Caroline Heitz, Maria Wunderlich, Martin Hinz, Martin Furholt (Eds)

# Rethinking Neolithic Societies

## New Perspectives on Social Relations, Political Organization and Cohabitation

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New Perspectives on Social Relations, Political Organization and Cohabitation

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# INTRODUCTION

# Promoting bottom-up approaches to social archaeology

*Maria Wunderlich, Caroline Heitz, Martin Hinz, Martin Furholt*

## Abstract

*Traditional ideas about Neolithic societies were shaped by questionable premises. The modern concept of the social and cultural coherence of residence groups and the ethnic interpretation of "archaeological cultures" fostered ideas of static and homogeneous social entities with fixed borders. Farming – as the core of the Neolithic way of life – was, in most archaeologists' minds, associated with sedentariness rather than with mobility. Furthermore, the widespread use of evolutionist theoretical frameworks led to the assumption of a universally growing social hierarchisation in the course of prehistory. Ultimately, such "top-down" perspectives deprived individuals and groups of genuine agency and creativity. In recent years, a wide array of empirical data on social practices related to material culture and settlement dynamics, (inter)regional entanglements and spatial mobility based on stable isotope analysis, aDNA, and other factors were produced. Yet the question of possible inferences regarding social organisation has not been sufficiently addressed.*

*Therefore, the aim of this volume is to study social practices and configurations in Neolithic societies based on such results, mainly from bottom-up perspectives. The contributions assembled here discuss how data can be methodologically combined on the basis of corresponding theories, as well as the potential of such bottom-up approaches to infer models of social organisation that may do justice to the diversity and dynamism of Neolithic societies. This includes perspectives on mobility, social complexity, the importance of (political) interests, and kinship factors.*

*Keywords: social archaeology, Neolithic, research history, bottom-up approaches*

## 1. The role of the social in cultural-historical and evolutionary paradigms

As archaeology itself is largely concerned with communities that are long gone and have vanished, no dialogue can be established between the researchers and their research subjects: the human communities of the past (cf. Veit 1998, 134; also Ingold 2017, 21). Furthermore, due to the immense distance between the researchers themselves and their objects of interest, both regarding their socialisation and their place within chronological and spatial contexts, archaeologists seek to understand otherness in the sense of past human identities (cf. Gramsch 2000, 9; Gosden 1999, 205; Kienlin 2015). Despite the attempt to close this gap by, for example, phenomenological approaches focusing on the sensory experience of landscapes (Tilley 1994), the basic problem of understanding otherness remained within archaeological research. Interpretational frameworks therefore were, and still are, often heavily reliant on other disciplines, with a prominent focus on results and models derived from cultural and social anthropology

(*e.g.* Binford 1962; Binford 1978; Gosden 1999; Hodder 1982; Hodder 2012). In order to understand the development of archaeological thought and interpretation, a brief look into the research history and influential paradigms is helpful. Due to their importance in the development of the problems connected to the interpretation of social organisation in the Neolithic as we see them in this book, we will focus on two of the most influential schools of thought. These are the schools or paradigms of cultural-historical archaeologies, as well as the immense influence of evolutionary and neo-evolutionary theories derived from cultural anthropology, partly in the context of New Archaeology.

The early formation phase of archaeology as a discipline took place in the first half of the 19th century, and the first major outcome of this early phase of archaeology as a discipline was the three-age system developed by Thomsen and published in 1836 (cf. Hansen 2001), although the acceptance of this concept varied immensely in different European countries (cf. Rowley-Conwy 2007, 2). Especially in the second half of the 19th century, the increasing contact between Europeans and, for example, African and Asian societies, led to the development of a specific anthropological evolutionism that distinguished between stages of savagery, barbarism, and civilisation, but also applied more complex stage systems and markers for a unilinear system of cultural evolution (*e.g.* Morgan 1877; Tylor 1871). The key term in these early works is that of "progress" and the belief that human societies undergo various predefined steps towards more complexity. Within this formative phase of (prehistoric) archaeology, a certain reliance on the biological theories of evolution as proposed by Darwin in 1859 was still discussed, especially with regard to the development of prehistoric archaeology in Scandinavia (cf. Riede 2006, 8).

Towards the end of the 19th century, when especially unilinear explanations of the human past came under attack, new approaches to interpret the known material culture were developed (Rebay-Salisbury 2011, 42). The cultural-historical paradigm includes different approaches and strands of interpretational frameworks, among them a focus on ideas such as diffusionism and migration. Of special importance, especially for the German-speaking countries of central Europe, was the *Kulturkreislehre*, which was developed by ethnologists in Vienna and methodologically first defined by Fritz Graebner (1911). The abandonment of the key thoughts of the evolutionary school came quite quickly and brought a radical change, though the exact developments vary profoundly across the countries and regions of Europe and cannot be described in due detail here. Overarchingly, instead of progress and age systems, the term "cultures" rose to prominence. This development at the end of the 19th and beginning of the 20th century is connected to the influence and thoughts of various scholars, with Oscar Montelius (1899), Gustaf Kossinna (1911), and V. Gordon Childe (1929; a focus on the connection between evolutionary and diffusionist thoughts) being among the most famous. The success of the cultural-historical paradigm was closely interlinked with a growing need for identification and past narratives in the nationalistic *Zeitgeist* of this period. With a shifting emphasis on "cultures", influential archaeologists partly reconstructed deep histories of ethnic traditions that were linked with the material culture of the prehistory of modern-day Europe (cf. Härke 1991; Niculescu 2011). The underlying premise of a clear continuity between modern societies, or ethnic groups, and their assumed pre- and protohistoric ancestors carried massive presumptions. The main focus of this particular research tradition lay in the material record and saw an investment in the development of extensive typologies and regional chronologies. Although some valuable insights into superregional variations and similarities of material culture were gained during this process (cf. Riede *et al.* 2012, 103), it was the aforementioned close connection to nationalism in many approaches that proved to be harmful (*e.g.* Rieckhoff and Sommer 2007; Trümpler 2008; Parzinger 2012). The underlying assumption that closely related or similar sets of material culture represented social entities, or "cultures", further led to a rather static interpretational approach to the human past. The agency of individual communities or groups was clearly not the focus of these investigations,

although the cultural-historical approach played an influential part in the formation of archaeological theory and interpretational thought. However, the question of social organisation was not directly addressed. Instead, the archaeological cultures constructed in the course of typochronological attempts to order archaeological find materials were equated with societies without internal conflicts and elevated to collective social actors.

The rise of the New Archaeology in the 60s of the 20th century, or processual archaeology, saw the abandonment of many ideas that were linked to the cultural-historical paradigm. Besides the growing importance and role of scientific methodology within this new approach to archaeology, it also saw, to some degree, the return of (neo) evolutionary ideas (cf. Hodder and Hutson 2003, 21; O'Brien and Lyman 2000, 129). Apart from the focus on factors of environmental adaption and the interpretation of find patterns (*e.g.* Binford 1978), the broad field of New Archaeology brought archaeology closer to the field of cultural anthropology (cf. Trigger 2006, 393f.). However, it must be mentioned restrictively that the intensity of contacts between archaeology and cultural anthropology were and are extremely variable. In the USA, four-field anthropology was established in the late 19th to early 20th century (Hicks 2013, 755–756) and has continued to be influential up until today, putting archaeology in close connection with other areas of study, including cultural anthropology. Contrastingly, archaeology often remains a subfield of history in continental Europe and became, for example, in Germany and large parts of central Europe, disconnected early on from its close connection to social and cultural anthropology (Sommer 2010, 6).

Despite the differences in national research traditions, and partly within the context of processual archaeology, ideas and models derived from cultural anthropology made a deep impact within archaeology. The famous neo-evolutionary (Steward 1942; Service 1962) and cultural evolutionary (*e.g.* White 1959) models that were developed within cultural anthropology brought forms of social organisation to the attention of archaeologists. The key concepts and examples include terms such as "tribes", "bands" (Service 1962), "chiefdoms", and "big man" societies (*e.g.* Godelier 1982; Goldman 1970; Sahlins 1963). These models were soon applied to archaeological case studies, in which they were used to enhance an understanding of sites such as Stonehenge (cf. Renfrew 1973) and to societies that were not yet characterised by their central means (*e.g.* centralised decision-making hierarchies, hereditary within the system of social hierarchies, economic centralisation and specialisation; cf. Junker 2015), which are typical for state societies (*e.g.* Wright 1984). Although the diversity that is inherent to broad terms such as "chiefdoms" was indeed emphasised by archaeologists, it is still a heavily discussed issue whether these broad terms and "boxes" are actually suited to describe the social organisation of prehistoric and Neolithic communities (*e.g.* Pauketat 2007; Yoffee 1993). The variability (cf. Carneiro 1981; Kirch 1984; Sand 2002), the historical particularity of their evolvement (including the influence of European expeditions, missionaries and colonialism; cf. Gosden 1999, 103; Spriggs 2008), and the detailed parameters used to identify the presence of these kinds of social organisation in prehistoric contexts are rarely discussed in sufficient depth. Argumentations that focus on the need for central authorities and the existence of vertical hierarchies also within the Neolithic periods are still heavily present within the international discourse (cf. Junker 2015; *e.g.* Drennan and Peterson 2006, with an emphasis on the variability of chiefdoms; Feinman *et al.* 2000). Although it should not be argued here that these interpretations are not valid, it seems that other modes of social organisation (*e.g.* concepts of sharing or cooperation; Blanton *et al.* 1996; Carballo *et al.* 2014; Hunt 2000; Widlok 2016; Woodburn 1998) do not necessarily play the role they would need to within interpretational frameworks.

This brief glimpse into the research history of prehistoric archaeology shows how strong influence derived from prominent paradigms and narratives changed the interpretation of the human past, with the Neolithic being only one of many periods. Social organisation played very different roles within these approaches. While the

cultural-historical paradigm emphasised the study of the typology of material culture, New Archaeology, did, among other things, put an emphasis on factors of social organisation, such as an ideological framework or expressions of status, rank, and identity. Yet, the study of societies was often done through the larger lenses of complex models derived from cultural anthropology.

Within the complex field of interpretational thought and the theories being applied, a key problem of the application of overarching frameworks, such as the comparison of whole "cultures" or "societies", seems to be the lack of a suitable methodology. While the cultural-historical approach put an emphasis on material culture, the influence of neo-evolutionary concepts and models led towards the application of predefined societal systems. Although the application of models or examples such as "big man" societies or chiefdoms might provide superficially comparable concepts, they partly gloss over the variability that is not only visible within anthropological datasets but is also what should be expected for the vast timespan of prehistoric realities.

## 2. From social systems and societies to social practice

Under the cultural-historical paradigm, the social was seen as part of the cultural and there was little specific attention to the social itself. However, during the 20th century, one can identify an overall shift of interest from cultures to societies, or rather social systems within archaeology (Hodder 2004, 23). In new and processual archaeology, forms of social organisations were identified as subsystems within an overall system, for which the frequent use of the term "sociocultural system" is indicative. Thereby, the social subsystem remained subordinate to the environment and to economic and technological subsystems (Hodder 2004, 25). For instance, for G. Clark, the social was a subset of the overall "sociocultural system" that he conceptualised as a hierarchical network of personal relationships, including kinship and rank status (Clark 1934, 102 cited after Hodder 2004, 25). C. Renfrew argued in his book *Approaches to Social Archaeology* that social archaeology aims at reconstructing past social systems and relations. Therefore, social rank systems and systems of exchange between the different social rankings within a society could be identified (Renfrew 1984, 4, cited after Hodder 2004, 25). All in all, in most processual archaeological approaches, social subsystems remained subordinate to the environment and to economic and technological subsystems.

Over the past decades, cultural and social sciences have undergone various paradigmatic shifts, so-called turns, such as the "practice turn". The latter is particularly relevant to the archaeology of the social. In contrast to the paradigms of modernity, such as the cultural-historical approach or evolutionism, such turns are not to be understood as mutually exclusive grand theories, each explaining the "great history" in a comprehensive way using one single approach. The turns that are symptomatic for the multifocality of postmodernism and post-processual archaeology are to be understood rather as pluralistically juxtaposed perspectives. They are different foci, which again and again enable new findings on a research topic or open up new, additional fields of research. What they all have in common is thinking in terms of mutual relationships rather than fixed disparate entities. The practice turn is about overcoming operating with disparately constructed entities and dualisms such as "actors" and "social structure" and instead thinking of them as constitutively (re)produced in mutual, dialectic relationships between both (Heitz *et al.* 2017, 16–17). Accordingly, the relational relationship between individual agency and social practice is seen as a fundamental dynamic of human coexistence (Rapport *et al.* 2003, 2–5; Robb 2005, 3–7). Through this change of perspective, it is possible to overcome the problematic premises and inadequacies of the cultural-historical approach, such as the conceptualisation of humans as mere carriers of their culture as German ethnographer Leo Frobenius (1873–1938) did with his

*Kulturkreislehre* (culture cycles), and the equation of cultures with people or ethnic groups that were seen as bodies of social collective actors (Heitz *et al.* 2017, 14–16). Even more than the functionalist anthropologist Bronislaw Malinowksi (1884–1942), who developed "participant observation" as an essential anthropological method, it was British social anthropologist Alfred Radcliffe-Brown (1881–1955) who triggered the change in perspective from "cultures" to "societies" and "social actors" that was later also taken up by archaeologists (Heitz *et al.* 2017, 17; Hodder 2004, 23; 36–37). He understood culture as the result of the process of "enculturation", which is a continuous reproduction of a social structure (Eriksen and Nielsen 2013, 38). Hence, he shifted his focus from cultures to societies as he was interested in different forms of social organisation (Lentz 2016, 3).

In archaeology, one of the most influential practice theories is certainly that of French ethnologist, sociologist, and philosopher Pierre Bourdieu (1930–2002). In his works, he aimed at an understanding of societies and cultural forms from the perspective of action (cf. Schatzki 2001, 10–23) while creating the concept of "habitus" that generatively mediates between actors and social structures (Bourdieu 2007; Hahn 2014, 276). By "habitus", he refers to dispositions for action and social and cultural skills that enable people to act meaningfully in their daily lives in a social, cultural, and material environment (Bourdieu 2009; Barrett 2005, 102). The actors' actions are oriented towards social structures. Social structures generate cultural forms, which in turn generate practices that ultimately reproduce social structures (Rapport *et al.* 2003, 4; see also Heitz in this volume). The habitus concept offered a welcome alternative approach to the cultural-historical paradigm for post-processual and interpretative archaeology from the 1980s onwards: observable regularities in the material, such as pottery styles, can be interpreted as results of social practice (Dietler *et al.* 1998; Knapp *et al.* 2008; Robb 2012; Schreg *et al.* 2013; Stockhammer 2012; Stockhammer 2015).

Besides Bourdieu's theory of social practice, the "structuration" theory of British sociologist Anthony Giddens, formulated in his work *The Constitution of Society* (1984), was also received in archaeology. Following Giddens, the relationship between structure and actor is not a dualism, but should rather be understood as duality: structure is both the cause and the result of an action. Accordingly, he too conceptualised the relationship between actor and structure as a mutual one (Eriksen *et al.* 2013, 159–161; Giddens 1979, 1–28; Hodder *et al.* 2003, 94; Robb 2005, 4). All in all, therefore, the work of Giddens, Bourdieu, and others gives human action and social practice a dominant, if not decisive role in social coexistence and the emergence, continuation, and transformation of cultural forms.

Along with such practice approaches, concepts of "agency" were also intensively discussed in archaeology. Agency can be roughly defined as the capability and the power of actors (or agents) to act (Rapport *et al.* 2003, 3), along with an abundance of other individual, collective, multiple, or relational conceptualisations of agency (cf. Dobres *et al.* 2000, 3–17; Rapport *et al.* 2003, 5–9; Robb 2012, 496–504; VandenBroek 2010, 481–482). Recent developments in agency concepts focus on the question of non-human actors and their relations to people, on the interactions between the same and thus on "relationality" in action contexts (see also Robb 2012, 502–506), which is generally referred to as the "material turn" in social sciences and humanities. Theorists arguing with such perspectives aim to take into account the mutuality in human-thing relations. This relational understanding of humans and things has been described by some theorists using the metaphors "network", "meshwork", and "entanglement" (Hodder 2012; Hodder 2014; Ingold 2007, 94; Knappett 2011; Latour 2005; Latour 2010). The much-cited actor-network theory proposed by Bruno Latour and others, for example, addresses how relationships and ties between things, people, places, technologies, knowledge, norms, and values are interconnected. They are established through communicative processes, but also dissolved and transformed (Latour 1988; Latour 1999; Latour 2014). In such networks of relational materiality, things play a crucial role in shaping social relations. Accordingly, "non-humans" also become actors or "actants". These "actants"

are considered in such symmetrical approaches too, which have also been applied in archaeology (see also Olsen 2012; Shanks 2007).

To sum up, within post-processual archaeology and the practice turn, the focus shifted from social systems to social practices and social actors (Hodder 2004, 26) and thus from the description and theoretical modelling of structures to the processes themselves and hence the understanding of their dynamics. Furthermore, it is important to distinguish society from the social on a theoretical level if one argues that societies as entities of a social totality do not exist, and they thus cannot be identified as archaeological objects of inquiry with reference to the prehistoric past. Similarly, we would argue that societies are rather a matter of imagined collective identities in emic perspectives that might not have a fixed corpus of materiality one can archaeologically draw on. So, we agree with Michael Shanks and Christopher Tilly that it would be unhelpful to shift the objects of inquiry from archaeological cultures and thus constructed cultural entities to societies as another constructed totality. Rather, the focus should be "on the active negotiation of social roles and processes as part of a continual process" in social practices (Hodder 2004, 26). Accordingly, we advocate for perspectives that focus on materialities of social practice and thus on bottom-up approaches to the social. What we mean by bottom-up social archaeological approaches will be outlined in the following subchapter.

## 3. In search of alternatives: bottom-up approaches to the social in this volume

Following Lynn Meskell and Robert W. Preucel, social dynamics can be located at the intersections of temporality, spatiality, and materiality (Meskell *et al.* 2004, 3–4). It is especially in the latter that past social practices left traces that protrude from the past into the present. And it is us archaeologists that perceive, evaluate, and recognise them as such and make sense of them in the archaeological research, which, in turn, is a social practice (Heitz 2018). The term "materiality" – or rather "materialities" – emphasises the seemingly endless dialectics and multivocality and multitude of notions that unfold in the mutuality of human-thing relations, or rather human-material relations, that are relevant in the social practices of both the prehistoric past and the contemporary present. Besides deep time and *longue durée* perspectives, it is in particular these material horizons of understanding – the materialities – in which archaeologists can make significant contributions to contemporary social theory (Meskell *et al.* 2004, 4). In this volume, we would like to advocate for bottom-up approaches to the materialities of the social by focusing on social relations, political organisation, and cohabitation as fields of inquiry. But what do we mean by "bottom-up" approaches and what separates them from "top-down" ones?

In our understanding, "bottom-up" has two interrelated levels of meaning that can be related to the empirical and epistemological dimensions of research:

1.  The term is most likely to come from the field of politics, where "bottom-up" refers to the position and orientation of the actors. So, "bottom-up" refers to grass-roots movements, from the "middle of the people", which are directed "upwards". Transferred to social-archaeological research, this would open up new empirical fields of inquiry that address all those processes of social (trans)formation that were initial-ised by those individuals or social groups who are not initially identified as "rulers" or "elites" in the prehistoric past. In a broader sense, such bottom-up perspectives might also lead research to social groups that are considered to be subaltern in contemporary social worlds and thus have too often been underestimated or ignored in research of the prehistoric past as well, such as women, children, mobile people, immigrants, and people with disabilities. In contrast, top-down research foci would

include (trans)formations that are initialised and controlled by those individuals or social groups in positions of power that, as a consequence, are the focal point of research.

2.  In its epistemological dimension, "bottom-up" can also be seen as referring to the level or scale of consideration. A bottom-up perspective is one that focuses on individual activities and uses them to understand historical situations, while top-down perspectives are more generalising, more "big-picture" statements or "grand narratives". Taking this further, bottom-up approaches as such are, in our understanding of social archaeology, those that follow inductive reasoning in terms of inferring forms of social organisation, while top-down approaches operate deductively. Accordingly, by taking on the latter, one would start from existing social models – such as "big man" systems or chiefdoms – and then search for evidence to verify or falsify them in the research process. Following inductive reasoning in bottom-up approaches, one would start with smaller, more local concepts such as social practice and its materialities in order to find regularities that then can be interpreted accordingly regarding forms of social organisation. However, since such ways of reasoning always already include some predefined concepts and thus include deductive phases, the overall process could be best understood as abductive, as proposed by scholars of American pragmatism (Reichertz 2011). Bottom-up approaches include multivocality as well as the multitude of different complementary or even conflicting narratives, since – with reference to the metaphor of grass roots – numerous different perspectives on the social in the past are possible because they are growing in the field of tensions between the materials of the past and their perception in the present and thus in the social practices of the social worlds of the respective researching archaeologists. As Ian Hodder (Hodder 2004, 36) cited Maurice Merleau-Ponty (1945): "[...] we can go a step further and argue that our very selves develop in relationship with the object world, and that the boundaries between self and object vary historically and socially".

3.  Accordingly, we see the strength of bottom-up approaches not only in their explorative openness but also in the accompanying, necessary self-reflexivity of the researchers and their research and the social and historical quality of such social archaeological research results themselves. The contributions in this anthology have in common that they all represent bottom-up approaches in this sense. Despite this common ground, they offer very different perspectives and approaches on diverse case studies, and pose fundamental questions about methodologies, terminologies, and epistemological aspects.

In the first section, "Conceptual and methodological approaches to forms of social organisation", different contributions are collected that are concerned with methodological, epistemological, and terminological questions and issues. Within this framework, Till Förster reflects on the anthropological concept of acephalous societies (*i.e.* societies without a central government), its history and implications, and its analytical potential. While the outlines of the social organisation in acephalous societies may be described in different polarities, Förster illustrates how diverse and unique these societies appear within the social anthropological case studies available. A closer look into possible forms of prehistoric political organisation is provided by the second contribution of the first section. In his article, Martin Furholt focuses on the deficiencies of the classical political economy narrative, offering an alternative that focuses on a bottom-up perspective of political agency, a fluid understanding of sociospatial organisation, and the implications of a discussion about the nature of power. The importance of these arguments is illustrated with a case study of the Early Neolithic settlement site of Vráble in Slovakia.

Taking mobility as an epistemological entry point to understanding forms of social organisation, Caroline Heitz explores pottery production and distribution practices by drawing on ceramics from precisely dendrochronologically dated Neolithic wetland sites on the northern Alpine foreland (3920–3800 BCE). She elaborates an overall social

archaeological approach by using Pierre Bourdieu's theory of *habitus* and social practice as well as Etienne Wenger's concept of communities of practice. Based on a practice-based pottery classification, it can be inferred that social configurations were related to the residential mobility of individuals or subgroups. She proposed the understanding of these sociospatial configurations as forms of horizontal social organisation that might be referred to as translocal communities.

The last contribution within this section focuses on the importance of reflective working methods. Within their article, Maria Wunderlich and Julian Laabs compare the similarities of ethnoarchaeological approaches and agent-based modelling and present the potential these approaches have to broaden understandings of past human social organisation.

Section II, "Material dimensions of social organisation", focuses on material expressions and dimensions of social organisation. In this section, different approaches on questions of entanglements and exchange and their material representations present diverse perspectives on Neolithic case studies. Within this framework, Philipp Gleich examines the distribution of different domestic pottery styles in Central Europe in the early third millennium BCE. This article combines a practice theory outline with an in-depth case study of technological and typological aspects of pottery belonging to the Goldberg III complex. A broader look at the distribution of pottery styles is presented by Marta Andriiovych with regard to the Neolithic in the northern Black Sea area. With a focus on the Lysa Hora cemetery, Andriiovych discusses questions of exchange and social group mobility and their potential expression in the presence of pottery styles.

By examining Chamblandes burials in the Middle Neolithic site of Lausanne-Vidy in Switzerland, Katharina Jungnickel sheds light on the transition phase from individual to collective burials in the fourth to fifth millennium BCE. Based on the burials' temporal distribution and the demographic data, she argues that the necropolis represents a village community where children might have had a unique place in the burial practice. With her results, she rejects former assumptions that the graves are embodied kinship structures.

A study on lithic procurement and production activities during the Late Neolithic in south Transdanubia by Kata Szilágyi is the last contribution in this section. Within her contribution, Szilágyi focuses on the narratives of emerging social inequality in the interpretation of burial practices. With an alternative bottom-up approach, the accessible material and its representation within archaeological features is used for an alternative interpretation of social organisation.

Section III, "Scales and forms of social organisation" offers insights into different scales of the social in different case studies and theoretical outlines. A case study with a strong focus on questions of how spatial organisation is linked with social organisation on a local scale is presented by Isabel Hohle. Based on the example of the LBK settlement site of Altscherbitz, Hohle discusses the meaning and terminology of villages with an emphasis on the communal structures identifiable in the archaeological record. Questions concerning the cross-regional scale of distribution regarding the main categories of material culture and the assumptions and potential misrepresentations given by classic distribution maps are the main topic of the article presented by T. Link. With a focus on Late and Final Neolithic assemblages and sites in Franconia, Link offers new insights into interregional connections and relations between what are often treated as separate material entities. In their contribution, Aleksandr Diachenko and Iwona Sobkowiak-Tabaka focus on the analysis of mutual influences between what are usually classified as archaeological cultures. The social framework within which these influences appear is analysed with the help of the toy model of dynamic cultural development, thereby offering perspectives on culture change and diversity.

The final section comprises a thematic synthesis, broader reflexions, and an outlook on what we might consider when examining forms of social organisation in Neolithic studies in future research. A comprehensive and in-depth insight into the terminology,

analytical categories, and cultural concepts used, among others, in the archaeology of Neolithic societies is offered by Brigitte Röder. With an emphasis on the interconnected importance of social sciences and scientific methods, Röder questions and discusses practices of historical interpretation and epistemological approaches.

The last contribution of this book uses a different approach to raise a discussion about the use of concepts and ideas with regard to Neolithic societies. In his article, Alexander Veling reflects on the importance of practice-based approaches and offers ideas on how to approach the complexity of archaeological records. As a final thought, Maxime Brami brings together the contents of this book in a synthesis, which is framed as a thematic review and afterword to the contents of this volume that give an outlook on future research in this field, along with echoing and adding to our thoughts outlined in the last section of this introduction.

## 4. Future directions: Reflections on (social) archaeology as social practice

One of the greatest challenges for an archaeology of prehistoric social phenomena is to scrutinise and critically reflect on the concepts and premises used, and to avoid reifying current social conditions and professional academic and popular views thereof and projecting those currently dominant, yet historically situated, culture-specific prejudices about what is called human nature, rationality, or social relations, onto the past. This has always been the case, and each period will have had its own reasons why it is especially necessary to be aware of, and critically engage with, current biases. Right now, from our standpoint as Central European archaeologists, we would argue that it is the increasing commercialisation and formalisation of publishing in archaeology that poses a great challenge. While in European archaeology this still seems to be less of a problem than in other scientific communities, the development is surely trending in the wrong direction; we have witnessed that the more sweeping the premises about past societies, the more convincing – at least at first glance – are the resulting narratives, and the more easily will archaeological work be published, cited, publicised, and disseminated. The need to sell one's research is a factor that increasingly dominates the way scientists are supposed to publish if they want to prevail in academia or get that next research grant. This is also very visible in the context of aDNA and other molecular biological techniques, in the context of what has been coined the "third science revolution" (Kristiansen 2014). Here, not only is renewed empiricism but also deterministic views of human conduct and social interaction seemingly on the rise again (Blakey 2020), precisely furthering this tendency to misunderstand historically inherited concepts and categories as universal essential truths. However, there is no need to be overly pessimistic, as these tendencies are currently under scrutiny, and a healthy dialogue is underway between geneticists with their focus on the biological, and archaeologists as well as cultural and social anthropologists who emphasise the historical nature not only of prehistoric societies, but also of the categories we use to describe social interaction – be it rationality, human biology, gender, politics, the culture-nature divide, and many more.

There is, it seems to us, a rising awareness that, if social archaeology is supposed to be of any relevance at all, we cannot just try to identify the narrative that most readily confirms our own preconceptions about prehistory. Instead, we should look and actively search to bring to the fore the whole breadth of human possibilities and their diverse manifestations and use this breadth of possibilities to understand the past. This poses a challenge, as it is obviously difficult to picture and adequately describe a world in which our categories might mean something different than we ourselves have been taught, but it is also extremely rewarding to interrogate the rich record we have of present and past societies with a mind open enough to ask what alternative worldviews, forms of

social interaction, and social orders might have existed during prehistory. There are obviously epistemological limits to such an explorative endeavour, but we feel confident in arguing that we are not even near a situation where these limits are even being remotely approached. On the contrary, especially when it comes to the Neolithic of Europe, the breadth and richness of the anthropological and historical record of human possibilities is still heavily underused.

Studying the European Neolithic period from a perspective of self-critical exploratory curiosity about human possibilities is above all an exciting endeavour, as societies encountered during this period – defined by the dominance of a set of technological and economical practices – so clearly defy our initial expectations, if one only dares to look behind the top layer of essentialised beliefs about traditional farming communities, simple social organisation, immobility, and social boundedness, as well as the dogma of emerging chiefdoms and social stratification. The legacy of teleological grand narratives, which have dominated the big picture at least since J.-J. Rousseau, were most effectively promoted by L.H. Morgan, F. Engels, and later, V.G. Childe (without trying to give an exhaustive list here), and are now currently being propagated by popular books such as Y.N. Harari's (2015), or J. Diamond's (1998). The narrative suggests that the Neolithic economy – food production – constitutes the start of our current extractionist worldview, which inevitably leads to a competitive race for the accumulation of scarce resources, which then inevitably leads to social stratification that, in turn, forms the basis for a later state formation. Recently, J. Scott (2018) dedicated a whole book to the insight of how blatantly this narrative misrepresents the empirical data, which imply a period of at least 4000 years in which not many of the predicted developments actually happened.

If we want to explore the breadth of alternative human possibilities, this is necessarily a self-reflexive social project in the here and now that involves actively challenging the widespread belief that our current socioeconomic arrangements were as "natural" and thus inevitable in the past as they are in our modern, complex, and technologically advanced world. Obviously, such a view is based on a failure to historically situate and thus critique the concept of "nature" itself, as well as the nature-culture divide, upon which the definition of the social is built (Sahlins 2008; Sahlins 2013). The extractionist, profit-seeking mindsets that many want to project onto prehistoric human actors are hard to imagine prior to the enlightenment era's devaluation of the non-human (Scheidler 2020). The Hobbesian view of a violent and brutish prehistory, while probably still dominant as an implicit assumption (Keeley 1996; Pinker 2012; Kristiansen *et al.* 2017), has been increasingly challenged from different directions (Tomasello 2009; Ferguson 2013; Westphalen 2019; Bregman 2020), while others would reject the idea of a fixed set of human dispositions, or human nature in general (Sahlins 2008; Wengrow *et al.* 2015). In the archaeological discourses, one can surely sense a rising push for an exploration of human pasts that are different from the dominant narratives, where human actions are seen as more variable and dynamic but also self-conscious and contradictory (González-Ruibal 2014; Ray *et al.* 2019; Currás *et al.* 2020; Hansen *et al.* 2017). Any attempt to challenge the teleology, or the sense of being inevitability embedded in the concept of human nature, needs to acknowledge the historicity and variability of human actions, and thus apply a bottom-up approach. A significant symptom of this is the rising popularity of anarchistic perspectives (Graeber 2004; Angelbeck *et al.* 2012; Angelbeck 2016; Borake 2019), which is probably the movement with the clearest bottom-up orientation. Yet other approaches to social archaeology also try to widen the picture away from the top-down perspective on how larger systems evolve to a view that more broadly covers the whole array of social actors involved in the negotiation of political systems, social arrangements, and ways of thinking, such as postcolonial archaeology and gender archaeology. Several European archaeologists have challenged the one-dimensional, elite-focused view of history and emphasised the plurality of actors (Kienlin *et al.* 2012; Furholt *et al.* 2020) and phenomena of resistance and rebellion within past societies.

It is, however, important not to build up a divide between a particularistic, historically oriented archaeology and a generalising empiricist grand narrative archaeology. For example, the emerging archaeogenetic discourse needs to incorporate a critique of its basic assumptions to enhance its awareness of cultural variation with respect to concepts such as kinship, community, gender, human-animal, and landscape relations, in order to be able to test for a variety of possible models. And any real exploration of the variety of human possibilities needs the rich and constantly growing datasets and computing abilities emerging in the context of the third science revolution in order to proceed from the stance of critique and deconstruction to the active exploration of plausible past realities, the recognition of patterns, and the detection of changes and transformations in human activities and social relations.

## Acknowledgements

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PART II

# CONCEPTUAL AND METHODOLIGICAL APPROACHES TO FORMS OF SOCIAL ORGANISATION

# Anarchy: Anthropological reflections on an unruly concept

*Till Förster*

## Abstract

*Acephalous societies (ἀκέφαλος, "headless") were a prominent concept of British anthropology after the theory was introduced by Evans-Pritchard's work on the Nuer and Fortes's work on the Tallensi. At the time, foraging societies were known to have no central political organisation, as they presumably represented the "oldest of human history". But most colonial officers assumed that pastoralists such as the Nuer and agriculturalists such as the Tallensi would unavoidably have headmen or some other form of centralised social organisation. That big settlements and large areas were "ungoverned" and acephalous challenged colonial thinking.*

*As a concept, "acephalous" had been a tremendous success. From anthropology, it moved into disciplines such as political science and archaeology. It seemed to provide a reliable analytical framework to study systems of checks and balances that kept conflicts and, eventually, violence at bay. That these checks and balances were stable was taken for granted – and their stability was often projected onto the past, assuming that acephalous societies had existed in precolonial times as they had been described and analysed in the 20th century; if you know what an acephalous society is, then you also know what it is to have an acephalous society under colonial domination.*

*Keywords: acephalous societies, anarchy, conflict, social theory*

## A Hobbesian prejudice and its consequences

There was a time when Europeans thought that all societies that they classified as "primitive" would have some kind of leadership; a headman or a chief if you were speaking English, or a *chef* in French, a *Häuptling* in German, a *jefe* in Spanish, or a *cacique* in Portuguese. The root of the terms in the Romance languages was the Latin word *caput* (literally "head"). The German *Häuptling* and the English headman had the same basic meaning. The idea that underpinned this vocabulary was the same throughout the colonial period and for a long time afterward: a community or an institution had to have a person as its head – and this eventually included anything from a tiny group to a state. The conviction that a group needed somebody as its head was so strong that the colonial rulers at the end of the 19th century assumed that all their new subjects were in some way or another bound to a community with a person – usually a man – who led it. Otherwise, the community would unavoidably slide into "disorder", "chaos", or "anarchy". The vocabulary was largely pejorative, and it was meant to be. Anarchy was equated with chaos and, for bourgeois politics, with modern anarchism; a political ideology that would lead directly to a state of social disorder, tyranny, and eventually, terrorism.

Literally translated from Greek, anarchy (ἀναρχία) means "without domination".[1] Communities without formalised leadership, that is without a "head", would be anarchic societies, no matter whether they are driven by strict rules. Anarchy is a social order that prevents the emergence of domination.[2] In contrast, the widespread translation of "anarchic" and "acephalous" orders as "stateless" regimes is misleading, as the state is a highly specific mode of domination, while anarchy avoids *all* forms of domination. The strict dividing line between state and non-state or hierarchical and acephalous regimes is deduced from the historical experience of the West and projected onto other societies and their political regimes – even if the neatly defined concepts of political sociology suggest otherwise.

The lack of a leader was not extraordinary in history, as the briefest look at human societies shows. When imperialism divided the world into colonies in the late 19th century, however, very few societies were recognised as headless. Only forager societies who testified to the "earliest stages of human evolution" were thought of as lacking any leadership. Almost all other societies were expected to have leaders or simply a "head" – or to need one if no such head could be found. Taking a Hobbesian attitude, the colonisers assumed that lack of leadership would lead to dysfunctional social orders or simply to the absence of any order. Anarchy was a synonym for anomy, chaos, disorder, and confusion.

Yet social order did exist where leaders and "heads" of communities were not found. Since there were no categories in colonial vocabulary for such phenomena, they were often not recognised as such. However, throughout the colonial era, in particular during its formative years, the absence of chiefs was a pressing problem. Neither the British nor the French had sufficient human resources to establish direct administrations. To avoid the "anarchy" and "chaos" that they were convinced would surely surface when there were no chiefs, colonial administrations were in desperate need of personnel that would be loyal to them and help them to prevent said "anarchy" to emerge.

The French colonisers answered this challenge by installing administrative chieftaincies under their tutelage (Zuccarelli 1973; Tosh 1973; Olivier de Sardan and Alou 2009; Alou 2009). Whenever they could not find a leader or a headman, they nominated one, often by appointing someone who came from another region of their empire, or by making somebody a chief who had no experience of leadership and no legitimacy in the eyes of those he was expected to govern. The administrative chieftaincies, les *chefs de canton*, were given local names so that they appeared to have some kind of "traditional" legitimacy. As intermediary rulers, they were in an awkward position: on the one hand, they had to serve the interests of their superiors, the white colonial administration, while on the other, they were expected to live in harmony with the local populace in order to be able to report anything that did not comply with the rules set up by the white colonisers.[3] Of course, the newly established rulers could not do this if they wanted to survive and enjoy at least some respect among the people they lived with.

The situation under British colonial rule was not much different. In southern Sudan, where many societies favoured an acephalous social order, the colonial administration engaged in "'the hunt for the chief.' It was the government's firm belief that some sort of chief with administrative and executive powers did exist, at least in principle" (Johnson 1981, 514). Unsurprisingly, they could not always find one, but still believed that such powers had existed in the past. Those who were eventually appointed were, very much as their counterparts under French rule, rarely respected by the local

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1    Negative prefix ἀν and ἀρχία, "domination," "systems of government," "forms of control".

2    Taking domination and not the state as the object that these societies oppose solves some problems of anarchist theory, namely the question of how such societies could "...be organising their societies against the emergence of something [*i.e.* the state] they have never actually experienced" (Graeber 2004,23, see below p.6).

3    Development cooperation and governance still cherishes this idea of "customary chiefs" as intermediaries, see for instance: http://www.afrique-gouvernance.net/bdf_experience-1579_fr.html, also Miles (1993).

populace, and relied on the support of the colonial administration – a situation that further weakened their legitimacy. Caught in a double bind situation, the paradoxes of administrative chieftaincies were a recurrent theme in colonial discourse as well as in historical writing on colonial states and their successors.[4]

The focus on chieftaincies and how to make them work as intermediaries of the colonial administration concealed much of the local realities from French colonial anthropology. It was up to British social anthropology to "discover" the many "headless" societies under their domination. As the British sought actively for already-existing chieftaincies that complied with the idea of indirect rule, they became increasingly aware that there were large areas where it was impossible to identify any chiefs. The classic works of E.E. Evans-Pritchard, M. Fortes, A.R. Radcliffe-Brown, E. Leach, and other anthropologists made it clear that headless societies accounted for a much bigger part of the peoples under colonial domination than had hitherto been assumed.

To define the basic types of political organisation, anthropologists coined the term "acephalous societies" to describe those which had no central institutions of power. The term was deduced from the Greek ἀκέφαλος, literally "headless", and was conceived as direct counter-concept to and critique of the colonial presumption that all polities must have a head. First, it questioned the Hobbesian presumption that all human societies needed some superior power – the Leviathan[5] or the state – to "civilise" man in order to avoid "the war of all against all". Second, it contested the idea that only foragers were living in anarchy because of the small size of their "bands" and the early stage of human evolution that they were believed to represent. Any other peoples further up the ladder would inevitably develop some sort of centralised leadership as their societies grew. However, acephalous societies are not "petrified hangovers" (Barclay 1998, 39) of some distant past. They are as contemporary as any other society on earth. In addition, there were and are many more acephalous societies; for instance, pastoralists who, when necessary, could fight and win wars against powerful kingdoms as well as agriculturalists living in comparatively big, compact towns. Acephalous social orders sometimes exist in spaces that have emancipated from larger polities, not least the state and, at times, they exist in politically invisible forms under the surface of other regimes. Their size, pervasiveness, and contemporariness challenge the (neo)colonial arrogance that only modern society is able to foster civil life, to build social orders, and to solve problems of scale. On the contrary, acephalous societies organise civil life and sustain ways of "ordered" (Evans-Pritchard 1940)[6] or "regulated" anarchy (Sigrist 1967 [1979]).[7]

This paper probes conceptual tools that anthropology could use to analyse acephalous societies in their own right; that is, without implicitly reproducing the conceptual framework of modern statehood. It will outline three polarities: hegemony *vs.* autonomy, flow *vs.* closure, and individual *vs.* collective agency. These polarities will allow anthropological analysis to map the processes that structure the social in acephalous societies. They may serve as analytical tools to gain a better understanding of acephalous social orders and how societies create and sustain them. As conventional social theory will not suffice to conceive acephalous societies and anarchy as social order, I will conclude with a few remarks about the central problems that a theory of anarchy must address.

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4     For example, Olivier de Sardan 1984; van Rouveroy van Nieuwaal 1987a; 1987b; Beck 1989; Bernault 1996; von Trotha 1994; 2006; Ray and van Rouveroy van Nieuwaal 1996; Alou 2009; Keese 2010; Förster and Koechlin 2018; Comaroff and Comaroff 2018.

5     The biblical sea monster expressed the fears and obsessions of Hobbes almost perfectly. As it was composed of human beings and their needs, Leviathan was the sovereign body of man to which all individuals had to cede their rights to satisfy their own needs.

6     Also, Radcliffe-Brown and Forde 1950.

7     After the publication of his book, Sigrist was summoned by the German secret service, who suspected him of being a political anarchist publishing a blueprint for upheavals and terrorist attacks (Sigrist, pers. comm., 1987).

## Checks and balances: The standard model

One of the first and most perceptive accounts of an acephalous society was published by Edward Evans-Pritchard. His work on the Nuer[8] (Evans-Pritchard 1940) introduced the concept into social anthropology, while *African Political Systems*, edited by Evans-Pritchard and Meyer Fortes (Fortes and Evans-Pritchard 1940), became the foundational publication of political anthropology (Fortes 1953). The first book focused on the livelihood and political institutions of the pastoralist people in what is today South Sudan, while the second comprised a collection of papers on societies across the continent, offering a comparative perspective on politics in Africa. Drawing a rough line between societies that were organised as centralised polities or states on the one hand and acephalous societies on the other, the latter were sometimes simply labelled as "stateless" societies (the Nuer being the classic example).

Acephalous societies build on specific sets of practices and institutions – sets that may differ significantly from one people to the other. To find a common denominator for such societies was one of the first tasks of political anthropology. In his book on the Nuer, Evans-Pritchard elaborated a standard model that became a famous example of an acephalous society, and which dominated the understanding of "ordered" or "regulated" anarchy for many decades. Evans-Pritchard developed two key themes: firstly, the segmentary lineage system and, secondly, the feud as a political institution.

Segmentary lineages based on unilineal descent – in the case of the Nuer in the male line – are widespread in Africa among both anarchist herders and agriculturalists.[9] The important point is that a lineage is a closed group that is defined by prescribed social attitudes towards other members of the same segment: within the lineage, solidarity is expected, and failure to act accordingly is sanctioned. This solidarity is visible in the sharing of basic goods that adult members of the segment need in order to make a living. For instance, a creel may be used by all the women of the segment as long as they do not prevent others from using it. This attitude of "prescriptive altruism" was later labelled "kinship axiom" or, in short, "amity" by Fortes (1969, 110, 231–235). Among anarchist gardeners and in agricultural societies, such amity applies to basic tools such as hoes and knives.[10]

The prescriptive altruism within the lineage segment is counterbalanced by the rule of reciprocity between lineages (Kramer and Sigrist 1978) – again a trait of herders as well as agriculturalists. Land and access to land are a classic example, but the most prominent example is certainly marriage. In this model, conjugal unions are a reciprocal exchange of partners that create alliances between lineages and tie them into one bigger network. The segments thus turn into corporate groups; that is, groups wherein property rights in material objects and rights of land use are vested, though not necessarily inherited (Goody 1961). The balance between amity and reciprocity may be precarious at times but, in general, it sustains a balanced social order.

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8    I use the definite article only when I refer to ethnic communities as imagined by modern anthropology: "Social systems were spoken of as if they were naturally existing realities and the equilibrium inherent in such systems was intrinsic, a fact of Nature" (Leach 1954 [1964: x]).

9    The social order of hunter gatherers, such as the San, in the arid zones of southern Africa, the Aka and other groups, once described as "pygmies," in the central African rainforest, or the Aborigines in central Australia, is not based on lineages but on small, mobile bands.

10    One may be tempted to attribute the shared use of such tools and utensils to the scarcity of the objects that could be used more evenly when all members of the segment have access to them. However, neither Evans-Pritchard nor Fortes aim at such a materialist explanation. According to them, the value of sharing is to create sustainable ties between the members of the lineage segment. Social and political reason inform the social order – not material necessities. Regardless of reason, it is possible to look at material culture of the Nuer and anarchist agriculturalists from this perspective: if this sort of sharing suddenly ended, one would expect the distribution of such objects to mirror the segments of an anarchist society.

The feud is a fascinating political institution among the Nuer. It integrates men and women into a group that reflects the size of the respective opposing group. When a man kills a member of another lineage segment, the feud will involve all kinsmen up to the level where the opposing segment can integrate. The more distant the two segments are to each other in terms of descent, the more far-reaching the level of integration and the bigger the groups become. So, the feud has an integrating function, but it also binds the two opposing segments to each other. The latter function is mediated by a religious person and ritual specialist, the leopard-skin chief in Evans-Pritchard's terminology. He immediately adds that "chief" is a misleading term, as he has no real power to impose his will. The leopard-skin chief serves more as a mediator between the two lineages or their segments rather than as a judge of the facts. A feud channels conflicts and makes them manageable.

Similar institutions existed and continue to exist in other acephalous societies.[11] Generally speaking, the stability of acephalous social orders is sustained by the juxtaposition and interlocking of these practices and institutions. However, the neatly woven and elegantly presented picture of checks and balances is not the whole story. If anarchic societies were based exclusively on these, they would not persist for a long time. Anarchists such as the Nuer and the Lugbara in East Africa, or the Konkomba and the Senufo in West Africa, do not contest the legitimate domination of a particular other, such as the colonial state or, more recently, the postcolony. They contest domination itself. In the words of Pierre Clastres, they are not simply without centralised government or a state – they are anti-state (Clastres 1974). Replacing one ruler by another centralised regime is not what they aim at; rather, they want to get rid of any ruler – not because they contest the legitimacy of the respective person or administration, but because they are suspicious of domination.

The aim of people who live in acephalous social orders is autonomy – not a more legitimate state that warrants political participation based on democratic principles. James Scott's work on peasant resistance to the state and non-governmentality illustrates this anarchist attitude (Scott 1985, 1990, 2009). To this extent, acephalous societies such as the Nuer were profoundly misunderstood by the colonial (and postcolonial) administration – a fact that Evans-Pritchard recognised repeatedly in his interactions with the Sudan Political Service, who wanted to build new and more appropriate governance structures in the Nuer area of the colonial Upper Nile Province after a punitive campaign.[12]

Being basically against any domination also means that settled structures may be perceived as inflexible, if not oppressive, obstacles to achieving the autonomy that one desires. Many Nuer reacted accordingly when the colonial administration wanted to implement their policy of devolution, which required the codification of "customary law" that could be "…modified to meet administrative standards" (Johnson 1981, 514). The colonial attempts to generalise, codify, and regulate local social order as a fixed body of "customary law" created more and more suspicion and resistance. Indeed, the institutions and practices that made up the checks and balances were not as stable as the model suggested. For instance, when people moved from one settlement to another, they could either remain members of their original lineage or become members of the new one. The flexible identification with the local community came first (Evans-Pritchard 1940, 203–205).

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11    For example, among the horticulturalist Lugbara in Uganda and the Congo (Middleton 1958; 1965; Middleton and Tait 1958).

12    In 1902, the colonial administration had hoped that an awe-inspiring show of force would bring the Lou, a Nuer subgroup, under their domination – but it rather "increased Nuer suspicion" (Johnson 1981, 523). By the end of the 1920s, the campaign included air raids and the bombing of settlements where their prophets were believed to live (Johnson 1982, 231f.) – acts that, unsurprisingly, increased Nuer suspicion further.

The social reality on the ground proved that colonial presumptions about ethnic groups and their purity and boundaries were wrong. By the end of 1928, when Evans-Pritchard proposed his research on the Nuer to the colonial Sudan government, they enjoyed a dubious reputation. They were imagined to have outstanding martial virtues or, in colonial jargon, to be brutal, savage warriors who were hostile to all foreigners – in particular to the Dinka, their "hereditary enemies". That this prejudice had a long history that dated back to 1839, when an Egyptian flotilla sailed through the Bahr al-Jabal to search for the sources of the White Nile (Johnson 1981), strengthened its discursive power rather than questioned it. Regardless of their complex history, the image of the Nuer and Dinka as hereditary enemies was raised again in recent times when their ethnicity became a subject of political articulation at the national level of (then still united) Sudan (Jok and Hutchinson 1999).

Acephalous societies can adopt many different forms, and their interactions with other societies are as multifaceted as their history. However, three things can be deduced from the anthropological classics: firstly, anarchy does not mean anomy. Of course, acephalous social orders may disintegrate as may any other social order – but acephalous societies are not drowning in chaos and disorder as Hobbesian views want us to believe. Secondly, acephalous social orders can exist in comparatively large settlements of several thousand people (Kramer 1978, 13ff.). Thirdly, anarchy does not mean that these societies are always at peace with themselves or others. It depends on how they are organised and how they situate themselves in the larger historical context. So, the anthropological standard model raises the question of how to conceive anarchy and acephalous societies without the institutional scaffold of checks and balances. There is no coherent social theory of anarchy – probably because it is impossible to conceive anarchic polities as political "systems".[13] The following three polarities do not constitute such a theory, either. They aim at being a methodological tool for further analysis. However, as with all methodology, the three polarities build on theoretical presumptions, which I will address briefly before looking at brief case studies that will illustrate what the respective polarity is about.

## Hegemony and autonomy

The polarity of hegemony and autonomy is central to acephalous societies. In descriptive terms, the dichotomy addresses competing attitudes and practices rather than well-defined political programmes or settled institutional frameworks. A conceptual clarification of what this polarity entails in analytical terms is helpful to further our understanding of acephalous societies. One has to keep in mind that the protagonists of acephalous societies do not aim at dissolving any form of social order, nor is anarchy a state of the social that exists in a pure form. Anarchy is not chaos as bourgeois prejudices claim. Anarchic social order unavoidably has to embrace opposing forces and contingencies – or it would harden and produce the same bedrock as other hegemonic regimes. It is always in the making and has to be created and recreated continuously. The tension that is marked by the two terms *hegemony* and *autonomy* can adopt many discursive as well as institutional forms that are created and sustained by people as individuals as well as by collective actors. The polarity also circumscribes an empirical and analytical task.

One example may suffice to illustrate this flexibility. The centuries-old strategy of opting out of domination, of authoritarian regimes, empires, and states by moving into marginal areas – sometimes unfavourable for the basic economic activities and

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13   Barclay (1998) asserts the lack of social theory and so do Morris (1998; 2005), Graeber (2004), High (2012) and Macdonald (2012).

the livelihood of the people – did not end with the colonial partitioning of Africa and its postcolonial consequences. Very much as some elements of statehood are still performed in stateless regimes (Förster 2012), anarchic modes of social organisation can and often do persist under the surface of weak statehood. Today, there are again stretches of land or sometimes urban neighbourhoods that have bred their own, largely acephalous ways of organising social life. Many parallels with the colonial past could be drawn: oftentimes, the elites of postcolonial states have only a limited understanding of the social and political realities in such areas, and so do many development agencies who, very much as the colonial administration in the case of the Nuer, still believe "that some sort of chief with administrative and executive powers" (Johnson 1981, 514, above p. 3) must exist.

Small communities may move into areas disadvantaged by nature – very much as the hill farmers in the Jos Plateau in Nigeria and the Adamawa highlands in Cameroon moved up to the hills in the early 19th century, cultivating the stony soil and bearing a hard but free life while leaving the more fertile, wet land of the river plains to the mounted soldiers of Usman dan Fodio and the emerging Sokoto caliphate (Netting 1968, Fricke 1979, Waters-Bayer and Bayer 1994). There is much more continuity to such practices and the will to remain autonomous than ordinary social science research acknowledges. For centuries, anarchy had to articulate itself in opposition to hegemony or attempts to establish hegemony – and it has to do so more than ever in a world where states claim to cover the entire habitable surface of the earth. No matter how far or close spaces under domination may be, acephalous societies today must situate themselves in relation to these and must articulate their own claims to anarchy in a way that creates free, open space so that they can emancipate themselves from attempts to establish centralised political institutions. Anarchy also exists in cities and in huge urban agglomerations, where acephalous social orders may emerge in neighbourhoods in which the state or its subsidiaries have no interest or the means to establish centralised structures of domination. Spontaneous settlements in areas of deficient infrastructure are but one example from Latin American cities such as Lima or São Paulo.

However, the polarity of hegemony and autonomy is not forced upon acephalous societies from the outside. In all acephalous societies, hegemonic tendencies may emerge from within. "Big men" may usurp more and more power during their lifetime. Some may manipulate the institutions that once limited their power in their own favour, eventually converting them into pillars of an authoritarian regime. Hegemony and autonomy are neither ready-made institutional configurations or institutional settings that could be defined in abstract terms as a sociostructural equilibrium, nor are they elusive discursive practices only. They are social practices that may, under certain conditions, sediment into social structures – but it would be misleading to reduce them to such structures. Hence the difficulties in theorising them in conventional terms or in reducing them to economic incentives (for hegemony, see Laclau and Mouffe 2001; Butler, Laclau and Žižek 2000).

It is unsatisfying to reduce hegemony and autonomy to the axiomatic values of the respective societies as Clastres (1974) and, to some extent, Scott (2009) have suggested. They are neither given facts embedded in a primordial culture, nor are they an unchanging part of the people's identity. Hegemony and autonomy are rather political imaginaries of the social, constituted by the agency and discursive articulations of the actors and the historical situations that they had to face. As political imaginaries, they thus mirror the dialectical relationship between political discourse and the collective experience of the social. Anarchic social orders have to embrace contingencies and need flexibility to survive. The two ends of the polarity are better conceived as situational – sometimes short-lived, sometimes long-lasting – orientations of social practices towards specific social goals: freedom from domination or not to be governed on the one side, and stable societal and political regimes of domination on the other.

However, building on this background, such political imaginaries may acquire a normative stability that could be characterised as an ontology – that is, as a figure of thought and practice that is difficult to translate into other images and practices.[14] As collective intentions and imaginaries, hegemony and autonomy can inform a growing variety of social practices and then coalesce in regimes that remain stable until they no longer satisfy these imaginaries. The struggles between the two tendencies may thus lead to the end of an acephalous order, replacing it by other, centralised regimes. Keeping hegemonic tendencies and attempts to establish outright authoritarian regimes at bay is a challenge that anarchic societies cannot address solely with an institutional setting of checks and balances – the contingencies and uncertainties that such a social order unavoidably has to embrace are too imponderable.[15] It has to address the agency of those collective and individual actors who pursue hegemonic aims and who may be very inventive in finding new ways to circumvent existing checks and balances – very much as hegemonic regimes try to keep the "chaos" and "disorder", which they would associate with anarchy, at bay. Anarchy thus has to be flexible and must be ready to transform its social organisation whenever the respective tendencies need to be answered: plus ça change, plus c'est la même chose.

## Flow and closure

From a long-term perspective, moving from one form of acephalous social order to another is probably the rule and not the exception, as the standard model of institutional checks and balances suggests. Acephalous societies can be very creative in inventing new anarchic forms of social organisation, and their formation is very rarely predictable. Scholars such as Clastres (1974) argued that anarchic social formations would not transform into centralised regimes unless they are forced to do so (Diamond 1974).[16]

A prominent exception is perhaps the Kachin of highland Burma (present-day Myanmar). Edmund Leach's (1954) seminal study describes their political regime as oscillating between two states: centralised polities on the one hand and acephalous social order on the other. Leach's book was partially written as a critique of the standard model which is, says Leach, ahistorical, too static, and too focused on an equilibrium of forces: "It is the thesis of this book that this appearance [of equilibrium] is an illusion", he writes (1954 [1964, x, also 4–8]). In his depiction of the Kachin, their social order moves in a cycle between a hierarchy of lineages called *gumsa* and *gumlao*, an acephalous social order where the chiefs lost most of their power to egalitarian communities. Leach argues that the breakdown of the centralised gumsa chieftaincies at the end of the 19th century was due to latent, inner contradictions of the social order, in particular the inconsistency of lineage status and lineage affinities. As with Evans-Pritchard's Nuer, Kachin society is based on segmentary lineages but, in the gumsa state, they are ordered into a strict hierarchy of slaves, commoners, and aristocrats. As in acephalous societies, these lineages are linked by generalised marriage exchange, which generates affinal ties that eventually undercut their hierarchy. The struggles between warring parties provoked

14    Ontology is a debatable term and the subject of an intensive discussion in anthropology (*e.g.* Bessire and Bond 2014, Holbraad and Pedersen 2017). In a comparative, anthropological understanding, ontology is neither a claim to a state of being nor a claim to some distinct reality as such. I use it mainly as a reference to the work of Descola (2005) and his third ontology of social ties and his fourth of theories of otherness.

15    Western liberal democracies are currently facing a similar challenge. They have to face illiberal tendencies in many parts of the world and are becoming increasingly aware that the already-existing institutions of settled Western democracies may not suffice to sustain liberal regimes.

16    This argument is again a critique of late Hobbesian, Western presumptions that political power and the will to dominate are universal (see also Gil 1998: 236.6–7).

gumlao upheavals and finally brought the gumsa order to an end. In this reading, the emergence of the gumlao social order would be the outcome of decline and political disintegration (Nugent 1982).

The novelty of Leach's take on anarchy and domination is perhaps best summarised by himself: "Unlike most ethnographers and social anthropologists, I assume that the system of variation as we now observe it has *no* stability through time. What can be observed now is just a momentary configuration of a totality in a state of flux. Yet I agree that in order to describe this totality, it is necessary to represent the system *as if* it were stable and coherent" (Leach 1954 [1964, 63], emphasis in original). Hegemony and autonomy were linked by a systemic, constant interaction that, under certain historical circumstances, brought one or the other side to the front. As a system, gumsa and gumlao depended on each other and would best be conceived as a pair. Leach thus relegates the question of stability to another, higher level – which caused some confusion in the interpretation of his argument. Interestingly, he goes on to argue in part II of his book that the Kachins of the gumsa persuasion share imaginaries of how their society should function – an image that puts hegemony first.

The counterargument to Leach's gumsa/gumlao cycle is not that it overemphasises the role of contradictions and instability in the formation of political order – it surely does not. The problem is rather whether his depiction of Kachin social order still construes it as "a finite 'object' for study and analysis" (Nugent 1982, 524), or whether his analysis reflects the actors' ideas of social order as a social imaginary that guides their political practice. In that case, gumsa and gumlao would hint at moments of closure when the actors were trying to stabilise a state of the social that, to some extent, satisfies their normative expectations. So, the real problem lies elsewhere, namely in the origin, reproduction, and lasting co-existence of these normative social imaginaries or, in other words, their ontologies. How is it that anarchist political imaginaries persist in contexts where hegemonic orientations are as prevalent as they are in the Kachin hills of northern Myanmar? Or in strong states? Even the most intensive interaction with centralised political regimes does not seem to affect them. Of course, this essentialising "ontological" take on anarchy is problematic and leaves many questions unanswered. At the very least, Leach's book shows clearly that acephalous societies are not isolated entities that can only survive where centralised polities have no interest in conquering and dominating others. There is a constant flow of goods, people, and ideas between areas and spheres where anarchy prevails and areas under state domination.

Another case may further help to conceive the polarity of flow and closure. Northern Côte d'Ivoire has long been identified as an area of acephalous societies. For centuries, its geographical location at the margins of the old, mediaeval empire of Mali left enough leeway for social and political plurality. From a linguistic and ethnic point of view, the area was never homogenous. The "people of Mali" living in the northern savannahs of Côte d'Ivoire summarised local agriculturalists under the somewhat pejorative term "Bamana", which was translated as "those who refused to be governed" and later "those who refused God".[17] The term pointed to their peasant life and their acephalous social structure. Their anarchy became a challenge for many conquerors, including Samory Touré, the last founder of a Manding empire, then the colonial and later the independent state.

In northern Côte d'Ivoire, "Bamana" was a generic label mainly used by Muslim merchants. As an umbrella term, "Bamana" covered several languages and ethnic identities. The biggest group were agriculturalists who spoke Senari or a variation of it. They were later inscribed in the colonial archive as "Senufo", again a foreign appellation coined at the end of the 19th century when the first colonial officers were asked by the

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17    On the history and problematic ways of naming the Bamana as an ethnic group see Bazin (1985), MacDonald (2015). Both understandings are popular interpretations and not based on documented etymologies.

central administration to register the ethnic identity of the population under French domination. At the time, the wars of Samory had just ended and many Senufo farmers had sought refuge in bigger, fortified villages to defend themselves against the conqueror, who was infamous for his ruthless and violent treatment of "heathens". Such movements to avoid domination were not new, nor was this the last time that they happened.

By the end of the 20th century, roughly a hundred years after the wars of Samory, the north of Côte d'Ivoire experienced a political and economic downturn. Many public services withdrew from much of the area. In particular, security was no longer provided by the police and gendarmerie, who enjoyed the dubious reputation of being corrupt to the bone. They were seen as robbers authorised by the state, who acted only on behalf of the rich and the powerful (Förster 2010). During this time, a movement away from state-controlled towns intensified and led to the foundation of new hamlets and villages in formerly uninhabited or very sparsely inhabited areas. Oftentimes, these settlements were difficult to reach. There was virtually no infrastructure, only narrow pathways and wooden, timbered overpasses across streams and rivers. Civil servants working in town offices had no, or only fuzzy, knowledge of these villages. In addition, the settlers tried to make their settlements invisible to outsiders, in particular the state and its subsidiaries. The incipient civil war reinforced these movements further in 2002 and the following years. Being invisible to the administration and later to the insurgents who controlled the northern half of the country from 2002 through to 2011 meant that these settlements could distance themselves from the violence around them. They were havens of peace during the years of the military conflict (Förster 2018). Once in a while, itinerant traders passed by to sell industrial goods and even took orders if they were unable to provide what their clients had asked for. Small tricycles of Chinese production were the means of transport in the bush. The villages were "remotely global" (Piot 1999) – and yet, they were not controlled by the state or the insurgents, and more often than not, were not even known to them.

Being left to themselves, the settlements bred their own anarchic forms of governance. The social organisation of the Senufo had largely been acephalous and resembled that of the Konkomba, another agricultural people living in northern Ghana and Togo (Tait 1953, 1958). Village chiefs had no real power. As successors of the first settlers, they were earth priests and ritual specialists who had to mediate access to land between new migrants who wanted to settle in a village and the beings of the wilderness, the "bush spirits" who were the real owners of all land. Accommodating people of different origin, culture, and religion, often speaking different languages, meant that neatly integrated lineages and their alliances could not provide the backbone of social order. In the beginning, these hamlets were tiny, sometimes consisting only of a few shelters. But when they grew, they became compact villages. The composition of the population became increasingly heterogeneous and often changed quickly according to how the flows that linked the settlements to the world evolved over time. There was a constant movement of people and commodities. If the village was big enough, the first settlers were sometimes seen as chiefs, but conflicts over power arose more or less regularly when a "chief" usurped more power than his ritual function as earth priest involved. Such men were met with what one may call anarchist distrust.

However, many of the bigger villages had and still have a core population that is fairly stable. They settle conflicts before they turn into violent clashes. Social practices mediate between warring parties, or at least draw a curtain over them. One way of doing so is to avoid outright confrontation, which often means not seeing or hearing personal or group offenses and not speaking about possible consequences. This seems to contradict all modern psychological advice, but it is a widespread social practice, which means that these societies tolerate more "deviant behaviour" than polities with strict laws. Thus, the interplay of hegemony and autonomy may not turn into a public issue – and it also does not become visible to outsiders. As most of these settlements try to protect themselves against outside interventions, being socially invisible is an important advantage for

such "peaceful" villages because they will not attract the attention of strangers with hegemonic agendas.[18] "Closure" here means that such social practices foster a sociality of tolerance within the community that is largely invisible to outsiders.

## Individual and collective agency

The last polarity addresses sociality in anarchic societies, particularly in regard to the formation of individual and collective agency. Many outsiders presume that anarchic societies breed highly individualistic attitudes towards the social and that larger, collective intentions very rarely emerge, if at all. Such presumptions are again related to Hobbesian prejudices about human nature: if people are not coerced into larger social bodies, they will only act on behalf of their own, individualistic interests and not develop any collective agency – but empirical research proves otherwise.

If any society could be described as truly acephalous and "egalitarian", it would be hunter-gatherers (Lee and Daly 1999, 4). Ethnographies of their sociality come, for instance, from the Mbuti in the Central African rainforest (Turnbull 1961), the Hadza in the Tanzanian savannahs (Marlowe 2010), or the Semai of Malaysia, who combine hunting and fishing with cultivating grain crops (Dentan 1968). Hunter-gatherer societies are composed of bands that are characterised by a constant process of fission and fusion. Exchange with the wider world was certainly less common in precolonial times, but the composition of bands was very rarely stable, nor was it reduced to members of only one kin group. Their kinship system allows them to grant outsiders and unrelated individuals kin status, often misunderstood as "real" kin (Hill *et al.* 2011). Locality and personal affinities were more important than strict kin relationships (Ingold 1987, 165–197). Such acephalous social orders seem to have also existed elsewhere in history, and some examples come from early farming communities with several thousand inhabitants (*e.g.* Çatalhöyük, Pilloud and Larsen 2011).

