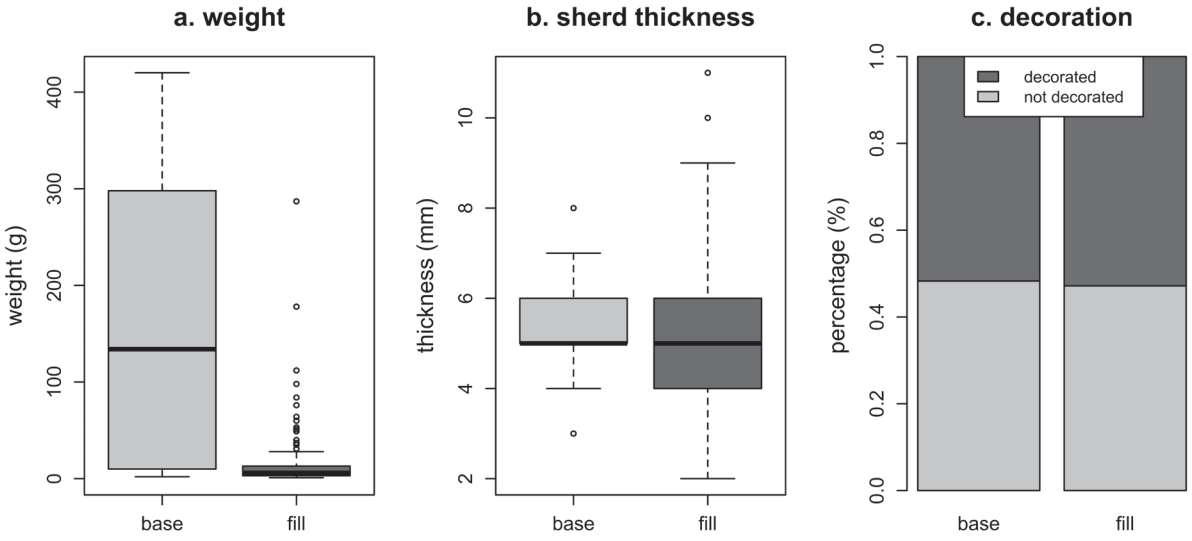

Figure 2. Attributes of the pottery from the cemetery of Arnoldsweiler-Ellebach, differentiated by location in the grave.

of Arnoldsweiler with a systematic comparison of all attributes of the pottery from the different sub-areas is presented in Balkowski (2018).

In total, 251 vessel units from graves have been recorded. The majority, more than three quarters, originate from the fill and only 29 vessel units are from the base of the graves. Following the common interpretative scheme, it could be assumed that the latter comprise complete vessels as a positive selection, while the finds from the fill are composed of smaller sherds and vessel fragments which could be interpreted as a negative selection, perhaps in form of settlement noise. Indeed, looking at the weight of the vessel units, there definitely is a clear difference between pottery from the base and from the fill (Figure 2a). The sherds from the fill weigh 13 g on average, whereas the average weight of vessel units from the base is about 193 g and therefore considerably higher. But it is worth noting that there are heavy and well-preserved pots in the fill, just as there are vessels with a low weight from the base. How can this observation be interpreted?

As demonstrated by the weight of the pottery, the vessels from the graves of Arnoldsweiler show quite different degrees of preservation. There are only a few complete vessels alongside large parts of whole vessels or only a few sherds of one vessel unit. Concerning the possible relation between the completeness of vessels and their position in the grave, it can be stated that there are also complete or nearly complete vessels from the fill, which cannot easily be dismissed as settlement noise. In addition, in two burials there are sherds from the fill and the base which could be assigned to almost complete vessels. Five other vessel units from four graves also combine sherds that were found at the base and in the fill. This shows that pottery from different locations need not necessarily belong to different vessels. Moreover, it is striking that only a small proportion of the whole pottery assemblage consists of nearly complete vessels — consequently only a few vessels can be regarded as typical grave goods.

Another noticeable observation is the proportion of decorated and undecorated vessels (Figure 2c). Decorated pottery makes up approximately 50 % both at the base and in the fill. In contrast, only about 20 % of the pottery from the settlement

is decorated (Balkowski 2018). Likewise, the sherd thickness shows that vessels from both categories have an average thickness of 5 mm, which is typical for fine ware of the LBK (Figure 2b). Again, this is not the case in the settlement material, where there is more coarse ware.

Finally, the main motifs from each grave can be analysed. These typical elements of LBK pottery decoration represent the basis of the chronological classification of the LBK in the Rhineland (*e.g.* Stehli 1994). Features with at least two main motifs are included in a correspondence analysis, which results in a sequence of features that is interpreted in terms of relative chronology. If some vessel units from burials are settlement noise and do not belong to the grave itself, then pottery from different phases could be expected to occur in one grave. For example, there could be a difference in date between base and fill. But the Arnoldsweiler graves do not regularly show such differences in dating, which could have been recognised in the outlying position of graves in the correspondence analysis of main motifs (Balkowski 2018). Thus, the pottery from grave fills and bases does not show a considerable temporal difference.

To summarise the analysis of pottery from graves, it can be noted that the pottery from the cemetery of Arnoldsweiler does not fit the common interpretative scheme, as only a few vessels can be interpreted as grave goods. These vessels are preserved completely or in large parts and they can be found mostly on the bases, but also in the fill of the graves. Concerning the smaller sherds from graves, especially from the fill, it can be shown that they differ from the nearly complete pots in Arnoldsweiler, but also show similarities to them, such as sherd thickness or the proportion of decoration. Therefore, these sherds cannot be interpreted as settlement noise, as a lot of attributes deviate from settlement pottery. That is why it seems probable that much of the pottery from the base and the fill should be interpreted in the context of the burial, maybe as part of a burial ceremony. Alongside the observations of the location in the grave and the possible associated practices, it is therefore necessary to look at the attributes of the pottery, too. For example, the completeness, the frequency and the dating of the sherds can be recorded and can open up different possibilities for interpretation (Balkowski 2014, 87–8). In addition, the practices in the context of the burial should be focussed on in more detail, as the analysis of pottery showed that a large part of the pottery assemblage relates to ritual activities beyond the simple deposition of grave goods.

Indeed, the observations concerning the pottery from Arnoldsweiler are not unique, but can be found in other LBK burials, too. For example, in about 7 % of the graves recorded in the dataset of D. Hofmann (Hofmann in prep.), complete pots in the fill of the graves are documented. On top of that, sherds in the fill occur quite often — more than half of all graves contain pottery sherds in the fill, which shows that this is a frequent phenomenon. Interestingly, the number of sherds in the fill is not higher in settlement graves, which can be understood as another argument against the interpretation of pottery finds from the fill as settlement noise. This means that the presence of pottery in the fill is on average the same in cemetery burials and in settlement graves and could therefore hint at practices in the context of funerary rites.

Stone artefacts

The lithic assemblage from the burials of Arnoldsweiler-Ellebach comprises 111 flint artefacts. All objects were studied macroscopically and recorded using the scheme developed by the DFG project "Siedlungsarchäologie der Aldenhovener Platte" (SAP, Löhr *et al.* 1977; Zimmermann 1988). Half of the lithics (n = 56) have been recovered from the basal level of the burials, the other half consists of finds from the grave fill (n = 55) (Figure 3a). In this section, we compare and characterise these two sub-assemblages using an attribute analysis.

The majority of chipped stone from both the fill and basal assemblages belongs to the so-called Rijckholt flint type, which is a variety of the west European Cretaceous flint and can be found in the Dutch/Belgian limestone area at a distance of c. 50 km from Arnoldsweiler (De Grooth 2011). The lithics from the fill are slightly more heterogeneous in raw material than those from the basal level of the burial.

Lithics in the fill are on average smaller than pieces from the base of the grave (Figure 3b). All in all, 85 % of the artefacts from the grave fill are smaller than 3 cm, while this holds true for only 55 % of the lithics from the base of the burials. The high proportion of small artefacts (< 3 cm) in the fill is comparable to that of LBK features believed to contain knapping refuse (*e.g.* feature 4734 in Erkelenz-Kückhoven, Kegler-Graiewski 2004, 368–70). A large share of small artefacts can, however, also be considered as an indicator of careful excavation (Peters 2018).

There is a very pronounced difference concerning the blanks of the two sub-assemblages. Flakes dominate the grave fill with 81 %, while at the base of the burial pits the share of flakes and blades is balanced (Figure 3c). Furthermore, most artefacts in the fill (89 %) are unmodified pieces — so-called "debitage" — while at the base two thirds of the artefacts are tools (Figure 3d). The preform parts are different as well. The majority of flakes and blades at the base of the grave pits are medial fragments, which are commonly interpreted as the aim of LBK lithic production (Löhr *et al.* 1977, 202). In the fill there is no selection towards medial fragments, but a random distribution of preform parts (Figure 3e).

Cortical pieces make up half of the assemblage from the fills (Figure 3f). At the basal level there are considerably fewer pieces with cortex (14 %), which originate from an early stage of the chaîne opératoire. Two tablet cores ("Kernscheiben") in the fill are also indicators for flint tool production. Finally, burnt pieces are restricted to the grave fill and absent at the base of the pits.

The tool inventory at the basal level consists almost exclusively of arrowheads, sickle blades, end- and side-scrapers. Three arrowheads, a side-scraper and a splintered piece were recovered from the grave fill.

The inventory of colourants, ground and polished stone consists of 47 artefacts from the basal level of the burials and only eight from the grave fills. This difference in numbers already hints at a different formation of the assemblages. Due to the small numbers involved, a quantitative attribute analysis is not possible, but we can investigate what kinds of artefacts have been found at the base and in the fill of the burials. At the basal level the majority of ground stone artefacts are amphibolite or basalt adzes, but there are also some red ochre pieces, a grinding stone, a hammerstone and an unmodified flake. Adzes are completely absent in the fill of the burials, but there are two red ochre pieces and another hammerstone. It must be pointed out that the ochre pieces from the fill are considerably smaller than the pieces at the base of the grave. Saddle querns, which are commonly found in LBK burials, are absent

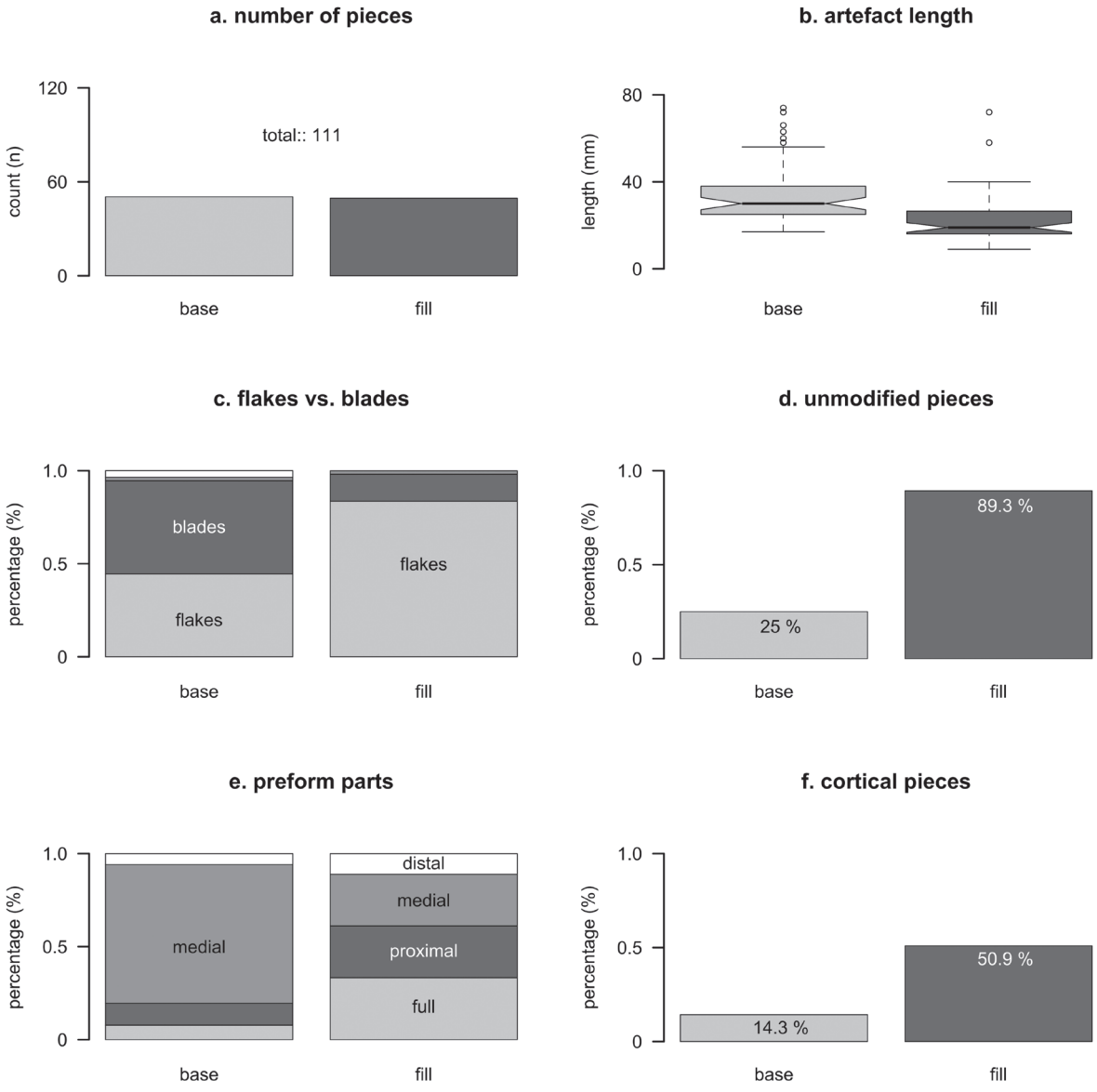

Figure 3. Attributes of the lithics from the cemetery of Arnoldsweiler-Ellebach, differentiated by location in the grave.

in Arnoldsweiler, as are ochre scatters. Considering that querns are known from the nearby cemeteries at Altdorf A, Niedermerz 3, Jüchen-Holz, Bergheim-Zieverich and Elsloo (Heinen 2005; Heller 2014; Hoyer 2009; Modderman 1970; Richter 2011) their absence in Arnoldsweiler is quite surprising.

All in all, lithics from the fill and from the base of the burial pits differ in size, in the type of blanks used, in the proportion of tools, the amounts of cortical and burnt pieces and the type of tools. Differences in the type of ground stone artefacts are apparent as well. It is very likely that these differences are due to a different taphonomy of the assemblages. The artefact size and the large proportion of medial fragments and tools at the basal level are indicators of a "positive selection". In contrast, the large number of unmodified flakes and cortical pieces in the grave fill can be interpreted as "negative selection" in the terms of Eggers. Finally, it has to be said that there are great similarities between the assemblage from the grave fills and the assemblage recovered from the settlement pits (Peters 2018).

	distance to settlement	lithics (n)	unmodified flakes (n)	unmodified flakes (%)
Arnoldsweiler-Ellebach	< 15 m	111	44	39.6
Elsloo	c. 50 m	80	16	20.0
Altdorf A	c. 250 m	32	0	0
Niedermerz 3	c. 500 m	162	15	9.3

Table 1. Distance to settlement and proportion of unmodified flakes in the burial assemblages of Arnoldsweiler-Ellebach, Elsloo, Altdorf A and Niedermerz 3 (data from Heller 2014; Hoyer 2009; Modderman 1970; Peters 2018).

Although the assemblage from the grave fills has been characterised as "refuse" in the broadest sense, there remain multiple scenarios of how the assemblage came into being. For example, are the stone artefacts in the fill the remains of rituals conducted during the funeral or are they the remains of activities not connected to the burial in question? One way to approach this difficult issue might be to think about the time range over which an assemblage formed. As a working hypothesis one can assume that remains from a single event should be more homogeneous than those from several events. Accordingly, refuse from the funeral itself would be less heterogeneous than an inventory accumulated over a longer time span. The assemblages from the grave fills are indeed quite heterogeneous in several aspects. For example, from most grave fills lithics of several raw material types were recovered, and burnt and unburnt pieces were frequently found intermixed. The small number of artefacts per burial is an argument against the idea of knapping at the open grave, as this would have produced hundreds of flakes. Due to the small artefact size and small number of tools, the thought that tools used during the funeral were disposed of in the fill of the graves is also unlikely. The red ochre fragments found in the grave fill, on the other hand, might indeed be remains of funeral ceremonies. The two arrowheads in the fill can be regarded as unusual as well. Then again, dealing with general categories like basal and fill finds we have to expect a certain error margin due to excavation difficulties or disturbance by animals.

In order to compare Arnoldsweiler-Ellebach to other cemeteries between Rhine and Meuse we have to investigate the burial finds as a whole, as fill goods and basal goods were not always systematically differentiated for the other sites. This means we will treat the two sub-assemblages at Arnoldsweiler as one. Since the stone assemblages of the cemeteries of Niedermerz 3, Altdorf A and Arnoldsweiler-Ellebach have been analyzed using a single recording scheme, the datasets can be compared easily and will be supplemented by the assemblage from the cemetery of Elsloo, which has been adapted to the SAP recording scheme (Heller 2014; Hoyer 2009; Modderman 1970).

It becomes obvious that neither at Elsloo nor at Niedermerz 3 or Altdorf A is the share of unmodified flakes as large as in Arnoldsweiler-Ellebach (Table 1). Considering the question whether the debitage can be connected to funeral or settlement activities, it is interesting to investigate the relationship between cemeteries and settlements. There seems to be a correlation between the distance to the settlement and the proportion of unmodified flakes. In Arnoldsweiler-Ellebach the cemetery is immediately adjacent to the settlement and unmodified flakes make up c. 40 % of the assemblage. At Elsloo the cemetery is at a distance of c. 50 m and the share of debitage is about 20 %; finally, in Niedermerz 3 and Altdorf A, which are some hundreds of metres from the next settlement, the proportion of unmodified flakes deceases to 9 % in the former case, while there are no unmodified flakes in Altdorf A at all. Due to the very small number of cases, the correlation is not statistically significant, but nonetheless the idea is worth pursuing. In the

future, the dataset could be enlarged by the analysis of the cemeteries at Bergheim-Zieverich, Jüchen-Holz and Merzenich-Morschenich (Gaitzsch and Janssens 2010; Gaitzsch *et al.* 2012; Heinen 2005; Richter 2011). Of course, large distances between cemetery and settlement might by due to research bias. But for example in the case of Niedermerz 3 in the Merzbach valley, large areas have been investigated and the researchers are confident that there is no settlement close to the cemetery.

The presence of stone artefacts in grave fills is documented at other LBK cemeteries as well, though far less often than pottery sherds in the fill (Hofmann in prep.). Whether this disparity is due to a research bias and a certain neglect towards stone artefacts is not clear. To broaden the scope of this analysis we will briefly review some examples. So far, stone artefacts have been found in grave fills at the cemeteries of Elsloo, Niedermerz 3, Schwetzingen, Bruchstedt, Derenburg, Aiterhofen and Essenbach (Brink-Kloke 1990, 446; Dohrn-Ihmig 1983, 61; Fritsch *et al.* 2011, 62, 79; Gerling 2012, 16; Hofmann in prep.; Kahlke 2004, 74–8, 83–4; Modderman 1985, 95; Nieszery 195, 68, 110; Veit 1996, 98). However, in most cases it is just mentioned that stone artefacts have been found in the grave fill. This statement is usually not followed by an explicit analysis of these finds or further information whether the fill yielded chipped or ground stone artefacts or whether the finds are tools or just unmodified pieces ("debitage").

The observations on burial 606 made by D. Schimmelpfennig at the cemetery of Derenburg correspond most closely to our results (Fritsch *et al.* 2011, 79). He recorded 22 stone artefacts in the fill of this single grave, of which eleven are non-flake debitage/shatter ("artifizielle Trümmer", Andrefsky 2005, 84), eight are unmodified flakes and one is an umodified blade. Some of these artefacts could be refitted, which led Schimmelpfennig to the conclusion that the debitage of a single knapping event was deposited in the grave fill (Fritsch *et al.* 2011, 79). In regard to the morphology of the lithics, this observation is in line with the characterisation of the Arnoldsweiler-Ellebach lithics as debitage. However, the timescale is different, as a single event rather than the accumulation over a long time span is proposed. These results show that a meticulous analysis of stone artefacts from grave bases and fills is worthwhile and should be a standard procedure in LBK cemetery analysis.

Wood

Charred wood or layers of charcoal have been found in eleven burials at Arnoldsweiler-Ellebach (Figure 4). The charred remains are up to 1 m long and during excavation some gave the impression of wooden planks (Cziesla *et al.* 2013, 269–72; Ungerath 2014, 142–3). The charcoal that could be recovered "en bloc" was studied anthracologically and in regard to the wood microstructure (Tegtmeier 2011). In eight cases the type of wood could be determined as oak (*Quercus*), but no artefacts could be recognised in the laboratory (Tegtmeier 2011, 1). Unfortunately, oak is quite ubiquitous in the Linearbandkeramik and was used as construction timber, firewood or for tools, meaning that identification of this species does not shed any light on the function of the remains. The analysis also revealed that the wood had been burnt in an oxidising atmosphere. The position of the wooden remains in relation to the buried body is interesting. In seven cases charred wood or charcoal was found immediately above the skeleton. Especially the cases where the wooden remains seem to cover the skull of the deceased raise the question whether the wood was used to cover the corpse or to seal the burial pit (Figure 4). An accidental incorporation of the wood into the burial

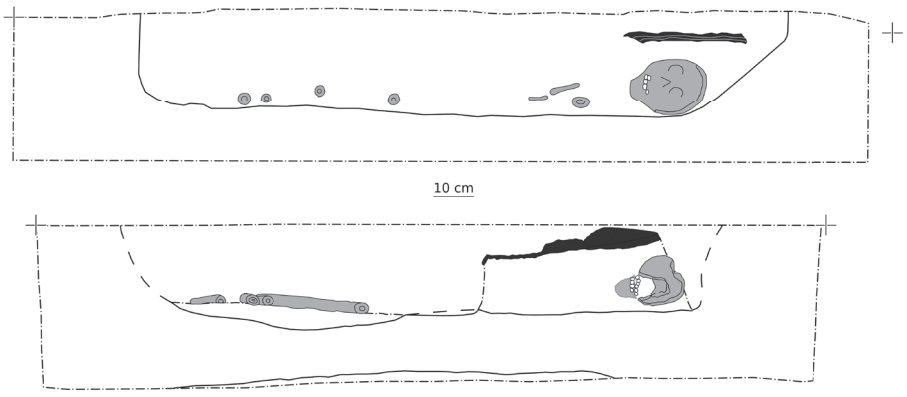

Figure 4. Section drawings of burial features 5831 (top) and 3360 (bottom) with burnt wood / a charcoal layer immediately above the skull of the interred individuals.

fill seems unlikely due to the specific patterning of the charred wood. For example, in burial feature 3354 the wooden remains cover the leg area of the skeleton and the upper and lower jaw of a second individual were found resting on top of the wood. In this case the wooden remains seem to cover one individual and serve as support for the remains of another one.

In Arnoldsweiler-Ellebach there is only one case of wood underneath the skeleton which could, in analogy to the features at the LBK cemetery of Rutzing, be interpreted as a bier ("Totenbrett", Kloiber and Kneidinger 1970, 24). The only other wooden structures in an LBK grave known so far are the possible traces of a log coffin at Dresden-Nickern (Baumann 1960, 62–4). Regarding the cemetery of Aiterhofen, Nieszery does mention some charcoal layers beneath or next to the skeleton and interprets these as remains of wooden grave constructions (Nieszery 1995, 67–8). The greatest similarities for the wooden remains from Arnoldsweiler are found in the observations made by Modderman at the cemetery of Elsloo. He describes layers of charcoal in the fill of four burials and arrives at the conclusion that after the burial the grave pits were filled with wooden branches and twigs (Modderman 1970, 69; 1985, 100). In Arnoldsweiler-Ellebach charred wood or wooden remains are only associated with adults (n = 8) and male burials (n = 3), but χ^2-tests of independence and a Fisher–Yates test show that this might be a result of small sample size.

Returning to the question of basal and fill finds, the seven burials with wooden remains above the skeleton could be particularly interesting. Does the wood act as a dividing line between fill finds and those at the base? Surprisingly it does not, as pottery is found only in the fill of these burials (n = 5). Stone artefacts are found at the base (n = 2) and in the fill (n = 1) but there is no single case with finds in both locations.

Animal bones

Due to the poor bone preservation in Arnoldsweiler-Ellebach, animal bones and teeth are most likely underrepresented. There are only six animal remains from the basal levels and two from the grave fill. The assemblage from the grave fills consists of a sheep/goat tooth and a burnt undetermined bone. There are no burnt bones at the level of the base. However, two unburnt bones from the basal level stand out due to their unusual position, respectively in front of the skull and of the jaw of the deceased. These two cases might be interpreted as a kind of food offering, though one of the bones, a cattle metatarsus or metacarpus, is not usually a prime meat-bearing bone (Arbogast 2013; Fritsch *et al.* 2011, 61; Kahlke 2004, 60; Neugebauer-Maresch and Lenneis 2015, 88; Nieszery 1995, 200).

All bones belong to domesticates such as sheep/goat or cattle. Tools or ornaments made from bone or shell are not present in Arnoldsweiler-Ellebach. Whether the absence of shell ornaments is due to the poor preservation conditions of the acid soils in the Rhineland or a social phenomenon remains an open point.

Finds in context

At this point it seems appropriate to investigate the contexts of the burial finds. Are there recurrent associations between finds and are there any differences in age or sex of the individuals buried with objects at either the basal level or in the fill? In the following we will concentrate on the major find categories: pottery and stone.

Overall, pottery is present in 107 graves, while only 65 graves yielded stone artefacts. Pottery has been recovered exclusively from the basal level of nine burials and in a further 17 burials it is present both at the base and in the fill. In contrast, chipped and ground stone artefacts are far more common at the base (39 graves) and there are also six burials with stone artefacts both at the base and in the fill. Therefore, burials with pottery in the fill are far more common than burials with stone artefacts in the fill.