The largely autonomous villages presented above show a similar process of fission and fusion. Though the principle of unilineal descent is recognised by most people, it is constantly adapted to the circumstances of the current situation and the locality. Switching between matrilineal and patrilineal descent is not exceptional and, because of this flexibility, such settlements can easily accommodate people from elsewhere, while sedentary lineage societies very rarely allow such flexibility. According to Marxist models, the control of the workforce of the descendants is more important (Terray 1969). There are more differences between foragers and village societies today: while incoming members of historic hunter-gatherer bands shared by and large the same cultural background, the contemporary savannah villages often must – and do – integrate people of a different culture. Comparing hunter-gatherers with today's self-governed settlements reveals interesting parallels and differences that may further a theory of acephalous social order.

In an insightful general characterisation of forager societies, Tim Ingold wrote that their distinct sociality subverts "…the very foundations upon which the concept of society, taken in any of its modern senses, has been built" (Ingold 1999: 399). Ingold meant that the absence of corporate groups and the lack of definite social borders did not allow them to imagine themselves as a community, an ethnic group,[19] or, more generally, as a social entity. They were certainly imagined by others as distinct communities, but the insiders'

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18   Since 2015, I have visited five settlements in areas that are not controlled by the state. The tiniest hamlet had four houses and was inhabited by two related families. The biggest village consisted of 101 compounds, each consisting of three to four houses.

19   Or a nation if one understands a nation as an imagined ethnic community with a state (Anderson 2006, Eriksen 2002).

perspective focused on social relations and localities only. In that sense, foragers had no society – which surprisingly echoes recent developments in social theory. Globalisation dissolves, many sociologists claim, the borders of societies and thus leaves the social as a sphere of flows and mobilities (*e.g.* Urry 2003). Such parallels may be far-fetched, but the "distinct modes of sociality" that Ingold attributes to forager societies seem to be much more widespread than anthropologists thought. Charles Macdonald (2012, 55–56) argues that such forms apply to acephalous horticulturalists[20] as well. One may conclude that they are less a phenomenon of hunter-gathers than the anarchic social order at large.

Macdonald characterises this sociality as "gregariousness, immanence and unmediated interpersonal relations" (Macdonald 2012, 56), while Ingold looks more at the principles that inform it: "immediacy, autonomy, and sharing" (Ingold 1999, 408). Immediacy and gregariousness are indeed key elements in the formation of basic social and personal trust and collective agency. Sociality emerges from interactions that comprehend everything from the subtlest twinkle of facial expressions to bold bodily exchanges. In that sense, sharing does not only mean that property rights or access to resources such as food and tools – important though they may be – are shared, it also means the sharing of activities. Eating together is the most obvious example of sharing that is not reduced to its material dimension. Food is not only eaten by all participants – the act of eating together is a social practice that creates trust in others. In many societies, the end of hostilities and the return to peace were sealed with a shared drink or meal. Refusing to share a meal with others is a rude rejection of sociality – in almost all societies.

"Unmediated interpersonal relations" in Macdonald's words means to share activities or simply doing something together. Such sharing creates trust and collective agency as much as the sharing of objects. The more familiar one becomes with the acts of others, the more one will be able to engage in an empathic relationship with them. As the social is constantly adapting to the current situation, the actors will learn more about each other than in strictly organised hierarchical societies where social roles are predefined by institutional settings. Basic social trust is often understood as the generalisation of personal trust that we have had with many others. This understanding focuses on the experiential dimension of trusting, but the projective dimension of trust that informs collective agency is more relevant here. When more people as social actors trust that a particular place is safe, the safer it is. Trust creates social spaces where people can peacefully engage in interactions with others. Hence another feature of anarchy; a peaceful social life. Although violence and war are not foreign to acephalous societies, as the Nuer and the Dinka show, many more mitigate conflicts in a non-violent way (Fry 2007; 2013, 241ff.; Pim 2009).

A more intricate issue is normative trust; that is, trust that violations of norms will be sanctioned. If sanctions are executed by some superior institution, for instance, the state and its executive authorities, trust that norms will be respected is transformed into institutional trust. The police and the judiciary are institutions that one may trust because the society has delegated the sanctioning of norms to them. This form of trust is what modern societies and their states build on. In an acephalous society, such institutions are absent but norms and sanctions do exist. They are not delegated to an apparatus of domination.

An example from my own fieldwork may suffice to illustrate this point. A middle-aged married couple lived in my neighbourhood. The two of them were rarely on good terms, and loud quarrelling frequently suffused the compounds. One day, the wife was pounding maize in a mortar in front of her door while her husband passed by. She took

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20    Macdonald builds on his own work on the Palawan in the Philippines and on Thomas (1989) on the San in the Kalahari Desert, Turnbull (1961) on the rainforest Mbuti, Stauder (1971), (1972) on the Majangir in the Ethiopian mountains, and Dentan (1968) on the Semai.

her heavy wooden pestle and hit the back of her husband's head from behind. The man fell and lay motionless on the ground. Two other women who were working nearby came running, but the man had already lost consciousness and died a few minutes later. The case was immediately reported to the elders of the two families as well as to the chief and the earth priest of the village. The latter convened a meeting of elders who were experienced enough to judge such a case, as he himself would not be able to sentence anyone. The woman defended herself by claiming that her husband had insulted her, resulting in her becoming so furious that she no longer thought about what she was doing. The elders decided not to report the killing to the gendarmerie. The woman was not sentenced to any formal punishment because "her husband had been unfair to her before". However, the earth priest urged the family of the woman to give him a goat to sacrifice over the place where the village had been founded so that peace would be restored. That was done. The woman remained in her house but she was no longer "greeted", which, in local parlance, means that nobody communicated with her. Her children were an exception; they brought her food and sometimes gave her tiny amounts of money. Being isolated in a village where gregariousness and immediacy of daily encounters dominates social life was the real sanction of her crime. She never saw a prison from inside but, in a way, her isolation was not far from being one.

## Tracing anarchy through time and space

Political regimes may acquire – as do other social regimes – a certain institutional inertia. Ways to bargain over power and political influence and to negotiate how individual as well as collective social actors will want to live together can turn into habits and eventually adopt the form of an institutionalised practice. However, political debates are very rarely, if ever, exclusively bound to the representational sphere of such institutions. Political regimes are rarely as coherent and orderly as their protagonists may believe. Of course, certain actors will have an interest in making others believe in the stability and reliability, if not the superiority, of a particular political regime, but such claims are regularly questioned by those who are easily labelled as "opponents". Illiberal regimes make enormous efforts to control such dissenting views.

Politics in acephalous regimes have other reference points and foster other articulatory practices than centralised hierarchies. Speaking in general, such regimes lack not only the central institution of a feudal court or a state – they are characterised by the absence of the totality of an overarching imaginary of domination and dominant political institutions. Nodal reference points of political discursive formations are situational and emerge only when the actors begin to articulate their interests. They dissolve again when that articulatory practice fades out. In other words, in acephalous regimes, it is hard to establish hegemonic discursive formations, let alone institutions, to which actors would need to refer when articulating their interests and claims.

That does not mean that ambitious individual or collective actors will not try to overcome the structural hurdles that such regimes have for them. Acephalous social orders are challenged by attempts to establish some sort of hegemony. Anarchic social figurations thus reverse the usual political game: the challenge is not so much to implement some sort of hegemony – it is rather to avoid it. Of course, they may oppose the state and engage in Clastres's (1974) "barbaric attitude" against all forms of domination but, at the end of the day, they would not draw their motivation only from what they do not want. Their collective agency builds on a positive imaginary of how they will want to live (Pim 2009). The dichotomy of domination and resistance is unsatisfactory, as it does not address the emic, local images of an acceptable, just political regime that suits their own normative ideas of how such a social order should look. It presumes a totality that is not theirs.

Most hunter-gatherers, for instance, do not think of themselves as members of a bounded society. Unsurprisingly, foragers lack the collective imagination of themselves as an entity or a totality that could be conceived of as a collective actor (see above). They lack the notion of "society" as an imaginary institution (Castoriadis 1975). As a highly flexible social formation with no boundaries, hunter-gatherers are beyond the imagination of other societies, particularly modern societies and nation states as imagined communities (Anderson 2006). Foragers' collective imaginations of the social follow another "onto-logic" that is incompatible with Western thought. Such ontologies of others are autonomous to hierarchical political regimes. Autonomy is more than independence: it is self-governance as the collective capacity to make uncoerced decisions to solve social problems. Hegemony as its opposite would mean that such decisions would partially or entirely fall under the regime of another ontology. In line with Gramsci, hegemony is not mere power and eventually the violence of the state – it is alienation by another ontology (Flank 2007).

Such ways of "thinking the social" in different terms may come under pressure by individuals who seek to dominate others, by groups and institutions, and finally by those who perceive and conceive such social formations as objects of possible domination. The making of "big men" in New Guinea is a famous example of how largely acephalous societies may temporarily turn into more or less centralised polities under the hegemony of one man (Godelier 1982; Godelier and Strathern 1991). But the hegemony of a "big man" dissolves when his performance weakens. No one can inherit the position of a "big man"; each man crafts his own success. There is no institutional continuity, and is hence significantly different from chieftaincies (Sahlins 1963; Lindstrom 1981; Strathern 2007), while the oscillating regime of the Kachin builds on another normative political imaginary (see above). They have different political ontologies: individual hegemony is acceptable to many New Guinea people, but institutional hegemony is not. The Kachin accept temporarily ranked lineages but no "hereditary aristocracy" as their Shan neighbours do. In all cases, the relationship of hegemonic to autonomous intentions is distinct and constitutes different sets of political articulation.

Ontologies can be blurred and opaque to the actors, as political regimes may not be what they pretend to be. Many "weak" states claim that they hold power over their populace while they lack the means to foster a reliable social order or to organise public space (von Trotha 1995). Turning into Geertzian "theatre states" (Geertz 1980), they may perform statehood through drama and ritual rather than building "real" governance. Being more states of imagination (Hansen and Stepputat 2001), they may demonstrate their stateness by limited interventions in specific social fields rather than by an agenda of governance. In such settings, implicit and largely normative juxtapositions of state *vs.* non-state are not helpful. They may point at stark contrasts between settled political regimes, but they do not lead very far in the analysis of actual regimes and their complex transformations on the ground. Very much like states, anarchic regimes may be opaque to others, who may just assume that these people simply "resist" state domination.

Anarchic social orders channel conflicts, but they also channel the distribution and consumption of tools, utensils, goods, and commodities. The social has material dimensions, and tracing the flow and distribution of things in time and space discloses how acephalous regimes create, conceive, and order the material world. Sharing in gregarious sociality leaves other traces than ceremonial offerings to a "big man" or a powerful ruler. Their materiality, often evenly distributed and shared by many, is part of the normative political imaginary – very much as the regalia of a king are part of the image of his sovereignty, divine or otherwise.

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# Negotiating power in Neolithic communities: The politics of cohabitation

Martin Furholt

## Abstract

*This paper explores the reasons why the classical political economy narrative on the development of social organisation shows such a mismatch with the archaeological record of Neolithic Western Eurasia. I identify several flaws in the political economy model: faulty premises, a skewed perspective focusing on elites while neglecting bottom-up agency, and a misrepresentation of structural conditions, namely the ideas about sociospatial systems, the scarcity of resources, and the nature of power. As alternative models of structural conditions more in accord with the archaeological record, I propose translocal, socially fluid compositions of Neolithic social groups. Drawing on Hannah Arendt's concept of power and violence, I propose that, during the Neolithic, we have to assume a prevalence of forms of power that are based to a much higher degree on collective consensus and to a much lesser degree on coercive domination, due to the lack of means of coercion and the strength of bottom-up counter-agency. A case study from Early Neolithic LBK settlements is used to illustrate how these newly defined structural conditions, and the integration of a plurality of actors and interests in social negotiations and conflict in specific historical cases, explain the diversity of outcomes in addition to overall trends, such as the absence of sustainable systems of stratification during the European Neolithic.*

*Keywords: political economy, Neolithic Europe, translocality, power theory*

## Introduction

There are a number of very popular books that present a narrative of the development of social organisation from Palaeolithic hunter-gatherers up to our current globalised societies (*e.g.* Diamond 1998; Flannery 2014; Fukuyama 2012; Harari 2015; Mann 2012). These books regularly – some more explicitly than others – present a teleological, Eurocentric account of continuously rising social complexity and stratification, in which they regularly identify the Neolithic as a period of decisive change; a period that laid the basis of stratification and statehood (see Graeber and Wengrow 2021 for a critical discussion). It is remarkable how little the actual state of knowledge of the Neolithic archaeological material is acknowledged in these accounts, let alone that it could actually play a role in the construction of the narrative. On the contrary, the Neolithic is characterised very much as it was centuries ago, for example, by Lewis Henry Morgan (1877) or Friedrich Engels (1884), as the period in which, through the invention of food production and sedentism, private property was invented, and the storage of wealth created social inequality, conflict, and war, which then formed the basis for the

development of sociopolitical stratification and, finally, statehood. The reason this story is repeated over and over is, besides the fact that those authors usually have very little access to the current state of knowledge in archaeology, that it quite strictly follows what one could call the classical political economy narrative, which is behind both the liberal and Marxist views on human history – the two most dominant worldviews among current historians and social scientists.

This teleological worldview brushes over the more than 5000 years of the Neolithic period without paying much attention to the actual empirical evidence. The narrative employs a model that focuses on the material consequences of a delayed return economy, storage, and restricted access to grain and arable land, and thus predicts the emergence of inequalities in relation to access to land or material resources, and the establishment of forms of social stratification during the Neolithic (as discussed in Furholt *et al.*, 2020a). And indeed, these kind of arguments are compelling. After all, is not the necessity to restrict access to land or stored grains clearly creating the opportunities for monopolisation and accumulation by some, thus laying the groundwork for a fundamental rigging of the playing field? Do not the first large population agglomerations in single village or proto-urban settings such as Catalhöyük or the Tripolje megasites (Hodder 2006; Müller *et al.* 2016; Ohlrau 2020) during the Neolithic even necessitate some form of centralised political government? This absolutely makes sense, and thus it is even more remarkable that, empirically, there is not much convincing evidence that those things actually happened in those particular cases. We know what an established social stratification looks like in the archaeological record. In Europe, during the Mediterranean Bronze Age, there was a combination of clearly differentiated settlements, both internally and regionally, and rich individual monumental burials (Lull *et al.* 2011; Younger and Rehak 2008). In the temperate European Iron Age, we find extraordinarily rich individual burials and clearly centralised settlement systems, together with clear indications for differentiated diets between the inhabitants of sites with a more or less elevated status (Fernández-Götz 2014; Krausse *et al.* 2016).

By contrast, during the Neolithic period, possible indications of social stratification are scarce, and spatially and temporally isolated. One might point to some of the megalithic structures in western Europe (Scarre, 2011), early long barrows of the Passy type (Chambon and Thomas 2011), or similar structures in Germany (Gronenborn *et al.* 2018), or "Copper Age" cemeteries, such as the necropolis of Varna (Ivanova 2008; Krauß *et al.* 2017), but these cases are all restricted to the realm of burials and cannot be connected to any kind of equally differentiated evidence from the settlement record. They are also relatively short-lived and do not in any case represent a durable or sustained system of social stratification. By contrast, even in the largest settlement agglomerations, such as the central Anatolian Çatalhöyük, or the Tripolye megasites, in which thousands of people lived together, signs of political stratification are conspicuously absent (Chapman and Gaydarska 2017; Hodder 2013; Hofmann *et al.* 2019; Wengrow 2015). And apart from these few cases mentioned, 99% of all the Neolithic communities studied show few or no signs of social stratification (Furholt *et al.* 2020a). Many authors try to maintain the idea of a constantly rising social stratification, either by biologisation (*i.e.* alluding to dominance behaviour as part of what is thought to be "human nature" [Ames 2010]), by the conflation of complexity with hierarchy (Price and Bar-Yosef 2010), or simple assertion (see the books cited above). Often implicitly, the findings of rich burials or complex settlement structures at individual sites are taken to indicate an overall level of stratification reached, thus placing them into a generalised teleological scheme.

## Three flaws in the popular political economy narrative

However, while there can be a legitimate discussion about the forms and scale to which phenomena of material inequality and social stratification might be present in some Neolithic contexts, there is no way around acknowledging this remarkable millennia-long absence of the predicted social effects of the Neolithic mode of production. Even if we reject the teleology from the start, it is interesting to further explore the flaws in the model. I would argue that these flaws can be found on three different levels: faulty assumptions, a skewed perspective, and misrepresented structural conditions.

The first flaw, faulty assumptions, stems from the essentialising of our modern western prejudices about "human nature" (Sahlins 2008) and community (Barth 1982; Gupta and Ferguson 1997; Joyce and Gillespie 2017). Especially the elevation of modern forms of rationality to universal status, and thus its projection into prehistory can easily be rejected, from both an anthropological (Sahlins 1972, 2008; Descola 2014) and a psychological perspective (Hrdy 2011; Tomasello 2009). The dominance of the idea of *homo eoconomicus* springs from our Western capitalist ideology, which overemphasises individual egoism, aggrandisement, and competition, and underemphasises sociality, empathy, communality, and solidarity among humans. Private property, profit motives in social interaction, and competition are far from being universal concepts or forms of behaviour (Hann 1998; Widlok 2016). A second misrepresentation springs from a skewed perspective, with an overemphasis on a top-down view on the development of social organisation, focusing on elite competition and elite abilities to muster followers (Earle 1997) but neglecting other groups within societies, lineages, clans, neighbourhoods, and their abilities to cooperate, share, and provide mutual aid, or their abilities to engage with top-down elite attempts to concentrate power, to evade, resist, or negotiate with top-down actors (Furholt *et al.* 2020a). In order to understand the development of sociopolitical systems in individual communities, a broader array of agencies has to be accounted for. Here, the idea of dialectic and heterarchical social organisation is helpful (Crumley 1995; McGuire and Saitta 1996; Saitta and McGuire 1998). More recently, collective action theory has emphasised the negotiation power of subgroups within the community (Blanton and Fargher 2008; DeMarrais and Earle 2017), while anarchist anthropology (Amborn 2019; Clastres 1989; Graeber 2004; Sigrist 1967) and anarchist archaeology (Angelbeck and Grier 2012; Borake 2019) point to the importance of bottom-up agency.

The third flaw is the misrepresentation of the structural conditions of economic and social organisation during the Neolithic. These, I argue, are flawed on at least three levels: namely, in connection to concepts of sociospatial organisation, scarce resources, and the nature of power.

## Sociospatial organisation

A crucial variable in the modelling of economic and political interaction is the spatial organisation of social groups. Unfortunately, this has not been sufficiently acknowledged when it comes to the European Neolithic and European prehistory in general. Although there has been some explicit work showing the opposite (Furholt 2018; Gerritsen 2003; Hofmann 2020; 2016), the idea of stable, socially bounded settlement communities is the mainstream position – the default assumption in European archaeology – even though everyone is well aware of the constant expansion of Neolithic ways of life, as well as the remarkable connectedness of European Bronze Age societies. This notion of bounded, internally coherent social groups is a blatant misrepresentation of most of the sociospatial organisation during the Neolithic, with severe consequences for

our model of political economy. Contrary to mainstream views, in most cases where a local settlement community has been studied, isotope and aDNA data indicate the cohabitation of people with diverse patterns of mobility, or biological relatedness (Bickle and Whittle 2013). Just to give a few examples, strontium isotope ratios showed that a significant number of individuals buried in the context of Early Neolithic LBK settlement communities had non-local signals (Bentley 2007; Bentley *et al.* 2003; 2002; Turck 2019), and that these were, in many cases, marked by differential burial patterns (Bentley *et al.* 2002; Zvelebil and Pettitt 2013). In Talheim, it was possible to find three different groups, each sharing biological kin and distinct mobility patterns (Bentley *et al.* 2008). In Karsdorf, the spectrum of mitochondrial DNA haplogroups on site was as diverse as the haplogroup spectrum connected to the entire transregional LBK phenomenon (Brandt *et al.* 2014). Cohabitation of people with different economic practices and different traditions of pottery manufacture could be found in Cuiry-les-Chaudardes (Gomart *et al.* 2015), and in Vaihingen/Enz (Bogaard 2011). All of this indicates that the intermixture of residence communities and the thus permeable or fluid social boundaries are not exceptions or anomalies, but should rather be seen as the default sociospatial configuration during the Neolithic period (Furholt 2018).

In the Late Neolithic, there is evidence for a comparable pattern in case studies focusing on burial communities. In the southern German Lech Valley (Knipper *et al.* 2017) and in the central German site of Eulau (Haak *et al.* 2008), a high number of individuals were non-local, and a great majority of them were women. The same pattern was found in Switzerland (Furtwängler *et al.* 2020), indicating population circulation (Schachner 2012). Studies of burial communities in the megalithic grave of Niedertiefenbach show a genetically diverse population (Immel *et al.* 2021), while in other cases megalithic burial communities could have been comprised of groups that were tied together more tightly by biological kinship (Alt *et al.* 2016; Sánchez-Quinto *et al.* 2019).

It makes no sense to assume a uniform sociospatial organisation for the span of the Neolithic period in Europe; it seems that, especially in the early (6500–4500 BC) and late (3000–2000 BC) periods of the Neolithic in Europe,[1] it would be more accurate to drop the default assumption of socially bounded, spatially stable communities and instead assume social fluidity and forms of population circulation to be the rule rather than an exception. Sociospatial organisation during the Neolithic is much closer to what in anthropology is called "translocality" (Gupta and Ferguson 1997; Greiner and Sakdapolrak 2013), or what Hillier and Hanson (1984) referred to as "non-correspondence systems", in which local social group structures are fluid due to a high rate of intersite mobility, creating strong transpatial or translocal relations (Fig. 1). Such a system is, as I have argued elsewhere (Furholt 2018), responsible for one of the most striking patterns visible in the archaeological record, namely the formation of relatively homogeneous regional styles and technological traditions such as pottery, tools, and house-forms, which are usually referred to as "archaeological cultures". Unfortunately, because of the ideological baggage connected to this concept (Furholt 2019), these "cultures" are usually conceptualised as expressions of an essentialised ethnic identity, and thus the mechanisms of their formation have not been further explored. Closer inspections of the material connected to these units generally reveal (Bickle and Whittle 2013; Furholt 2008; Müller 2001; Vander Linden 2006) a dynamic and heterogeneous "internal" patterning of the main archaeological find categories, and blurred and fluid "borders" that clearly indicate we are, in most cases, dealing not so much with bounded entities, but with a continuum of similarities and dissimilarities that is determined by the rate of local

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1    Acknowledging that terms such as "Early Neolithic" and "Late Neolithic" refer to very different time periods in different regions, here, "Early Neolithic" refers to the main period of expansion of Neolithic ways of life into Europe, which technically also continued long after 4500 BCE, and "Late Neolithic" refers to the period of 3000 to 2000 BCE, although this period is also often referred to as the "Early Bronze Age".
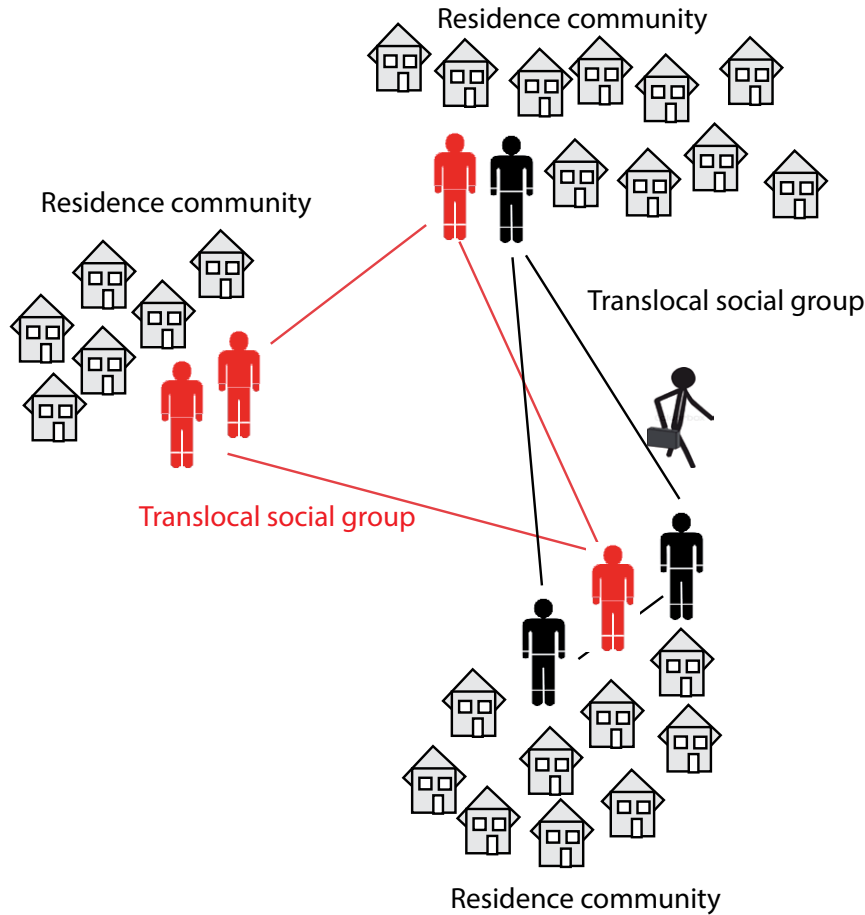
Fig. 1: Schematic representation of a translocal sociospatial system highlighting the connection between population circulation and fluid local social group composition (residential communities), resulting in strong translocal social groups, after Furholt (2018).

intercommunity mobilities and the way in which networks connected to these patterns of translocality change.

The strength of translocal social networks is, however, a crucial factor to take into account when we think about political economy, because it highly affects the possibilities of bottom-up agency and the negotiation power of individuals, households, or other small groups in the face of top-down attempts at an accumulation of power or political centralisation. Such decentralised translocal networks provided individuals or households with the possibility of mustering non-local aid in political negotiations, but also provided leverage through the offer of an alternative place to go to live (Angelbeck and Grier 2012; Furholt *et al.* 2020a). Also, Förster (this volume) emphasises that fluidity of social boundaries and intersite mobility are important means to counter centralised social control. In such a setting, any attempt at the accumulation and concentration of power by some will probably have to rely much more on persuasion or bribery than on coercion and domination.

## Scarcity of resources

At the basis of most modern economic theories, there is the idea of scarcity of resources, which is seen as a main driver for competition and markets (Porter 1965; Sadler 2010). The idea of a "Malthusian trap" – that population growth would inevitably surpass carrying capacities for resource production (Malthus 1798) – is clearly behind the classic political economy model. Newer approaches reduce this concept to the idea of more

selective bottlenecks of resources, which can be exploited by aspiring elites in order to gain power (Earle *et al.* 2015; Earle 2017). During the Neolithic period, population growth has been identified as a main driver of continuous expansion of a settlement area (Ammerman and Cavalli-Sforza 1971; Bocquet-Appel and Bar-Yosef 2008). Thus, we can probably speak about "population pressure" but, as Shennan (2018) makes clear, this is not to be understood as a situation in which local or regional carrying capacities would actually have been exhausted but, more probably, it created levels of social stress that motivated social fission (Leppard 2014; 2021). In other words, arable land or areas for animal grazing were probably never scarce in the Neolithic. What might have been scarce in certain situations could have been human labour; the workforce which, in a situation of fluid social boundaries and in a situation of constant expansion driven by fission and fusion, would actually provide a powerful leverage for bottom-up resistance to any top-down accumulation of power (Angelbeck and Grier 2012).

## The nature of power in the Neolithic

The third structural condition that is usually misrepresented in discussions about prehistoric political organisation is power. The main source of the confusion is the widespread failure to differentiate between power and domination, which is very often seen as more or less the same thing (Clastres 1989). It is crucial to look more closely at the nature of power and the different forms in which it works in order to better understand politics in the Neolithic. My point of differentiating between power and domination is close to Clastres's (1989) coercive *vs.* non-coercive power, but I have chosen to build my concept upon Hannah Arendt`s ideas because her theoretical approach to power is much more suited to an analysis of communities in Neolithic Europe (see also Lund *et al.* 2022). Conventional definitions of power, such as the one by Max Weber, are, in their overall conception, individual, confrontative, and dominance-based – Weber's definition being about making people do as one chooses, by whatever means necessary, including violent coercion (Weber 1922, 38). Indeed, while Weber does acknowledge "Herrschaft" (best translated as "rule", or "domination") to be only a subcategory of power, he then goes on to almost exclusively discuss the different forms of domination (Herrschaft). Such a concept of power clearly comes out of and is geared towards contexts structured by a state monopoly of coercive force to back up power. They are thus not well suited for prehistoric societies. By contrast, Arendt's concept builds upon power fuelled by collaboration and the mutual sharing of values, which are fundamental to any kind of community life. For her, power is not based upon violent coercion; in fact, she holds that power and violence are two very different phenomena and even famously states that power and violence are opposites (Arendt 1970, 56). Power, in Arendt's understanding, is the fundamental human ability to collectively act and the basis of all social interaction, which enables human agency and the existence of any form of society. By contrast, violence is defined as an instrumental force which, when applied, usually has the effect of destroying the possibility of human action. It can technically be perpetrated by one single individual, as opposed to the collective nature of power. In practice, Arendt concedes, power and violence always appear in combination, but their relationship is complementary. The more pronounced power is in a situation, the less violence is effective; the more violence is perpetrated, the more power diminishes. This helps define the difference between power and domination. It is helpful to think of it as two ends of a spectrum in which the relationship between power and violence is gradually shifting (Fig. 2). As Arendt writes, "The extreme form of power is all against one, the extreme form of violence is one against all. And this latter is not possible without instruments" (Arendt 1970, 42).
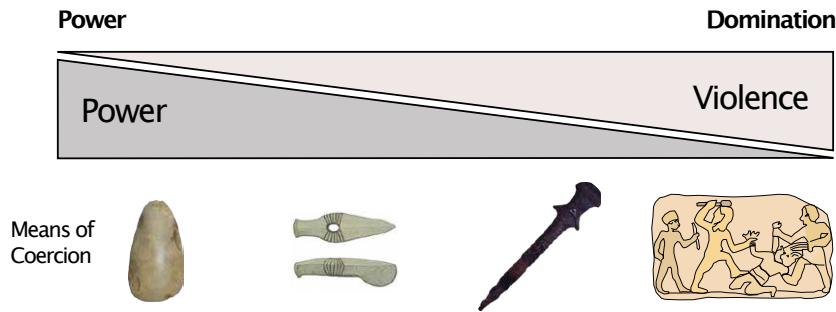
Fig. 2: Schematic representation of Arendt's concept of the complementary relationship between power and violence, translated into a definition of power *vs.* domination. Also indicated is the role of the availability of means of coercion in the differentiation between power and domination.

Domination is a form of politics that relies to a higher degree on violent coercion, but it is still always to some degree based on power and the possibility of mobilising collaborative action. Power, on the other hand is not, or only to a much lesser degree, based on the possibility and threat of inflicting physical harm. Anthropologists who work with societies without centralised governments in different parts of the world have reported that often, if in different ways, the idea of one adult giving another adult an order, or having to obey a command, is seen as offensive or ridiculous (Evans-Pritchard 1940; Sigrist 1967; Clastres 1994; Overing Kaplan 1975; Barclay 1996; Graeber 2004; 2007; Amborn 2019; Förster, this volume). Power in this case mainly rests on a collective acceptance and consensus, most likely guaranteed by internalised social norms. It is probably inevitable that the use of power in this way will be strongly connected to the forms of social relations between the actors. Thus, by definition, this form of power is socially embedded. Domination can also be socially embedded, but coercive violence often does, at least to some degree, replace social consensus and the reliance on internalised norms (see Clastres 1994; Amborn 2019 and Förster, this volume).

For domination to be successful, effective means of violent coercion such as weapons or combat training must be present, and they must be unequally distributed between actors. Equal access to the means of violence will likely, in the case of conflict, lead to a situation where it is ultimately the number of people one person or interest group can muster as support that will determine success; in other words, success is mainly dependent on power as it is defined by Arendt. More effective weapons, or training in their handling, will enhance the possibility of creating an unequal access to violence and coercion, which is the prerequisite for domination. Thus, the possibility of perpetrating domination is bound to the availability of weapon technology and the ability of actors to use them. As Arendt herself discussed, one single person with a powerful weapon could, theoretically, terrorise all other human beings into obedience. Yet even the most totalitarian and brutal forms of oppression and tyranny in human history have always relied on cooperating groups of people (Arendt 1970, 41). On the other end of the spectrum, even the most socially embedded and democratically governed societies, for example, the acephalous societies with a "structured anarchism" (see Förster, this volume), do ultimately include some "last resort" means of coercion (Amborn 2019, 88). This means that power and domination are not absolute terms but extremes in a continuum determined by the extent to which the use or threat of coercion determines social power relations.

For a study of prehistoric forms of power and domination, this is a crucial point. The argument I want to make is that, during the Neolithic period, possibilities for domination were extremely limited due to a lack of specialised weapons, a lack of specialisation in the perpetration of violence, and the lack of possibility for creating a clear imbalance of access to violent coercion. Prior to the Copper Age, which began in parts of Eurasia roughly around 4500 BC, specialised weapons are practically non-existent. A specialised weapon refers to a tool designed and produced to kill, injure, or threaten human beings. This excludes adzes or axes, spears, or bows and arrows, whose primary function was to be used as tools for hunting, woodworking, and other activities. For example, the large

arrowheads of the Early Neolithic in the Near East are often referred to as weapons (*e.g.* Cauvin 2000), but they clearly come from a tradition of hunting implements, which determines their overall shape, even if they could also be used as weapons in interpersonal conflicts. Maceheads have been discussed as specialised weapons, but also here a more "profane" function, such as hunting or fishing, is probable (Chapman 1999; Hamblin 2006). In Europe, the earliest maceheads are indeed mostly connected to hunter-gatherer-fishers in coastal regions (Biermann 2015).

Equally important as the fact that there are no sophisticated specialised weapons is the observation that there are no archaeological indications for specialised fighters, something very prominent in the burial ritual and iconography of later phases (Vandkilde 2006; Schulting 2013). While there is a rich tradition of figural representations during Western Eurasian prehistory, starting with Upper Palaeolithic cave art, armed conflict between humans is never deemed worthy of depiction, and neither are fighters. This dramatically changes after around 3500 BC, when weapons and armed individuals are increasingly displayed (Risch 2015). Since the later Neolithic, after 3000 BC, such armed individuals are also regularly displayed in the burial record, equipped with new tools that are specially designed as weapons, such as daggers, battle-axes, halberds (daggers shafted like axes), and swords. This is not a one-dimensional, linear development. For example, during the Late Neolithic in the Carpathian Basin (4800–4500 BC), shaft-hole axes are frequently deposited in male burials (Zalai-Gaál *et al.* 2012; Bánffy *et al.* 2013), and in the later southeastern European Copper Age we find similar combinations (Bognár-Kutzián 1963; Krauß *et al.* 2017). However, such regionally and temporally contained phenomena never reach the scale and durability that we can observe after the third millennium BC.

Specialised weapons, and the persons skilled in their use, create the potential for an unequal distribution of the capacity to use violence for coercion. Without them, an individual person, untrained in using a tool as a weapon (see Chapman 1999), will have difficulties coercing someone else to obey his or her commands. To a large degree, he or she would be dependent on collaboration with others – power – and this group of collaborators would probably need to be more numerous than those people they are trying to coerce. It would also be relatively easy for someone faced with such a coercive attempt to mobilise counterpower or resistance.

## The conditions for a political economy in the European Neolithic

So, my argument obviously does not claim that there was an absence of violence or warfare during the Neolithic (a claim that could be easily refuted: Bentley *et al.* 2008; Teschler-Nicola 2012; Wahl and Trautmann 2012; Meyer *et al.* 2015; 2018). Förster's (this volume) account of the feud among the Nuer as a political institution furthering internal integration and intergroup conflict settlement could serve as an illustration of one possible manifestation of such conflicts. But this example again emphasises the importance of collective power, even if these feuds rely on violence to some degree.

What my argument does emphasise, however, is that violent coercion could not have played a very big role in the politics of inner-community social interaction, due to the lack of the means to create an imbalance in the possibilities for coercion. Instead, social power will, to a great degree, have been of the kind Arendt refers to and which is described for acephalous societies, for example, by Förster (this volume) and Amborn (2019). Community-wide organisation and social interaction are built on socially established and widely accepted norms, and conflicts have to be solved in ways that keep this consensus intact, so violations of these rules were, in most cases, settled through remorse and compensation rather than corporeal punishment. Only in a few very severe

cases did ostracism or the death penalty represent coercive solutions (Amborn 2019, 88). This should not be taken to evoke a generally peaceful, harmonic, or egalitarian picture of Neolithic communities. On the contrary, especially if one takes the possibilities of bottom-up agency seriously, Neolithic communities will have been in a constant state of social negotiation, often leading to conflict. Most important, however, is that we widen our view from the traditional perspective focused solely on the elites, or aspiring chiefs, and acknowledge the existence of a plurality of different agencies, and the power these different actors have to actively take part in the shaping of social organisation.

Such ethnographic observations as referred to above (*e.g.* Amborn 2019, Förster, this volume) help us understand how low-coercion forms of social power might have looked in communities, and I would propose this as a kind of baseline for the Neolithic, without excluding that more coercive forms of social organisation and power relations might have evolved in certain historical contexts.

The three main structural conditions discussed here – the absence of domination, the translocal sociospatial setting, and the scarcity of labour instead of land – will probably have been obstacles to top-down attempts to gain and centralise social power, while at the same time strengthening the possibilities of negotiation, resistance, or evasion by other actors. In other words, the main reason the Neolithic way of life, the delayed return economy, the storage of resources, or even the social agglomeration of people into large settlement communities do not lead to the predicted outcome of established and durable systems of social stratification is that, during the Neolithic period, there were structural conditions that weakened the possibilities for top-down centralisation efforts and strengthened the possibility of bottom-up agency, including evasion and resistance.

## Case study: The Early Neolithic LBK

This is the background on which, as an illustration, I would like to present a historical case study of Early Neolithic LBK communities in central Europe around 5000 BC, drawing especially on work carried out at the settlement site of Vráble in southwest Slovakia (Furholt *et al.* 2020b; 2020d). With its 50 hectares and minimum of 312 houses, Vráble is one of the largest known Early Neolithic settlement sites in central Europe. Starting with an extended magnetic plan of the site (Fig. 3), we were able to reconstruct 300 years of the settlement history of this extraordinarily concentrated settlement site. It was founded around 5250 BC, after which it continuously grew at the cost of the other settlements in the same valley (Müller-Scheeßel *et al.* 2020a; 2021) until it reached its peak around 5075 BC, when it consisted of 50 to 70 contemporaneous houses. Rather than it being a village in the sense of a built environment with a coherent spatial outline, such as house-rows, circular house arrangements, or other variants, we are dealing with a low-density agglomeration of spatially independent and economically autonomous farmsteads. In addition, they were grouped into three spatially separated neighbourhoods, one of which was surrounded by a double-ditched and palisaded enclosure. Excavations at six different farmsteads and in the enclosure revealed several indications for social dynamics and conflict in Vráble (Furholt *et al.* 2020b). Firstly, we found clear signs for unequal access and even the monopolisation of certain exotic (obsidian and Spondylus shells) and essential (flint) resources (Müller-Scheeßel *et al.* 2020b). Stable isotope analysis on cereal grains and animal bones suggests a spatially unusually concentrated subsistence system that strongly integrated animal husbandry and cereal farming in the direct vicinity of the settlement – animals were partly grazed on the harvested cereal fields and provided large amounts of manure, potentially causing higher yields (Gillis *et al.* 2020; Furholt *et al.* 2020c). In a situation of up to 70 contemporaneous farmsteads, there is the potential for unequal access to the closest or most fertile arable fields, which could lead to conflict. And finally, the burial record found at the enclosure around the southwest

Fig. 3: Map of the LBK in central Europe, marking the sites mentioned in the historical case study and highlighting the site of Vráble, southwest Slovakia, with the minimum of 312 houses as derived from the magnetic prospection plan, projected onto the modern landscape. Arrows indicate the position and direction of entrances to the enclosure, after Furholt *et al.* 2020d.

neighbourhood of the settlement suggests some form of social inequality, as the burial practices differentiate between different categories of people (Müller-Scheeßel *et al.* 2021). Some are buried in the regular fashion of Early Neolithic burials, that is, hocker burials in shallow pits containing burial goods, with some burials positioned in a central place close to the main entrance of the enclosure system, while a different category of people are headless depositions without grave goods at the bottom of the ditches. A third category comprises people deposited in refuse pits. Some of the skeletons show signs of violence, but no lethal pathologies were found (Müller-Scheeßel *et al.* 2021).

However, contrary to what the classic political economy model would make of this, this is not a standard story of emerging social stratification based on economic concentration by the most potent farmsteads. Instead, we have to take into account a multiplicity of agencies interacting in Vráble, forming a social dynamic that plays out in a historically unique manner. Firstly, our study of the pottery in Vráble (Cheben *et al.* 2020; Cheben and Bistakova 2020) shows that, while pottery production and style is farmstead- or household-specific, all of them are strongly integrated into the regional Želiezove pottery style. In light of what has been discussed above, the farmsteads in Vráble were integrated into regional alliances within a translocal system, which will have potentially been an asset-providing aid and refuge, thus strengthening their bargaining position overall in local social negotiations.

And then we have the neighbourhood as a collective social unit, within which institutions of communal sharing were most probably practiced. We found decentrally located, beehive-shaped storage pits, which we interpret as repositories for the long-term storage of large amounts of grain and its subsequent sharing across farmsteads (Furholt *et al.* 2020b). The neighbourhoods were also probably the arenas for larger communal projects, such as the construction of a 1.4 kilometre-long double-ditched, palisaded, and likely walled enclosure around the southwestern neighbourhood. At the time of the enclosure erection, roughly 5075 BC, 15 contemporaneous houses would have existed in that part of the settlement (Müller *et al.* 2020), which means that probably all inhabitants would have participated in the collective effort (Wunderlich *et al.* 2020).

The enclosure is, however, ambivalent in social terms. Creating a physical boundary around a residential group is, on a pragmatic level, an act that undermines social fluidity and translocality, and, at the same time, might enhance intra-neighbourhood solidarity. However, in the specific case of Vráble, it can also be seen as an indication for inter-neighbourhood discord, or conflict. This is clearly shown by the position of the six entrances (Fig. 3), all of which are located in such a way that they point away from the other two contemporary neighbourhoods. The enclosure is thus not a fortification against some outside enemy, but a barrier between one neighbourhood and the two others. The concentration process in Vráble thus culminates around 5075 BC in a crisis-like situation with social antagonisms between neighbourhoods. In addition, within the southwestern neighbourhood, the differential treatment of human bodies can be seen as an indicator of internal social tensions, manifested in the manipulation of human bodies along and in the enclosure ditches. This is a well-known theme in many contemporaneous LBK settlements and, at roughly the same time, in Asparn-Schletz (Teschler-Nicola, 2012), Herxheim (Zeeb-Lanz, 2016), or Schöneck-Kilianstetten (Meyer *et al.* 2015). These, however, do involve a much higher degree of violence or ritual manipulation of body parts. The concentration of such findings towards the end of the LBK, roughly between 5100 and 5000 BC, has often been interpreted as a sign of an overall societal crisis at the end of the LBK, visible, for example, in a rising degree of intercommunity warfare (Golitko and Keeley 2007). Yet the diversity of practices connected to these different instances of depositions of human bodies in ditches indicates that increasing warfare is not a sufficient explanation. As we have seen, in Vráble, community-internal conflicts seem to be more prominent than intercommunity warfare. In Herxheim, rituals involving human bodies are much more central than violence.

However, what is most relevant for the topic discussed here is that the different signs of violence we do see in these different cases are never instrumental in shaping new forms of social organisation. We have no evidence that violence would be tied to, or be constitutive for the emergence of domination as a new form of social power, giving rise to a new social order. On the contrary, what does happen in Vráble is that the situation is resolved by the most potent means of counterpower, namely social fission – the possibility of leaving a community to found a new one or join a different one – facilitated by the existing system of translocality. In the decades following the erection of the enclosure, until 5000/4950 BC, the whole social experiment in large village life was ended by a rapid population decrease (Furholt *et al.* 2020b). The other sites mentioned show comparable, individual histories.

## Conclusion

These historical case studies from the later period of the Early Neolithic LBK in central Europe show that, under the structural conditions discussed for the Neolithic, social tensions probably arose in different contexts. For example, in a situation of settlement

agglomeration as in Vráble (Furholt *et al.* 2020b), or in other places (Hofmann *et al.* 2019), a tension will probably always arise between the interests of individual households, who have the means to accumulate and concentrate, and the imperatives of communal solidarity, such as sharing (Leppard 2014; 2021). This will create different outcomes in different situations, as the different actors will have different possibilities and stronger or weaker negotiating positions. Different degrees of inequality will probably seem acceptable as long as the benefits of remaining part of those unequal arrangements outweigh the disadvantages, or resistance, evasion, or secession are perceived as less a favourable option. But the structural conditions we have to assume existed during the European Neolithic are of such an overall nature that the emergence of an institutionalised and durable form of social stratification as it developed during the fourth millennium in the Middle East, or probably in the third millennium in the Mediterranean, is not sustainable. Such developments are actively prevented by the strength of bottom-up power, which rests, among others, on the nature of power, specifically the lack of effective means of coercion, the abundance of arable land, and the easy possibility of social fission in a translocal social system.

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# From "communities of practice" to "translocal communities": A practice-theoretical approach to mobility and the sociospatial configurations of Neolithic groups

Caroline Heitz

## Abstract

*The paradigm of cultural history still has an influence on how forms of Neolithic social cohabitation are imagined. Once established for the purpose of relative chronology, and based on pottery, concepts of Neolithic cultures implied the existence of homogeneous, static social units with more or less clear spatial-temporal boundaries. Even if their initially ethnic interpretation has long been rejected, the prevention of any other social interpretations led to a blind spot, which was filled unintentionally by top-down projections of premises onto the past. Furthermore, I observe a lack of epistemological and theoretical reflections on what determines different forms of social cohabitation and how they could be approached archaeologically. How do things, social practice, and social formations relate to each other? What can be inferred from the distribution and mobility of things regarding the social? By taking mobility as an epistemological entry point to understanding forms of social cohabitation, I will explore pottery production and distribution practices by drawing on ceramics from precisely dendrochronologically dated Neolithic wetland sites on the northern Alpine foreland (3920–3800 BCE). Inspired by Pierre Bourdieu's theory of habitus and social practice, I propose an inductive bottom-up approach to explore typical local pottery production practices. Following Wenger, it is assumed that pottery was produced within settlements in so-called communities of practice, leading to the (re)production of typical local pottery styles. However, shifting to a supra-regional perspective, it can be shown that stylistic and thus social and cultural diversity in settlements was not an exception but a reoccurring phenomenon that suggests cross-regional entanglements, which were related to spatial mobility between settlement groups with different pottery production practices. The material and social histories of ceramic vessels correspond well with known settlement histories. From a social archaeological perspective, both point to the residential mobility of individuals or subgroups and can be understood as forms of horizontal social organisation of translocal social groups and thus sociospatial configurations.*

*Keywords: Neolithic wetland sites, mobility in sedentary societies, pottery, communities of practice, translocality*

## 1. Introduction

In this paper, I will propose an alternative bottom-up approach to gain a deeper understanding of the sociospatial configurations of Neolithic wetland settlement groups living on the northern Alpine foreland during the first quarter of the fourth millennium BCE. Waterlogged and thus anaerobic preservation conditions enable us to date the timber of house remains to the exact year. Accordingly, the spatial and temporal dynamics related to social configurations can be examined with a temporal resolution of decades. In order to do so, I will use the materiality of pottery as an empirical field to gain insights into the spatial mobility of past communities and thus their social connectedness. Hence, the materiality of mobility will serve as an epistemological entry point to the social. The aim is to question the premises of immobility and cultural homogeneity as have been implicitly fostered by models of Neolithic cultures that were taken as a substitute for the social, according to the cultural-historical paradigm. To this end, I will first reveal the shortcomings of the top-down concepts of Neolithic cultures that have been taken as models for the social before outlining my alternative practice approach to discussion concepts such as mobility, habitus, social practice, and communities of practice, as well as local, translocal, and intermediate things from a theoretical point of view. The theoretical and methodological implications will serve as tools for empirical inquiry of the social by examining stylistic entanglements in the pottery found at Lake Constance from around 3900 BCE that are taken as indicative for social ties and spatial mobility. In the last part, these results will be discussed by drawing on the concept of "translocal communities" as a form of sociospatial configuration.

## 2. Shortcomings of top-down concepts of "Neolithic cultures" as models of societies

Looking back at the history of research in Neolithic archaeology, forms of the social were barely addressed in their own respect in the early days of the discipline. Instead, the focus was on the spatial and temporal distinction of different "cultures" (Hodder 2004; Meskell *et al.* 2004). Regarding the research of the Neolithic period in Europe, typical sets of "material culture" – mostly specific pottery types – where taken as indicative to establish chronological and spatial units that were then labelled as "cultures" in schemes of regional relative chronologies. Furthermore, the defined Neolithic cultural blocks were ethnically interpreted based on the cultural concepts that go back to Kossinna (Kossinna 1920, 3) and Childe (1929 in Veit 1984). These concepts can be situated in the cultural-historical paradigm that has its origins in the 19th century and the emergence of nationalism in Europe. The search for identity, cultural unity, and commonality within the nation states in the present meant that ideas of spatially clearly delimited cultural entities were projected onto the past. This is evidenced by maps from the European Neolithic, which depict cultures as clearly delimited, culturally uniform entities right up to the most recent research history.

The premises of the cultural-historical paradigm and the ethnic interpretation of Neolithic cultures have been rejected for epistemological and ethical reasons since their ideological misuse of them by the National Socialists in the 1930s and 1940s (Wotzka 1993, 27–32; Veit 2014, 353). The points of criticism can be summed up as follows (see also Furholt 2009; Furholt 2008, 21; Hafner *et al.* 2016; Roberts *et al.* 2011, 3; Wotzka 2000): the grouping of archaeological objects into a mosaic of disparate, culturally homogeneous, constructed units does not reflect the overlapping spatial distribution pattern of things; these analytically constructed chronological entities were taken as ethnic groups or societies; the selection of material artefacts (pottery) as indicators of ethnic identity is random and does not question the epistemic accessibility of their possible emic
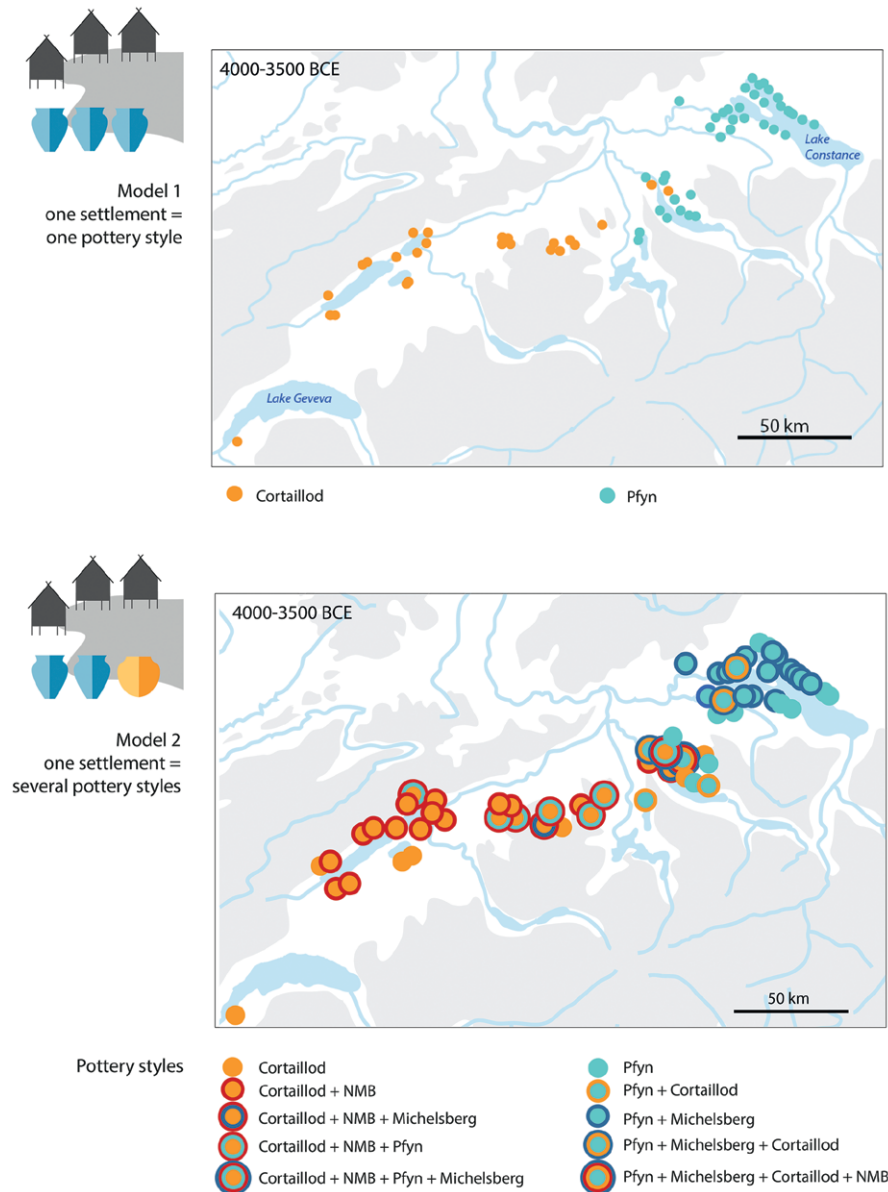
Fig. 1: Two models of the spatiality of pottery styles. Top: Model 1 corresponds to the premise of the cultural-historical approach ("Neolithic cultures") that pottery of a single style was produced and used in each settlement. Below: The rough mapping of different pottery styles shows that stylistic diversity was a common phenomenon in the period between 4000 and 3500 BCE, NMB: Néolithique Moyen Bouguignon.

meanings or consider polysemy and multivocality and the multitude of shifting contexts of meaning and practice; and, finally, the use of an altogether re-reduced, simplified concept of identity and models of the social that are too static and mechanical.

Despite this criticism, the use of cultural concepts did not change much in German-language research; archaeological cultures were just emptied of any social interpretation and were continuously used as *termini technici* of typo-chronological frameworks – even despite the introduction of absolute dating techniques such as radiocarbon dating and dendrochronology in archaeology. The general avoidance of thinking about social issues after World War II has led to a continuation of otherwise already rejected cultural-historical models in research practice for want of better alternatives.

In my view, a striking example that shows the persistence of cultural and social assumptions of homogeneity up until recent years is the discovery of so-called foreign pottery vessels (German: *Fremdformen*) in dendrochronologically dated Neolithic wetland sites on the northern Alpine foreland, such as Concise-Sous-Colachoz (Lake Neuchâtel, six phases dating between 3868 and 3516 BCE) and Arbon-Bleiche 3 (Lake Constance,

one phase, 3384–3370 BCE). There, besides the expected local pottery style that would be perceived as being typical for the respective archaeological culture, significant amounts of pottery vessels made in other styles were found, too. In both cases, the findings were explained by residential mobility or migration, as most of these vessels were made of materials from the proximity of the sites (de Capitani *et al.* 2002; Burri 2007).

A systematic review of already published pottery dating to the second half of the fourth millennium BCE from other wetland sites on the northern Alpine foreland (Heitz *et al.* 2016) showed that stylistic plurality was a common but not yet studied phenomenon (Fig. 1). Even with this first rough, incomplete survey, it became clear that models of homogeneous and spatially mutually exclusive Neolithic cultures and their associated presumed disparate social groups are empirically untenable (Heitz 2017, 257–262; Heitz 2018; 2023). Furthermore, the sedentary farming settlement groups seem to have been much more spatially mobile than previously assumed (see below). As a consequence, spatial mobility can be taken as an approach to gain a deeper understanding of Neolithic forms of social life beyond the premise-loaded cultural concepts.

While the cultural-historical approach has led to presumptions of cultural homogeneity, coherence, and territoriality, the paradigm of evolutionism has fostered preconceived notions of sedentarism in early farming communities. Taken as the lowest evolutionary state, Palaeolithic and Mesolithic foraging societies were conceptualised as conducting a predominantly mobile lifestyle according to their foraging forms of subsistence economy. As a counterpoint, the seemingly more developed farming societies with a higher evolutionary state were equated with sedentariness; the term "sedentary" meaning forms of residence where spatial mobility is not expected to play an important role (Barnard *et al.* 2008). The emergence of agricultural techniques and food storage was seen as having facilitated permanent housing, and sedentary social groups were conceptualised as living in permanent settlements year round and residential mobility was neglected (Scharl 2017, 10). This oppositional conceptualisation of mobile foraging *vs.* sedentary farming communities has not been questioned until lately. If mobility was taken into account, it was reduced to the narrative of one-time, long-term migrations of whole "peoples" to explain rapid culture changes detected in the typochronologies of archaeological findings (Heitz 2017; Van Oyen 2017; Heitz *et al.* 2017; Van Dommelen 2014; Anon n.d.; Leary 2014). Accordingly, spatial mobility in the Neolithic period was reduced to exceptional, unplanned, more or less disaster situations (Hahn 2015; Scharl 2017, 9).[1]

## 3. A bottom-up practice approach to forms of the social

The aforementioned criticism of the concepts of "Neolithic cultures" shows that they are unsuitable for approaching forms of social organisation during the Neolithic period, since they were not conceptualised for social archaeological research questions. Accordingly, the premises associated with them direct the gaze from the outset to predefined models of the social. To avoid stepping into this trap of self-fulfilling prophecies of circular reasoning, it is helpful to search for alternative takes. To separate desires to establish relative chronologies from questions about social aspects of past Neolithic communities, it is most helpful to draw on approaches that are grounded in sociological or social anthropological practice theories and to appropriate them for archaeology. Furthermore, methodologies are needed that allow the examination of the social by exploring past

1    This take on "migrating cultures" is most explicitly expressed on maps with cultural blobs and arrows indicating the direction of population shifts. One can currently observe a dangerous "resurrection" of such problematic models in the scope of increasingly important aDNA studies (for more on this issue, see Furholt in this volume).

human-thing-relations and their material traces from the bottom up. In order to do so, I will use pottery production and distribution practices as well as rhythms and regimes of mobility as an epistemological entry point to the social.

## Mobility as an indication for sociospatial configurations

At the beginning of the new millennium, mobility became more and more the focal point of research in social sciences and humanities (mobility turn) (Cresswell 2006; Sheller *et al.* 2006; Hannam *et al.* 2006; Salazar 2013; Glick Schiller *et al.* 2013; Faist 2013). The roots of all life were no longer seen in categories of fixity and *stasis*. Instead of searching for the "roots" of cultures, the tracing of the "routes" that lead to different cultural forms was proposed (Clifford 1997; Salazar 2016, 1; Rapport *et al.* 2003, 298). Cultural and social phenomena are thus seen "through the lens of movement" (Heitz *et al.* 2017, 23; Salazar 2016, 2–3; Hannam *et al.* 2006, 2). Appropriating this perspective in archaeology means to acknowledge that mobility not only underpins a large part of today's human practices but also those of the past in their material, social, political, cultural, and economic worlds (see also Leary 2014, 16). Furthermore, taking mobility into account challenges the notion that identities are primarily yielded by sedentarism, which "locates bounded and authentic places or regions or nations" and that those should be taken as the basic units of social research (Sheller *et al.* 2006, 209). Instead, cultural and social entities are seen as being the subject of negotiation through moving and acting human beings. Taking this perspective, social life seems to be full of "multiple and extended connections", and "topologies of social networks" and their "nodes" are the primary focus of research (Hannam *et al.* 2006, 12–13). Accordingly, the materiality of mobility can serve as an epistemological entry point to understanding forms of social organisation in the past. In the next section, I would like to outline my conceptualisation of mobility.

Human social life and its spatial and temporal organisation are unthinkable without movement and various forms of mobility, as I will argue. While "movement" – the counterpart of "stasis" – can be seen as embodied action unfolding in a spatial and temporal expansion, it is helpful to conceptualise "mobility" as a special kind of movement, one that includes changing between different units of a context (see Burmeister 2013, 36–37). Such units and contexts are the subject of emic or ethical, and thus social and cultural constructions. Categorisations such as "here" and "there", "close" and "distant", "self" and "other", "foreign" and "familiar", "similar" and "different", "space" and "place", and "local" and "neighbouring" (Frello 2008, 27–32) illustrate that social life involves engaging with the environmental spaces to make them habitable places. In the case of humans moving in, around and between what they consider places as they organise their lives (Salazar *et al.* 2011, 2; Salazar 2013, 553), moving from "place" to "place" means overcoming geographical distances, and can be referred to as "spatial mobility" (Heitz 2017, 275). "Spatial displacement" and thus "spatial mobility" can be taken as a condition and integral part of human social life (Burmeister 2013, 36–37; Frello 2008, 26, 28; Salazar 2016, 1–2; Salazar *et al.* 2011, 1–2; Glick Schiller *et al.* 2013, 185, 187).

As I have already outlined elsewhere, I find it helpful to think of three different spheres of mobility: "spatial", "social", and "mental" (Heitz *et al.* 2021). By "social mobility", I describe the change or transgression of social spheres of belonging, while with "mental mobility", I refer to engaging with otherness, difference, or something that is new or not present (Frello 2008, 28–29; Hannam *et al.* 2006, 14; Sheller *et al.* 2006). Mental and spatial mobility are related, since the latter requires imagination of the destinations along the way. Arriving at another place might involve encounters with the unfamiliar and the unknown, with cultural as well as social differences. Engaging with that otherness requires the capacity for empathy, which again requires mental flexibility, because it means learning, and learning means being mentally mobile (Heitz 2017, 276). Furthermore, one's social status might change to being perceived as a "foreigner", "migrant", "traveller", "trader", or "visitor". The changes or oscillation of social states and groups of belonging involved in this process are what one can refer to as "social

mobility" (Frello 2008, 28–29; Hannam *et al.* 2006). Along with changing to new social spheres of belonging, adaptation, assimilation, and integration into the new community, segregation or marginalisation might also become relevant. Accordingly, mental, social, and spatial mobility are entangled.

## The materiality of mobility as an epistemic entry point to the social

Mobility is also dependant on the material, as it becomes materialised in many ways: from the materiality of the landscapes and its paths, roads, and bridges we walk, ride, or drive on, to the means of transport that carry us across spatial distances on the ground, over water, and in the air in our protective clothes and shoes, carrying with us belongings or goods. As much as we walk in a world full of materials and are carried by them, we can also take them along. In terms of Neolithic pottery practices, this means that the potters, with their pottery knowledge, might also have taken vessels along. By focusing first on the spatial mobility of potters, for example, with their knowledge, skills, overall habitus (see below), and the materials and things they take with them or pass on to others as they move across cultural and social boundaries, mental and social mobility can also be approached archaeologically; spatial mobility can lead to encounters with otherness and thus trigger creative transformation processes in social practice that might also become visible in the material, as will be elaborated in the next subchapters. Accordingly, the social practices of production and reproduction, distribution and consumption, communication and the making sense of cultural identification and alienation, and the political are all unthinkable without practices of spatial mobility. Mobility is integral to social practice and thus the organisation of social life. In conclusion, the material traces of social practices of making and using things and being mobile in space are indicative for the respective sociospatial configurations. And if, as proposed above, movement and the variety of different forms of mobility are considered as an integral and indispensable aspect of how social groups organise their everyday life, the dichotomy of sedentary *vs.* mobile communities loses its argumentative power. Mobile and immobile lifestyles thus do not become mutually exclusive opposites; mobility and immobility are rather understood in a coexisting form being omnipresent in human social life in changing grades.

## Things as processes, things as intertwined histories

Things, taken as temporarily stable material forms that originate from mutual human-material/thing-relations (Heitz 2017, 284; Ingold 2007; Ingold 2013), can accompany us on our journeys and thus be moved from place to place. They, too, oscillate between movement and stasis over time and have their own "itineraries" (Hahn *et al.* 2013, 2–8). When moved and passed around by humans, things shift between different contexts of meaning and practice. On their itineraries, things might be altered materially, as their material existence as bundles is only of temporarily stability. In a broad temporal perspective, things are matter in flux, subject to material transformations and processes of fragmentation and reorganisation. A pottery vessel – as an example – can be understood as an ongoing process of mineral material in a process of transformation: from the rocks eroding and becoming the sedimented clays that were used for pottery production to the finally broken and discarded pottery vessels that then undergo further processes of erosion (Heitz 2018; 2023).

Things like pottery vessels can thus be conceptualised as knots that temporarily bind together ongoing histories of materials (*e.g.* geology, taphonomy) and humans (biographies). They have their own histories of becoming and their own itineraries throughout space and time (Heitz 2017, 284–285). Also, their social and material itineraries might sometimes have left traces in their materiality and thus are indicative for various forms of mobility of humans and things. Accordingly, pottery vessels unite not only the histories of their materials but also of their makers and users (*ibid.*). To retrace and separate these different "itineraries" from each other heuristically means to approach forms of spatial mobility of humans, material, and things.

## Habitus, social practice, and communities of practice

To follow the itineraries of the material used for pottery making, tried and tested archaeometric methods of geological provenance determination exist that are already well described in the respective literature (*e.g.* Stapfer *et al.* 2019). The social or cultural provenance of the vessels, however, raises epistemological questions. The approach chosen here is to use an action-theoretical approach to examine pottery production practices while conceptualising processes of making as a correspondence in two respects: between the material and the makers on the one hand (Ingold 2013) and the individual makers and their social groups on the other hand.

Thereby, I find the approach of Michael Dietler and Ingrid Herbich to "style" helpful because it mediates between material and human action. They conceptualise a "material style" as "the result of characteristic ranges of responses to interconnected technical, formal, and decorative choices made at all stages of a *chaîne opératoire* of production" (Dietler *et al.* 1998, 246). Such "characteristic ways of doing things" – or a distinctive "style of action" or "techniques" – are generative for "material styles" (Dietler *et al.* 1998, 246–248). Although not emphasised as such by these authors, a habitual way of doing something is, in experience, related to bodily routines by also drawing on predefined mental concepts of things. As already elsewhere: "(…) while different kinds of action in making things results in different kinds of material properties, it is the routine of working towards an intended design of vessel and the multiple repetition of similar – if not necessarily equal – actions that result in a characteristic material style. With regard to pottery, this might include a pot's shape, its decorations and colours, the structure of the surface, its lustre, etc." (Heitz *et al.* 2021, 110). It can be concluded from this that pottery vessels made in the same material style share characteristics of visually discernible features.

Like most of the skills gained in life, crafts such as pottery making are learned in a social context that can also be presumed for the Neolithic. Wenger has proposed the concept of "communities of practice" to describe socially embedded learning (Wenger 1998; Wenger 2010, 179); learning happens in the field of tension between the members of communities of practice and their engagement with the surrounding world. Within the group, knowledge and skills are expanded as the different actors participate in activities, conversations, and reflections that lead to the production of "physical and conceptual artefacts" and other forms of "reification". Through that constant exchange of knowledge, the actions of the members become "aligned". Over time, a social history of learning emerges within a community of practice. Members of the same community of practice can be recognised by a shared "regime of competence" or – transferring this to our example – a shared pottery production practice and hence a specific "material pottery style" (Wenger 1998, 57, 73, 174; 2010, 174, 179, 180, 184).

Using this approach, material styles are the result of styles of action that are shared within a community of practice. From an archaeological point of view, the spatial and temporal dimensions of stylistic phenomena need further theoretical foundation. The production of similar pottery styles can be traced over decades during the Neolithic. Furthermore, regional varieties and temporal transformations in pottery styles indicate that the similarities in pottery production expanded well beyond local communities of practice and the duration of one single settlement. To gain a deeper understanding of this observation, Bourdieu's theory of practice and his *habitus* concept offer a way forward. Following his explanatory reference framework, styles – be it styles of action, pottery styles or whole lifestyles – emerge in the interdependent relationship between individual actions and social practice, between the actor's agency and the social frame. In the course of their lives, actors appropriate "dispositions" and "schemes of action" that enable them to act habitually within the social frame, while thereby reproducing it at the same time (Bourdieu 2009, 159, 199; Bourdieu *et al.* 2013, 41, 153). The practical logic incorporated in their minds and bodies is guided by what Bourdieu refers to as the *habitus* (Bourdieu 2014, 167). The latter exists in both the actions and the representations of

these actions ( Bourdieu *et al.* 2013, 161) – as, for instance, in pottery production practices but also in the materiality of pots themselves (Dietler and Herbich 1998, 244–246). The making and using of pots are interconnected in social practices of production and consumption, and the reproduction of them is mediated though the *habitus* – which informs practices in often unconscious ways – over generations (Bourdieu 2014, 101–102; Bourdieu and Wacquant 2013, 158–159; Bourdieu 2014, 111; Bourdieu 2009, 179). What is important regarding the temporality and spatiality of stylistic pottery groups is that – following the *habitus* concept – practices can correspond without the need for conscious governance, agreement, collective intention, or even direct communication between them. Accordingly, the temporality and spatiality of stylistic similarities of pottery beyond single settlements and communities of practice could be explained not only by a synchronous entanglement resulting from face-to-face encounters but by the temporal expansion of these entanglements into the past – a shared history – and shared aspects of the potter's *habitus* belonging to directly or indirectly entangled habitus groups.

## Local, translocal, and intermediate things

The material traces of spatial mobility in pottery vessels – the materiality of mobility – concerns two itineraries: the provenance of the materials of which a vessel was made and the social provenance of its material style in terms of the community of practice and its respective habitus group. It is important to note that these two provenances must not be spatially congruent. As I have already outlined elsewhere, I would like to distinguish three different categories of vessels based on their provenance: the place they were made, the place they were found as archaeological sherds, and their place of final consumption and disposal (Heitz *et al.* 2021), specifically, "local", "translocal", and "intermediate" vessels.

Adopting a settlement perspective, specifically of respective groups of a settlement's inhabitants, I define "local vessels" as those whose place of production is the same as their place of consumption and disposal; in other words, those vessels whose material and social provenance are spatially congruent or not recognisably different. In this case, the potters would have collected their materials near their settlements. Generally, sources of natural clay and tempering material are abundant and there is a high likelihood that they are located within a few kilometres of settlements. Pinpointing the origin of the used materials in the landscape would hence be dependent on the successful archaeometric determination of the material sources in the landscape. The localness of the material style of a vessel – and thus its social provenance – can be approached by examining the local pottery production practices of a settlement's ceramics. The underlying presumption is that the continuous iteration and sharing of a pottery practice by the community of potters and pottery users in such settlements led to specific local pottery production practices. With this approach, a "local vessel" would be one where the localness of the used materials, the vessels material style, and hence the practices of making (style of action) correspond in terms of spatial congruence.

In contrast to local vessels, in the case of "translocal vessels", the place of consumption and final disposal differs from the place of production regarding the material and social landscape: neither their materials nor their material style are typically local to the place they were found. Translocal vessels, therefore, have transgressed the spatial material, social, and thus cultural boundaries that indicate they were transported over spatial distances by mobile humans, and were thus spatially mobile (Heitz *et al.* 2021). Using this conceptualisation, the recognition of the translocality of the vessels depends on the methodological differentiation of material sources and material styles.

There is a third category of things, or, in this case, pottery vessels, that I refer to as "intermediate vessels". A pottery vessel of non-local style could as well have been made in the settlement where it was used and discarded, or near that place. One possible scenario would be that the vessel was made by local potters who took a translocal pot with its non-local style as a model or learned to make pottery in a different, non-local style.
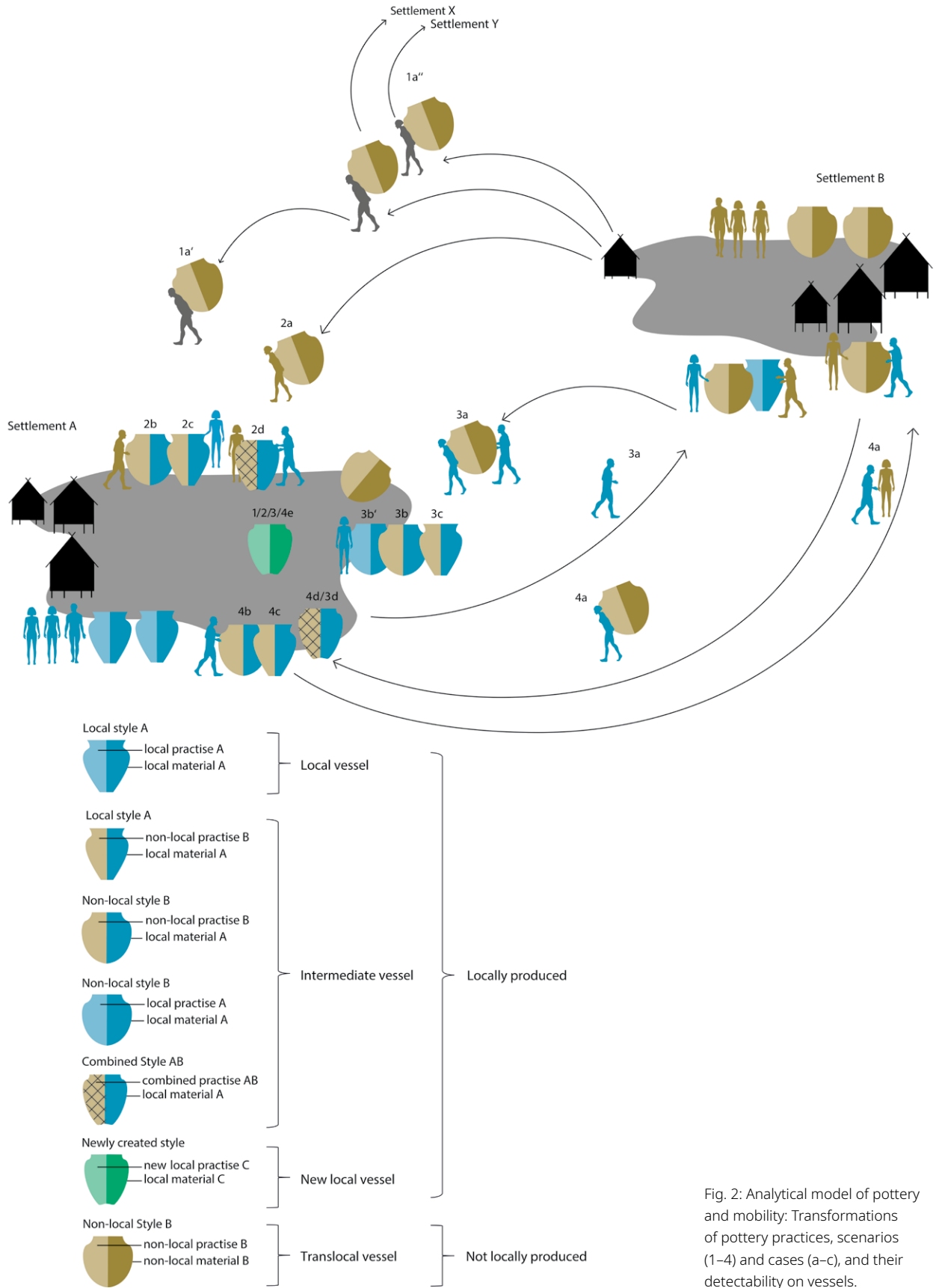
Fig. 2: Analytical model of pottery and mobility: Transformations of pottery practices, scenarios (1–4) and cases (a–c), and their detectability on vessels.

In addition, it is also plausible that the vessel was made by non-local potters who had moved to the settlement and started to use locally available materials to make pottery in their own habitual style. In my conceptual scheme (Fig. 2), in both cases, the materials used to make such vessels would be considered "local", whereas the design and overall style of the vessels would be "non-local". In contrast to the "translocal vessels", in both scenarios it was not the vessels as such that were on the move. However, the making of such vessels is mobility-related, as they emerged after previous events of spatial mobility that included the transgressing of habitus groups and communities of practice.

Furthermore, when dealing with spatial mobility and translocality in archaeological contexts, we should keep in mind that encounters between humans of different social and cultural groups might have occurred that are highly likely to have triggered processes of transformation in social practices, which might have led to a multitude of in-between material cultural forms. Taking the case of residential mobility beyond the particular habitus group and community of practice as an example, social processes such as adaption, rejection, alteration, marginalisation, integration, and absorption could follow (see Eriksen 2007, 167) when confronted with otherness in terms of things and practices that could be perceived as "new", "different", or "foreign". Such processes could be recognised archaeologically when pottery vessels were made with features of different styles using appropriated pottery-making techniques with locally available materials. In the case of, for example, a temporal or permanent change of residence, potters might be informed through their different skills or inspired by different looking pottery vessels while working in spatial proximity. In anthropological literature, concepts such as "creolisation" or "syncretism" (Eriksen 2003, 223–253; Eriksen 2007, 171–173; Hahn 2004, 88) are used to describe such phenomena of mental and social mobility. According to the dynamic inherent in these processes, intermediate vessels are more than a mixture of two homogeneous or pure entities; they also include a third: new cultural forms that I refer to as "syncretic vessels".

The spatial mobility of vessels, but also of pottery makers from different practice and habitus groups, results in complex materialities of pottery vessels that can be found in the remains of settlements. These mobility-related material entanglements and transformative processes in pottery production are so diverse that only the simplest cases of four different mobility scenarios can be described schematically (cf. Hegmon *et al.* 2000, 218–219). In addition to the mobility-related vessel categories presented in the analytical model in Fig. 2, further variations can be expected when examining concrete cases. However, all of them have deliberately not been presented here, so that the model of the investigation remains open as a tool and can be contrasted empirically. Additional complexity is to be expected for the following reasons: 1) It is conceivable that different local materials and clay recipes had already been used for local ceramic production per se, for example, with regard to different vessel functions – if one considers that in a settlement not only two styles but also stylistic plurality must be expected, then, theoretically, numerous other combinations of intermediate vessels can be expected; 2) the recognisability of such mobility-related phenomena also depends on the degree of standardisation of the respective ceramic production.

## Stylistic classification by design

In the overall project, the results of which I refer to in the case study discussed here, we have adopted a mixed-method methodology (Hafner *et al.* 2016; Heitz 2018; 2023) to determine the geological and stylistic provenance of the vessels, thus differentiating between local, intermediate, and translocal vessels within the pottery of single settlements. Referring to the three analytical levels, we have developed a quantitative and a qualitative approach to classify vessels according to their designs and styles (Heitz 2018; 2023), elaborated an approach using pXRF-analysis in combination with other archaeometric methods for characterising the provenances of the vessels' materials (Stapfer *et al.* 2019), and conducted *chaîne opératoire* observations in order to distinguish

different pottery production practices (Heitz 2017). Since the case studies listed below focus on the results of qualitative stylistic examination, only the relevant methodological approach to this is outlined in more detail here.
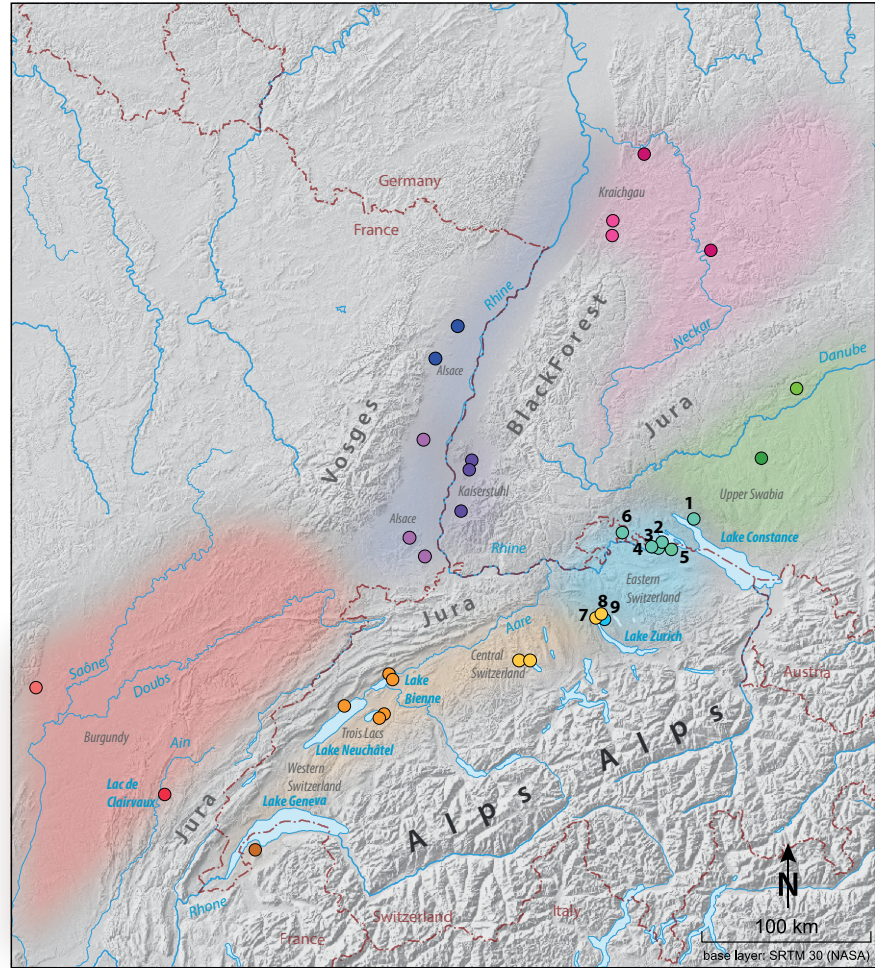
The subjective qualitative classification conducted is based on the sorting of ceramic drawings and the similarities perceived by the eye of the classifying archaeologist. The aim of the sorting is to group the vessels into designs, specifically to find the imagined type that was strived for by the potters by tracing intentional actions from the perspective of the actors in pottery production. Based on that, the objective was to identify vessels produced in series and as individual pieces, as well as stylistically local, non-local, and mixed designs, and, if applicable, design variants.

Silhouettes of the designs were created to reveal the subjective view of the archaeological eye and its assessment of similarities. For the determination of designs, I preferred vessels with largely continuous semi-profile preservation. In a second step, less extensively preserved pottery items could also be fairly reliably assigned to the designs. When sorting, the general, eye-catching, identical "habitus" of the vessels was decisive. Behind this is a combination of vessel proportions, the structure of the vessel body, profile shape, handling, and other applications. The sorting into the final designs was done according to features such as the presence of handles, eyelets, lasts, knobs, and decorative elements. Whether such applications were attached to the vessels at all and, if so, in what position on the vessel body, and in what form and in what number, required conscious decisions in the manufacturing process. The same applies to the decision as to whether round, pointed, or flat-bottom shapes should be produced. Sometimes, variants within the designs could be distinguished on the basis of the vessel sizes or variations in the profile shape. The degree of standardisation in production and the phenomena of mobility and appropriation blur stylistic differences, which makes some vessels difficult to classify unambiguously. The results of the classification therefore remain subjective.

## 4. Mobilities and entanglements at Lake Constance (3900 BCE)

On the northern Alpine foreland, numerous Neolithic wetland settlements dating to the fourth millennium BCE are preserved, providing archaeological sources of a unique quality thanks to the anaerobic preservation conditions of organic material and the resulting possibility for dendrochronological dating of wooden construction elements of houses. The histories of the settlements and their communities can be examined in a temporal resolution of single years and decades. The extraordinarily preserved pottery makes it possible to reconstruct the shapes of numerous vessels. In many cases, the latter can easily be assigned to the organic cultural layers, which comprise the remains of individual settlements or settlement phases that only existed for one or two decades. Accordingly, the pottery of settlements that existed during exactly the same years can be compared independently of dating issues. Furthermore, by comparing stylistic similarities between the pottery from the wetland and dryland sites of neighbouring regions, the micro perspective of the former can be combined with the macro perspective of supra-regional contexts.

In this paper, the focus will be on settlements in the Lake Constance region dating to around 3900 BCE and their supra-regional entanglements (Fig. 3). As a first analytical step, the pottery of two simultaneously existing settlements at Lake Constance, Hornstaad-Hörnle IA (3918–3902 BCE), and Sipplingen A, (3914–3904 BCE) was classified into 44 different vessel designs and numbered consecutively (e.g., "BOS_D1"), referring to them in German as *Bodensee* designs. The 221 selected pottery vessels from Hornstaad-Hörnle settlement IA (HHIA) were grouped into 42 designs based on their typological drawings (Schlichtherle 1990, 173–180, Taf.1–9; Matuschik 2011, 409–501, Taf. 1–86). From

Fig. 3: Selected Neolithic settlements used in this study and their dating.

| 1. Sipplingen-Osthafen | SiA | 3919–3904 (dend.) | 7. Zürich-Kleiner Hafnen | 4D | before 3900 (typo./strat) |
| | SiB | 3878–3825 (dend.) | | 4E | 3865–3820 (cal BCE 2σ) |
| | SiC | 3795–3786 (dend.) | | 4F | 3875–3800 (typo./strat.) |
| | | | | 4G | 3850–3800 (typo./strat.) |
| 2. Hornstaad-Hörnle | HHIA | 3918–3902 (dend.) | | | |
| | HHII | 3869–3862 (dend.) | 8. Zürich-Mozartstrasse | 6u | 3913–3901 (dend.)* |
| | | | | 6o | 3888–3880 (dend.)* |
| 3. Wangen-Hinterhorn | KS 1 | after 3850? (typo.) | | 5 | –3681 (dend.)* |
| 4. Eschenz-Insel Werd | IIIA | after 3900? (typo.) | 9. Zürich-KanSan | 9N | after 3860 (dend.) |
| 5. Steckborn-Turgi | | after 3875? (typo.) | | 9S | after 3860 (dend.) |
| 6. Thayngen-Weier | I | 3796–3787 | | | |

* Attribution of dendrodates to cultural layers uncertain
dend. = dendrochronological dating
strat. = stratigraohic dating
typo. = typological dating
cal BCE = radiocarbon dating

the settlement of Sipplingen A (SiA), out of the 86 pottery drawings, 51 were classified into 23 designs.[2] The absence of some designs there can be explained by the smaller sample and thus the smaller likelihood of representation regarding rarely produced designs. In a second step, these designs, as well as those from younger settlements and settlements of other regions not discussed in detail here, were compared. By doing so, it was possible to distinguish typical local designs from non-local designs for the potters of each settlement.

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2    In doing so, I considered some pottery individuals from the SiAB layer mixed with younger finds from Sipplingen B, which were attributed to SiA typologically.

## Variability of pottery designs

The designs are shown in Fig. 4, and briefly described. The silhouettes summarise the distinguishing nominal features and reveal the subjective view of the archaeological eye and its assessment of similarity. The question marks indicate which features cannot be determined with certainty due to fragmentation and which designs are therefore incomplete. Overall, the ceramics can be classified into relatively clearly distinguishable vessel designs. This suggests iterative practices in the production of pottery, specifically the intention to produce vessels according to certain design concepts that led to specific standardisation in production practice and thus morphologically similar material forms.

Variability within the design classes can be determined by differences in the profile shapes within the designs, the design of bottom or edge shapes, or the number of attached knobs and eyelets. Overall, however, they are less significant than the differences between the designs. Ultimately, the variability is due to the fact that the vessels are handmade pottery. In addition, ten designs are represented by single pieces only: BOS_D6, D10, D18, D27, D29, D30, D35, D37, D41, and D42.

The designs differentiated here differ in the frequency of their occurrence (Fig. 5). Although the degree of fragmentation of the sherds may have had a negative influence on the representation of larger vessels, the quantities of the designs tend to reflect the frequency with which they were produced and used in these settlements. Overall, pot-, bottle-, and jug- or mug-shaped vessels are more abundant than those of bowl- or dish-shaped designs (Heitz 2017, Fig. 2).

Furthermore, the designs identified in a cross-regional comparison of the pottery from simultaneously existing sites show that typical local designs are usually more frequent than non-local ones. The non-local designs are similar to the pottery styles known from the Lake Zurich and Trois-Lac regions (Cortaillod), the Jura Mountains and Burgundy (Néolithique Moyen Bourguignon), the southern Upper Rhine Valley (Munzingen), the Kraigau and Neckar regions (Michelsberg), or the Danube region and Upper Swabia (Schussenried) (see Fig. 3). A one-on-one detailed comparison of the vessels' features with items from these regions makes it possible to distinguish stylistically non-local vessels, whose designs correspond fully to the stylistically intermediate reference pieces on which features of different styles are combined in many different ways to create new designs.

Furthermore, some of the designs seem to be typical for more than one region and thus are addressed here as shared designs. These phenomena of stylistic entanglement and mutual appropriations led to the transformations of local pottery production practices, which, in some cases, makes it difficult to separate local from non-local or intermediate vessels.

BOS_ **D1**
*Pot- and cup-shaped double-conical vessels with rim band, nubs and flat base shapes*

BOS_ **D2**
*Pot- and cup-shaped double-conical vessels with nubs and flat base shapes*

BOS_ **D3**
*Pot- and cup-shaped, stretched vessels with stand bases*

BOS_ **D43**
*Pot- and cup-shaped, stretched vessels with undercut lower part and stand bases*

BOS_ **D4**
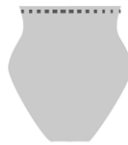*Pot- and cup-shaped vessels with imprint decorated rim and flat base shapes*

BOS_ **D5**
*Pot- and cup-shaped vessels with rimmed knobs and flat base shapes*

BOS_ **D6**
*Cup-shaped vessels with bulbous nub pairs and concave bases*

BOS_ **D7**
*Pot- and bottle-shaped vessels with row of nubs on the rim*

BOS_ **D8**
*Pot- and bottle-shaped vessels with flat bases*

BOS_ **D9**
*Pot- and bottle-shaped vessels with single horizontally perforated eyelets (pairs) and flat base shapes*

BOS_ **D10**
*Pot- and bottle-shaped vessels with double horizontally perforated eyelets and flat bases*

BOS_ **D11**
*Bottle-shaped, spherical vessels with separated shoulder (segmentation) having horizontally perforated eyelets and flat bases*

BOS_ **D12**
*Bottle-shaped vessels with horizontally perforated eyelets in the lower part of the body*

BOS_ **D13**
*Bottle-shaped vessels with eyelet ring in the lower part of the body and pointed bases*

BOS_ **D14**
*Bottle shaped vessels with nubs in the lower part of the body and flat base shapes*

BOS_ **D15**
*Bottle-shaped vessels with conical neck and concave bases*

BOS_ **D16**
*Bottle-shaped, double-conical vessels with rim band and flat base shapes*

BOS_ **D17**
*Small spherical, bottle-shaped vessels with flat bases*

BOS_ **D18**
*Jug shaped, narrow-mouthed handle vessels with rim and flat bases*

BOS_ **D19**
*Jug shaped, narrow-mouthed handle vessels with nubs and flat base shapes*

BOS_ **D20**
*Simple jug shaped, narrow-mouthed handle vessels with flat base shapes*

BOS_ **D21**
*Jug shaped, narrow-mouthed handle vessels with incised decoration and flat base shapes*

BOS_ **D22**
*Mug-shaped, wide-mouthed handle vessels with rim band and flat base shapes*

BOS_ **D23**
*Mug-shaped, wide-mouthed handle vessels with nubs and flat base shapes*

BOS_ **D24**
*Simple mug-shaped, wide-mouthed handle vessels with flat base shapes*

Fig. 4: Pottery designs found at Lake Constance between 3920 and 3900 BCE.

BOS_ **D25**
*Bowl-shaped vessels
with nubs on the belly*

BOS_ **D44**
*Bowl- or dish-shaped vessels
with convex wall and imprinted rim*

BOS_ **D26**
*Bowl-shaped vessels with
funnel rim and concave bases*

BOS_ **D36**
*Bowl- or dish-shaped vessels
with convex wall and flat
or stand bases*

BOS_ **D27**
*Bowl-shaped vessels with
wall bend (segmentation)
and horizontally perforated eyelet*

BOS_ **D37**
*Bowl- or dish-shaped vessel with
convex wall and incised
decoration*

BOS_ **D28**
*Bowl or dish-shaped vessels
with s-curved wall*

BOS_ **D38**
*Bowl-shaped, conical vessels
with concave wall and stand bases*

BOS_ **D29**
*Bowl-shaped vessels with straight
wall, segmentation and round bases*

BOS_ **D39**
*Bowl-shaped vessels with straight
to concave wall, nubs at the rim
and flat bases*

BOS_ **D30**
*Bowl-shaped vessel with straight
wall, segmentation with a pair of
eyelets and round bases*

BOS_ **D40**
*Bowl or dish-shaped vessels with
straight to concave wall and
flat bases*

BOS_ **D31**
*Bowl-shaped vessels with
separated rim*

BOS_ **D41**
*Bowl and dish-shaped vessels with
straight walls, nubs at the rim,
incised decoration and flat baes*

BOS_ **D32**
*Conical, bowl-shaped vessels
with rim band and horizontally
perforated eyelet*

BOS_ **D42**
*Shallow bowl- or dish-shaped vessels
with convex  wall, horizontally
perforated eyelet and flat bases*

BOS_ **D33**
*Conical, bowl-shaped vessels
with horizontally perforated
eyelet and stand bases*

BOS_ **D34**
*Conical, bowl-shaped vessels
with horizontally perforated
eyelet, incised decoration and
flat or concave bases*
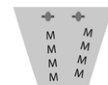
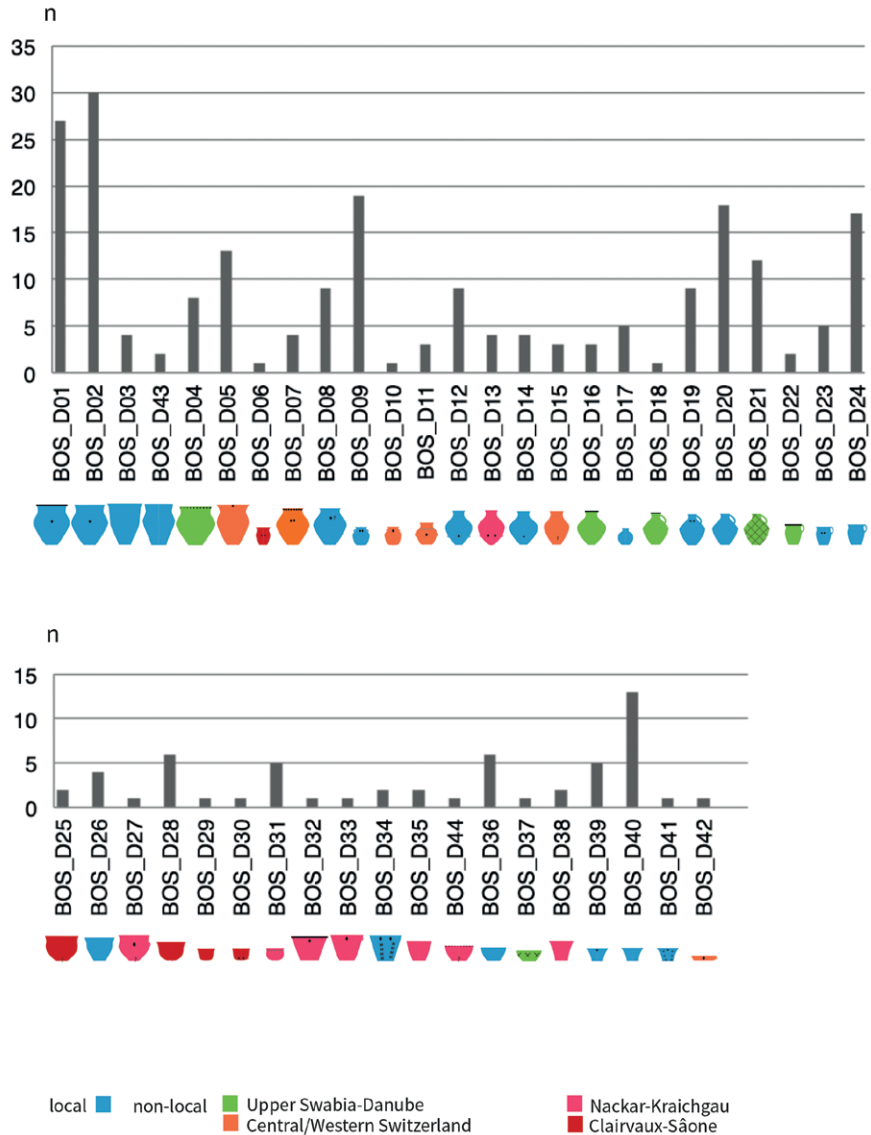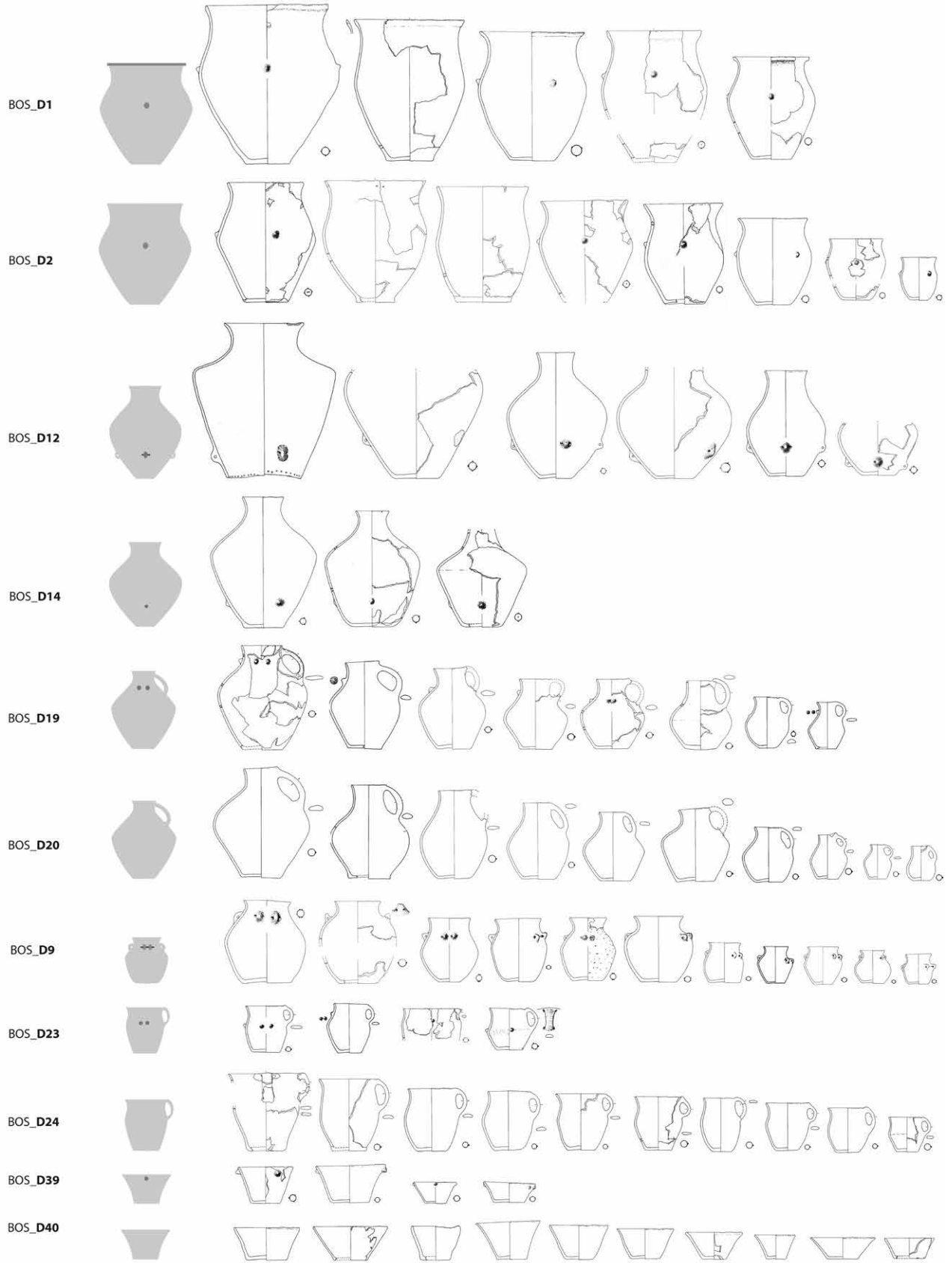BOS_ **D35**
*Bowl-shaped vessels with
convex wall and stand bases*

Fig. 5: Absolute frequencies of pottery designs found at Lake Constance between 3920 and 3900 BCE and their sociospatial provenances.

Fig. 6: Stylistically typical local pottery designs as produced at Lake Constance between 3920 and 3900 BCE (pottery drawings: Matuschik 2011, © LAD/I. Matuschik).

## Local production practice

Conical and double-conical vessels with flat bases are characteristic for the stylistically typical local pottery production of the Lake Constance area at the end of the 40th century BCE (Fig. 6). Pot- and cup-shaped vessels may have smooth rim bands or thickened rim lips and nubs attached at the belly. Nubs as well as eyelets also occur on bottle-shaped vessels. Single or paired nubs were typically attached onto jar- and mug-shaped vessels with handles and onto conical bowl-shaped vessels. Designs with these features are generally referred to as belonging to the Hornstaad style. Conical bowls with eyelets and incised decorations are also regularly found and might have already been appropriated from the so-called Lutzengüetle pottery style of the Alpine region before 3920 BCE (Heitz 2018; 2023, 319; Matuschik 2011).

The local designs were all made by using materials that are available in the sites' surroundings, such as siliceous clays and grus of granitic rocks as well as grog used as temper (Heitz 2017, 278). Furthermore, the vessels' bodies were coiled and additional coils added as a stand base or rim band. The exterior surfaces of cooking pots that had food residue inside were whipped off with water, resulting in a fine self-slip covering the

BOS_D1

BOS_D2

BOS_D12

BOS_D14

BOS_D19

BOS_D20

BOS_D9

BOS_D23

BOS_D24

BOS_D39

BOS_D40

temper while the bottle and jar-shaped vessels were sometimes also lustred, burnished, and polished using hard tools such as stones or bones. All vessels were reduction fired, which resulted in characteristically dark surfaces and a banded colour pattern visible in the section of freshly made breaks in the sherds (Heitz 2017, 263–266, 278–280, Fig. 4 and 9).

Two different types of wares can be identified: a coarse and a finer one. In both cases, different local silicate matrix types were used, all with carbonate (Ca) contents below 5% and being more or less fatty and micaceous (Matuschik 2011, 309–310; Scharff 2011, 379, Tab. 3a–b). The pre-evaluations of the p-XRF analysis I performed on some of these pieces show that both wares belong to the same chemical group. The coarse fabrics include mainly pot and cup-shaped vessels (BOS_D1 and D2), which were probably used for cooking food or heating other contents. Traces of secondary heat effects on the surfaces and the adhering crusts can be regularly observed on the sherds of these vessels. The finer ware encompasses bottle-shaped vessels and vessels with handles as well as bowl and dish-shaped vessels.

## Non-local pottery production practices

In addition to the vessels produced in a typical local pottery production practice, others were found showing features of several non-local styles. By taking the provenance of the materials as well as their manufacturing technique into account, locally produced intermediate vessels could be distinguished from translocal vessels in some cases. Overall, it can be inferred that the settlement groups living at Lake Constance around 3900 BCE were entangled with those of four neighbouring regions.

## Stylistic entanglements: Lake Constance – Danube – Upper Swabia

***Shared designs***: In general, the stylistically typical local production of Lake Constance shows great similarities to the pottery produced in Upper Swabia and along the Danube. The designs BOS_D20, D36, and D39 occur frequently in the pottery of both regions and can thus be described as stylistically shared (Fig. 7). There are also great similarities between the styles, especially in the pot- and cup-shaped vessels. Thus, for some pieces the boundaries between stylistically non-local and shared designs are blurred, as in the case of the designs BOS_D1 and D2, which are addressed as shared designs. This indicates that close relations existed between the agents of the settlements' communities of practice in both regions that were most likely established by spatial mobility.

***Stylistically non-local vessels:*** The hypotheses of spatial mobility regimes between settlement groups of the Lake Constance and the Upper Swabia and Danube regions is supported by the presence of vessels made in non-local vessel designs at Lake Constance that are typical for the Danube region and Upper Swabia: Designs_BOS_D4, D16, D18, D21, and D22.

In particular, the jars, with their non-local Schussenried-style incised decorations, show also a non-local calcareous tempering material, rhombohedrally crystallised calcite, which is mainly found in fissures in the Jura Mountains. The extent to which calcite also occurs in the Lake Constance region as a secondary material, such as pebbles in streams draining from the Swabian Jura, still needs to be conclusively investigated. Since Upper Swabia and the Danube region are closer to the Jura, an increased use of calcareous temper constituents in the local ceramic production there is understandable. Furthermore, in the case of the small jug-like vessel, HHIA_45, not only its materials but also its style and technique could be considered non-local in respect to Lake Constance pottery production (Scharff 2011, Tab. 3b; Matuschik 2011, 257).

The vessel SiA_460 can be clearly stylistically assigned to the Schussenried pottery practice, not only because of its stocky form, undercut lower body part, and rim with impressed decorations, but also because of its production technique. In addition, it is

Fig. 7: Vessels showing stylistic entanglements with the Upper Swabia-Danube region (pottery drawings: Matuschik 2011; forthcoming, © LAD/I. Matuschik).
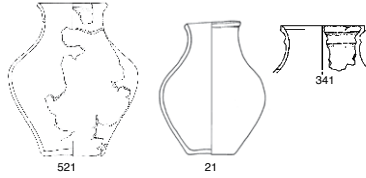
stylistically non-local
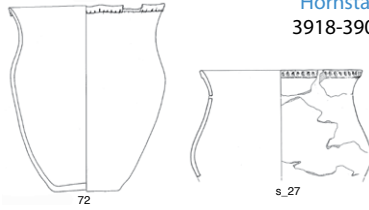
Hornstaad-Hörnle IA
3918-3902 BC (dend.)

Sipplingen A
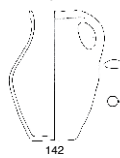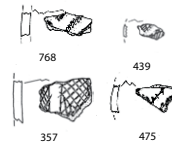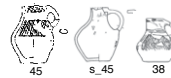3914-3904 BC (dend.)

BOS_**D4** b, c

BOS_**D16**

BOS_**D18**
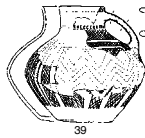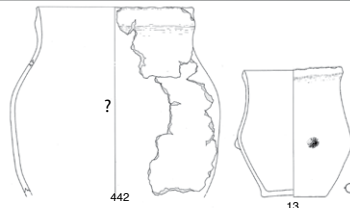
BOS_**D22**

BOS_**D21**

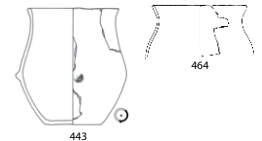M 1:6

stylistically intermediate
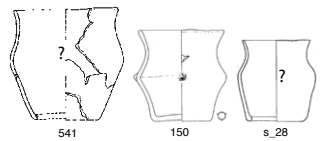
BOS_**D21**

BOS_**D37**

stylistically non-local or shared
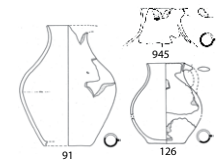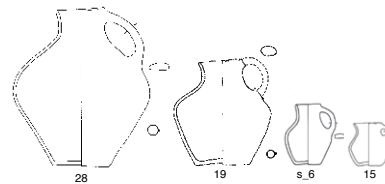
BOS_**D1**

BOS_**D2**

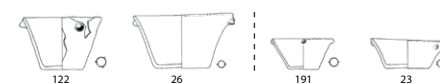stylistically shared

BOS_**D20**

BOS_**D36**

BOS_**D39**

M 1:14

tempered with limestone grus. The increased Ca-values in the p-XRF-measurements that I have carried out match this result (Heitz 2018; 2023). Consequently, by taking all three levels – style, technique, and material – into account, it was possible to identify HHIA_45 and SiA_460 as translocal vessels that were manufactured elsewhere and then brought to Lake Constance.

***Stylistically intermediate vessels:*** The bowl-shaped vessel HHIA_346 (BOS_D37) belongs to the designs shared between the communities of practice in both regions. In Upper Swabia and the Danube region, however, such designs are not decorated with incisions. The large jar HHIA_39 of the design BOS_D21 is an intermediate vessel, too: while its incised decoration has the same features and arrangement as some of the vessels found in the Danube region, the band of fingerprints on its neck is atypical, since the typical decorations in the neck area, according to the Schussenried style, are short, incised lines or triangles. Furthermore, the stacked, V-shaped decorations under the handle are typical of the local Lutzengüetle style (Matuschik 2011, 80–81, 248–249). The decoration of the vessels thus seems to combine features from two different ornamental styles: the local Lutzengüetle and the non-local Schussenried. The temper of that jar is grog of pottery that was itself also tempered with grog. The grog in the grog of vessel HHIA_39 contains grus of crystalline calcite (Scharff 2011, 381, Tab. 3b). It is probable that HHIA_39 was made from a clay that is locally available at Lake Constance but tempered with old sherds of a vessel that was itself a translocal one. It can be inferred that HHIA_39 was produced locally at Lake Constance and shows phenomena of appropriation and combination between the two different pottery production practices. However, its design as a whole is typical for the Danube region and Upper Swabia.

## Stylistic entanglements: Lake Constance – Kraichgau – Neckar – Danube

***Stylistically non-local and intermediate vessels***: Other stylistically non-local typical vessels can be found at Lake Constance, which indicates connections to the settlement groups living in the Neckar and Kraichgau areas (Fig. 8). They occur only in small numbers and include mainly bowl-shaped vessels of the designs BOS_D27, D31, D35, D38, and D44, as well as bottle-shaped vessels of the design BOS_D13, which are typical for the pottery of the so-called Michelsberg culture (Lüning 1968). It is interesting to note that such vessels also occur in the Danube region and in the Kaiserstuhl as well. They thus connect communities of the Lake Constance, Danube, Neckar, Kraichgau, and Kaiserstuhl regions with each other.

Of particular interest are the variants of the design BOS_D31, which represent basin-shaped bowls (*Beckenförmige Schüssel*) according to the typology of J. Lüning (1968).

The BOS_D31a variant does not occur in the Danube region. The basin-shaped HHIA_255 bowl is most likely a translocal vessel (Matuschik 2011, 258, Fig. 172). The (p)XRF analyses performed by M. Scharff and myself have shown that the vessels of the BOS_D31a variant have significantly higher values of $Al_2O_3$, V, and Zn (see also Matuschik 2011, 258; Scharff 2011, 389–393, Tab. 3a and 6; Heitz 2017, Fig. 9A). This makes it very likely that their matrix is a kaolinite clay, which does not occur locally at Lake Constance but about 25 to 30 kilometres away in the Swabia Jura. In addition, HHIA_255 has unique technical characteristics. Its outer surface has small, rounded impressions (Matuschik 2011, 56, 256, 430; Heitz 2017, Fig. 10A). The uniqueness and otherness in terms of material, design, style, and technical features thus refer to a non-local stylistic and geological origin.

The variant BOS_D31b, basin-shaped bowls with a smaller rim, is common in the Danube region, too. The ones found at Lake Constance do not differ chemically, mineralogically, or petrographically from local pottery production (cf. also Scharff 2011, Tab. 3a–b and 6). Accordingly, they were probably produced locally and can thus be referred to as stylistically non-local designs but intermediate vessels. Local appropriations
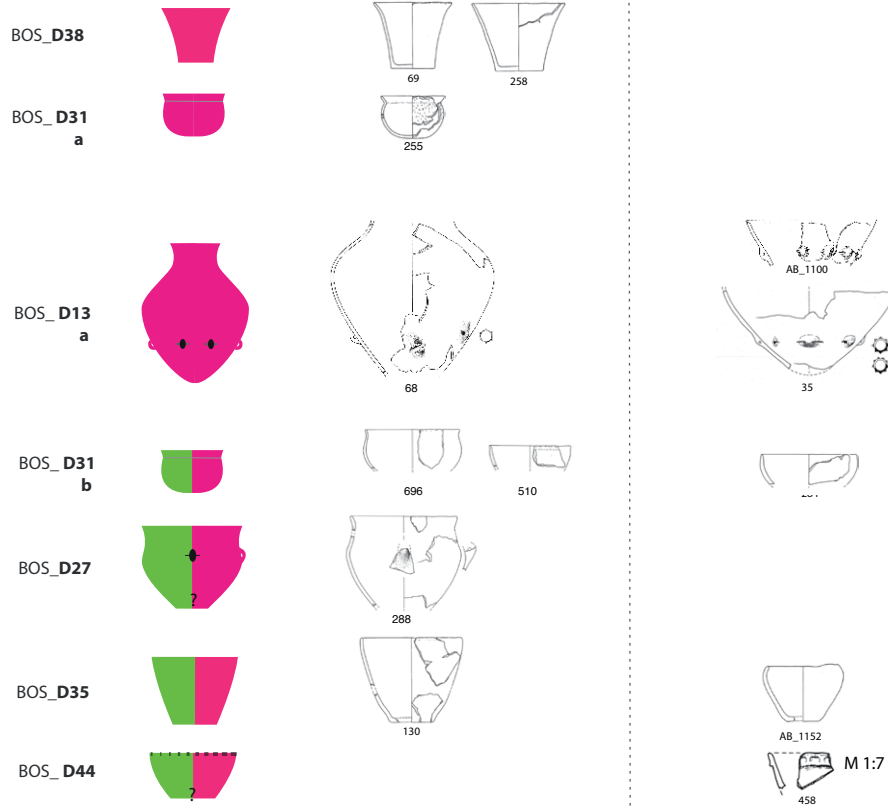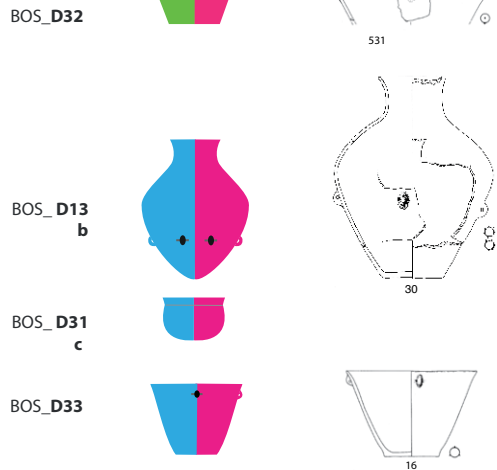
Fig. 8: Vessels showing stylistic entanglements with the Neckar-Kraichgau region (pottery drawings: Matuschik 2011; forthcoming, © LAD/I. Matuschik).
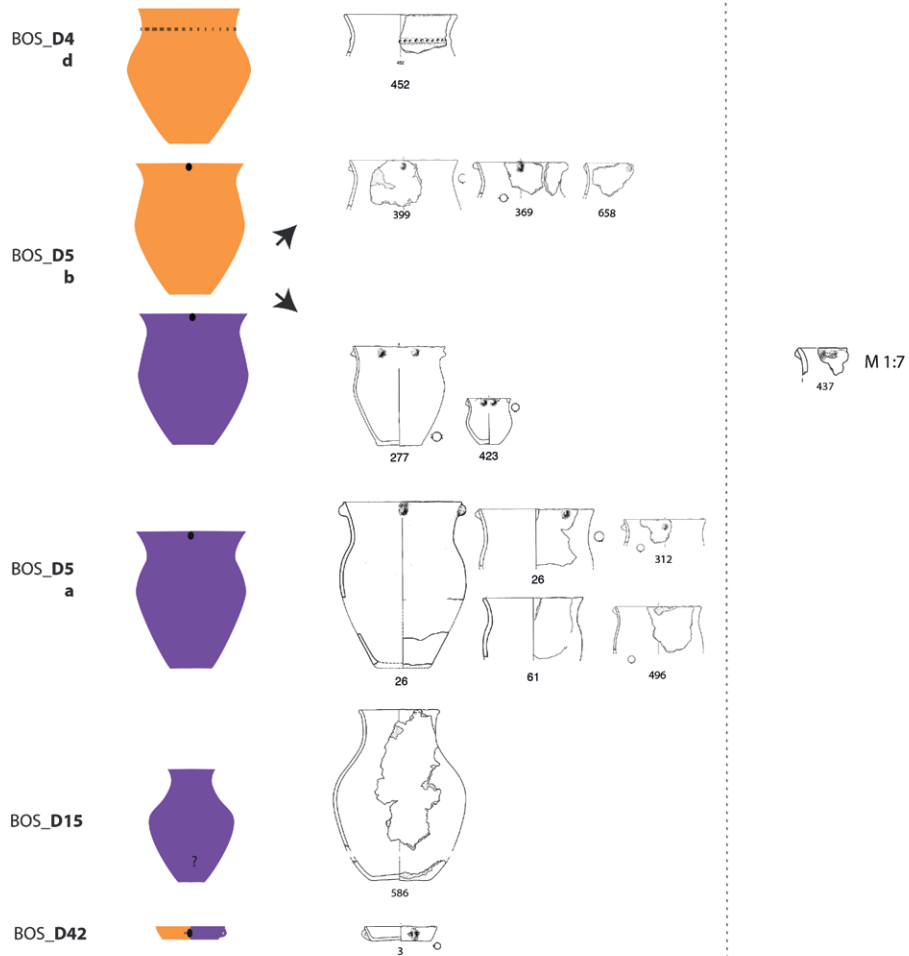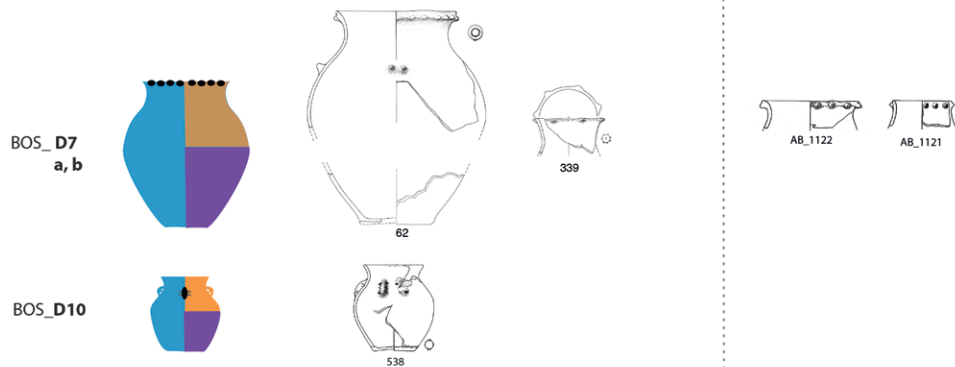
Fig. 9: Vessels showing stylistic entanglements with central and western Switzerland and the Upper Rhine Valley (pottery drawings: Matuschik 2011; forthcoming, © LAD/I. Matuschik).

at the stylistic and manufacturing level can be observed in the case of design variant BOS_ D31c. Like the other basin-shaped bowls of design variant BOS_D31b, SiA_96 (BOS_31c) does not differ chemically, mineralogically, or petrographically from local Hornstaad pottery (cf. also Scharff 2011, Tab. 3a–b and 6). The vessels were produced locally. Here, once again, appropriation phenomena are evident, possibly due to the coming together of ceramic producers from different practice and habitus groups.

Locally made vessels of stylistically non-local designs (intermediate vessels) and non-locally made ones (translocal vessels) are also attested in the case of the bottles with eyelet rings attached to the lower part of the body (*Ösenkranzflaschen*). SiA_35 is highly likely to be a translocal vessel, as it shows a different post-firing trace pattern, is heavily tempered with grog, and is made of a clay that is richer in Sr than those locally available at Lake Constance, as the pXRF-analyses have shown. However, HHIA_30 is stylistically intermediate compared with vessel SiA_35, which has a typical, local-style flat base, a ring attached higher on its body, and fewer eyelets, making it more similar to the local BOS_ D12 bottle design. Furthermore, as it is made of materials that can be found in the Lake Constance region, it was likely produced there.

## Stylistic entanglements: Lake Constance – Lake Zurich – southern Alsace

The stylistic interconnections between the pottery of the Lake Constance, Lake Zurich, and southern Alsace regions are extremely complex. Again, stylistically non-local and intermediate vessels can be found (Fig. 9). While some of the stylistic features of the non-local vessel designs refer to the Lake Zurich area (Cortaillod), others are more typical for the southern Alsace (Munzingen A). However, especially for the latter region, well-dated assemblages of pottery are not available because of poor preservation conditions in the dryland sites there. As non-local designs that are rather typical for the mentioned regions, BOS_D4d, D5a–b, D15, and D42 can be mentioned. The vessels attributed to the designs BOS_D7a–b and BOD_D10 could be referred to as stylistically intermediate or shared.

Archaeometric analyses are missing for the pottery of southern Alsace. Also, there are no systematic studies of the manufacturing practices for vessels of stylistic origin from the Zurich region or southern Alsace. The clays and tempering materials used are very similar to the typical local production of the coarse ware made in the Lake Constance region. Mineralogical, petrographical, or chemical differences have not yet been clearly identified. The reason for this is primarily the similar geology of the Lake Zurich and Lake Constance areas, with moraines of the Rhine-Linth glacier present in both places, as well as various molasses (Scharff 2011, Tab. 3a–b and 6). Accordingly, at the current state of research, it cannot yet be determined whether the vessels of these designs, which can be described as non-local at Lake Constance, were produced locally or not.

## Stylistic entanglements: Lake Constance – Lac de Clairvaux – Sâone

The stylistic entanglements between the Lake Constance region and eastern France (Néolithique Moyen Bourguignon, Motte aux Magnin, [see Pétrequin *et al.* 2015]) are numerous, even if the areas are relatively far apart (Fig. 10): the basically double-conical profile shape of pot-shaped vessels as well as the nubs attached to the shoulders or bellies and flat-based shapes are shared features. Pairs of nubs also occur in both pottery practices. In the case of the vessels listed as intermediate (BOS_D1, Da, D15, and D11), it is not always clear whether they are non-local or appropriated forms, given the great similarity between the two pottery practices. Here, once again, the stylistic differences are blurred.

At the Lac de Clairvaux region, however, smooth rim bands are missing, whereas vessels there often have segmentations in terms of separated shoulders. While flat and stand bases are typical at Lake Constance, flattened and concave bases seem to be characteristic of the French Jura region. Since the local pottery designs at Lake Constance
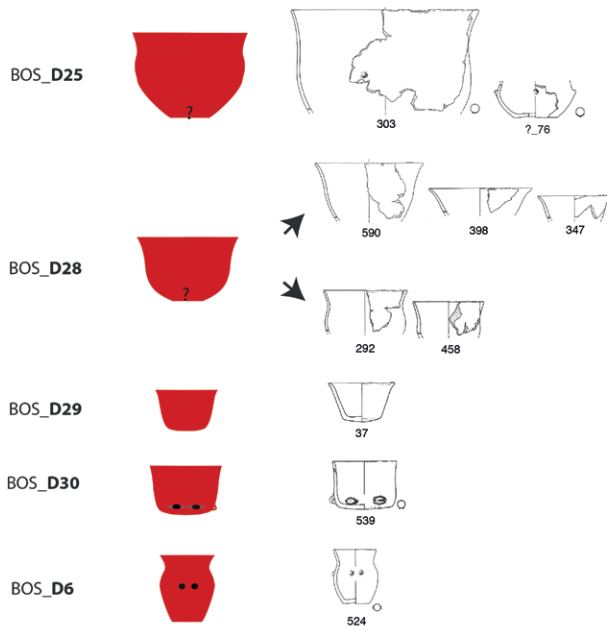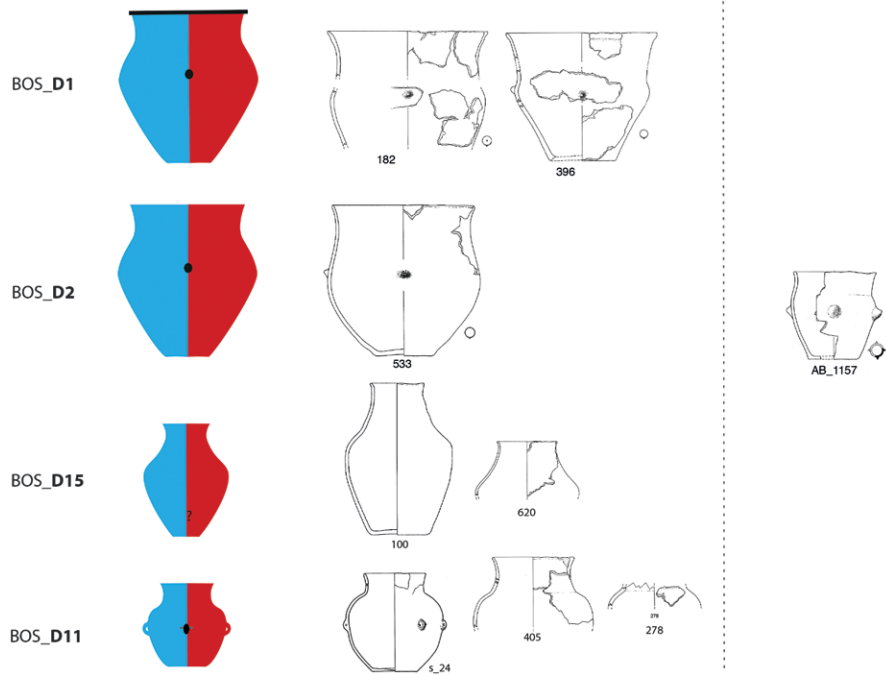
Fig. 10: Vessels showing stylistic entanglements with the Lac de Clairvaux-Sâone region (pottery drawings: Matuschik 2011; forthcoming, © LAD/I. Matuschik).

lack bowl-like vessels with an s-profile or segmentations and eyelets, the vessel designs BOS_D25, D28, D29, D30, and D6 can be described as non-local but typical for the Lac de Clairvaux-Sâone region.

Vessel HHIA_182 was tempered with calcite spar. The geological origin of this temper material is to be found in the Jura Mountains, in the Swabia, the French or Swiss Jura. The calcites cannot yet be distinguished any further geographically. A possible scenario would be that the pot-shaped vessel HHIA_182 was produced locally at Lake Constance, while calcite from the nearby Jura was collected and brought to the settlement because the pottery makers – probably newcomers – knew of its favourable properties for ceramic firing. This would have meant that the producers had retained their pottery production practice, since the pot and cup-shaped vessels at Lac de Clairvaux and Lake Constance had very similar designs at the time. In this case, HHIA_182 would be a locally produced intermediate vessel in terms of style and manufacturing process. An argument against it as a translocal vessel that was transported over long distances is its large size. In contrast to this is the vessel HHIA_539 (BOS_D30), which has a carbonate clay matrix. Carbonate clays were not used at Lake Constance for typical local vessel production, but were used on the Swiss Plateau and the French Jura (Scharff 2011, Tab. 6). They are associated with the pottery production practices of the NMB-style group. Thus, HHIA_539 could be a translocal vessel, since neither its style nor its material correspond to the typical local pottery production at Lake Constance.

## 5. Translocality as form of sociospatial configuration

The examinations of pottery from around 3900 BCE in the Lake Constance area have shown that, with the praxeological approach chosen here, stylistically typical local vessels can be distinguished from non-local ones. The former can be identified by their abundance within the pottery spectrum of a settlement, as well as by the use of locally occurring materials. Besides the local pottery, all settlements also contain vessels of non-local styles. In the settlement groups of the period between 3920 to 3880 BCE, stylistic diversity within the pottery of settlements can thus be considered normal (Fig. 11).

As the determinations of the stylistic and thus social origin of the vessels as well as the geological origin of their clays and temper have revealed, translocal vessels are rare. In addition to such individual cases of mobile vessels, the remaining stylistically non-local vessels were most probably produced locally. The phenomena of appropriation in such intermediate vessels indicates that stylistic diversity is probably less likely to be explained by the regular exchange or "import" of certain vessels from neighbouring regions than by skilled potters who were frequently mobile between settlements and regions. The overall picture that emerges is one of stylistic entanglements and, accordingly, the entangled relations between settlement groups. These results fit not so much to rare events of spatial mobility, such as "migrations" of entire "cultures", but rather to persistent and frequent local, regional rhythms of mobility that might have been connected with changes of residence, whereby some vessels were taken along.[3]

### From "communities of practice", to " translocal communities"
The results outlined above show that in about the first quarter of the fourth millennium BCE, the settlements' inhabitants were rather diverse: they were composed of several communities of practice concerning pottery production, which had different social and cultural belongings (habitus). On the one hand, these groups sharing one and the same habitus were larger than a single settlement group, and, on the other hand, several

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3    However, this basic pattern of residence-based mobility does not exclude the transfer or exchange of individual vessels in economic contexts.
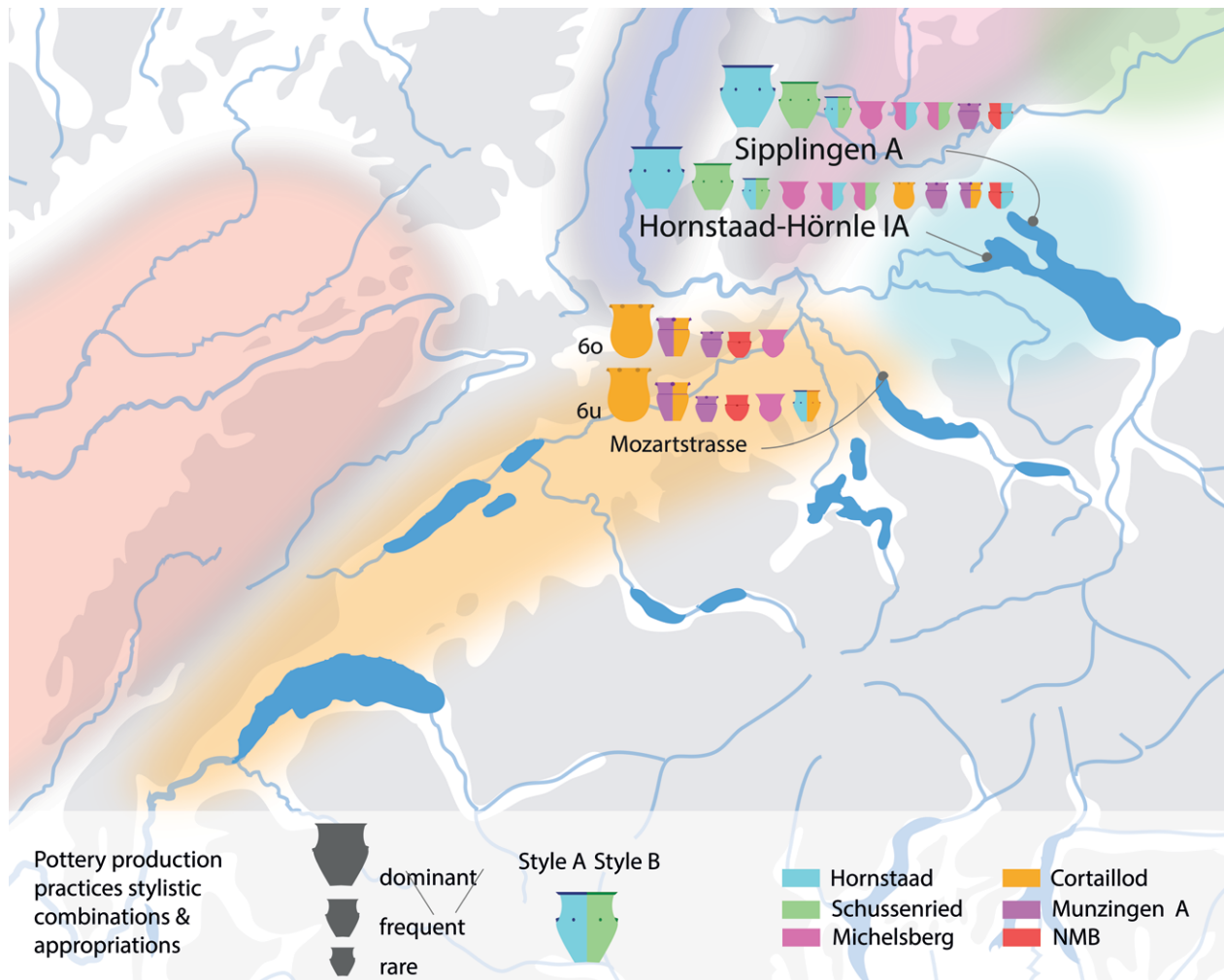
Fig. 11: Stylistic entanglements of pottery from around 3900 BCE found in dendro-dated settlements at Lake Constance and Lake Zurich: Sipplingen A (3914–3904), Hornstaad-Hörnle IA (3918–3902), Zürich-Mozartstrasse 6u (3913–3901?), and Zürich-Mozartstrasse 6o (3888–3880 ?).

different habitus groups could be encountered within a single settlement. Accordingly, the distinguishable, more or less standardised pottery styles were produced within a region that comprised several settlements. The associated habitus group was thus composed of several local communities of practice, which were related to each other by spatially and temporally entangled relations spanning several settlements and generations. Since the pottery styles shared by several settlement groups were transformed synchronously and similarly over time, it is reasonable to conclude that the potters from local communities of practice in the respective settlements encountered and exchanged continuously by moving around – being recurrently spatially mobile. This explains why an alignment of pottery styles had repeatedly taken place, which suggests socially shared production practices. Mobility within habitus groups, however, could only be directly verified by the vessels' materialities if the associated settlements were located in geologically different areas. However, such a case has not yet been identified in the pottery under study here.