In most burials without stone artefacts pottery is missing as well. But there are also many burials without stone artefacts, but with pottery in the fill. As the χ^2-test residuals show, stone artefacts at the basal level are more often associated with pottery at the basal level than one would expect, a hint at their possible function as so-called grave goods. The combination of stone artefacts from the fill and pottery at basal level is underrepresented and occurs only in one burial. Due to the small sample size, these results are not statistically significant. There is, however, no relationship between the number of finds in the fill and the number of finds at the base. Burials with many finds at their bases do not regularly have more finds in the fill.

Several scholars have pointed out the phenomenon of empty graves or grave-like features at LBK cemeteries (Lenneis 2010, 161–3; Neugebauer-Maresch and Lenneis 2015, 74–5; Pavúk 1972, 124; Veit 1996, 99–101). Therefore, one could assume that there might be a relationship between fill and basal finds and the presence of human remains in a grave. For example, are fill finds only present in graves without a skeleton? But surprisingly, 80 % of the burials with stone artefacts in the fill and 78 % of the burials with pottery in the fill are "proper" burials with evidence for an inhumation.

Turning to the sex and age of the deceased, overall there are roughly as many female (n = 16) as male burials (n = 18) in Arnoldsweiler. The sex of 14 burials with pottery and 15 with stone artefacts could be determined anthropologically. Regarding the pottery and stone finds from the fill, the sex ratio is balanced (Table 2). In contrast, stone artefacts at the basal level are slightly more often associated with male burials, but the difference is not significant. The approximate age of the buried individuals could be determined for 57 burials with pottery and for 42 with stone artefacts. Children (< 12 years) are generally underrepresented in Arnoldsweiler-Ellebach and account for only 24 %. This holds true for both burials with fill finds and those with finds at the base. The χ^2-test shows no deviations between the observed and the expected frequency (Table 3). All in all, there seems to be no relationship between finds at the base and fill finds and the sex and age of the buried individuals.

The spatial distribution of burials with fill finds is also of interest. The similarity between the lithics from the burial fills and those found in the pits of the settlement raises the question whether burial pits with fill finds are more frequently located close

		male (n)	female (n)	expected	male residual	female residual	χ^2	p-value	significant?
burial with pottery	base	2	0	1	1	-1	2.00	0.16	no
	fill	7	5	6	0.41	-0.41	0.33	0.56	no
burial with stone	base	8	3	5.5	1.07	-1.07	2.27	0.13	no
	fill	2	2	2	0.00	0.00	0.00	1.00	no

Table 2. χ^2 goodness-of-fit test. Sex of individuals buried with pottery/stone finds at the base or in the fill.

		adult (n)	child (n)	adult expected	child expected	adult residual	child residual	χ^2	p-value	significant?
pottery	base	8	1	7.6	1.4	0.2	-0.4	0	1.00	no
	fill	40	8	40.4	7.6	-0.1	0.2			
stone	base	28	3	28	3	0	0	0	1.00	no
	fill	10	1	10	1	0	0			

Table 3. χ^2 test-of-independence. Age of individuals buried with pottery/stone finds at the base or in the fill.

to the settlement. In other words, does the number of burials with fill finds decrease with increasing distance from the settlement? All burials with pottery and stone in the fill were plotted and kernel density estimates calculated using the "spatstat" package in R (Baddeley *et al.* 2015). The most important variables regarding a kernel density estimation are the bandwidth and the observation window. As observation window we used a section of the excavation area and the bandwidth was estimated assuming a cox point process (Baddeley *et al.* 2015, 449–59).

From the results shown in Figure 5 it is obvious that there is no relationship between the density of burials with fill finds and the distance to the settlement. Both the distribution of burials with pottery and the distribution of burials with stone artefacts are not gradual but grouped. But although both pottery and stone artefacts are clustered, their distributions are quite different. Whereas the pottery from the fill has a very extensive spread, and there are several concentrations, most stone artefacts from the fill are part of one clearly delimited cluster with a diameter of c. 15 m. These different distributions point at a different taphonomy in the formation of the sub-assemblages. While pottery in the fill is ubiquitous, stone artefacts in the fill are limited to a certain area. Concerning the concentration of burials with stone artefacts in the fill, different scenarios can be suggested. The cluster could hint at practices limited to this group of graves. In regard to the results of the attribute analysis and the fact that the burials are not contemporaneous (Balkowski 2014), it is plausible that an activity area connected to lithic production existed here before the establishment of the cemetery.

Conclusion

Our approach to investigate the formation of the sub-assemblages from the bases and the fills of the burials at the site of Arnoldsweiler yielded some interesting and surprising results. Concerning the pottery from graves, it could be shown that there are substantial differences (Figure 2). There are a few more or less complete pots mostly found on the bases of the graves, but also in the fill. These can best be interpreted as a positive selection or intentional grave goods. On the other end of the spectrum, there are sherds that often cannot be reconstructed to whole vessels.

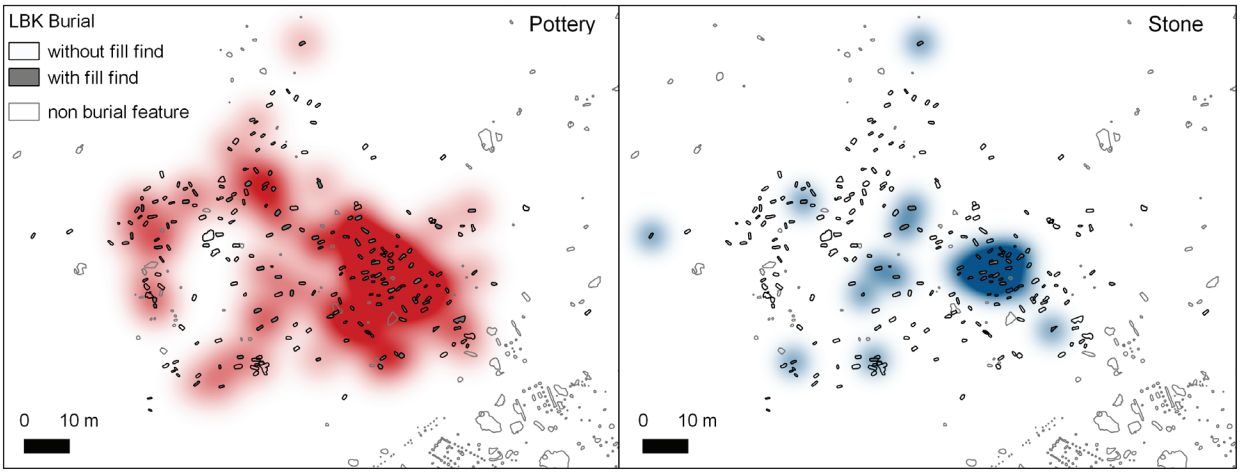

Figure 5. Distribution and kernel density estimation of pottery (red) and stone artefacts (blue) in the burial fill of the graves of Arnoldsweiler-Ellebach.

An important observation regarding these sherds or vessel fragments concerns the similarities to the complete pots — for example in terms of the proportion of decoration or the average sherd thickness. In addition, the pottery assemblage from graves as a whole seems to differ clearly from the sherds from settlement pits. Therefore, it is argued that the smaller sherds, especially from the fill, cannot be understood as some kind of negative selection, as items which simply accumulated over a longer time span. Rather the pottery from graves, and therefore from both the base and the fill, belongs to the context of the burial and can best be interpreted in relation to ritual activities in the cemetery.

On the other hand, there is a striking difference between the lithic and ground stone material in the fill and at the bases of the burial pits (Figure 3). The size, the prevalence of unmodified flakes and the share of cortical and burnt pieces are reasons enough to confidently characterise the lithic assemblage from the fill as "debitage". In its composition, the assemblage bears similarities to the lithic inventory from the settlement pits and could have accumulated over a longer time span. A major difference between the fill and the settlement assemblage is the smaller size of the fill finds, although this could be due to the more careful excavation of the burials. All in all, the formation of the lithic assemblage from the bases and from the fills seems to be caused by different factors. In comparison to other cemeteries in the Rhine-Meuse region, the inventory from Arnoldsweiler-Ellebach exhibits a large proportion of unmodified flakes. This observation was tentatively related to the short distance between settlement and cemetery, a hypothesis that needs to be tested in the future.

The observation of burnt wood or charcoal layers covering some skeletons in Arnoldsweiler-Ellebach is quite extraordinary and could shed new light on LBK funerary practices (Figure 4). However, due to the absence of burials with wood and finds at both the base and in the fill, these features do not provide any clues regarding the interpretation of the finds.

Due to preservation issues animal bones are rare in Arnoldsweiler. Two cases of bones near the skull of the deceased could be interpreted as possible meat offerings or as a token for food. Besides these two unambiguous grave goods, the restricted assemblage of only six animal remains is much too small to assess its formation further.

As a next step, we investigated the context of the basal and fill finds. It could be established that both sub-assemblages (fill and base) are commonly associated with actual inhumation burials and rarely found in empty graves or grave-like

features. In the LBK cemetery of Rixheim, sherds in the fill are claimed to be associated with male and child burials (Peschel 1992, 226). At Aiterhofen, flint flakes have only been found in the fills of male graves (Nieszery 1995, 68; Hofmann 2009, 227). However, at Arnoldsweiler the presence of fill finds is not associated with the sex and age of the buried person. The spatial distribution of the fill finds yielded some interesting results as well (Figure 5). Whereas pottery in the fill is widespread, stone artefacts from the fill concentrate in a clearly delimited zone. This observation supports the result of the attribute analysis indicating a different formation process for the two sub-assemblages.

Summing up our results from the different materials, it could be shown that there are different possibilities to interpret finds from graves. Once again it has to be repeated that not the individual find, but a kind of assemblage average, the "average find" has been considered here. In line with other scholars, we envisage many of the finds from the base of the pits as grave goods. The possible formation scenarios regarding the fill finds are more complex. We regard the formation of the pottery fill assemblage in the context of ritual practices during the funeral as the most likely scenario. In contrast, the more heterogeneous formation of the stone assemblage seems not to have taken place as part of a temporarily limited event and is not directly associated with the funeral. In addition to considering the assemblage average, single finds — for example the red ochre in the fill — should not be neglected and may also represent remains of rituals. To summarise, the interpretation scenarios for pottery and stone artefacts are different and there is no single deposition scenario that suits all materials.

In the terminology of Eggers (1959), many of the finds from the base are evidence of a "positive selection", while they could also be described as being "structured" in the sense of Richards and Thomas (1984). The stone artefacts from the fill can be characterised as "not structured" and likely represent a case of "negative selection". The pottery finds from the fill do not seem to fit the strict concepts of either Eggers or Richards and Thomas. On the one hand, they are positively selected, on the other hand their attributes differ from the basal finds. This case illustrates the limits of the aforementioned binary concepts. Therefore, the polar oppositions of positive and negative selection or structured and unstructured deposition appear insufficient in detail. As another result of our analysis it became clear that the concepts of cemetery finds have to be broadened. Alongside grave goods and finds without any relation to the funeral, another kind of find has to be considered. Although ritual activities are hard to grasp archaeologically, we can expect that some remains of rituals could have become incorporated in the burial fill.

Finally, we will try to paint a picture of the course of events during a LBK funeral as we envisage it. Of course, any such attempt is hypothetical and subjective, but in our opinion thinking about such specific scenarios or chains of operation is very helpful. In this scenario we focus on the finds, a more detailed account concerning burial pit morphology, body posture and so on is given elsewhere (Peters 2018).

The first episode of the funeral that is archaeologically visible is the digging of the burial pit. Burial pits are not just like any other pit but show distinct characteristics concerning size, depth and morphology that indicate that they are a specific type of Linearbandkeramik architecture (Peters 2018). In Arnoldsweiler-Ellebach there is no evident lining of the bases of the pits, the body of the deceased seems to have been placed on the ground surface without any further preparation. Presumably after the laying down of the body, objects were placed next to the deceased. As the two cases of animal bones next to skulls illustrate, some of these items were placed in reference to

certain body parts. Along with items attached to the interred person, such as personal adornments, these objects make up most of the inventory we call grave goods. But already at this point we have to take into account a small number of finds introduced into the burial pit as the remains of rituals or for other reasons. After these events, at least in some cases in Arnoldsweiler, the body was covered with burnt wood or a layer of charcoal. These covers might have acted as a support for further grave goods, as has been suggested for the graves in the Paris Basin (Thévenet 2004, 822, fig. 8). In Arnoldsweiler-Ellebach in one case a human jaw was placed on a piece of burnt wood. Additional items, especially pottery, could have been deposited on steps in the side of the pit ("Erdbänke", "Absätze" or "banquettes"), as known from other sites (Allard *et al.* 1997; Bonnabel *et al.* 2003; Dohrn-Ihmig 1983, 154). Then the burial pit was backfilled and pottery sherds as remains of ritual activities became part of the burial fill. During this refilling process, finds, especially lithics, which were probably present on the surface and in the top soil layer were introduced into the backfill of the burial. This could also mean that we have to imagine the cemetery surface not as an area devoid of objects, but with finds scatters. We have no indication, however, that this infilling of the burial pit was carried out at a time far removed from the funeral event. To the contrary, pottery refits and the contemporaneity of pottery motifs rather indicate a proximity in time. Finally, due to the small number of intercutting burials, we assume that the burial was marked or at least visible for a longer time span.

Reviewing our interpretative scheme, it turned out that there are certain characteristics, such as fragmentation, the size of artefacts or the distribution of finds, which can be interpreted in terms of "structured deposition" and "positive selection". As heuristic tool, we focused on an attribute analysis, a quantitative way to approach this issue, but a qualitative approach focussing on "odd" cases or refits is also valid. Returning to the discussion on structured deposition, some problems have been recognised. The concept of structured deposition lacks a clear definition and the scientific debate seems to be stuck at a mere descriptive "interpretation level", while proxies or analytical methods of how to identify structured assemblages are rarely discussed. From our point of view it is important to focus on both proxies and interpretation and to distinguish between them. Another important point is that, from our perspective, the concept of structured deposition always needs a "reference assemblage". In our case we compared the sub-assemblages from the burials to each other and to the settlement assemblage.

To conclude, not all finds in burials should be *a priori* interpreted as grave goods. The distinction between finds from the fill and the base of burials is appropriate and should be accorded more analytical weight in the future. Excavators of (LBK) cemeteries should directly address this issue. Where circumstances permit, a three-dimensional recording of every find in the burial is advisable.

By now we know a lot about the single LBK burial, while the cemeteries are still a relatively unchartered territory. Regarding the place where LBK individuals were interred, a lot of open questions remain. Where were the cremation sites? Were there any burial markers? How long would a burial be remembered? Were there any buildings or trees in the burial ground? Was there a demarcation between settlement and cemetery? Is there evidence for non-funerary activities or a change in the use of the cemetery? The often neglected finds from the fill could provide information on non-funerary practices before, during or after burials and the use of the cemetery in general and this could lead to a more holistic perspective on cemeteries, seeing them as more than a concentration of burials.

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Suspiciously rich pits in the Wetterau

Johanna Ritter-Burkert

Abstract

Some LBK sites in the Wetterau region in Hessen (Germany) are characterised by the presence of what are here termed suspiciously rich pits, *i.e.* features which differ from other refuse pits in their unusual and densely packed assemblages of well preserved and mostly richly decorated pottery. This contribution aims at a first characterisation of these features for the region of the Wetterau, although similar finds are present elsewhere and would benefit from systematic collection and analysis. "Deposition" means objects which were placed in the ground by humans, but were not part of refuse disposal or of grave inventories. Difficulties lie in the complexity of the structures and finds that seem "ritual" — they are all summed up within one term without any consistent nomenclature. This makes it difficult to decide whether all the instances covered by this term are part of the same phenomenon. It is hoped that in the future, the systematic collection of such "suspiciously rich pits" and their comparison to more obviously structured deposits could open further avenues of interpretation.

Keywords: *LBK sites; Wetterau; suspiciously rich pits; ritual deposition; profane deposition*

The Wetterau in Hessen (Germany) is a region rich in LBK (Linear Pottery culture or Linearbandkeramik) sites. Among these, some are characterised by the presence of suspiciously rich pits which differ from usual refuse pits in their unusual and densely packed assemblages of well preserved and mostly richly decorated pottery. This contribution aims to arrive at a first characterisation of these features for the region of the Wetterau, although similar finds are present elsewhere and would benefit from systematic collection and analysis. Although the precise motivations for this practice remain obscure and were most likely varied, the recognition of this kind of feature could help to identify ritualised elements of action at the heart of LBK settlements, away from more "obvious" contexts such as burials and enclosures. As such, this contribution aims to further erode the opposition between "sacred" and "profane" which all too often still pervades our narratives of the LBK.

The well-known central LBK settlement of Bad Nauheim-Nieder-Mörlen "Auf dem Hempler" delivered several rich pits which can be interpreted in a sacrificial or ritual context (Bánffy 1986, 156; Makiewicz 1987, 249–51). Other examples for this practice are present in Friedberg B3a km 19 and Wöllstadt A6 (both Wetterau). The term "rich pits" has been introduced by U. Boelicke at Langweiler 8. For one of the categories of decorated or undecorated pottery, flint tools or stone tools, those pits contain 1% or more of the inventory of the whole site (Boelicke 1988, 360–3). The "suspiciously rich pits" of the Wetterau additionally contain special finds like idols or spindle whorls and a variety of high-quality pottery.

Difficulties lie in the complexity of the structures and finds that seem "ritual" — they are summed up in one term without there being a consistent nomenclature. This makes it difficult to decide whether all the instances covered by this term are part of the same phenomenon. The suspiciously rich pits of the Wetterau form the archaeological context to define an intentional deposition of goods in a settlement site. The motivation of deposition at first has to stay unknown, but it is a fact that there was an intention (lat. *intentio* — intent) behind the deposition. "Deliberate deposits, as well as the burial, deposition in water and so on, of one or several objects which are neither grave goods nor the abandoned remains of settlement activities, were summarised under the term deposits. In itself, this designation — excepting the restrictions just mentioned — does not provide any information on the occasion or background of the deposit, its location and the kind and material of the objects involved; the term comprises sacrificial and votive offerings […] as well as hoards and other hiding places" (Kubach 1983, 113; translation by the author)[1]. Therefore the term "intentional deposition" can be used as a neutral superordinate, while the background or meaning of the deposition remains obscure. One could differentiate between a profane / functional and an ideal / imaginary sense of deposition. The first category finds its explanation in a functional context, while the second is caused by religious or magical purposes and can be best described by the term "cult" because of its relative neutrality (lat. *cultus* — ministration, adoration). "Cultic deposition" is connected to an intention concerning an otherworldly domain (Beilke-Voigt 2007, 30–1). In most cases this is the critical point from which onwards archaeological research faces the limits of its interpretive possibilities.

Suspiciously rich pits at the "Hempler"

The LBK settlement Bad Nauheim-Nieder-Mörlen "Auf dem Hempler" lies in the Wetteraukreis district in Hessen at the northern edge of the village of Bad Nauheim-Nieder-Mörlen and was already reported by Meier-Arendt in the 1960s (Meier-Arendt 1966, 110). The place is situated 185 m a.s.l. at the southern edge of a plateau and in Neolithic times was on the banks of the Usa River (Kneipp 1998, 326). Numerous survey finds soon suggested a settlement of trans-regional importance. This was confirmed by the excavations of the Landesamt für Denkmalpflege Hessen (hessenARCHÄOLOGIE Wiesbaden) between 1997 and 2001, which were carried out in advance of construction works (Schade-Lindig 2002). The "Hempler" can definitely be characterised as a centre of LBK settlement activities (Saile 1998, 187–8, 292) with a more than regional significance. Traces of Neolithic land use and settlement covered an area of 5 ha of which 1.6 ha have been excavated and have yielded 3360 archaeological features — among them 35 pit furnaces, 15 settlement burials, a circular enclosure, numerous pits and almost 120 houses dating into several phases of the LBK (Schade-Lindig 2002, 99). Ceramics play the most important role among the 29 t of finds, alongside grinding stones, bones, daub and lithics. To date, an inventory of 21,000 pottery finds has been drawn up. Bad Nauheim-Nieder-Mörlen soon delivered numerous

1 "Absichtliche Niederlegungen bzw. Vergrabungen, Versenkungen u.ä. eines oder mehrerer Gegenstände, bei denen es sich weder um Grabbeigaben noch um zurückgelassene Siedlungshinterlassenschaften handelt, werden als Deponierungen zusammengefasst. Mit dieser Bezeichnung wird zunächst – abgesehen von den eben gemachten Einschränkungen – nichts über Anlass oder Hintergrund der Deponierung, ihren Ort sowie Art und Material der deponierten Gegenstände ausgesagt; der Begriff umfasst Opfer- und Votivfunde […] ebenso wie Schatz- und andere Versteckfunde".

figural clay objects (Kneipp 1998, 325, plates 64–9) and almost every special type of LBK ceramics is present at the site: besides small anthropomorphic and zoomorphic sculptures, there are cups with interior decoration, goblets, clay seats and altar-like pieces, which have already been published (Schade-Lindig 2001; 2002, 100–8) and emphasise the importance of the settlement.

In addition, at the site of Bad Nauheim-Nieder-Mörlen several pits have been reported which must be distinguished from the usual rubbish pits of the LBK. Those pits are characterised by a suspiciously rich assemblage of well preserved and richly decorated ceramics which can be accompanied by lithics, bone tools, loom weights, spindle whorls, beads and idols of clay. Daub, animal bones and waste from stone production are usually absent (Schade-Lindig 2002, 110). Similar pits have already been interpreted as sacrificial features in the earlier literature (comparable pits with or without idols published in Ankel and Meier-Arendt 1965; Hampel 1989, 149–50; Höckmann 1972, 195–6; Kalicz 1990, 81, 123 plate 7; Lindig 2001, 98–102, 170–1) which may contain the remains of ritual feasts. In the following, these pits and their assemblages will be described in detail in order to draw out recurrent patterns, which can be confirmed using examples from further nearby sites.

The first special pit to be presented here is feature 137 in area 2 of Bad Nauheim-Nieder-Mörlen. The circular pit lay in a complex of pits and comprised two spindle whorls, five bone tools, some flint blades, fragments of axes and parts of a grinding stone. The volume of the artefact assemblage was much more extensive than that of the sediment in the feature. Moreover the bones of nine slaughtered animals (Table 1) were recorded. The long bones had been broken while the pelves, scapulae and crania were well preserved and the vertebrae were found in anatomical connection. The elements had been deposited together and therefore imply a single slaughtering event, maybe in autumn if birth was in spring. It is possible that the animals were slaughtered to avoid having to feed them during winter. The age of the animals could be determined as between six months and four and a half years because of the state of epiphyseal fusion.

Finally, one of the rare LBK bone spatulae was found in pit 137. It was burned and broken into two pieces and can be interpreted as a highly stylised depiction of a woman. Spatulae are among the oldest finds categories of the LBK (Höckmann 1972, 194). They can be found between Hungary and Germany, where six examples have been reported. The shape of the spatulae can be traced back to the idols of the Karanovo III culture (Höckmann 1968, plate 34, 1240). A find from Turdas/Tordos shows similarities to the spatula from Nieder-Mörlen (Müller-Karpe 1968, plate 180). The piece from Nieder-Mörlen dates into the Flomborn phase of the LBK, while most comparable finds have to be dated either to the Earliest and the very beginning of the Early LBK, or into the latest phase (Earliest LBK: Mannheim-Vogelstang, Eilsleben, Prague; Latest LBK: Mühlhausen, Barleben, Erfurt, Mainz-Weisenau; see Schade-Lindig 2002). Almost 500 sherds could be attributed to 58 LBK bowls, bottles and pots with plain incised bands filled with irregular dots which were combined with undecorated rims and simple secondary motifs such as short single or double lines. Pot shapes with inverted rims dominate (Schade-Lindig 2002, 108–13) (Figure 1).

Another extraordinary concentration of finds was reported in pit 2210 in area 13 of Bad Nauheim-Nieder-Mörlen. In this pit bones of several slaughtered goats (four goat horns) were found together with a pottery goat protome. This combination of animal bones and zoomorphic sculpture might imply a ritual

Animal	Individual	Age	Bone weight
cattle	1	4–4½ years	5.66 kg
cattle	2	2–2½ years	
pig	1	2½–3 years	0.37 kg
pig	2	2½–3 years	
pig	3	6–7 months	
sheep / goat	1	2–2½ years	0.86 kg
sheep / goat	2	3–3½ years	
sheep / goat	3	3–6 months	
sheep / goat	4	?	

Table 1. Faunal remains of pit 137 at Bad Nauheim-Nieder-Mörlen "Auf dem Hempler".

slaughter (Höckmann 1972, 194). Moreover the pit contained spindle whorls and a remarkable amount of decorated sherds. Mostly, simple incised linear motifs were combined with undecorated rims and secondary motifs of short lines and music notes, which date the feature to a Mid-Flomborn phase. Furthermore, an undecorated miniature pot, a piece with barbotine and a body sherd with the "rain motif" were brought to light. The extreme polish of some pieces is witness to the excellent preservation and the low degree of wear of the high-quality ceramics.

The next special pit is feature 3111 with a diameter of 1.2 m and a depth of 35 cm. The enormous density of finds and the combination of objects can be compared to pit 137 — except for the absence of idols. Among the finds were two grinding stones, two antler picks, a bone spatula, four loom weights, several fragments of axes, haematite, an arrowhead, two beads of clay and animal bones, including two goat horns. The ceramics comprised mainly undecorated pots, bowls and bottles, some simple decorations on coarse ware and vessels with broad incised linear decoration, as well as stroke-incised bands and rim decoration, dotted beads and rims. Some pottery showed traces of white incrustation.

Another example of a suspiciously rich pit is feature 3286 in area 17. The assemblage was deposited as a coherent spread of finds composed of lithics, axes, haematite, a bone awl and eight clay marbles. Besides a variety of undecorated coarse ware, several decorated vessels and almost complete miniature pots were found. The ornamentations are carried out in the "Leihgestern" style in tremolo or stroke-and-line decoration. A remarkable object is a small figural lug with lateral perforations and elongated pointed ends. Figural lugs are mostly a characteristic of the Earlier LBK (Figure 2). The presence of this example in a pit of the Latest LBK makes it even more exceptional (Schade-Lindig 2002, 109–10).