Interestingly, the different habitus groups did not exist disparately, that is, spatially clearly separated from each other, on the northern Alpine foreland and in the adjacent regions. Rather, they were loosely entangled. Therefore, the stylistically non-local vessels (translocal and intermediate vessels) that can be found in the settlements on a regular basis are indicative of this (Heitz 2018; 2023; Stapfer *et al.* 2019; Stapfer 2017). The settlement groups thus consisted of different communities of practice, which in turn belonged to different habitus groups, which again were entangled over several settlements and generations. It can be hypothesised that the relationships between the

communities of practice within a habitus group were denser than with other communities of practice in the same settlement group. The habitus-bounded, translocal relationships across settlements might thus have been stronger than the internal, local ones across different habitus groups within a settlement group. That the latter nevertheless existed is evidenced by the appropriation phenomena, which are observable on what I refer to as "intermediate vessels". In my opinion, this indicates that there was at least some engagement between communities of practice related to different habitus groups.

To sum up, in order to understand the social configurations of prehistoric communities on the basis of materiality – such as in the "field" of pottery practices, to use Bourdieu's vocabulary – it is helpful to take spatiality and temporality into account in addition to mobility. Following that, it can be revealed that the settlement groups on the northern Alpine foreland dating to the period between 3920 and 3750 BCE were composed of various translocal social groups belonging to different habitus groups.

## Translocality and diversity

In a seminal paper, Martin Furholt has called for action theory-driven approaches to rethink our concepts of forms of social organisation regarding the Neolithic by taking the mutuality of social practices and materialities into account (Furholt 2018, 305 see also Furholt in this volume), which is quite similar to the approach I have chosen in my research (Heitz 2017; 2018). By drawing from geographers Greiner and Sakdapolrak (Greiner *et al.* 2013), he has proposed the concepts of "translocal communities" for sociospatial social configurations where social ties are, to a large degree, maintained across different residence groups and thus where individual mobility must be high (Furholt 2018, 309). Furthermore, he has argued that, in Neolithic groups for which one can assume local, self-supplying (pottery) production, translocality might have led to diversity in social group composition as well as cultural homogeneity, and that this phenomenon led to regionally different pottery styles that were equated with cultures (Furholt 2018, 311–313). The cross-settlement alignment of pottery production practices is explained here by frequent spatial mobility between settlement groups and related translocal social ties.

My empirical results on the regionally, cross-settlement spanning stylistic entanglements and thus the observable translocality within habitus groups (*e.g.* the material equivalent of the typical local "Hornstaad" pottery style) support this hypothesis strongly: the shared materiality (pottery styles) of settlement groups within a region is related to the spatial mobility between them. However, the sociospatial configurations on the northern Alpine foreland during the first quarter of the fourth millennium BCE are more complex. But let us stay for a moment on my empirical results that support Furholt's hypothesis. These translocal sociospatial configurations, which have so far been described on the basis of mobility and pottery, can also be examined in the settlement practices of wetland sites using dendrochronological data.

Neolithic lakeshore settlements of the fourth millennium BCE were highly dynamic in terms of their short lifespans, which encompassed only 10–20 years. This is seen in the temporality of their settlement construction histories, which show a gradual growth, and in the settlement relocations within the bay of single lakes (Ebersbach *et al.* 2017). These spatiotemporal dynamics of the settlement practices provide evidence of spatial mobility. There are a few cases where lakeshore settlements were excavated to their full extent so that the temporality of their construction history can be traced by means of dendrochronology to the exact year (Fig. 12). The settlements of Sutz-Lattrigen, Riedstation, and Murten-Pantschau in the Three Lakes region in western Switzerland, dating to around 3400 BCE, provide good examples (Crivelli *et al.* 2012; Hafner 1992; see also Heitz *et al.* 2021). In the first pioneering phase when the settlements were founded, only three large rectangular houses were built. In the following years, the number of houses gradually increased until the settlements reached full size and then lasted for some years, as the felling dates of the timbers indicate, and they were thereafter
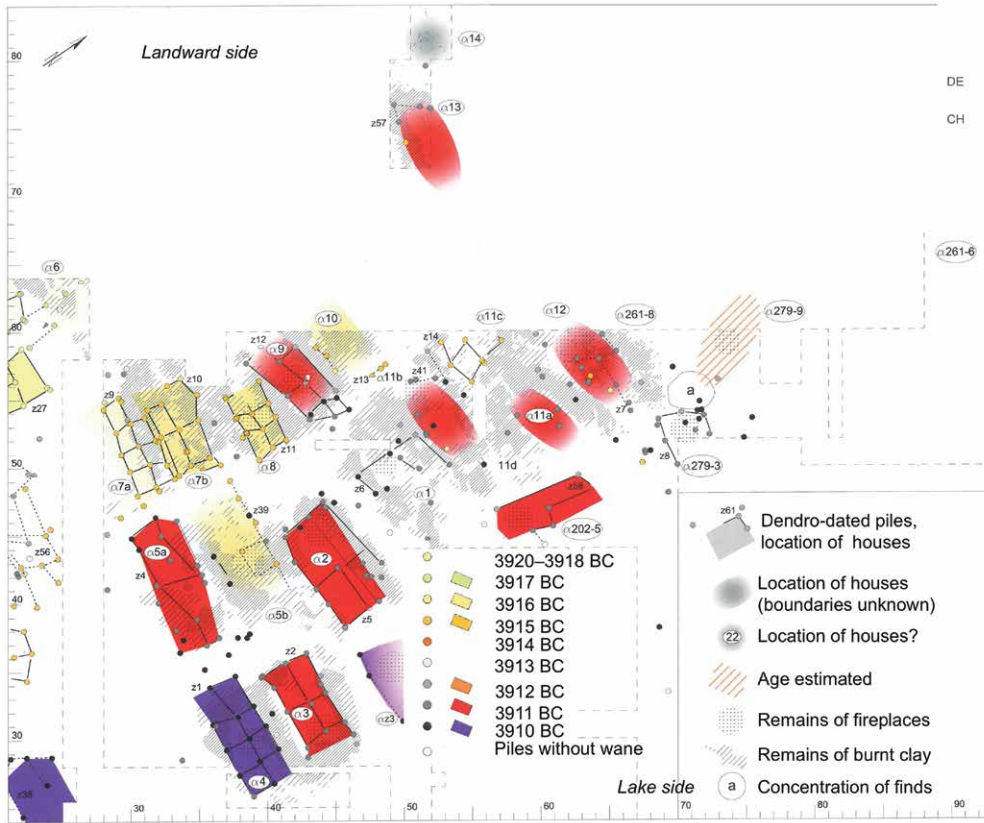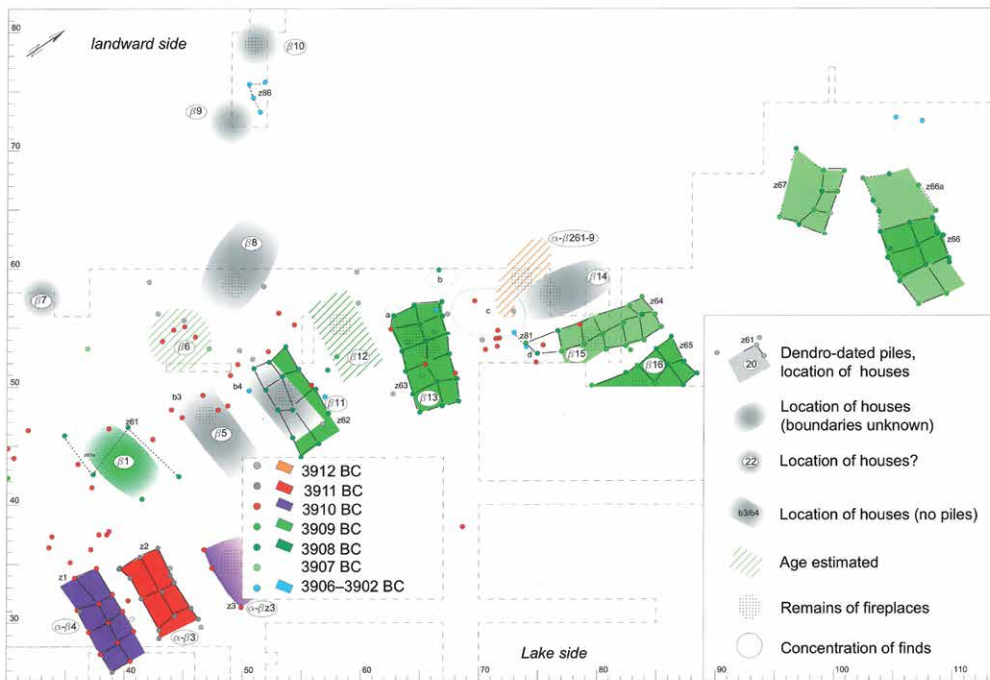
Fig. 12: Histories and dynamics of the settlement construction at Hornstaad-Hörnle IA (after Matuschik 2011, © LAD/I. Matuschik), Sutz-Lattrigen, Riedstation (Hafner 1992, © ADB/A. Hafner), and Murten, Pantschau (Crivelli *et al.* 2012, © SAEF/C. Crivelli).

3428–3415 BCE
Murten, Pantschau

| | | |
|---|---|---|
| Foundation, pioneer phase | | 3428 BCE |
| 6 Houses | | 3427 BCE |
| 5 Houses | | 3426 BCE |
| 1 House | | 3425 BCE |
| .... | | |
| Abandonment | | 3415 BCE |
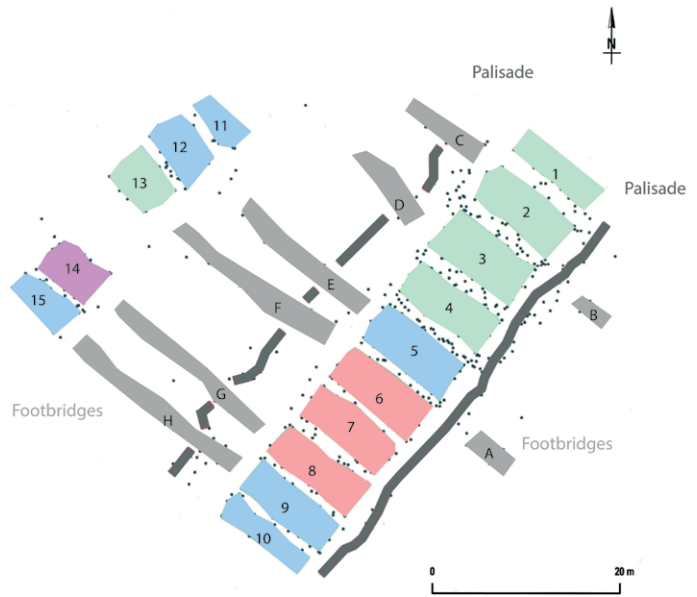
3393–3388 BCE
Sutz-Lattrigen, Riedstation

| | | |
|---|---|---|
| Foundation | | 3393 BCE |
| Pioneer phase | | 3392 BCE |
| 7 Houses | | 3391 BCE |
| 8 houses | | 3390 BCE |
| 1 House | | 3389 BCE |
| Abandonment | | 3388 BCE |
| .... | | |
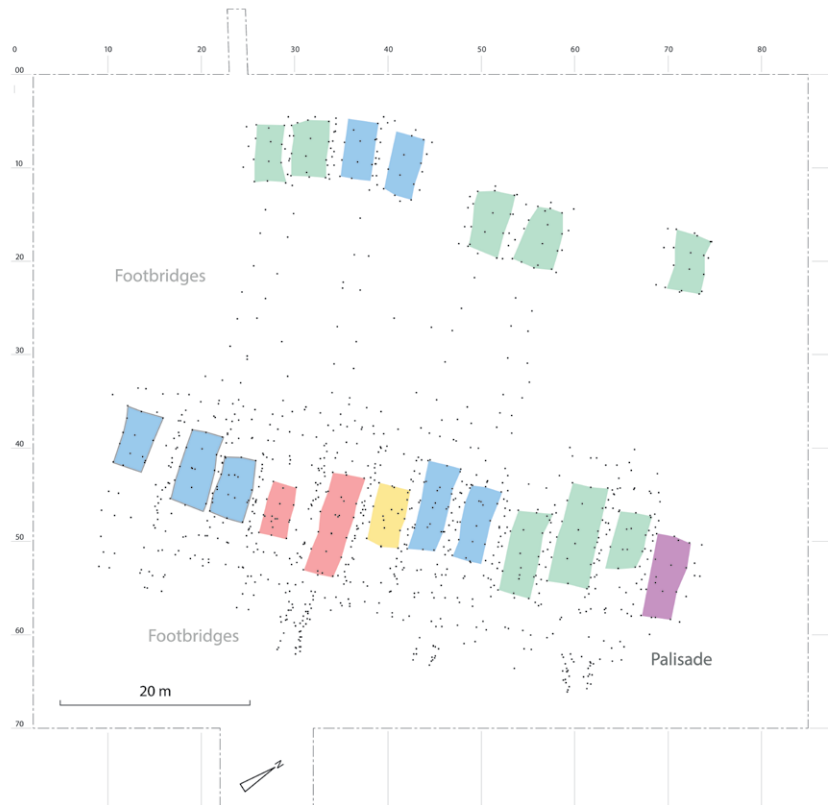
abandoned. The time of the occupation can be calculated because the houses and other facilities within these lakeshore settlements needed yearly repairs due to the rotting of timber in the wet soil conditions (Ebersbach 2010; Hofmann *et al.* 2016). A similar gradual growth is also attested for the settlement Hornstaad-Hörnle IA, which burnt down in the year 3909 BCE and was rebuilt immediately thereafter (Matuschik 2011, 28–39). Renate Ebersbach has mentioned that the gradual growth of the settlements also means a gradual influx of inhabitants from older settlements to the new settlements over time, which is again an indicator for the translocality of these social groups. She has even noticed that places of houses within the settlement layout might have stayed empty for a certain time, as if they were reserved for their inhabitants who were presumably temporarily not living there (Ebersbach 2010).

Based on her findings, Ebersbach discussed alternative models regarding the correspondence between spatial groups and social groups. She suggested that the Neolithic social groups were organised into so-called non-correspondence systems (Ebersbach 2016, 143–145, Fig. 182).[4] In this model, adopted from sociologists Bill Hillier und Julienne Hanson (1984, 256–262), the spatial group of everyday social cohabitation and coexistence is smaller than the social group with which a person on the whole has social ties. Thus, individuals and social groups may have been connected to each other through kinship, economic, ritual and other relationships across different settlement groups (Ebersbach 2016, 143–144). Thus, the social groups that corresponded to these translocal ties maintained by mobility extended spatially beyond the households of the local social groups, but at the same time were smaller than the local settlement groups (Ebersbach 2010, 202–204). Therefore, not only in the field of pottery but also in the field of settlement practices, there are strong indications for frequent and short-term rhythms of residential mobility and thus translocal social groups.

Let us go back to the hypothesis of Furholt, that translocality might have led rather to cultural homogeneity – or a shared regional materiality as I would rather frame it – than to heterogeneity (Fig. 13). My empirical results on the regionality of pottery styles and thus the observable translocality within habitus groups strongly support this hypothesis; a pottery style that is commonly shared between contemporaneous settlement groups, such as Hornstaad-Hörnle IA and Sipplingen A, can be explained by the social relations between them, supported by spatial mobility. Translocality here leads to a shared regional materiality of one and the same habitus group. However, the sociospatial configurations on the northern Alpine foreland in the first quarter of the fourth millennium BCE were more complex. Overall, the pottery found in the lakeshore settlements studied here cannot best be characterised by cultural homogeneity but by stylistic plurality. With respect to the field of pottery production practices, the different habitus of the multiple communities of practice within settlement groups can still be distinguished in the materiality of pottery. Thus, several more or less separated communities of pottery production practice – or potters – can be expected within a settlement group. However, the observed phenomena of appropriations and shared pottery designs also show moments of mutual alignment and thus probably the integration of different communities of practice. What can be inferred from the research presented here for the northern Alpine foreland around 3900 BCE are complex forms of social organisation and of translocal, sociospatial social configurations in which settlement groups were integrated and for which they were actively mediating social ties in a widely ramified transcultural entanglement (Fig.14).

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4    On the other hand, the model associated with the concepts of the cultural-historical approach (*i.e.* the premise of a settlement or a ceramic style) corresponds, according to Hillier and Hanson, more to a so-called correspondence system. Social relations are maintained within a settlement group that might lead to cultural homogeneity (Furholt 2017, 308–-310).
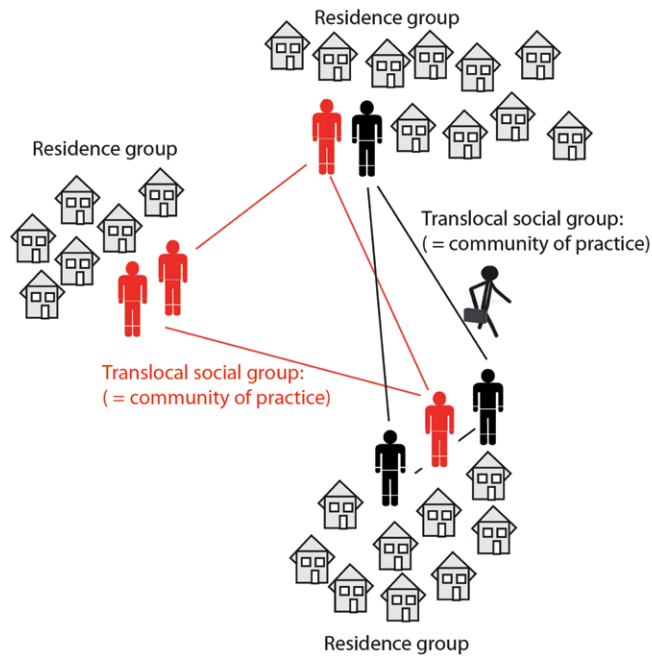
Fig. 13: Theoretical model of "translocal communities" (after Furholt 2017, Fig. 1).
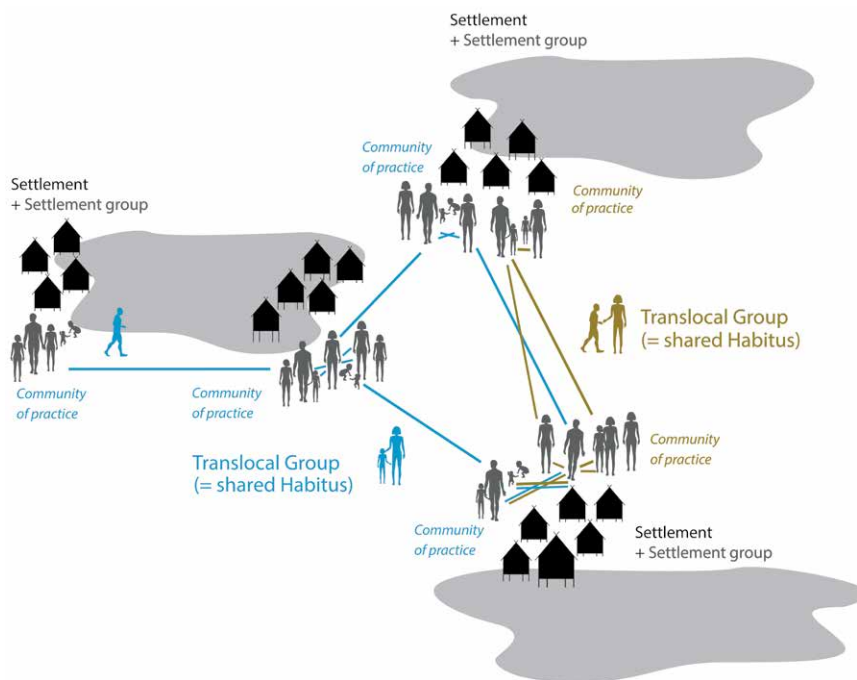


Fig. 14: Empirical model of translocal social configurations on the northern Alpine foreland (3920–3800 BCE) based on pottery practices. Within settlements, inhabitants could belong to different communities of practice that were making pottery either separately or together with members of other groups (indicated by different colours here) and which belonged to different translocal groups sometimes sharing the same pottery style (habitus).

## 5. Conclusion

In this paper, I have proposed an alternative bottom-up praxeological approach to the top-down premise-loaded concepts of Neolithic cultures to gain a deeper understanding of the sociospatial configurations of communities living in lakeshore settlements on the northern Alpine foreland in the first quarter of the fourth millennium BCE. This led to several methodological and empirical insights and conclusions. Specifically, by examining the field of pottery production practices, it is possible to address questions of shared practices as well as the social and cultural diversity of these settlement groups.

In the empirical case under study here, it could be shown that diversity was not an exception but the rule. By examining the vessels' styles, manufacturing techniques, and materials, it is possible to approach the social and material provenances of the pottery vessels, which is indicative for the degree of connectedness and spatial mobility of these basically sedentary prehistoric farming communities. By distinguishing locally produced vessels (local vessels and intermediate vessels) from those that were produced elsewhere (translocal vessels) and then brought to the settlements, it is possible to gain a deeper understanding of the entanglement of social ties and thus the sociospatial configurations. For the case under study here, one can conclude that the settlement groups were composed of several communities of practice belonging to different multi- and thus translocal habitus groups and that were living in at least spatial proximity, but probably also social closeness. At this stage of research, there are no signs of social uncertainty such as physical violence triggered by the encounter or confrontation of cultural and social otherness within these settlement groups. Rather, the maintenance of differences in pottery production practices over decades might indicate that the possible tensions caused by cultural otherness were not perceived as negative. Even more, the observable creative appropriations between different pottery production practices in the materiality of some vessels might be a sign of mutual alignment and social cohesion.

## Acknowledgements

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# Ethnoarchaeology and agent-based simulation modelling as bottom-up approaches: Perspectives for archaeological research

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## Abstract

*Bottom-up approaches have recently been gaining momentum within archaeological research and can be seen as a counter tool against re-emerging top-down narratives. However, they also provide a tool for reflective working procedures and help make research more accessible and reliable. A brief introduction to the current ethnoarchaeological research debate is rounded off with a brief example of the authors' ethnoarchaeological work on megalithic building traditions on the island of Sumba, Indonesia, and in Nagaland, India. The principles of agent-based simulation modelling and a partial result of a recent simulation study of the land use and settlement dynamics of Neolithic lakeshore settlements in western Switzerland are briefly presented. Both examples show how ethnoarchaeology and agent-based simulation modelling apply bottom-up approaches in their specific field of archaeological knowledge production. Based on the examples' different perspectives on bottom-up approaches and their place in current debates, it is concluded that both research fields offer much potential for the further use and progressive pursuit of bottom-up guided research in archaeology.*

*Keywords: bottom-up approaches, ethnoarchaeology, megalith building, agent-based modelling, simulation*

## Introduction

Within the current discourse in archaeological research, we are witnessing a shift towards and calls for bottom-up approaches (*e.g.* Furholt *et al.* 2020; Perry and O'Sullivan 2018; Watkins 2013), and we think that such approaches could unite a wide variety of positions and research traditions. The call to turn away from "top-down" perspectives that group archaeological cultures together as homogeneous units, place social organisation into evolutionary schemes, or see elites as the only progressive force in societies is not new (*e.g.* Crumley 1995; Kienlin and Zimmermann 2012; Meller *et al.* 2018). The historicity of our discipline and the advancement of scientific methods and approaches in archaeology over the last decades have brought us to a point where tensions have once again arisen within the archaeological community. There are no longer clear labels – such as processualist or post-processualist – to identify the camps of thought from which one comes, because most of us move somewhere in between those poles. However, it seems that the debate is moving towards whether narratives about the past are constructed from and consist of "top-down" or "bottom-up" perspectives (*e.g.* Arponen *et al.* 2019; Furholt *et al.* 2020; Kristiansen 2019; Ribeiro 2016).

We, the authors, work in two different fields of archaeological research – ethnoarchaeology and agent-based simulation modelling – which we see as being united in the idea of bottom-up approaches. We believe that applying bottom-up perspectives to archaeological studies will enhance the construction of narratives about the past and sharpen researchers' focus on the variety of human behaviour and social organisation. In our view, the following points are particularly important when considering bottom-up approaches for the study of prehistoric communities:

- The object of interest is a social or socioecological phenomenon under consideration of its spatiotemporal dynamics and scales.
- The phenomenon is a product of the relations and interaction of its constituting parts.
- It is acknowledged that structural or external constraints (*e.g.* sociopolitical institutions, ecological settings) may influence the development of the observed phenomenon and vice versa. Nevertheless, the focus is not on these overarching structures.
- The diverse and multifaceted realities of individuals who shape the phenomenon under study are acknowledged and seen as an important characteristic of a bottom-up approach.
- A reflection of the epistemological basis must accompany the process of analysis and reasoning.

We are aware of the incompleteness and bias of the list above, as we have tried to include very basic points that can and should be added, depending on one's own research topic. These are the points on which an ethnoarchaeologist and a modeller can agree. The aim of this contribution is to present the conceptual foundations of two different research perspectives that, in our view, can be characterised by similar approaches and preconditions. We see our text as a way to provide some stimulation or inspiration of thought and not as a complete review article in which all background information is presented in detail. Nonetheless, we aim to contribute to the current discussion on perspectives that are considered from a bottom-up approach in archaeological research, with a particular focus on Neolithic studies.

## Situating ethnoarchaeology and simulation modelling in current arenas of archaeological thought and debate

In recent years, the archaeological sciences have experienced methodological and theoretical discussions, changes, and progress that are so profound they have been called, among other things, a "revolution" (Kristiansen 2014). Based on this scientific progress, tremendous advancements in digital infrastructure, and the available big data, archaeology is said to finally be ready to address the "grand challenges of archaeology" that have always been the endeavour of our discipline (Kintigh *et al.* 2014). What is particularly associated with digitalisation in the sciences and digital humanities is the ability to aggregate and analyse data quickly, resulting in rapid and high scientific output that is more associated with quantitative research. In some cases, this can lead to a lack of exploration of results, incomplete contextualisation, and abridged interpretations (Alleva 2006; The Slow Science Academy 2010). The notion of "publish or perish" – with its good and bad sides – is encouraged by such developments (Fanelli 2010) and is increasingly making its way into archaeological knowledge production (Salazar *et al.* 2019). However, increasing digitalisation within archaeology also brings very positive developments, as calls for reproducible research and "open access" become louder and more sustained (Kansa *et al.* 2013; Lake 2012; Marwick 2017a). The quantitative working community, in particular, is gradually integrating the accessibility of data repositories

and the availability of (detailed) processing steps into their research designs, not only to show the reproducibility of their own study, but also to allow other researchers to use their data and methods for their own research (Janssen *et al.* 2008; Marwick 2017; Perry and Taylor 2018).

Much has changed since the introduction of simulations into social sciences and archaeology during the era of processual thinking and systems theory (*e.g.* Doran 1970; Hodder 1978). This is true for the ongoing growth in computational power, but is also true for the epistemological foundation that has abandoned (unreflective) positivism and linear models of causation in favour of the insights of chaos theory (*e.g.* Holland 1998; Lorenz 1995) and the study of complex adaptive systems. The so-called complexity sciences are intensely concerned with understanding the complexity of systems emerging from self-organisation under non-linear relationships of the systems' parts (*e.g.* Bar-Yam 1997; Hooker 2011; Jeldtoft Jensen 2009; Juarrero 1999). In recent years, simulation models and, in particular, agent-based simulation models (ABMs) – representing the fundamental ideas of complex adaptive systems – have gained influence (Axelrod 1997; Barton 2014; Bonabeau 2002) and were rapidly adopted by archaeologists beginning in the late 1990s and early 2000s to simulate past societies (Axtell *et al.* 2002; Kohler and Gumerman 2000). Since the late 2000s, ABMs and computational modelling have become more mainstream in archaeology (*e.g.* Kohler and van der Leeuw 2007; see Lake 2014; Rogers and Cegielski 2017).

In addition to the question of methodology, digitalisation and the tension between theoretical approaches, ethical questions, and fundamental questions about scientific working methods, as well as the organisation of science, have been raised in the last decades. Postcolonial approaches and the demands of an anticolonial archaeology (Gosden 1999; Lydon and Rizvi 2010; Meskell 2007; Porr and Bell 2012) as well as the question of how ethnoarchaeology can be framed as an explicit "slow science" have had, and continue to have, a major influence on ethnoarchaeological approaches. In their important contribution to future viability and the potential of ethnoarchaeological research, the authors point to the problems associated with ethnocentric patterns of interpretation (Cunningham and MacEachern 2016). In this context, the demand for multiple possibilities of interpretation of material legacies can only be achieved through the inclusion of diverse research approaches shaped by different research schools and social contexts. Ethnoarchaeology offers the potential to meet these demands (Politis 2016), even if this cannot be taken for granted and the reflection of the epistemological basis and ethical concerns is up to the individual researcher.

At the centre of various contributions and approaches dealing with bottom-up perspectives, and in archaeology in general, are increasing demands for reflective or reflexive methods and working practices (cf. Arponen 2017; Arponen *et al.* 2019; Hodder 2000; Londoño 2014). In our opinion, this welcome development is in line with a variety of research debates, especially within the humanities. Here, we would like to exemplarily emphasise the approaches of postcolonial or anticolonial archaeology (*e.g.* Hingley 2014; Hutchings and La Salle 2015), feminist archaeology (*e.g.* Blackmore 2015; Conkey 2003; Wylie 1997), anarchist archaeology (*e.g.* Angelbeck 2019; Angelbeck and Grier 2012; Brock and Sanger 2017; Flexner and Gonzalez-Tennant 2018), and grassroots movements (*e.g.* Morgan, 2015). The basic topics of these archaeological currents of thought are by no means new and can be seen as a resurgence of critical approaches in archaeology (Shanks and Tilley 1993; 1988).

Although only loosely connected to the examples mentioned above, both ethnoarchaeological approaches and (agent-based) simulation modelling are, we believe, in a similar reflexive tradition due to the required reflexive way of working. Assumptions and the reflection on one's research agenda are fundamental prerequisites for working with ethnoarchaeological perspectives or when building a simulation model of the past. Both approaches require explicit knowledge about the epistemological underpinnings of the theoretical models and methodological tools chosen; perhaps more so than usual

archaeological research approaches. A movement towards a "slow science" is, in our opinion, a necessary step due to the "reflective turn", since in "fast science" – polemically speaking – the reflection on one's own science is also often quickly lost. In the context of the digitalisation of archaeology, ethnoarchaeological work should be made accessible for all involved parties and not embargoed or hidden behind a pay wall.

## Comparative approaches and multivocality: The potentials of ethnoarchaeology

In its current state, ethnoarchaeology cannot be defined as one method or common approach. Rather, it is situated at the intersection of different discourses and debates and pursues diverse approaches and research strands that include both experimental approaches and complex studies of social relations (*e.g.* Jordan 2003; Näser 2005; Owen and Porr 1997). Over the last decades, ethnoarchaeology has undergone a changeful history. After becoming fully established in the wake of processual archaeology (Binford 1978), it was also used in the context of post-processual approaches (Hodder 1982) and, beyond that, remained of minor importance in many archaeological discourses. Ethnoarchaeology has been the subject of intense criticism (*e.g.* Gosselain 2016), pointing to, among other things, the incomprehensible selection of analogies and the use of non-European societies as "exotic" illustrative examples. On a more general level, this criticism also concerns the use of well-known ethnographic examples of political organisation, such as "big man" (*e.g.* Sahlins, 1963), which are quite consistently used by archaeologists as an analogy or explanation of material remains. One of the major problems in this regard is the missing examination of the specific historical situation that may have led to the emergence of these political structures (cf. Spriggs 2008), or the variability and non-conformity of these famous concepts in their original contexts (cf. Roscoe 2000). Against the background of these criticisms, the use of complex models of social and political organisation and their direct transfer to archaeological contexts must seriously be questioned (cf. Artemova 2020), especially with regard to their potential connection to neo-evolutionary thinking (Pauketat 2007). Yet, ethnoarchaeological research, especially in recent years, has moved beyond this rather limited and partly unreflected use of direct analogies to describe and explain complex systems of sociopolitical organisation.

### Is there a need for ethnoarchaeological perspectives?

Ultimately, ethnoarchaeological approaches can be located at a wide variety of intersections and they focus on areas of tension, such as human-environment relationships or relations between groups and individuals (cf. Binford 1978; Gosden 1999; Posner 2008; Shankland 2012). Archaeology and cultural anthropology have in common that both disciplines try to understand the "other" or the "foreign" (cf. Gramsch 2000; Veit 1998), but in doing so they start from their own social and societal location. Nevertheless, in social and cultural anthropological research, a correspondence with the societies and communities that are the focus of scientific interest seems achievable (cf. Ingold 2017), which is no longer possible in the case of archaeological research. An approach to this ideal, as well as an active reflection on the researchers' own role and socialisation and on the chosen theoretical framework, seems possible within ethnoarchaeological approaches. These developments are already visible in various studies (*e.g.* Maier 2015).

The possible points of contact for the inclusion of social and cultural anthropological perspectives and ethnoarchaeological research are manifold and concern both the application of complex anthropological models of social organisation (*e.g.* Earle 1997; Iversen 2017; Ling *et al.* 2018; Řídký *et al.* 2019) and specific aspects of archaeological interpretation. These include, for example, aspects of kinship relations, which play an

important role in the application and interpretation of aDNA studies (Bentley *et al.* 2012; Brück 2021; Ensor 2021; Mittnik *et al.* 2019, cf. Hofmann 2015). The potential benefit of an integrative approach that encompasses archaeological as well as social and cultural anthropological perspectives can be briefly illustrated by the example of the interpretation of aDNA analysis with a focus on kinship. The already-existing case studies of kinship relations at collective burial sites of the Central European Neolithic and Bronze Ages showed different results. These included a close positioning of directly biologically related individuals (see Meyer *et al.* 2008), but also a mixed composition of a burial community of biologically related and unrelated individuals (*e.g.* Lee *et al.* 2014; Meyer *et al.* 2012; Simón *et al.* 2011). Although source-critical aspects such as the potential chronological depth of permanently accessible collective burials in particular and the much more frequent preservation of mtDNA have to be taken into account, further questions remain open (*e.g.* Rott *et al.* 2018; Simón *et al.* 2011). The fact that many collective burials are indeed characterised by a mixture of biological related and unrelated individuals, even in close spatial proximity, should open up questions and debates concerning the actual importance and reliability of concepts such as nuclear families and the concentration on kinship as (mostly) biological relatedness. Close kinship relationships that extend beyond a biological relationship are known from various ethnographic case studies (see Godelier 2011; Sahlins 2012), and they are conceptually well researched and defined when it comes to the acting entities, such as clans and lineages (cf. Sousa 2003). Many existing sociocultural anthropological studies have in common their conclusion that kinship is also, or even primarily, a flexible concept influenced by active mechanisms. Performative aspects often play a role here and, although biological relatedness is significant, it is not necessarily the most significant factor in kinship relations (*e.g.* Alber *et al.* 2010; Carsten 2004; 2000; Howell 2006). This highlights that other factors, such as the establishment of kinship through active mechanisms, or the importance of adoption in the broader sense (*e.g.* Gunawan 2000), may have played an important role in the selection of a burial community represented within a collective grave. These aspects explicitly do not exclude the importance of biological relatedness (*e.g.* Shapiro 2017), but they do offer possible guidance to establish a more open and non-biased interpretative framework.

## Unpacking megalith building

The study of megalithic monuments in their many forms and manifestations has shown a close interlocking of monuments, social processes, and implications. This is true especially due to the recent decades of methodological innovations. The deciphering of monument biographies (Mischka 2014; Müller 2018), the biological relationships within collective burials (*e.g.* Meyer *et al.* 2008), as well as the investigation of grave goods and the use of specific food and plants (*e.g.* Kirleis and Klooß 2014; Weber *et al.* 2020) were able to clarify how complex the use of these graves actually was. Comprehensive dating programmes have also shown that megalithic tombs can be expected to have been built in phases or steps and subsequently expanded (*e.g.* Blank *et al.* 2020; Linares Catela 2015). This applies not only to the largest and best known of these graves, but also to comparatively small passage graves in northern Germany (*e.g.* Brozio 2016). In addition, extensive ritual activities took place around and in the graves, which accompanied the actual burial procedures (*e.g.* Kjærum 1969; Strömberg 1971).

The importance and potential of ethnoarchaeological or social and cultural anthropological perspectives within this complex field of research can be illustrated by two aspects. The amount of labour invested in a megalithic tomb by a local community or an individual group is an important benchmark for the importance attached to the monument and for the question of which individual and collective mechanisms were at play during its construction. Within prehistoric archaeology, this approach is controversial, but at the same time, it is used again and again and in different contexts (*e.g.* Müller 1990). Critical to this approach is the lack of a systematic recording of data

across case studies, as well as the uncertainties in the calculations due to the variance of the data, which is connected to a specific step in the construction process. In the end, the calculations of labour seem to be based on a possible overestimation of economic factors; thus, the necessary investment of labour in different work steps will primarily follow principles of efficiency (cf. Kerig 2009). However, ethnographic case studies (cf. Hutton 1922) show that social factors that have nothing in common with capitalist notions of efficient labour allocation may have played a significant role. In general, it should be noted that labour calculations of archaeological finds or features are usually based on either experimental data or ethnographic observations (*e.g.* Atkinson 1956; Erasmus 1977; Röder 1944).

The major advantages of labour input calculations include the creation of a comparable database and, if the necessary archaeological datasets are available, a direct link between the demographic estimates of a known contemporary settlement and the preserved graves in the surrounding vicinity. In the case of megalithic graves, precise dating often poses a problem, whereby the dating of the initial construction period of the graves is particularly salient (cf. Furholt and Mischka 2019). Burial phases can partly be dated well if the buried individuals are present. However, this does not necessarily apply to the construction phases of the grave complexes; in new excavations, they can sometimes be integrated into solid models through extensive sampling (*e.g.* Brozio 2016), but this is usually not the case for old excavations. Therefore, especially in regional or supra-regional case studies where a whole series of labour calculations are carried out, it is sometimes necessary to work with rather large timespans (often more than 100 years) into which different graves of diverse dating are integrated. Instead of a precise calculation of the labour for the construction of the megalithic tombs, estimates are therefore often more for the overall labour invested in the final stage of the construction of the tombs. Despite all these obstacles, it is these comparative approaches within a given regional or supra-regional framework that can provide information on the intensity of landscape constructions in and over different periods. As stated earlier, this information helps to clarify questions regarding the possibility and importance of corporate strategies and cooperation (cf. Carballo *et al.* 2014; Feinman 2000), as well as the potential role of what might be called a ritual economy (Kristiansen 1984).

The need to back up these calculations with an understanding of the possible mechanism and conscious decisions behind megalith building traditions becomes apparent with regard to the available ethnographic and ethnoarchaeological data. While experiments in the past have already indicated that the erection of megaliths (or erratic blocks) does not necessarily involve many people or working hours (see Erasmus 1977), examples of recent megalith building activities in Indonesia and northeast India have further highlighted the role of megalith building activities as an arena of social representation and action (cf. Jamir 2004; Wunderlich 2019, also Dietler and Herbich 2001 for a general outline). Various accounts of megalith building activities on the island of Sumba, Indonesia, show that the dragging and the erection of stones used for the construction of dolmen graves involve large crowds of relatives, friends and otherwise obligated or interested men. Although the size of the sandstone blocks may easily exceed three metres in length (Fig. 1), large crowds would also participate in the transport of a relatively small stone. Another way to artificially increase the labour associated with a grave monument is to use distant quarries, which results in longer transportation routes. All the construction phases and activities on Sumba connected to megalithic monuments are framed by extensive feasting activities and rituals, which provide an arena for the organisation and negotiation of relations, the redemption of important obligations, and the renegotiation of debt relations. Furthermore, megalith building activities provide an opportunity for social gathering and celebrations involving members of a kin-group from different villages or even distant regions of the island (Fig. 2; *e.g.* Adams 2010; Hoskins 1986; Jeunesse and Denaire 2017; Wunderlich 2019). These mechanisms are not only characteristic to Sumba, but can also be traced in recent

Fig. 1: A quarry area in Kodi, Sumba (Indonesia). The sandstone resources are still mainly used for the extraction of stone slabs used for megalithic graves (photo: K. Rassmann).
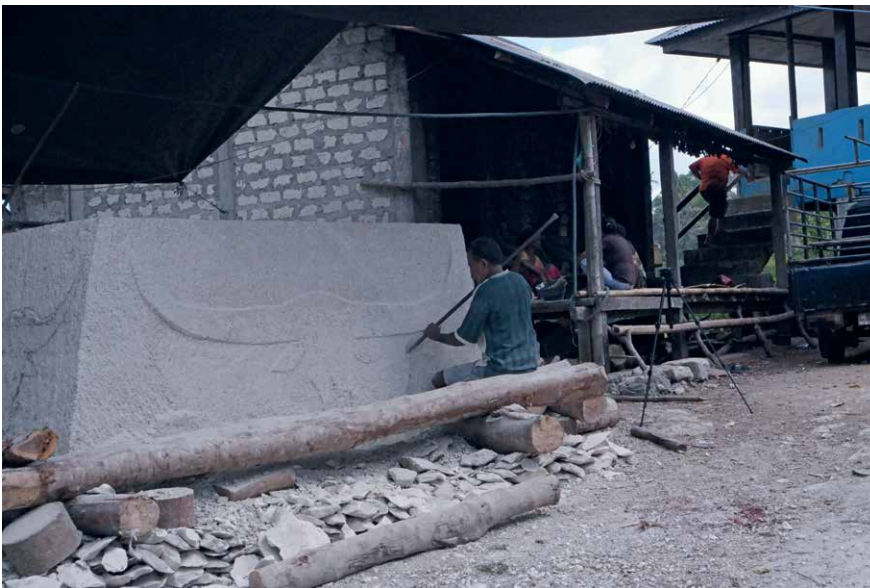


Fig. 2: A megalithic grave under construction in central Sumba, Indonesia (photo: K. Rassmann).

megalith building traditions in northeast India (*e.g.* Nagaland: Devi 2011; Jamir 2015; Manipur: Mawlong 2004; Meghalaya Mitri 2016; Wangjin 2014).

With this briefly outlined example, we would like to emphasise an aspect we understand to be of crucial importance for the interpretation of archaeological data. The example of labour estimations for megalithic tombs shows that contextualising available ethnographic or ethnoarchaeological data can prevent the use of potentially truncated lines of interpretation. In the case of the megalithic tombs, this includes an

overly narrow focus on efficiency and economic aspects (cf. Dobres 2001), which are particularly close to the concept of labour as a service in capitalist systems. However, this does not make the calculation of the labour involved in the construction of a megalithic tomb worthless. Ethnoarchaeological studies from the aforementioned example of the Indonesian island of Sumba also showed that the size of the tombs, as well as the presence of ornamentation, is directly related to overall higher expenditure on the tomb construction by the tomb builder. This is a direct indication of economic inequality, especially in communities without strong institutionalised hierarchies (cf. Wunderlich 2019). Again, no direct equation or analogy between this case study and Neolithic societies exhibiting megalith building traditions is possible or desirable. Nevertheless, the social anthropological perspective offers potentials and possibilities of interpretation for specific patterns in our archaeological data, without being directly transferred.

## Agent-based simulation modelling

Simulations can basically be considered as experiments that serve to gain knowledge about an observable or conceptualised process or context in order to be able to make statements about reality. Simulations or experiments are therefore an integral part of scientific knowledge production. If real experiments are not feasible because conditions cannot be created or the temporal and/or spatial dimensions do not allow them to be carried out, computer simulations are necessary. In this context, a simulation refers to the conversion of a theoretical model of a studied object into a computer code that generates artificial datasets based on model-inherent hypotheses, processes, and relationships (McGlade 2014; Nakoinz and Knitter 2016). Computational simulation models, also in archaeology, should be regarded as virtual laboratories inviting people to test hypotheses, develop new ideas (Lake 2014; Whitley 2017; 2016), and create narratives about the past (McGlade 2014; Perry and O'Sullivan 2018).

### What is an agent-based simulation model?

As the name suggests, ABMs focus on agents. Agents can represent a set of discrete entities that are constituted according to the scale of the system under consideration. Agents are embedded in one or more network topologies that can represent different kinds of spaces (*e.g.* geographical, social). ABMs consist of a large number of agents that interact with each other and with the simulation model's environment. These interactions are subject to the rules of behaviour (possibilities of action) of the agents. ABMs are literally rule-based simulation models. The behavioural possibilities of agents are specified by the modeller on the basis of hypotheses, and/or they are subject to stochastic processes. Behavioural specifications are usually kept simple, yet ABMs tend to exhibit complex phenomena, such as self-organisation and emergence (*e.g.* Axelrod 1997; Gilbert 2019; Kohler and Gumerman 2000; Railsback and Grimm 2019). Agent behaviour does not have to remain static over the course of the simulation but can change according to the simulation specifications (*e.g.* when certain limits are exceeded) or adapt due to the self-organisational properties when structures, information, and energy flows in the agents' networks change (*e.g.* Bonabeau 2002; Breitenecker *et al.* 2015). In archaeology, agents often represent individuals, households, kinship groups, or settlements (*e.g.* Romanowska 2016; Saqalli *et al.* 2014).

Emergence refers to the phenomenon where the interaction of existing parts within a system leads to new properties or structures that did not previously exist. The phenomenon of emergence creates ever new properties, instances, and structures within the system, which are very closely interlinked and interconnected via different geographical and topological scales (*e.g.* Crooks *et al.* 2008; Hooker 2011). Self-organisation is a prerequisite of emergence. Structures or order emerge from the interactions of the many decentralised

acting parts of a system (bottom-up), without the need for a superordinate controlling instance. Agents often act locally and according to, mostly quite simple, rules without having complete information about the entire system (*e.g.* Breitenecker *et al.* 2015; Gilbert 2019; Hooker 2011). However, the possible freedom of action is often constrained by (emerged) structures of the system or by external forces. Therefore, the phenomenon of emergence is always a product of the reciprocal relationship between structural or external constraints and the opportunities of self-organisation of the system's parts within these boundaries. Those boundaries do not necessarily remain narrow; there is always the potential that developments might lead to the exceeding of pre-existing constraints and increased freedom of actions (Gunderson and Holling 2002; Rogers 2017).

As structures are constituted from the interaction of the smallest parts of the system, agent-based modelling is a bottom-up approach that can be used to simulate and understand the emergence of structure-giving phenomena that we can observe in our archaeological data collections and quantitative-statistical models. One of the great advantages of agent-based modelling is the possible incorporation of social science theories into its research agenda (Cegielski and Rogers 2016; Lake 2015), such as the structuration theory of Anthony Giddens (1984) and the linked idea of agency, or Pierre Bourdieu's concept of habitus (1979). ABMs embrace the idea of the relatedness of agents in their different networks over time and hold the opportunity not only to graph it by material proxies, as is often done in archaeology (Furholt 2014; Przybyła 2016; Sosna *et al.* 2013), but to set in motion a dynamic of interconnected actions and behaviours. In this way, we can test whether the ideas we hold about processes and the interactions of agents are actually reasonable and whether they explain (parts of) what we see in the archaeological record or its interpretation.

## How is agent-based modelling useful in archaeology?

The benefits of agent-based modelling in archaeology depend, as so often, on the question asked. There are two major purposes of ABMs in archaeology: 1) testing hypotheses, and 2) theory building (Lake 2014). Most questions asked can be addressed by either one of the two types of ABMs. Theory-building simulation models are often abstract in their design and are concerned with processes and their influence on pattern formation, with the purpose of generating alternative hypotheses or testing existing ones (*e.g.* Drost and Vander Linden 2018). The second of these is more often the goal of ABMs in archaeology. These ABMs produce a computational model from narratives, interpretations, or descriptive models of a past situation or a long-term development, and they compare the simulation results against the known archaeological record or other proxy data (*e.g.* Barton 2014; Janssen 2009; Kohler *et al.* 2012). If simulation results and archaeological proxies are similar or in agreement, it can be reasoned that the behaviour and processes of the simulated agents, as well as the environmental constraints and freedoms, represent a reduced but complex model of the studied situation (Breitenecker *et al.* 2015; Gilbert 2019, Romanowska 2016). A simulation model, with all its initial variable specifications, represents a very unique possible narrative or trajectory of the past. To reduce the possibility of equifinality means that the same result is achieved under different initial conditions; many simulations run under different "what if" scenarios to test the variability of the simulation models' output when initial variables or specific behaviours of agents are changed. The results of the different scenarios are compared against the validation proxies (*e.g.* the archaeological record) and may serve to argue for a particular scenario and therefore validate a specific hypothesis (Cegielski and Rogers 2016; Lake 2014; Whitley 2016). It should be borne in mind that a mismatch between the simulation results and the proxy data can also be a fruitful outcome, as it either rejects the hypotheses or at least provides a counterargument, which could open up new perspectives on the object under investigation.

## Unpacking Neolithic socioecological systems with agent-based modelling

So-called socioecological systems (SESs) or coupled human and natural systems are prominent and frequently modelled research objects in archaeology. Many of the most elaborated simulation models in archaeology, such as Artificial Anasazi (Dean *et al.* 2000; Swedlund *et al.* 2015), the Village Ecodynamic Project (VEP; Kohler *et al.* 2012; 2007), or the Mediterranean Landscapes Project (MedLand; Barton *et al.* 2016; 2012) are SESs. In archaeological SESs, the starting point is often that the social system extracts resources and information from the ecological system to fuel its metabolism (cf. Fischer-Kowalski *et al.* 2011). Induced changes within the social and ecological system through the satisfaction of (basic) needs sets in motion a dynamic that can be described as a coupled relational network of elements and subsystems (*e.g.* Barton *et al.* 2016; Fitzhugh *et al.* 2019; Kohler *et al.* 2012; Prentiss 2019).

Within the scope of the trinational BELAVI project (Hafner *et al.* 2017; 2016), a mesoregional SES model (LUTES; Land Use and Technological Evolution Simulator) was created to study the demographic evolution, land use, and anthropogenic land cover changes in Neolithic western Switzerland (Laabs 2019). Agents here represent settlement communities and, on this scale, they are interacting with each other and within the environment. LUTES, a hybrid simulation model based on the well-established GLUES (Global Land Use and technological Evolution Simulator; Lemmen *et al.* 2011; Wirtz and Lemmen 2003) and WELASSIMO (WetLAnd Settlement SIMulatOr; Baum 2016; Baum *et al.* 2020; 2016) simulation models, adds genuine functionalities and modules of agents' spatiotemporal behaviour to investigate long-term developments of settlement dynamics, especially in regard to feedback arising from land use-induced land cover change.

The Neolithic of western Switzerland and of the northern Alpine foreland in general, dating from approximately 4300–2400 BCE, is characterised by so-called lakeshore settlements or pile dwellings. Due to the waterlogged preservation conditions of organic materials at such sites, (bio- and/or dendro-) archaeological investigations provide insights into their economy and ecology that are often lacking from sites on mineral soil (*e.g.* Archäologisches Landesmuseum Baden-Württemberg and Landesamt für Denkmalpflege im Regierungspräsidium Stuttgart 2016; Erziehungsdirektion des Kanton Bern und Archäologischer Dienst des Kanton Bern 2013; Röder *et al.* 2017; Stöckli *et al.* 1995). The preservation of wood allows dendrochronology to date the settlement's occupation year precisely and has brought to light that many were inhabited for only 10–15 years and exhibit histories of fluctuating size. Also, a quite distinct mesoregional settlement dynamic of reoccupation of formerly settled locations in a seemingly recurring pattern could be revealed by dendroarchaeological studies (*e.g.* Billamboz and Köninger 2008; Bleicher 2009; Ebersbach 2013; 2010a; 2010b; 2010c; Hafner and Suter 2000; Hasenfratz and Gross-Klee 1995; Suter and Francuz 2010). Since then, many reasons and, of course, a combination of these reasons have been held responsible for the short-lived and mesoregional dynamics of the Neolithic lakeshore settlements of the northern Alpine foreland. To name the most prominent ones:

1. Soil depletion (*e.g.* Baum *et al.* 2016; Schibler *et al.* 1997).
2. Slash and burn farming (*e.g.* Rösch 1987; Rösch *et al.* 2014).
3. Timber shortages (*e.g.* Baum *et al.* 2020; Billamboz and Köninger 2008).
4. Climate-induced lake level changes (*e.g.* Magny 2004; Schlichtherle 2011).
5. Kinship and social structures (*e.g.* Ebersbach 2010a; 2010b; 2010c).
6. Duration of and labour input into buildings (*e.g.* Ebersbach 2010c; Hofmann 2013).

All of these points, embedded in a narrative or in descriptive models of the past and supported by other archaeological and/or palaeoecological data, make sense and seem more or less logical when reading or hearing the arguments. However, many of these points

still await validation, as they either are based on a correlation of settlement abundance and environmental proxies with different temporal resolutions (B, C, D), or they are merely theoretical assumptions based on ethnographical, historical, or recent analogies (A, E, F).

The modelling process within the framework of an ABM always involves unpacking the narrative of, and the revelation of, knowledge gaps and missing explanatory models in certain parts of the system under study. The foundation of a narrative is often the correlation of datasets and time series under explicit or implicit hypotheses and/or theory, culminating in an intelligible and probable picture of the past (Barton 2014; McGlade 2014; Perry and O'Sullivan 2018). For this kind of modelling, the basic assumptions of agents might be unimportant and can be ignored, but in many agent-based modelling approaches, these often become crucial factors because they inform the way in which the agents should behave and what basic actions aggregate to the observed systems' behaviour. In the case of lakeshore settlements, it is difficult to use archaeological or palaeoecological methods to explore how communities perceived territoriality, located economic spaces, and organised access to the landscape. Here, archaeological studies tend to either leave it or look for possible analogies in ethnographic, historic, or recent sources for an explanation (*e.g.* Ebersbach 2010a). However, an agent-based modelling approach can be a way to test something that is difficult to verify through further proxy data collection. By formalising and incorporating the hypothetical analogy as the agents' behaviour, the interaction of the agents should result in a pattern in the simulated data that is consistent with the archaeological and/or palaeoecological data. Of course, when integrating analogies from ethnography (historical or current), one should comply to the standard of working with such data and models (see Ethnoarchaeology section).

In the case of LUTES, the assumptions of territoriality and location of economic areas are very basic, as no overlapping of settlement catchments are allowed and the nearest suitable resources are used to satisfy needs, such as food, fuel wood, and timber. Based on the (bio-)archaeological- palaeoecological information about the Neolithic lakeshore settlements, two hypotheses (A and B) were implemented into the formalisation of LUTES to compare their spatiotemporal patterns of settlement dynamics against each other and the archaeological record (Laabs 2019). The hypotheses are tightly connected to the discussion about which farming regime – permanent (intensive) or shifting cultivation – was practised by northern Alpine foreland Neolithic lakeshore settlement communities (see Jacomet *et al.* 2016; Rösch *et al.* 2014). LUTES simulates behaviour over several hundreds of years to trace emergent long-term developments associated with the specific farming regime. Due to the character of this contribution, only a very limited presentation of the results LUTES can produce will be given. Fig. 3 compares the histograms of the settlement durations during artificial time slices of 500 simulation time steps of LUTES (Fig. 3A–B) with the dendrochronologically investigated durations of lakeshore settlements in western Switzerland (Fig. 4). In the first time slice for both scenarios, the initial number of settlement communities increases, which means more favourable locations for fewer agents and thus better dwelling conditions. The later bimodal distribution of the shifting cultivation scenario (Fig. 3A) can be explained by the settling of rather unsuitable locations, which lack the resource availability and productivity of the more favourable and archaeologically well-documented settlement locations. The short-lived shifting cultivation settlements are thus an effect of the agents' behaviour, in that they also colonise areas that are less prosperous when other locations are already occupied. Settlements that occupy a location with reasonable resource availability and productivity tend to last longer and relocate when other resources (*e.g.* timber) begin to decrease due to gradual overexploitation. For the permanent cultivation scenario, it can be seen that a left-skewed distribution emerges in the later time slices (Fig. 3B), as soil productivity steadily decreases as favourable locations are colonised first and, due to the increase of settlement communities over time, more unfavourable locations are occupied as well. Compared with the dendrochronological data (Fig. 4), the simulated settlement durations of the permanent cultivation scenario
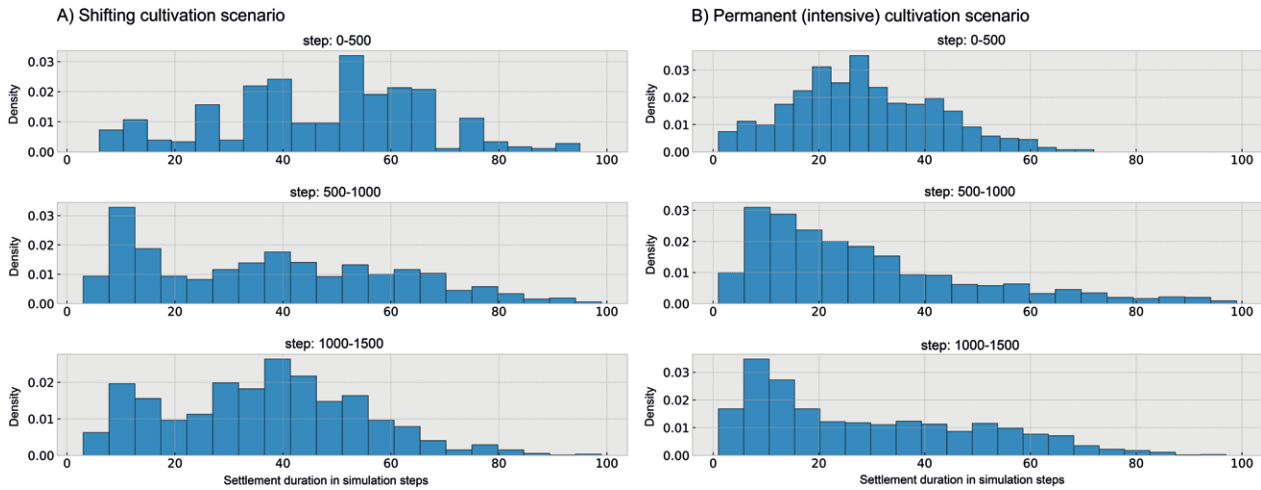
Fig. 3: Histograms of in LUTES simulated settlement durations, phased in 500 step time slices. 1 simulation step = 1 year. A) Shifting cultivation scenario. B) Permanent (intensive) cultivation scenario.
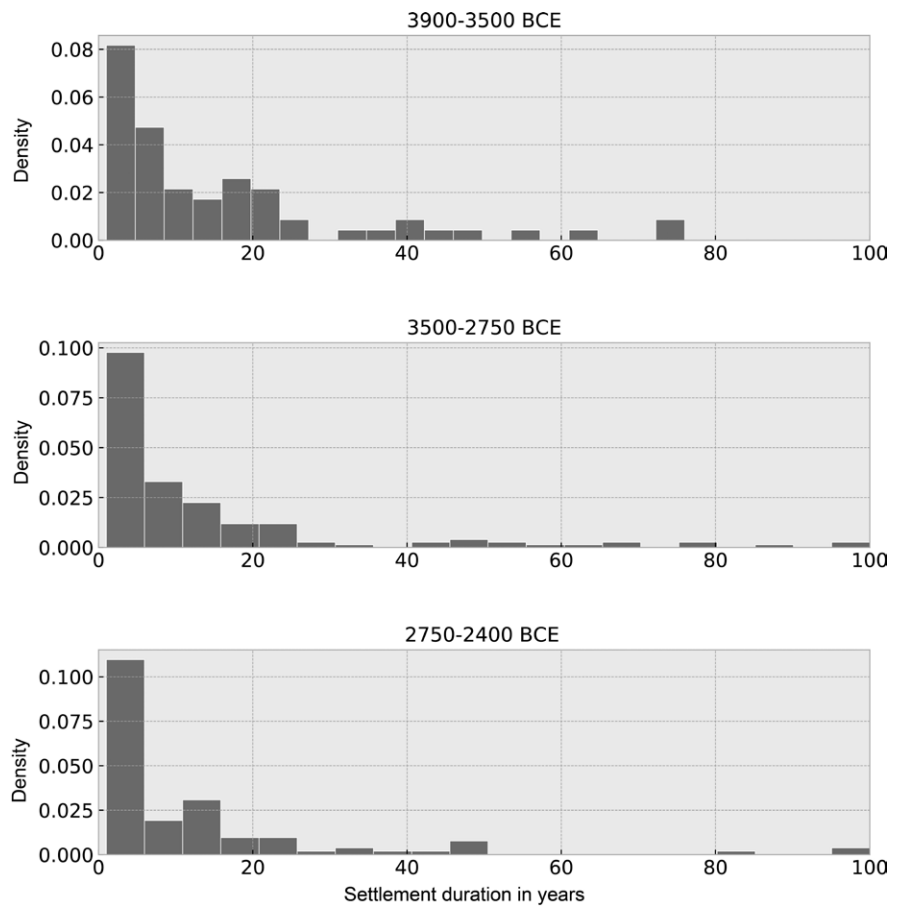


Fig. 4: Histogram of dendrochronologically dated durations of western Swiss lakeshore settlements. Phased in Younger Neolithic (3900–3500 BCE), Late Neolithic (3500–2750 BCE), and Final Neolithic (2750–2400 BCE).

are closer to the original in distribution and durations. These results are a product of the interaction of the agents (settlement communities) with each other and the reciprocal relationship with their environment under given behavioural assumptions derived from the archaeological-palaeoecological narratives already in use. They show an emergent structure over a long-term simulation from the bottom-up, based on the set of rules/ hypotheses (when and how to change settlement locations) under the constraints of environmental utility (resource extraction potential) and the interactions with other agents (integrity of territoriality). The simulated settlement durations represent, at the

least, a structural, comparable picture of the past, where the described narratives of the past are formalised in a systemic approach and simulated with a computational model. As mentioned before, simulation results are not the true past, but they show a possible one where processes/causalities can be investigated and which is therefore worthy of being considered when creating narratives about the past.

## Perspectives of ethnoarchaeological approaches and ABMs in prehistoric archaeologies

We hope we have been able to provide a small glimpse into the fields of ethnoarchaeological research practices and agent-based modelling simulations, which underlines the way they deal with research objects and the bottom-up perspectives they follow. These approaches are not congruent but complementary, as the systems view of simulation modelling needs a corrective from the social science perspective of ethnoarchaeology and vice versa.

### Explicit reflection

The importance of explicitly reflexive approaches has been gaining momentum in various disciplines for several years now and has therefore found its way into the discussion on the epistemological foundations of scientific practice (*e.g.* Foley 2002). These fields of study encompass diverse strands of research, which in turn address multiple issues and questions, such as the influence of colonial traditions in anthropological research (*e.g.* Hingley 2014), the importance of incorporating feminist perspectives (*e.g.* Blackmore 2015), the influence of paradigms within research and interpretation (*e.g.* Arponen *et al.* 2019), accessibility of research and data (*e.g.* Kansa *et al.* 2013), and many more. Although ethnoarchaeological approaches and/or studies by no means necessarily incorporate such reflexive perspectives, it is partly due to the critical reception of this field that, for example, ethical dimensions were intensively discussed and awareness of this issue was established (cf. Politis 2016). The situation is similar with simulation modelling. Many parts of ABMs are so-called white-box models, where the transformation from input to output can be understood by the elements involved, as the agents' behaviour and relations are very explicit (Breitenecker *et al.* 2015; Cegielski and Rogers 2016). The transparency that this way of working requires should make it necessary for the modellers to be very reflective and justify their choices of specific parametrisation and (sub)models, which constitute agents, agent behaviour, and the environment in their simulation models. Since both agent-based modelling and ethnoarchaeology are concerned with applied models or interpretations of human behaviour and social organisation, both have the responsibility and potential to incorporate explicitly reflexive perspectives into their research agendas.