Pit 2111 in Bad Nauheim-Nieder-Mörlen can also be numbered among the special pits in the Wetterau, but shows a different character. Several stone tools, burnt loom weights, beads of clay and a large amount of undecorated coarse ware and storage pots were deposited within an ash layer. The decorated pots showed combinations of simple lines and plain rims. Moreover, two miniature pots came to light. Pit 2111 was certainly a suspiciously rich feature, but could also be the remains of a burnt house (Schade-Lindig 2002, 110). The frequent occurrence of extremely rich pits once again underlines the special position of Bad Nauheim-Nieder-Mörlen, but the phenomenon of the "suspiciously" rich pits has also been reported at other LBK sites of the Wetterau.

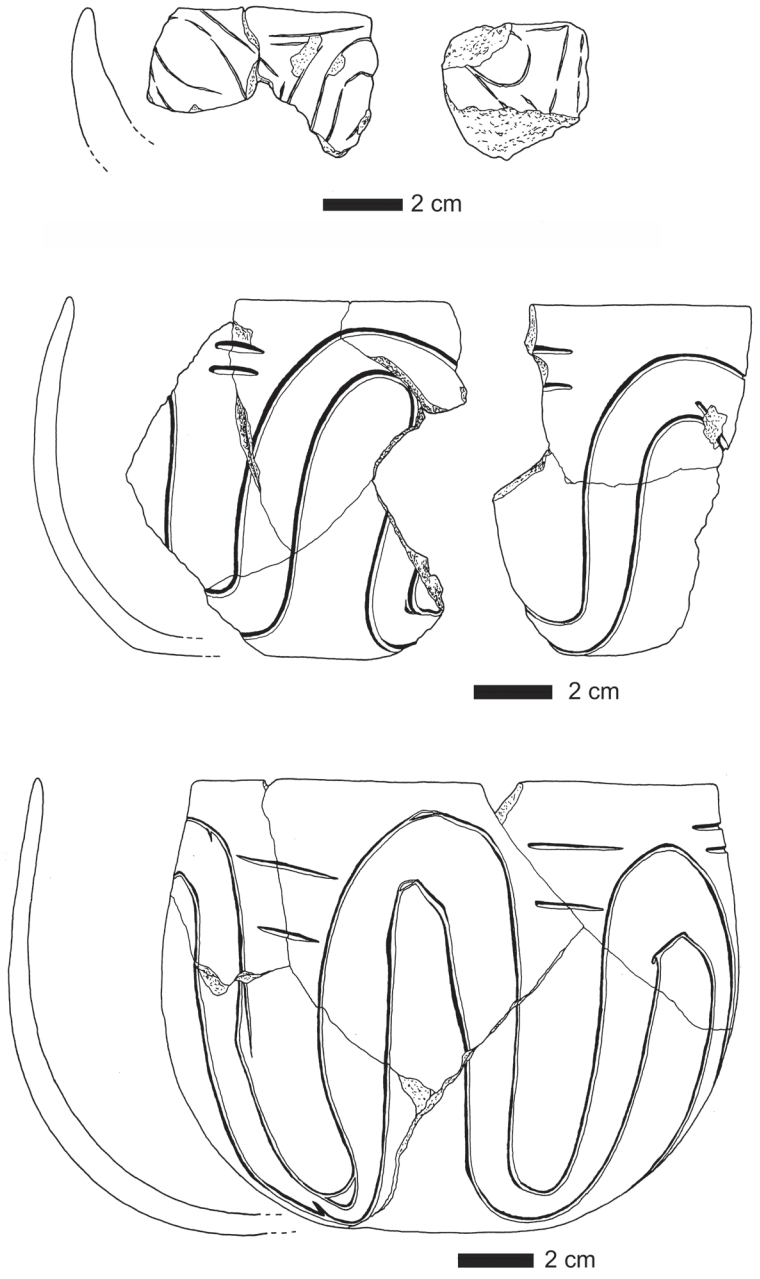

Figure 1. Pottery from pit 137 at Bad Nauheim-Nieder-Mörlen (drawings: Landesamt für Denkmalpflege Hessen, Wiesbaden).

Suspiciously rich pits at Friedberg B3a km 19

The site of Friedberg B3a is situated in the Wetteraukreis district and was excavated in 2007 in the course of road works along the Bundesstraße 3. The settlement dates to the Middle to Latest LBK and comprised numerous pits, a ditch, several longhouses, ovens and crouched inhumations. The 3500 vessels from this site were recorded in 2013 (Ritter 2013; 2014; 2015). In Friedberg B3a a special pit, feature 304, was located in area 4. The position of the structure in the centre of a complex of pits is reminiscent of the situation of pit 137 in Bad Nauheim-Nieder-Mörlen. The pit contained just a few bone fragments and no discarded stones. Among the very densely packed assemblage were 459 sherds and a small but high-quality flint tool. The pottery was very well preserved and alongside several coarse ware vessels there were many

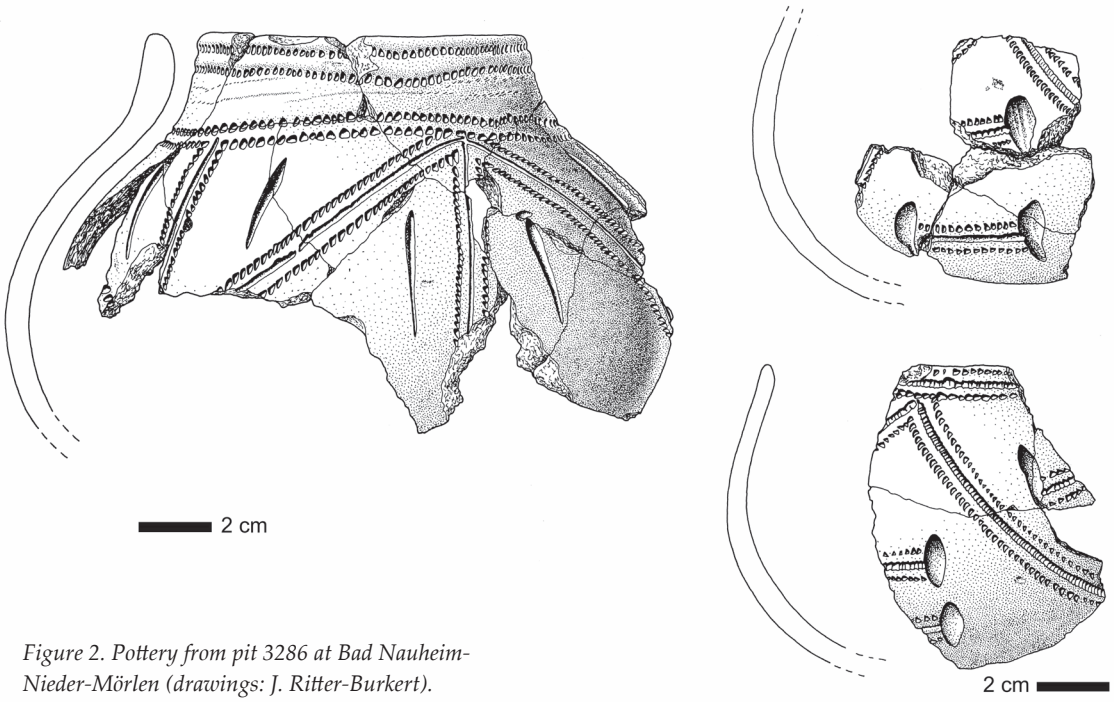

Figure 2. Pottery from pit 3286 at Bad Nauheim-Nieder-Mörlen (drawings: J. Ritter-Burkert).

decorated pots (mainly the globular *Kümpfe*). The most frequent ornamentations include double lines of strokes, incised dots and comb-impressed ornaments and indicate a date in the latest LBK phase (Figure 3).

Suspiciously rich pits at Wöllstadt A6 (2013/6)

The phenomenon of the suspiciously rich pits has also been reported from the site of Wöllstadt A6, which was excavated in 2013 and dates to the Later and Latest LBK. The excavation took place in the course of roadworks along the Bundesstraße 3. The site of Wöllstadt A6 lies at the southern edge of the village of Nieder-Wöllstadt in the Wetteraukreis district and covered 1.8 ha. During the excavation by hessenARCHÄOLOGIE numerous LBK pits and a crouched burial came to light. The rich pit 2027 in area 2 measured 2.1 m in length and 56 cm in depth and contained pottery of the Latest LBK. Daub, stones and bones were almost absent from the assemblage, which comprised sherds, flint tools, axe fragments and some haematites. Among the decorations comb-impressed ornaments, tremolo and cross-hatching were most frequent and five-tined combs were used as tools for ornamentation. These elements imply that the pit dates to the Late LBK in Hessen. Very thin-walled sherds (0.3 cm) and traces of polishing and incrustation attest to the high quality of the ceramics (Figure 4).

A comparison with the Latest LBK refuse pit 2043 in Wöllstadt A6 emphasises the special character of the pits presented above. Pit 2043 contained a very rich assemblage, but the pottery was highly fragmented and accompanied by typical waste elements, such as larger amounts of burnt daub, stone tool production waste and animal bones.

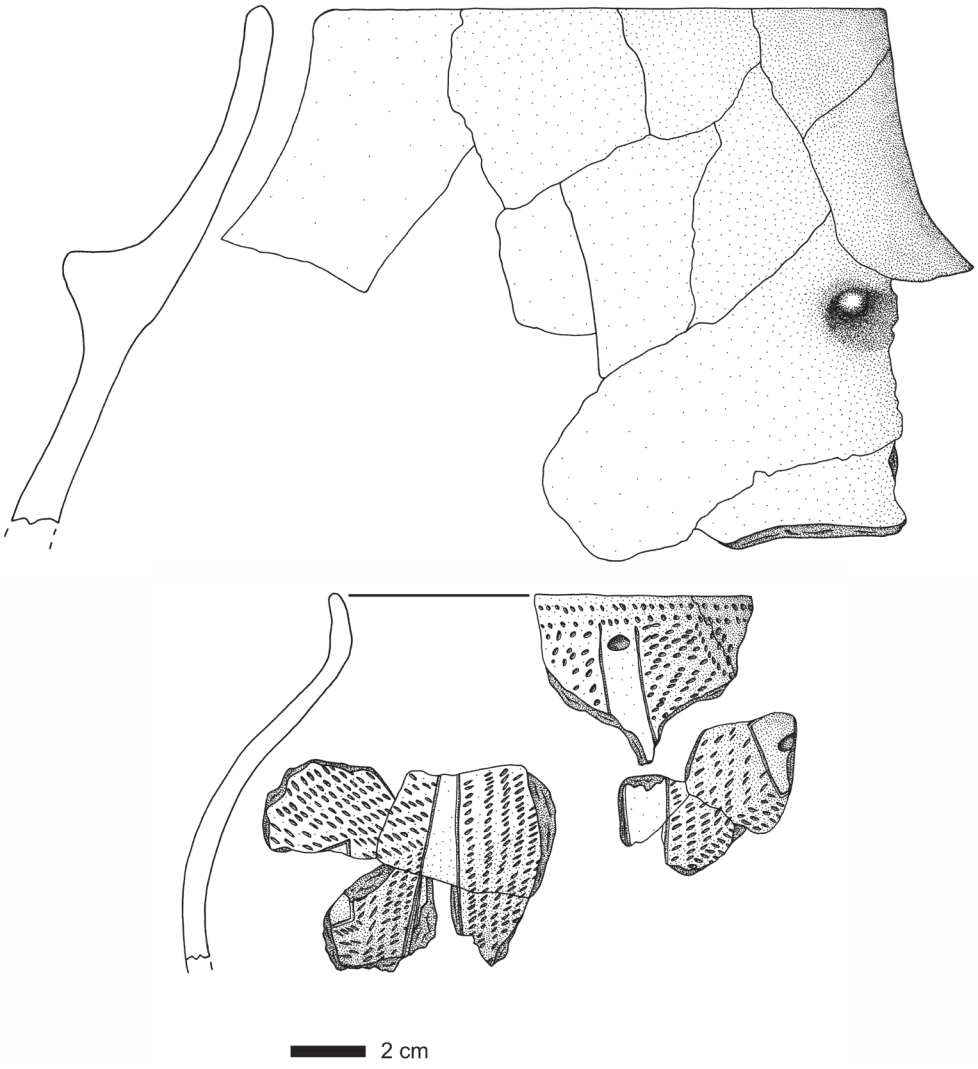

Figure 3. Pottery from pit 304 at Friedberg B3a km 19 (drawings: J. Ritter-Burkert).

The practice and interpretation of deposition — ritual and cult?

Mostly, the first aim of any study is to ascertain the motivation of the depositions and to discern the intention behind it. But it has to be taken into account that a categorical differentiation between profane and sacral intentions does not exist. The understanding of depositions as a part of social practice can provide an alternative approach. For instance, the act of deposition can also be regarded from the point of view of the deposited objects. As Ariane Ballmer (2010, 122) wrote: "Deposits are the material consequence of social and possibly also ritual practice; they are bound to structural rules and at the same time help to produce these rules" (translation by the author)[2]. Deposits can therefore be understood as acts of social meaning or social practice (agency in contrast to action as mere act). In her interpretation of Bronze Age deposits, Ballmer follows the approach of the French sociologist Pierre Bourdieu and identifies three criteria for the identification of deposits as collective acts:

2 "Deponierungen sind die materielle Konsequenz einer sozialen, möglicherweise auch einer ritualisierten Praxis; sie unterliegen strukturellen Vorgaben und sind gleichzeitig an der Gestaltung dieser Vorgaben beteiligt".

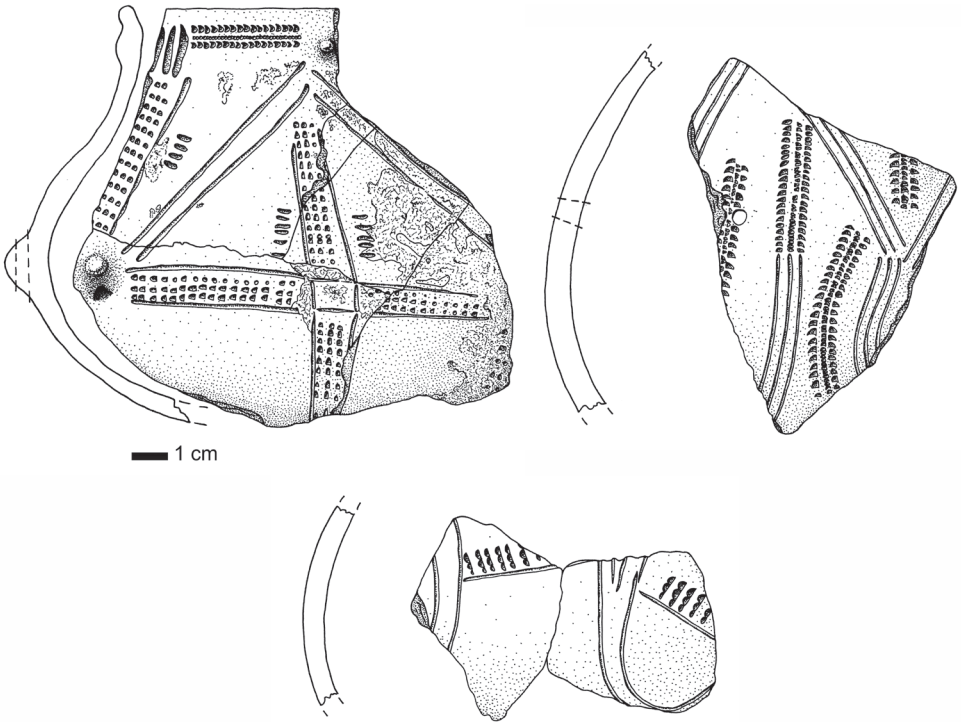

Figure 4. Pottery from pit 2027 at Wöllstadt A6 (drawings: J. Ritter-Burkert).

1. Regularity: the deposits follow a fixed and structured pattern concerning the combination, the preservation and the state of manufacture of the deposited objects.
2. Relative temporal continuity and dynamics: the act of deposition is carried out continuously, but can change gradually.
3. Divergence: variations in combination, number and state of the deposited objects are possible, but nevertheless a common intention and style is obvious.

Regularity, formalisation and traditionalising, in combination with sacred symbols, allow a ritualisation of the act (Ballmer 2010, 120–5; 2015, 1–11).

The combination, the quality of manufacture and degree of use, as well as the arrangement of the objects can imply patterns of deposition. A high density of well-preserved ceramics, the presence of high-quality lithics, bone tools, haematites and special vessels connected with an almost complete absence of stones, daub and bones is typical of the suspiciously rich LBK pits in the Wetterau (Table 2). Those special pits have been reported from all phases of the LBK (Early Flomborn to Latest LBK) and the composition of objects does not change significantly over time (Hampel 1989, 149–50; Schade-Lindig 2002, 110).

At LBK settlements pottery can almost be considered as omnipresent and was generally used in a domestic context. But the finds circumstances in the suspiciously rich pits characterise them as deposited goods in contrast to mere settlement waste (Figure 5). Therefore, finally, the question of interpretation has to be brought up. The extremely rich pits can be referred to as depositions or deposits — terms such as "non-profane pits" or "sacrificial pits" (also "offering pits", see Makkay 1975, 162–4) already contain a distinct interpretation. "Deposition" means objects which were placed in the ground by humans, but were not part of the waste of ancient settlements or of the inventory of graves. The rich LBK pits of the Wetterau have to be interpreted as intentional deposits because the deposited objects — such as sherds and fragments of stone tools — were of no material value, which speaks against a profane hoard.

Characteristic	Occasional	Scarce or absent
high amount of finds	zoomorphic / anthropomorphic figurines exceptional pottery	daub
high density of finds (deposited as a distinct layer or concentration)	high quality lithics haematite	stones (quartzite)
little soil matrix (compared to finds)	bone tools	
high quality of pottery	spindle whorls loom weights	
excellent preservation of finds (some vessels nearly complete)	slaughtered animals	

Table 2. Characteristics of the suspiciously rich pits in the Wetterau.

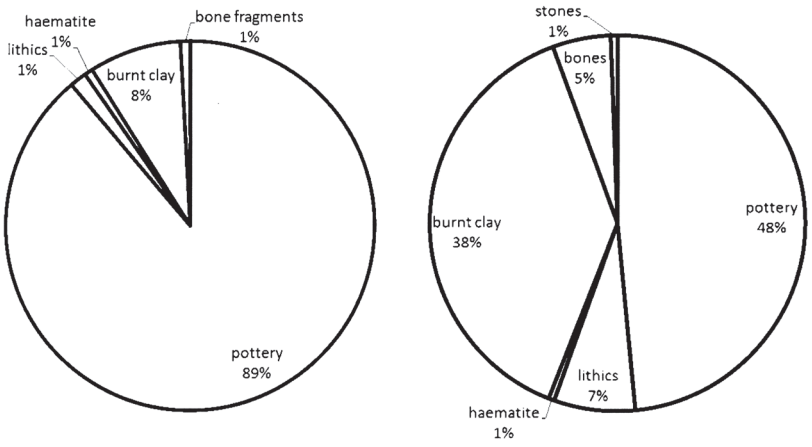

Figure 5. Comparison between suspiciously rich pits (left) and refuse pits (right) (J. Ritter-Burkert).

From a technical point of view, the assemblage remained accessible over time, but the intention of deposition seems to be irreversible. The motive for deposition remains obscure — but it should be discussed whether the finds could be interpreted as remains of ritual actions or feasts (Geißlinger 1984, 320–2; Wunn 2006).

Cult can be defined as the attempt to appropriate the divine, to assert religious experiences or to avert dangers through the use of communal ritual actions which were celebrated by a community. As Kaufmann (2002, 2–3) has argued, following the well-known German-language encyclopedia *Brockhaus*, offerings played an important role in early religious traditions for precisely this reason. Rituals can mean a cultic act (words, gestures, actions) whose components follow a fixed canon.

In the 1950s, Johannes Maringer (1956, 49–50) wrote: "Religion is the known and felt dependence on one or several otherworldly powers: a god, gods, demons, ancestors, spirits of the dead and other beings, with which humans enter into a reciprocal relationship. It is also the entirety of actions in which this knowledge and feeling becomes manifest and is reaffirmed: sacrifices, prayers, asceticism, dedications, processions, rituals, idols, cultic activities and more besides. These examples clearly show that prehistoric religiosity will not be visible to us in all its forms" (translation by the author)[3].

Among the models of interpretation (Figure 6) there are also several "profane" ones whose probability should be discussed here. Especially the older archaeological

3 "Religion ist das Wissen und Fühlen der Abhängigkeit von einer oder mehreren übermenschlichen persönlichen Mächten: Gott, Göttern, Dämonen, Ahnen, Totengeistern und anderen Wesen, zu der oder zu denen der Mensch in ein gegenseitiges Verhältnis tritt, und die Gesamtheit der Akte, in denen sich dieses Wissen und Fühlen äußert und bestätigt: Opfer, Gebet, Askese, Weihe, Umzüge, Riten, Kultbilder, Kulthandlungen und anderes mehr. Aus den angeführten Beispielen erhellt [sich] ohne weiteres, dass die vorgeschichtliche Religiosität uns nicht in allen ihren Formen fassbar sein wird."

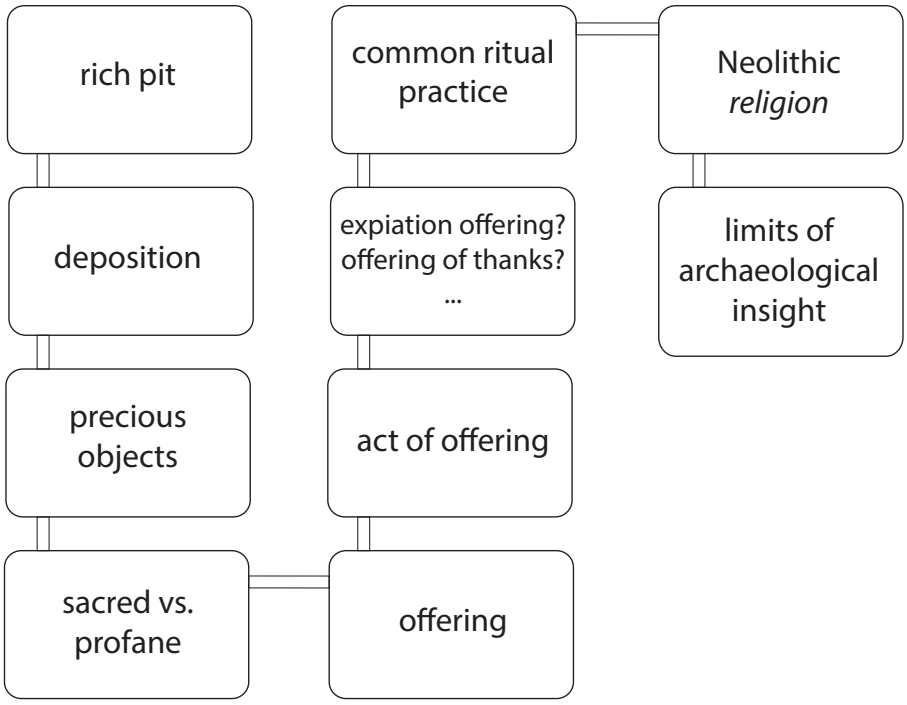

Figure 6. Act and interpretation of deposition (J. Ritter-Burkert; adapted from Ballmer 2010; 2015).

literature is inclined to explain depositions as the temporary hoards of potters or merchants. It is certainly possible that those potters or merchants deposited their products in some areas of settlements so that they had unrestricted access. These deposits for reuse are often connected to stacked vessels in pits — this practice could save space. Nevertheless, the traces of use and state of fragmentation make this interpretation for the rich LBK pits unlikely, just as it seems unlikely to bury pottery for storage. Another possibility is the self-endowment with goods for the afterlife: deposits of pottery without skeletal remains could mean that their owner had chosen a representative ensemble of pots for the beyond and buried them while he/she was still alive. Finally, the deposit does not have to be planned by the deceased him-/herself but could have been part of a post-funeral ritual of the survivors. These explanations refer to the world of thought of ancient populations and can therefore be neither confirmed nor denied. Furthermore, the pottery could once have contained food or beverages which would enable archaeologists to interpret these instances as mere storage deposits or as sacred food offerings. This implies that deposition may not have taken place because of the pottery itself, but because of its contents. However, taking the dense pit fill and the state of the pots into account, this seems improbable for the LBK deposits. Rather, it seems more appropriate to speak of "ceremonial pots" which had been used in cultic meals, feasts or ritual actions. After those actions the pottery had to be removed from profane use and disposed of in an appropriate manner. In this context one can also expect the ritual destruction of deposited elements. "Foundation deposits" are another reading of the rich pits of the Wetterau: settlement communities may have taken part in ceremonies to found a village or hamlet and to express their communal identity (Beilke-Voigt 2007, 293–303).

Because of the lack of possibilities for verification (Makiewicz 1987, 250), the ambiguity of archaeological finds and the limits of archaeological insight

(Kaufmann 2002, 14–6), the meaning of the suspiciously rich pits of the Wetterau cannot be determined. Finally there is no definite answer to the question of "sacred" or "profane" and probably that would not even be appropriate (Elburg 2011, 25). It is hoped that in the future, the systematic collection of such "suspiciously rich pits" and their comparison to more obviously structured deposits could open further avenues of interpretation.

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The structure of chaos: decay and deposition in the Early Neolithic

Penny Bickle

Abstract

A close relationship between material waste and the house is found throughout Neolithic Europe. This paper considers the ways in which depositional practices at Linearbandkeramik (LBK) settlement sites, particularly the means by which material culture reached the loam pits which flank the walls of longhouses, may have structured everyday life and experiences of architecture. This discussion is used as a starting point to consider LBK social and cultural attitudes to the left-over residues of everyday activities, or waste materials, and their deposition. The argument is put forward that waste was not considered as "polluted" or "polluting", but rather kept deliberately close to houses, as it was effective at materialising particular temporalities for LBK communities. It is suggested that certain aesthetics of decay were desired, built out of attitudes to the past and desired futures. The discussion then considers how death and the dead, both in the form of human remains and abandoned houses, were incorporated into and shaped LBK settlements. Overall, the paper argues that careful attention to deposition practices can provide useful insights into broader themes around social life in the Neolithic, and can help overcome an artificial divide between the sacred and profane.