Linked to the importance of analogical reasoning in both fields of archaeological research is the urgent need for contextualisation and reflection of the social and societal background of the researcher and the influence of these factors on the interpretative frameworks that are used and produced (cf. Gramsch 2000). By implementing perspectives that do not derive from already-existing archaeological interpretations or Eurocentric contexts, a substantial reflection on possible presuppositions can be achieved. A close connection to philosophical reflection on paradigmatic thoughts in archaeological reasoning and interpretation (cf. Arponen *et al.* 2019) is a further point of contact for both ethnoarchaeology and agent-based modelling.

The idea of increased reflection on the object of research and one's own involvement in the world is nowadays accompanied by the ideas of "open access" and reproducible research, as they force researchers to work accurately enough that most people can repeat their studies. But also, "slow science" contributes to the "reflective turn", because the more time available, the more necessary (not eternal!) reflection can take place.

## Towards bottom-up perspectives

At the heart of bottom-up perspectives, we find the plurality of individuals, relations, topics, research foci, and thought. In this paper, we have presented two very specific examples that can be seen in the larger context of bottom-up research. Ethnoarchaeology and agent-based modelling have the potential to focus on specific scenarios of social organisation that are sometimes underrepresented. Although they cannot provide direct analogies, they can offer explanations of complex phenomena by contributing models and interpretations of human behaviour that have emerged from a specific scenario or context under study. In this way, narratives and interpretative frameworks can be complemented and aligned with "normal" actors. The view is that possibilities for action and potential are significantly shaped and moulded by the interaction of individuals or small groups, and not by aggregated containers such as "cultures" or assumed "elites". Ethnoarchaeology and agent-based modelling can, in our opinion, provide important impulses for new perspectives and reflected ways of working within archaeological research as a whole.

The example of megalithic building traditions in recent contexts on Sumba and in Nagaland clearly illustrates that this specific tradition occurs in very different social systems. However, within the execution of this shared symbolism, there are individual translations and decisions that have communal imprints and differ from one another. The reality of these specific examples thus shows that a close look at the agency of individual communities and individuals is as important as the existing overarching system.

The very brief overview of agent-based modelling shows that its basic idea is bottom-up. Modelling and simulating the elements, relations, and rules of a system to understand the overall picture will offer a systemic way to approach complex phenomena. The results from LUTES simulations show that ABMs can help to comprehend – or at least map – (long-term) processes and feedback that might be behind the patterns we see in our archaeological datasets. It does not necessarily matter if the simulated settlement durations do not exactly match the real dendrochronologically determined durations (cf. Fig. 3 and 4). The structure and development of settlement durations in the permanent (intensive) cultivation scenario (Fig. 3 B) seem to explain the real data better; therefore, the processes leading to that should be considered also possible for the past.

With regard to our understanding of important aspects of bottom-up approaches, two main points may be seen as programmatic: 1) the use of ethnoarchaeological and ABM approaches enables the integration of diverse and multifaceted viewpoints into archaeological interpretation. This viewpoint holds the potential to go beyond paradigmatic and/or Eurocentric perspectives in the sense of the 'reflective turn'. 2) ABM and Ethnoarchaeology offer the possibility to observe and/or learn about the entities – such as single individuals or small groups – their interactions and behaviours which form the (social) phenomena of interest. Both are rather interested in the small scale to understand how from this often unique situations large scale phenomena are constituted and lived.

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# PART III

# MATERIAL DIMENSIONS OF SOCIAL ORGANISATION

# The world in a village? Regional and supra-regional transmission of pottery-making practices in southwestern Germany in the early third millennium BC

Philipp Gleich

## Abstract

*In this paper, it is argued that the spatial distribution of domestic pottery styles in central Europe in the early third millennium BC was governed by a complex interplay of regional and supra-regional transmission processes. Culture-historical classification approaches based on vessel typology alone offer only limited access to the multifaceted choice-making during vessel production and possible explanations. Instead, an attribute-oriented, practice theoretical outline, relying mainly on the theoretical and methodological ideas of Caroline Heitz and Etienne Wenger, is sketched here. An integrative analysis of typological and technological attributes offers a fine-grained search method for learned dispositions shared by a group of pottery-making persons and deviations from them. This way, it is possible to trace not only the practice and mobility of the members of pottery-making communities, but also the negotiation processes between members of different communities of practice, specifically those with different learning backgrounds.*

*The approach is empirically demonstrated for a southwestern German case, the pottery vessels from the wetland sites of the so-called Goldberg III culture in Upper Swabia. A comparison of selected typological and technological attributes with those of neighbouring regions reveals a high level of diversity regarding choices and combinations of choices made by pottery makers in Upper Swabia. This cultural "in-betweenness" implies personal mobility between neighbouring regions as well as between communities of practice and the concomitant negotiation processes. However, to deepen the understanding of possible transmission processes of the more supra-regionally spread features like cord decorations, further practices, such as vessel exchange, need to be taken into account in future analysis.*

*Keywords: Upper Swabia, Goldberg III culture, pottery analysis, practice theory, communities of practice, cultural transmission*

## 1. General problems: Regionality, supra-regionality, and the culture-historical framework in the early third millennium BC

From a traditional culture-historical perspective, the first two to three centuries of the third millennium BC appear to be the last phase in which central Europe was covered by
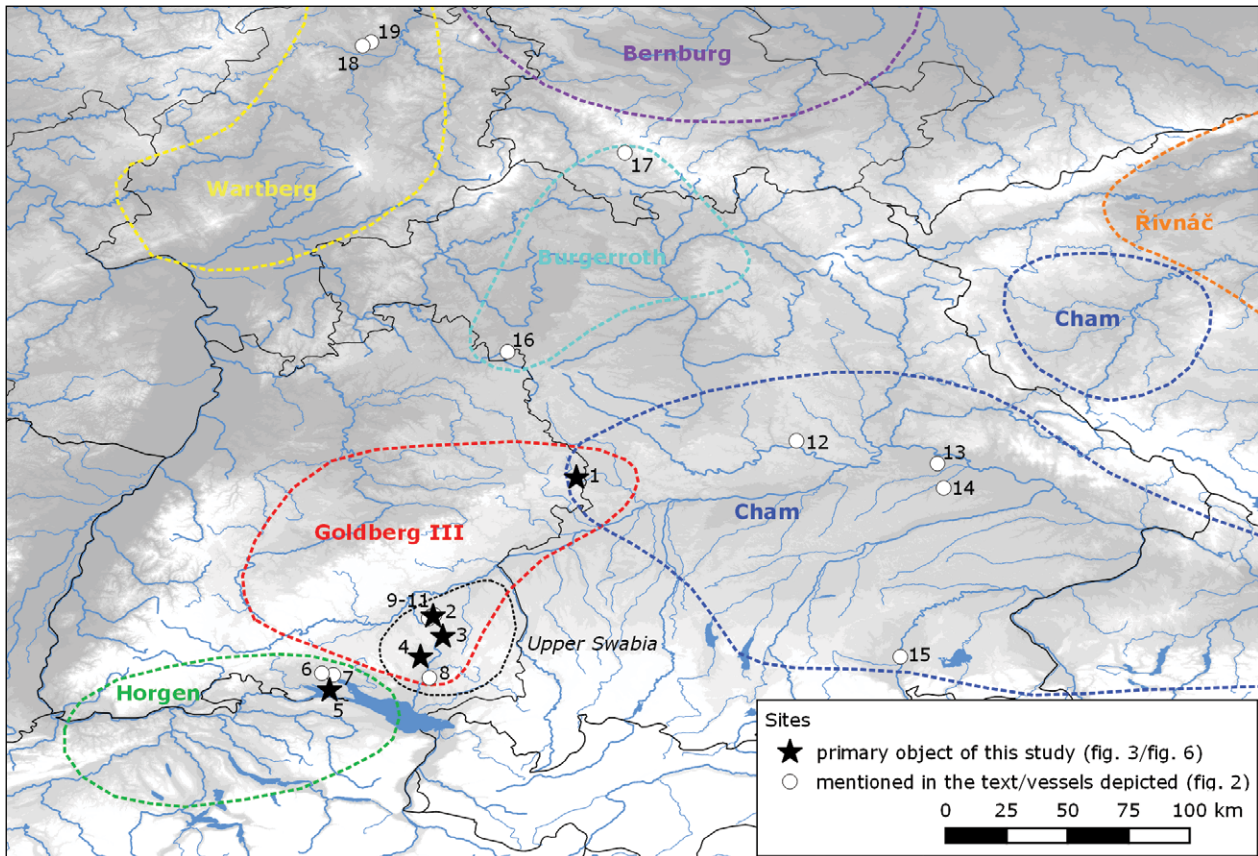
Fig. 1: Map of Southern Germany and adjacent regions with important sites and archaeological culture groups mentioned here. Geodatasets used for background map: SRTM elevation model by NASA (Link: http://srtm.csi.org); waterbodies by European Environment Agency (Link: https://www.eea.europa.eu/data-and-maps/data/wise-large-rivers-and-large-lakes); political borders by Natural Earth Data (Link: https://www. naturalearthdata.com/downloads/10m-cultural-vectors/10m-admin-1-states-provinces/). 1: Riesbürg/Goldburghausen-Goldberg, 2: Seekirch-Achwiesen, 3: Olzreute-Enzisholz, 4: Wolpertswende-Schreckensee, 5: Allensbach-Strandbad, 6: Bodman-Weiler II, 7: Sipplingen-Osthafen, 8: Ravensburg-Veitsberg, 9/10/11: Alleshausen-Täschenwiesen/Alleshausen-Grundwiesen/Seekirch-Stockwiesen, 12: Dietfurt an der Altmühl, 13: Riekofen-Kellnerfeld, 14: Geiselhöring-Hadersbach, 15: Prutting-Dobl, 16: Burgerroth-Alter Berg, 17: Prosselsheim, 18: Lohne-Hasenberg, 19: Kirchberg-Wartberg.

dozens of more or less regionally limited archaeological cultures before the spread of the Beaker cultures, which are considered a pan-European phenomena.

Despite an intense discussion focusing on the spread of Corded Ware and the role of mobility and migration during this process (Furholt 2017; Kristiansen *et al.* 2017; Furholt 2019; 2021), more attention should be paid to the spatial patterning of material culture in the first centuries of the third millennium BC to develop a better understanding of social changes in this period in general.

That the archaeological culture map only grants limited access to the spatial scope and the transmission of pottery-making traditions in the early third millennium BC may be illustrated by a brief look at the research history.

For the area between the Northern Alps and central Germany, a multiplicity of archaeological "cultures"[1] was defined between the 1930s and 1950s (Fig. 1). Particularly important for the following considerations are the Goldberg III culture of Baden-Württemberg (Bersu 1937), the (Late) Horgen culture of eastern Switzerland and the

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1    In German, some of these archaeologically defined entities are called "cultures" (*e.g.* "Chamer Kultur") and some are called "groups" (*e.g.* "Goldberg-III-Gruppe"), mainly for research historical reasons. For simplification I will only use the term "culture" here.

Fig. 2: Pots and bowls from Southern Germany exposing similar attributes regarding vessel shapes and decorations.
(1: ©Landesamt für Denkmalpflege Baden-Württemberg/Helmut Schlichtherle; 2: ©Landesmuseum Württemberg Stuttgart/Philipp Gleich; 3: Matuschik 1996, Pl. 97,1 (©Irenäus Matuschik); 4: Burger 1988, Pl. 26,19 (©Bayerisches Landesamt für Denkmalpflege); 5: Spennemann 1985, 139, Fig. 7,1 (©Landesamt für Denkmalpflege und Archäologie Sachsen-Anhalt); 6: Spennemann 1984, Pl. 45,371 (©Dirk H. R. Spennemann)).

Lake Constance region (Vogt 1934), the Cham culture of southern Bavaria (Hundt 1951), the Wartberg culture of Hesse (Müller-Karpe 1951), and the Late Neolithic of northern Bavaria, which is sometimes referred to as the Burgerroth culture (see Link 2018 and Link [this volume] for a critical discussion). In a further perspective, the Bernburg culture of eastern central Germany, the Globular Amphora culture of northeastern Germany, the Řivnáč culture of Bohemia, the Jevišovice culture of Moravia, and some others are usually included in the discussion of this culture complex (Burger 1988, 146–189).

Strong connections between the named cultures were stressed shortly after their definition. For example, Rudolf Albert Maier referred to a "culture-typological polymorphism" (Maier 1965, 97, translation by P. Gleich) to describe the frequent copresence of pottery styles attributed to different cultures within a single settlement of the early third millennium BC. The first researcher who created a detailed map of these cultures and systematically compared their material remains was Wolfgang Pape (1978). He sketched an area reaching from the Parisian Basin to Slovakia that was occupied by cultures with certain regional peculiarities but strong similarities (Pape 1978, 206).

This diagnosis was confirmed by Irenäus Matuschik, who, referring to David L. Clarke's (1968) work, suggested a polythetic structure of the Cham culture. In opposition to the more traditional archaeological culture concept ("cultural brick model"), the polythetic model emphasises the non-congruence of the spatial distributions of archaeological types as the standard model. Polythetic cultures are determined by a core area of overlapping traits surrounded by a less defined periphery of interference with neighbouring polythetic cultures with whom they can actually have a large number of traits in common (Clarke 1968, 35–38; 246–249). For example, Matuschik noted small differences between the Cham and Goldberg III cultures of southern Germany that could only be measured by quantitative aspects; one was the higher the frequency of notched cordon decorations in the former, the higher the frequency of smooth cordons in the latter (Matuschik 1999, 87).

In his study of the Hessian Wartberg culture, Dirk Raetzel-Fabian stated that some vessel shapes, especially biconical pots and bowls, occur over large areas in a typologically identical, or very similar, style within different thus-defined archaeological cultures (Raetzel-Fabian 2000, 219).

Fig. 2 illustrates examples of such vessels from southern Germany that demonstrate a high degree of similarity in their formal attributes. Typically, the lower parts of the pots are roughened, often by dense cord impressions produced by a cord rouletting technique (Fig. 2,1.3.5) (Schlichtherle 2018). The carination and the rim part may have plastic elements, such as ridges, lugs, or impressions added. The sharply carinated bowls (in German: *Knickwandschüsseln*) often bear groups of small round or cylindrical lugs on the carination, sometimes with short cordons in between (Fig. 2,2.4.6). These supra-regionally distributed attributes usually occur as parts of larger site assemblages that also contain more regionally specific elements. Consequently, Raetzel-Fabian recognised the importance of a more holistic analysis of the pottery also regarding both the typological and technical aspects of vessel production, such as tempering practices, to assess pottery-making traditions in the early third millennium BC (Raetzel-Fabian 2000, 219).

However, this requires not only new empirical research, but also a theoretical shift away from the culture-historical concept. The notion of the typological appearance of a vessel being the material expression of a culturally determined idea shared by all its members seems especially inadequate, considering the complex interplay of attributes with quite different spatial distributions.

The aim of such a theoretical approach must be to make pottery a useful source for the research of regional and supra-regional transmission processes, such as personal mobility, vessel exchange, and learning processes. This is especially important within regions where burials and human remains are largely missing as direct sources for mobility, which is the case in southern Germany in the early third millennium BC.

## 2. An attribute-oriented practice theoretical approach

An inspiring theoretical and methodological framework has recently been suggested in German-language Neolithic archaeology by Caroline Heitz (2017). She criticises the prevailing notion of stable, immobile, and culturally homogeneous village populations producing a uniform pottery style (Heitz 2017, 258–260). Instead, she develops a model

that draws upon the practice theory of Pierre Bourdieu (1976) and the communities of practice approach by Etienne Wenger (1998). Her deliberations are extensive, so only the most important methodological parts can be addressed here.

For Heitz, the production of pottery style is a two-sided process that encompasses individual actions and the production of a style within wider collectives, such as communities of practice (Heitz 2017, 269). As inhabitants of settlements, potters can become members of such communities through common learning and common practice. Nevertheless, they themselves and the vessels they make stay potentially mobile. In a case study of the wetland settlement of Hornstaad Hörnle IA on the shore of Lake Constance (3918–3902 BC), Heitz distinguishes three categories of pottery vessels by taking into consideration typological and technical aspects of the production sequence as well as the clay choices of pottery-making persons. The predominating "local vessels" follow the local "Hornstaad style" and are made from local clay resources. These are interpreted as the serial production ("repeat ware") of a local community of practice. On the contrary, "translocal vessels" bear foreign stylistic attributes and are made from nonlocal clay resources. These are cases of travelling vessels, which were brought into the settlement from further away. Particularly interesting are the "in-between-vessels", which are made from local clay resources but demonstrate a nonlocal style, or a mixture of different local and nonlocal styles. These vessels are possible indicators of individual mobility between different communities of practice and the appropriation processes of foreign pottery-making practices (Heitz 2017, 278–284).

Heitz's approach overcomes many shortcomings of the archaeological culture concept and is well suited to study the phenomenon of mobility, which needs to be addressed when studying the transmission of pottery-making practices in Neolithic times. Nonetheless, the identification of a local style - a locally dominant style within a settlement – is a key element of the approach. However, that this task is not necessarily easy may be illustrated by a look at drawings of pottery assemblages from the southern Bavarian Danube region of the early third millennium BC. Dietfurt an der Altmühl (Gohlisch 2005, 90–91) and Riekofen-Kellnerfeld (Matuschik 1999, 70–72), which are among the most important sites attributed to the Cham culture, reveal a great diversity, even among the basic shapes. The pots demonstrate a variety of profile shapes, such as biconical, shouldered, belly-shaped, S-shaped, conical, or cylindrical, which are applied to vessels of quite different sizes. Bowls show a broad formal variation as well. If more attributes such as decorations or surface treatments are taken into consideration, the complexity might increase exponentially. In Heitz's terminology, one encounters the problem that these assemblages seem to be governed by a high and varying level of in "in-betweenness", where the "local" itself is hard to identify or is truly diverse. Furthermore, large proportions of the named assemblages consist of vessels of a supra-regional character, as is illustrated by the examples in Fig. 2. While the concept of communities of practice is extremely helpful in the understanding of the production of pottery styles in general, these only briefly mentioned examples from southern Germany point to a specific problem: the question of the locality of style production between the local, regional, and supra-regional space must not only be addressed theoretically but also methodically and empirically, since it might have changed over time.

This implies the necessity of studying the spatial structure of pottery-making communities of practice and the mobility of their members as well as the more dynamic processes of negotiations and exchange within and between them. The methodology suggested here is based on a comparative analysis of vessel attributes between different sites to search for the more standardised pottery-making sequences as well as deviations from them. The aim is a more sensitive look at the "in-betweenness" of vessels and thus at changes in pottery-making practices.

Promising approaches for the study of the attributes and attribute states of pottery vessels to uncover learning, transmission, and mobility have been proposed by archaeologists and ethnoarchaeologists (Carr 1995; Stark 1999; Roddick 2009,

181–184). The design of a vessel is considered to be the sum of choices made during the manufacturing process (Stark 1998, 6). In Stark's words, "technological styles, rather than ceramic subvarieties, may become evident when we view ceramics as combinations of technological attributes rather than simply as types" (Stark 1999, 32).

Following this methodology is an attempt to take a learner's perspective on pottery-making. Indeed, ethnoarchaeological studies suggest that learning to make pots in traditional societies is done in a step-by-step manner, with the shaping technique often being learned rather late (Köhler 2008, 338–349; Gosselain 2011, 213–215). In the archaeological record, these learned steps are visible as repeatedly appearing attribute states. Through the analysis of inter- and intrasite variation of single attributes, learned tendencies for certain choices within sites or regions can be revealed. These tendencies illustrate standardised and shared choices of pottery-making persons. To stay within the practice theory terminology of Bourdieu, the term "disposition" is used here for a tendency to make a certain choice. Dispositions are designed by Bourdieu as more dynamic subsects of the habitus, which structure daily practice but feature a higher ability to respond to changes of the social setting (Bourdieu 2001, 183, 207). Thus, the term is suitable for underlining a dynamic understanding of learned tendencies and relearning processes. To put it into Michael Dietler and Ingrid Herbich's words: "[…] it is recognised that dispositions which generate action in all domains of social life are formed together in the course of practice" (Dietler and Herbich 1998, 247).

If a specific sequence of dispositions is repeatedly reflected by pottery vessels, one can speak about designs illustrated for example, by the "repeat ware" (Heitz 2017, 270, Fig. 6) from Hornstaad-Hörnle IA. Such designs are interpreted here as the results of common learning. Thus, they offer an analytical access to communities of practice whose members are interconnected by "shared histories of learning" (Wenger 1998, 86). This concept seems particularly useful for the study of Neolithic settlements as learning contexts, since it addresses less formal learning environments. Although it is not possible in most cases to reconstruct the learning mode of pottery-making within Neolithic settlements in detail, a certain degree of communality may be presumed. Pottery-making practices are already highly visible due to the necessity of performing many steps of the production sequence in the open, such as the acquisition of raw materials, the drying of the vessels, or the firing process. Thus, enough opportunities for common learning and common practice, which are necessary for the potential formation of communities of practice (Wenger 1998), seem to be provided within a Neolithic settlement.

Although living together within the same settlement was an important part of daily life in the Neolithic, the examination of the Northern Alpine wetland settlements in Switzerland and southwestern Germany during the last decade has delivered plenty of evidence for the leaving and shifting of settlements, which were often inhabited for less than 20 years, meaning shorter than one human generation (Ebersbach 2010; Ebersbach *et al.* 2016, 609–610). A certain ephemerality seems to be especially true for the Upper Swabian sites of the early third millennium BC, from which pottery vessels are discussed below. Based on dendrochronology, Niels Bleicher has suggested two alternative models of settlement dynamics for these sites where settlements were shifted either every five or ten years (Bleicher 2009, 159–161). Thus, the inhabitants of a settlement might not necessarily become a close-knit community of practice regarding pottery-making. Some inhabitants might have left before the settlement was eventually abandoned to move to another place.

What happened to designs and dispositions if members of different communities of practice, specifically persons who had learned making pottery within different learning histories, were meeting as inhabitants of the same settlement?

According to Wenger, in such "boundary" situations, learned abilities are mutually exposed to different measures of competence (Wenger 2000, 233–234). It can be expected that such a situation leads to an encounter with previously unknown practices. Possible processes emanating from this encounter are numerous, ranging from the adaptation or mixing of practices to competition or conflict. The whole range of these

processes could be called negotiations in Wenger's vocabulary (Wenger 1998, 84–85). The analytical focus on attributes allows for access to such negotiations through the fine-grained search for learned sequences and deviations from these. While the coexistence of different designs within a settlement might indicate the distancing of members of different communities of practice, the combination of choices might be a symptom of common learning and approximation.

To sum up, the methodology outlined above aims especially at the following questions:

1. Can repeated sequences of choices (designs) during vessel production be revealed, and do they indicate common learning processes within communities of practice?
2. Were choices characteristic for different communities of practice combined during vessel production, and how?
3. Do combinations of choices repeatedly appearing in the same way indicate the establishment of a new practice and hence a new design?

Answering these questions in a comparative synchronistic study between different settlements allows us to research the spatial structure of communities of practice and the mobility of their members, as well as negotiations and change resulting from it. To illustrate the approach, an empirical application is demonstrated for selected Baden-Württemberg sites of the early third millennium BC.

## 3. Setting the case: The Goldberg III culture of southwestern Germany

Since 1979, research conducted by the Cultural Heritage Service of Baden-Württemberg has led to the discovery of seven settlements of the early third millennium BC in the wetlands of Upper Swabia. These have revealed a series of important pottery assemblages, some of which have been successfully dated by dendrochronology. Until today, six wetland sites and one mineral site have been discovered and have been examined by test-trenching (Schlichtherle 1981; 1999; 2004a; Bleicher 2009; Schlichtherle 2010) (Fig. 1).

The settlements were erected in various positions on former lakeshores, in peat bogs, and, in one case, on elevated territory. According to drilling programmes, the occupied areas rarely exceed 2000–2500 m². Settlement structure details are known for two of these sites: Seekirch-Stockwiesen revealed one central street with large houses (up to 5 × 15 m) on each side of it (Schlichtherle 2004a, 22–34). Alleshausen-Grundwiesen seems to have a densely scattered structure of small and often rebuilt dwellings of around 4 × 4 metres (Schlichtherle 2004a, 34–40). Botanical and zoological studies indicate a high intersite diversity of subsistence economies based on varying proportions of cattle breeding, hunting, and husbandry (Maier 2004; Steppan 2004; Herbig 2009). The cultivation of flax and poppy was especially important at all the researched sites (Maier 2004, 131; Schlichtherle 2004a, 51–52; Herbig 2009). For Alleshausen-Grundwiesen, a seasonal occupation combined with a specialisation in flax and poppy cultivation was suggested, given the scarcity of cereal remains and the unfirm construction of the dwellings (Maier 2004, 120; Schlichtherle 2004a, 51–52; Bleicher 2009). A peculiarity of the sites included frequent finds of wooden wheel remains. Until now, eight parts of large wagon wheels have been found at several sites, being themselves an indicator of mobility (Schlichtherle 2004b, 2016).

In his dendrochronological examination of the construction timbers, Bleicher established correlation curves for the beech and ash wood from several settlements, indicating that the majority of it dated to a rather narrow timespan of around 60 years

(Bleicher 2009, 144 Abb. 101). Via wiggle matching, this floating regional chronology could be dated with relative security to a timespan between around 2890 and 2830 BC, with a maximum deviation of around 15 years (Bleicher 2006). The settlements of Seekirch-Stockwiesen and Alleshausen-Täschenwiesen were occupied at the beginning of this timespan, and Alleshausen-Grundwiesen was inhabited in the later decades. New excavations at Olzreute-Enzisholz (Wolf *et al.* 2017) and Wolpertswende-Schreckensee (Gleich, Million and Hagmann 2019) have revealed dateable construction woods also pointing to the 29th century BC. Yet, at both sites, repeated occupation events over several decades within that century are possible. Although the chronology of the last two mentioned sites is not yet completely clear, most of the Upper Swabian settlements can be placed within the 29th century BC. The only site that has not delivered dateable woods until now is Seekirch-Achwiesen. Three radiocarbon measurements derived from charcoal and plant particles from the cultural layer have wide calibration ranges (Schlichtherle 2004a, 44, Fig. 45). They indicate that Seekirch-Achwiesen does not belong to the first decades of the dendrochronologically dated timespan and most probably dates to between 2860 and 2600 cal. BC. Thus, a considerably younger dating is conceivable for Seekirch-Achwiesen than for the other sites in Upper Swabia.

Based on pottery and other finds, Helmut Schlichtherle attributed these sites to the "Goldberg III Group in Upper Swabia" (Schlichtherle 1999). Thus, he spatially expanded the term "Goldberg III", which was introduced in 1937 by Gerhard Bersu for the finds from occupation phase III on the elevated site "Goldberg" in the Nördlinger Ries (Bersu 1937) (Fig. 1). While the new definition is established in southwestern German wetland archaeology, it has only been accepted sceptically by Raetzel-Fabian (Raetzel-Fabian 2000:119) and declined by Andrea Zeeb-Lanz, who attributed the Goldberg itself to the Cham culture (Zeeb-Lanz 2003, 302–303). This discussion, which has its roots deep in research history (Schröter 1975:108), is based not least on the stylistic ambiguity of the pottery of this period, which seems to resist strict cultural classifications that rely on vessel typology.

Instead, the Upper Swabian discoveries offer an opportunity to empirically test the attribute-focused approach outlined above. In addition to the Upper Swabian sites themselves offering good dating, the conditions for an interregional comparison with pottery from the neighbouring southern region of Lake Constance are ideal.

The shore of Lake Constance has revealed a row of wetland sites that are dateable to about the same timespan, between 2950–2820 BC, and attributed to a different archaeological culture group, the so-called Late Horgen (Kolb 1999; Köninger 2007; Fischer 2015).

## 4. Considered pottery vessels and a critique of the sources

In a PhD project at the University of Basel and the Cultural Heritage Serive of Baden-Württemberg, the pottery vessels from Upper Swabia were analysed in a comparative attribute study together with finds from the Lake Constance area. In addition, the pottery finds from Bersu's excavations and stray finds from the Goldberg in the Nördlinger Ries were included in the examination (for location, see Fig.1). This assemblage is more problematic since stratigraphic information is largely unavailable and natural scientific dating is missing. A large part of Bersu's finds was destroyed by the bombing of Stuttgart in World War II. Consequently, these finds can only roughly be placed within the early third millennium BC by typology. The number of occupation phases and the timespans they represent remain unknown. Despite these restrictions, however, a look at these finds is enlightening.

For the southern neighbourhood of Lake Constance, pottery assemblages from the site of Allenbach-Strandbad have been chosen as a reference example. These finds have already been published (Fischer 2015). They stem from a Late Neolithic wetland site and have been dated to 2914–2897 BC by dendrochronology (Billamboz 2015).

In the next section, a selection of finds from the three Upper Swabian sites of Wolpertswende-Schreckensee, Olzreute-Enzisholz, and Seekirch-Achwiesen are presented and compared with finds from the Goldberg in the Nördlinger Ries and Allensbach-Strandbad sites at Lake Constance. The study takes a synchronistic perspective. While a date within the 29th century BC is supported by dendrochronological data for Wolpertswende-Schreckensee, Olzreute-Enzisholz, and Allensbach-Strandbad, Seekirch-Achwiesen might date to the second half of the 29th century BC, or even later, and the Goldberg can only be put roughly into the early third millennium BC.

## 5. Typological attributes

The vessels from Allensbach-Strandbad can be considered a typical assemblage of the early third millennium BC in the Lake Constance area. It is fully dominated by large, coarse pots of cylindrical or slightly bellied profiles. The decoration on the pots is reduced to a row of holes occurring under the vessel rim alone (Fig. 3,18) or placed within a horizontal groove (Fig. 3,19). Many of the pots are undecorated. Less than 5% of the assemblage consists of pottery of a fine fabric. In one case, a profile of a biconical bowl is secure (Fig. 3,16). While these bowls seem to be rather rare in Allensbach-Strandbad, they occur in slightly higher proportions in Sipplingen-Osthafen on the northern shore of Lake Constance (Kolb 1999; Billamboz *et al.* 2010, 266).

Cylindrical pots, which share their simple steep-walled shape with the ones from Lake Constance, occur in Wolpertswende-Schreckensee (Fig. 3,14), Olzreute-Enzisholz (Fig. 3,9.10), and especially Seekirch-Stockwiesen (not depicted here, see Schlichtherle 2004a, 32, Fig. 26). Some of these individual examples are undecorated or they show the typical rim holes (Fig. 3,9). Other cylindrical pots bear decorations that are not found at Lake Constance, such as a row of finger imprints (Fig. 3,14). Besides these cylindrical individuals, there are also bipartite pots that occur in most of the Upper Swabian sites and have remained unknown in the Lake Constance area until now. In Seekirch-Achwiesen, nearly every pot has a bipartite character with an often cordon-like accentuation of the carination (Fig. 3,6.7). Here, this pot shape is associated with the cord roughening of the lower part, which appears on approximately every second pot. Bipartite pots are also well represented at Olzreute-Enzisholz and Wolpertswende-Schreckensee. The carinations are only slightly accentuated (Fig. 3,15) or have remained unaccentuated (Fig. 3,11.13). The cord roulette roughening technique only appears on four out of 8200 pottery sherds in Olzreute-Enzisholz. In Wolpertswende-Schreckensee, this surface treatment occurs on some better-preserved profiles (Fig. 3,13) and on several hundred sherds, though exact proportions are hard to determine because of fragmentation. The variety in the dimensions of the pots from the Upper Swabian sites and from the Goldberg, which embraces a continuous range from small beaker-like vessels to large pots with rim diameters of 35 cm, is remarkable.

The pots from the Goldberg are dominated by bipartite shapes (Fig. 3,2). Rather rare are pot profiles with a low belly (Fig. 3,3), which seem to be absent in Upper Swabia. Similarities to the Upper Swabian pots can be seen in bipartite profiles with short cordons or lugs on the carination. Some pots from the Goldberg and Upper Swabia seem to be almost exchangeable (cf. Fig. 2,1; 3,2). On the other hand, there are significant differences, such as the high frequency of complex decorations of multiple applied cordons and notched cordons at the Goldberg (Fig. 3,4). These mark a connection to the nearby Bavarian Danube Valley (Matuschik 1999; Gohlisch 2005). From Upper

## Riesbürg/Goldburghausen-Goldberg
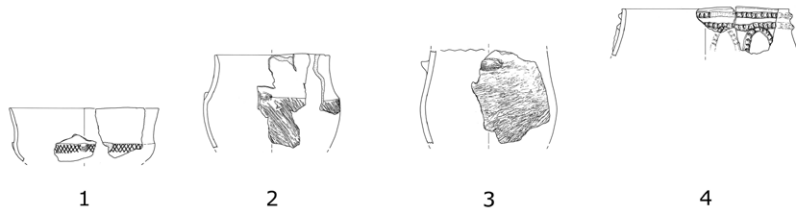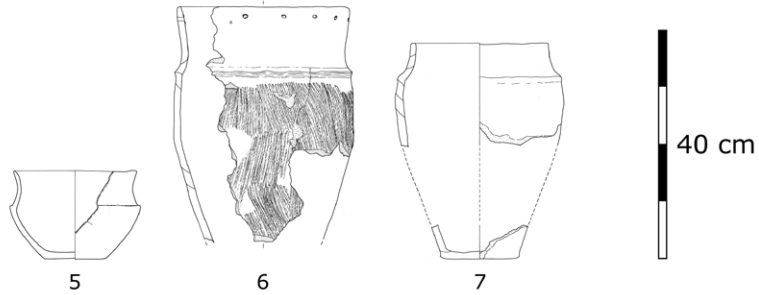


1      2      3      4

## Seekirch-Achwiesen



40 cm

5      6      7

## Olzreute-Enzisholz



8      9      10      11
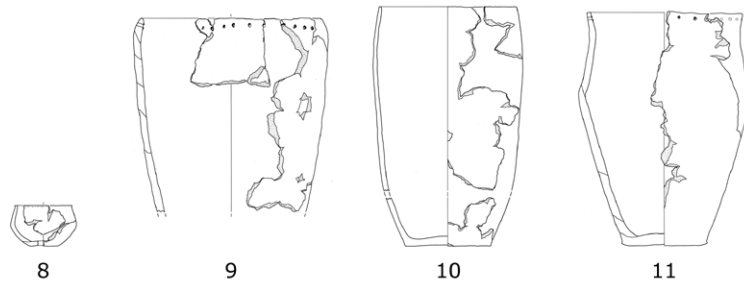
## Wolpertswende-Schreckensee
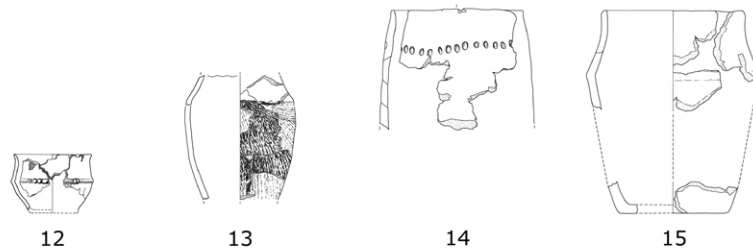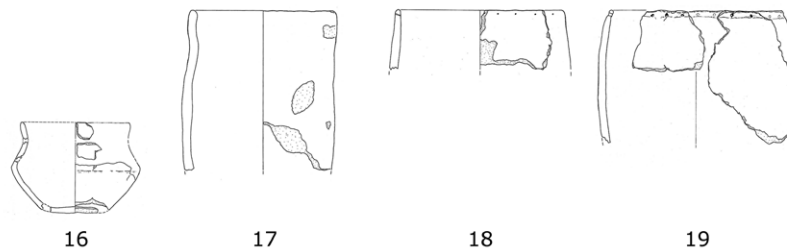


Fig. 3: Selection of pottery vessels from South Western Germany. For the location see Fig. 1. 1-4 (©Landesmuseum Württemberg Stuttgart/Philipp Gleich; 5-7: ©Landesamt für Denkmalpflege Baden-Württemberg/Philipp Gleich; 8-11: ©Landesamt für Denkmalpflege Baden-Württemberg/ Sebastian Böhm; 12-13: ©Landesamt für Denkmalpflege Baden-Württemberg/Helmut Schlichtherle; 14-15: ©Landesamt für Denkmalpflege Baden-Württemberg/ Philipp Gleich; 16: Fischer 2015, Pl. 5,16; 17: Fischer 2015, Pl. 4,63; 18: Fischer 2015, Pl. 2,68; 19: Fischer 2015, Pl. 1,153; 16-19: ©Landesamt für Denkmalpflege Baden-Württemberg/Jürgen Fischer).

12      13      14      15

## Allensbach-Strandbad



16      17      18      19

Swabia, only one such vessel is known from the site of Alleshausen-Täschenwiesen up until now (not depicted here, see Schlichtherle 1999, 39 Fig. 5,3). Another difference is the missing cylindrical profiles at the Goldberg. Considering the stray find character of the assemblage, their absence cannot be proved but, at any rate, they do not seem to be frequent.

The Upper Swabian sites are connected by similar proportions of bowls, between around 10% and 15%. Most of the bowls have a finer fabric than the pots. Some of the bowls are biconical, some belly-shaped (Fig. 3,8). Bowl carinations are the main carriers of more complex decorations, such as notched short cordons (Fig. 3,12), groups of horizontally incised lines, lugs (Fig. 3,1), and sometimes geometrical cord impressions (Fig. 8,2) or cross hatches (Fig. 3,1). While the mentioned motifs appear in Upper Swabia and at the Goldberg, the bowls and pots from the Goldberg reveal a much wider range of plastic and engraved decorations that will not be presented here in detail (Bersu 1937, Pl. 32; Schröter 1975, 102). Furthermore, the proportion of bowls seems to be slightly higher at the Goldberg than in Upper Swabia.

As a minor conclusion, it can be stated that the inter- and intrasite variation regarding choice-making during the profile shaping and decoration of the vessels between the discussed sites is considerable. While characteristic vessel shapes of the southern and northeastern neighbour regions are present in Upper Swabia, the various decorations known from the Goldberg are only partially picked up. However, a look at the more technical attributes reveals even more complexity.

## 6. Technological attributes

It is beyond the scope of this paper to present a detailed technological analysis. Instead, three significant attributes are selected for a comparison: the surface treatment of the outer vessel walls, the wall thickness, and the maximum temper grain size. For the wall thickness, an average value per vessel was determined depending on the profile preservation. The maximum temper grain size was determined by measuring the dimensions of the largest visible grain for each record. Although this value does not fully cover the tempering practices (*e.g.* temper density), it is quite objective and provides a general impression of the vessel fabric. The chosen tempering materials will not be discussed here in detail. Generally, stone temper was preferred at all the discussed sites. In the Lake Constance area and Upper Swabia, granite temper prevails, with proportions usually over 90% (Fig. 4,1–3). Limestone temper (Fig. 4,5) or grog occur in lower percentages. The great majority of the vessels from the Goldberg were tempered with limestone (Fig. 4,4).

In the examination of the surface treatment, five main categories have been differentiated. Smoothened surfaces (Fig. 5,1) are rough, with the temper grains standing out several millimetres. Traces of finger smoothing are easily detectable on the surface. In most cases, this treatment was performed on the wet clay surface by bare hands. Well-smoothened surfaces (Fig. 5,2) are also quite rough. In contrast to the foregoing technique, a considerable effort was made to level the temper grains. Well-preserved pieces show parallel groups of fine, hair-like stripes that indicate the use of tools, possibly rags, or textile pieces from fibre plants. Burnished (Fig. 5,3) and polished surfaces (Fig. 5,4) are similar. In both cases, the use of hard tools, such as stones or bones, is indicated by mostly horizontal stripes. Burnished surfaces appear dull in contrast to polished surfaces, which are shiny and light-reflecting. Thus, polished surfaces are the result of a more intense and careful treatment than the ones that are only burnished.

A characteristic feature of the early third millennium BC within large parts of central and eastern central Europe are distinct cord impressions that appear especially on the lower parts of pots (Pape 1978, 149–150). While it has been assumed that these were

**1** Granite temper
(Olzreute-Enzisholz)

**2** Granite temper
(Olzreute-Enzisholz)

**3** Granite temper
(Seekirch-Achwiesen)

**4** Limestone temper
(Riesbürg/Goldburghausen-Goldberg)

**5** Limestone temper
(Seekirch-Achwiesen)
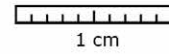
1 cm

Fig. 4: Examples of granite and limestone temper from southwestern Germany. 1,2,3,5: ©Landesamt für Denkmalpflege Baden-Württemberg/ Philipp Gleich. 4: © Landesmuseum Württemberg Stuttgart/Philipp Gleich.



**1** Smoothened
(Wolpertswende-Schreckensee, compare Fig. 3,14)

**2** Well smoothened
(Olzreute-Enzisholz, compare Fig. 3,10)

**3** Burnished
(Seekirch-Achwiesen)

**4** Polished
(Olzreute-Enzisholz)

**5** Cord roulette roughened - yarn
(Seekirch-Achwiesen, compare Fig. 3,6)

**6** Cord roulette roughened - twisted cord
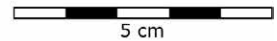
5 cm

Fig. 5: Examples of different surface treatments from Upper Swabia (©Landesamt für Denkmalpflege Baden-Württemberg/Philipp Gleich).
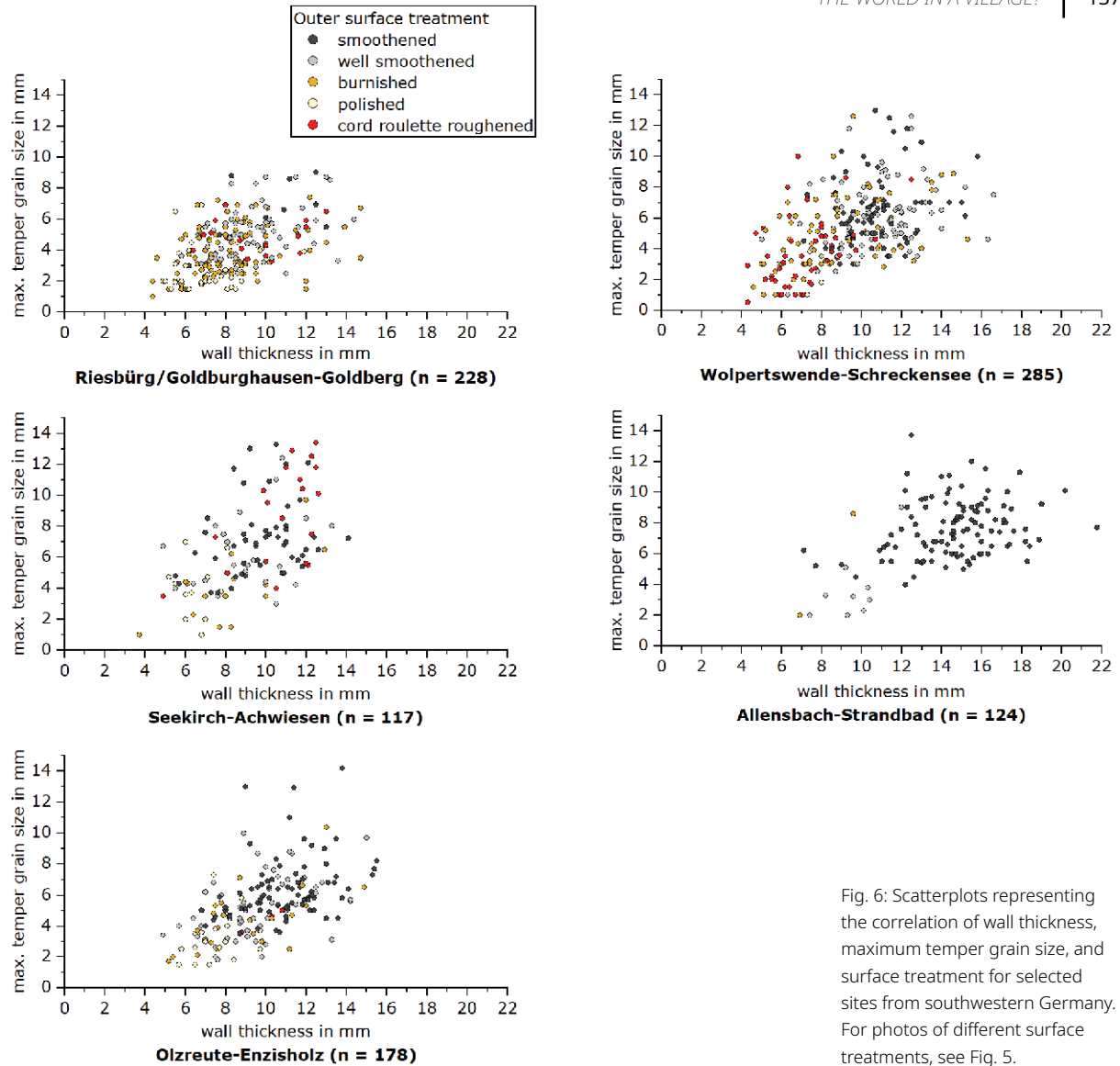
Fig. 6: Scatterplots representing the correlation of wall thickness, maximum temper grain size, and surface treatment for selected sites from southwestern Germany. For photos of different surface treatments, see Fig. 5.

made by impressions of textile mats (in German: *Mattenrauhung*) (Schlabow 1960), recent experiments by H. Schlichtherle have demonstrated that a rouletting technique was used in most of the Upper Swabian cases. For this purpose, a simple yarn (Fig. 5,1) or a twisted cord (Fig. 5,2) was wrapped around a stick-like roulette and rolled over the not-completely-dried clay surface (Schlichtherle 2018).

Fig. 6 shows the correlation of the three described attributes: wall thickness, maximum temper grain size, and the surface treatment at the individual sites.

The assemblage from Allensbach-Strandbad could be considered the coarsest one. Wall thicknesses of the pots normally range between 10 mm and 20 mm, while the maximum grains reach sizes of around 12 mm. Among the surface treatments, hand-smoothing fully predominates. The few vessels with well-smoothened or burnished surfaces are set apart as a group. Generally, most pieces of this group are bowls or other special vessels.

The three Upper Swabian sites of Wolpertswende-Schreckensee, Olzreute-Enzisholz, and Seekirch-Achwiesen cover a similar scatter area that begins with thin walls of around 4 mm and reaches far into the coarse part of the spectrum. However, vessel walls thicker than 16 mm, which are well represented in Allensbach-Strandbad, are only rarely found in Upper Swabia. The maximum temper grain sizes also vary greatly,

reaching up to 14 mm in some cases. The records from Wolpertswende-Schreckensee and Seekirch-Achwiesen especially reveal a relatively coarse temper frequently occurring in relatively thin-walled vessels, which is less visible in Olzreute-Enzisholz. The colourful appearance of the ceramics from the Upper Swabian sites indicating the variety of surface treatments applied is remarkable. A great portion of the larger and coarser pots bears the hand-smoothing typical for Allensbach-Strandbad. Besides that, well-smoothened surfaces and cord roulette roughening appear on vessels of fine and coarse fabrics. The burnishing and polishing techniques are restricted to finer vessels. In most cases, these are bowls, and only rarely pots.

The consideration of the plotting of the Goldberg vessels must be carried out with great caution since the largest part of the records is unstratified and was only attributed to the early third millennium by typological arguments. The random sample appears finer compared with the discussed Upper Swabian ones. The average vessel wall thickness at the Goldberg is 8.6 mm, while it ranges between 9.3 and 10.5 mm for the Upper Swabian sites. In this respect, the Goldberg is closer to the group of southern Bavarian sites, where most vessels have wall thicknesses around 7 and 8 mm (Gohlisch 2005, 76, Fig. 36). The hand smoothing only appears on single vessels from the Goldberg. Most of the surfaces are well-smoothened or burnished, with the burnishing technique also regularly appearing on larger pots at the Goldberg, which is not often the case in Upper Swabia. The cord rouletting technique generally occurs in lower numbers than at Wolpertswende-Schreckensee or Seekirch-Achwiesen.

## 7. A preliminary interpretive attempt

Although only a short overview of a selection of vessels and attributes was possible in this article, several interesting trends have emerged. The pots from the Lake Constance area follow a rather standardised design that encompasses vessel shapes, vessel sizes, wall thickness, tempering, and decorations. This kind of serial production corresponds to the "repeat ware" (Heitz 2017, 270, Fig. 6) described by Heitz for Hornstaad-Hörnle IA. It can be interpreted as the production of a community of practice that probably not only occurred at Allensbach-Strandbad but also at other sites around Lake Constance, such as Bodman-Weiler II (Köninger 2007) and Sipplingen-Osthafen (Kolb 1999), in the early third millennium BC. Because of the lack of stratification, the character of the Goldberg assemblage can only be estimated from the data presented here. Despite some distinct connections, the vessels demonstrate a higher diversity of decoration in comparison with those from Upper Swabia. Most of the multiple cordoned vessels illustrate practices that appear predominantly in southern Bavaria but, looking at the vessel shapes, wall thicknesses, and tempering practices, the assemblage reveals a certain technological uniformity: bowls and pots are predominantly of bipartite shapes. However, while some of the bowls on the Goldberg and in Upper Swabia follow similar designs, this is not true for the pots. The pots from the Goldberg demonstrate a tendency towards finer fabrics and more intense surface treatments, such as good smoothing or burnishing.

In relation to the neighbouring sites, it is more difficult to characterise the Upper Swabian vessels in general. Some of the pots are examples of more or less exact applications of characteristic designs from neighbouring regions, such as the coarse cylindrical pots that appear as serial ware around the Lake Constance area, or the biconical, cord roughened "supra-regional pots" or many of the biconical bowls of nearly identical design at the Goldberg.

On the other hand, an "in-betweenness" of the Upper Swabian sites is not only illustrated by the copresence of these diverse designs but also by a multiplicity of in-between vessels that demonstrate a recombination of choices typical for neighbouring regions. This may be illustrated by a consideration of individual vessels. A good example is the undecorated cylindrical pot from Olzreute-Enzisholz (Fig. 3,10). Its rather simple

Fig. 7: "Mixed choices". Pot from Seekirch-Achwiesen with a cord roulette roughened lower part and a hand-smoothened upper part (© Landesamt für Denkmalpflege Baden-Württemberg/Philipp Gleich).

shape and undecorated appearance are reminiscent of pots from Lake Constance, but its thin walls and well-smoothened surface (Fig. 5,2) are choices that were almost never made there. Even the assemblage from Seekirch-Achwiesen, which is potentially the youngest one and characterised by strong dispositions for bipartite pots and cord rouletting, is not free of these symptoms that are visible, for example, in the coarse temper and the often only roughly smoothened upper parts of the cord-roughened pots (Fig. 7). Even though the assemblage of Seekirch-Achwiesen could indicate an approximation between the vessels from Upper Swabia and the Goldberg regarding the more aesthetic, formal attributes, the more technical choices such as the tempering, wall construction, and surface treatment of the larger pots reveal a coarseness that could be considered a truly regional Upper Swabian disposition.

Besides that, it is difficult to name specifically Upper Swabian vessel designs that could indicate a shared set of dispositions as being characteristic of a consolidated community of practice. Potential candidates for such standardisation processes are coarse-tempered bipartite pots and rough surfaces treated by hand-smoothing, which deviate from the more southern regions only in their biconical or shoulder-like profiling (Fig. 3,7). Due to the lack of younger sites in Upper Swabia, it must remain open whether a further standardisation was ever reached.

Upper Swabia, with its settlements and their inhabitants, resembles a turntable, on which picking up practices from neighbouring regions and renegotiating them regionally led to a great variety of applied choices and to the creation of vessels that demonstrate unique combinations. This implies a certain openness of the settlements and their inhabitants regarding pottery-making practices as well as creativity.

It is probable that the mobility of members of different communities of practice between neighbouring regions was involved in this process. People who learned pottery-making in the Lake Constance area or eastern Switzerland likely were present in Upper Swabia in the 29th century BC. This does not necessarily mean long-distance migration but a type of mobility connecting regions that are less than 50 kilometres apart. The absence of known sites between Upper Swabia and the Goldberg obscures the situation in the northeastern region. "Missing links" allowing for more direct personal mobility and potential vessel exchange between Upper Swabia, the Goldberg, and the Bavarian Danube Valley may be expected.

**1** Riesbürg/Goldburghausen-Goldberg

**2** Wolpertswende-Schreckensee

**3** Riesbürg/Goldburghausen-Goldberg

5 cm

Fig. 8: Examples of supra-regional decorations from southwestern Germany (1: Globular Amphora motif, 2–3: cord impressions. 1,3: ©Landesmuseum Württemberg Stuttgart/Philipp Gleich. 2: ©Landesamt für Denkmalpflege Baden-Württemberg/Philipp Gleich).

That the transmission of pottery-making practices was not a one way road and Upper Swabia was not the final station is underlined by the biconical bowls appearing in some numbers at Lake Constance (Kolb 1999) and by cord-roulette-roughened pottery known from elevated sites in the hinterland of Lake Constance (Hopert *et al.* 1998) and several sites in eastern Switzerland (Schlichtherle 1999, 46; Fig. 13). The question of how far vessel exchange was involved in the production of this picture must remain largely open. The use of similar granite temper makes it especially difficult to recognise translocal vessels that were exchanged between Upper Swabia and the Lake Constance area using the optical methods applied here.

While a mosaic of dynamic interregional mobility and exchange systems could be an explanation for the more regional negotiation of pottery-making practices, certain outstanding pieces that demonstrate distinct choices typical for areas that are sometimes hundreds of kilometres apart should not be forgotten.

Well-known examples are the sherds from the Goldberg, which bear a complex incised decorative motif typically found at sites of the Globular Amphora culture in northeastern Germany (Fig. 8, 1). Older petrographic analyses suggest that the vessel was potentially made of local clay (Stroh 1938). This would indeed indicate a much further reaching mobility of members of communities of practice who had the possibility of applying their learned designs in a new environment. This far-reaching mobility was maybe less frequent than small-scale interregional mobility and vessel exchange, but it nonetheless multiplies the complexity of local negotiation processes. Another example of such supra-regional phenomena are cord decorations with hanging triangles, which appear at Wolpertswende-Schreckensee and at the Goldberg (Fig. 8,2–3). In the early third millennium BC, this practice reached at least to Bavaria (Matuschik 1996, Pl. 56, 2; Pl. 57, 1; Pl. 58, 4; Graser 2001, Pl. 16, 1), the Czech Republic (Prostředník 2001, 114, Fig. 40, 11; Zápotocký and Zápotocká 2008, 174, Fig. 65), Hesse (Schwellnus 1978, Pl. 39,4), and northeastern Germany (Woidich 2014, 45–46), which indicates a horizon of cord decorations before the Corded Ware connecting large parts of central Europe. The underlying transmission processes remain unknown.

An attempt to develop more detailed explanatory models implies the question of whether Upper Swabia is to be considered a special case, or if a comparably high level of variability in pottery-making practices may be observed within other sites or regions of central Europe in the early third millennium BC and thus should be considered a more typical phenomenon of that era. The search for explanations also requires considering pottery-making practices that were embedded into regional and interregional "landscapes of practice" (Wenger 1998, 118–121), for example, mobility and exchange practices and potential agents affecting them. In the case of Upper Swabia, the geographic position of the sites is remarkable, since they are all placed within the direct vicinity of the main European watershed between the Danube and Rhine rivers. In a traffic system mainly based on watercourses (Mainberger 2017, 2020), such a position could well be connected to more intense and frequent mobility practices.

## 8. Conclusion

The Upper Swabian settlements of the early third millennium BC presented here reveal a broad diversity of pottery-making practices. Despite their spatial and temporal proximity, neither the single sites nor the region as a whole can be attributed to a consolidated community of practice. Rather, they reveal intense negotiations that allowed the development of new vessel designs but also hindered a stronger degree of standardisation. This underlines an astonishing integrative ability of these sites, which left space for multiple designs and creative negotiations into which highly visible choices, such as vessel shapes or decorations, as well as the less visible technical practices such as tempering, were involved. It is suggested here that the mobility of pottery-making persons between neighbouring regions and communities of practice, in addition to vessel exchange, contribute to this picture.

Through a practice theoretical, attribute-oriented framework, we have focused on the complexity of these negotiation processes from a pottery analytical perspective. In order to explain the varying degrees of variability between different sites and regions detected here in more detail, it will be necessary in the future to improve our understanding of possible interdependencies between pottery-making practices and other practices within Neolithic settlements, such as mobility practices, practices of settlement shifting, or subsistence economy.

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# Tracing the evidence of Neolithic social groups' mobility according to the ornamentation on ceramics from the Lysa Hora burial site

*Marta Andriiovych*

## Abstract

*Investigations of the first pottery production in the Dniester-Dnieper region are the most thrilling enquiries into the Ukrainian Neolithic. The appearance of the new production technology was one of the important features of Neolithic societies. Like the transition of the economy from gathering and hunting to the first forms of agriculture and cattle-breeding, the production of the ceramic vessels did not take place within all the territories in the same way. The adaptation of ceramic production and its transference from one community to another followed processes of migration and cross-influence between the Neolithic groups in the region. By adopting a broad stylistic classification and examining local variants, we can trace directions of the spatial mobility of Neolithic communities. In this article, we talk about the styles of ceramics in the region between the Dniester and the Dnieper, as well as the collection of ceramics from the burial sites of Lysa Hora and Mariupol, to trace the mobility and cultural ties in the region.*

*Keywords: Ukrainian Neolithic, pottery styles, spatial mobility, cross-regional relations*

## Introduction

The transition to the Neolithic in the territory of Ukraine began around 6200 cal. BC. At this time, several large Neolithic so-called culture groups were formed, which would instigate active cross-influences on the population of the northern Black Sea region during the Neolithic-Eneolithic period.

Mainly, cultures were divided into three stages of development. The transitions between the stages were normally connected with the visible development of production traditions of flint and ceramics, together with changes in the funeral rituals in the Middle and Lower Dnieper region.

In the territory of Ukraine, some leading researchers in the field of the dissemination of ceramic traditions of the Neolithic-Eneolithic era are N.S. Kotova, D. Gaskevych, and T.T. Tovkaylo. The open discussion concerning the culture's borders and the manner of their formation is ongoing (D. Ya Telegin, I.D. Potekhina, V.N. Danylenko, N.S. Kotova, D.L. Haskevych, T.T. Tovkaylo, L.L. Zaliznyak, and others).

The Lysa Hora cemetery was discovered in 1959 by A.V. Bodyanskyi. Fifty skeletons were found in the collective pit graves with grave goods and a large amount of ochre. The grave goods included about 80 pots, flint, Unio shells, beads, and ornamented boar tusk blades (Bodyanskyi 1961, 32–36). The ceramic complex at the Lysa Hora cemetery is similar to the ceramic pottery at Mykilskyi cemetery (Telehin 1961), and to the pottery that was found at the settlement of Sredniy Stog I (Telehin, Potiekhina and Mallory 1987).
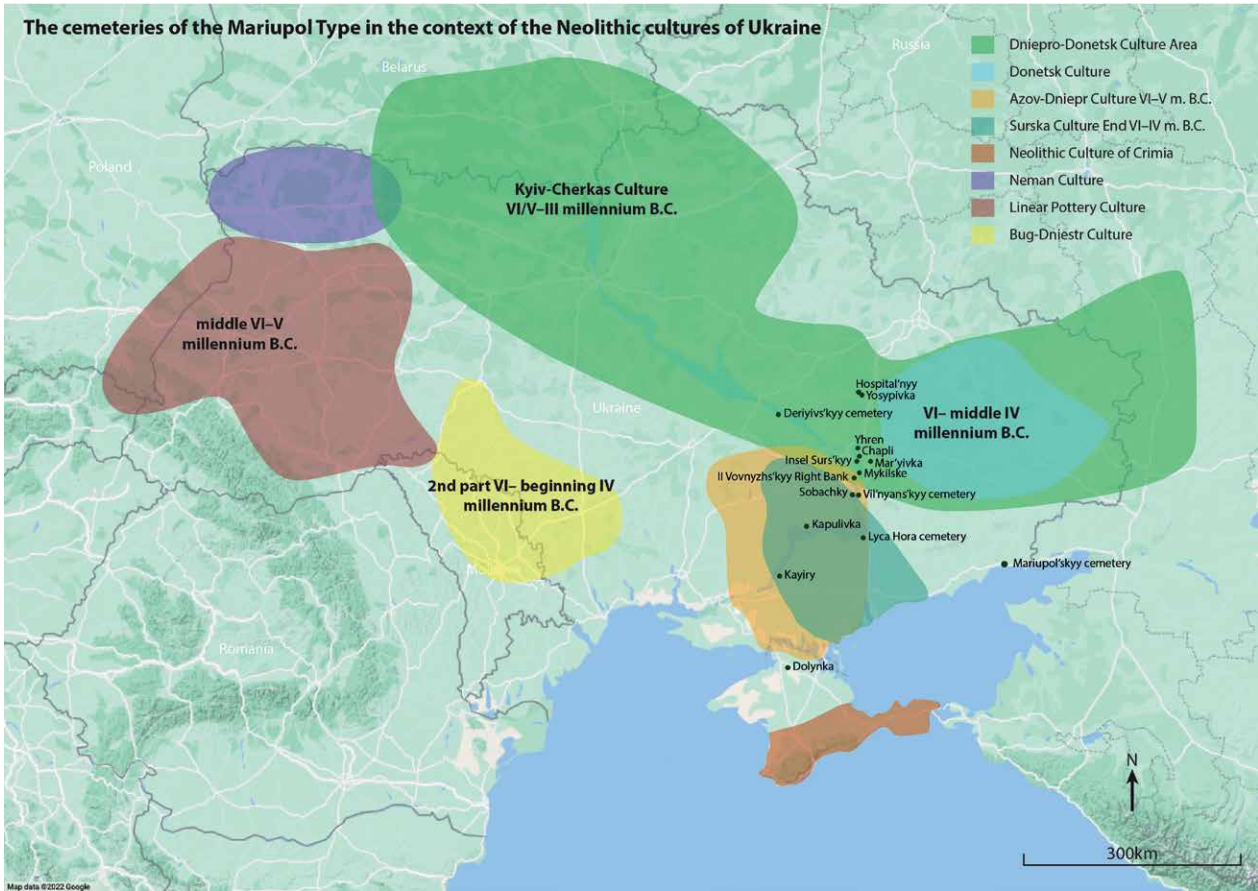
Fig. 1: The cemeteries of the Neolithic period in the context of Neolithic cultures of Ukraine.
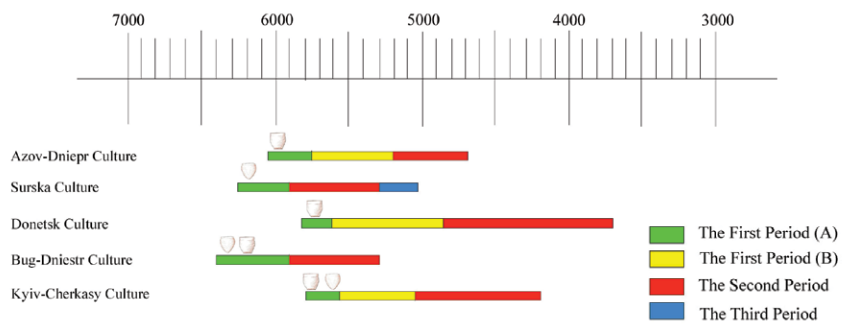


Fig. 2: The time synchronisation of the phases of the Neolithic cultures in the Middle Dnieper region.

## The introduction of pottery ornamentation in Dnieper Rapids and northern Black Sea Neolithic cultures

At the Bug-Dniester interfluve, the so-called Bug-Dniester culture appeared (BDC). The first stage of this culture dates to 6400–5900 BC, and the second stage dates to 5900–5300 BC (Fig. 1, 2).

From the beginning, ceramic production of this culture had a large variety of forms and clay composites. The clay had an admixture of sand and grass hay, with combinations of sand, grass hay and shells, hay with shells, or sand and shells. In the second stage, the technology of the clay mass preparation changed, and new kinds of admixtures appeared: talc; mica and sand; and sand with hay and mica. However, admixtures from the first stage were used as well (Kotova 2015, 41).

Development of ornamentation began mainly with scribbled lines and oval imprints, which were plotted with nets, vertical zigzags, rhombs, and meanders. In the second stage, the most common designs were comb stamps and scribbled lines; triangular impressions and dabbled-imprints also appeared. The design schemes of the ornamentation had a complicated structure, with horizontal zones and imprints divided by horizontal or zigzag lines.

The Surska culture appeared in the steppe, the Lower Dnieper region, and the western part of the Azov Sea (Fig. 1,2). According to N.S. Kotova, this culture is divided into three stages: The first is the Early Neolithic, from 6280 to 5900 BC; the second is the Neolithic stage, from 5900 to 5350 BC, and the third stage is from 5350 to 5000 BC (Kotova 2015, 27–33). Ceramic ornamentation developed from singular double-stamp comb imprints to comb imprints and comb-print zigzag designs, triangular impressions, and finger clips. The design of vessels had horizontal and vertical compositions during all stages and combined different ornamentation techniques. The clay composite contained admixtures of sand, pounded shell, and hay (straw), which, in the third stage, was substituted with a pure sand admixture.

In the Middle Dnieper region, in the seventh and sixth millennia BC, the Azov-Dnieper culture (ADC) was formed (Fig. 1,2). The Azov-Dnieper culture was also divided into three stages and substages. The first substage dates to 6050–5300/5200 BC, and the second stage to 5200–4750 BC. The decoration of the ceramics developed from comb-print stamp ornaments and scribbled lines with developed, complicated ornamentation designs along with spreading triangular, rounded, and squared imprints, scribbled lines, and comb prints, with the rare use of finger "clips" and imprints near the rim in the second period. The design scheme included vertical zigzags, horizontal and diagonal rows, and triangular composition. The clay of the ceramics had admixtures of sand and hay (Kotova 2015, 33–36).

In the territory of Ukrainian Polissya, the so-called Kyiv-Cherkasy culture appeared (Fig. 1,2). This culture is divided into stage 1-A, 5800–5550 BC; stage 1-B, 5550–5050 BC; and stage 2, 5050–4250 BC. The ceramics of the first stages were very similar to the Bug-Dniester culture's ceramics. At the 1-A stage, ceramics had comb-print ornamentation and scribbled lines, imprints, and sometimes oval impressions. At the 1-B stage, triangular impressions and long comb prints appeared. The typical decorative design scheme included horizontal and vertical rows, diagonal rows, zigzag scribbled lines, or herringbone ornamentation. In the second stage, the ornamentation consisted of triangular impressions, rows with pits under the rim, short comb prints, imprints, and combinations of comb prints and scribbled lines. Admixtures of sand and grass, and sometimes talc and graphite used in the first stage, were replaced by a pure sand admixture. At the end of the first stage (stage 1-B), some pottery had a slip layer of clay (Kotova 2015, 47–51).

Along the Seversky Donetsk region, the Donetsk Neolithic culture appeared (Fig. 1,2); it was also divided into stages: 1-A and 1-B, 5800–4850 BC; and stage 2, 4850–3800/3700 BC. This culture can be distinguished by scribbled lines, short comb prints and oval impressions, imprints, and combinations of ornaments. Ornamentation consisted of horizontal rows, horizontal and vertical zigzags, and nets. For the second period, diagonal and horizontal rows made with imprints were typical, and were united in design with scribbled lines and comb prints; sometimes the scribbled lines were wider than usual. The surface of the pottery was covered with a reddish slip layer, which disappeared in the 1-B stage. The earliest ceramics included hay and sand admixtures, and stage 1-B also included shell admixture; in the second stage, admixtures of sand and grass hay prevailed (Kotova 2015, 51–55).
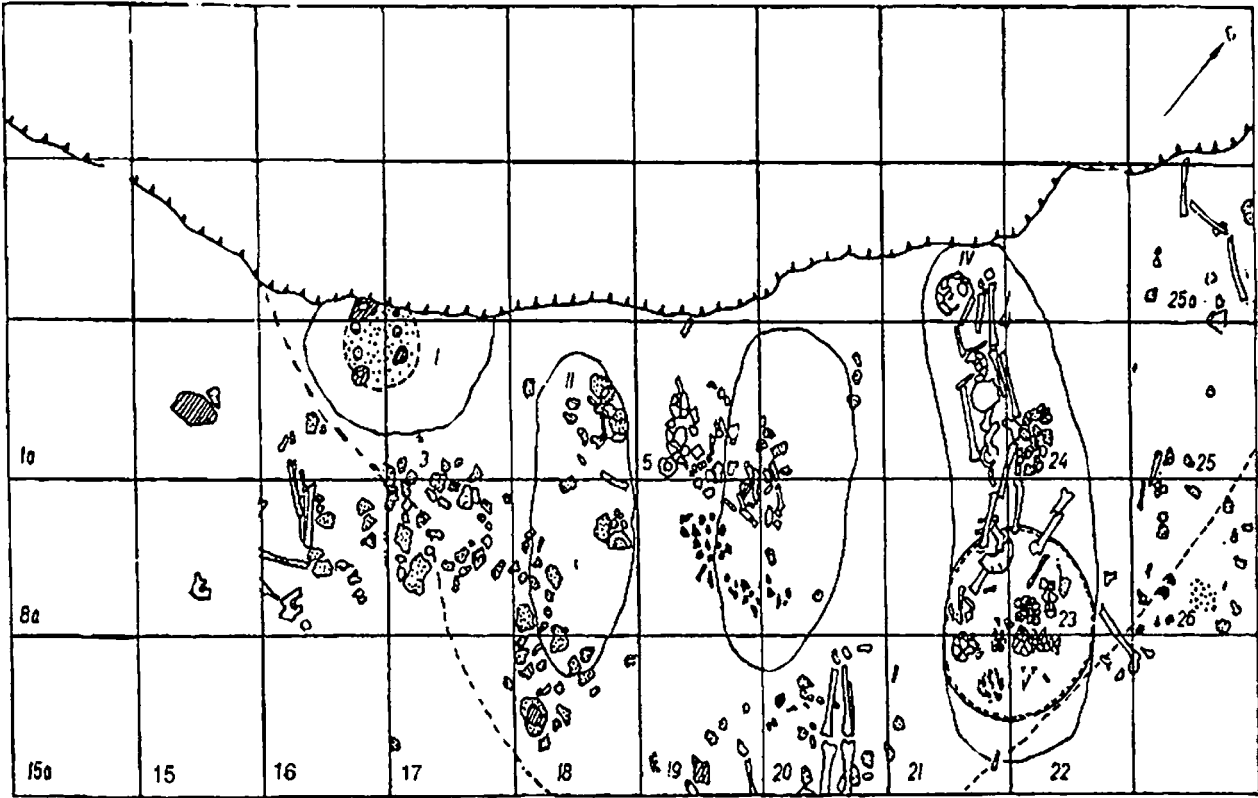
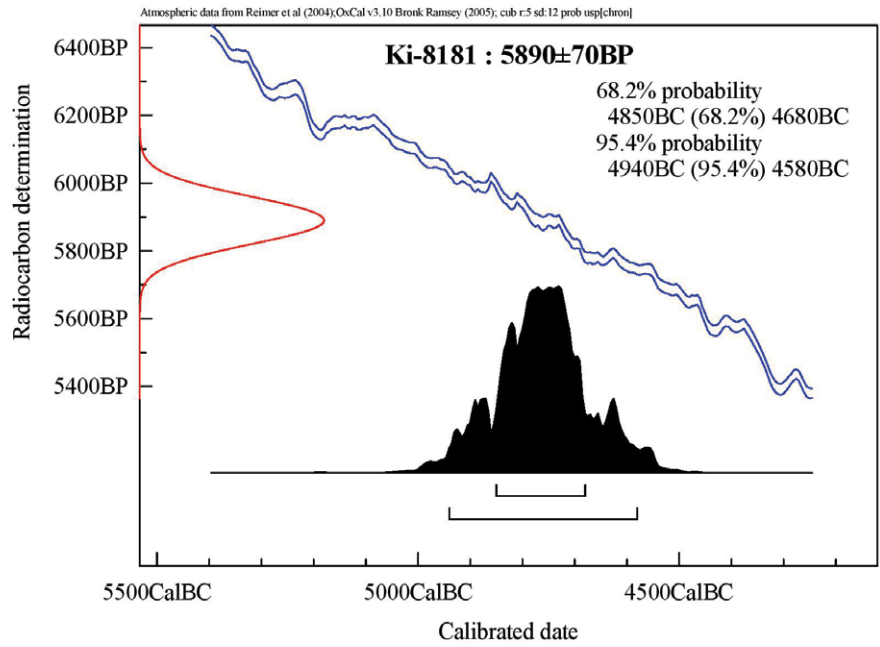Fig. 3: The map of the Lysa Hora cemetery.
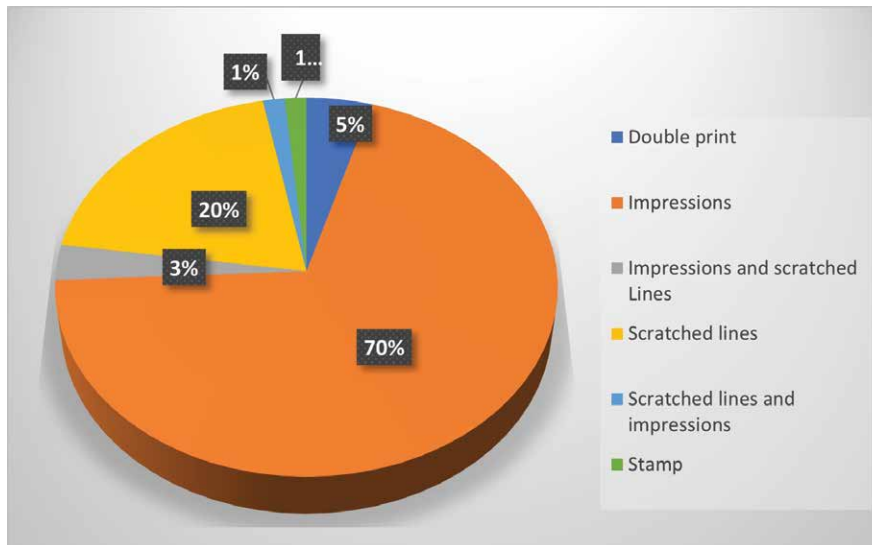


Fig. 4: C14 data for Lysa Hora.

Fig. 5. The diagram of the percentage of the different ornaments in the Lysa Hora ceramics collection.

## Description of the ceramics from the Lysa Hora cemetery

The ceramics at the Lysa Hora cemetery are unique; these vessels were grave gifts but were rather a part of the funeral ritual (Telehin 1991). The pottery sherds were found in all areas of the cemetery and had been crushed during the Neolithic period. Some collapsed vessels were found at the bottom of the pit (Pit I), or on the surface of the filled pit (Pit II). Quite specific was Pit IV, with three collapsed vessels on the right-hand side of the skeleton, which was in a supine pose. Inside Pit V were found three collapsed vessels. Pit V, the oldest pit in the cemetery, had a rounded shape. Sixteen skulls were found there that were then removed from the graves (Bodyanskiy 1961) (Fig. 3).

The cemetery dates to 4940–4580 BC (calibrated with OxCal 3.10, original data Ki-8181, 5890±70 [Kotova 2003] [Fig. 4]) and belongs to the 2-B stage of the Neolithic cemeteries of the Mariupol type.

In total, about 80 broken vessels were found. A.V. Bodyanskyi described them as biconical or jar-like pots, with flattened bottoms, from 5 to 50 centimetres high. The composition consisted of clay with quartz and hay admixtures, and one pot had shell and chalk admixtures. Noteworthy characteristics of the pottery include the carefully handmade shape of the slipware vessels, the hay-smoothed surface of the pots (the traces are visible on the inner surface of the chards), and the even firing (Bodyanskiy 1961).

The ornamentation consists of impressions and scribbled lines that fill the entire surface of the vessel`s body, the bottom, and the inner part of the rim. Several sherds also had painted red lines on the top of the triangular impressions' rows.

More than 80% of the vessels had impressions; 16.5% had only linear ornamentation and about 2% had combinations of ornamentation (Fig. 5). This proportions corresponds to that of the Mykilskyi cemetery, where 10 out of 60 vessels had only linear ornamentation. For comparison, 40% of all the ceramic finds at the settlements of Sobachky and Vovnyhy had linear ornamentation (Andriiovych 2018; Telehin 1991; Telehin 1968).

The vessel collection consists of big and small pots, jar-like pots, and bowls. The size of the pot's upper diameter varies from 8 to 20 cm, and the thickness of the walls of the pots is about 1–1.5 cm; several vessels have a wall thickness of less than 1 centimetre (Andriiovych 2018).

## The comparative method for finding the interactions between, and the exchange of, ceramic traditions

The easiest way to observe the connections between different archaeological groups is to find the objects (in our case, pots or sherds) that belonged to another cultural group. In this case, it would be direct evidence of cross-cultural action.

At another Mariupol-type cemetery, Mykilskyi, which is synchronous with the Lysa Hora cemetery, small pots of the Trypillia culture style were found that, in periodisation, correspond to the A stage of the Trypillia culture in the territory of the South Bug River (Telehin 1991).

The contacts of the population with the Azov-Dnieper ceramic style at the Lysa Hora cemetery can be proved with the pottery styles of the population of the Bug-Dniester, Surska, and Kyiv-Cherkasy cultures. Analysing ceramics, we should remember several points:

• The technical characteristics of the pottery itself.
• The background that had caused a possible migration process (such as climate, and economic type of the tribes as settled, semi-settled, or nomadic populations [Andriiovych 2019]).

The technical description of the pottery starts from the very classical approach of the form, ornamentation, and clay composition but includes the typical features of Neolithic ceramics in the Middle and Lower Dnieper region.

## The form description

In the case of the Neolithic population of Ukraine, this is essential:

1. The shape of the bottom
   • Sharp
   • Flat
   • Rounded

2. The rim profile
   • Open, straight, closed
   • With or without the collar
   • Obliquely cut to the middle or not

3. The profile of the vessel
   • The largest central diameter on the upper, middle, and lower part of the vessel body
   • With or without handles

## The ornamentation

1. The design consists of one ornamentation type:
   • Comb prints
   • Scribbled lines
   • Impressions
   • Non-ornament

2. The design consists of a combination of decorative elements:
   - Comb prints and impressions
   - Impressions and scribbled lines
   - Comb prints and scribbled lines
   - The combination of different forms of one type of ornamentation

3. The distribution of the ornamentation:
   - The body of the vessel
   - The body of the vessel and inner part of the rim
   - The body of the vessel and the bottom
   - The body, inner part of the rim, and bottom of the vessel
   - The ornamentation is not on the full surface of the vessel

4. The plot variations:
   - Horizontal rows
   - Vertical rows
   - Horizontal zigzag
   - Vertical zigzag
   - Fir-tree plot
   - Diagonals rows
   - Geometric plots: triangle, rhombus, rectangles filled with ornamentation

## The clay composition and admixtures (which, as a rule, appear in a combination of the several categories)

- Sand
- Hay
- Shells
- Chalk
- Graphite

Each culture`s pottery style has a certain set of these characteristics that create the basic "type/types" of the vessels inherent in this culture and distinguish them from others. Since each group normally held tightly onto their traditions (Cetlin 2012), it is almost impossible that the tradition rapidly changed. This means that, at some point, a new trend in at least one of the three categories provides evidence for cultural exchange or adaptation (Andriiovych 2019).

## "Detected" cross-influences between different cultures using the example of linear ornamentation on Lysa Hora pottery styles

Tracing cultural group contacts according to the ornamentation style changes on the ceramics seems to be problematic but possible. The first problem we faced when overviewing the cultures is that all cultures' ceramic styles had a limited variety of ornaments: comb prints, impressions, and scribbled lines. The second problem is the low variety of the pottery forms: in all potteries, of possible Lysa Hora-type ceramics, only pots, jar-like pots, and some bowls were found (Telehin 1991). However, on the other hand, each category might have brought certain diversity. In the book *Drevnejshaja keramika Ukrainy* ("The Oldest Ceramics in Ukraine"), N.S. Kotova described a circumstantial

typology of Neolithic ceramics by the shape of the vessels. In the category "pots", there are 28 types of vessels (Kotova 2015, 21–25). This is important because, after analysing the ceramics from the Lysa Hora burial ground, scientists identified a separate type of vessel: pots with a sub-biconical body shape with a maximum diameter at the upper part of the vessel and a high, straight neck (Kotova 2015, 25), which was also typical for the Bug-Dniester culture in its first stage of existence (Kotova 2015, 42). Combining this with the fact that linear ornamentation also appeared on the most ancient Bug-Dniester-style pottery, we can trace the movements and reorganisation of the community that produced the Bug-Dniester pottery style and its influence on the Lysa Hora cemetery community and the Azov-Dnieper pottery style (Andriiovych 2018). Climate changes in the northern Black Sea region can strengthen this idea: there was regression of the Black Sea, aridification, and movement of terrestrial zones to the north during the fourth and fifth millennia BC (Kotova and Makhortych 2010). Climate changes triggered a part of the Bug-Dnieper tribes to move to the Bug-Dnieper interfluve and influence the local tribes.

Climate changes also influenced the development of the Surska culture and pushed them to resettle in the middle Dnieper region before its decline and to influence the Azov-Dnieper culture (Andriiovych 2018; Kotova and Makhortych 2010; Danylenko 1969). According to V.N. Danylenko, linear ornamentation was one of the main indications of the Surska pottery style, as well as the admixture of shells in the clay composite.

## Conclusions

The investigation of the spreading of pottery styles between different tribes and cultural Neolithic groups has the potential to develop a deeper understanding of the cross-cultural links and spreading of new ideas. Even if the ornamentation itself seems quite simple and unpretentious, in different variants and combinations, it was distributed throughout the large territory beside the Dniester, Bug, Dnieper, and Donets. Detailed analysis of the pottery ornamentation and morphological structure together with studies of the clay composites could reconstruct more about the mobility of the Neolithic population that was related to the Lysa Hora cemetery.

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# Lausanne-Vidy: From single to social?

*Katharina V.M. Jungnickel*

## Abstract

*Chamblandes burials were first discovered and classified during the 19th century. They have since been radiocarbon dated to the Middle Neolithic and are found throughout Switzerland, parts of France, and Italy. Literature suggests that, within Chamblandes practices, there are two distinct phases: first, individual burials in stone coffins that were never reopened, and then, later, multiple and sequential (collective) burials that reused the same coffin. Furthermore, it is assumed that the change from individual to collective burial emerged due to a rise in the importance of kinship. Spatial and demographic analysis of the cemetery of Lausanne-Vidy emphasises its unique ability to shed light on the transition from individual to collective burials due to its chronological position in the fourth to fifth millennium BCE. Results show that collective burials were already occurring at the time of the early necropolis, thus excluding a clear-cut two-phase model. Additionally, close to no distinction is discernible in the treatment of the deceased in individual or collective burials regarding age or sex. Based on the burials' temporal distribution and demographic data, the necropolis represents a village community rather than reflecting kinships, and children might have held a unique place in burial practice.*

*Keywords: Chamblandes burials, Neolithic, Switzerland, Demography*

## Introduction

Pully-Chamblandes, discovered in the early 19th century, is the eponym of a grave type consisting of four vertical stone panels that are sunk into the ground, sloped against each other, and covered by a large horizontal panel. The panels near the head and feet are shorter and generally clamped between the side panels.[1] However, after 200 years of research, "Chamblandes type" is still a loosely defined term, subsuming different funeral practices. First and foremost, Chamblandes is a form of architecture without a clear definition of material or rite (Moinat 2007, 196). Most authors report that the coffins are recessed into the local end-moraine substrate and seldom have an intentional stone ground floor (Moinat and Simon 1986; Baudais 2007). As there are rarely overlaps between contemporaneous graves, cover panels were either visible at the time of use or the graves were indicated aboveground, such as those at Lenzburg, St. Léonard, Däniken, and Wettingen (Kramar, Sauter and Weidmann 1978; Moinat and Simon 1986; Wyss 1998). Inhumations are commonly oriented (north)east-(south)west, with the head

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1   See Naef (1901, 271) for a schematic representation of the burials and a description of the smaller panels' trapezoid shape.
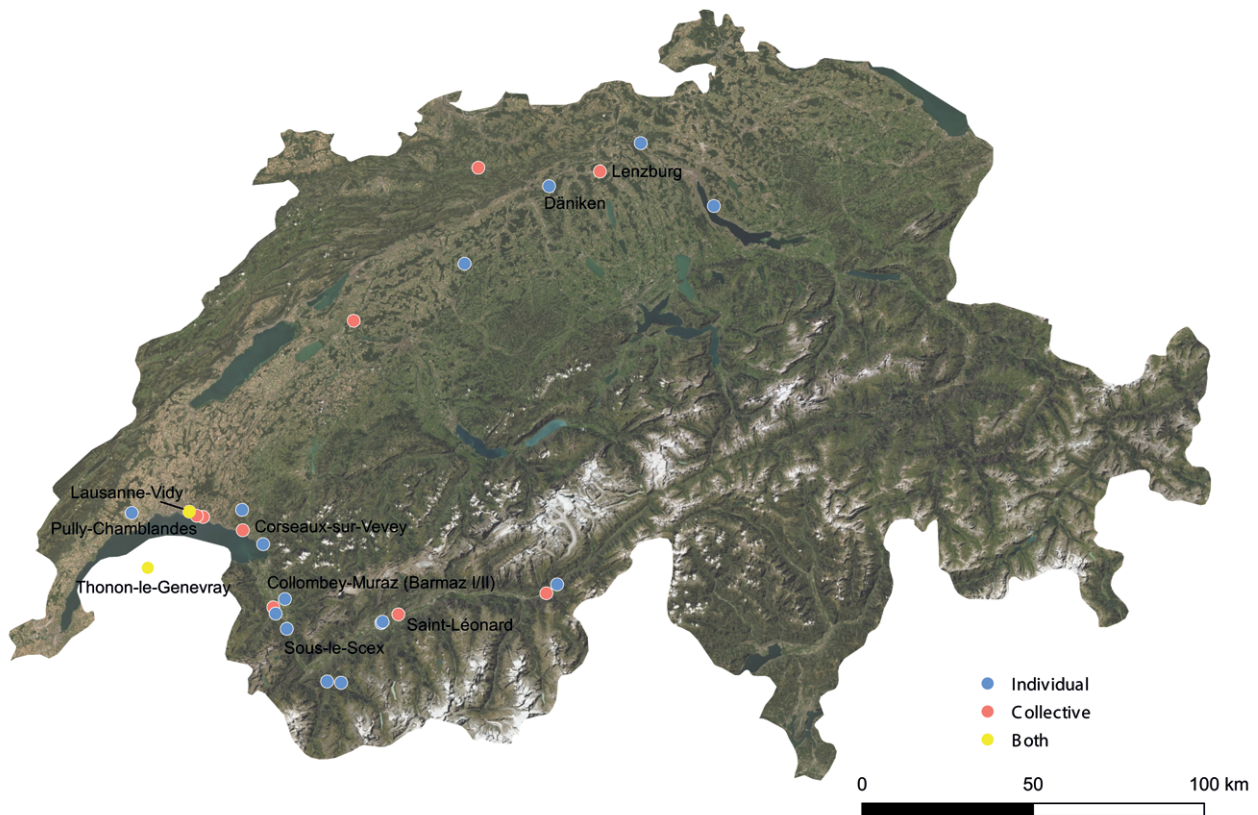
Fig. 1: Distribution of Chamblandes burial sites in Switzerland, categorised by necropoles with only individual or collective burials, as well as sites that show both practices.

to the (north)east and the body placed on its left side in a contracted position that varies in the compactness of the limbs (Moinat and Simon 1986; Moinat 1991c).

The majority of sites are clustered in southwestern Switzerland (Fig. 1), with the substantial part of the necropoles comprising only individual burials and a small percentage comprising collective burials (Kramar, Sauter and Weidmann 1978; Moinat and Simon 1986; Baudais and Kramar 1990; Honegger and Desideri 2003; Moinat 2007; Honegger and David Elbiali 2011; Jungnickel 2013). In all of Switzerland, roughly two dozen sites of this type were discovered, of which the majority are located around the more sizeable lakes of western Switzerland. This type first appears in the early fifth millennium BCE and, in the first phase, contains exclusively one inhumation per coffin (individual burial) (Stöckli 1995, 232–233). The oldest thus far discovered graves were unearthed at Sion-Ritz.

The second phase of Chamblandes burials dates from 4300 to 3250 BCE and introduces the reuse of coffins for double, multiple, or sequential (hereinafter collective) burials (Stöckli 1995, 236; Hafner and Suter 2005, 453). The *linksseitige Hocker/en position repliée sur le coté gauche* ("flexed position, lying on the left side") is present in individual and collective burials alike. Stöckli (1995) notes that the construction method of the grave is slightly different in individual burials, as they are supposedly placed deeper into the ground without surface markers. Contrary to this view, necropoles such as Barmaz, with only individual burials, do not show overlaps or intersections of graves, and sometimes even exhibit small groupings, which presupposes knowledge of the exact position of each grave (Jungnickel 2013, 74). Stöckli (1995, 236–238) assumes that collective burial stone coffins were more carefully constructed and placed to be reopened for later inhumations. A review of Chamblandes burials from 5500 to 3500 BCE in Switzerland did not demonstrate any distinctions in the treatment of entombed individuals for either individual or collective burial practice (Jungnickel 2013). As the transition from individual to collective burials took place in the mid or late fifth to early

fourth millennium BCE, graveyards such as Thonon-Le-Genevray (Baudais 2007) and Lausanne-Vidy (Moinat 2007; Jungnickel 2017) play an essential role in differentiating phases and clearly describing the transition. They are the only Chamblandes necropoles known to house individual and collective burials, temporally and spatially intermixed, and where wood and stone architecture both exist. They date to a timeframe when a transition from individual to collective is assumed and are essential sites for the question of societal and ritual change. Due to past documentation and excavation practices, there is likely a research bias for stone coffins to dominate most Chamblandes sites. This is why Lausanne-Vidy provides a uniquely valuable corrective in intrasite comparison, as mixed architectures and practices conglomerate.

## Lausanne-Vidy

The exceptionally well-documented[2] necropolis of Lausanne-Vidy is one of several late fifth to mid-fourth-millennium-BCE sites in western Switzerland clustered around Lake Geneva (Fig. 1). As individual and collective burials occur together, it constitutes an excellent gateway for understanding the ritual changes of that time. The necropolis encompasses 126 graves with 237 entombed individuals. It sits on the northern shores of Lake Geneva on a 500-metre-wide glacial terrace (Moinat 1991b), with at least nine other Chamblandes sites located within a perimeter of roughly 50 kilometres. The first 30 graves were discovered during construction work in 1962 (Moinat 2007, 195–197) and excavated by Edmond Hennard but never published. His documentation consists of a few photographs with brief handwritten notes and an overview map (Moinat 2007, 197). Patrick Moinat revisited the material and documentation from 1962 and added his anthropological ascertainment (Moinat 2003, 182). The trench layout shows that the excavations were limited in space and restricted to the cellar of a present-day residential building (Moinat 2007, 197). Combined with Moinat's drawings (2007; 2010), a visible segmentation of the 1962 excavation area explains the seemingly linear grave distribution (Fig. 2.A).

   Between 1989 and 1990, Moinat excavated 1500 square metres just east of the first cemetery findings and uncovered roughly 870 square metres of the same necropolis. The site retains features from the Roman, Iron Age, and Mesolithic periods, as well as another 96 Neolithic graves. The counting of the Neolithic burials excavated in 1989/90 follows the 1962 excavation's numbering. The younger excavation forms the eastern extension of the initially discovered Chamblandes inhumations (Moinat and Weidmann 1990). Besides that, this new excavation creates a more precise knowledge of the necropolis's extension (Moinat 1991a), clearly showing the cemetery's eastern border (Fig. 2.B). In 1991, in succession to the fieldwork, 18 in-bloc recovered burials were minutely studied under laboratory conditions and showed various ways of placing the dead in a nonetheless unifying manner. Besides individual and collective body inhumations, cremated remains, secondary deposits, and surplus bones were recorded (Moinat 1992; 2003). Moinat presented preliminary reports up until 2010 (Moinat 1990; 1991c; 1991b; 1991a; 1992; 1994; 2003; 2007; 2010), but the rich anthropological data of Lausanne-Vidy were never entirely published. Moinat (2007) presents some aspects concerning grave orientation, burial sequence, and the number of individuals per grave and includes 16 radiocarbon dates of bone material from the graves of both excavations. Systematic cataloguing of the 126 Neolithic graves[3] and extensive spatial and temporal

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2    It is one of the very few modern excavated and extremely well-documented sites in all of Switzerland that has seen large-scale excavations twice.

3    The detailed catalogue of the thesis incorporates unpublished data, such as drawings of graves and an anthropological ascertainment fully elaborated by archaeo-anthropologist Patrick Moinat.
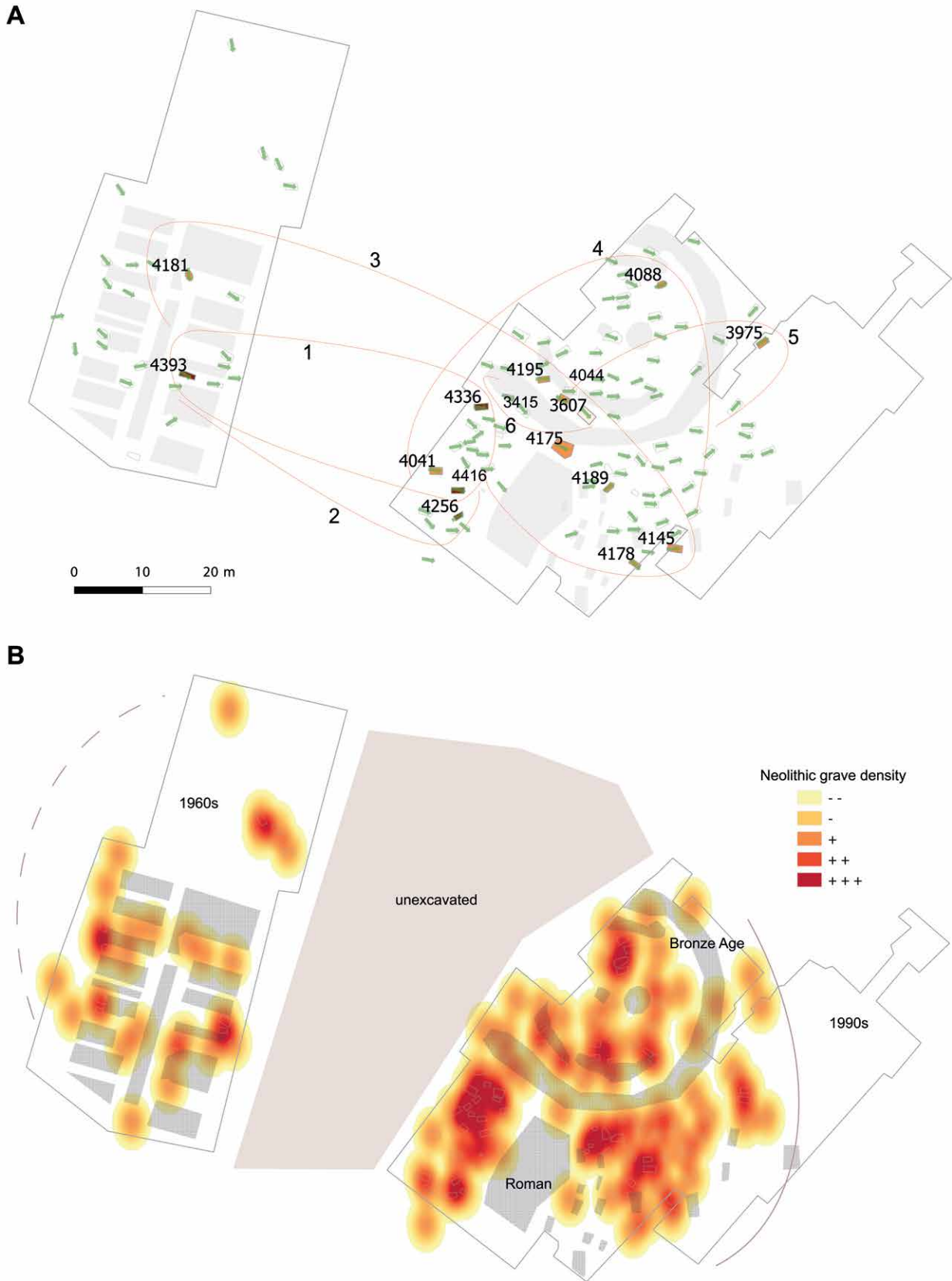
Fig. 2: (A) Plan of the excavation at Lausanne-Vidy from 1962 (left) and 1989 (right) based on P. Moinat, Archéologie cantonale, Lausanne. Small squares with arrows show the Neolithic graves and their orientation. Grey areas mark the younger disturbances. Numbers are median cal. BCE radiocarbon dates for 16 graves. Encircled, numbered areas depict projected horizontal expansion of the graveyard. (B) The grave density of Neolithic graves and unexcavated areas.
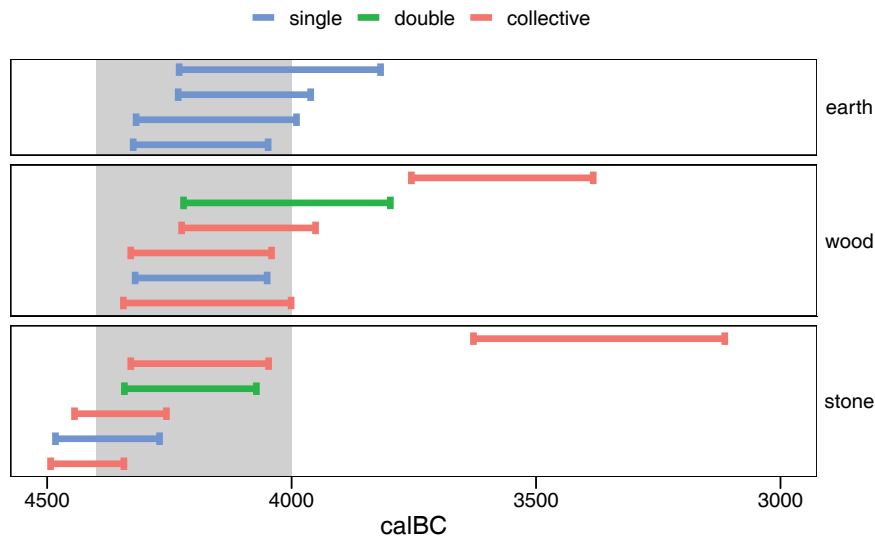
Fig. 3: 2-Sigma calibration interval of 16 radiocarbon dates for Lausanne-Vidy (after Moinat 2007, 201, Fig. 5), sorted by architecture and number of individuals per grave.

analysis of various aspects of the necropolis is presented in an unpublished thesis (Jungnickel 2017), giving detailed analysis of age and sex distribution, calculations of life expectancy and population, spatial distributions of architecture, grave goods, age combinations, and the number of individuals per grave (NIPG), plus a review of the chronology.

## Chronology

The necropolis of Lausanne-Vidy dates from the second half of the fifth to the late fourth millennium BCE. This time window should show if there are discontinuities between the phases of individual and collective burial practice. However, collective burials were already present at the onset of the necropolis,[4] making a clear-cut two-phase model unlikely. There is no need to contest an overall use of around 1400 years (Moinat 2007), as radiocarbon dates range from 4500 to 3100 BCE. However, most of the dates fall into a range of approximately 300 years, from 4300 to 4000 BCE. Since it is a random sample of just 13% of all the graves, the concentration in this temporal interval is striking (Fig. 3). This pivotal phase, in which radiocarbon dates cluster, could indicate a very short usage interval.

Consequently, the usage of the graveyard for one and a half millennia is undebatable, but it is questionable whether it was in high or active use continuously. Moinat (1998, 132; 2007, 201) views the orientation variances in the graves as indicators of prolonged use. Alternatively, the 300-year interval in which the dates accumulate might indicate that the occupation time was shorter and that the burial ground may have been used recurrently in segmented intervals (Jungnickel 2017). The radiocarbon dates of Lausanne-Vidy span the two phases of individual and collective burial practices previously considered separate (Stöckli 1995). Thus, one would expect to see distinct phases for individual and collective graves, respectively, in this graveyard. However, collective burials already occur during a phase of supposedly purely individual burials and are among the oldest graves, resulting in a unique situation in which both customs coincide and may present a transition phase. It is precisely this mixing that makes a clear cut observable in other Swiss sites,[5] but hardly recognisable in Lausanne-Vidy.

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4    The oldest grave in Lausanne-Vidy (Grave 77) dates to 4500–4341 BCE (2-sigma) and holds four individuals (see Jungnickel [2017, 157]), based on Moinat (2007) and unpublished anthropological data.

5    Clearly separated use-phases occur at the Chamblandes graveyard of Sous-Le-Scex (Honegger 2007).

Looking at the cemetery's horizontal stratigraphy, the expansions of the graveyard reinforce the considerations of separate burial phases and recurring occupancy at the necropolis. With the available radiocarbon dates, expansion intervals show possible wave-like enlargements of the cemetery: first towards the south, to the north and then to the east, circling back to the middle for the last inhumations (Fig. 2 A). The youngest graves occupy a prominent central position despite the chronological gap between them and the other burials (Fig. 3).

A detailed statistical and spatial analysis of the graves, individuals, grave goods, and architecture does not offer a more precise resolution of the two presumably separate chronological phases. Throughout the graveyard's usage time, individual and collective burials, as well as architectural types, coexist. Due to this, the spatial distribution of architecture, and the NIPG, are somewhat intangible. Only at around 4300 BCE did some differentiation in grave orientation occur (Jungnickel 2017). In the 16 radiocarbon-dated graves, no other architecture but stone occurs until 4300 BCE. Shortly afterwards, burials in stone and wood coffins and in the bare earth coexist. The youngest burial is in a stone coffin, which dates to several hundred years after the other stone coffins (Jungnickel 2017, 55). It remains speculative as to whether the change in materials was economically motivated due to resource availability or whether it was a symbolically driven choice. The stone coffins do not vary much in dimension and are, on average, smaller than the wooden ones, whereas the simple earth graves are very heterogeneous in size (Jungnickel 2017, 42, Fig. 21). Individual burials make up 50% of all the graves, followed by 25% double burials and 25% that entomb three to eight individuals. GIS mapping shows no spatial preference in the distribution of NIPG, besides a slight tendency of individual and double burials, mostly in wood coffins or plain earth, to form an outer rim in the southeast and of the collective graves to cluster slightly at the centre of the necropolis (Jungnickel 2017).

Regarding the extension of the necropolis and its disturbances, the distribution of the 126 Neolithic burials shows some densely clustered areas (Fig. 2 B). However, there are no groups that the many younger disturbances could not easily explain. Burial distribution density at the necropolis is influenced variously; one major factor is the overlapping with younger features that reshapes the initial distribution and creates artificial clusters. This overlapping is notably visible around a Bronze Age circular ditch feature (Fig. 2 B), which creates local pseudo clusters. As various Bronze Age burials cut into the Neolithic graves, the Bronze Age ditch has probably also destroyed several Neolithic graves. One could assume a more regular distribution pattern if all the graves were preserved. Nearest neighbour analysis shows very little clustering (0.71)[6] and no even dispersion of the graves. The excavation history of the site has also left its marks as, during the 1960s, only search trenches were excavated, and documentation of these graves is minimal and undetailed. Thus, it is reasonable to estimate that graves have been overlooked. During the thorough excavation of the 1990s, many post-Neolithic disturbances were recorded, and there are no overlaps between Neolithic graves (Jungnickel 2017). The eastern extent of the cemetery is discernible, the southeast border fuzzy, and the western part very unclear. Judging by the remaining intact areas, the Neolithic necropolis must have been densely packed, and all the graves must have been marked on the surface or been in active use with a visible stone lid. Contemplating the not-yet-excavated area and missing graves, an estimated minimum of 480 individuals for the entire graveyard, twice the number of inhumations discovered thus far, appears conservative.[7]

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6     Value "0" represents a clustered distribution; "1" is a random, unstructured distribution, and values above "2" signify an even dispersion.

7     Moinat (2007) suggests a total of 230 graves for the necropolis, not-yet-excavated areas included. From an arithmetic mean of two individuals per grave (237 individuals/126 graves = 1,88 NIPG) and the estimate of 230 total graves, projections of 460–480 individuals are within a conservative range.

## Population

There is no differentiation by age or sex in the treatment of the dead for individual or collective Chamblandes burials in Switzerland (Jungnickel 2013). While Lausanne-Vidy exhibits several more fine-grained tendencies in the demographic phenomena, the general picture remains the same (Jungnickel 2017).

A demography-based geospatial analysis[8] shows no discriminatory patterns that exclude any ages or sexes in the cemetery regarding a normal population distribution[9] (Fig. 4 B). Among 237 individuals, neither men nor women are over- or underrepresented.[10] There is no spatial distribution tendency based on sex. We can see a representation of all ages, including neonates and seniles. The high percentage of children, 50% of all inhumations, contrasts a small number of juvenile dead. Men dominate the mature ages, while, among adult individuals, many are gender-unidentified. Children from birth to six years old were most frequent among the buried, both in individual and collective inhumations (Fig. 4 B). The significant number of neonates also includes a substantial share of stillborn babies or in-womb deceased, often entombed as mother-child burials. Life expectancy (Tab. 1) lay at around 20 years at birth and rose to 25 years in puberty, then declined continuously but not steeply (Jungnickel 2017). A comparison of population data through mortality tables[11] shows that men tended to get older than women once they had passed juvenile age, while women had a clear risk of death by childbirth during their fertile years, starting by 15 and reducing after 30 (Fig. 5).

Women, men, and children are buried together in double and collective burials in succession, over a timespan that ranged from several weeks to some years.[12] Men and women share tombs across ages and sexes. Children are more frequently buried in stone architecture, while adults are often buried in wooden architecture or plain earth (Tab. 2). Women tend to be entombed more often in stone than wooden coffins, with the reverse for men. Men are also more often buried alone, especially mature male individuals, in wood coffins. Among individual burials, mature men and younger children occur frequently, whereas children are also represented more than any other age group in collective burials. Women occur more regularly in combinations with other individuals than men and are less often individually buried. Combinations of different age groups show only minor trends: younger adults tend to be buried with younger children and older adults with older children, while women may also have been given preference in combination with younger children and newborns. Where men are entombed with children, they tend to be with older ones. Besides being buried with adults, children of different ages are consigned to the grave with other children or juveniles. Younger children are sometimes buried individually but slightly grouped. Children are significantly more often gifted with grave goods, primarily decorative elements, than adults. In general, fewer than 20% of all individuals received jewellery. There are no gender-specific offerings for men or women. Men who are buried with weapons and tools remain isolated cases (Jungnickel 2017, 79–86).

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8     Inspired by the very well presented example of Thonon-le-Genevray (Baudais 2007).

9     The age and sex distribution is average considering what is expected for that time: high infant mortality, the deaths of fertile-age women, and men living longer after reaching adulthood (Eades and Simon 1996; Wahl, Strien and Jacob 2007).

10    The necropolis holds more males than females (with a masculinity index of 213, which Herrmann (1990) classifies as a male surplus). However, it is likely a result of many gender-unidentified adult individuals (Fig. 4 B) due to generally bad bone preservation.

11    Mortality tables were calculated after Grupe (2012) as well as Kunow and Gebühr (1976, 193), Gebühr (1975, 438–439), Kokkotidis and Richter (1991, 227–228), and Grupe, Harbeck and McGlynn (2015).

12    Grave 79 offers a compelling example of burial succession intervals and their time variation: three children were buried first and, after decomposing, were moved aside to be followed by a young adult female, who had only a few weeks to decompose and whose body was separated from the head while being moved aside for a mature male individual.
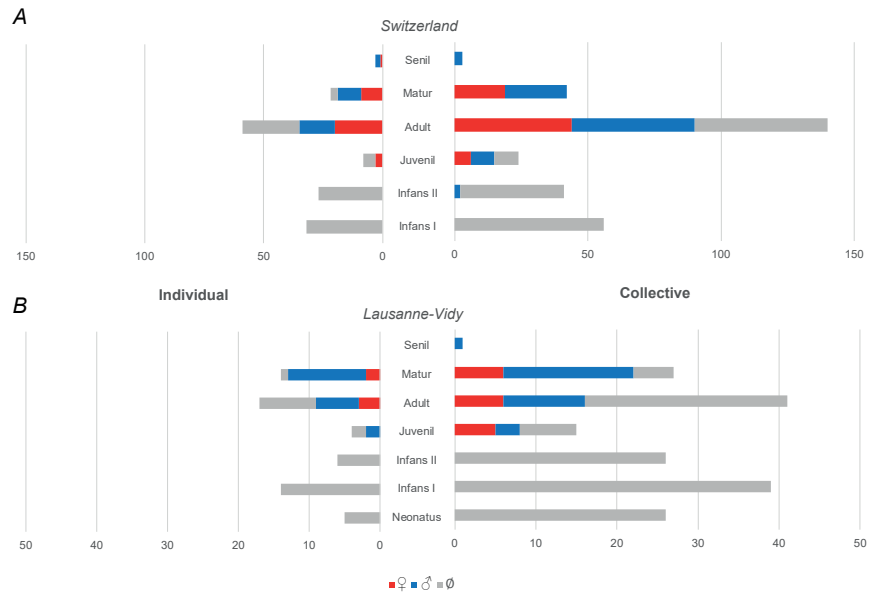
Fig. 4: (A) Demographic data
from 19 Chamblandes necropoles
throughout Switzerland
from 5500 to 3500 BCE
(Jungnickel 2013), and (B)
demographic data from Lausanne-
Vidy, split into individual (left)
and collective (right) burials
(Jungnickel 2017).
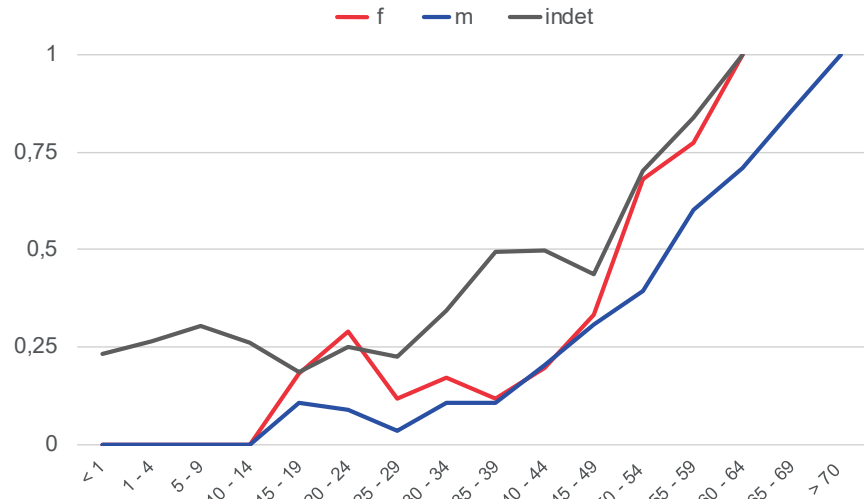


Fig. 5: Probability of death (q^x) per
age group, sorted by sex.

| age | a | Dx | dx | lx | qx | Lx | Tx | ex | Jx | Ax | Bx |
|---|---|---|---|---|---|---|---|---|---|---|---|
| < 1 | 1 | 38.1 | 16.2 | 100 | 0.16 | 91.9 | 2050 | 20 | 216 | 18.4 | 4.5 |
| 1–4 | 4 | 33 | 14 | 83.8 | 0.17 | 307 | 1958 | 23 | 180.5 | 15.4 | 15 |
| 5–9 | 5 | 28.1 | 11.9 | 69.8 | 0.17 | 319 | 1651 | 24 | 150 | 12.8 | 16 |
| 10–14 | 5 | 16.8 | 7.14 | 57.9 | 0.12 | 271 | 1332 | 23 | 127.6 | 10.9 | 13 |
| 15–19 | 5 | 18.2 | 7.73 | 50.7 | 0.15 | 234 | 1060 | 21 | 110.1 | 9.39 | 11 |
| 20–24 | 5 | 18.9 | 8.03 | 43 | 0.19 | 195 | 826 | 19 | 91.56 | 7.81 | 9.5 |
| 25–29 | 5 | 9.41 | 4 | 34.9 | 0.11 | 165 | 631 | 18 | 77.42 | 6.6 | 8 |
| 30–34 | 5 | 13.8 | 5.89 | 30.9 | 0.19 | 140 | 467 | 15 | 65.8 | 5.61 | 6.8 |
| 35–39 | 5 | 12 | 5.12 | 25.1 | 0.2 | 112 | 327 | 13 | 52.87 | 4.51 | 5.5 |
| 40–44 | 5 | 11.7 | 4.97 | 19.9 | 0.25 | 87.3 | 214 | 11 | 41.01 | 3.5 | 4.3 |
| 45–49 | 5 | 11.5 | 4.88 | 15 | 0.33 | 62.6 | 127 | 8.5 | 29.44 | 2.51 | 3.1 |
| 50–54 | 5 | 11.3 | 4.8 | 10.1 | 0.48 | 38.4 | 64.2 | 6.4 | 18.06 | 1.54 | 1.9 |
| 55–59 | 5 | 7.86 | 3.35 | 5.28 | 0.63 | 18.1 | 25.8 | 4.9 | 8.485 | 0.72 | 0.9 |
| 60 –64 | 5 | 3.36 | 1.43 | 1.94 | 0.74 | 6.11 | 7.74 | 4 | 2.872 | 0.24 | 0.3 |
| 65 –69 | 5 | 1.02 | 0.43 | 0.51 | 0.86 | 1.45 | 1.63 | 3.2 | 0.68 | 0.06 | 0.1 |
| > 70 | 5 | 0.17 | 0.07 | 0.07 | 1 | 0.18 | 0.18 | 2.5 | 0.085 | 0.01 | 0 |
| sum | | 235 | 100 | | | 2050 | | | 1172 | 100 | |

Tab. 1: Mortality table for all
individuals at Lausanne-Vidy.

| | | 1 | | | 2 | | | 3 | | 4 | | | 5 | | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | stone | wood | earth | stone | wood | earth | stone | wood | stone | wood | earth | stone | wood | stone | wood | wood |
| Neonatus | indet | 3 | | 2 | 8 | 4 | 1 | 4 | | 5 | | | 1 | | 2 | 1 | |
| Infans I | indet | 9 | 1 | 4 | 8 | 1 | 4 | 3 | 2 | 5 | 2 | 2 | | 3 | 5 | 1 | 3 |
| Infans II | indet | 2 | 2 | 2 | 2 | 1 | 1 | 1 | 1 | 6 | 1 | | 4 | 2 | 4 | 2 | 1 |
| | M | 2 | | | 2 | | | | | | | | 1 | | | | |
| Juvenile | indet | | 1 | 1 | 1 | 2 | 1 | | | 1 | | 1 | | | | 1 | |
| | F | | | | 2 | | | | | 2 | | | | 1 | | | |
| | M | 1 | 4 | 1 | | 3 | | 1 | | 1 | 1 | | 1 | | | | 3 |
| Adult | indet | 1 | 2 | 5 | 2 | 1 | 5 | 1 | 3 | 1 | 5 | 1 | 3 | 2 | | 1 | |
| | F | 1 | 2 | | | 2 | | 1 | | | 1 | | 1 | | | | 1 |
| | M | 1 | 6 | 4 | 2 | 5 | | 1 | 2 | 1 | 2 | | 2 | 1 | | | |
| Mature | indet | | | | 1 | | | | 1 | 1 | | | | 1 | | 1 | |
| | F | 1 | 1 | 1 | 2 | 1 | | | | 1 | | | 1 | | 1 | | |
| Senile | M | | | | | | | | | | | | 1 | | | | |

The large overall number of infant inhumations in this necropolis might lead to the interpretation of children having an essential position within society. Cannon and Cook (2015) point out that the habit of burying children in the community's cemetery indicates a general, loss-oriented mourning expression and that a constant connection to the dead is sought. Building on psychological attachment theories and the "dual process mode of bereavement", Cannon and Cook (2015, 404–413) show a predictable relation between attachment style and strategies for keeping or dissolving connections with the dead. Nonetheless, the social convention of revisiting the dead does not infer the personal grief felt over specific dead individuals.

Tab. 2: Age classes (sorted by sex) in combination with individual (1), double (2), and collective (3–8) burials and their respective architecture.

## Funeral community

Calculations for a funeral community of contemporaneously living individuals[13] (Jungnickel 2017) help to understand the size of the group who carried out burials at this necropolis and how long they used it. The variables available to calculate the size of the funeral community at Lausanne-Vidy are: 237 individuals (D), radiocarbon dates that span a maximum of 1400 years[14] (t), and a life expectancy[15] at birth (e0) of 20 years (Tab. 1). Consequently, the funeral community (P) for the excavated burials at Lausanne-Vidy was a community of 3.7 individuals (Fig. 6). Moinat (2007) conservatively estimates the total number of graves[16] to be 230, with each grave containing on average two deceased, allowing for an estimated 460 individuals. The funeral community for this (D = 460) would be 7.2 individuals (Fig. 6).

As argued before, the period of intensive use for Lausanne-Vidy was more likely 300 years than 1400 years (Jungnickel 2017). We can assume that the uniform burial habitus, both in individual and collective graves, reflects a period of only a few hundred years rather than deducing that rites did not change for more than a millennium. If we were to accept the use of one-and-a-half millennia, we would have to consider a

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13    Derived from Acsádi and Nemeskéri (1970). Herrmann (1990, 305–311) provides the formula to calculate a population (P) (*funeral community*): P = 1,1 * (D * e0/t).
14    Moinat (2007, 200) assumes a long use of the necropolis.
15    Derived from the mortality tables in Jungnickel (2017, 26–34).
16    Including unexcavated areas.

Fig. 6: Community size projections based on P = 1.1*((D*e)/t) with three different inhumation numbers (D). Community sizes are shown on the Y-axis (P), while the X-axis represents the usage time of the graveyard (t).
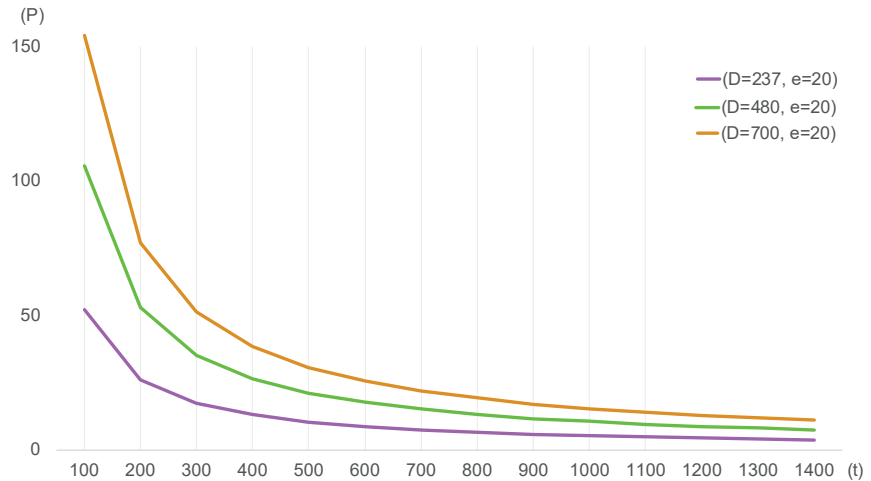
much larger community, and the size of the graveyard would rise drastically. Most of the necropolis's borders were discovered during the excavations, making 200 to 300 graves reasonable.

The funeral community was likely formed by a village that used this space to bury its inhabitants. The reason for this assumption is the unselected population, displayed in the high proportion of children and a reasonably balanced sex ratio.[17] Taking contemporary settlements in the area into account might help to put this into perspective: the pile dwellings of Corsier-Port at Lake Geneva are dated to the 39th century BCE (Corboud and Seppey 1991, 184–188), and the graveyard of Lausanne-Vidy was in active use in the fourth millennium (Fig. 3). Ebersbach (2013, 152) estimates roughly seven people per household for a wetland settlement, which correlates well with a funeral community of 7.2 (see above). However, with the previous assumption of one household, we are still far below the lowest assumed value for a village of that time**.** The necropolis may extend much further and could have been used by a large community for more than a thousand years. Alternatively, accepting its current extent, it must have been used for a shorter time. To adjust for this, we accept a core phase of 300 years and consider the later dates to be outliers (Fig. 3). Otherwise, assuming intervals of recurring use corresponds with the model of recurring abandonment for settlements. Houses in pile dwelling settlements in Neolithic Switzerland had a lifespan of five to a maximum of 40 years, being rebuilt at intervals of 10 to 20 years (Stöckli 1995, 204; Ebersbach 2010b, 42). The settling of the beach area may only have been possible at times of low lake levels. Village sites in the Cortaillod period do not seem to have persisted for more than 30 years (Hafner and Suter 2003, 28). Between the settlement phases, flood levels may have caused an interruption in settlement for up to 20 years (Ebersbach 2010a, 198–99). General mobility in the fourth millennium BCE and reoccurring settlement at short intervals is also described by Stapfer, Hafner and Heitz (2016).

As a calculation example, we can divide 1400 years of occupation at Lausanne-Vidy by equally long periods of use and abandonment of 20 years, respectively, and get 35 occupancy intervals and an actual use of 700 years for the burial ground. Temporary interruption in a settlement may not reduce the total occupancy of the necropolis, but it may limit the usage years per se.[18]

Before equating a village with a funeral community, we expect six to ten simultaneous houses (Stöckli 1995, 206–207) per community. Fewer than seven people per household

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17    See Jungnickel (2013, 74); Jungnickel (2017, 29).
18    For Lausanne-Vidy specifically, one may have to assume even shorter overall or phased usage time based on the currently available C14 data.

results in a maximum of 60 people in the village community. A results-oriented calculation example goes as follows: ten houses of six people each (funeral community of P = 60), 480 dead individuals, and 20 years' life expectancy result in 176 years usage time (Fig. 6). For 237 individuals, 87 years suffice for a village community of 60 people to occupy the necropolis. Accepting a graveyard use of 300 years, even 35 people, meaning a four- to five-house village, are sufficient to fill up the cemetery (Fig. 6).

Some conclusions arise from these considerations: if a village community had used the cemetery for more than a thousand years, the site of Lausanne-Vidy must be much larger. Accepting its current expansion and a long chronology, it had to have been continuously used by a single household. However, chronologically, an interval of amassed radiocarbon dates makes a strong case for a usage of only a few hundred years and possibly recurring phases. In 300 years, a village of six houses will be enough for an estimated 480 inhumations. This raises the community size close to 40. A village of 60 people would need a little more than 150 years to fill up this necropolis.

The inhumations in other necropoles – Collombey-Barmaz, Sion-Collines, and Pully-Chamblandes – lying roughly within the same chronological span as Lausanne-Vidy, and including either individual or collective burials, could have been accumulated by a community of ten houses within 10 to 50 years.

## Discussion

Moinat and Gallay (1998) suggest that several phases of social change took place in Switzerland. A phase of pioneers (4700–4300 BCE) includes the Neolithic settlement of the Alpine region by carriers of the Cortaillod culture. A less stratified society, unstable boundaries, and high population mobility are assumed (Moinat and Gallay 1998, 11–12). From 4300 to 4000 BCE, a putative increase in inequality manifests in the social sphere of burials. Moinat and Gallay (1998, 5) claim that the number of people buried increases slightly during this period. Their final phase (4000–3200 BCE) is one of expansion and population growth. The observation that burial practices changed transitively rather than suddenly is discussed by Moinat (1998, 131), showing that individual burials peaked around 4300 BCE and then slowly declined in number. However, they were only gradually replaced by collective burials, and both practices continued into the fourth millennium.

Another chronological distinction by Stöckli (1995) proclaims two phases in Chamblandes burials in Switzerland. A two-phase nature of Chamblandes burial rites would assume a primary uniform phase of individual burials followed by a phase of collectivity (Moinat 1998, 129). In a two-phase model, however, there should be a distinction in the burial context at around 4300 to 4100 BCE, which is not evident in Lausanne-Vidy, where, early on, individual and collective burials occur contemporaneously. Change in the form of a clear cut between individual graves and collective burials is not observable. Instead, the necropolis shows a diversification phase in the second half of the fifth millennium, with various customs. As early as 4500 BCE, burials are already inconsistent in the number of individuals and, shortly after, they depict extreme diversification in architecture, orientation and NIPG (Fig. 3).

The assumption that Lausanne-Vidy was used intensively from 4300 to 4000 BCE coincides with the considerations of several phases (Moinat and Gallay 1998), but no inequality shows up in the burial customs. Instead, the non-selective treatment of society members regarding age and sex shows a reasonably equal and permeable social structure with no discernible hierarchy. The uniform positioning of every member of society (Moinat 1998, 133) hints at little social inequality. Population data from 19 sites throughout the sixth to fourth millennium BCE elaborate that individual or collective burials do not exclude anyone (Fig. 4 A). People of all ages are buried carefully, but it remains unclear whether this points to "ethical thinking that even the newborns were

already accepted as human beings" (Stöckli 1995, 268). Being placed in an individual or collective grave does not reflect who is eligible for a funeral but instead stresses the importance of burial itself. The resulting flexibility and diversity expressed in minor tendencies stem from the individuals who carry the potential for change in the treatment of the dead (Cannon and Cook 2015). Perhaps the rise in collective inhumations is simply a general process of collectivisation, which is also observable in the concentration and enlargement of the settlements in that Neolithic period (Gallay 2007, 343).

Experimentation in the symbolic sphere could reflect a shift in belief systems and cause observable differences in tomb usage. The origin of the Chamblandes funeral practice lies in western Switzerland (Moinat 1998, 129), and it seems that the origin of collectivisation does, too. If we find ourselves in a period of restructuring, the first change is the introduction of collective burials, and the second is the use of different building materials.

Individual stone burials are costly in time and workforce, and need to be constructed by a community. To put more than one person in a stone/wood coffin could adhere to a belief that certain people need to enter an afterlife manifestation together. This would give rise to the conventional idea of an increase in kinship importance. Alternatively, there are practical reasons, such as less work(force) needed for construction if a tomb is reused. Restraints of time, population, or materials might encourage such changes. It might be a workforce choice to use different materials and collectivise the inhumations. Woodworking would, in principle, be more manageable than stone processing, and the transport of different materials requires more/less complex logistics. Chamblandes stone coffins for individual and collective burials are constructed in basically the same way. Wooden and earthen burials are rare in the fifth millennium BCE, which might just be a consequence of an early observation bias towards more permanent stone structures. The role of the different architectures in an economic and social context is challenging to grasp. For Lausanne-Vidy, we solely recognise tendencies that children are buried more often in stone architecture and male adult individuals in wooden coffins. To offer purely pragmatic considerations, we may presume that the work involved in setting up a large stone coffin was considered too much and, therefore, material that was more readily available and workable (wood) was used instead. Less work effort might be assumed for small stone coffins, but further investigations are needed to clarify whether the workload of a small stone coffin coincides with that of a large wooden box. Some practices, particularly the high number of jewellery items for children, could also indicate special treatment for these age groups[19] and correlate with the effort made to create stone architecture for individually buried children in Lausanne-Vidy. Additional perspectives on the importance of different materials and the extent to which they were available could be drawn from the study of contemporaneous settlements. One would have to study how building materials were handled at the settlements and whether structures of work organisation are discernible, which can then be compared with the graves – potentially revealing changes in the social or economic structure of the settlements around the emergence of collective burials.

Because of its size, Lausanne-Vidy is representative of demographic reconstructions showing the possibility of a village community using the graveyard. The variability of burial customs in orientation, architecture, and NIPG can be attributed to recurrent

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19   Cannon and Cook (2015, 402) assume that high child mortality, emotional dissociation of child death and care in the burial practice are not correlated. In Lausanne-Vidy, high child mortality and a careful, sometimes elaborate burial of children can be observed. Other practices in Lausanne-Vidy, such as bone reorganisation, support a constant connection with the dead. This revisit suggests a social convention for mourning but says nothing about the individual sorrow felt over each dead person and does not make an attachment of the funeral community with children any more likely than an attachment with adults. According to Cannon and Cook (2015, 400), the representation of grief in the form of burials and other treatments discrepate from the experience and expression of grief. Graves form an idealisation of the worldview and do not have to depict the practice of the living environment.

colonisation (Stöckli 1995; Ebersbach 2010b; Stapfer *et al.* 2016), and thus to phases of abandonment in a mobile society (Moinat and Gallay 1998). Alternatively, they result from the flexibility and diversity of the funeral communities handling the treatment of the dead (Cannon and Cook 2015, 404–412). The argument that village communities are represented in the necropolis, meaning all members of a settlement population had equal access and rights to be buried in the graveyard, does not directly respond to why people were placed in individual or collective graves.

In Lausanne-Vidy, as in other necropoles, it is noticeable that people of all ages were carefully and uniformly buried. There is no discernible difference in the way the various age groups are spatially clustered. Lacking aDNA analysis, a depiction of exact kinship structure is not possible. Merely looking at the members of a collective burial will not provide any insights without knowing the exact timing of the burial succession or biological family structures. There is no hint as to whether our definition of blood relations was of significance back then. Besides the evident in-womb mother-child burials at Lausanne-Vidy, there is no definitive proof in the burial context of what we nowadays might discuss as family relations. Gallay (2007) regards various collective burials as displaying family connections, but in only two cases are these credible: in Sembrancher, a mother and her daughter, identified by epigenetic markers, lie close together in individual graves (Rohrer-Wermus, Masserey and Pousaz 1986, 212), and, in Barmaz (Gallay 1986; Honegger 1993), spatial clusters of small, mixed groups of different ages and sexes are visible (Jungnickel 2013, 23–25).

In Lausanne-Vidy, the mixture of individual and collective graves and the many disruptions inhibit the recognition of clusters, but there may have been two small groups of child burials (Jungnickel 2017, 68). None of these examples answers the question of whether we are encountering a prehistoric version of a "family grave" in Chamblandes tombs. It remains questionable whether the burial customs and the possibility of every member of society having access to a regular burial can mirror family structures at all. Even though there are necropoles in which individual and collective burials coexist, Gallay (2007, 342) still assumes that the increase in individuals in the graves is a progressive collectivisation process, resulting in the megalithic society of the third millennium BCE. For him, the change in numbers documents the increasing importance of the family over the individual.

Fundamental problems, such as our current views shaping the definition and concept of family, and that we can only vaguely grasp it for the Neolithic, are crucial for this debate (Jungnickel 2013, 69).