Keywords: *Neolithic settlement; Linearbandkeramik; depositional practices; decay; memory*

Introduction

Attitudes to discard, decay and deposition are culturally defined and vary enormously between different cultures (Douglas 1966; Rathje and Murphy 1992; Thompson 1979). This was brought home to me when, in 1998, I spent four months living in the eastern highlands of Zimbabwe. The rubbish pit for our house was situated some five or six meters away, squarely opposite the front door and, just in the same way the house's new foreign inhabitants sparked curiosity, so did the unusual contents of the pit. I was shocked when, shortly after our arrival, children started playing in the pit. Attempts to encourage them not to do so failed and over the months, items placed in the pit were returned to us (empty shampoo bottles and other plastics, an unspooled cassette tape (returned fixed), food cans, a broken flip flop etc.) or distributed, often to my horror, about the landscape. While I reacted negatively to this, the children did not have such qualms and were free to use the rubbish pit to inspire games and play. Over time, I came to realise how culturally defined my reactions had been. I had failed to understand that the material did not reach the

end of its life by entering the pit, thereby breaking its connection with its owner. As such, the objects continued to be a meaningful way of getting to know the newcomers through their unusual classification of perfectly useable objects as waste. Furthermore, the action of discarding rubbish did not result in it becoming "dirty" or "polluted" just because it had been thrown away. In contrast, from my viewpoint, the objects changed their nature the moment they entered the pit.

This example illustrates three Western attitudes to rubbish which should not be unthinkingly applied to archaeological contexts: 1) items of rubbish are contaminated or polluted ("dirty"); 2) as such, these objects have to be separated from daily life; and 3) the action of discard is itself neutral and without meaning (Chapman 2000a, 4; 2000b, 62). In the place of these assumptions, the residues of everyday life from the past can be reconfigured as meaningful, contextual and affective, while deposition can be viewed as a significant activity informative to archaeologists in its own right (Brück 1999; Chapman 2000a; 2000b). Building on these insights, studies of waste can provide powerful understandings of beliefs and attitudes to cultural institutions such as the house. Waste itself can occupy an ambiguous position, always potentially ready to be re-used or recycled into another object (Douny 2007; Edensor 2005). The emotions surrounding discard may not necessarily be straightforward, but can be highly charged, inspiring enjoyment and competition (Dikötter 2006, 63) or invoking sadness through the recalling of painful memories (Finn 2007). Failure to follow defined patterns brings in an element of risk, with potentially stark consequences for those who do not adhere to culturally accepted rules (Gosden 1999, 156).

Concentrating material residues around the house was a practice recurrent in many prehistoric societies (Bradley 1996; Chapman 2000b, 83; Hodder 1990; Whittle 1996) and deposition may therefore have had a substantial impact on how domestic architecture was experienced. The longhouse of the Early Neolithic *Linearbandkeramik* (hereafter LBK) culture is no exception to this union of deposition and architecture. Longhouses are rarely found without nearby pits, scattered across the settlement, and the loam pits, which either continuously or intermittently flank the axial walls of the house (a practice long acknowledged in LBK studies, *e.g.* Stäuble and Wolfram 2012, 36). In the absence of preserved floor plans[1], these loam pits and their contents have had a prominent role in the study of LBK longhouses. Thought to have been created as "borrow pits", when clay was sought for the construction of wattle and daub walls (Modderman 1988), the ceramic remains from these pits have played a crucial role in defining the chronology of settlement sites (Boelicke 1982; Boelicke *et al.* 1997; Lüning 1988; Modderman 1970) and it is on the basis of these remains, in conjunction with radiocarbon dates, that the 20–30 year use-life of the house was first proposed (Boelicke 1982; Boelicke *et al.* 1997; Jakucs *et al.* 2018; Modderman 1970; Stehli 1989; cf. Rück 2007; 2009).

Similarly, finds from loam pits have been variously drawn on to characterise the house's inhabitants. At Cuiry-lès-Chaudardes (Aisne Valley), Lamys Hachem (1997; 2000) suggested that households could be divided into different spatial groups on the basis of which animal species was best represented in the pits of different houses. She concluded that some households showed a preference for the hunting of wild boar while others predominately herded cattle or sheep,

1 In the Paris Basin, occupation levels appear to be preserved at only one site, Jablines (Lanchon *et al.* 1997; see below).

extrapolating to propose groups of "hunters" and "herders" occupying LBK settlements (Hachem 1997; 2000). In another case, the status of certain houses was inferred from the occurrence of higher numbers of polished stone tools in their loam pits (*e.g.* Elsloo, Van de Velde 1990). The general assumption is that the materials within these pits represent, in an unbiased fashion, the "rubbish" of daily life, deposited in a convenient location close to the house. Whether the discarded objects are thought to arrive by chance or purpose, many researchers adhere to Coudart's (1998, 73, author's translation) view that the deposits around the longhouse were "a veritable log book, from which the daily life of the inhabitants can be recovered" (but see below). Once a longhouse was abandoned, the structure is thought to have mostly decayed *in situ,* leaving mounds often interpreted as ancestral to the long mounds found along the Atlantic Seaboard (Hodder 1984; 1990; Midgley 2005). Decay and dissolution therefore tempered the everyday during the LBK.

In this paper, I consider the different practices (deliberate as well as unstructured) that brought varied materials to the loam pits in order to explore the ways in which these pits framed how communities encountered and experienced the construction of architecture and its subsequent decay. The aim is not to survey the entire spectrum of depositional practices and taphonomic processes which created LBK loam pits (for this see discussions in Hamon *et al*. 2013; Stäuble and Wolfram 2012), but rather to investigate the relationship between deposition and decay, considering their role in the daily experiences of life and death at Early Neolithic settlements. The majority of the evidence in this paper is taken from the westernmost region of the LBK: the Paris Basin. Longhouses were constructed in this region from about 5000 to 4700 cal BC (Figure 1). They belong to two successive and related cultures, the LBK or *Rubané*, which is itself divided into two phases (*Rubané récent du Bassin parisien*; RRBP and *Rubané final du Bassin parisien*; RFBP) and the *Villeneuve-Saint-Germain* (VSG)[2]. Over its life the architectural practices of the LBK longhouse became a nexus of different routines and rhythms, and, if we are to recapture the broader role structured or ritual deposition played in forming LBK social life, then the everyday engagements between community, architecture and deposition, between the sacred and profane, should also be a part of the debate.

Culture in the ground. Everyday accumulation and deposition

Everyday accumulation

Before I turn to explore possible attitudes to rubbish and discard in the LBK, several key questions must be asked of the taphonomy of waste material at settlements[3]. Central to this investigation are the loam pits which flanked the walls of the longhouses: when they were constructed, the speed and manner in which material remains entered the pits and how their fills related (temporally and spatially) to the house by which they were located. There is much still to be understood about the

2 This sequence is contested and some researchers have argued that the RRBP and VSG are actually contemporary (Dubouloz 2003; Jadin 2007). For our purposes here, I follow the consensus and envisage the VSG as succeeding the RRBP.

3 I.e. how culture got *in* the ground. The title of this sub-heading is adapted from that of Tim Ingold's (2004) paper *Culture on the ground*.

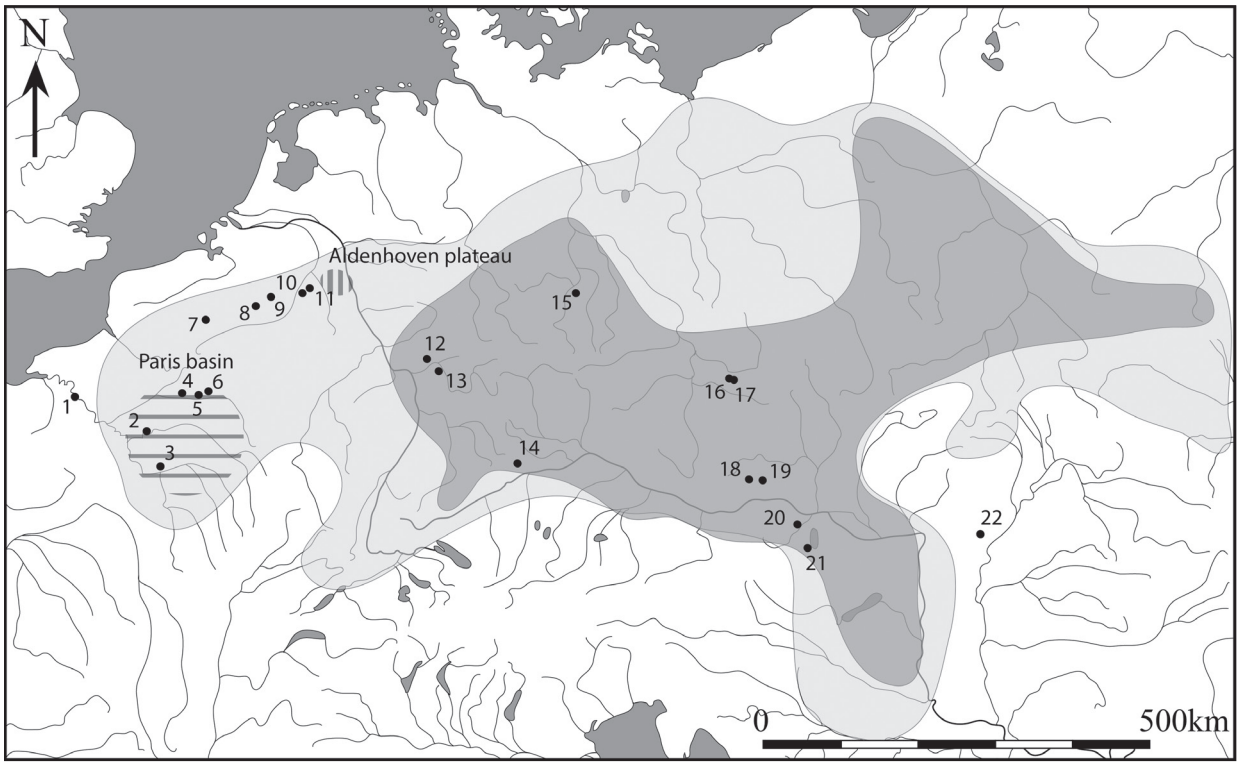

Figure 1. The distribution of the LBK showing early (c. 5500–5300 cal BC; darker shading) and later (c. 5300–5000 cal BC; lighter shading) phases. Sites mentioned in the text and Table 1, from west to east: 1 Poses; 2 Jablines; 3 Marolles-sur-Seine; 4 Bucy-le-Long; 5 Cuiry-lès-Chaudardes; 6 Berry-au-Bac; 7 Irchonwelz; 8 Remicourt "En Bia Flo II"; 9 Verlaine "Petit Paradis"; 10 Elsloo; 11 Geleen-Janskamperveld; 12 Bruchenbrücken; 13 Hanau-Klein-Auheim; 14 Altdorf-Aich; 15 Eythra; 16 Miskovice; 17 Bylany; 18 Strögen; 19 Mold; 20 Brunn am Gebirge; 21 Neckenmarkt; 22 Füzesabony-Gubakút (Alföld Linear Pottery culture). The Paris Basin and Aldenhovener Platte are marked by stripes. Base map after Jeunesse 1997, 10, fig.1.

taphonomic processes in play and how much of the pits has been lost to erosion, particularly as the loess soils on which LBK settlements were built suffered high rates of loss resulting in the erosion of walking surfaces (Stäuble and Wolfram 2012; Wolfram 2008). Table 1 is an attempt to summarise the different conclusions drawn by research into LBK settlements to date. There has been almost unanimous agreement that such pits were excavated at the same time as the longhouse was constructed; the unity of house and pit seemingly was a fundamental part of the living space at LBK settlements. This view dates back to the 1960s, when the "house complex" was first proposed (Soudský 1966), if not before. It has rarely been challenged and, although several different models have been offered since, they are variations on the same theme. However, the temporal relationship between the fill of the pit and longhouse occupancy continues to be debated, as are the means by which it was refilled. The proposed models vary from filled in immediately on construction, to waste only being collected in the pits after the house was abandoned (see Table 1). Whittle (2003) raised the possibility of the pit fills signalling foundational deposits (*e.g.* of feasting remains) at the beginning of a house's life, after they had previously been suggested as immediately refilled after construction to support the walls of longhouses from the earliest phase of the LBK (Cladders and Stäuble 2003, 493; Stäuble 1997). In contrast, Wolfram (2013) and Květina and Řídký (2017) argue that waste only collected around houses, and pits were finally filled in, after a longhouse was abandoned.

The general consensus, however, is that the fill of loam pits was formed at least partly in a drawn-out fashion, at the same time as the house was occupied (Table 1). Pits appear to be open for a short while at least before refilling began. The lower layers of pits often seem to be relatively sterile and to have arisen from the initial erosion of natural loess soils. In the Paris Basin, Allard *et al.* (2013, 14) identify sterile layers

Table 1 (opposite). Summary of interpretations of loam pit taphonomy.

Reference	Site	Region	Interpretive model (as indicated in the text)	Overlapping house plans?	Material culture type studied	Proposed relationship of loam pits to house	Method of infilling	Speed of infilling	Directness of infilling	Stratigraphy identified in pits?
Soudský 1966; Soudský and Pavlů 1972	Bylany	Bohemia, Czech Republic	House complex	Some	Architecture	Excavated at house construction	Gradual; during house occupation	No definitive conclusion	No definitive conclusion	No
Boelicke *et al.* 1997; Lüning 1988	Aldenhoven plateau	Rhineland, Germany	Hofplatz	Some	Architecture	Excavated at house construction	Gradual; during house occupation	No definitive conclusion	No definitive conclusion	No definitive conclusion
Cladders and Stäuble 2003; Stäuble 1997	Bruchenbrücken	Hessen, Germany	Hofplatz	No	Architecture; all finds	Excavated at house construction	Filled in to support walls of house at construction	Refilled almost immediately	Indirect	No?
Last 1998	Miskovice and Bylany	Bohemia, Czech Republic	House complex	Some	Pottery and lithics	Excavated at house construction	Gradual; variation in deposition at different locations around the house	At least while house is occupied	Both	Yes?
Coudart 1998	76 settlements	Various	House complex	Some	Architecture	Excavated at house construction	Gradual; during house occupation	No definitive conclusion	No definitive conclusion	No?
De Grooth 2013; Louwe Kooijmans *et al*. 2003; Van de Velde 2007	Geleen-Janskamperveld	Limburg, Netherlands	Hofplatz/Yard	Rarely	Pottery and lithics	Excavated at house construction	No definitive conclusion	No definitive conclusion	Mostly indirect, but refuse practices poss. changed between Early and Late LBK	No definitive conclusion
Allard *et al.* 2013	Aisne valley	Paris Basin, France	House complex	No	Animal bone, human bone, pottery and lithics	Excavated at house construction	Not a single episode, but few recuts	1–5 years	Both	Yes — initial weathering
Bosquet 2013	Remicourt "En Bia Flo II"	Liège, Belgium	Not stated	No	Pottery and lithics	Excavated at house construction	Gradual; during house occupation?	Few years at most	Indirect — after deposition in "open-air refuse dumps"	Yes
Wolfram 2013	Eythra and Hanau-Klein-Auheim	Saxony and Hessen, Germany	Aim of research to test	Yes	All	No definitive conclusion	Dumps of material, possibly accumulating after house is abandoned	No definitive conclusion	Indirect	No definitive conclusion
Květina and Koncělová 2013; Květina and Řídký 2017	Bylany	Bohemia, Czech Republic	Aim of research to test	Some	Pottery	Challenge assumption that pit fills are contemporary to houses	Dumps of material, possibly accumulating after house is abandoned	No definitive conclusion	Indirect	No definitive conclusion
Burnez-Lanotte and Allard 2013	Verlaine "Petit Paradis"	Hesbaye, Belgium	House complex	No	Lithics	Excavated at house construction	Three types: immediate and discrete, diffuse layers, dispersed and heterogeneous	No definitive conclusion	Both	Yes
Domboróczki 2013	Füzesabony-Gubakút (ALPC)	Heves county, Hungary	Row model	No	All	Excavated at house construction	Gradual over early part of house occupation	4–5 years; possibly up to 10	Indirect	No definitive conclusion
Rück 2013	Multi-regional (but mainly Aldenhoven plateau)	All	Row model	Yes	All available	Excavated at house construction?	Highly variable	Impossible to define	No definitive conclusion	Yes

at most sites along the Aisne valley. They conclude these layers form from the initial erosion of the pit sides, suggesting that there was a short gap in time between the creation of the pits and their infilling. Such layers can also be identified at other sites in the Paris Basin, such as at the Villeneuve-Saint-Germain site of Poses, where the depth of the layer can be estimated as up to 10 cm (Bostyn 2003, 51–3). Outside of this region, Lenneis (2013) also argues that at the large site of Mold, Lower Austria, no immediate refilling of pits could be identified. Overall, the presence of these layers strengthens arguments that pits were created for the extraction of the soils, rather than deliberately for containing waste (cf. Allard *et al*. 2013, 12).

After an indeterminate period of time, therefore, during which pits were left open to the elements, material remains began to accumulate in the loam pits. The nature of this accumulation has been described in different ways. The main driver behind the description of pit fills has been to determine whether they can provide a reliable chronological estimate for the length of house occupancy (see *e.g.* Květina and Řídký 2017) and this has had an impact on the features of deposition which have been given attention to date. In contrast, the focus here is on what we can capture of social attitudes to waste disposal in the LBK, which has seen less direct debate. For the sake of space, I have attempted to summarise three elements of pit fill description which repeatedly appear (see Table 1):

1. Method of infilling: whether material entered in single or multiple episodes of "dumps", or as a gradual accumulation of remains.
2. Speed of infilling: whether it was a quick event once it had begun, or slow (or rather, whether pits were infilled across the length of time the house was occupied).
3. Directness of infilling: whether deposits were made straight into the pit (direct) or material reached the pit from nearby middens (indirect).

For each of these different aspects of pit infilling, there is also the possibility that material made its way into the pit in a variety of ways, and the majority of approaches acknowledge that this was likely. From Table 1, it seems that most researchers favour gradual accumulations of material in the pits, arriving from middened material nearby. This conclusion is based on fragments from the same object found dispersed spatially, and in more recent research, vertically through the pit (*e.g.* Allard *et al*. 2013; Bosquet 2013), mostly through analysis of the ceramic and lithic remains. This focus on lithics and ceramics may be partly due to preservation, as animal bones are not uniformly preserved across the LBK (Lüning 2000, 109). Where animal bones are preserved, attempts have been made to assess the rate of accumulation in terms of season and calendar years. The discarded deer antlers found in loam pits at Cuiry-lès-Chaudardes suggest they were open for at least a year, but shorter than the entire duration of house occupation (Allard *et al*. 2013, 16). The extent of preservation here (though erosion rates are high) allows for comparison between different forms of evidence and Allard *et al*. (2013, 20) make a useful distinction between the recurrent build-up of waste from food preparation and more irregular accumulation from craft activities, such as the manufacture of tools. Accompanied by few identified episodes of recutting, therefore, pit fills seem from current research *most probably* to have come together piecemeal (or at least over the course of a year) as a mixture of deliberate and gradual accumulation of material (see also Stäuble and Wolfram 2012, 42–3). There is no denying that we have lost a significant amount of material, which may obscure some patterns. However, it seems probable that there was no deliberate sorting and separation of waste. It also seems likely that waste was not treated as in any way polluted, resulting in it being discarded at a greater distance from the settlements.

Figure 2. The "empty" spaces identified as the possible location of middens at Remicourt "En Bia Flo II". After Bosquet (2013, 38).

The question then remains where material was collected before deposition in the pits. The only instance of an Early Neolithic surface being preserved in the Paris Basin is at the settlement of Jablines, where about 10 cm of occupation debris survived, indicating material was kept close to the longhouses (Bostyn *et al*. 1991; Hachem 2000; Lanchon *et al*. 1997). Wolfram (2008; 2013) has examined one of the few cases where an occupation layer is preserved (to be specific, when material is not recovered contained within cut features) at the site of Hanau-Klein-Auheim (Hessen). The layer, which showed no evidence of stratigraphy or features, was on average between 20 and 30 cm thick (Wolfram 2013, 81). After examining the size, abrasion and weight of pot sherds, Wolfram (2013, 82) suggests the material was well trampled, having accumulated around houses during and after occupation. Wolfram (2013, 83–4) makes a distinction between the "clean" internal spaces of houses and the external accumulation of material; very little material gathers alongside the inside of walls during occupation, but it does so as the house decays. A similar result was also seen at Altdorf-Aich in Lower Bavaria, where phosphate traces were low within the houses themselves, but relatively high in and around pits and pit complexes (Lüning and Reisch 2011, 251). At Remicourt "En Bia Flo II", Bosquet (2013, 38) identifies particular "empty" spaces between house rows at the settlement, where material may have accumulated as middens (Figure 2).

The spatial distribution of material residues in loam pits has also inspired considerable debate about activity zones around houses (Boelicke 1982; 1988; Boelicke *et al*. 1994; Last 1998; Stäuble 1997), but very little about the impact of the pits on how the settlement and longhouse were encountered (though Hofmann 2006 is a notable exception). At Jablines no overall uniform patterns of discard could be identified, but there were distinct areas of flint knapping to the north and west of the house (Hachem 2000, 308; Lanchon *et al*. 1997, 328). This pattern is repeated at Hanau-Klein-Auheim, where "chipping floors" were identified behind houses (Wolfram 2013). A similar *in situ* cultural horizon was found at Altdorf-Aich, Lower Bavaria, containing sherds, small pots and a grinding stone, along with three spreads of small stones (*Kieselrollierung*: pebble paving or surface) possibly representing hearths or ovens (Engelhardt *et al*. 1997, 34), but again this layer was outside houses and fairly mixed (but see Lüning and Euler 2011).

At the Bohemian sites of Bylany and Miskovice, deposits near the southern or south-western door appear to be characterised by sweepings from inside the house, while deposits at the back of the house may have built up from specific activities taking place nearby (Last 1998, 26–7). However, unlike the regularity of house plans (Coudart 1998), variability seems to be the main attribute of pit deposits and patterns identified on one site or in one class of object are not necessarily repeated elsewhere (Last 2015). Thus the deposition of scrapers and burins in a location spatially distinct to other flints in a loam pit of house 200, Cuiry-lès-Chaudardes (Chataigner and Plateaux 1986, 322), may suggest that certain tools, and by extrapolation certain activities, were kept separate, but this specific pattern has only been found to date in this instance. At Cuiry-lès-Chaudardes house 380, refitting fragments of decorated ceramic and flint ended up on both sides of the house (Ilett *et al*. 1980, 39) (Figure 3). Overall, this discussion suggests that houses were kept clean, perhaps they were swept on a regular, if not daily, basis. In contrast, the outside of houses may have been characterised by the gradual accumulation of material, the gathering of which accelerated after the house was abandoned and began its decay. These patterns suggest that moving around an

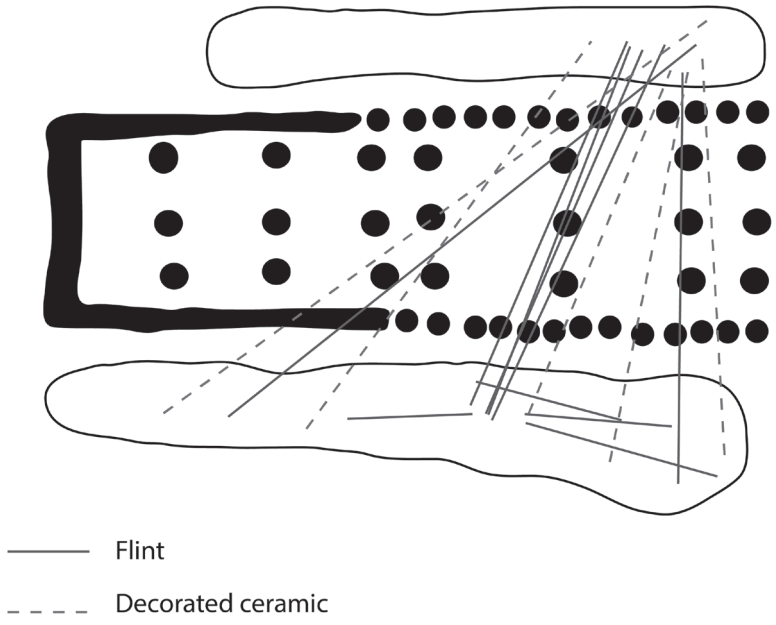

Figure 3. The distribution of refitting lithic and ceramic material found in the loam pits of house 380 at Cuiry-lès-Chaudardes. Lines indicate refitting pieces found either side of the house. After Ilett et al. (1980, 39).

LBK settlement meant being surrounded by the residues of everyday life scattered around, and there may have been middened and mixed heaps of objects, and decaying organic waste, across the settlement.

Structured deposits

In contrast to the apparent gradual and haphazard way in which loam pit fills came together, a number of specific "events" or structured deposits appear to have been made, although the extent to which the material was laid out in specific forms appears to have varied. At Berry-au-Bac, Hachem and Auxiette (1995, 134) suggested that the animal bone in the pits represented specific butchery episodes in which the meat was prepared for consumption. At two Early Neolithic sites in Austria, Neckenmarkt and Strögen, flint artefacts and animal bones accumulated in the same areas of the loam pits, which the excavators, Lenneis and Lüning (2001, 59–63), suggested were the result of episodes of meat preparation. Deposits of this nature, along with flint working debris, may have resulted in material going into the pit in one-off events, but even these stand out from occasions when clear structure can be attested. The starkest example of this was identified by Hamon (2008, 204) at Berry-au-Bac, where three querns were found in a loam pit placed face-down in an arc over their corresponding grinders. This does not appear to be an accidental configuration of objects, as similar arrangements are attested elsewhere (Constantin *et al.* 1978; Hamon 2008, 204; this volume). Constantin *et al.* (1978) suggested that a comparable find of querns at Irchonwelz, Belgium, was a terminal deposit marking the end of the house's life.

However, as Hamon (2008, 206) argues, they could easily have been retrieved from the pit and they could have been placed here for storage when not in use (cf. Allard *et al.* 2013). Echoing this suggestion is a collection of limestone beads from the loam pit of a longhouse at the VSG settlement of Marolles-sur-Seine (Augereau and Bonnardin 1998, 25, 34). These beads were roughouts and had not yet reached their finished form, but were contained within a pot (or base of a pot) and probably once

wrapped in some form of perishable material (Augereau and Bonnardin 1998, 25)[4]. Nestled in amongst the accumulated residue by the house, perhaps those responsible for placing this collection of items in the loam pit intended to retrieve it at a later date and finish the production of the beads.

Therefore, while these seemingly transient and carefully placed deposits are admittedly rare, they may indicate that the contents of the pit were sorted through and objects retrieved. Proof for this will be difficult to come by, but it is an interesting proposition. Wolfram (2013, 84) argues that broken pottery was kept along the outer walls of houses for "recycling". Recovered or not, after material had accumulated by the house, there is no reason to consider it to have been "dead" or no longer active in everyday routines. Therefore, a number of different practices which brought material remains to these pits can be identified, from the collection of refuse from people working close by and sweepings from inside the house to the gradual build-up of middened material, to name but a few of the suggestions. Despite the difficulty in defining their temporality directly, the loam pits seem to have come together gradually through everyday tasks and movements in the spaces between longhouses rather than in one "event" or through an overly deliberate and structured pattern of deposition.

Human remains

Human remains are also found in a disarticulated state in loam pits, caught up with other materials. In the Paris Basin, the association of human remains with houses follows that of other materials, perhaps evidenced by the unstructured finds of disarticulated remains in loam pits at Cuiry-lès-Chaudardes (Pariat 2007). Pariat's (2007) study of the human bone found in the loam pits at Cuiry-lès-Chaudardes concluded that the pieces ended up in the pits accidentally after first being middened with other detritus. Earlier burials, one assumes, were disturbed by later pit digging and the remains unceremoniously allowed to disintegrate with the rest of the rubbish. I find this argument unconvincing, as burial on settlements is often close to houses, which are not subsequently built upon[5]. The child burials in the Paris Basin are often considered to be associated with loam pits (see *e.g.* Jones 2005, 209), and this has fed into a general assumption that settlement burials were low status (critiqued in Hofmann 2009; Hofmann and Bickle 2011). In fact, this is rare and only four (from a total of 27) child burials in the Paris Basin were actually placed in part of the loam pit, two of which were interred in especially extended sections of the pit (Bickle 2008, 191, 444). For the majority of burials associated with houses, an individual pit was created between the loam pits and the walls of the houses and occasionally it appears as if the burial was placed in the line of the wall (*e.g.* the two child burials at Berry-au-Bac "Le Chemin de la Pêcherie"; Farruggia and Guichard 1995). When child burials are found in loam pits they do not appear to have been unthinkingly included in the pit, as if thrown out with the rest of the rubbish. In one instance, burial 271 at Cuiry-lès-Chaudardes, a child was placed on the edge of a loam pit, in an apparently extended section created specifically to receive the burial (Soudský *et al.* 1982, 75; see Hofmann and Bickle 2011, fig. 9.5). Thus the child was placed in association with the pit, but at the

4 The same pit, north of house 1, also contained flint and bone tools thought to be used for preparing the limestone beads (Augereau and Bonnardin 1998, 25).

5 Overlapping house plans are very rare in the Paris Basin (there are four instances currently known; Bickle 2008). This is not the case for all Early Neolithic sites in central Europe and further east sites appear to have been more densely packed.

Phase	House	Disarticulated human remains present	Trenched NW end	Rooms (in western end)		
				1	2	3
1	45		X			X
	90			X		
	112			X		
	126			X		
	390			X		
2	320			X		
	400			X		
	440			X		
	500		X			X
	520					
	560				X	
3	11		X		X	
	360	X	X		X	
	380	X	X			X
	420		X		X	
	570	X				
	580			X		
4	85			X		
	89			X		
	245		X			X
	320			X		
	425			X		
	460			X		
5	80			X		
	225					X
	280	X			X	
	410			X		
	450				X	
	530				X	

Table 2. The pattern of human bone and architectural features at the houses of Cuiry-lès-Chaudardes (Aisne). Data collated from Pariat (2007) and Coudart (1998).

same time a certain separation from the loam pit was maintained. The burial was placed on a layer of sprinkled ochre (Ilett *et al.* 1980) further marking out the ground the child lay upon. The relative timings between the pit and the burial are uncertain, but it can be suggested that space was made in the tumultuous and unruly deposits for the burial, as if space was being made in everyday routine for mourning and ritual, even if only temporarily.

At the nearby site of Berry-au-Bac "Le Vieux Tordoir" (Allard *et al.* 1995), Thévenet (2004) suggested that burials may have remained open, with the deceased placed in a niche enclosed by an organic (*e.g.* wooden) covering. Remains could have then been removed and deposited with other waste or taken further afield. The buried human body might not have been forgotten or disregarded, but viewed, like the quernstones or limestone beads, as recoverable and always capable of rejoining the daily engagement of bodies, material and decay — or the process of decay could have been carefully monitored (this will be returned to below). The majority of the disarticulated remains from Cuiry-lès-Chaudardes are found in houses built during

the third phase of five, which sees substantial architectural changes (Allard *et al*. 2013; Bickle 2008, 198; Hachem 1997; Pariat 2007) in the western/north-western end of the house, limited to this phase. First, this phase sees the most houses with a trench-built north-west end (four out of a possible seven), which contrasts with only one each belonging to phases one, two and four; and second, rather than the majority of houses having one "room" in the western part of the house, five houses have two or more (Bickle 2008, 191, 198) (Table 2). The connection between architectural changes in this section of the house and human remains turning up in the loam pits is interesting in light of Bradley's (2001, 53) suggestion that this end of the house was possibly a mortuary shrine (expanded on by Lüning 2009).

The burial of the child at Cuiry-lès-Chaudardes discussed above (burial 271) would have forced people to touch the contents of the loam pits. This may also have been the case for loam pit 151 at Vignely "La Porte aux Berges", where the excavators suggested that an inhumation was placed in the pit, with the main bones later recovered (Thévenet 2018, 193). The material excavated from the loam pits today is hard and relatively clean and in a different state to the teeming, rotting mass that would have surrounded the LBK longhouse (Hofmann 2006; Wolfram 2008). During the LBK, therefore, communities would have lived with the decaying mass of material on either side of their houses and across the settlement. The remnants of tool making would have mixed with broken pieces of pot (possibly someone's favourite?) alongside organic matter that has not survived today. Such accumulations of material in the daily living space, in which people came into contact with its textures, views and smells, may have been actively sought. In her anthropology of the Dogon, Mali, Douny (2007, 311) describes how their houses were "surrounded by agglomerations of flies, multiple forms of straw, rags, tin cans, animal bones, tree leaves, dung, torn plastic bottles, and shredded plastic bags" which "accumulate[d] in the furrows of the paths that weave around Dogon households". The experience of waste "between your toes" is viewed positively by the Dogon, while cleanliness is viewed unfavourably, considered to indicate lifelessness or laziness (Douny 2007, 311, 315). In a comparable way, I propose that the build-up of material by LBK longhouses could have been desired: evidence of a busy, active household.

Patterns of deposition across the settlement

Early Neolithic longhouses in the Paris Basin were most often constructed in settlements of various sizes, of which the largest was the settlement of Cuiry-lès-Chaudardes with more than 35 preserved house plans (Coudart 1998; Hachem 1997). Often the deposition histories of houses are regarded as uninfluenced by their setting amongst other houses, with the area around a house viewed as a "Hofplatz" marking out an independent social unit (Boelicke 1982; Lüning 1988). Rück (2007; 2009) has recently suggested that LBK settlements were arranged in rows, but does not really comment on the forms of relationships that existed between houses and the independence of houses seems to be borne out in how rarely refitting objects are found dispersed across the settlement (Ilett *et al*. 1986, 36). However, given the enormous task of checking for refits across a large settlement, such instances are likely to only be spotted when preservation is particularly good (Hofmann 2006; Wolfram 2008). "Next Neighbour Analysis" from the sites of Brunn am Gebirge and Mold, Austria, demonstrated that material tended to stay close to houses, with houses situated close to each other demonstrating the strongest similarities

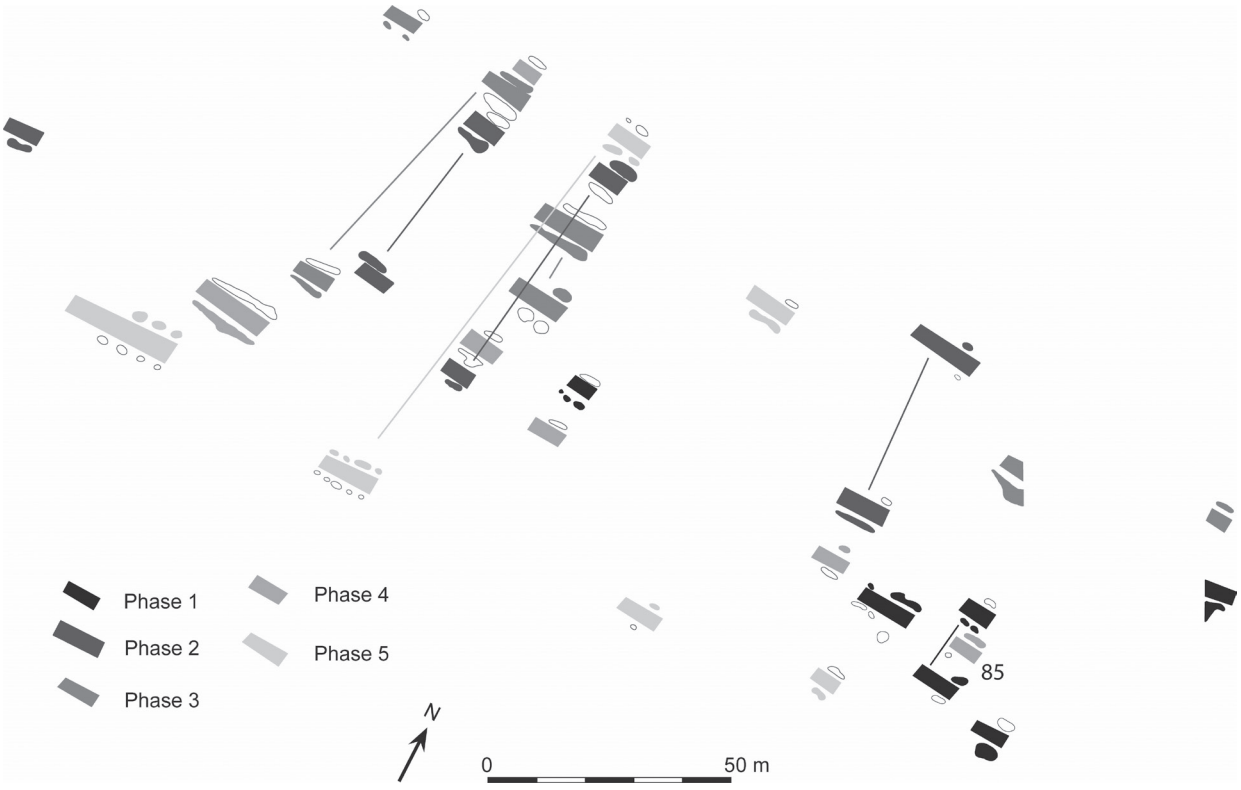

Figure 4. The "paired" houses at Cuiry-lès-Chaudardes, indicated by the straight lines joining each house with its "opposite". After Hachem (1997, figs 8–9).

in ceramic designs (Stadler 2005, 270, fig.13; Stadler and Lenneis 2009). While care must be taken in transposing the evidence from Austria wholesale onto sites in the Paris Basin, it seems likely that material from different houses was not actively mixed in the loam pits, bar the occasional intrusive object.

Despite this, in the Paris Basin, certain houses seem to be linked through depositional practices. At Berry-au-Bac "Le Chemin de la Pêcherie", in all three houses more remains ended up in the loam pits on the southern side of the house than the north (Constantin 1995, 151). There are numerous explanations as to why this might be the case. The southern side could have received more deposition because it was not shaded by the house and therefore people gathered here preferentially when carrying out tasks. However, this tendency to deposit remains on the southern side of the house is not repeated at other sites. For example, at Bucy-le-Long, Boiron (2007) found that the places of deposition were not regularised nor repeated between households. She concludes that each household arranged the spatial location of its own tasks (Boiron 2007, 305). Such patterns then speak to the kind of habitual bodily routines and preferred styles of movement, such as those described by Bourdieu (1990) in the concept of the *habitus* or Ingold (2000; 2011) in the taskscape, with structure and pattern arising in how people chose to walk around the settlement and carry out tasks, rather than in deliberate strategies.

Of the 23 houses at Cuiry-lès-Chaudardes whose loam pits have been studied, a tendency for material to be placed on the southern side of the house has been identified at 15 (Constantin 1995, 151; Ilett *et al.* 1986). This pattern is further complicated as houses seemed to be "paired" along an east–west axis, with both houses preferentially depositing material on either the side further away from to the house they are paired with or the side facing it, but never do both

houses choose their north or both their south pit, suggesting deliberate choice (Hachem 1997; Plateaux 1993; see Bickle 2013, fig. 7.6) (Figure 4). This network of depositional practices suggests that different houses had varying relationships to each other. It can therefore be expected that there are a number of explanations as to why certain depositional practices developed. We can envisage a situation where slightly more convivial relations led to households preferentially sitting on the same external side of the house, opposite one another, talking and sharing jokes, with people moving backwards and forwards across the intervening space and a residue of waste building up in the vicinity where people worked. However, in later phases the remains of earlier houses would also force contemporary houses into different relationships with each other. Where the other sides of the houses were favoured for deposition, perhaps relations were a little cooler and people took to working on the other side of the house or conceivably households wanted to hide certain tasks or the disposal of some objects. It is equally possible that the materials placed alongside the houses and in the loam pits were on display to other members of the settlement and, therefore, where deposition on the same side was favoured, households were perhaps engaged in some form of competition.

Instead of trying to distinguish whether this was associated with closer cooperation between houses or with increased competition, as we are unlikely to ever satisfactorily determine between these options, this pattern is best interpreted as revealing the interconnectedness of the architectural structure of the house and the practices of inhabitation during the LBK. Here, there is a tension between each house standing alone as a separate structure, emphasising household identity, with only rare instances of refitting objects occurring in the pits associated with more than one house (see discussion above), and depositional patterns around the house, which were partly created through interaction with nearby households. Therefore, although the focus for everyday routines was probably organised by individual households, at the same time how and where they were carried out was influenced by the very fact of being part of a wider community.

Decay and dissolution: deposition of the longhouse

Analogous to the decay alongside houses and in the loam pits, longhouses are thought to have decayed *in situ*, with few if any interventions or alterations after their abandonment (Coudart 1998; Modderman 1970; 1988; Whittle 1996; 2003; cf. Rück 2007; 2009). From the size of the posts, it is estimated that these houses could have lasted for 80 or so years, yet the phasing and duration of the settlements suggest that they were occupied for about 20 to 30 years (Boelicke 1982; Boelicke *et al*. 1997; Bradley 1996; Coudart 1998; Hodder 1990; Lüning 1988; Whittle 1996; 2003; cf. Rück 2007; 2009). Therefore, after the initial phase of the settlement, the inhabitants would live with the decaying remains of the past around them; a very tangible reminder of specific people and events from the previous decades of the settlement. As post pipes do occur during excavation in some cases, it seems highly likely that at least the posts from some houses were left (Allard *et al*. 1995, 60). The rarity of overlapping house plans in the Paris Basin suggests more strongly that in this region houses were left to decay, while elsewhere in the LBK a substantial effort may have been put into clearing older houses to make way for new buildings. There is of course the possibility that some posts could have been removed at ground level or re-used in subsequent houses (Hofmann 2006).

It is likely that the wattle and daub walls, as well as the roof, went first, leaving upright posts protruding from a mound of clay and straw (Bickle 2008, 164; Borić 2008, 127; Hofmann 2006). Borić (2008, 127) evokes Hugh-Jones' (1995, 247, my emphasis) anthropology of the Maloca[6] in north-west Amazonia: the "roof and walls rot away leaving the heavy hardwood columns, standing like bleached bones *on a site full of memories, the histories of its residents*". These mounds and uprights would eventually have been taken over by plants. This process might have been viewed as analogous to the re-growth of woodland, which is not clean, but involves decay and disintegration (see Bickle 2013, fig.7.7). Plants, dead leaves and fallen branches litter the floor of the forest, with new shoots forcing their way through the messy tangle situated above the soil level. As the posts decayed and fell, plants would begin to take over, first grasses and weeds, then more substantial shrubs and bushes. Just as the material in the loam pits decayed in full view, moving from recognisable object to concentrated mass, so did the longhouse.

The build-up of material and its subsequent decay allowed, through an intimate engagement with its fabric, for the history of the house to be felt and known materially. Borić (2008, 127) has argued that taboos originating in ideas of the house becoming polluted on the death of particular individuals may have been a prominent reason for the abandonment of Starčevo–Köros houses (see also Tringham 1991) and, furthermore, that this may have been transferred to the earliest LBK houses (Bánffy 2004; Domboróczki 2010). Given evidence in the Paris Basin for the continued access to graves and little to support the deliberate burning of houses at the end of their use-life, pollution may not be a useful concept for imagining the end of the houses in this region. Rather, notions of a drawn-out dissolution, encompassing not only the break-up of the household, but of its physical structure as well, appear more appropriate. Hence, in place of a temporally shorter and dramatic rite ending the house (though see Midgley 2005, plate 21, reproduced as fig. 7.7. in Bickle 2013)[7], the longhouse of the Paris Basin continued on after it was abandoned, probably for some significant time, with waste accumulating around it.

These houses would have been at once both familiar and unfamiliar: a sensory mix of "smells, profuse and intrusive textures, surfaces, peculiar and delicate soundscapes, and perplexing visual objects, juxtapositions and vistas" (Edensor 2005, 144). Just as the accumulation of remains around a living longhouse may have been viewed as integral to a successful household, subsequent decay would texture the passing of time at a settlement. Newly abandoned houses could still have been entered, their contents available for reuse, while older buildings may have become more dangerous places with the risk of being hurt by falling posts and inhabited by the memories (or ghosts) of individuals known only through stories. The history of the settlement could thus be known through its architectural structures and the relative states of decay. However, as well as perhaps tapping into a generic sense of ancestry *sensu* Bradley (1996; 2001), these histories were most likely also specific, contingent and local. In this sense the decaying longhouses of a settlement were not only a significant aid to social memory, the physical presence of the house demanded that their stories were told (Borić 2008, 127; 2010, 53), but the histories of different houses were layered together, built up out of a network of different relationships (Bickle 2008, 292). We can think of this as

6 A longhouse housing several families (usually related through patrilineal lines) in different compartments (Hugh-Jones 1995).

7 The reconstruction of a longhouse, built by Constantin, was attacked by vandals and burnt (Midgley 2005). As the photo demonstrates, a considerable amount of the house remained.

the "present past", closely co-located with the living. Elsewhere in the Neolithic, it has even been suggested that houses were deliberately abandoned in the early stages of tell formation as an active process of memory creation (Draşovean *et al*. 2017)

Decay thus tempered life at LBK settlements, forging links between past and present, and it may have done so with death as well. Working in south-east Asia, Adams (1971; 1977) argued that funerary rites paralleled everyday activities, particularly around the action of pounding. Sounds familiar to everyday life (the pounding of rice, of the ground prior to planting, in metalworking and in clothes washing) are echoed in the rites surrounding death, with regular pounding of gongs and rice pestles (Adams 1977, 47). This parallel between everyday activities and ritual expressions articulates something of the fabric of this particular world view, in which noise making accompanies transitions in state: from rice to flour, from bare earth to planted, from raw material to tool, from dirty to clean, from life to death. For the LBK, concern with and particular experiences of decay may have in a similar way framed the transition from life to death. While lived in, longhouses were regularly swept clean, in an action of what was probably daily care. As the household and the longhouse came to an end, deposition and decay continued, while sweeping was discontinued. Material was allowed to gather around the building, perhaps becoming part of a midden which was part house, part more recent remains of daily life. Similarly, the decay of bodies does not seem to have been controlled, nor do attempts at preservation appear to be in evidence. There is also little suggestion that the body on death became "polluted", nor did discarded waste material. In contrast, the transformation from alive to dead (or rather from active part of the settlement to blended with its history) could have taken place over a prolonged period of time, in which decay was an essential part of the process (Bloch and Parry 1982). Decay of houses and persons, therefore, may have taken place on analogous paths of transition, always materially present to be investigated and renewed. I am not the first to suggest that the LBK communities made links between human bodies and houses (*e.g.* Jones 2005; Whittle 2012), but here I am making a slightly different argument. Rather than suggesting that bodies and houses were thought of as analogous in the LBK, I propose that they were subject to the same aesthetic and material processes, in which decay was part of the experience of deposition, and the present past at LBK settlements.

Conclusion

Concentrating material residues around the house was a practice recurrent in many prehistoric societies (Chapman 2000b, 83) and while this has provided a wealth of possibilities for capturing daily life through the materials themselves, it is rarely seen as an inherent part of the architectural structure and everyday life. Considering the routine and rhythm of inhabitation (how houses were lived with) permits exploration of the qualities of building and decay of the longhouse in the Paris Basin and how they framed a cyclical pattern of creation and disintegration that may have applied as much to human relations as to the longhouse architecture itself. So, in the sense that longhouses in the Paris Basin were likely left to decay *in situ* and the space the house occupied was *not* subsequently built upon, the longhouse outlived the household. This potential abandonment and decay must have been part of the anticipated future for the longhouse as it was built, and in turn, also that of the household. Thus, following Douny (2007, 329), the

processes of accumulation and decay materialised particular temporalities for *Rubané* communities in the Paris Basin. Rather than disregarding the contents of the loam pits of LBK longhouses as a by-product of material practices, when taken together the homogeneous and unstructured deposits are physically connected in their affect and temporality. Once space had been cleared and the house constructed, the material practices which took place in and around the house were inscribed onto that architectural space. These are inhabited networks in which the pits are a focus for activity and a crucible for creating an experience or aesthetic of decay in the LBK settlement context. Eventually, the pit contents collapsed in on themselves and would have disappeared from view completely.

More broadly, therefore, the wider community was partly constituted out of these histories of decay. The growing settlement may have been seen as analogous to the build-up of remains around longhouses. In the same way, depth of time at settlements may have been desired, as it stimulated particular emotions associated with belonging and affiliation, but difficult to achieve, as it required commitment to and negotiation of the everyday making of relationships. In some cases this led to more substantial numbers of houses being constructed, while in others, the area was abandoned after a couple of generations. This discussion hopes to provide a starting point for re-casting how the sacred and profane are considered in LBK contexts, and for rethinking deposition and decay as meaningful ways of getting on and making life happen in the LBK.

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What happened at the settlement? The testimony of sherds, animal remains, grinding tools and daub

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Abstract

In our contribution, we offer several interpretative models for discussing the individual categories of finds and finds contexts from the Late Neolithic site of Vchynice in north-west Bohemia (Czech Republic). Here, the remains of a Neolithic rondel ditch were uncovered in 2008. The site formation processes that took place at the settlement during its active use and long after its demise were certainly complex. However, among other finds such as sherds, lithics and animal bones, the analysis of daub from the rondel ditch and from the contemporary features in the vicinity indicates the possibility that the settlement witnessed a larger conflagration at a certain time. This can be explained as an accidental catastrophe, an attack by foreign communities or as due to ritual reasons, for instance during the abandonment of the site.

Keywords: *refuse; Neolithic settlement; enclosure, Stroke Pottery culture (STK/SBK); daub*

Introduction: the LBK background

The territory of the temperate zone of Europe in the Neolithic (5500–4400 BC in Czech chronology) is characterised by the fact that most information concerning the form of society in this period comes from settlement refuse. Following from its definition (*e.g.* Schiffer 1987), refuse does not reflect the behaviour of extinct populations directly, but only indirectly. It also means that the archaeological material need not preserve spatial associations between places where activities took place and places where refuse was deposited. The whole picture is made even less transparent by the fact that Neolithic occupation traces often accumulated on one and the same place for a long time. However, this did not create vertical settlement layers as we know them from the Balkans or the Near East; instead, the settled area extends horizontally. Neolithic settlements in this region thus have the form of extensive zones of mutually overlapping pits, ditches and layouts of post structures, which create an image of settlement remains of often different ages and different archaeological cultures. A typical example is the succession of settlements of the Linear Pottery culture (hereafter LBK, 5500–5000 BC) and the Stroke Pottery culture (STK, 5000–4400 BC; often also abbreviated SBK in the literature).

From the perspective of archaeological interest in the deposition and the general relation between artefacts and the original settlement context, more emphasis

is undoubtedly laid on the LBK horizon. Some of the authors of this article have recently attempted to show that the appearance of archaeological finds at Neolithic settlements is the outcome of an immensely complex set of formative processes (Květina and Řídký 2016). At some sites, the refuse apparently indeed refers to behavioural strategies at the level of particular individual inhabitants of houses, which has been shown in France for instance by Lamys Hachem for animal bone refuse (Hachem 2000). Elsewhere, however, the characteristics of the refuse are rather the result of its treatment at the scale of the whole settlement community. This has been demonstrated using the example of spatially differentiated deposition of specific types of non-pottery refuse at the Bylany site in the Czech Republic (Květina 2010). The analysis of this kind of Neolithic refuse has also shown that the appearance of the refuse is strongly affected by the duration of settlement on the site (Květina and Řídký 2016, fig. 3). The parameters examined for non-pottery finds in Bylany suggest that at the time when only a few houses existed at the site, the average amount of refuse was much greater than during the following chronological phase, when many more houses were present there (Květina 2010, 355–8). This trend is repeatedly clearly observable throughout the existence of the Neolithic occupation. This leads us to an interpretation that is in accordance with deposition practices documented ethnoarchaeologically (Deal 1985; Hayden and Cannon 1983) and garbologically (Wilk and Schiffer 1979): plots with abandoned houses were not excluded from the everyday life of the continuing settlement community, but transformed into places where refuse from the surrounding inhabited places was deposited. Whether specific areas around the longhouse are connected with specific activities, as is often argued (for example Last 1998, 28; Pavlů 2000), must therefore be checked in each case.