The biggest problem has been the concept of family itself: house(hold) and family are often assumed to be identical. Archaeologists primarily define households as residential family units, but Lutz (2013, 43) contests that "family is not defined by a joint locality (a housing unit) because members of a family do not live, eat or sleep in the same place everywhere. Families [are] complex, multifunctional social institutions, [...] characterised by great diversity and high dynamics". This means that the term "family" can be interpreted differently or be non-existent (Lutz 2013, 41–43). Family structures and terminology result from the respective social structure at the time. The community also defines the roles of the sexes, the upbringing of children, economic security, and often cultural and legal norms, especially where there are no state structures (Bucerius, Schmidt and Dönhoff 2005, 435–437).

Besides broader society, kinship/family formed and structured the social network. The general amorphous nature of the term "family" creates problems in interpreting archaeological findings, including those from graves. The grave is just the normative ideal that a community projects in its treatment of the dead onto its former members (Lutz 2013, 44). The question of "biological" relations can only be answered by aDNA

analysis[20] and large-scale radiocarbon dating untangling the chronology between individual and collective burial and giving an understanding of whether collectivisation was due to rising kinship importance. We aim to answer pressing questions with anthropological data that are already available. Collectivisation seems to materialise in an observed tendency to form smaller heterogeneous groups within the necropoles of Barmaz and a parent-child connection at Sembrancher (Jungnickel 2013). However, not one grave was considered a clan tomb with an observable family structure. The term "family" and other words considered synonymous with it are often misused, especially in Neolithic lakeside settlements.[21] The hypotheses that Chamblandes burials had some family connotation and that the collectivisation process in the inhumation habitus was kinship-based cannot be upheld with the current data.

## Acknowledgements

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20    This would have the potential to make substantiated statements about the social structure of the Neolithic in Switzerland, because it would clarify if back then, as seems to be prevalent today, the concept of kinship was based solely on biological relations. It could be clarified whether there were social conventions for individual members of society and, for example, whether this can explain an often-observed secondary displacement of bones and burials.

21    "Genetic kinship analyses enable [decoding of] the biological structures of a population, which are valuable for [sociohistoric] research, and their relevance for the social organisation of the funeral community needs to be scrutinised in a second step" Lutz (2013, 46). Lutz (2013, 36–45) addresses the problem of equating house residents with relatives and points out that archaeological features, such as houses or graves, cannot be used to make any sociostructural statements.

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# Perversion of the Pareto principle: Using a bottom-up approach to study burial practices in the Late Neolithic Carpathian Basin

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## Abstract

*The paper focuses on Late Neolithic burial practices in the western part of the Carpathian Basin (Transdanubia). Here, the dominant narrative of the emergence of social inequality is one that heavily focuses on a group of supposedly more valuable, or exotic "prestige items", whose existence is taken to indicate the elite status of the buried individual. This positivistic, top-down approach has led to the idea of a socially ranked, male-dominated Neolithic society. This narrative highlights some preselected features, objects, and burial types, while at the same time more or less ignores most of the visible patterns of burial practices, which are deemed "ordinary" or insignificant. To oppose this tendency, a bottom-up approach focuses on the entirety of the accessible material, the archaeological features, and, more specifically, their statistical and spatial patterns. The southeast Transdanubian region in the Late Neolithic is an especially interesting region from this perspective; here, almost 3300 Lengyel burials are known, providing a good basis on which to study the main patterns and characteristic features of the burial practices and interpret them in the light of social organisation. For this reason, I use a case study from the Late Neolithic Alsónyék site to apply a bottom-up approach, which suggests a different interpretation of the whole burial practice than the established top-down narrative.*

*Keywords: Carpathian Basin, Late Neolithic, burial practice, lithic artefacts, social organisation, bottom-up approach*

## Introduction

In the Carpathian Basin and its surroundings, the emergence of a more or less stable and regular burial practice (*i.e.* interment of the deceased in a grave pit with a non-random orientation, location of burials inside the settlement, non-random skeleton position, and non-random placement of burial goods) is dated to the Middle and Late Neolithic periods (5500–4500 cal. BCE). From the period prior to 5500 BC, we know of several single burials in settlement contexts, many of which contained grave goods that were more random, such as small vessels, ornaments, and stone tools, without any discernible pattern. In the context of Early Neolithic and Körös units (6000–5500 cal. BCE), burial numbers are low and the majority of them did not contain any items at all (Paluch 2007, 250–252; Whittle *et al.* 2013, 50–52). In Starčevo contexts, about 30 graves are known, 25 of them at the site of Alsónyék (Bánffy *et al.* 2010, 42–43; Oross *et al.* 2016, p. 95). In Körös contexts, we know of 130 burials, of which only 11 graves contained any burial goods. Körös burials do, however, have an east-west orientation pattern.

The number of LBK burials in the Carpathian Basin is also not very high but, in contrast to the earlier period, some of them form grave groups and increasingly standardised sets of grave goods appear (Whittle *et al.* 2013, 57–58). The presence of a limited number of vessels, stone axes, and a few Spondylus bracelets, as well as the first appearance of copper beads (Csanytelek–Újhalastó and Csongrád–Bokrospuszta sites) in the same place indicates that a new ritual behaviour had reached this region and started to change material culture and, at the same time, the cognitive world of the LBK communities (Hegedűs 1981, 8–9; Hegedűs 1983, 25, 30; Siklósi *et al.* 2017, 69–70). After this, two larger Late Neolithic regional units appeared, often referred to as "post LBK communities", which were different in many ways: the Tisza and the Lengyel units. The Tisza unit on the Pannonian Plain, mostly along the Tisza river, is known from many horizontal settlements and a number of large tell settlements with a rich material culture, elaborate incised pottery decoration, idols, anthropomorphic vessels, and other human and animal figures, which are all often interpreted as signifying a complex cognitive world (Hofmann *et al.* 2020; Raczky and Anders 2012; Raczky 2015; Raczky 2018; Raczky *et al.* 2008). The burials, higher in number than before, were still located inside the settlement and show some gender-specific differences in the materials (Anders *et al.* 2007; Siklósi 2013) (see below).

The Lengyel unit on the west bank of the Danube river is better connected to central Europe, and the horizontal Lengyel settlements were numerous; some of them had enclosure ditch systems (Bertók *et al.* 2011; Pásztor *et al.* 2015; Barna 2007; Barna *et al.* 2010; Barna *et al.* 2011; Barna *et al.* 2015; Podborský *et al.* 2006). The number of burials is large, with many of them located in small groups inside the settlement (especially in Tolna and Baranya counties/southeast-Transdanubia). Burial rites are very homogeneous and the grave goods are abundant, with different standardised sets and many "prestige items"; in short, there are a lot of differences to the previous LBK period in Transdanubia and also to the contemporaneous Tisza unit (Zalai-Gaál 2002a; Zalai-Gaál 2002b; Zalai-Gaál 2004; Zalai-Gaál 2005; Zalai-Gaál 2007a; Zalai-Gaál 2007b). The massive number of Lengyel burials and grave items, which were gathered at specific places, show a new phenomenon in the Carpathian Basin. The well-known archaeological narrative for this new phenomenon is the emergence of a social inequality; a more complex and ranked society that maintained long-distance network systems that manifested in the cognitive and material culture (Osztás *et al.* 2016, 189; Zalai-Gaál *et al.* 2009; Zalai-Gaál, Köhler *et al.* 2012; Zalai-Gaál, Gál *et al.* 2012).

This statement reflects a classic top-down approach that focuses on the especially rich burials and their grave goods, and is based on the premise of the individual ownership of the prestige items in those burials, and their representation of the person's wealth and social power. In this article, I would like to reconsider the fundamental concept of this narrative and apply a bottom-up approach to define the primary pattern of burial rites in the Late Neolithic Lengyel community. The enormous number of burials at the site of Alsónyék–Bátaszék (2236) provides an especially good basis for this discussion.

## The popular top-down narrative of Late Neolithic burial rites

The development of Neolithic societies in central and southeast Europe and the early emergence of their social inequality have been discussed from several perspectives (*e.g.* focusing on households, neighbourhoods, gender differentiation and male dominance, prestige items and their regional origins using provenance analysis, resource flows, long distance networks, exchange systems). In the more recent research history on this issue, new datasets and analytical methods (*e.g.* aDNA, stable isotope analysis) focusing on burial materials have been added. Overall, the social archaeological research in this area

| Site number | Site | Country | County | Number of burials | Literature |
|---|---|---|---|---|---|
| 1 | Alsónyék–Bátaszék | Hungary | Tolna | 2236 | (Bánffy *et al.* 2016; Osztás *et al.* 2016) |
| 2 | Aszód–Papi földek | Hungary | Pest | 224 | (Kalicz 1985, 21–40) |
| 3 | Borjád | Hungary | Baranya | 1 | (Gáti *et al.* 2016) |
| 4 | Esztergályhorváti | Hungary | Zala | 38 | (Barna 1996; Barna *et al.* 2011) |
| 5 | Felsőnyék–Kenderföldek | Hungary | Tolna | 1 | (Csalog 1936; Zalai-Gaál 1982b, 10) |
| 6 | Friebritz–Süd | Austria | Mistelbach, Niederösterreich | 10 | (Neugebauer-Maresch *et al.* 2002) |
| 7 | Györe | Hungary | Tolna | 15 | (Zalai-Gaál *et al.* 2008) |
| 8 | Kakasd | Hungary | Tolna | 1 | (Zalai-Gaál 1982a, 11) |
| 9 | Karancsság–Alsó rétek | Hungary | Nógrád | 2 | (Bácsmegi 2003) |
| 10 | Kölesd–Lencsepuszta | Hungary | Tolna | 2 | (Zalai-Gaál 1982a, 11) |
| 11 | Lánycsók | Hungary | Baranya | 2 | (Kalicz 1977, 140–142) |
| 12 | Lengyel–Sánc | Hungary | Tolna | 86 | (Wosinszky 1885; Wosinszky 1890; Zalai-Gaál 2002a) |
| 13 | Mauer-Antonshöhe (Wien 23) | Austria | Grieskirchen, Oberösterreich | 1 | (Ruttkay 1970) |
| 14 | Mórágy–Tűzkődomb | Hungary | Tolna | 109 | (Zalai-Gaál 2002a; Zalai-Gaál 2002b) |
| 15 | Nógrádverőce | Hungary | Nógrád | 1 | (Dinnyés *et al.* 1993; Diaconescu 2014, 23) |
| 16 | Paradicsompuszta | Hungary | Tolna | 15 | (Zalai-Gaál 1982a, 12–13) |
| 17 | Pári–Altacker | Hungary | Tolna | 8 | (Zalai-Gaál 1999, 3–11) |
| 18 | Pusztataskony-Ledence | Hungary | Jász-Nagykun-Szolnok | 1 | (Sebők 2012) |
| 19 | Reichersdorf | Austria | Sankt Pölten-Land Niederösterreich | 2 | (Neugebauer *et al.* 2013) |
| 20 | Svodín/Szőgyén | Slovakia | Nové Zámky, Nitra | 111 | (Demján 2012; Pavúk 2007; Točik *et al.* 1966; Zalai-Gaál 2007) |
| 21 | Szekszárd–Ágostonpuszta | Hungary | Tolna | 23 | (Zalai-Gaál 1982a, 7–9) |
| 22 | Újberekpuszta | Hungary | Tolna | 2 | (Zalai-Gaál 1982a, 15–16) |
| 23 | Veszprém–Jutasi út | Hungary | Veszprém | 8 | (Regenye 2007) |
| 24 | Villánykövesd–Jakabfalusi út mente | Hungary | Baranya | 28 | (Dombay 1959) |
| 25 | Zengővárkony–Igaz-dűlő | Hungary | Baranya | 368 | (Dombay 1939, 4–35; Dombay 1960) |
| **Total number of burials** | | | | **3 295** | |

Tab. 1: Published burials in the Lengyel period in the west part of the Carpathian Basin (Transdanubia).

is based on two main pillars, one of which is the study of the archaeological data linked to settlement (*e.g.* settlement patterns, regional networks, household organisation, craft specialisation, cooperation within and between neighbourhoods and settlements; see Champion *et al.* 1984, 140–149; Lichter 1993; Müller-Scheeßel *et al.* 2020; Renfrew 1974; Renfrew 1980; Renfrew 1984; Renfrew *et al.* 1982; Whittle 2010). The second pillar of the social archaeological research is the burials, which are especially prominent in the southeast European context, due to the relatively high number of burials in the archaeological record as compared with central and north Europe. The popular narrative of the emergence of social inequality in central Europe, particularly in the Carpathian Basin, is thus also based mainly on the Late Neolithic burials, where what are defined as prestige items (*e.g.* Spondylus bracelets, polished stone axes and adzes [especially from jade], obsidian chipped stone tools) appeared for the first time. In the Early Copper Age

| Site number | Site | Country | County | Number of burials | Literature |
|---|---|---|---|---|---|
| 26 | Békés–Povád | Hungary | Békés | 8 | (Siklósi 2013, 123–124) |
| 27 | Berettyóújfalu–Herpály | Hungary | Hajdú-Bihar | 40 | (Siklósi 2013, 125–127) |
| 28 | Bodrogkeresztúr–Kutyasor | Hungary | Borsod-Abaúj-Zemplém | 2 | (Siklósi 2013, 127) |
| 29 | Bodrogzsadány/ Sárazsadány–Akasztószer | Hungary | Borsod-Abaúj-Zemplém | 6 | (Siklósi 2013, 128) |
| 30 | Čičarovce/Csicser | Slovakia | Michalovce, Kosice | 12 | (Lichardus *et al.* 1995, 144–151; Vízdal 1980, 144–147) |
| 31 | Čoka/Csóka–Kremenyák | Serbia | North Banat, Vojvodina | 13 | (Banner 1960; Korek 1973, 266–269) |
| 32 | Hódmezővásárhely–Kökénydomb | Hungary | Csongrád-Csanád | 21 | (Banner 1930; Horváth 1986, 14; Korek 1973, 266–269) |
| 33 | Kenézlő–Szérűskert | Hungary | Borsod-Abaúj-Zemplém | 2 | (Kiss 1939) |
| 34 | Kisköre–Gát | Hungary | Heves | 33 | (Korek 1989; Siklósi 2013, 136–143) |
| 35 | Ószentiván | Hungary | Csongrád-Csanád | 1 | (Banner 1928) |
| 36 | Öcsöd–Kováshalom | Hungary | Jász-Nagykun-Szolnok | 50 | (Siklósi 2013, 144–150) |
| 37 | Polgár–Csőszhalom | Hungary | Hajdú-Bihar | 124 | (Anders *et al.* 2007; Raczky *et al.* 2017) |
| 38 | Szegvár–Tűzköves | Hungary | Csongrád-Csanád | 73 | (Siklósi 2013, 151–154) |
| 39 | Szerencs–Taktaföldvár | Hungary | Borsod-Abaúj-Zemplém | 4 | (Siklósi 2013, 154) |
| 40 | Tápé–Lebő | Hungary | Csongrád-Csanád | 38 | (Bognár-Kutzián 1963, 412; Korek 1958, 151–152; Siklósi 2013, 155–159) |
| 41 | Vésztő–Mágor | Hungary | Békés | 31 | (Siklósi 2013, 159–165) |
| **Total number of burials** | | | | **458** | |

Tab. 2: Published burials in the Tisza period in the eastern Carpathian Basin.

(4400–3000 BCE), the numbers of these "prestige items" rise, and are complemented by copper artefacts and other ornaments and gender-related differences in burial practice (see Tiszapolgár cemetery with the strict burial rites based on biological sex) (Bognár-Kutzián 1963a; Bognár-Kutzián 1972; Borić 2015). In southeast Europe, the well-known Durankulak and Varna cemeteries are accordingly taken as clear signifiers of early social inequality (Milisauskas *et al.* 2002; Müller 1997; Müller *et al.* 2016; Renfrew 1978; Renfrew 1984; Renfrew *et al.* 1982; Todorova 1978; Windler *et al.* 2013).

Here, I would like to contrast this top-down narrative with a more detailed account of the data, leading to a bottom-up account of social development. In the Carpathian Basin, the first appearance of a substantial number of burials with unambiguous grave goods is in the Lengyel context. Almost 3300 burials from 25 sites represent these Late Neolithic communities (see Tab. 1).

The burials in the Transdanubian region (eastern area of the distribution of the Lengyel communities) seems to reflect a more structured social organisation than those in the east part of the Carpathian Basin. In the same time period, on the Pannonian Plain, only a few sites show a higher density of burials close to the Tisza river, and roughly 500 burials are published from 16 sites (see Tab. 2).

Some of these graves contained "prestige items", the main argument of the traditional social inequality narrative. Both Zsuzsanna Siklósi (for the eastern Carpathian Basin, Siklósi 2010, 2013) and István Zalai-Gaál, who published the majority of the Lengyel burials (Zalai-Gaál 2002b; Zalai-Gaál 2002a; Zalai-Gaál 2004; Zalai-Gaál 2005), highlighted the existence of "prestige items" and their importance in a burial practice and social organisation context as an indicator of inequality. According to these two authors, in line with widespread views, prestige items are seen as objects made from non-conventional, very rare, exotic material; these objects in themselves, and/or the production technique that required special knowledge or skills, all add up to a higher value of these items (Siklósi 2004, 7–9). From this perspective, it is assumed that the prestige items are viewed as equally valuable for the entire community and constituted a form of wealth for the owner, which could be the buried individual or the whole community. In the burials discussed here, these prestige items were shell ornaments (Spondylus, Glycymeris, and
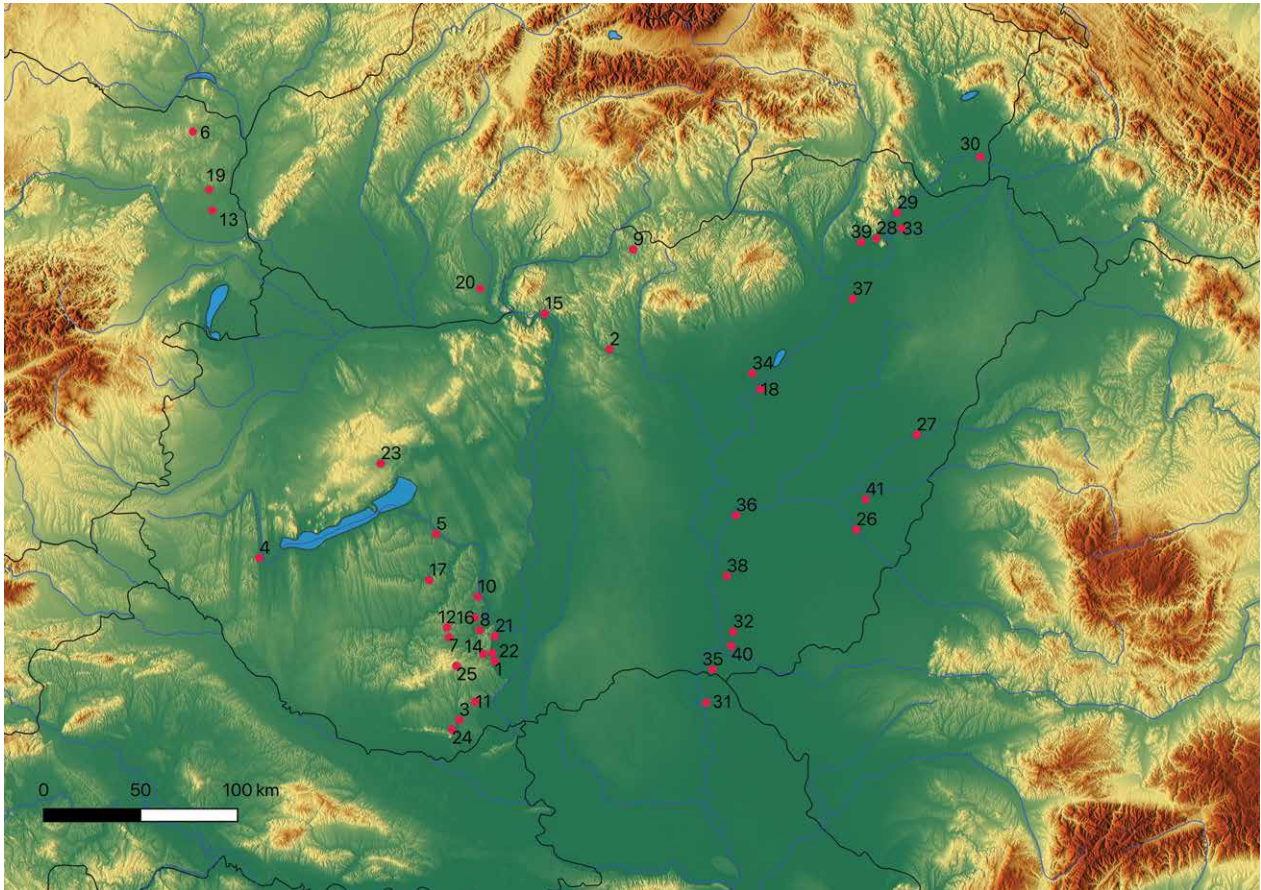
Dentalium bracelets), wild boar tusks, deer canine teeth, copper ornaments (beads, finger and arm rings), and stone tools, namely, obsidian and later, in the Copper Age, Volhynian flint blades and, in a very few cases, cores (Siklósi 2004, 9–13). When it comes to the empirical level, thanks to work over the last few decades, our knowledge about these prestige items has substantially increased using provenance analysis, based on which it was possible to point to exchange networks located alongside the Danube and Tisza rivers (see Bajnóczi *et al.* 2013; Séfériades 2000; Ifantidis 2011; Siklósi *et al.* 2015; Siklósi *et al.* 2017; Fig. 1).

Still, the whole approach to social inequality research connected to this top-down narrative shows a deeply positivistic approach focused on grave goods and especially the "prestige items" connected to burial practices, without much discussion about the justification or validity of the premises used for interpretation. This is more visible in southeast Europe, where the cultural-historical approach focused on the creation of relative chronological periodisation was dominant well into in the second half of the 20th century. Numerous fine-grained relative chronological charts were created from sequences in tell settlements and large cemeteries, which were then used for comparative studies and to match and synchronise the charts from different countries. Those objects in the archaeological materials that could be used as good chronological markers were deemed as especially important and thus overemphasised in this research context. Many of these, apart from pottery vessels, are among the group of "prestige items", which at least partly explains the special attention these objects have received in our area of study.
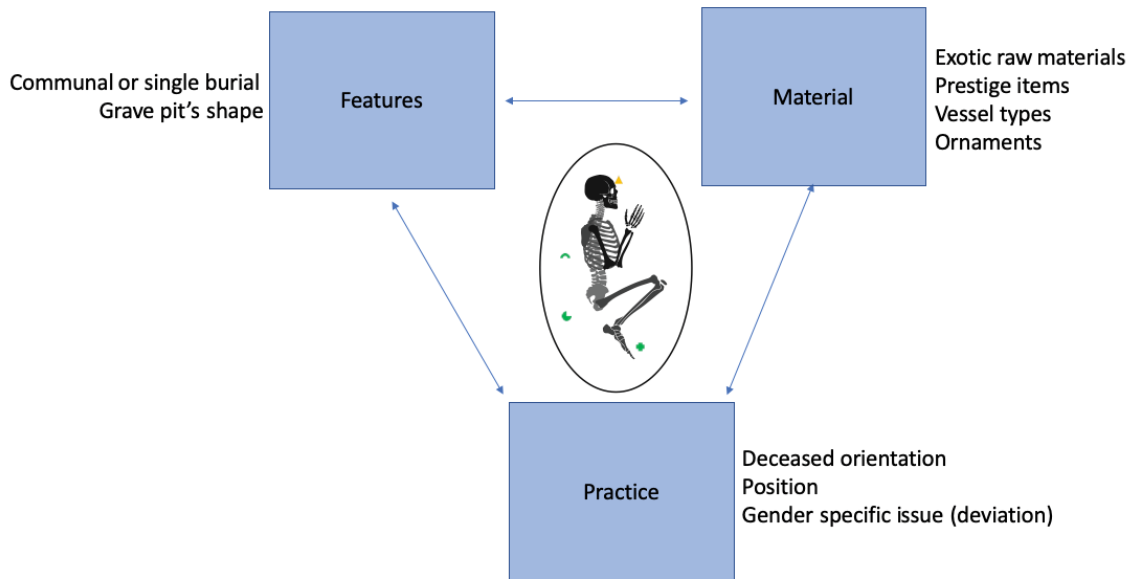
## Components of the burial and analytical concepts using a bottom-up narrative

It is not the goal of this article to create a new opposite narrative or fundamental contrast between top-down and bottom-up approaches, or replace one perspective by the other. Top-down narratives (*e.g.* evolutionist schemes such as "big man", chiefdom, archaic state societies) are easier to communicate and thus spread more widely, even extending to popular media outreach. But most top-down approaches focus too much on how leaders come to power and maintain and strengthen their power, often with reference to their access to or control over those previously mentioned specific prestige items (Ames 1995; Earle 1997; Earle 2017; Furholt *et al.* 2020; Lund *et al.* 2022). Here, using as a case study the site of Alsónyék (Bánffy *et al.* 2016; Osztás *et al.* 2016), I would like to present and discuss how a bottom-up approach can provide fresh insights into the current top-down-heavy research discourse. First of all, I will define the elements of the burials for further quantitative analysis. I will look at a burial as a primary source of social archaeological research and the burial as a discrete unit in a basic dataset of the burial analysis. I describe the burial as a three-component entity, which consists of "features", "practice", and "material" (Fig. 2).

(1) The primary feature of the burial is based on the following parameters: the number of individuals per burial (single or multiple burial), the density of the burials (are they clustered into grave groups or cemeteries or are we just dealing with individual graves?), and the graves' location (inside or outside the settlement). (2) The component of the burial practice I aim to describe is the principal funerary activity, which could reflect movements, gestures, manipulations, and past actions related to the deceased (*e.g.* orientation, position of the skeleton, existence of gender-specific patterns) (Aspöck 2013; Devlin *et al.* 2015). (3) The material component consists of every item in the burial (*e.g.* the number and type of the grave goods, raw materials, the item's exact position inside the grave). In light of the social inequality analysis, the last two components (features and material) are quantified in order to create a consistent scale comparable across the dataset (see usage of the Gini index (Cowell 2000; Windler *et al.* 2013, 204–206; Haughton *et al.* 2009; Müller *et al.* 2016, 101–105). This method of classification and quantification is helpful in characterising and comparing burial practices, because a statistical approach can separate regular from irregular patterns.
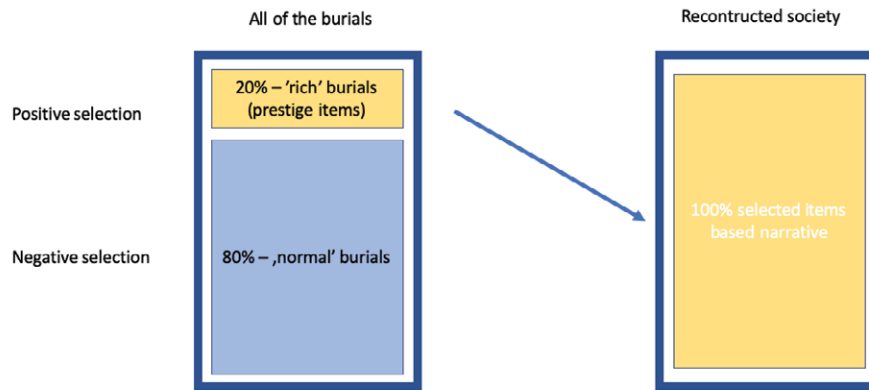
Fig. 3: The logical concept of the top-down approach and its imbalance.

This three-component classification characterises the burial in general, and it is important to emphasise that all of the components are equally important in defining the burial practice standards that can be found in a community. In the context of the "classical" archaeological culture definition, a "culture" is erroneously equated with one distinct society, and it is assumed that such a society could be identified by the same – or very similar – archaeological materials, settlement patterns, buildings, burial practices, beliefs, religion, and language (Kossinna 1926, 21; Childe 1929, v–vi; Childe 1956, p.124). In this framework, the southeast-European rich grave materials seemed to provide a readymade basis to apply western European anthropological and archaeological positivist theories (Bognár-Kutzián 1963b; Bognár-Kutzián 1972; Chapman 1991; 1994; 2000; Figler *et al.* 1997; Hawkesworth 1954; Preston 2014; Skomal 1980; Soafer-Derevenski 1997). Thus, what was done was to collect the numerous grave goods and interpret them from a top-down social archaeological perspective – a group of graves from a few sites taken to represent the whole society. Hence, this research tradition selected and isolated the grave goods and mostly ignored the features (grave construction) and the practice element of the burials. From this viewpoint, the study of the presence or absence of prestige items plays the key role in identifying, or rather postulating, social inequalities (see, as an early example, Varna cemetery (Chapman 1983; Chapman 1991; Renfrew 1978; Renfrew 2001). Very selectively highlighting some "important", "valuable" materials, namely prestige items, and collecting mainly those from all of the sites and burials, one neglects most burial materials. Approaching the material in this way cannot represent the material well, and any quantification is not significant in a meaningful or statistical way, so, from the beginning, the system description is heavily imbalanced (Fig. 3).

Besides this imbalance, when the research only focuses on material objects and preselects supposedly "valuable" items, these items are unduly taken as representatives of the whole community, which is bound to create a very skewed image of past societies.

This skewing of the data through a biased perspective is also known as the 80/20 rule, or the Pareto principle (Koch 1998). We over-focus on those 20% of "richer" graves we preselected, and on the idea that they represent the top of a hierarchy. We thus neglect the great majority of the society and their social roles. Moreover, we should not forget that the number of archaeologically visible burials is itself a selection, as they do not represent the whole community. We thus use even less than 20% of the whole community to reconstruct the entire past society, even though the assertion of a hierarchy inferred from that minority of graves stalls further investigations into social organisation. Thus, in this top-down narrative, what is thought of as "society" is based exclusively on the richly furnished graves, and this heavily biased framework is then projected onto the whole community.
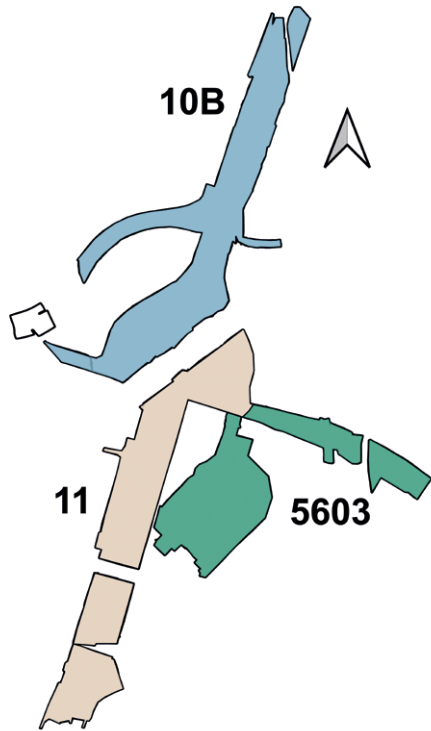
| Subsites | Higest Posterior Density interval (95%) | Higest Posterior Density interval (68%) |
|---|---|---|
| Span: 10B | 1-95 years | 1-40 years |
| Span: 11 | 120-325 years | 175-270 years |
| Span: 5603 | 215-355 years | 240-315 years |
| Start: 10B | 4740-4685 cal BC | 4715-4690 cal BC |
| End: 10B | 4705-4640 cal BC | 4695-4670 cal BC |
| Start: 11 | 4820-4730 cal BC | 4795-4745 cal BC |
| End: 11 | 4635-4480 cal BC | 4585-4515 cal BC |
| Start: 5603 | 4815-4725 cal BC | 4790-4740 cal BC |
| End: 5603 | 4530-4440 cal BC | 4515-4465 cal BC |



Fig. 4: The excavation surfaces, absolute dating, and the oval and rectangular burials at Alsónyék.

## Quantification and positioning of the grave goods

The main message of the traditional historical narrative is that, in the Late Neolithic period, grave goods appeared in massive numbers, and that their distribution in the burials indicate the beginning of a hierarchical stratification of the society. To examine this claim, the primary questions I want to ask are: what kind of items appear in graves, what are their positions within the graves, how often are they found in graves, and how many are found per grave? Furthermore, I would like to ask in what ways these aspects of burials reflect any patterns or regularities relating to the sex and the age of the dead.

Here, I will count all of the grave goods based on the raw material, technological features, and (especially) their exact position inside the grave to study the burial practice. In the case study of Alsónyék, I will focus on the stone tools and examine the preferred places and positions in which stone tools had been placed, and how their relative frequency is distributed inside the grave (Fig. 4).

I have created a general "burial position system" (BPS), which can be applied to all of the grave goods in further research at Alsónyék (other grave good analyses not specifically discussed here are ongoing). The majority of the prestige items are jewellery
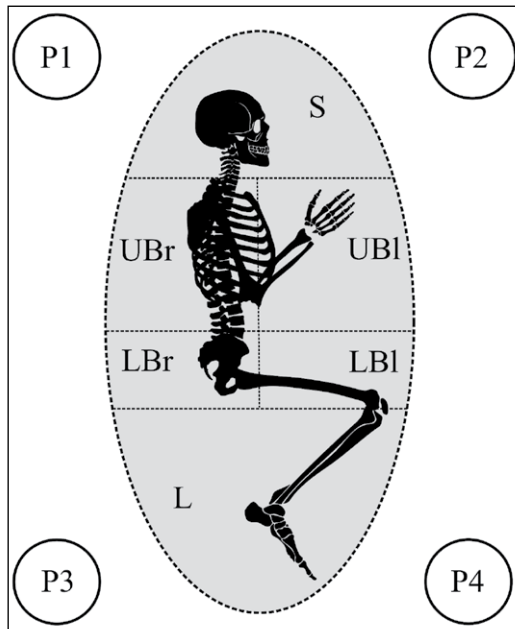
Fig. 5: The predefined shape of the burial (including the grave and the body areas).

(Spondylus and Glycymeris bracelets, beads, copper ear, arm and finger rings, shell and copper dress ornaments, and polished stone tools), so most of them are concentrated around the skeleton. The stone tools, vessels, and other items are not directly related to the body and also do not show a physical connection to the deceased in the grave. The basic concept used here is to distinguish between the various grave areas and body regions inside the burial, and also to differentiate more specific places within every area. The reason this is so important in the case of Alsónyék is because this site was the first documented, rectangularly shaped burial in the Lengyel context. These burials contained some sort of a wooden structure, which was visible by four postholes in each corner, and the grave pits themselves were deeper and bigger (in general 2 × 2 metres) than the ordinary oval-shaped burials (Osztás *et al.* 2016). This initial difference and the previous top-down interpretation indicated the need to create a consistent measurement system for a comparative analysis, in which I defined and assigned the following grave areas, along with the regions of the body and its positioning: (1) Grave areas: the majority of the graves do not have any special archaeological features (*e.g.* posthole, coffin trace). In the special case of rectangular burials with four postholes, one in each corner, we separated and marked the postholes, P1–P2 always being the ones closest to the skull. (2) Body regions: the main four regions are the skull, upper and lower body, and leg regions. To study the possible difference between the sides, we separated the upper and lower body/pelvic regions into the left and the right sides (see similar method in Bourgeois *et al.* 2017). The body regions are separated following anthropological classifications: (2.1) Skull, from the skull to the first thoracic vertebrae; (2.2) upper body, from the first thoracic vertebrae-clavicula line to the pelvic bone (the proximal end of the os ilium); (2.3) lower body/pelvic, from the proximal end of the os ilium to (the distal epiphysis of) the femur; and, finally, (2.4) the leg region, from (the proximal end of) the tibia to the toe bones (Fig. 5).

All of the positions are defined by the skeleton, which also constitutes the axis of the grave (not the astronomic orientation because, in Lengyel burials, west-east and east-west orientation are both generally used but the body is, as a rule, positioned with the face towards the south). In this predefined schematic burial layout classification, we ignore the orientation differences caused by symmetric switches of orientation. Instead, I propose that the dead body was the real axis; the fixpoint for the funeral community. This might be supported by the argument that in the Neolithic the head was a very

special part of the body, and the majority of manipulation happened to the skull which is expressed, for example, by trepanation or post-mortem skull removal (Kuijt 2008), and the painting of the skull with hematite or ochre. Ritual or magic practices also often focused on the head (*e.g.* mask-wearing, such as the triangle mask idol in the Alföld LBK and Tisza contexts) (Makkay 1978; Hofmann 2020). These are just some of the numerous examples that emphasise the importance of the skull region.
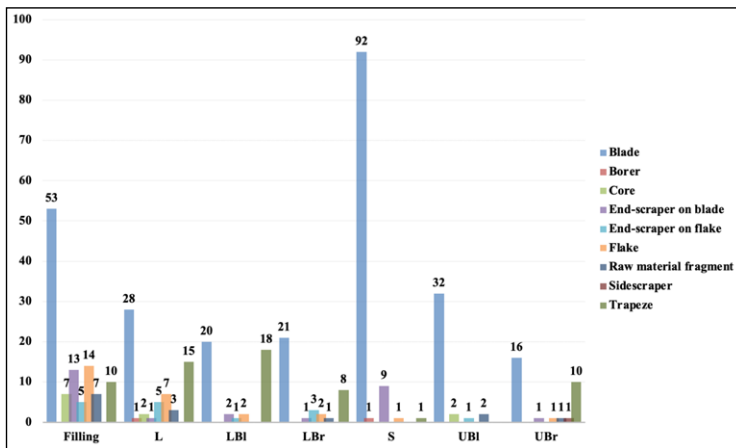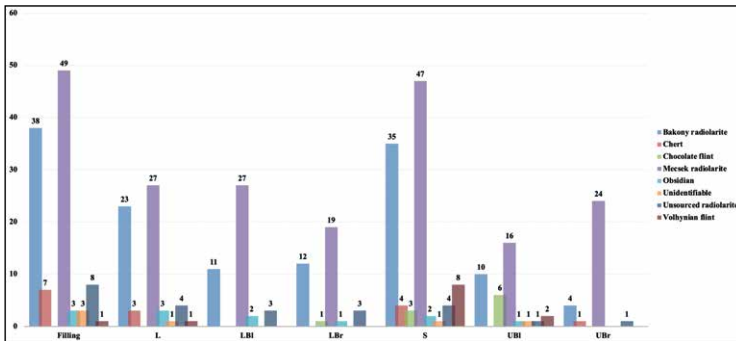
## Comparing "special" and "common" burials

At the start of the research at Alsónyék, the classical top-down narrative guided the first interpretations to focus on indications for social hierarchy. In this way, a group of rectangular burials was singled out and taken to represent the most important, probably elite, members of the local community, as it was argued that these burials contained prestige items and the most valuable grave goods (Zalai-Gaál *et al.* 2009, 245–249; Zalai-Gaál 2013, 480–481). However, this was not based on a quantitative analysis, but was related to only a few select graves (No. 927, 1473, 3060, 3368, 3742, 4032.) (Osztás *et al.* 2016, 182–189, 217–218). My goal here is to examine the validity of this top-down narrative, and to more systematically compare the oval and rectangular burials at Alsónyék based on the quantification and positioning of the grave goods. Instead of focusing too much on the prestige items, I will look at all of the information to understand the entire assemblage, with a special focus on stone tools. The primary questions are: (1) How often did the burials contain stone tools? (2) What kind of differences and similarities are to be found between the rectangular/"special" and the oval/ "common" burials? (3) Do the stone items show any patterns in relation to the sex and age of the deceased? (4) What is the most frequent type of raw material and technological category? (5) Is there any preferred location inside the grave that is related to the lithic artefacts? (6) Is there any regular pattern that could show the importance of the lithic tools in the context of burial activity?

It is my goal to use the BPS method for all of the burials that contained lithic artefacts, detect the possible regularities and special patterns of the lithic artefacts from a bottom-up perspective, and connect this to the available anthropological data to study the possible connections to sex and age. I will compare the oval and rectangular burials from the perspective of quantitative and spatial distribution relating to stone tool numbers, raw materials, technological categories, and average stone tool depositional patterns.

## Oval-shaped burials

Of the entire Lengyel burial record, 92% shows a more or less oval grave pit and, all in all, 463 graves contained stone tools as a grave goods. Here, I am thus dealing with 1105 chipped stone tool pieces from the oval-shaped burials, which is the majority (85%) of the entire 1313 stone material pieces in the burial. The almost 500 oval graves with lithic items represent 22% of this grave type. Almost 70% of the burials contained only one stone tool, and a still substantial number contained up to four pieces per burial. Five stone tools were deposited in 18 cases, and in 19 cases, more than five lithic items were found. Thus, in general, one tool was placed in the burial, and the majority of these were created from local raw material (Mecsek radiolarite/local supply zone) or the second closest mountain's knappable radiolarite (Bakony/regional supply zone) (Szilágyi 2017b). All in all, 43 pieces of stone artefact are made from distant raw material, that is, Volhynian, Cracow Jurassic and "chocolate" flints, which define the north-northeast direction of the

| Raw materials | Quantity (pcs) | Ratio (%) |
|---|---|---|
| Mecsek radiolarite | 533 | 48.24 |
| Bakony radiolarite | 349 | 31.58 |
| Unsourced radiolarite | 92 | 8.33 |
| Chert | 42 | 3.80 |
| Obsidian | 30 | 2.71 |
| Limnic quartzite | 0 | 0.00 |
| Unidentifiable | 16 | 1.45 |
| Distant raw material | 43 | 3.89 |
| Total | 1105 | 100.00 |

| Distant raw materials | Quantity (pcs) | Ratio (%) |
|---|---|---|
| Balkan flint | 0 | 0.00 |
| Southern radiolarite | 0 | 0.00 |
| Chocolate flint | 12 | 27.91 |
| Cracow Jurassic flint | 6 | 13.95 |
| Volhynian flint | 25 | 58.14 |
| Plattensilex | 0 | 0.00 |
| Total | 43 | 100.00 |

| Technological categories | Quantity (pcs) | Ratio (%) |
|---|---|---|
| Core | 31 | 2.81 |
| Raw material fragment | 35 | 3.17 |
| Flake | 78 | 7.06 |
| Blade | 736 | 66.61 |
| Tool | 225 | 20.36 |
| Total | 1105 | 100.00 |

| Tool types | Quantity (pcs) | Ratio (%) |
|---|---|---|
| Indeterminate endscraper | 2 | 0.89 |
| Endscraper on flake | 28 | 12.44 |
| Endscraper on blade | 58 | 25.78 |
| Sidescraper | 3 | 1.33 |
| Borer | 6 | 2.67 |
| Trapeze | 128 | 56.89 |
| Total | 225 | 100.00 |



network system of the communities in question. Distant raw materials represent less than 4% of all lithic material. The dominant technological category in the burials was the blade (736 pieces, 67%). The second characteristic technological category is the group of tools (225 pieces, 20%) (different kinds of end-scrapers, scrapers, borers, and trapezes constitute this category). Among these, trapezes (128 pieces) are undoubtedly dominant (Fig. 6).

Fig. 6: The distribution of raw material and technological categories in oval-shaped burials.

| Raw materials | Quantity (pcs) | Ratio (%) |
|---|---|---|
| Mecsek radiolarite | 533 | 48.24 |
| Bakony radiolarite | 349 | 31.58 |
| Unsourced radiolarite | 92 | 8.33 |
| Chert | 42 | 3.80 |
| Obsidian | 30 | 2.71 |
| Limnic quartzite | 0 | 0.00 |
| Unidentifiable | 16 | 1.45 |
| Distant raw material | 43 | 3.89 |
| Total | 1105 | 100.00 |

| Distant raw materials | Quantity (pcs) | Ratio (%) |
|---|---|---|
| Balkan flint | 0 | 0.00 |
| Southern radiolarite | 0 | 0.00 |
| Chocolate flint | 12 | 27.91 |
| Cracow Jurassic flint | 6 | 13.95 |
| Volhynian flint | 25 | 58.14 |
| Plattensilex | 0 | 0.00 |
| Total | 43 | 100.00 |

| Technological categories | Quantity (pcs) | Ratio (%) |
|---|---|---|
| Core | 31 | 2.81 |
| Raw material fragment | 35 | 3.17 |
| Flake | 78 | 7.06 |
| Blade | 736 | 66.61 |
| Tool | 225 | 20.36 |
| Total | 1105 | 100.00 |

| Tool types | Quantity (pcs) | Ratio (%) |
|---|---|---|
| Indeterminate endscraper | 2 | 0.89 |
| Endscraper on flake | 28 | 12.44 |
| Endscraper on blade | 58 | 25.78 |
| Sidescraper | 3 | 1.33 |
| Borer | 6 | 2.67 |
| Trapeze | 128 | 56.89 |
| Total | 225 | 100.00 |

Fig. 7: The distribution of the raw material and technological categories in the rectangular-shaped burials.

## Rectangular-shaped burials

Over the entire site of Alsónyék, 130 rectangular-shaped burials were discovered, and the majority of them were located the northern part (marked 10B) of the settlement. It is especially interesting to note that this part shows the highest density of graves, and also of grave groups, while at the same time, it has been shown that it represents the shortest time duration of burial activity (1–95 year span/2–3 generations, 4740–4685 cal. BCE [95% probability], Bánffy *et al.* 2016, 282) when compared with other areas of the site. This special kind of grave – rectangular-shaped – represents less than 11% of all the burials at Alsónyék, and only 59 of them (45%) contained lithic artefacts. This ratio is, however, higher than in the case of the oval-shaped burials, but it is still important to note that lithic items

were not found in every rectangular-shaped burial, and prestige items were found in even fewer of them. All in all, 208 pieces of chipped stone artefact were found in rectangular-shaped burials, which represents 16% of all the lithic burial goods. Almost half (55%) of the rectangular graves contained only one stone item, the majority of which were made from the local Mecsek radiolarite and the regional Bakony radiolarite. Altogether, 17 stone tool pieces were made from distant raw materials, from north and northeast of the Carpathian Basin, representing only 8% of the rectangular burial's assemblage and less than 1% of the entire lithic material at Alsónyék. The spatial distribution of rectangular-shaped burials shows that they are concentrated in the north, the most densely occupied part of the site. Among these distant raw materials, the Volhynian flint prevailed, followed by Cracow Jurassic and "chocolate" flint. Again, the blade (64%) is the most frequent technological category and the trapeze is the most frequent tool. With no exception, every distant raw material appeared in the form of blades (Fig. 7).

This comparison has useful implications regarding the patterns of the chipped stone tools as elements of the burial rite. There are some differences between these two kinds of burial forms when it comes to the number of the raw materials and tool types – especially the numbers of distant raw-material tools – but, all in all, the similarities are much more striking. Blades are the dominant technological category in both kinds of burials, and they are similarly made from the most local raw material (Mecsek radiolarite) and the regional supply zone's radiolarite (from the Bakony Mountains).

The ratio of the Mecsek radiolarite is almost 50% in both cases, while the Bakony radiolarite is very similar, at around 30% in both grave forms. In these cases, in which only one piece of stone tool was in a grave, blades dominated, and here, the conventional lithic deposition practice was to place the blade on the skull. Singular blade depositions are slightly more frequent in the oval-shaped burials, but this is not statistically significant. More than five or ten stone tool pieces per burial occur in an almost equal ratio in both grave forms, a fact that does not strengthen the idea of rectangular-shaped burials being especially rich. The interesting pattern is the dominance of the trapezes, which could represent a novel phenomenon of the burial practice, and which I will now discuss in more detail.

While blades were placed in every area of the grave and in every relation to the body, they were most frequently placed in the skull region. The items from distant raw materials were almost without exception located on or around the skull, and the Volhynian blades are especially concentrated on the skull. Trapezes represent the prevalent type in the tool category, both in the oval-shaped burials (57%, 128 pieces) and the rectangular ones (85%, 51 pieces). Many lithic items came from the grave filling, 19% of them from the ordinary graves and a slightly higher percentage (31%) from the rectangular-shaped graves. The reason for this could be the existence of postholes, in which stone tools and vessels were often deposited, especially larger versions (*e.g.* Butmir-type vessels and pedestaled bowls). There is a minor difference in technological categories, as the tools in the ordinary graves and the cores in the rectangular-shaped graves are missing from the grave filling material. In the case of rectangular-shaped burials, the blade is the only type of lithic artefact, while in the oval-shaped graves, flakes and tools are also known.

## Comparative analysis with the anthropological data

To study the question of how to relate the lithic deposition practice to the sex and age of the deceased, I have integrated the available anthropological data. This dataset does not exist for all of the human bone material (at the time of writing); the basic anthropological investigations (biological sex and the relative age of the death) have only been carried out for the northern and southern part of the site. This issue thus limits and heavily reduces the number of the burials in this comparative analysis. In addition, I have excluded from

Skull: mostly blades, most varied raw materials, distant raw materials
Leg: most varied tool types, mostly trapezes
Trapezes mostly in adults graves
Adultus-maturus aged over represented
(119 grave/94% and 267 pcs. stone tools/96%)

Skull: only blades
Leg: mainly just trapezes
Trapezes mostly in adults graves
Just blades and trapezes in adults graves
No stone tool from C3 posthole

Burials: 127
Tools: 279

Number of raw materials: 8
Number of distant raw materials: 2
Number of tool types: 5

Number of raw materials: 11
Number of distant raw materials: 5
Number of tool types: 3

Burials: 22
Tools: 70

Burials: 50
Tools: 112

Skull: mostly blades, most varied raw materials, distant raw materials
Leg: most varied tool types, mostly trapezes
Trapezes mostly in adults graves
Adultus-maturus aged

No stone tool in the skull region
Leg area is the dominant region
No distant raw material
No trapezes, the only tools are end-scrapers
No stone tool from C3 posthole

Burials: 10
Tools: 17

Number of raw materials: 7
Number of distant raw materials: 2
Number of tool types: 4

Number of raw materials: 4
Number of distant raw materials: none
Number of tool types: 1

Fig. 8: Table of the comparative anthropological and grave position analysis results.

the research those graves where the sex was questionable. All in all, 177 oval-shaped and 32 rectangular-shaped burials could be included in this analysis, a very significant difference in total numbers, and thus I tried to focus on the tendencies and motifs that show the pattern of the commonly applied lithic deposition practice.

In total, 127 males and 50 female individuals were identified in the oval-shaped burials, and 279 stone tool pieces were discovered in the male graves and 112 pieces in the female graves. The buried individuals do not only show male dominance, but also a strong overrepresentation of mature-adult age classes (119 graves, 93.70%), from which the vast majority of stone tools (267 pieces, 95.70%) also derived. In the case of the female graves, 47 graves belonged to the mature-adult age group (94.00%). Thus, in the cases of both sexes, the lithic tools were predominantly placed next to mature adult individuals, but it is important to note that this age group is overrepresented in the whole assemblage as well (Köhler 2013). In those cases where the sex was anthropologically identified, the juveniles were of a small number in both sexes, namely eight male graves (6.30%, of 12 stone tool pieces and 4.30% of the stone material in male burials), while only three female graves (6.00%, four stone tool pieces and 3.57% of the stone material in female burials) belonged to this age group. There was not any lithic item in the senior age group in either burial type.

Altogether, 32 rectangular-shaped burials and their 87 stone tool pieces were part of the analysis. There were 70 stone tool pieces from 22 male burials, and just 17 pieces of lithic items derived from the 10 female graves. Only the adult and mature individual burials contained lithic grave goods. There was an overrepresentation of males in both the oval and rectangular-shaped graves, though, and based on the physical anthropological data, there were slightly more females in the entire population of Alsónyék; thus the lithics predominantly denote males. The demographic, metric, and
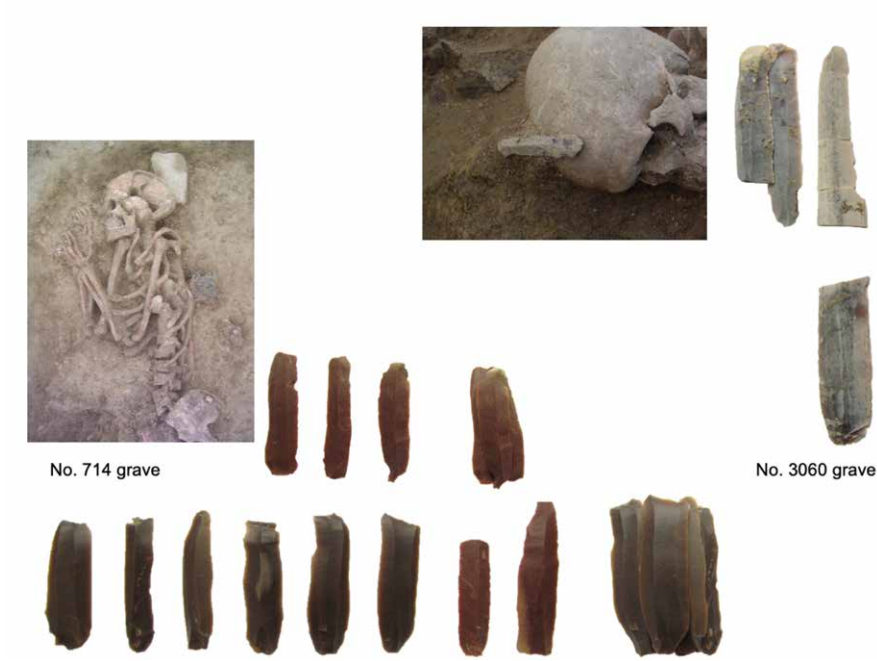
Fig. 9: Blade sets from Alsónyék.

No. 714 grave

No. 3060 grave

No. 813 grave

No. 4392 grave

No. 6688 grave

No. 813 grave

No. 4392 grave

No. 4411 grave
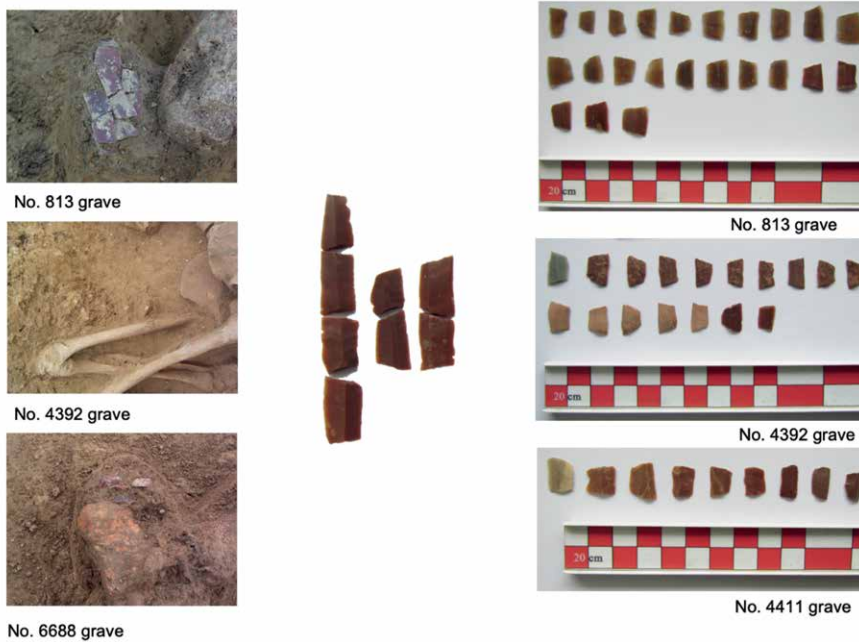
Fig. 10: Trapeze sets from Alsónyék.

morphologic anthropological results do not show any difference between the individuals in these two kinds of grave shape (Köhler 2012, 124–125) (Fig. 8).

## The visible pattern from a bottom-up approach

Besides the dominance of local radiolarite blades in the burials, another interesting statistical and spatial pattern is the appearance of specific sets of artefacts. They occur frequently and their homogeneity is very visible, placed as they are in one spot near the skeleton and being made from the same raw material and of the same tool type.

These are blade and trapeze sets made from radiolarite, either the Mecsek or Bakony variant (Fig. 9). They were located mostly at the lower body region (especially the pelvic bone or the leg bones) and gathered in one place, which could show that these were perhaps placed in a container (a small bag made from an organic material). According to macroscopic investigation, these artefacts do not appear to show any use-wear traces; most of them could be absolutely newly made, a proposition strengthened by many matching pieces within the sets. In some cases, all elements of the blade set are matching; specifically, they can be refitted so that they show the original blade debitage-surface. The phenomenon of "matching pieces" is not typical for the blades; there are also many trapezes that can be combined to create the original blade support (matching ends). These matching sets were created just before the burial or kept together and placed in the grave, which strongly suggests that the knapping activity happened on a single occasion, probably by one person (likely a knapping expert). Both the blade and trapeze sets are a new element of the burial practice in the Lengyel context (Fig. 10). This homogeneity of the material, tool type, morphology, position, and the initial gesture (in one place) together represent a very distinct act that is an important pattern of the burial practice. This gesture reflects a special burial activity, with the community's habit potentially having a specific meaning in this context connected to the exact position inside the grave.

The trapeze as a dominant tool type also represents a new element that was introduced into the burial practice in the Lengyel context, and highlights different aspects of the research very well. The majority of the archaeological narratives quite often use binary opposites that, in the case of the evolutionist perspective, completely exclude each other. The trapeze as an artefact first appeared during the Mesolithic in central and southeast Europe; in the context of hunter-gatherer communities, this tool type was used as an arrowhead (Eichmann *et al.* 2010; Gronenborn 2003; Gronenborn 2007; Kaczanowska 2001; Kertész 1994; Kertész 1996; Marton 2003; Taute 1974). The trapezes were very seldom found in the assemblages of the Early and Middle Neolithic period in the Carpathian Basin (Bácskay 1976; Bácskay *et al.* 1987; Biró 1987; Kozłowski 1987; Mateiciucová 2001; Mateiciucová 2008; Mateiciucová 2010), but in the Late Neolithic, this tool type appeared again more often. One trapeze, from the Polgár–Csőszhalom site, is drilled into the atlas of an ox, which is an undoubtedly clear indication of its function as an arrowhead (Vörös 1987). The appearance of massive numbers of trapezes is a novelty first found in the Late Neolithic period in Alsónyék, where approximately 40 pieces from the settlement features and a total of 179 pieces from the burials have been described (Szilágyi 2019; Szilágyi 2019). The high homogeneity of these sets of trapezes could be interpreted as them representing a kit of sickle inserts. Some trapezes in a burial context (Grave 65) from the Late Neolithic have already been published (Berettyóújfalu–Ficsori-tó dűlő site [Kaczanowska *et al.* 2015, 101–103]). Małgorzata Kaczanowska and Janusz K. Kozłowski also discuss these trapezes as sickle inserts, and they argue that the sickle symbolises harvesting activity, a symbol also displayed in the "Sickle God" figurine from the Szegvár–Tűzköves site (Gimbutas 1974; Tringham 1970). The usage of the trapezes with fragmented regular, retouched, and truncated blades as sickle inserts and their importance in harvesting activity is well known in the Balkan Neolithic (Gurova 2014; Gurova 2016; Gurova 2018). At Alsónyék, some of the trapezes from the settlement context have sickle-gloss, but those that come from the burials do not have this kind of use-wear. Thus, it seems that the trapezes in the burials represent the genuine element of the sickle, or perhaps only symbolised the sickle instead of being functional tools (Szilágyi 2019).

The regular spatial pattern inside the grave and the lack of any visible post-depositional activities strongly indicate that these items belong to the burial equipment. From these considerations, it becomes clear that there are concrete patterns of meaning connected to the lithic items placed in the burials, patterns that transcended the difference between "special" or "ordinary" burials. Exotic raw materials or prestige items

were not significantly associated with rectangular-shaped burials, which undermines the idea of this burial form as an indicator for social inequality or an elite status based on transregional networks. On the contrary, from a bottom-up perspective, what becomes very visible is the strong connection to the local region, and probably its emphasis in the burials. The most salient symbolic expression might also have been the sickle, or sickle kit, again emphasising the importance of domestic productive activities over elite networks. From the bottom up, there is not much support for the top-down narrative.

## Conclusion

In this article, I have discussed the mainstream top-down narrative that identifies rectangular-shaped burials as a special grave form that reflects the higher-ranked members of the Alsónyék community because of their supposed connection to prestige items. I have compared the ordinary (oval-shaped) and special (rectangular-shaped) grave-forms' chipped stone assemblages to look more closely at the differences and similarities between them. Applying a bottom-up approach, starting with the graves and their contents, many new, interesting patterns become visible that emphasise the strong local connection and the more regulated burial practice of this Late Neolithic community. The local Mecsek radiolarite is the most common raw material type in the lithic assemblages of burials in Alsónyék. Based on this, the Alsónyék community shows a very strong orientation to southeastern Transdanubia, especially towards the east Mecsek Mountains. We know from previous research (Szilágyi 2017b; Szilágyi 2017a; Szilágyi 2018) that the entire stone tool-making procedure took place inside the settlement, where local radiolarite is also the dominant raw material. In the burial assemblages, the non-local/distant lithic artefacts appeared only in blade form and were almost exclusively deposited on or around the skull. Their number is quite low, almost negligible when compared with the total amount of material. The rectangular graves are a special kind of burial, and some of them contained prestige items (*e.g.* jade or other polished stone axes, Spondylus bracelets and ornaments, copper jewellery). Although these burials seem to be exceptional, they are not necessarily centrally located and, what is more, stone tools are not always included as grave goods. The oval-shaped graves reflect the same burial practice and, as in the case of the special, rectangular graves and based on the anthropological data, it seems there is no overarching correlation between sex and deposition of stone tools. Adult and mature individuals are heavily overrepresented in the rectangular-shaped burials, but equally so in the oval ones.

Besides the larger rectangular-shaped burials, the blade and trapeze sets and the large amount of trapezes are a new phenomenon, occurring for the first time in the Alsónyék burial practice. Using a top-down approach, this phenomenon is not recognisable, because these sets were not made from exotic raw materials, nor from prestige items. They are invisible from the predetermined ranked society's concept, which highlighted the predefined "valuable" grave items. This means that the predetermined research framework connected to the top-down narrative is basically blind to patterns such as the combinations of ordinary burials, single grave items, local raw material, and specific placements.

The bottom-up approach helped to explore patterns of lithic tool depositional practices. In this community, lithic artefacts were, in most cases, only represented by one blade on or around the skull. The majority of the raw materials showed a strong connection with the local area. Another common motif is that the distant raw material always appeared in the form of a blade, which suggests that this is how the prestige item was expressed in the realm of lithic artefacts. Moreover, it means that these items were produced outside the settlement (there is no debitage material in the settlement material), and it can be assumed that these came into these communities' assemblages by

gift-exchange systems. These "valuable" items are quite often discovered in supposedly ordinary oval-shaped graves. Larger blades, probably imitating the Volhynian super blades (Dzbyński 2008; 2011), were also produced from local radiolarite, thus the raw material is not the most important scale of value in every case. The preferred positions in which to place the lithic grave goods were beside the skull and in the pelvic and leg regions. The blade and trapeze sets were also located in these regions, their homogeneity reflecting that they were produced at the same time, probably temporally close to or as part of the burial practice.

It can be concluded that the types of tools, their raw material, and their placement positions did have specific meanings for the community, and that it is those meanings that structure and differentiate the burials at Alsónyék. It is not known or even probable that the buried individual and the grave goods had a direct connection, nor that they would represent primarily economically valuable objects or personal possessions of the deceased. The burial practice is the key to better understand the meaning of the grave goods. The bottom-up approach is useful to define that pattern and the burial practice of one community.

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PART IV

# SCALES AND FORMS OF SOCIAL ORGANISATION

# Setting the ground for a village: Communal organisation and space at the Early Neolithic site of Altscherbitz (Germany)

*Isabel A. Hohle*

## Abstract

*The way in which spatial organisation is linked to social organisation has long been discussed, and not just in Neolithic research. The paper will focus on the results of the thesis about the Linear and Stroke-Ornamented Pottery culture (short: LBK and SBK) site of Altscherbitz (Germany). This site is remarkable, as it consisted of a large LBK settlement with a graveyard, a wooden well that was rescued and excavated "en bloc" with lots of (special) finds, some kind of "pioneer houses", and a small SBK settlement – all in one place and fully excavated in their complete dimensions. This opened up new, extensive perspectives on an entire Early Neolithic site. The various (possible) meanings of the LBK houses, the identification of households, and the settlement community or village community as an overarching form of social organisation are of special interest here. In particular, the term "village" and questions about communal structures will be discussed in this paper.*

*Keywords: Linear Pottery culture (Linearbandkeramik, LBK), settlement archaeology, social organisation, communal organisation, communal space, village*

## Introduction

The way in which spatial organisation is linked to social organisation has long been discussed, and not just in Neolithic research, where methods and theories from anthropology and sociology are indispensable (*e.g.* Hahn 2010; Hillier and Hanson 1984; Kent 1990; Parker Pearson and Richards 1994; Spain 1992; Trebsche *et al.* 2010).

The background of this article is a study of the Linear Pottery culture or Linearbandkeramik (LBK) site of Altscherbitz (Germany). In addition to having a mainly material template, my thesis discussed the scales of the houses and the household plus the settlement structure in relation to the question of the underlying social and spatial organisation (Hohle 2023). The various meanings of LBK houses, the identification of households, and the settlement community or village community as an overarching form of social organisation are of particular interest (Hohle 2023).

It is assumed that the construction and arrangement of houses, the choice of places for particular areas of work and activity, and the location of (waste) pits, open spaces (places), and so on were based on conscious spatial planning. These arose largely from social action, and the spatial structures in turn shaped people's actions. One of my working hypotheses is therefore that it is possible to draw conclusions about certain activity zones, work, and daily life activities based on the distribution of artefacts and groups of artefact types. Together with spatial analysis of certain types of findings and the evaluation of the house plans, up to the identification of possible households and "living spaces", it should be possible to make assumptions about forms of social organisation

within a settlement. The term "spatial organisation" means the spatial distribution, density, and arrangement of houses, pits, kilns, fireplaces, graves, and so on, as well as of certain artefact groups in the settlement as a whole. "Space" is understood as a social and cultural factor, which raises the question as to what extent the forms of the "built environment" (cf. *e.g.* Trebsche *et al.* 2010) are connected with the social organisations and patterns of the LBK community at the site of Altscherbitz. In this context, "social organisation" refers to the horizontal structure, including kinship systems, houses and households, yards, and settlement communities, as well as the levels of the division of labour, the degree of cohesion, and categories such as age and sex.