A transformation of the social identity of Neolithic longhouse communities is attested by a change in the treatment of refuse at settlements during the Late Neolithic period (c. 5000–4400 BC in Czech terminology). The existence of pits inside the settlement is typical for the LBK period. The spatial arrangement of these pits is bound exclusively to the longhouses; from the perspective of the overall arrangement of the settled area, it is chaotic. This suggests that the village as a whole, as we view it in the archaeological record today, did not come into existence in an organised manner. The origin, demise and spatial disposition of the individual houses correspond to the needs of their respective inhabitants rather than of the whole settlement community. This situation changed during the Late Neolithic and the STK, when specific pits were moved behind the house. The refuse is now deposited outside the area of everyday activities. STK settlements thus apparently formed internally organised units, in which the original households bound to the longhouses were losing their economic and social independence. The internal arrangement of the settlement was more or less organised and the settlement area was managed collectively by the entire community (Květina and Řídký 2016, fig. 4).

As social and settlement complexity developed, hierarchisation increased both within the community and between sites. This process is evidenced by Late Neolithic rondels (circular ditched enclosures, *Kreisgrabenanlagen*), which appeared approximately between 4850–4700 BC (Řídký *et al.* 2019). This contribution is focused on the information potential of the refuse at the Neolithic settlement of Vchynice, north-west Bohemia (for a summary, see Řídký *et al.* 2013; 2014a). Various categories of finds and features from the LBK and STK periods have been gradually studied over the past six years, including pits (their shapes, dimensions, location or function), pottery (the shapes, quantity and typochronology of the vessels), animal

bone remains (preservation, species determination), chipped industry (technological categories, functional groups, sources of material) and grinding tools (technological categories, functional groups, level of preservation, sources of material). The most conspicuous and apparently the most important structure at the Vchynice site was the V-shaped ditch of a Neolithic circular ditched enclosure, a so-called rondel (*e.g.* Literski and Nebelsick 2012; Petrasch 2012). These circular structures (with dimensions of c. 30–230 m) consist of an inner foundation trench (or trenches) and a ditch (or more ditches) with two to four entrances. Among the list of their possible functions, the socio-ritual function is listed most often (*e.g.* Podborský 1999).

In this contribution, we summarise the development of existing interpretative models of the activities at the mentioned Neolithic settlement, as they have been published almost annually in the form of the results of partial analyses of the individual categories of finds (*e.g.* Řídký *et al.* 2012; 2013; 2014b; Stolz *et al.* 2015). By a complex study of the refuse, we attempt to offer a narrative of one possible event important for the understanding of the function of Late Neolithic settlements with rondels. Given that "structured deposits" that would directly refer to a ritual function of rondels or to a "special" significance of the surrounding settlements have not been identified anywhere at the site, we focus on "ordinary" refuse at the Late Neolithic settlement and analyse it from several points of view. We consider the preservation of various finds, the taphonomy and the occurrence of some properties of artefacts and biofacts in the area of the examined part of the settlement.

Following on, we focus above all on sherds, animal bones, grinding tools and daub fragments. The latest analysis of daub remains, so far largely unpublished, can be described as a kind of culmination of more narrowly focused analyses. We believe that daub as an archaeological source material has been rather neglected by central European researchers, yet it answers many questions concerning not only the original appearance of no longer existing structural elements but particularly the way of demise of various structures (*e.g.* Ďuriš 2015; Lüning 1988; Vencl 1991; Zürn 1965). The interpretation of these finds categories relating to the supposed periods of construction, use and demise of the rondel, *i.e.* in the late phase of the STK period (STK IV according to Pavlů and Zápotocká 2013), is fundamental for our contribution.

The Vchynice site — research methodology and dating of features

The site was discovered and examined in 2008–2009 by M. Půlpán and M. Volf during a salvage excavation before the construction of the D8 motorway connecting the Czech Republic and the German state of Saxony. An area of up to 1 ha was uncovered, and more extensive prehistoric pits and postholes were detected on an area of c. 0.5 ha in the eastern part (Figure 1). The features at Vchynice were examined by so-called artificial layers within half-sections or sectors. Apart from 13 more extensive pits, most pits (a total of 29) could be dated to the Neolithic based on the content of their fills. Most postholes that could be joined into some more meaningful structure fall into the same period. In what follows, the basic chronological classification of Neolithic features and the primary function of larger pits are briefly summarised.

Three pits were assigned to the LBK period (LBK II phase according to Pavlů and Zápotocká 2013). Two of these pits can be described as long pits or loam pits accompanying the walls of former longhouses. The almost complete skeletal remains of a child (infans I, 9–12 months old) surrounded by stones have been

found in the third pit (No. 62), which had an irregularly rectangular layout. Numerous finds of sherds and animal bones come from its fill. According to the highly varied character of the documented layers, this pit was filled over a longer period through the activity of various agents; most probably, it is a superposition of two features — a long pit and a pit of an irregularly rectangular layout.

Five pits can be categorised as belonging to the early phase of the STK (Nos 15, 21, 27, 37, 55). One of them (No. 55) might have originally fulfilled a storage function; the function of the remaining four regrettably cannot be determined with certainty.

Eight more pits belong to the late phase of the STK (Nos 20, 22, 28, 33, 36, 45, 53, 60). Altogether six pits with a circular or oval layout, perpendicular or conical walls and more or less flat base have been described as storage pits (Nos 22, 28, 33, 36, 45, 60), two were more extensive clay extraction pits.

Pottery from both main chronological phases of the STK has been found in four features (Nos 3, 4, 35, 59). Apart from one storage pit (No. 59), they included more extensive clay extraction pits and also the examined rondel ditch (No. 4).

Six more pits (Nos 5, 12, 13, 14, 31, 32) supposedly fall into the STK period as well, but the material excavated from their fills does not show clear diagnostic signs that would enable more precise dating into chronological phases. Some of them are also storage pits (Nos 12, 14, 31). Based on the spatial distribution and types of features from the last two groups, it is more likely that they were also dug during the late phase of the STK, and earlier material was incorporated into their fills by disturbance of earlier settlement structures.

At least one longhouse from the group of house layouts found approximately 30 m south-west of the rondel ditch can also be dated to the STK period.

Vchynice is a multi-phase site, featuring finds from the LBK period to the Late Iron Age. The examined area was thus used, in various ways and with interruptions, for a period of more than 5,000 years, which entails some generally known problems in the chronological classification of the features. Already in the course of fieldwork, earlier or later intrusions could be detected for most of the more extensive Neolithic features. Their recording is very important in the case of a joint occurrence of LBK and STK pottery or of the pottery of the early and late phases of the STK, because analyses of non-pottery finds, including osteological assemblages, are based on primary dating carried out by the archaeologist. Assemblages from features with a sufficient amount of datable material have been preferentially chosen for targeted analyses of various categories of finds (Řídký *et al.* 2013), as were assemblages from features with chronologically clearly distinguishable materials, those from more sizeable features (excluding all postholes and trenches) and those from features that were not in superposition with another feature of a different period.

Of the total of 23 larger STK features, ten (including the rondel ditch) have been selected based on the above-mentioned criteria. These ten features were subsequently divided into three reference groups:

- G1: STK, early phase: pit No. 37 (regrettably, this is the only pit that can be reliably assigned to the early phase of the STK);
- G2: STK, late phase: clay extraction pit No. 20, storage pits Nos 28, 33, 36, 60;
- G3: STK, early/late phases: clay extraction pits Nos 3 and 35, storage pit No. 59, rondel ditch No. 4.

These three groups of features can be used in various constellations to compare the finds according to the two chronological phases (groups G1 and G2) or

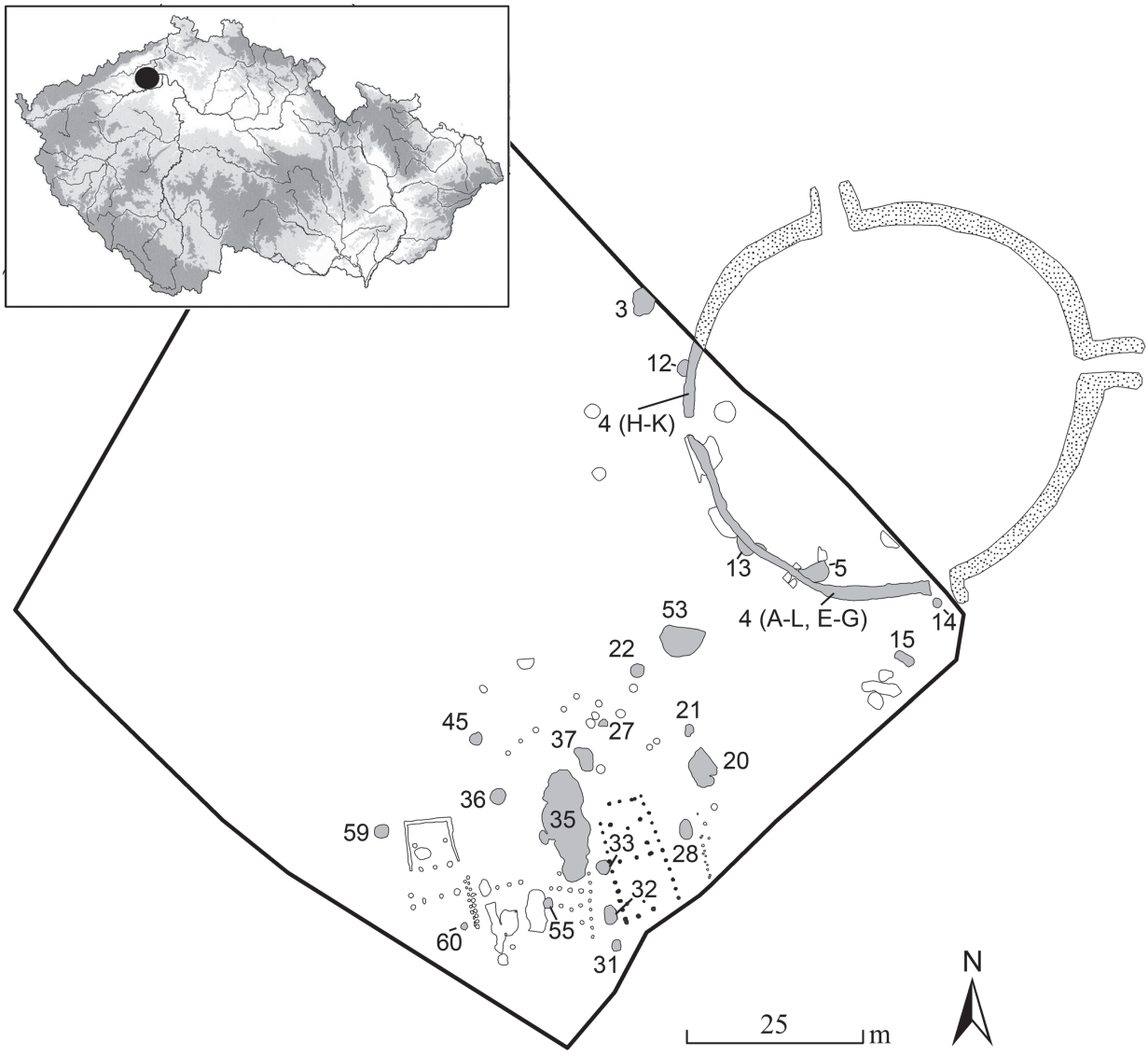

Figure 1. Location of the Vchynice site and overall plan of the excavated features. Features dated to the STK are shown in grey. Postholes of the STK longhouse are shown in black. The rest of the rondel layout, documented by geophysics, is marked by a stippled fill. Larger white features are earlier (LBK) or later than the STK. Drawing: J. Řídký.

according to provenance from features of various sizes, from features situated in various parts of the settlement and from features of various primary functions (for instance, the rondel ditch, storage pits, clay extraction pits).

Analysis of STK sherds

Traces of so-called site formation processes taking place at the site have been examined above all on pottery excavated from the rondel ditch (No. 4) and from three more pits, this time "typical settlement features" (features No. 28, 33 and 35). Storage pits Nos 28 and 33 were selected because the characters of their fills suggest short-term infilling with material of anthropogenic origin (*e.g.* Řídký *et al.* 2013); moreover, they were from the G2 feature group. It has previously been argued that storage pits were situated close to residential units (*e.g.* Šumberová 1996). Feature No. 35 (a clay pit from the G3 group) has been chosen because it, like the rondel ditch (No. 4), appears to have filled up over the long term; like the ditch, it contained above all pottery of the late phase of the STK, along with pottery of the early phase of the

STK and sporadically also LBK pottery. The analysis thus included a total of 1,351 sherds (23,643 g) originating from at least 953 vessels (refits). All the mentioned features were exceptional not only due to the number of individual sherds and the number of individual vessels this represents, but also because of the number of other finds — lithics, animal bone remains or daub.

The analyses compared for instance the ratio between various parts of vessels: rims; rims + bodies; bodies; rims + bodies + bases; bases. The level of abrasion has been evaluated by an original descriptor within the sequence: p1 = sharp-edged sherd (all edges sharp), p2 = partially worn sherd (about half of the edges are sharp, half are worn), p3 = quite worn sherd (no sharp edges or considerably eroded surface), p4 = so-called reutilised sherd (during the predeposition stage, the shape of the sherd was intentionally modified for other purposes, *e.g.* into a smoothener or a spindle whorl). The size of each sherd was measured in categories by centimetres and the average wall thickness calculated from the minimum and the maximum thickness of the sherd. The ratio of the size and wall thickness, the so-called S/W (size/wall) index, was calculated; it is supposed to express the sherd's susceptibility to breaking: the higher the value of the S/W index, the more likely higher fragmentation is (Květina and Končelová 2011, 60–1).

The outcomes of various analyses have shown that in the case of most of the recorded variables (the occurrence of various parts of vessels, size representation of sherds, the ratio of fine/coarse pottery; Řídký *et al.* 2013), pottery refuse from the rondel ditch (No. 4) is more similar to larger clay pits, for which we can presume long-term infilling through the activity of various agents (Figure 2). On the other hand, group p1 (sharp-edged sherds) occurred much more often among the sherds from clay extraction pit No. 35. There are two possible interpretations of this phenomenon. Either the pit is actually an unrecognised superposition of several types of features, including those where refuse was deposited immediately after an item fell out of ordinary use or, in view of the vicinity of residential units, refuse was deposited there in a larger quantity (and repeatedly) and was therefore exposed to erosion only for a short time. In contrast, the rondel ditch could have been situated in an exposed part of the settlement (indeed, geophysical plots showed the absence of larger features beyond the boundaries of the excavated area; see Řídký *et al.* 2012, fig. 1), and it therefore remained open and exposed to erosion and various chemical influences for a longer time.

The analysis of the preservation and metric properties of the sherds has also been used in the search for the original appearance of the Vchynice rondel (*e.g.* Řídký *et al.* 2014a). Thanks to the thorough research carried out at Vchynice, it has been possible to compare various characteristics of the finds that became part of the ditch fill. Here, we were interested above all in an approximately 13 m long section of the examined ditch which was undisturbed by later interventions close to the west entrance. The ditch was up to 2.5 m wide and up to 1.8 m deep there. Pottery fragment analysis revealed, at various levels, sherds from the late phase of the STK, the period when the rondel is supposed to have been built, as well as from the earlier chronological phase of the same culture, the early phase of the STK, and even one sherd from the earliest occupation at the site, LBK II. The earlier sherds surprisingly came from middle and upper levels of the ditch fill, where we would only expect chronologically later material. A detailed analysis of the size and preservation of the sherds did not reveal any significant differences between the chronological phases of the STK — small sherds up to a maximum length of 2 cm and large ones exceeding

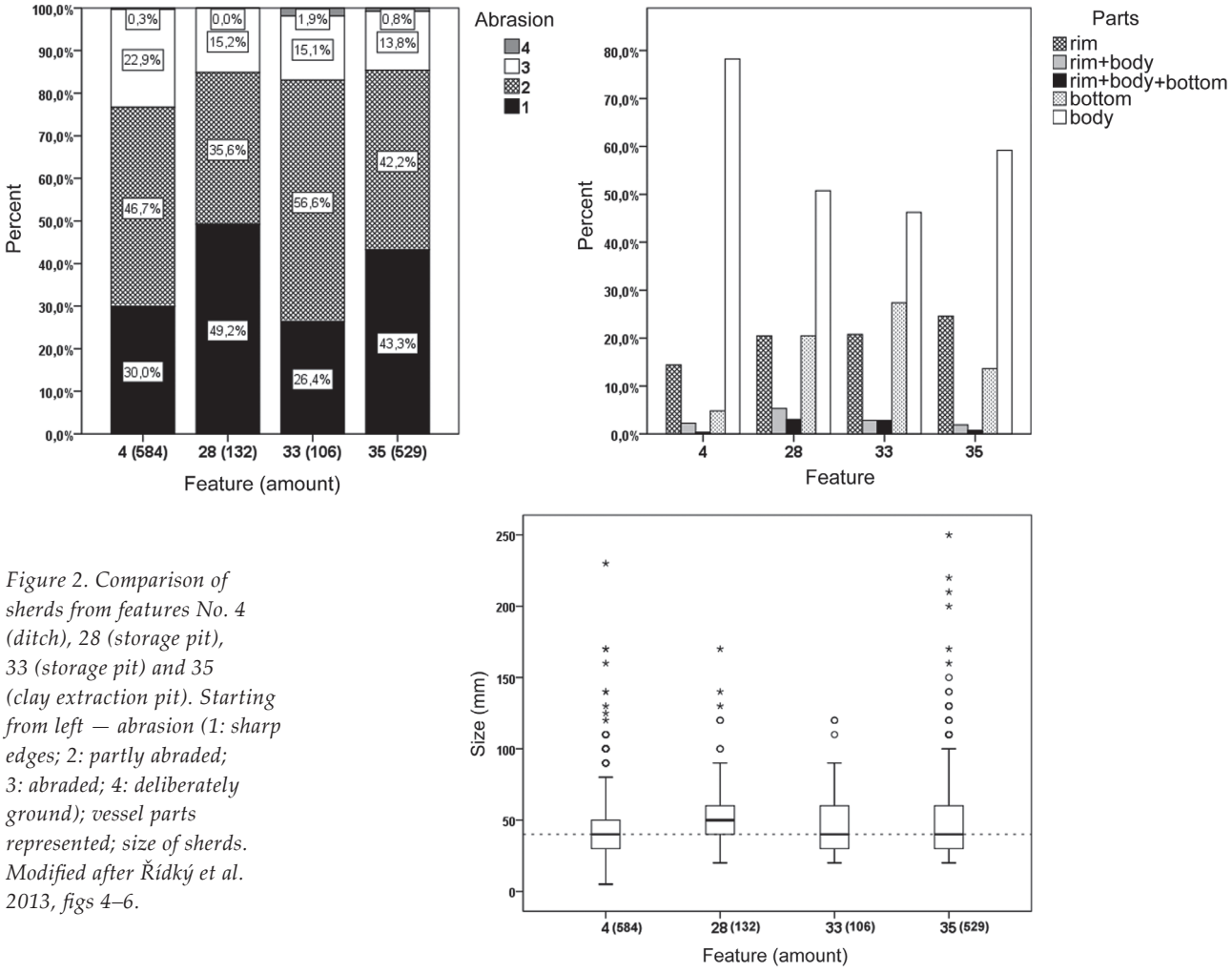

Figure 2. Comparison of sherds from features No. 4 (ditch), 28 (storage pit), 33 (storage pit) and 35 (clay extraction pit). Starting from left — abrasion (1: sharp edges; 2: partly abraded; 3: abraded; 4: deliberately ground); vessel parts represented; size of sherds. Modified after Řídký et al. 2013, figs 4–6.

5 cm were found in both groups. In view of the good preservation (the surface of some sherds was polished) and size of chronologically earlier sherds, it does not seem likely that these artefacts were lying on the surface for a longer time. It is possible that some chronologically earlier sherds were dug out of their earlier contexts during the digging of the ditch and originally accumulated (and were preserved) in the body of the bank that accompanied the ditch. After the rondel ceased functioning, the ditch, by that time partially filled by later settlement refuse, might have been intentionally filled with the material from the adjacent bank.

Let us add that the mixing of earlier finds with later ones has also been confirmed by radiocarbon dating of samples of animal bones from different levels of the ditch fill (Figure 3). Like the mentioned sherds, some dates from bone samples taken from middle and upper levels of the fill fall into the earlier period of the site's occupation (*e.g.* Řídký 2016).

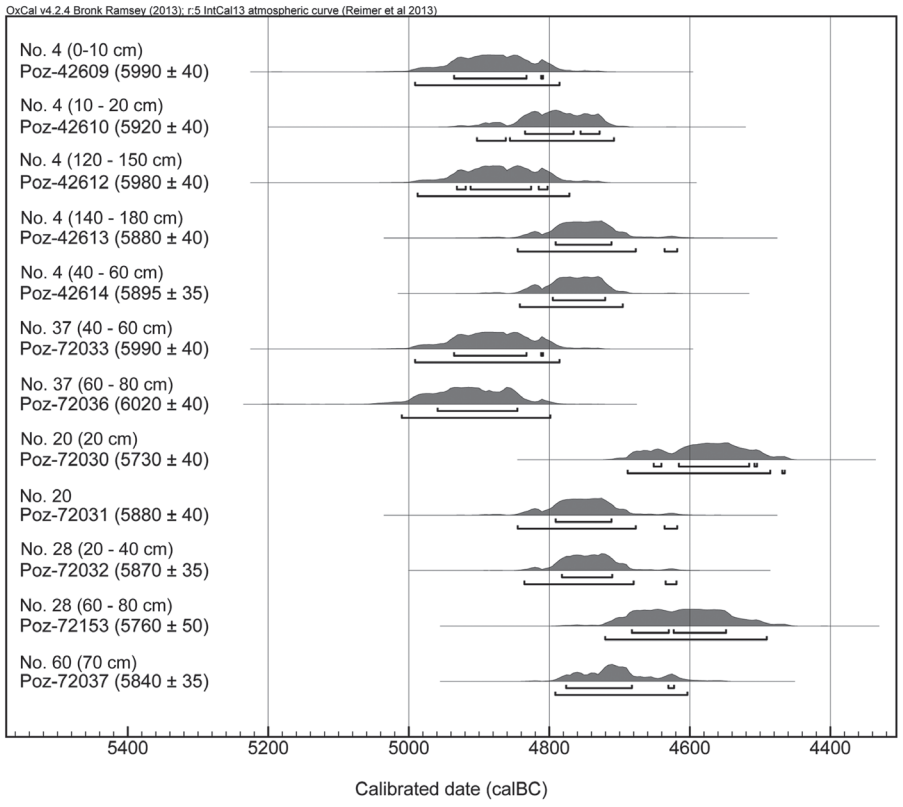

Figure 3. Calibrated radiocarbon dates obtained on animal bone. Modified after Řídký 2016, fig. 3.

Taphonomy of animal bone remains

Site formation processes were also examined on animal bone remains (Řídký *et al.* 2013). This type of biofacts brought some interesting information as well, especially regarding taphonomic indicators. It is important to emphasise that, regrettably, about two thirds of the animal bones have been impossible to taxonomically classify to species. That aside, the frequency of fragments and whole bones has been recorded, as were some specific taphonomic indicators of interest for this work (Table 1): burning of the bones, the level of infiltration of mineral substances into the bone tissue (so-called permineralisation), the presence of mechanical traces of human origin on the surface of the bones (*e.g.* butchering marks) or etching by plant roots and gnawing by animals (mostly carnivores).

First of all, we investigated the finds according to whether they belonged to group G1 or G2. The following numbers of finds came from the two chronological groups: G1 = 516; G2 = 453. The preservation of the assemblage expressed as the ratio of determined bones to the overall amount of material (NISP) was 150 (29.1 %) in the case of G1 and 119 (26.3 %) in the case of G2.

More complete bones and fewer postcranial fragments were found in the G1 group compared to G2, but the differences between the assemblages are not statistically significant. The outcome of the χ^2 test for whole bones is $\chi^2 = 1.580$; $df = 1$; $p = 0.209$, and for fragments it is $\chi^2 = 2.650$; $df = 1$; $p = 0.104$. Most frequent finds in both groups included teeth, skull fragments (most often facial parts) and bones of the distal parts of limbs (mostly metapodials). Long bones of the fore and hind limbs, vertebrae and ribs were found much less often. The representation of skeletal parts does not differ much for the two compared groups.

Animal bone remains	G1 (STK early stage)	G2 (STK late stage)	G3 (STK early/late stages)
Fragment	374 (72.5 %)	349 (77 %)	928 (73.5 %)
Complete	17 (3.3 %)	9 (2 %)	26 (2.1 %)
Burning	3 (0.6 %)	60 (13.2 %)	78 (6.2 %)
Root etching	0	2 (0.4 %)	7 (0.6 %)
Weathering	387 (75 %)	267 (58.9 %)	841 (66.6 %)
Permineralisation	237 (45.9 %)	95 (21 %)	228 (18.1 %)
Gnawing	1 (0.2 %)	0	3 (0.2 %)
Butchering	1 (0.2 %)	0	1 (0.1 %)
Bone tools	2 (0.4 %)	3 (0.7 %)	3 (0.2 %)

Table 1. Results of taphonomic analyses. N: number of bones and teeth; % N: share of bones and teeth based on all finds. After Řídký et al. 2013, tab. 8.

This conclusion can be corroborated by the outcome of a Mann–Whitney U test, which did not show a statistically significant difference between the groups from the two periods (U = 8.5; p = 0.402). We believe that the greater abundance of teeth or phalanges is the consequence of the higher resistance of tooth enamel and the higher density of bone tissue in the phalanges. This is in accordance with some earlier conclusions (Klein and Cruz-Uribe 1984).

The evaluation of the damage to the bone surface due to physical and chemical agents denoted as "weathering" (Table 1) has shown that the remains of animals from the earlier period (G1) were more damaged than the bones from the later one (G2). This conclusion can once again be supported by the results of a χ^2 test (χ^2 = 28.357; df = 1; p<0.0001). The process of weathering apparently did not negatively affect the ratio of complete bones, whose number (see above) did not significantly differ between the two periods. We could show that less than half of the bone finds from the earlier period (G1) were permineralised; in the later phase (G2), permineralised bones represent only about one fifth (Table 1). Permineralisation makes bone tissue more compact and tougher (Bartsiokas and Middleton 1992), and it therefore better resists disintegration.

The percentage of bones with traces of carnivore tooth marks or of plant roots (Table 1) usually did not exceed 0.5 %. Surprisingly, bone remains directly related to butchering were completely absent from finds of both periods. The absence of cut marks may have been influenced by the considerable fragmentation of the material — three quarters of the animal bones were disintegrated into small fragments by biostratinomic factors or diagenesis.

Burning was a separately evaluated taphonomic category, very important for our study. The reason is that mammal bones (other animal remains were not burnt) damaged in this manner were above all found in G2 features (Table 1). Most of them (80 %) came from feature No. 20, with one fragment each from features No. 28 and 60. Burnt or partially burnt bones were mixed with other skeletal remains that had never been exposed to fire. Burnt remains of different anatomical classification (ranging from jaws to ribs and vertebrae to diaphysis fragments of long limb bones and carpal bones) were most often of brown-black to grey colour, which indicates intensive heating at temperatures exceeding 600 °C (Shipman *et al.* 1984).

Let us now more closely compare the taphonomy of the bones from the rondel ditch (No. 4) and from the features of the reference group G2 (Table 2). This was roughly the period when the rondel is supposed to have been built, fulfilled its primary function and ceased to exist. The ditch had been completely filled by that time. The rondel ditch was comparably rich in burnt bones (c. 13 % of the finds) but poorer in permineralised remains (approximately 5 % fewer). However,

Animal bone remains	No. 4 (ditch)	G2 (STK-late stage)
Identified	183 (27.4 %)	119 (26.3 %)
Unidentified	484 (72.4 %)	334 (73.7 %)
Burning	90 (13.5 %)	60 (13.2 %)
Permineralisation	106 (15.9 %)	95 (21 %)
Weathering	663 (99.4 %)	267 (58.9 %)
Butchering	2 (0.3 %)	3 (0.7 %)

Table 2. Results of taphonomic analyses in the rondel ditch (No. 4) and in the reference group G2 (STK, late phase). N: number of bones and teeth; % N: share of bones and teeth based on all finds. After Řídký et al. 2013, tab. 10.

a significant difference has been found for the frequency of bones damaged by weathering, which completely dominate (99.4 %) in the rondel assemblage. Surprisingly, in the rondel ditch not only the more easily decomposing diaphyses of long bones but also teeth and small bones, which usually take much longer to decompose (Behresmeyer 1978), were eroded. Possible explanations include different micro-environmental conditions (such as humidity, temperature or vegetation) and a different timescale over which material was deposited. This discovery corresponds to a significant extent to the results of the sherd analysis, as they were more often abraded and smaller in the ditch compared to other features. According to both categories of finds (sherds and bones), the rondel was situated in a rather exposed place and its ditch was open for a longer time.

Other interesting results were obtained by the taphonomic analyses of bones with respect to their depth within the rondel ditch fill. These analyses could be performed only for the sectors richest in finds, denoted as A and AB, in close proximity to the south entrance. The ditch fill was excavated by regular artificial layers there.

Apart from the representation of the species and anatomical parts, differences in the amount of burnt and permineralised bones were also examined in the individual layers of **sector A**. For each layer, we also calculated the ratio of burnt and permineralised bones and teeth to all bones (Table 3).

The colour of the individual bone fragments was recorded for burnt remains, ranging from brown to black, grey and white and corresponding to temperatures starting at 350 °C and ending above 1,000 °C (Shipman 1988). Where burnt bone remains appeared in a layer, they did not show a consistent colour corresponding to a single temperature range, but rather a mixture of bones burnt at various temperatures along with unburnt material. This phenomenon repeated itself in all layers of sector A. The occurrence of burnt and permineralised bones is very similar, with the exception of the upper layers (0–10 cm and 10–20 cm). The amount of osteological material taphonomically affected in this manner steadily decreases as one moves deeper to 30–40 cm, 60–70 cm and 100–120 cm. The ratio of burnt bones and bones enriched with mineral substances from the surrounding soil is highest at depths of 40–50 cm and 80–100 cm. Bone remains characterised as refuse in view of the archaeozoological conclusions were spatially irregularly deposited.

A taphonomic analysis has also been carried out for **sector AB**. Compared to sector A, only brown-coloured bone fragments were discovered there. This colour corresponds to the temperatures of c. 250–550 °C (Shipman 1988), when the organic component of the bone is not yet completely burnt (Kiszely 1973). No other degree of burning has been observed in sector AB. In this sector, too, burnt bones were mixed with animal remains without any traces of burning. Burnt bones were found in two layers of the sector, at the depths of 55–65 cm and 100–120 cm. Apart from burning, permineralised bones were not exceptional, either; the difference is that there were fewer of them compared to sector A.

Depth (cm)	Animal bone remains	Burning		Permineralisation	
	N	N	% N	N	% N
0–10	102	17	17	32	31.4
10–20	51	6	11.8	16	31.4
20–30	33	8	24.2	11	33.3
30–40	33	7	21.2	3	9.1
40–50	8	3	42.9	2	25
50–60	14	2	14.3	1	7.1
60–70	5	0	0	0	0
70–80	48	12	26	4	8.3
80–100	46	18	42.9	6	13
100–120	24	1	4.2	0	0
120–150	21	4	19	2	9.5
150–180	0	0	0	0	0
Σ	***385***	***78***	-	***77***	-

Table 3. Overview of burnt and permineralised bones in particular layers of sector A. N: number of bones and fragments of burnt/permineralised bones in the given layer; % N: share of bones and fragments, including teeth, in the given layer. After Řídký et al. 2012, tab. 17.

In 2012 and 2013, when articles summarising the analyses of animal skeletal remains were published, we came to the conclusion that the burnt bones from Vchynice document a method of disposing of bone refuse by intentional burning (Řídký *et al.* 2013).

Grinding tools

Altogether 62 grinding tools from the STK period were found at the Vchynice site (Řídký *et al.* 2014b). As an important source of material for the production of grinding tools, quartz porphyry, is situated about 5 km north of the site, the finds of various technological categories — apart from final tools there are also blanks and flakes — did not come as a surprise. Knowledge about the grinding tool production process was acquired based on the study of production categories, of the assemblage of hammerstones and polished tools, and also based on the production of a replica using pebble tools comparable to those from our Neolithic assemblage. Traces of burning were recorded on a total of 11 artefacts from across the mentioned categories (three artefacts came from the depth of 40–60 cm in the rondel ditch).

In outline, the "life cycle" of the grinding tools from the Vchynice find assemblage can be reconstructed as follows:

1. A block of the raw material of the corresponding dimensions was extracted at the source. Basic shaping was performed on the spot using larger pebble tools and polished tools with a drill hole, reaching in some cases the more advanced stage of a semi-finished product (finer chipping).

2. The semi-finished products were transported to the settlement, where final shaping took place using smaller pebble tools — preparing the surface for better positioning and adjustment of the work surface for querns and for more careful adjustment of the body for grinders, for instance of the gripping parts. More careful preparation of the work surface probably took place only at the settlement. Production was apparently carried out at several places; no particular production area was recognised.

3. The tool could then be used until the total deformation of its shape (it could also crack due to material fatigue, but there are few such cases in the Vchynice assemblage), after which it was discarded. Alternatively, it was discarded due to its destruction during the continuous coarsening of the work surface or during an overall modification of its shape.
4. A tool could also have been destroyed intentionally — broken or hacked off (chipped off) — for archaeologically unrecordable (possibly ritual) reasons, then becoming part of ordinary settlement refuse (along with pottery fragments, animal bone remains, daub, etc.) in the fills of settlement features common in the STK period.
5. After a tool had lost its primary function, it could still be used for instance for the preparation of hot food (cooking stones, delimitation of fireplaces, etc.).

When the study on the grinding tools from Vchynice was published in 2014, we believed that the burnt final tools, semi-finished products and the one flake could also have been remnants of the extraction process — the cleaning of the surface at the raw material source or ways of extracting the rock (Řídký *et al.* 2014b, 307–9).

The evidence concerning daub, however, casts doubt on all of the above-mentioned interpretative models — the intentional burning of bone refuse as well as the use of fire to extract stone material.

What can we find out from daub remains?

Daub remains may be remnants of the plastering of the walls or floors, of mantles of furnaces or of other structures at prehistoric settlements (*e.g.* Ďuriš 2015; Vencl 1991). Daub either originated from the intentional burning of structural parts (*i.e.* dome-like furnaces, floors and sometimes also walls of buildings), or is evidence for violent behaviour (an attack) or a catastrophe (fire). Intentional destruction of a building or a settlement, for instance for ritual reasons, cannot be ruled out, either.

In the publication about the first thoroughly examined rondel at Těšetice-Kyjovice (Moravia, the Czech Republic; Podborský 1988, 148), the author already mentions the remains of daub plastering within the ditch fill, along with sherds, lithics, animal bones and bone tools. One of the possibilities mentioned by V. Podborský is that individual posts could have been interconnected by a wickerwork construction with daub plastering (Podborský 1988, 253). Daub remains were also frequent in the inner ditch (in middle and lower levels of the fill) of the rondel called Bylany 4/1 (Pavlů *et al.* 1995, 31–3), as well as in both ditches (and all three inner trenches) of the rondel known as Vochov I (Pavlů and Metlička 2013). In Slovakia, daub was found in both rondels in Svodín (Svodín 1 and 2) in lower levels of ditch fills, for the Svodín 1 rondel often mixed in the same layers as charcoal (Němejcová-Pavúková 1995, 39–40, 97–114). From Lower Austria, information about daub has been published from all three ditches (including the lower levels of the fill) of the rondel in Glaubendorf 2, in several levels (including the lower one) as well as in the nearby single ditch of the rondel Glaubendorf 1, in the three-ditched rondel Hornsburg 3 and practically in all other rondels examined by excavation (*e.g.* Trnka 1991).

It is therefore a rather frequently occurring component of rondel ditch fills, regardless of the geographic environment and the cultural milieu. At none of the mentioned sites, however, was there sufficient daub to attract greater attention and to motivate someone to try and interpret this finds category more thoroughly.

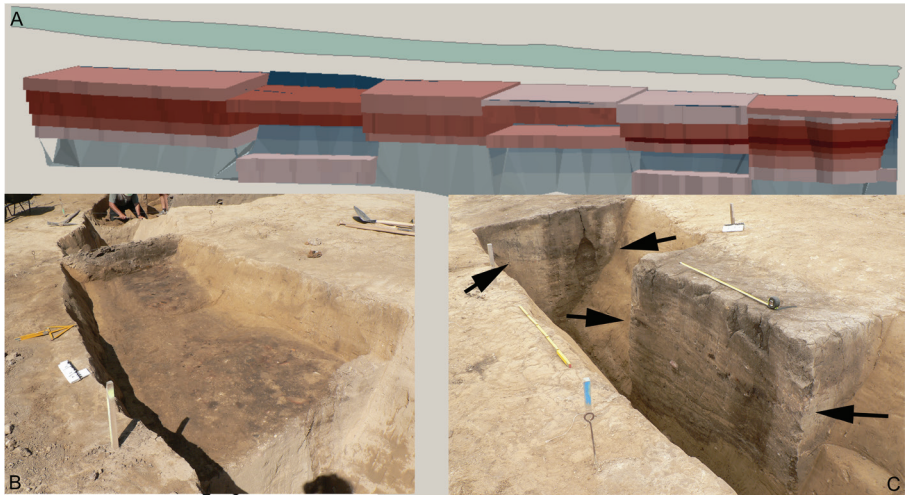

Figure 4. The south segment of the ditch (A) and the vertical distribution of daub weight (in grams; darker colours mean greater weight per cubic metre). The photographs (B–C) depict the daub layer (highlighted by arrows) in various parts of the ditch. Adapted with additions after Řídký et al. 2012, fig. 33. Photo: M. Půlpán.

Feature	Group	Max. lenght (m)	Max. depth (m)	Area (m^2)	% excavated	Daub weight (g)	Daub amount
3	G3	3.57	1	9.38	100	1845	146
4 (A-L; E-G; H-K)	G3	38.11	1.8	56.96	100	27668	1378
5	No	4.19	1.1	8.49	100	532	29
12	No	2.38	0.6	3.33	100	184	14
13	No	3.14	0.8	5.35	?	380	9
14	No	1.37	0.25	1.36	100	15	2
15	No	2.96	0.35	3.56	100	0	0
20	G2	5.68	0.8	14.79	100	1486	47
21	No	1.73	0.5	1.64	100	37	7
22	No	2.04	0.3	2.98	100	0	0
27	No	1.4	0.35	1.05	100	1	1
28	G2	2.84	1	4.12	100	1945	85
31	No	1.62	0.65	1.74	100	0	0
32	No	2.7	0.35	4	100	0	0
33	G2	2.06	0.9	3.11	100	774	30
35	G3	16.03	1.3	74.07	50	14610	362
36	G2	2.32	0.5	3.89	100	2967	80
37	G1	3.93	1.4	6.47	100	7840	367
45	No	1.86	1.1	2.47	100	936	118
53	No	6.53	0.9	21.13	100	62	11
55	No	1.3	0.8	1.63	100	64	8
59	G3	2.24	0.45	3.23	100	3466	145
60	G2	1.03	0.65	0.76	100	824	24

Table 4. Overview of the occurrence of daub remains in STK features.

A conspicuous daub layer (Figure 4) was first published from the ditch of the Vchynice rondel (Řídký *et al.* 2012). Here, we present the basic analysis of daub from all STK features at the settlement.

The unified descriptive system MAZANICE (DAUB), used in the Czech Republic for the processing of assemblages from the Bronze Age and from the Middle Ages (*e.g.* Vařeka 1995; 2012), has been utilised to determine the characteristics of the daub remains. For the purposes of the analysis, the daub remains in the individual

features were counted and the individual fragments divided based on macroscopic observation into pieces with evidence of some treatment (shaping) and with imprints of structural elements (A – timbers over 3 cm; B – carpentry traces (*e.g.* joints); C – combination of timbers and carpentry traces; D – combination of timbers and wattles; E – combination of carpentry traces and wattles; H – imprints of wattles of up to 3 cm; J – no wattle imprints, wall daub with external finish; L – planks or boards, outer side with white-grey paint). Based on macroscopic observation, the daub remains were further classified according to the intensity of firing (1 – weak, easy to break by hand; 2 – medium, more difficult to break; 3 – strong firing, daub cannot be broken by hand) and according to the material consistency (1 – not compact, friable, contains a significant amount of organic additions such as chaff, straw, small branches, etc.; 2 – medium compact, minimal crumbling, contains a smaller amount of organic additions; 3 – very compact, does not crumble, contains very little or no organic additions).

We need to allow for the fact that even during the destruction of a single structure the resulting pieces of daub can have different ratios of additions, the fragments may be differently burnt and their colour may also vary due to the influence of various organic materials and a different intensity of the heat. When interpreting these finds, we also need to take into account their high fragmentation, which may have been caused by the collapse of the original structure or could have occurred during refuse management or even during archaeological research.

The daub assemblage from Vchynice was collected from a total of 19 features (Table 4) and weighed almost 66 kg (2,863 units). The highest concentration of daub in terms of weight comes from the rondel ditch (28 kg, 42 %; the daub assemblage from the rondel ditch has been revised over the past two years and some units had to be excluded, because there were concretions of natural origin; the overall weight is therefore somewhat lower compared to the 2012 article) and from the extensive clay extraction pit No. 35 (15 kg, 22 %). Daub remains in the rondel ditch were concentrated above all in the middle level of the fill, where, according to an earlier interpretation, they mostly represented former human activity, apparently from the very end of the rondel's functional period (Řídký *et al.* 2012, 691–4).

The daub remains in other settlement pits were concentrated in particular levels of the fill: in feature No. 20 at a depth of 30 cm, in feature No. 28 at a depth of 40 cm, in feature No. 35 in the upper layers almost throughout the whole feature, in feature No. 36 at a depth of 30 cm and in feature No. 45 at a depth of 40 cm. The daub remains in features No. 59 and 60 were scattered throughout the fills of these storage pits. These finds are characterised as daub blocks or daub fragments in the excavation records.

We have also examined daub density per cubic metre (Table 5). This value was calculated by the division of the overall weight of the daub (in grams) by the volume of each feature. The rondel ditch (No. 4) was divided into two spatially delimited parts in this step. The south segment of the ditch, delimited by the west entrance and the south entrance, is denoted as No. 4 (sectors A–L, E–G), the north segment of the ditch, delimited by the edge of the excavation area in the north and the interruption in the area of the west entrance, is denoted as No. 4 (sectors H–K). Both segments of the ditch show values high above the median and in the case of the south segment (sectors A–L, E–G) also high above the average (Figure 5). Another interesting fact in this context are the high values (above the median) for features No. 28, 35, 36, 37, 59

Feature	Group	Volume of excavated parts (m^3)	Daub weight (g)	Density (g/volume)
3	G3	9.38	1845	196.695
4 (A-L, E-G)	G3	30.308	23325	769.599
4 (H-K)	G3	9.053	4343	479.73
5	No	9.34	532	56.959
12	No	1.1	184	167.273
14	No	0.34	15	44.118
20	G2	11.832	1486	125.592
21	No	0.82	37	45.122
27	No	0.368	1	2.717
28	G2	4.12	1945	472.087
33	G2	2.799	774	276.527
35	G3	48.146	14610	303.452
36	G2	1.945	2967	1525.45
37	G1	9.058	7840	865.533
45	No	2.717	936	344.498
53	No	19.017	62	3.26
55	No	1.304	64	49.08
59	G3	1.454	3466	2383.769
60	G2	0.494	824	1668.016
Median		***936***	***276.527***	
Mean		***3434.526***	***514.709***	

Table 5. Density of daub remains per cubic metre in STK features.

and 60, which meet the criteria for dating into the STK drawn up in the introduction (groups G1–G3) and which are scattered in various parts of the examined area.

Daub remains with some form of a finish (outer layers of the walls of buildings, blocks with white-grey paint) and with imprints of structural elements (timbers, carpentry traces, imprints of wattles and their combinations) have been identified in 1,070 cases (37 % of the whole assemblage) (Table 6). They occurred in 17 features distributed in all parts of the examined area where features from the STK period have been confirmed (Figure 5). Group L is the most frequent (37 %), followed by groups H (36 %) and J (20 %). These structural imprints originate from organic material used in the original structures, but their interpretation is complex and requires more comparative material from other sites (we will not discuss particular structures in this work). For instance, some of the fragments without organic additions may originate from the bases of furnaces and fireplaces (*e.g.* Lüning 1988; Zorn 1965). Other groups may document more complex constructions such as longhouses or other structures whose traces have not survived in the form of sunken features.

Groups A, B, E, H and J are frequent in both segments of the rondel ditch. As we have repeatedly stated, most of these finds come from a depth of 40–60 cm. An easy interpretation of this fact is that settlement refuse was deposited in the rondel ditch, which no longer fulfilled its original function at that time and was not cleaned. There is another possible interpretation, however. In view of the occurrence of daub remains with similar material composition (92 % of the units contained some organic temper), it cannot be ruled out that the whole examined part of the ditch contains the remnants of a single larger building structure. If there was a bank on the outer side of the ditch (see above), the structure would more likely have been situated inside the area delimited by the ditch (no evidence in

Feature	Group	A	B	C	D	E	H	J	L	Quality 1	Quality 2	Quality 3	Material 1	Material 2	Material 3
3	G3	0	2	0	0	0	20	10	4	3	126	17	27	89	30
4 (A-L, E-G)	G3	4	13	0	0	7	211	69	23	7	1249	54	214	1011	85
4 (H-K)	G3	0	4	0	0	2	31	14	8	3	142	18	26	125	32
5	No	0	2	0	0	0	4	1	1	0	28	1	6	20	3
12	No	0	0	0	0	0	4	0	2	0	11	3	2	5	7
13	No	0	0	0	0	0	2	0	0	0	9	0	2	7	0
14	No	0	0	0	0	0	0	0	2	0	2	0	0	0	2
20	G2	0	2	0	0	0	5	7	5	4	40	4	1	26	20
21	No	0	0	0	0	0	0	0	0	0	2	0	0	5	2
27	No	0	0	0	0	0	0	0	0	0	1	0	0	0	1
28	G2	0	0	0	1	1	9	6	9	1	77	7	8	31	46
33	G2	0	2	0	0	0	2	1	3	0	27	3	5	19	6
35	G3	6	12	1	3	0	52	54	14	7	323	28	138	172	52
36	G2	0	1	0	0	0	12	16	1	0	74	6	43	32	5
37	G1	0	0	0	0	0	2	7	300	2	357	8	12	35	320
45	No	0	1	0	0	0	10	14	1	0	11	0	0	1	10
53	No	0	0	0	0	0	0	0	1	1	0	11	0	1	11
55	No	0	0	0	0	0	0	0	4	1	9	0	0	2	8
59	G3	1	7	0	0	0	13	14	19	1	134	10	3	113	29
60	G2	0	2	0	0	0	3	5	1	1	15	8	2	14	8
Σ		***11***	***48***	***1***	***4***	***10***	***380***	***218***	***398***	***31***	***2637***	***178***	***489***	***1708***	***677***
Median		UI	1	UI	UI	UI	4	5.5	2.5	1	27.5	5	2.5	19.5	9
Mean		0.55	2.4	UI	UI	UI	19	10.9	19.9	1.55	131.85	8.9	24.45	85.4	33.85

Table 6. Overview of the characteristics of daub remains. For the meaning of the letter code, see text or the caption of Figure 5. UI = unidentified.

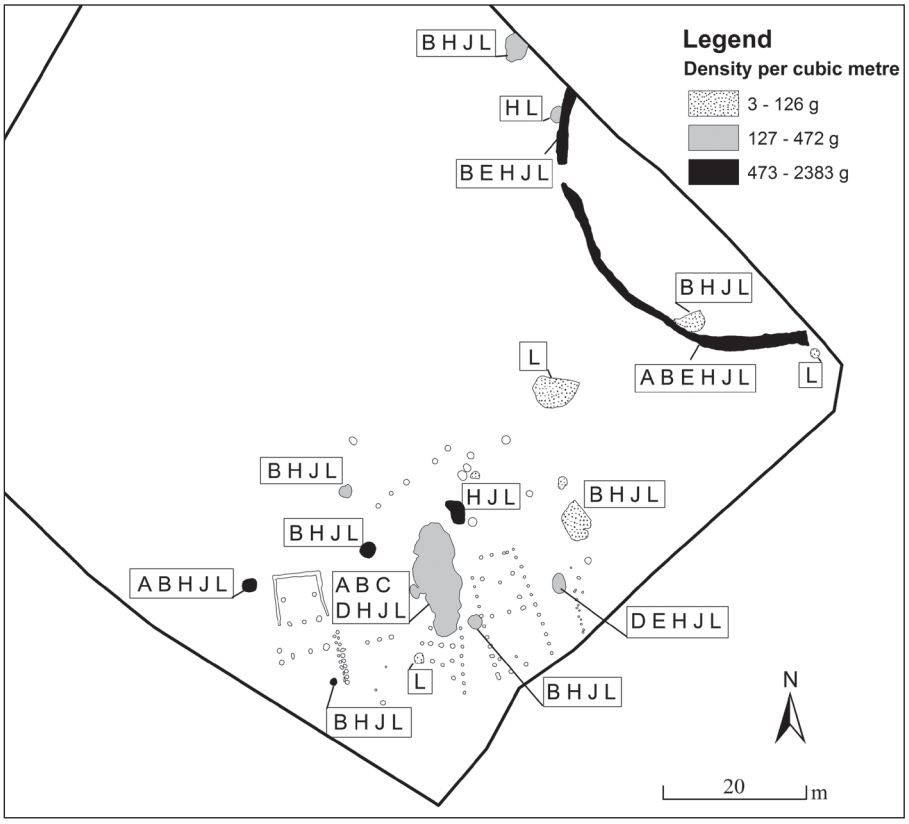

Figure 5. Distribution of daub with structural imprints. A – timbers over 3 cm; B – carpentry traces; C – combination of timbers and carpentry traces; D – combination of timbers and wattles; E – combination of carpentry traces and wattles; H – imprints of wattles of up to 3 cm; J – no wattle imprints, wall daub with external finish; L – slabs or boards, outer side with white-grey paint. Only larger features dated to the STK and postholes are depicted. Drawing: J. Řídký.

the form of postholes or a trench was observed there, but this may be due to deep mechanical stripping of the site), or on the top of the bank. In this case, the whole structure would have come to an end during a fire, collapsed or been intentionally pushed into the ditch and then covered by the material from the body of the bank.

The frequent occurrence of daub remains in other pits in the vicinity of the rondel could also be linked to the mentioned event in the late phase of the STK period. We believe that in this context, it is necessary to mention conspicuous so-called fire layers in the fills of some features: at a depth of about 20 cm in feature No. 3, at a depth of 50 cm in feature No. 20, at a depth of 80 cm in feature No. 28, at a depth of 100 cm (the base) in feature No. 45. Charcoal has also been recorded throughout the fill of feature No. 60. All the mentioned features could have ceased to exist together with the rondel (see Figure 1).

A more extensive fire could have been the result of an attack by other communities, the consequence of a catastrophic accident, or it could document some form of ritual behaviour, for instance during the abandonment of the settlement. Numerous possible interpretations offer themselves; we will return to this issue in the discussion.

Discussion

The outcomes of the analyses of individual categories of finds can be interpreted as follows: According to the analysis of the sherds, the rondel was situated in an exposed location in the settlement. Based on the position of sherds from the LBK, the early phase of the STK and the late phase of the STK, we can consider the possibility that the ditch was accompanied by a bank. Moreover, the rondel ditch was being filled in over a longer time, above all in its upper layers, and exposed

to various natural and human agents. The greatest number of sherds comes from the upper level of the ditch fill, from a depth of 40–60 cm and higher. The rondel apparently no longer fulfilled its primary function at that time. We consider it likely that the ditch was intentionally filled with the material from the bank.

The archaeozoological analysis also indicates that the rondel was situated in an exposed location within the settlement; according to poorly preserved bones, the ditch fill accumulated over a longer time. Radiocarbon dates from sampled animal bones confirm the occurrence of earlier finds in the middle and upper levels of the fill. This corresponds to the spatial position of earlier sherds and to the suggestion that the original bank alongside the ditch was destroyed. Most burnt bones appear at a depth level of 40–60 cm, *i.e.* where the highest concentration of sherds is found. This may document a certain method of refuse treatment, its intentional burning.

Traces of fire have also been observed on grinding tools; these burnt artefacts also occur in the ditch fill at a depth of 40–60 cm. Possible explanations include their secondary use for cooking practices; alternatively, they may be indicators for the procurement of raw material not far from the settlement, resulting from the clearing of bushes and trees or from an attempt to shatter the rock. It is also possible that artefacts from this group were mixed with animal bones (and apparently other organic material) and burnt together at the time of their deposition. The area where grinding tools were produced cannot be localised more precisely in the settlement; production refuse comes from various parts of the site, including the rondel ditch fill. We also consider it likely that grinding tools were intentionally broken at the settlement, for instance for ritual reasons.

The analysis of daub from the rondel ditch and from the features categorised into the G2 group (more or less contemporary with the rondel) indicates the possibility that a more extensive fire took place at the settlement at a certain time (this is also evidenced by burnt layers in some features). This can be explained as an accidental catastrophe, an attack by foreign communities or as due to ritual reasons, for instance during the abandonment of the settlement. A daub layer has been revealed along the whole examined course of the rondel ditch at similar depth levels of 40–60 cm. We know that daub can only come into existence through contact with fire, whether intentional or unintentional. Ethnographic analogy also teaches us that ritual structures such as men's houses or other ritual buildings tend to be the main targets of attacks in traditional societies using simple agriculture (*e.g.* Flannery and Marcus 2012). The aim of these attacks is not to totally eradicate the village but to kill its best warriors and acquire valuable renown. This would explain the absence of human remains with traces of violence. The village could then be relocated, or its main everyday activities later took place in another area.

The definitive end of the primary function of the rondel could be indicated precisely by the conspicuous daub layer at a depth of 40–60 cm and by other daub layers. Other burnt artefacts — bones and lithics — were recovered from the same level. Along with the upper level, it also contains the most sherds. If the daub in the ditch fill came from plastered constructions connected with the rondel, for example from plastered inner palisades or other structures, it would be possible (and interesting) to reconstruct these in greater detail from imprints in the daub.

Conclusion

We would not like to create the impression, based on the previous discussion, that we regard the destruction by fire of the examined part of the settlement during the late phase of the STK as the only possible explanation of our results (so-called Pompeii premise). We have offered several interpretative models when discussing the individual categories of finds. In a previous article, some of the authors of this contribution have even rejected the connection between the finds from the rondel ditch and the appearance or function of the rondel (Řídký *et al.* 2014a). However, the objective of archaeological research is to attempt to resolve defined questions (such as the function of monumental structures) from various points of view. We have been led to this variant, perhaps too simple and positivist, by a combination of observations and conspicuous concordances (the occurrence of daub remains, traces of fire and consistent depths of deposition) for various categories of finds.

Regrettably, neither the typochronology of pottery nor the use of interval radiocarbon dates were able to demonstrate that all pits dated to the late phase of the STK were really open at the same time and that they ceased to exist simultaneously. The site formation processes that took place at the settlement during its active use and long after its demise were certainly much more complex, and we are missing some important information in the archaeological record. For instance, we do not know other parts of the residential area and, as is so frequently the case, lack organic finds. Our narrative based on the presented arguments naturally contains gaps. Our aim was to offer one of the possible narratives of a settlement with an unusual Neolithic structure with the awareness that various specialists may offer different explanations of our results.

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Keeping order in the Stone Age

Richard Bradley

Abstract

The paper reviews some of the more influential writings on the problems of structured deposition. It also focuses on the notion of ritualisation and the taphonomy of the archaeological record. It considers their special significance in the LBK, addressing the topics discussed by the contributors to this volume. It places a special emphasis on prehistoric notions of time, the importance of fertility, and the new concerns that developed with the adoption of agriculture. All these issues are illustrated by the deposition of hoards, the role of cemeteries and the long-term histories of longhouses. A brief coda considers the evidence for specialised deposits in the Mesolithic period and for formal deposits of artefacts and human remains at Neolithic enclosures of the LBK and its successors.

Keywords: *fertility; time; farming; longhouses; ritualisation*

The solutions to archaeological problems are seldom self-contained. As soon as one difficulty is resolved another is identified. That certainly applies to accounts of structured deposition. Much depends on the history of research. Why were particular questions asked at particular times, and did the answers have a wider application?

In her introduction Daniela Hofmann considers the analysis of excavated deposits at Durrington Walls by Colin Richards and Julian Thomas (1984). Another influential study cited by several of the contributors is Christian Jeunesse's account of the stone axe hoards of the LBK (Jeunesse 1998). They provide the starting point for these reflections. Therefore, first of all, it is important to understand why these papers were written.

Durrington Walls and structured deposition

It is no accident that Richards and Thomas should have based their account of structured deposition on the material from Durrington Walls. It was the unusual character of the site that posed problems. When it was first investigated it was described as an enormous enclosure with an external bank and internal ditch. It was associated with at least two rings of wooden uprights and a large quantity of artefacts and animal bones. When the results of fieldwork were published the excavator interpreted the monument as a ceremonial centre (Wainwright and Longworth 1971). His view was no doubt influenced by the proximity of Stonehenge, where the settings of upright monoliths had a similar plan to the larger post circle at Durrington. He discussed whether the wooden structures had been roofed and in a later account (Wainwright 1989) compared them with public buildings observed by early travellers to the New World.

He went on to investigate similar monuments in Wessex, where his excavations extended to the Iron Age settlement of Gussage All Saints. Here he was struck by

the peculiar character of the deposits in disused storage pits and, in particular, by the ways in which they recalled the material from Durrington Walls. If Gussage was a domestic site — a view that has never been questioned — perhaps the same interpretation should have been followed at Durrington. Puzzled by the similarities between deposits of different dates, he reassessed his earlier findings, suggesting that the henge was actually a domestic site. It was associated with day to day activities rather than ceremonial (Wainwright 1975).

It was in this context that Richards and Thomas (1984) re-examined the finds from Durrington, showing that decorated pottery, stone artefacts and animal bones had been deposited at particular locations within the excavated area. Moreover certain types could be associated with one another, whilst others were kept apart. The same approach could be taken to deposits of the same date at the nearby monument of Woodhenge. These authors argued that the placing of the material followed certain conventions. And that is the reason they talked about "structured" deposition.

Why was it so important to characterise this phenomenon? It was because they wished to address the interpretation of Durrington itself. For Richards and Thomas, such a high degree of formality was *a defining characteristic of ritual*. If it could be documented unambiguously it would strengthen the argument that the site had been a ceremonial centre. They concluded that their criterion was met. In time Wainwright himself was persuaded by their case and in subsequent publications he reverted to his original interpretation.

But that is only part of the story. There have been more recent excavations at Durrington Walls, conducted by a team which included both Richards and Thomas. The new work formed part of the Stonehenge Riverside Project and has led to new discoveries. Two are especially relevant to this article. Renewed excavation of the Southern Circle at Durrington has shed fresh light on the deposition of artefacts and animal bones there. It is no longer thought that this material had been placed around standing posts, or in the hollows left behind when the timbers rotted. Instead their positions were commemorated by pits containing a selection of cultural material (Thomas 2007). A useful comparison is with the Neolithic timber circle at Ballynahatty (Northern Ireland) where the former positions of wooden uprights were marked by a series of cairns (Hartwell 1998). In this respect the new work at Durrington supported the interpretation proposed in 1984.

The results of renewed fieldwork introduced a further complication. Excavation identified a series of ephemeral but well preserved houses buried by the earthwork of the henge. They were occupied over very short periods and there is reason to believe that the occupants came to Durrington on special occasions (Parker Pearson 2007). Two features are particularly relevant here. These houses were very small but conformed to the same organisation of space as the largest timber structures on the site. In the Late Neolithic period the same plan — a square within a circle — was employed throughout Britain and Ireland and extended from unambiguous domestic sites to enormous public buildings. They formed a continuum from slight structures like the dwellings beneath the bank at Durrington to enormous monuments which have been described as "Great Houses" (Pollard 2009).

The newly discovered buildings were associated with pits and middens, but they had one outstanding feature, for they contained similar material to the finds recorded by Wainwright four decades before. Moreover they were organised with the same degree of formality. When one of these houses was abandoned its position was marked by a pit similar to the features that indicated the site of the

Southern Circle. Just as the forms of the timber buildings formed a continuum, so did the material found there. It was no longer possible to maintain a simple division between "ritual" and "profane" deposits within the excavated area.

Hoards and the LBK

Soon the same approach was applied to later periods. Following Wainwright's lead at Gussage All Saints, it was extended to the Iron Age. More recently it has been followed in Bronze Age archaeology. As other contexts were investigated it became even harder to distinguish between "mundane" and "special" deposits.

For a long time a similar distinction had influenced the interpretation of Bronze Age hoards in Continental Europe (Jockenhövel 2016). Were these collections of metal objects buried as offerings, or had they been stores of valuables which were never recovered? Were they concealed at times of crisis, or assembled in the course of distributing the raw material? These questions could be answered in different ways depending on local circumstances, but there seemed to be a consensus that the practice of hoarding began in the Chalcolithic and was specifically associated with metalwork. In 1998 that view was challenged by Christian Jeunesse, who showed that stone axes were already deposited in hoards during the LBK. His argument was important for two reasons. It severed the connection between hoarding and metallurgy and showed that the deliberate burial of groups of artefacts was a feature of the Neolithic period.

Studies of metalwork hoards had been dominated by one perspective. By assuming that their contents were deposited simultaneously, researchers were able to establish which objects circulated at the same times. That also applied to the artefacts found in graves. Typological studies could reconstruct the most likely sequences in which these types were made. In contrast to such studies, Jeunesse's paper was concerned with the burial of hoards *as a social practice* and showed that it was already important before the Copper Age. Indeed the one element of continuity between those periods was the emphasis on axes or adzes. Like the later artefacts, the contents of these hoards overlapped with those of cemeteries, although there might have been a subtle interplay between their chronologies and distributions.

A further complication is that some of the same types can be found in settlements. That is certainly true of the axes of the LBK and raises a significant problem. Again analogy with Bronze Age hoards may be helpful here. Some provide evidence for metal production and the recycling of artefacts, whilst others include objects in mint condition. They were deposited together in bogs at times when similar items were buried with the dead or reduced to scrap metal. That is not a problem for studies of their chronologies and associations, but it does mean that objects which shared precisely the same forms could be employed in very different ways. Their biographies must have been influenced by the occasions on which they were obtained and the circumstances in which they were used. Such considerations could have influenced the decision whether to employ them as offerings. The same point is important in every case. The histories of these deposits were influenced by the types of object involved, but they were also affected by the use-lives of individual pieces (Bradley 2017, 142–59).

An argument that applies to metalwork hoards is equally applicable to the stone axes considered by Jeunesse. Some of those buried in the ground are large and unworn, but the opposite can be true of their counterparts in graves which might

have been used, damaged or repaired. At the same time artefacts which shared their distinctive forms and raw materials were associated with settlements where broken examples were discarded among the houses. All these objects belonged to the same *types*, but they had *very different cultural biographies*, and this is reflected by the deposits in which they are discovered today.

Similar arguments apply to the querns discussed by Caroline Hamon. Some might have been stored and never retrieved, but others were damaged or worn out. They could be found as discrete deposits, arranged with some formality in the ground, but fragments of the same kinds of object were deposited in the middens associated with individual dwellings. There were even cases in which they were treated with red ochre. Again the lesson is the same. There must have been a continuum among the contexts where these objects were discarded just as there was among the material from Durrington Walls.

Some problems

Both studies show that it is impossible to make a categorical distinction between special and everyday deposits. That should not be surprising as the notion that rituals were confined to a distinct sphere of activity has been questioned in recent years. Now there is more emphasis on *ritualisation* as a strategy employed in different contexts. It extended from the unstated conventions followed in daily life to the conduct of public ceremonies. It was undertaken by knowledgeable actors, and for many reasons (Bell 1992). It is misleading to distinguish between the performance of rituals and more "rational" activities in the past. Assuming that the participants believed in a favourable outcome, their rituals would have played an eminently practical role (Brück 1999). Almost every part of domestic life in prehistoric Europe was coloured by ideas about the world that made sense to people at the time (Bradley 2005).

That certainly applies to "structured deposition". In her famous book "Purity and danger", Mary Douglas (1966) defined refuse as "matter out of place". That goes to the heart of the problem faced by archaeologists, for it suggests that even the definition of "rubbish" was determined by social norms. If certain kinds of matter had their rightful places, it follows that the process of excluding others must have been equally significant. For that reason it is unhelpful to limit the discussion to those which were obviously special. The decision where to deposit discarded matter would have been subject to accepted conventions. The point was made by Jonathan Last (1998) in his study of the LBK settlement at Bylany.

As well as theoretical arguments there are taphonomic questions to consider. They are treated most effectively by the contributors to this book, but recent developments in Continental and British archaeology suggest some additional factors.

In Britain and Ireland many of the more distinctive deposits come from pits rather than monuments. Studies of the excavated material demonstrate that it often came from a midden where it had been exposed to the elements and the damage caused by animals. Few of these features survive intact, but others may be represented by concentrations of artefacts in the ploughsoil. Detailed analysis suggests that particular artefacts or animal bones had been selected from surface deposits and carefully placed in the ground; it was rare for these collections to be assembled immediately (Anderson-Whymark and Thomas 2012). This implies that "structured deposits" might have developed in two stages: first, the accumulation

of material in these middens, and only afterwards the choice of pieces for burial. *The components of both assemblages must be compared with one another.*

There is a problem in taking this approach to Continental settlements, for sites on the loess have undergone much more erosion than their equivalents in Britain. It may be possible to sample the ploughsoil at sites in the British Isles but on some of the LBK settlements natural processes have taken their toll. A further contrast is becoming apparent only now. Isotopic analysis has shown that during the LBK cultivated land had been treated with manure in order to increase its productivity (Bogaard *et al.* 2013). By contrast, in Britain and Ireland there is little evidence of cereal farming after the Early Neolithic period, suggesting that there was no need to fertilise the land. It may be that some of the refuse that built up on LBK sites was collected and taken away for this purpose. By contrast, it still remained *in situ* in the domestic zone at Durrington Walls. Of course the argument is subject to many qualifications, and much depends on whether domestic livestock were kept near the houses. In that case their dung might become mixed with domestic waste and the artefact assemblage would be depleted. If the grazing areas were more distant this would not have happened.

Another problem is presented by the excavated deposits themselves. Studies of LBK settlements are based on three common assumptions:

1. The loam pits beside the houses dated from their original construction and filled with cultural material while those buildings were occupied;
2. The artefacts found in these features were associated with the adjacent structures and indicate their periods of use;
3. The process came to end when a dwelling was abandoned.

These assumptions have underpinned chronological studies based on excavated artefacts, but there are potential problems (Stäuble 2013). Perhaps the most serious is raised by Jan Turek (2016) who suggests that the relationship between the longhouses and these pits has been misunderstood. Perhaps the excavated soil was used to raise a mound over an abandoned structure — this was done when occupation had ended, and as an act of commemoration. His interpretation would have serious consequences for the dating of LBK buildings, but it does not explain why the placing of some of these pits mirrors the internal organisation of the dwelling. That is difficult to understand. Greater attention should be paid to finds of daub where it can be identified.

Even if the loam pits were contemporary with the nearest houses, they might have been recut and their contents could have been rearranged. In fact there is little to show whether the pits filled at a constant rate throughout the occupation of the building, and it is seldom clear if more material accumulated after its abandonment. It would be possible to resolve these problems by dating articulated human and animal bones, but they too rarely survive. The routine use of soil micromorphology offers an alternative method, for it could shed light on the composition of these deposits and might identify changes in their formation over time. More importantly, it could identify discontinuities in the accumulation of this material. It will be difficult to take the discussion of LBK deposits much further without this kind of information. Similar work might supplement the approaches outlined in this book.

The distinctiveness of LBK settlements

Other considerations seem to be specific to the LBK and its successors. Taken together, they shed some light on the deposits encountered by excavation. Three features seem to be especially significant.

The first was identified by Ulrike Sommer in 2001. She emphasised the unusual character of LBK settlements, stressing the remarkable uniformity of their layout and contents. It extended from the stereotyped ground plans of individual houses, to the separate rows or groups of buildings and their histories. She took the same approach to portable artefacts. Decorated pottery provided the clearest example, for it exhibited so much continuity over time. She argued that the inhabitants of these sites adhered to a set of norms that were rarely contested. It seemed possible that changes were actively prevented. Another perspective was offered by Andrew Jones who observed how successive settlements were established in very similar settings to one another — an "idealised image of settlement was constantly created", whereby people located themselves "in a place that always remain[ed] the same" (Jones 2007, 96, 98). Only towards the end of the LBK was the archaeological record less homogenous.

The second element is still more obvious and will be discussed later in this paper. This is the presence of massive longhouses, which seem to have been treated as monuments in their own right. Although there are differences in the plans, histories and dimensions of these extraordinary buildings they exhibit a uniformity which is difficult to match elsewhere in prehistoric Europe. They are particularly striking as the earlier examples dominated a landscape in which there were few other constructions of any size (Coudart 1998). Although there are certain exceptions, large earthworks were uncommon until the later part of the LBK and there were even cases in which ditched enclosures were constructed *after* settlements on the same sites had been abandoned. The longhouses were built on a large scale. Like the ceremonial centres that succeeded them, their erection may have involved the participation of entire communities (Startin 1978).

The third component is identified in Penny Bickle's chapter. This is the extraordinary amount of decaying matter associated with LBK settlements. It is easy to suppose that these accumulations were the outcome of a sustained period of settlement, but that is not self-evident. Had the inhabitants shared modern Western notions of cleanliness, the same material could have been discarded in rubbish pits or cleared from the living area. But it did not happen. As Bickle argues, that must be because the accumulation of decaying matter was viewed in a positive light. In fact it was one of the defining features of these places.

The problem for archaeologists is to consider how and why these unusual elements articulated with one another. That may seem an impossible ambition, but I believe that it is easier to accomplish than the fine-grained categorisation of individual deposits on these sites. Of course, specific studies like those in this edited collection can be taken further, but there is an inevitable tension between detailed analyses of particular contexts, artefacts and living places, and the broader phenomenon of which they formed a part. It is important to conduct research at both scales.

The diversity of LBK deposits

Some deposits made references that it is possible to construe. A few can surely be described as "irreversible". The most obvious are the finds from cemeteries and wells. The same argument applies to distinctive groups of animal bones — especially *bucrania* — and almost certainly to the contents of hoards. Both graves and hoards included axes, but those objects could have had different histories from one another. Artefacts that had obviously been used accompanied

the dead to their graves where their presence might have referred to past connections with the deceased. Following the same logic, newly-made examples in hoards could have been destined for a role in an imagined future. The same applies to intact ceramic vessels and particularly to the querns studied by Caroline Hamon. Those in mint condition might have been meant for use, either in this world or another one — it is impossible to tell. Some were damaged beyond repair and could have been discarded because they were no longer serviceable. In doing so, people consigned them to the past, but it does not mean that those objects were unimportant. They had played a role in preparing food and, like the contents of exceptionally productive pits, may have been associated with special occasions. Other artefacts must have been endowed with unusual powers that needed to be contained. One way of achieving this would be to reduce them to fragments (although the separate pieces may have continued to pass among the living). That might apply to LBK figurines, all of which were deliberately fractured. By breaking special objects people sought to end their potency. Another option would have been to bury or conceal them. It may be what happened to the magic bundles identified in Daniela Hofmann's contribution.

Other deposits are even more ambiguous. Houses could be associated with scattered bones and the burials of children. Perhaps young people were not regarded as full members of society, so that their bodies had to be treated separately from those of adults. Something comparable might apply to the remains of strangers at unusual sites like Herxheim where their corpses were reduced to fragments similar to portable artefacts. Perhaps the formal cemeteries of the LBK represented the ideal of an integrated community, even though they could only rarely have contained all the inhabitants of a settlement. By contrast, the remains of the young might be deposited separately, and those of actual or potential enemies were deliberately and violently destroyed.

The most important deposits are seldom discussed in these terms. They are the abandoned buildings which were such a conspicuous feature of LBK settlements. Again they can be interpreted in many different ways. Authorities do not agree on the lifespan of the longhouses, nor is it always clear whether they had been abandoned whilst the structure was intact. It is uncertain whether some of them had been repaired during their periods of use and if others were set on fire. What is obvious is that once a building went out of use — for whatever reason — its position was respected, and in north-west Europe it was unusual for a new one to be erected in the same place. Informal rules established where successive buildings ought to be located in relation to their predecessors. At any one time the living area could have been divided between the houses occupied by the living, decaying structures that had already been abandoned, and the vacant plots where buildings had existed in the past. The entire history of the settlement was put on display.

To some extent these sites were characterised by earthworks. It is a moot point whether the positions of collapsed buildings could have been recognised as mounds — the idea provides a possible genealogy for long barrows (Midgely 2005) — but there is little doubt that the positions of vanished or decaying walls were indicated by distinctive features. That is the implication of the borrow pits which followed the limits of so many of the houses. In some cases they can even be compared with the forms of enclosure ditches. They provided a focus for deposits of artefacts. It is not certain whether this process continued after the dwelling went out of use, but there can be no doubt that their contents were particularly fertile and would have supported the

growth of vegetation. In a way these spaces assumed a special character and became isolated from their surroundings.

It follows that the layout of LBK settlements was an explicit statement of the relationship between the present and the past. As Penny Bickle says in her contribution, "the longhouse outlasted the household". The conventions that determined the placing of successive buildings meant that the process would extend into the future. There was also an expectation that each dwelling would take the same form as its predecessor. There may have been even more explicit references to a past. Just as Andrew Jones suggests that newly established settlements were conceived as copies of older ones, it is possible that in western Europe these buildings were aligned on the areas settled by previous generations of colonists (Bradley 2001). But other interpretations of their orientations are possible (Vondrovský 2018).

Taken together, these deposits followed a certain logic. They emphasised the positions of monumental houses and enclosed them within a cordon of decaying matter. The deposits of artefacts and food remains were deliberately put on show. Such practices extended from each building to its successor and were repeated many times. They exhibited almost as much formality as the architecture of the buildings themselves. Why were these elements so significant?

The contents of LBK settlements emphasised certain concerns. There was an obvious interest in continuity, with an unusually strong emphasis on the past as well as a concern with the future. Novel conceptions of time were obviously important here. There was also an emphasis on fertility that extended from the manuring of cultivated land to the accumulation of decaying matter around the houses. These elements can be identified in many places, supporting Ulrike Sommer's observation that during the LBK communities respected strict norms.

It is important to view them in their historical context. For the most part LBK settlers occupied areas with little sign of hunter-gatherers. Their subsistence economy was entirely new and depended on the exploitation of crops and livestock that had to be introduced. Farming involved quite different ideas from the use of wild resources. It required a sustained period of preparation and planning, and decisions made in the past must have had lasting effects. Similarly, new methods of food production would only be sustainable if their future development was considered. At the same time the productivity of crops and livestock would be especially important and it was vital to maintain the fertility of the land. The careful management of manure and domestic waste was essential in order to maintain the food supply. Both these new concerns — with fertility and extended periods of time — were important because farming was an unfamiliar development (Meillassoux 1972). It may be why they were reflected by the deposits in and around LBK settlements.

Before and after

Finally, those deposits will need to be studied in relation to a longer sequence. Special deposits like those identified at Neolithic sites were not a completely new development and have been identified at a few Mesolithic sites, especially in northern Europe. There may have been shared ideas about where particular items should be discarded. Often they were placed around the edges of the occupied area, particularly in water (Toft 2009). Such evidence is not common and the information needs to be brought together. Perhaps it is best illustrated by the deposits at Hindbygården in Scania (Berggren 2007). The site is well known for its Neolithic phase, but stratigraphic

excavation showed that the earliest material placed in this pool included Mesolithic axes. It is an important reminder that some of the clearest evidence of "structured deposits" comes from topographical features rather than settlements or monuments. They may be under-represented in research on the LBK. There is the further problem that hunter-gatherers beyond the agricultural frontier treated imported artefacts in this way (Bradley 1998: xvii–xviii). There is no reason to believe that their practices influenced the farmers from whom these novelties had been obtained.

Later developments are important too. If the first settlements of longhouses were essentially self-contained, their successors could be associated with earthwork enclosures. Not all of them contained distinctive deposits, but a few of the later examples do provide evidence of a more complex arrangement. Either monuments of these kinds replaced the older houses or they enclosed a group of domestic buildings. In both cases their ditches contained similar material to the borrow pits excavated during earlier phases. The new constructions could also be associated with human remains. A good example is at Menneville in the Aisne valley, where a group of dwellings was enclosed by a ditch containing deposits like those at Herxheim (Thevenet 2017). This site dates from the end of the LBK, but during subsequent phases enclosures with similar contents were constructed at sites with little or no evidence of settlement. Now they were public monuments where the residues of special events were buried in ditches and pits. From that stage onwards the practices discussed in this article were to take on a life of their own.

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MAGICAL, MUNDANE OR MARGINAL?

This volume takes its starting point from the increasingly frequent discovery of deliberately placed deposits on Early Neolithic Linearbandkeramik sites. This includes the placement of complete and still usable tools in the ground, as well as the creation of complex abandonment layers for example in wells or the destruction of immense material wealth in enclosure ditches.

This is the kind of behaviour that archaeologists generally interpret as ritual (often using the label "structured deposition"), but it is surprisingly little discussed for the Linearbandkeramik. This volume thus addresses two main goals. First, it contributes a new approach to the study of Linearbandkeramik world view by focusing on depositional practices more generally and addressing the connections between them. How do the more striking or unusual examples of deposition articulate with routine discard, and what does this tell us about how Linearbandkeramik societies saw these objects and their use? Second, given the wealth of data available for the Linearbandkeramik, there is an opportunity to contribute to the ongoing discussion regarding the variety of depositional phenomena across the European Neolithic and their theoretical and methodological implications.

This book thus combines chapters dealing with routine discard, as well as those concerned with burial evidence, formalised deposition of objects and feasting debris. The introduction and discussion chapters draw out the wider significance of the findings presented in the individual contributions.

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