Not every aspect of the settlement and social organisation of the LBK is understood and, due to the large area of distribution, it is not surprising that there are distinct differences between the several regions relating to houses, settlement structures, proportion of settlements to graveyards, and material cultural in general. Therefore, top-down perspectives could be problematic when trying to apply models developed for a special microregion or settlement clusters on settlements elsewhere. Although this does not exclude that one will find similar and comparable observations at different sites, in general, bottom-up approaches are preferred by the author, as they accommodate intrasite dynamics rather than trying to find the same patterns as those at other sites. Bottom-up approaches could open up new perspectives and research questions, and these could, in a next step, be challenged for other sites.

## House – household – settlement structure

The discussion about LBK settlement organisation still seems to be widely influenced by the famous *Hofplatzmodell* ("courtyard model"; see, for example, Boelicke 1982; Boelicke *et al.* 1988; Claßen 2005; Zimmermann 2012), though there are some controversies regarding the methods, assumptions, and the model as a whole. Despite the critiques, the *Hofplatzmodell* is one of the first attempts at a developed, methodological, step-by-step analysis of LBK settlements as well as an approach for moulding LBK settlement development.

There will be no discussion of the *Hofplatzmodell* in detail, as there is a long tradition of debate on this subject (*e.g.* Link 2012; Petrasch and Stäuble 2016; Rück 2007; 2012; Stäuble 2013). However, I want to argue that the imprint of research tradition based on the *Hofplatzmodell* did have consequences on the social interpretation of LBK settlement organisation in general, which is why some relevant points will be briefly discussed here.

Primarily, the courtyard model is a method for reconstructing settlement structure in time and space. With the idea that a house is surrounded by its own area for daily activities and that the content of pits in the surrounding space is some kind of waste from the inhabitants, the founders of the model proposed the possibility of dating the timespan of house use by the pot decorations from these pits (for a brief overview and clarification of the misunderstandings, see Zimmermann 2012).

Not part of the method, but of the model as whole, are a few assumptions that are looked at critically here: every house is interpreted as a residential building, no matter its form, size, or positioning in the settlement space. There is an equation of house, household, and family, and the single farmsteads are seen as autonomous or even autarkic households. The assumption of activity zones around each house appear quite fixed, even if the founders of the model did not claim that their model would fit everywhere else.

Going deeper into the research history of the LBK, it becomes clear that the equation of house, household, and family has existed since the first systematic excavation and analysis of an LBK settlement (Buttler and Haberey 1936). In fact, Buttler and Habery suggested that the people of Köln-Lindenthal (Germany) lived in pit dwellings, and

the researchers interpreted the longhouses as granaries. But they also assumed that these dwellings were inhabited by one family that constituted one household and that the family was the basic unit of the social structure. Based on their chronological reconstruction of the settlement, they also discuss a "consolidation of larger collectives" ("Zusammenschluß größerer Verbände"; Buttler and Haberey 1936, 163) because of the increased size and the creation of a "village" at the end of the settlement's development. Although the interpretation of longhouses as granaries is obsolete, it is important to point out that Buttler and Habery also thought about different building structures for different functions. Besides granaries and pit dwellings, they reconstructed cellars and storage piles (*Pfahlbauspeicher*).

In 1950, Sangmeister even suggested that LBK settlements had been constructed following a plan (Sangmeister 1951). Sangmeister postulated so-called orientation groups (*Orientierungsgruppen*) based on the arrangement and orientation of the houses, which he believed had existed at the same time. With regard to house orientation, it has been shown that houses with the same orientation do not have to be simultaneous (see especially Mattheusser 1991, 41). In his thesis, Oliver Rück developed the so-called *Zeilensiedlungsmodell* ("row settlement model", Rück 2007; 2012), which has been seen as a model competing with the courtyard model. The two main differences from the courtyard model are the assumption of a significantly longer use of the houses of up to 100 years (Rück 2007, 144) and the inclusion of the settlement form as a structural element (Rück 2007, 243–245). As a result of a lot more contemporaneous houses, significantly larger settlements are reconstructed. The arrangement of the houses in lines suggesting paths leads to the idea of certain planning in the development of the settlement (Rück 2012, 31). Actually, the observation of rows of houses in LBK settlements is not new (*e.g.* those at the earliest LBK site of Schwanfeld: Lüning 2005, 52, Fig. 4); Anick Coudart also discussed rows of houses as a special form of LBK settlement structure in her thesis (Coudart 1998, *e.g.* 108, Fig. 116). Whether these rows are a result of a contemporaneous arrangement of houses or the end of a process of succeeding houses, has to be proven for each settlement by checking the stratigraphic situations and the dating of houses via the ceramic inventories from the elongated pits. However, even Rück himself concedes that it is not the case that all the houses in one row must have stood at the same time (Rück 2007, 121). Besides some weaknesses in the model, Rück's work puts the settlement more into focus. Here, house construction is based on the overall structure of the settlement.

According to the courtyard model, the picture of the settlement originates in the succession of single farmsteads, where new buildings have been built by offspring with regard to the older houses of their relatives. Because of the genealogical interpretation (cf. *e.g.* Lüning 2005; Strien 2010; Strien 2010) of house sequences in the courtyard model, the settlement or the village as a superordinate unit plays no primary role. The formation of rows or other arrangements of houses is seen as somewhat of a byproduct caused by the relation of individual houses to each other, not as a result of an overall settlement organisation.

Differences in the size of houses and the amount of findings are interpreted as social and economic differences between families. Moreover, the consolidation of larger collectives and communal structures is taken less into account. In general, it seems that, in german LBK studies, the research is very house- or household-centred, and the whole space of a settlement is rarely taken into account.

Accordingly, the subject of the usage of the term "household" in LBK research tradition is discussed briefly in a paper about Altscherbitz that was written when the project was at an early stage (Hohle, 2017). The aim of that article is a more detailed focus on the house or household as part of a more cooperative network inside a village, which may fit to a more realistic picture of social organisation and complexity inside prehistoric communities. Seeing a house as a representative of one household consisting of one family is a rather restricted assumption. These fixed assumptions neglect the

dynamics, inconstancy, and complexity of the social unit of the "household". Studies from anthropology have revealed many examples that could challenge the established assumptions in LBK research (*e.g.* Beaudry 2015; Bender 1967; Blanton 1994; Netting, Wilk and Arnould 1984; Wilk 1991). The integration of studies from anthropology can expand the field of vision concerning "households".

## What's in a name? – The term "village" in the context of the LBK

While studying the site of Altscherbitz and thinking about possible communal structures at that site, the question came up of why LBK settlements are rarely labelled as "villages". Instead, the neutral term "settlement" or, depending on size, duration, and evidence for supra-regional contacts, terms such as "hamlet", "centre", or "large settlement" (Zimmermann *et al.* 2004; Saile 1998; Zimmermann 1995; 2002) are used. In contrast, for the SBK as well as Rössen, a change in social organisation and settlement organisation is supposed. Jens Lüning, for example, suggests communal structures at the Rössen site of Inden 1 (Germany) and the emergence of village structures for Rössen in general and in contrast to the LBK sites of the Aldenhovener Platte region (Lüning 1982, 25, 32–33; 2000, 16). He also claims this for the SBK (Lüning 2000, 16). His arguments are the changes in settlement structure and the observation of the declining existence of elongated pits beside the houses during the SBK period, until they disappear, replaced by often quite large pits away from the houses or at the edge of the settlements (again, as in Inden 1, see recently published in Kuper 2018). This, of course, is problematic for dating houses (see also the case of the LBK and SBK site[s] of Eythra; Stäuble and Veit 2016). Palisade structures are interpreted as communal features and the average size of the houses increases in Rössen (Schiesberg 2007, 68), which leads Lüning to assume that more than one family inhabited the large Rössen houses (Lüning 1982, 32).

The point here is not to criticise the usage of several terms, but to ask for reasons why the term "village" is not used for LBK sites and to justify the usage in the case of Altscherbitz. Searching for studies about settlement types and definitions of the term "village" for prehistoric times is a quick job, as there is almost nothing. Using the term "village" evokes certain ideas, which are certainly shaped by what is known from mediaeval and historical research. One might think of the village forms of the street village (*Straßendorf*, *Angerdorf*) and the round village (*Rundling*) that were founded after concrete plans in the 12th and 13th centuries in mediaeval Germany. At that time, the concept of the village spread as a uniform term, while previously, names such as *villa*, *vicus*, or *civitas* were used less uniformly (Trossbach and Zimmermann 2006, 9). These planned mediaeval village foundations are comparable to only a limited extent to those of the LBK period. First of all, as a village is a rural settlement, the size of it takes a subordinate position. Since the 19th century, however, in the agricultural and municipal statistics, settlements that fall below a population limit of 2000 are defined as a village. This is in contradiction to some places with city rights that do not exceed this limit (Trossbach and Zimmermann 2006, 9). Basically, the term "village" represents a differentiation from the city, courtyard, or estate (Schützeichel 1977, 9). Similar to the general assumption for LBK settlement organisation, several households formed the economic basic unit of a village. Trossbach and Zimmermann describe several criteria of a village, including the importance of meeting points and areas with symbolic fixpoints, such as monuments, churches, or squares and the demarcation of village space not only on a spatial but especially on a social level, as well as the importance of paths, special buildings, and wells (Trossbach and Zimmermann 2006, 10). The existence of mainly or potentially autonomous economic households does not exclude the existence of communal organisation and the importance of these. Thinking about these criteria and

their application to LBK settlement organisation seems somehow trivial at first glance, but at a second glance, it could have crucial consequences for the interpretations of the social organisation of LBK sites.

With reference to the study cited above, I have developed four criteria to identify a neolithic village:

1. A village is a rural settlement with several simultaneous houses/homesteads and spatial permanence. The residents have the same economic basis; in the case of the Early Neolithic, this is the intensive garden management (see Bogaard 2004) as well as livestock.
2. The individual farmsteads may have operated independently, but the village is characterised by its exchanges and collaborative institutions, which serve to make it less vulnerable in times of crisis.
3. A central characteristic of a village is one or more shared, and possibly also jointly established, institutions as well as communal forms of social and economic organisation.
4. The area of the village is largely defined and demarcated from other settlements or villages.

If all of these points are met, an LBK settlement could be defined as a village. The term "settlement" is to be seen as a neutral, generic term. Among these four points, point 3 provides the most decisive criterion. However, the differentiation from other settlements or villages (point 4) also plays a crucial role, and this depends on the population density of a region, or the state of research being sufficient to evaluate this point.

As a result of studying the LBK research tradition and the thoughts that were already published in 2017 (Hohle 2017), combined with the aforementioned points about the term "village", three main hypotheses have been developed for working on the site of Altscherbitz (Hohle 2023):

1. Not every house at an LBK site was a dwelling (exclusively), and the actions and practices inside and around houses were diverse, heterogeneous, and dynamic. This means that the social and economic usage of space in and around LBK houses was not fixed.
2. A household was not necessarily represented by a house; households of one settlement could have been constituted differently.
3. The settlement type of Altscherbitz corresponds to that of a village.

There are several results and hints that lead to the interpretation of an overall settlement organisation and communal forms of social organisation for the case of Altscherbitz, which will follow below.


## The site of Altscherbitz

Thanks to large-scale excavations in central and East Germany, lots of Early Neolithic sites have been detected there (for an overview see Stäuble 2016). One of them is Altscherbitz, near the city of Leipzig (Saxony, Germany), which consisted of a large LBK settlement with a graveyard and a kind of "pioneer" house type, as well as a small SBK settlement – all in one place and fully excavated (Fig. 1). Besides a deserted mediaeval village in the west with very little overlapping with the LBK area, just a few features from other time periods were detected on the site.

Altscherbitz was excavated between 2004 and 2005 as a rescue excavation ahead of the extension of the Leipzig/Halle airport (Friederich 2005). The LBK settlement extended
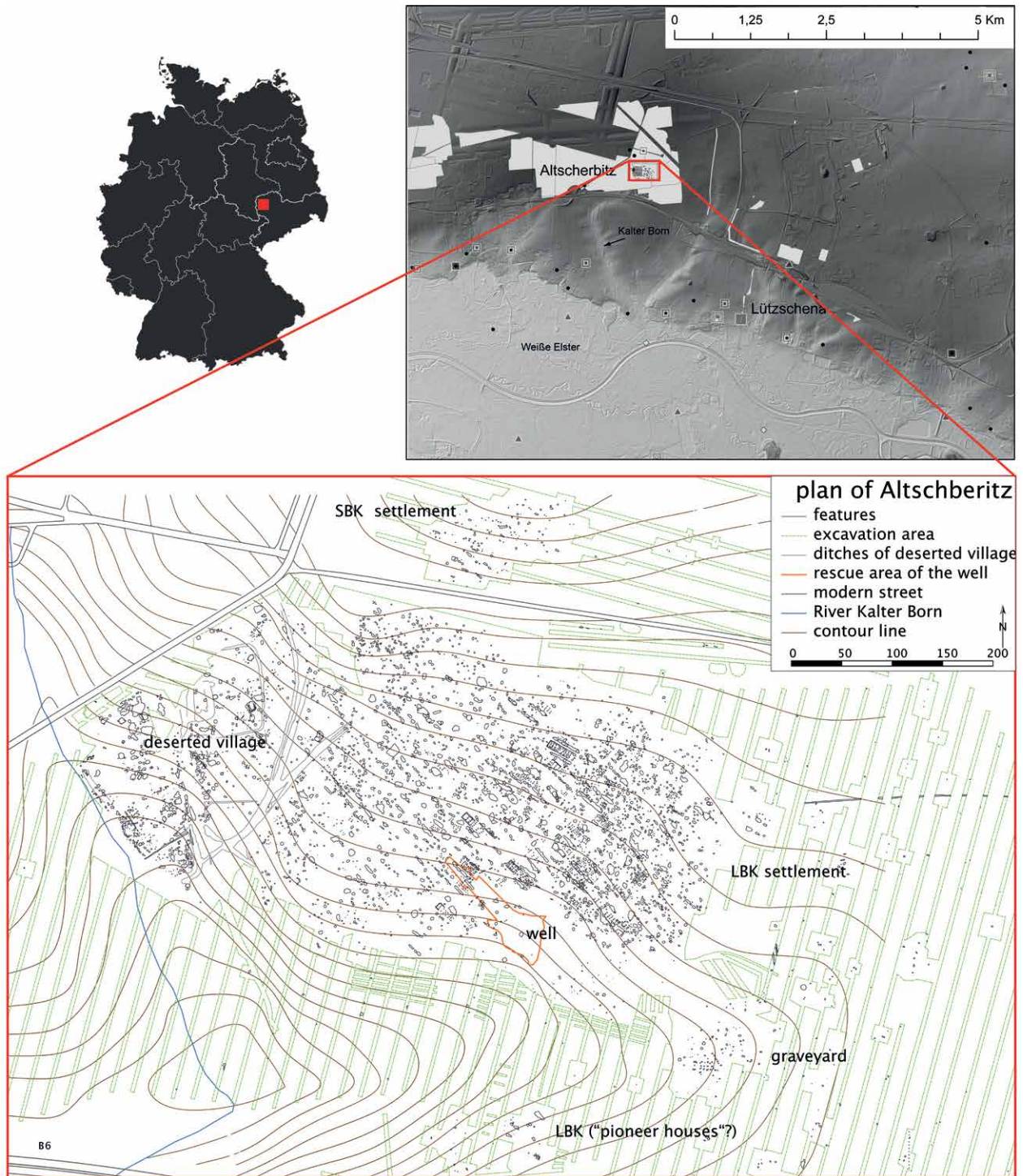
Fig. 1: Altscherbitz and its location in regards to the rivers Weiße Elster and Kalter Born in a LiDAR-scan image (after: Stäuble 2014, 84, Fig. 11) and the plan of the complete Early Neolithic site (I. Hohle).

over an area of around 8 hectares along a slope between 132-138 m a.s.l. A small group of SBK features north of the LBK settlement and a few features inside the LBK area lead to the question of the temporal dimension between the LBK and SBK. In total, 73 buildings, three of which belong to the small SBK settlement, were identified (Fig. 2).

A situation rarely observed for the LBK in general and especially in the case of Saxony, Altscherbitz consists of a small accompanying LBK graveyard with 33 burials (including three cremations) 120 metres southeast of the settlement, and a well that was rescued

Fig. 2: Remains of building structures at Altscherbitz (I. Hohle).

en bloc and excavated under almost laboratory conditions (Elburg, 2010 2014; Elburg and Herold 2010). Altscherbitz belongs to the central German distribution of the LBK, but is situated rather at the eastern periphery. The land close to the river Weiße Elster in the region of northwest Saxony is rich in Early Neolithic (LBK + SBK) sites (for an overview, see Stäuble 2014). A prominent example is the site of Eythra, which is currently the largest excavated LBK and SBK settlement area (Cladders *et al.* 2012; Stäuble and Veit 2016). The site of Droßdorf became famous for its many LBK wells and great distance from a water source (Kretschmer *et al.* 2016). Altscherbitz does not belong to the Early Neolithic sites that follow the river Weiße Elster directly, as it was about 3 kilometres away from the river. It is not clear if the small stream of Kalter Born, close to the LBK settlement, was water-bearing at the time of the LBK settlement. Either way, the river Weiße Elster was probably an important water source.

The special case of Altscherbitz – the complete excavation of a large LBK settlement with a well and its own graveyard and a small SBK site – allowed the analysis and classification of features, houses, and finds in the context of the complete site and a diachronic perspective from the early LBK (Flomborn) to the late LBK and SBK. As already mentioned above, this led to questions about communal structures in respect to a given settlement "plan" and the development of a village.

It appeared that a pair of two houses in the south (houses 72 and 73), around 150 metres away from the large settlement, are the earliest ones (Fig. 2 and 3). The pottery in the pit fillings around these houses is characterised by attributes of the

Fig. 3: Houses and distribution of pit fillings that date into the Flomborn, according to the correspondence analysis (CA) with *Bandtypen* (CA 3) and an extended dataset of pottery characteristics (CA 5). Like the first graves in the graveyard, a settlement burial inside an elongated pit dates into the early settlement phase.

early Flomborn, with some sherds in the tradition of the earliest LBK and developed Flomborn. There is only one house in the large LBK settlement area of Altscherbitz, whose elongated pits contained sherds in the tradition of the earliest LBK, but to a lesser extent than the area in the south. Are these two buildings in the south some kind of pioneer houses? Do they mark the explorers and founders of Altscherbitz? We will probably never know, but it seems as if the pioneer house phenomenon can be observed in other settlements, too, such as the sites of Remicourt, Fexhe-le-Haut-Clocher, Waremme, and Darion in Belgium (Bosquet and Golitko, 2012), the "cult building with ring of palisades" ("*Kultgebäude mit Palisadenring*") in Nieder-Mörlen "Auf dem Hempler" in Germany (Lüning 2009, 130–136; Schade-Lindig and Schwitalla 2003), and maybe in Arnoldsweiler

in the German Rhineland (Balkowski 2018). Although the one at Arnoldsweiler was accompanied by two other buildings and was not the only one from the earliest settlement phase (Balkowski 2018, 412), it stands out because of its architecture and position in the settlement space compared with houses of the succeeding phases. House 58 on the eastern edge of the Altscherbitz site stands out, too, and the small amount of sherds in the surrounding pits date into Flomborn. However, unlike houses 72 und 73, the sherds do not contain elements of the earliest LBK tradition. The outstanding position of these houses in combination with the early pottery style is definitely conspicuous and perhaps this observation could be made at many more Early Neolithic sites.

Studying the distribution of the first houses and the pit fillings containing pottery that date into Flomborn made it clear that they spread over the whole area of the future settlement space of Altscherbitz (Fig. 3). The first graves date into Flomborn, too. It appears that the area in the northwest had been an area that was used exclusively for pits. This means that the settlement space was marked out at a very early stage of colonisation. After comparing the distribution of features, houses, and finds with the succeeding settlement phases, it became clear that the spatial order of the settlement was not random but was organised right at the beginning and had been respected for the whole duration. This leads to the interpretation that there was somehow an "idea" of how the village should look like, that has been developed with the establishment of Altscherbitz. Furthermore, the question arises what kind of social organisation could be imagined behind that form of "planning" and who was responsible.

Around two-thirds of the settlement space is a built-up area with houses, pits, and paths. In addition, the western and northwestern part appears to have been an area that was set aside for special activities. There are no houses, just pits (Fig. 3 und Fig. 4). A conspicuously large amount of the pit fillings are linked with fire, through infillings with charcoal and pieces of daub. The definite kiln, which dates to the younger LBK, is situated in this area (Fig. 4) as well as some fireplaces and potential kilns. At Altscherbitz, just 23 grinding stones were uncovered in total. Most of these were found in marginal zones, especially in the northwest area (Hohle 2017, 133, Fig. 9).

The area where the well was built in one of the last settlement phases appears to have been an open space (Fig. 3 and 4). There are no buildings close to it, and just a few pits. This area remained open for the duration and for a long time before the well was built. If we interpret it as some kind of village square, it is not surprising that the well was built in this place. From a geological point of view, many areas of the settlement could have been considered, but the place that was deliberately decided upon must have previously been of importance to the village community. In addition, the extensive find ensemble in the backfilling illustrates the well's outstanding importance above its actual function as a water source (see also Elburg 2010, 2014). The different phases of the backfilling contained, besides several other findings, 24 complete or nearly complete pots. Two of the most splendid pots were decorated with bark strips and pieces that covered the older and typical linear decorations of the LBK.

A comparable structure of an open space with a later-built well is observed in Erkelenz-Kückhoven (Germany) (Lehmann 2004, 267) and Eythra (Cladders *et al.* 2012, 157; Gärtner, Cladders and Stäuble, 2016, 117).

There are other examples of LBK sites where special features are built in a former open space, or places that had special meanings before, such as the enclosure at Langweiler 9 (Kuper *et al.* 1977, 15, Fig. 4), and perhaps the rondel in Eythra (Cladders *et al.* 2016, 154, Fig. 13.3). There are other settlements where the first houses mark the whole area of later settlement space, again as at Eythra (see citation above, dark blue houses and triangles) or at Stephansposching (Pechtl 2012, 135, Fig. 4).

While analysing the different house types of Altscherbitz and their distinctive features (which will not be examined here in detail), one building was striking. House 30 (Fig. 2,3 and Fig 5) was the best preserved building of the site (wall postholes are rarely preserved at Altscherbitz) and dates into the early settlement phase. With its orientation

Fig. 4: Houses and distributions of pit fillings that date into the younger LBK after CA with *Bandtypen* (CA 3) and an extended dataset of pottery characteristics (CA 5). The houses of the SBK are mapped, too, as it is not clear to what extent their existence overlapped.

of 61.4°, it is one of the houses that are strongly orientated to the west (the average in Altscherbitz lies at around 46°). The inner structure allows us to define it as a rare type 2b house (house with northwest part with ditch and a central part, but no southeast part) and, at 30 metres long, it is the usual length of a tripartite house. Its position in the northern area may have given it an exposed position in the settlement space. The postholes around the northwestern and northeastern area of the house suggest structures such as fences or enclosures. The elongated pits and the pits in the inner part of the house were filled with younger LBK material, which leads to the question of a possible longer timespan of use, or a reuse of the building. The elongated pits of the house contained just six animal bones, which is quite unusual for large buildings with a northwest ditch at Altscherbitz.
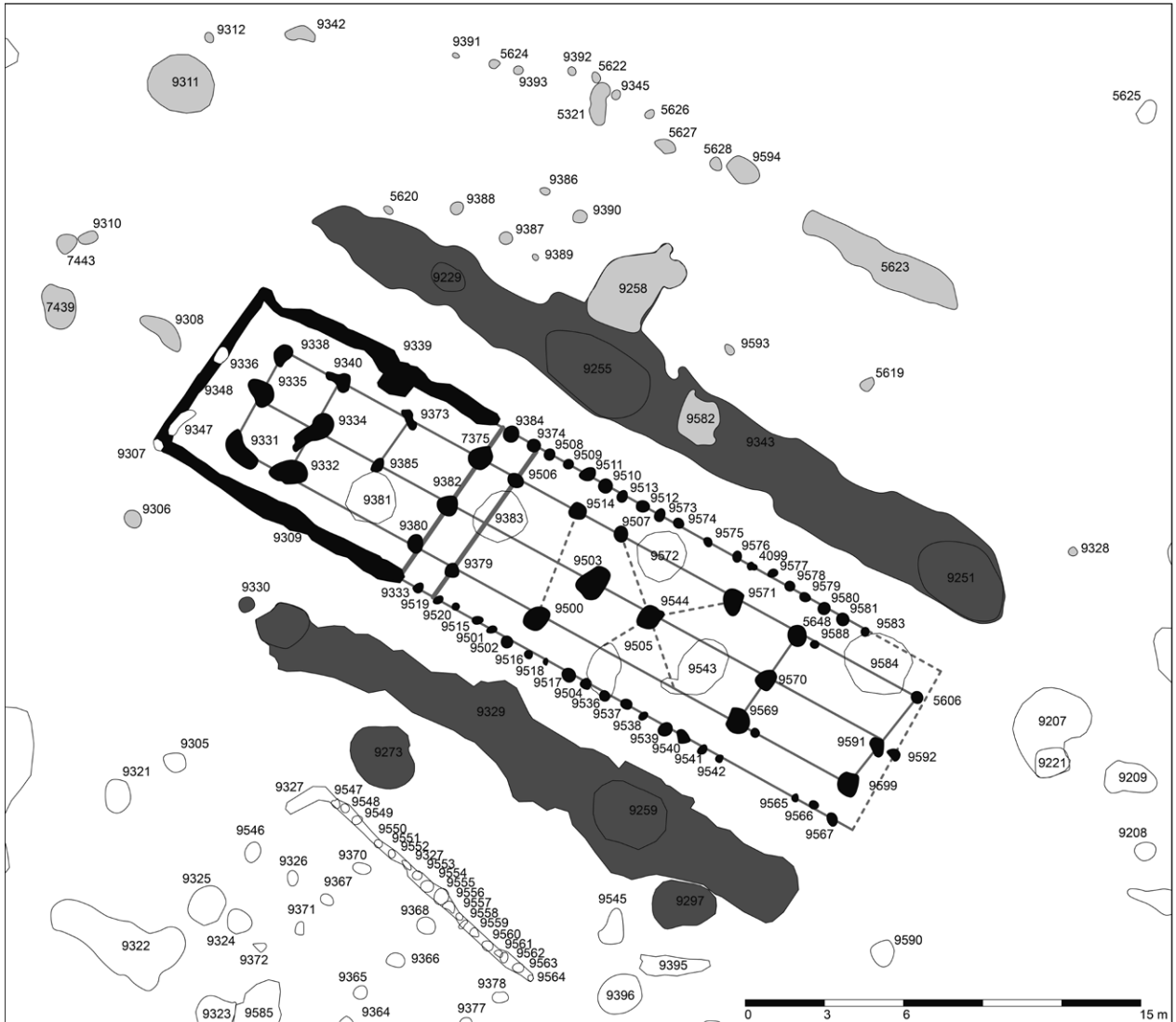
Fig. 5: House 30 (I. Hohle).

| Phases (model 1) | Dated pit fillings (CA 3) | Dated pit fillings CA 5 | Dated houses (CA 3 + 5) | Undated houses that could fit into this phase |
|---|---|---|---|---|
| 1 | 3 | 14 | 3 (5) | 1–6 |
| 2 | 10 | 20 | 8 (9) | 0 |
| 3 | 25 | 42 | 5 (6) | 1 |
| 4 | 19 | 41 | 5 | 2 |
| 5 | 22 | 52 | 8 | 0 |
| 6 | 28 | 30 | 3 | 3–4 |
| 7 | 24 | 46 | 6 | 1–3 |
| 8 | 24 | 37 | 4 | 1–4 |
| 9 | 42 | 28 | 5 | 1–5 |
| 10 | 15 | 53 | 4 | 1–9 |

Tab. 1 After the results of the CAs, two models of site development were created (Hohle, 2023, 193-222.). As an example for model 1, dated pit fillings and dated houses are listed here.

As a result of the comparison of the so-called *Zwickelmotive* of the pots from the well with the pottery in the settlement features, it appears that house 30 provides the most similarities, with four motifs in common. The *Zwickelmotive* are described as somewhat special signs or markers (Krahn 2003); some interpret them as genealogical signs (Strien 2005). Whatever they meant in reality, most researchers interpret them as special. As house 30 dates into an early settlement phase and the pottery from the backfilling of the well dates into the late settlement phase, these similarities in *Zwickelmotive* could not be explained chronologically. If these motifs are signs of special (social) groups, and as the well had been a communal feature, this could be a hint for a special meaning of house 30. It cannot be excluded that this house gained special meanings in addition to its function as a dwelling or that this house functioned solely as a special building. But the aforementioned characteristics make it plausible that house 30 was somehow exceptional.

Comparing the density of find distribution between the settlement phases makes it very clear that there are distinct differences at Altscherbitz. Whereas in early phases houses are quite easy to date, as there are a lot of sherds in the elongated pits, the amount of finds in the long pits decreases over time. In the later phases, most of the material originates from pits away from the buildings, which makes it difficult to date houses (for an overview of the relationship between dated pit fillings and dated houses, see Tab. 1). In contrast, 11 houses are dated into phases 1 and 2, to which nine of them had been dated directly through the intervals of the CAs from their elongated pits. In general, 13 pit fillings after CA 3 and 34 pit fillings after CA 5 are classified into the earliest settlement phases. For the last two settlement phases, nine houses were dated, but just five of them through inventories in both CAs. Four were dated through singular pot characteristics or even stratigraphically and spatially. Against that, 57 pit fillings of CA 3 and 91 pit fillings of CA 5 date into the last two intervals, which would suggest more houses in use, if we accept the correlation of the number of houses with the number of pits as an indicator for the level of settlement activities.

This is a very interesting observation in the context of the following Neolithic pot cultures of the SBK and Rössen, as the long pits disappeared and "waste" seems to have been disposed of in communal pits far away from the houses. There is no doubt that there were major changes in the spatial organisation of the settlement space between the LBK and the SBK. Compared with the LBK settlements, SBK settlements had features and houses arranged less densely, and there seemed to be more open space around houses and in the villages in general. House groups seem to appear more often. Because of this, the narrative about the spatial and social organisation of the SBK, as well as Rössen, is a different one compared with that of the LBK: instead of single-farmstead-based settlement organisation, a communal organisation of settlement space with communal areas is supposed (see above).

With recourse to cultural anthropology, Kvetina and Hrncir explain the change in spatial organisation from the LBK to the SBK in these social respects (Květina and Hrnčíř 2013). Their hypotheses is that the LBK longhouse lost its meaning as an independent social and economic unit. Whereas LBK settlements did not have an organised form, SBK settlements were organised in a communal way and large pits were used as communal waste pits. As shown for Altscherbitz, these changes had already started in LBK times.

During the LBK period, significant changes in spatial and social organisation occurred. In the case of Altscherbitz, this process started at quite an early stage. The organisation of settlement space with built-up areas of houses, non-built-up areas with pits for special purposes, and space for special communal activities (an open space that functioned as village square with the later-built well and a space allocated for the dead, even though just for a few graves). An open strip that runs through the whole settlement area and the positioning of the houses seeming to respect strips parallel to them suggests paths that probably led to the water source of the small river Kalter Born (Fig. 6). Maybe the existence of paths sound trivial, and at a first glance they appear to provide the obvious,
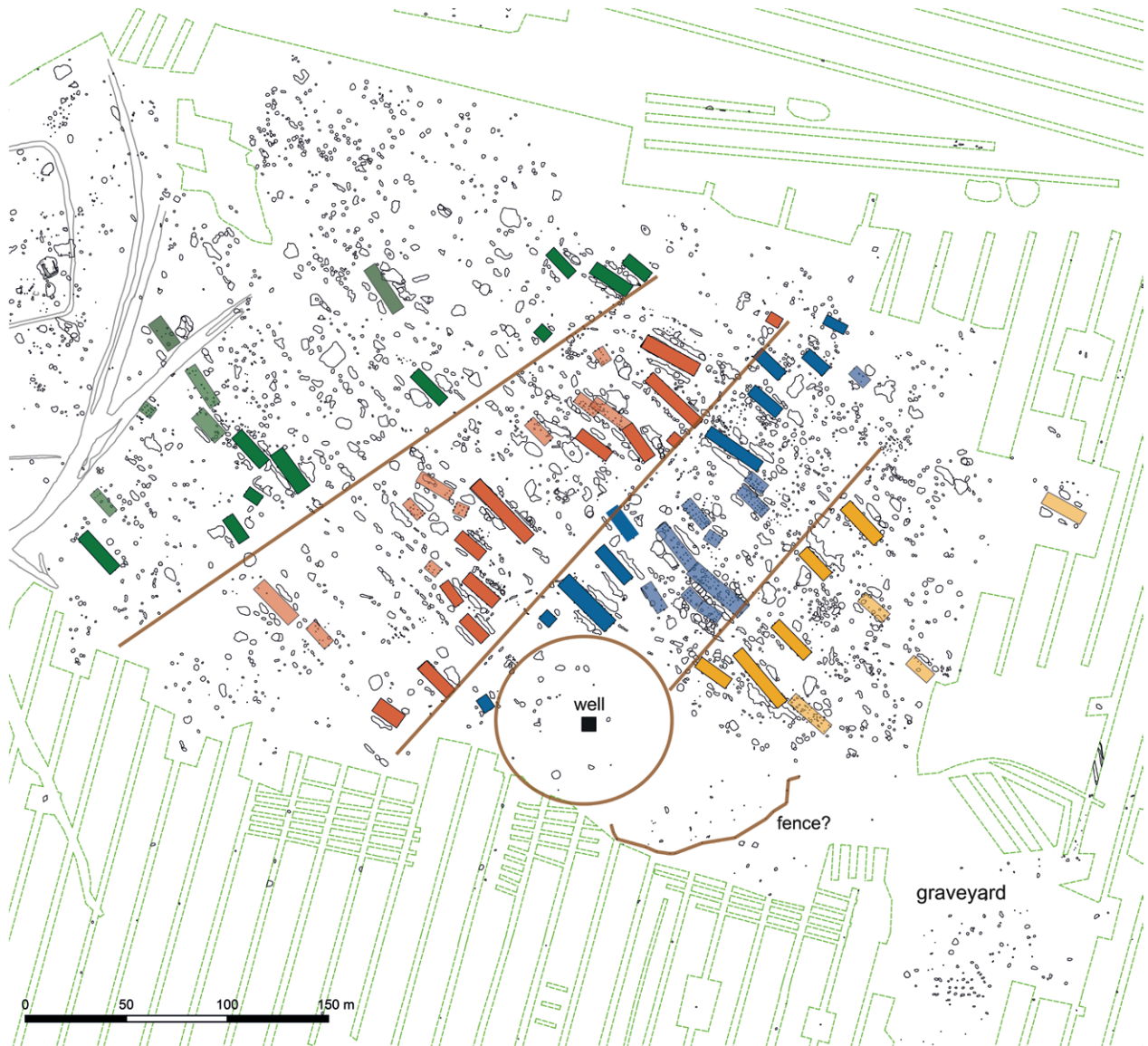
necessary function, but they could also have had important social functions in the sense of communication, respect, and spatial and social classifications, especially when they are fixed and respected for a long duration. In contrast to Rück's model, the rows at Altscherbitz seem to be the result of longer processes and do not (necessarily) indicate contemporaneous houses.

As Altscherbitz consists of these forms of communal features, because the settlement space had been fixed right at the beginning (and with that had been demarcated from others), and as there are some hints for complementary households, specialisations, and exchange (which I have not referred to here; Hohle, 2023, 235-261. it is not just a large settlement, it is a village. And, in my opinion, we should deliberately call sites with similar features villages, as there are differences in social organisation between hamlets and villages and these are important for our understanding of Early Neolithic social organisation.

In the case of Altscherbitz, the following story can be told: it all started with two apparent pioneer houses that might represent the founders of the village of Altscherbitz and, out of respect for the ancestors, this area remained untouched as the buildings of the founders started to decay and the large village of Altscherbitz prospered 150 metres

Fig. 6: The possible paths are marked as brown lines (the western one corresponds to an open strip with no features). Houses with the same colour might have respected the individual paths, and the lighter ones do not fit or stand in a sort of "second row". The houses in the reconstructed rows did not exist simultaneously.

north. There seemed to be something like an idea, a plan, as the spatial order of the village was defined at a very early stage. Apparently, there was already a certain intention for the area to be populated right at the beginning. Therefore, it is tempting to assume that the pioneer houses represent the planners of the future village of Altscherbitz.

It ended with depositions of pretty and complete pots in the well at Altscherbitz, although the well was fully functional, and it is assumed that more than one single household did this, as the pottery appears complex and heterogenous. The small SBK settlement respected the LBK settlement spatially – maybe because the settlements overlapped in time or maybe because the settlers respected their predecessors. Of course these interpretations contain uncertainty, but they are not implausible.

## Discussion in the context of the LBK

The so-called post-foundationalism assumes that necessarily contingent reasons have to be found and established again and again, even if they are temporary and/or unstable (Marchart 2013, 11). The idea behind this theory is that a society "has no reason or ground" of its own accord, but has to create it itself to prove and understand itself as a society (that does not exist per se). The ritualisation of certain practices, such as building a house and complying with certain rules in architecture and spatial positioning, is considered an essential part of LBK society. Architecture, as "a medium of the social", is fundamental for a society and/or community that does not express itself through architecture but builds itself through it (Delitz 2010, 2012). "[...] architecture is one of the cultural or symbolic modes in which collectives incessantly create themselves" (Delitz and Levenson 2019, 111) or, as Whittle has already stated: "The longhouse was the central fact of LBK existence" (Whittle 2012, 195). On a micro scale, the practice of building houses is a central act for several people in a settlement, which probably strengthened the cohesion within a community (see also Bánffy 2013, 138–139). The uniformity of LBK architecture on a macroscale over large parts of the distribution area leads to the assumption that the house was a demonstrative element of the identity of the LBK societies, as architecture is characterised by its perpetual presence (Delitz and Levenson 2019, 112). As Hofmann and Lenneis have already pointed out, the tripartite houses may have functioned for communal purposes as well as for demonstrating status: "the basic vocabulary was similar, but specific performances and iterations differed [...] Indeed, it is probably its potential for differences, rather than any single function or meaning, which ensured the central role of the longhouse" (Hofmann and Lenneis 2017, 156). Referring to the critiques at the beginning of this article, the equation of house, household, and family definitely has to be challenged, and more than just function as a dwelling should be discussed more often.

The possibly conscious allowance of the decay of something that is actually still usable could mean that the act of building belongs to a concept of renewing. Through these forms of repetition and respecting the concept of a village, the LBK communities renewed what they were referring to: they created a reason, a ground, and thus themselves as a community (Hohle 2023, 257-261).

The several probably communal structures and features and the overall spatial organisation of the site define Altscherbitz as a village. At a quite early stage of settlement development, the future settlement space of the village had been marked out. It does not seem that the village grew from a small cluster of houses.

Important paths that were respected emerged very early on in the village. This becomes clear through the arrangement of the houses along these paths. Throughout almost the entire period of settlement, certain people were buried in the burial ground southeast of the settlement. In a late phase of the village, the well was built by the village community on the southern edge of the settlement in the open space that had probably

served as a square previously. Besides the graveyard, paths, square, and well, there are further features of communal facilities. In the northwestern area of the LBK settlement, no houses had been erected; there were only pits. Among them were three fire pits as well as some findings related to fire, including several fired clay pieces and/or pieces of charcoal, as well as ashes. Many of the seldom-detected grinding stones come from this area. The area seems to have served for certain activities, probably for the entire village community over a long period of time.

For Altscherbitz, it is postulated that the village and the village community was an important social institution. The household as a (central) social unit was of great importance, but was probably not the central element in the organisation or, above all, the creation of a community (cf. Gernigon 2016, 174). To complement one of Hodder's sentences, "Without the house there was no society" (Hodder 1990, 117): Without the village there was no society.

This paper does not intend to demonstrate a new model or just critique existing models and hypotheses. The aim is to emphasise that settlements as a whole and their concrete structure should be discussed more intensively. Additionally, features and findings should be analysed within this whole context. Asking questions about communal structures and organisations besides single households opens up more research perspectives, as the example of Altscherbitz illustrates. The way in which we could imagine the social organisations that lay behind a village community, and what these dynamics and processes looked like in respect of a village, are left open for debate, as future studies will show if similar observations could be made at other sites.

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# Same but different: Cross-regional cultural entanglement during the first half of the third millennium BC – a view from Franconia

*Thomas Link*

## Abstract

*Archaeological maps of the late fourth and early third millennia are typically characterised by numerous cultural groups, most of them fairly regionally confined in comparison with the larger-scale entities of the Younger Neolithic. However, common elements of material culture can be traced across most of these regional groups, and it is hard to make clear distinctions. A closer look also reveals substantial gaps in the picture: archaeological data are virtually absent from some regions. The regionalised character of the Late Neolithic seems rather to be a product of research history than a reflection of prehistoric reality.*

*Franconia (northern Bavaria/northern Wuerttemberg) is one of the regions with very little evidence for the period in question. Recent excavations, however, have provided at least some new information and raise questions concerning interregional connections and cultural relations. At the hilltop site of Burgerroth (Lkr. Würzburg, Lower Franconia), prospections and sondage excavations in 2012–2014 provided new settlement features, which is a rarity in the region. Surprisingly, Late Neolithic elements seem to have been present at Burgerroth until the mid-third millennium BC, and associated finds of Corded Ware domestic pottery point to the parallel existence of regional Late Neolithic traditions and Final Neolithic innovations.*

*Keywords: Late Neolithic, Final Neolithic, Corded Ware culture, Franconia, Burgerroth, hilltop settlement*

Archaeological maps of the late fourth and early third millennia in central Europe are typically characterised by numerous "cultural groups", which have a rather limited regional extent in comparison with the larger-scale entities of the preceding Younger Neolithic (*e.g.* Schnurbein, 2009, 70–76). Regionalisation is often supposed to be a major cultural-historical characteristic of the Late Neolithic (LN) and Early Final Neolithic (EFN).[1]

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1   There is some variation in the use of the terms "Late Neolithic" and "Early Final Neolithic" between different traditions of chronological terminology. Jens Lüning (1996) established the term "Late Neolithic" as a phase between the Younger Neolithic and Final Neolithic (which mainly comprises the Beaker cultures), while in some literature from southwestern Germany, "Early Final Neolithic" is still being used for the same epoch or the younger part of it. However, this is not only a nomenclature problem. As shall be shown in this article, "Late Neolithic" traditions originating from the late fourth millennium BC have a long duration and overlap with the "Final Neolithic" Corded Ware culture almost until the middle of the third millennium BC. If we do not want to create a terminological overlap between "Late" and "Final" Neolithic in the chronological model, we should denominate these long-lasting traditions as "Early Final Neolithic". At the same time, this means that there cannot be a sharp border between the "Late" and the "Early Final" Neolithic, as there is tradition and continuity. Hence, the "cultural" groups of the transition phase at the end of the "Late" and the beginning of the "Final" Neolithic can hardly be satisfyingly covered by either one or the other of the two terms and shall therefore be described as "Late Neolithic/Early Final Neolithic" or "LN/EFN" here.

A closer look, however, reveals substantial gaps in the picture: archaeological data are very scant in many regions and virtually absent in others. At the same time, the individual regional groups share many material cultural features. The supposedly regionalised character of the LN/EFN could very well be a product of research history and lack of data rather than a reflection of prehistoric reality.
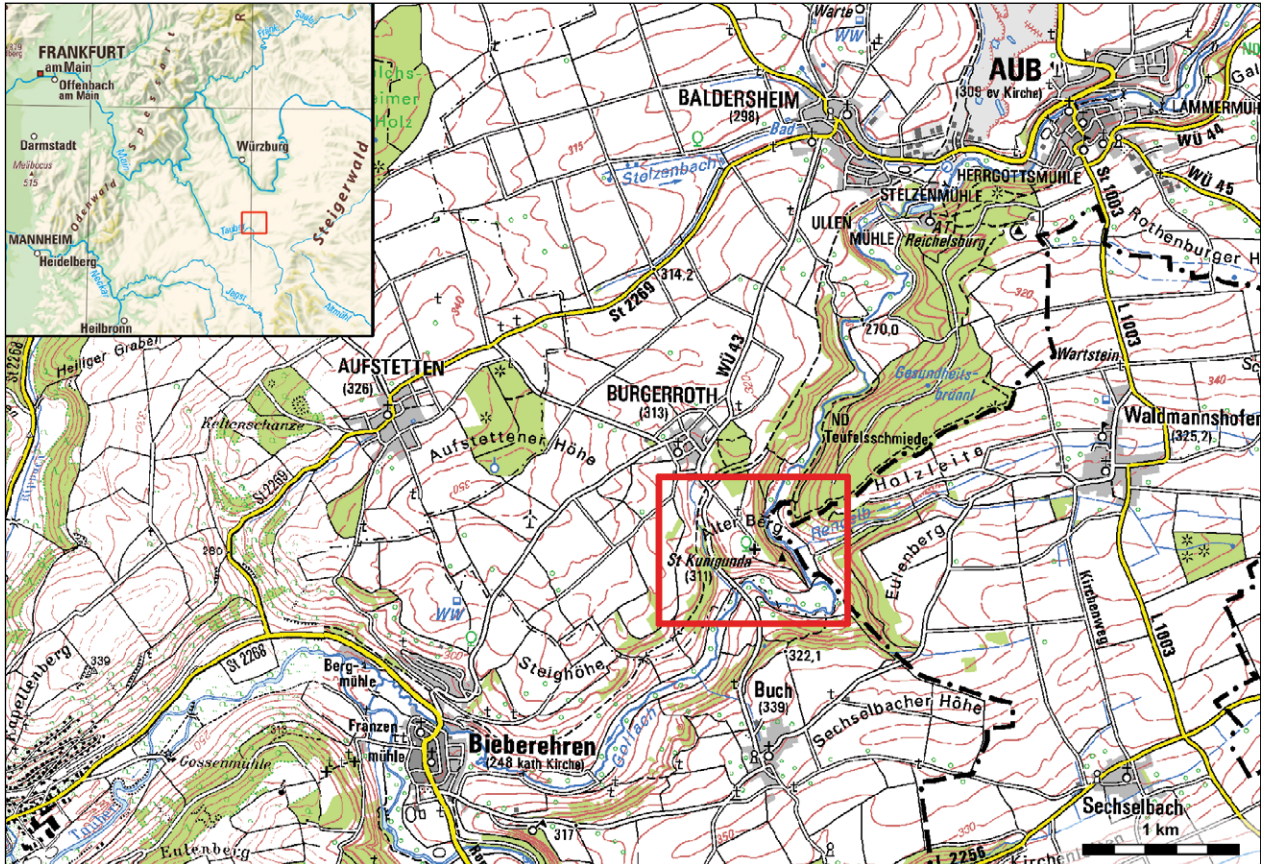
Cultural attribution becomes especially problematic for regions in between the larger and better-defined "cultural groups". Franconia, stretching across northern Bavaria and northern Wuerttemberg, is one of these "in-between" regions with only very poor evidence for the late fourth and early third millennia BC. There are only a few sites from this epoch, and most find complexes are small. Most of the relevant sites were already summarised by Dirk Spennemann in 1985, with the only major addition being a recently excavated site at Gollhofen (Lkr. Neustadt an der Aisch-Bad Windsheim), where a ditched enclosure measuring 50–60 metres in diameter and four small pit houses were uncovered (Beigel and Nadler, 2013). A Late Neolithic pit house had already been excavated in 1979 at Schwanfeld (Lkr. Schweinfurt) but was published after Spennemann's synopsis (Lüning, 1999), as was a Bernburg culture grave complex at Großeibstadt (Lkr. Rhön-Grabfeld; Koch, 2014). Two of the sites already listed by Spennemann have been further investigated by fieldwork over the last two decades: Voitmannsdorf (Lkr. Bamberg; Dürr *et al.*, 2004) and Burgerroth (Lkr. Würzburg; Link, 2013, 2018; Link and Herbig, 2016).

Burgerroth "Altenberg" has been a major reference point for the LN/EFN since the first excavations took place at this site in 1919–21. Attempts were made to define a regional group based mainly on this site (*e.g.* Fischer, 1981: "Altenberg Gruppe"; Burger 1988: "Wartberg-Burgerroth-Gruppe"; Matuschik, 1990: "Burgerroth/'Altenberg'"). However, they remain unsatisfying, as there are no typological features that are exclusive to this group; on the contrary, all of its elements can also be found in neighbouring "cultures", such as Goldberg III, Wartberg, Bernburg, Cham, or Řívnač (cf. Seregély 2008, 155). In fact, the material from Burgerroth looks like a blend of the surrounding groups; an exclusive cultural attribution of the site to one of these groups is not possible.

## Recent investigations at Burgerroth

Even 100 years after its first excavation, Burgerroth remained the most abundant LN/EFN find complex in Franconia and probably the region's most promising site for future research on this epoch. Therefore, new field investigations were carried out between 2012 and 2014 by a team from the University of Würzburg.

The site of Burgerroth "Altenberg" is situated in the valley of the Gollach, a tributary of the Tauber River, approximately 40 kilometres south of Würzburg and 30 kilometres northwest of Rothenburg an der Tauber. It is situated on an elongated promontory, rising about 40–50 metres above the valley bottom (Fig. 1). Large parts of the hilltop were affected by mediaeval building activity related to a Romanic chapel and by quarrying in the 19th and early 20th centuries. In the course of rescue excavations led by Georg Hock and Josef Maurer in 1919–21, several LN/EFN features dug into the Middle Triassic limestone bedrock were uncovered. Some of them had a more or less rectangular shape and were interpreted as building structures – mainly in light of Gerhard Bersus's contemporary large-scale excavations at the Goldberg, where a total of about 50 "pit houses" with sunken floors were documented (Bersu 1937). There were also sections of a Neolithic ditch uncovered at Burgerroth that could not be clearly separated from a mediaeval fortification (whose ruins are still slightly visible in the terrain today). Unfortunately, the documentation was very sparse, and it took six decades until Dirk Spennemann (1984) put together and analysed the available data and material systematically, complemented by some small-scale field activities. His seminal work remained the status quo until 2012.

Fig. 1: Geographical position and topographic situation of the site of Burgerroth "Altenberg" (maps: Bundesamt für Kartographie und Geodäsie and Bayerische Vermessungsverwaltung, www. geodaten.bayern.de).

## Magnetic prospections (2012–13)

In the winter of 2012–13, magnetic prospection with a fluxgate gradiometer was carried out on an area of 3.5 hectares, complemented by surface surveys and hand-operated drillings. As mediaeval activities, quarrying, and former excavations had destroyed most of the site centre, the investigation focused on the northwestern outer areas of the promontory, outside of the mediaeval fortification.

The Neolithic ditch that was cut during the first excavation and was again observed by Spennemann on the edge of an abandoned quarry (Spennemann 1984, 36–38, 42, Fig. 22) could be identified in the magnetic plan (Fig. 2). While its layout and extent had remained unclear before, large parts of its alignment could now be traced. What is more, magnetic prospection showed a previously unknown system of (at least) two linear anomalies about 80 metres further northwest. Soil drillings helped to verify that these are ditches preserved up to a maximum depth of approximately 80–100 centimetres. As the linear features closely neighbour and overlie each other, they evidently reflect a multi-phase ditch system. While the previously known inner ditch system encloses about 1–1.5 hectares, this newly discovered structure enlarges the site's size to around 4 hectares.

Between the mediaeval rampart and the outer ditch system, the magnetic plan shows a significant number of square or slightly rectangular anomalies, each measuring about 3–6 metres wide. Drillings have confirmed their interpretation as pits that have been dug into the bedrock. In shape and size, these features conform very closely to the "pit houses" of the 1920s excavations and at other Late and Final Neolithic sites.
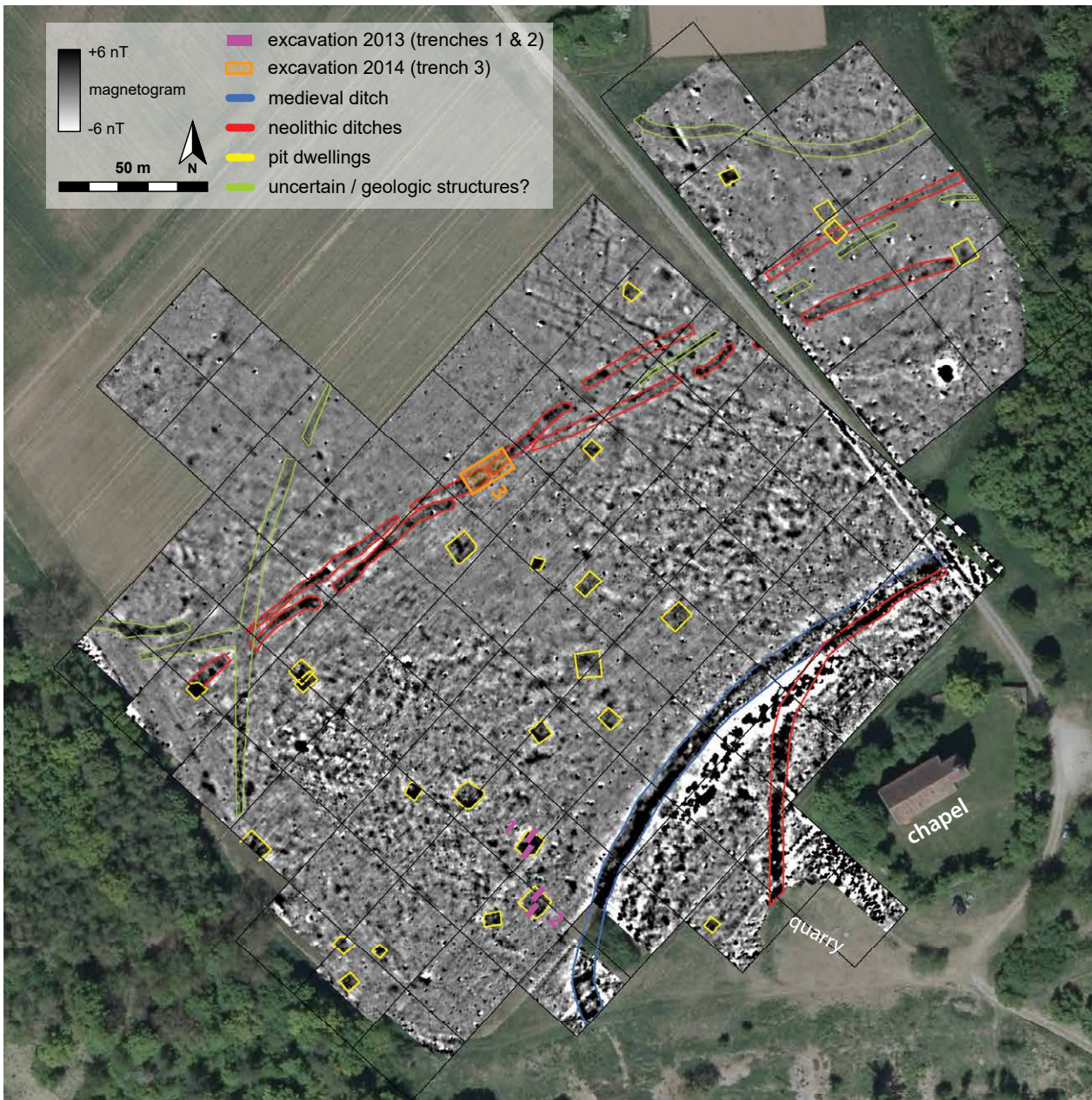
Fig. 2: Magnetogram with archaeological interpretation. Magnetic survey with dual fluxgate gradiometer Bartington Grad 601-2, point density 12.5 × 50 cm (interpolated to 12.5 × 25 cm), dynamics ±6 nT/256 grey levels (aerial photo: © Bayerische Vermessungsverwaltung, www.geodaten.bayern.de; magnetogram: T. Link, University of Würzburg).

## Sondage excavation of two pit dwellings (2013)

In 2013, two small test trenches were excavated through two of the square anomalies in order to verify (or falsify) their interpretation and dating and to evaluate their state of preservation (cf. Link and Herbig, 2016). Both trenches ran through the centre of a magnetic anomaly (Fig. 3); they were both 8 metres long and one metre wide, with a one metre offset in the middle, giving an option for later enlargement with a transverse profile.

Both excavation trenches showed very similar features, which correspond very well to the magnetic anomalies (Fig. 3). Outside of the features, the Middle Triassic limestone bedrock was reached at a depth of only about 20–30 centimetres below the modern field surface. Within the anomalies, pits with straight, steep, only slightly inclined edges came to light, measuring 6.3 metres (trench 1) and 5.7 metres (trench 2) in diameter (Fig. 4).

They had been dug into the bedrock to a depth of about 30–40 centimetres (approximately 50–60 centimetres below the modern field surface). In both trenches,
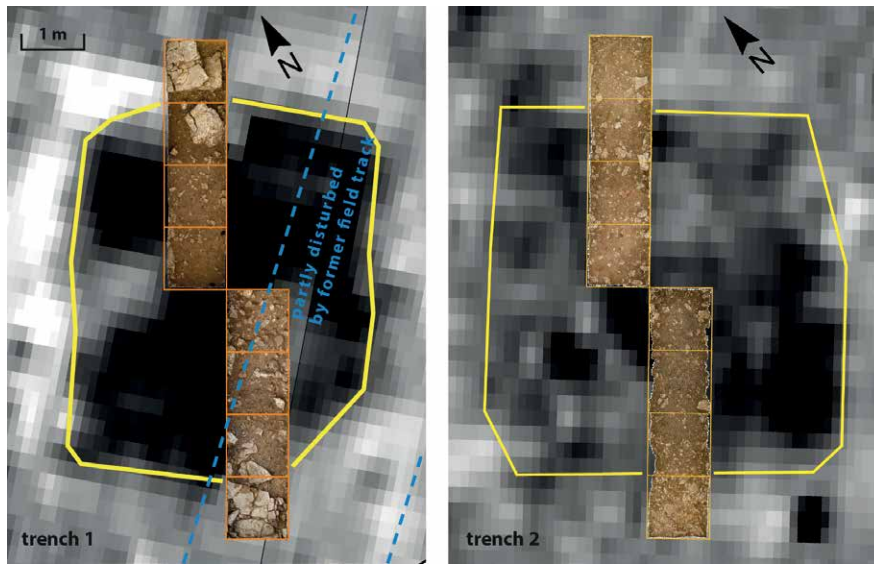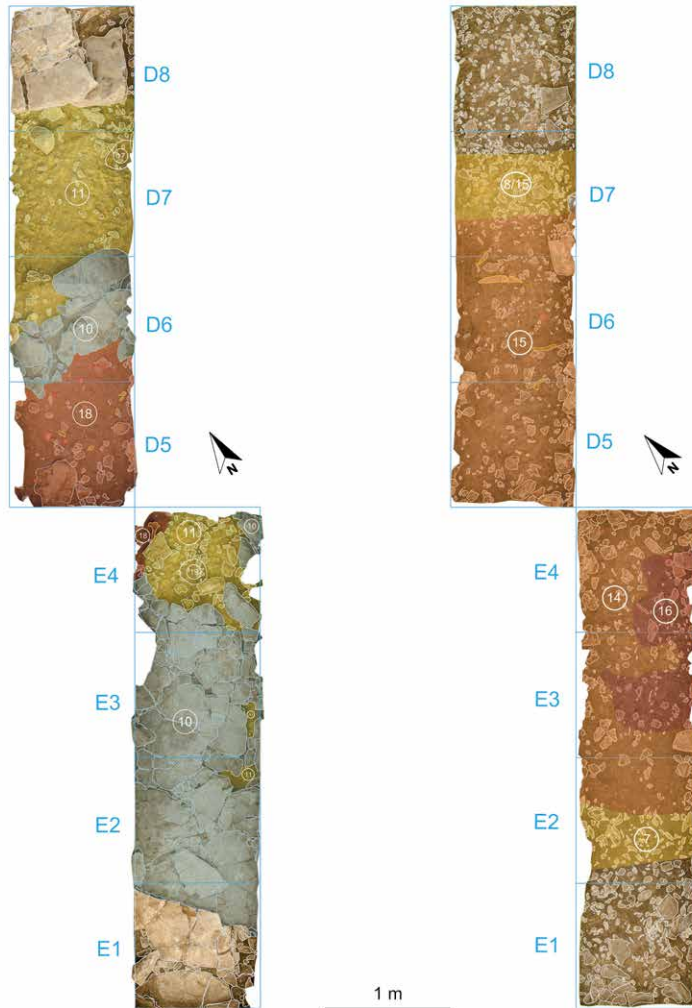
Fig 3: Overlay of the magnetogram (Fig. 2) and photogrammetric plans of trench 1 (planum 3) and 2 (planum 2) (T. Link, University of Würzburg).



Trench 1
Plana 6 (E1–4) and 8 (D5–8).
Pit bottom. 1:40.

Trench 2
Plana 3 (E1–4) and 4 (D5–8).
Lower infill level. 1:40.

Fig. 4: Photogrammetric plans of the bottom of the pit dwelling (trench 1) and of the lower infill layer (trench 2) (T. Link, University of Würzburg).

Fig. 5: Central pit of the pit dwelling, trench 2 (T. Link, University of Würzburg).

two layers of infill could be separated: a darker, humus lower layer, and a lighter, siltier upper one. The whole infill, and the upper layers in particular, contained a large quantity of limestone fragments and chippings.

The features in both trenches had a flat, level bottom. In trench 1, there was a solid layer of limestone flags almost throughout, while in trench 2, the bottom was dug into a loamy gravel layer. No postholes could be verified in the test trenches; it is questionable, however, whether traces of smaller posts could have been identified within the very inhomogeneous filling or the coarse gravel layer at the base of trench 2. Both features had a shallow pit in their centre that was about 10–20 centimetres deeper than the rest of the bottom surface (Fig. 4, trench 1, feature 18; Fig. 5). In both cases, the central pits were only partially excavated, but their diameter can be estimated to around 1–1.5 metres.

Although no postholes were detected, the overall quadratic structures with a level bottom, and especially the central pits, confirm the features' interpretation as building structures. "Pit houses" or sunken-floor dwellings are widespread during the 4th and 3rd millennia BC, and the central pit is a characteristic that occurs in many cases (see below).

The infill of both pit houses contained rich find material, which predominantly dates to the LN/EFN. Finds tended to be richer and better preserved in the lower layers and especially in the filling of the central pit in trench 1. Apart from the pottery, bone and antler objects in particular were very rich and exceptionally well preserved, which is due to the calcareous limestone environment. However, most of the find material is heavily fragmented. In total, 2749 ceramic objects (12 817 g) and 4198 bone/antler objects (10 231 g) were recovered – taking into consideration that only 16 m² was excavated, and only about 12 m² of that was actually archaeological features, the find quantities are very high. This confirms the impression already given by the 1920s excavation: Burgerroth is an exceptional site with an extraordinary wealth of find material.

## Test excavation of the outer ditch system (2014)

In 2014, a trench measuring 14 × 6 metres was excavated through the outer ditch system. In order to clarify the earthwork's chronology and the stratigraphic relationship

Fig. 6: Detail of the ditch during excavation of planum 4, with remains of the lower infill. Native level of the Triassic limestone (feature 34) and levels of anthropogenic deepening related to the 1st phase (feature 36) and the 2nd phase (feature 35) of the ditch system (T. Link, University of Würzburg).

of the two ditches that were identified in the geomagnetic plan, the trench was located at a position where the ditches seem to overlap each other (Fig. 2).

Just like the two pit dwellings, the ditch system had been dug into the limestone bedrock to a maximum depth of approximately 50 centimetres (80 centimetres below modern field surface). It varied in width from 2.5 to 3.5 metres, and its sides were irregular as a result of the natural jointing of the limestone (Fig. 6).

The stratigraphy of the ditch system turned out to be rather complex (cf. Link, 2018, 182–186 for more detail): at least two building phases followed by a phase of intentional backfilling could be identified (Fig. 7).

In its first phase, the ditch section within the excavated area was interrupted by two ridges of remaining bedrock, which probably formed passages at surface level. In the second building phase, the upper layers of these ridges were removed and the infill of the old ditch was partly dug out again, but this activity did not reach down to the bottom level of the first phase. Humus loam soil was deposited in the ditch over some period of time and finally, as a third phase of anthropogenic activity, it was intentionally filled up with stone blocks and large chippings. Finds of Iron Age pottery indicate that this may have happened a long time after the Neolithic use-life of the ditch. Both the first and the second phases, however, are associated only with LN/EFN material. A fourth building phase affected the upper infill in a small part of the ditch only, but its stratigraphic and chronological relation could not be completely clarified within the excavated area.

Right at the base of the final stone backfill, and stratigraphically linked to it, a human skeleton was uncovered. The juvenile individual lay in supine position, transversally to the ditch. No definite grave goods were present, but finds of late Hallstatt to early La Tène pottery nearby strongly indicate an Iron Age date for the burial's stratigraphic context.

Finally, a single radiocarbon date indicates that the earthwork may even have had an older predecessor from the Younger Neolithic (early to middle fourth millennium BC; see below). Only one sherd from this epoch has been found to support this hypothesis, however (Fig. 11,6). The character of the first ditch, with its bridge-like passages, would actually fit very well into a Younger Neolithic context; the earthwork might therefore have had older origins and have been reused and recut in the LN/EFN. Some sporadic finds from the 1920s excavations also document the presence of the Younger Neolithic Michelsberg culture at the site.
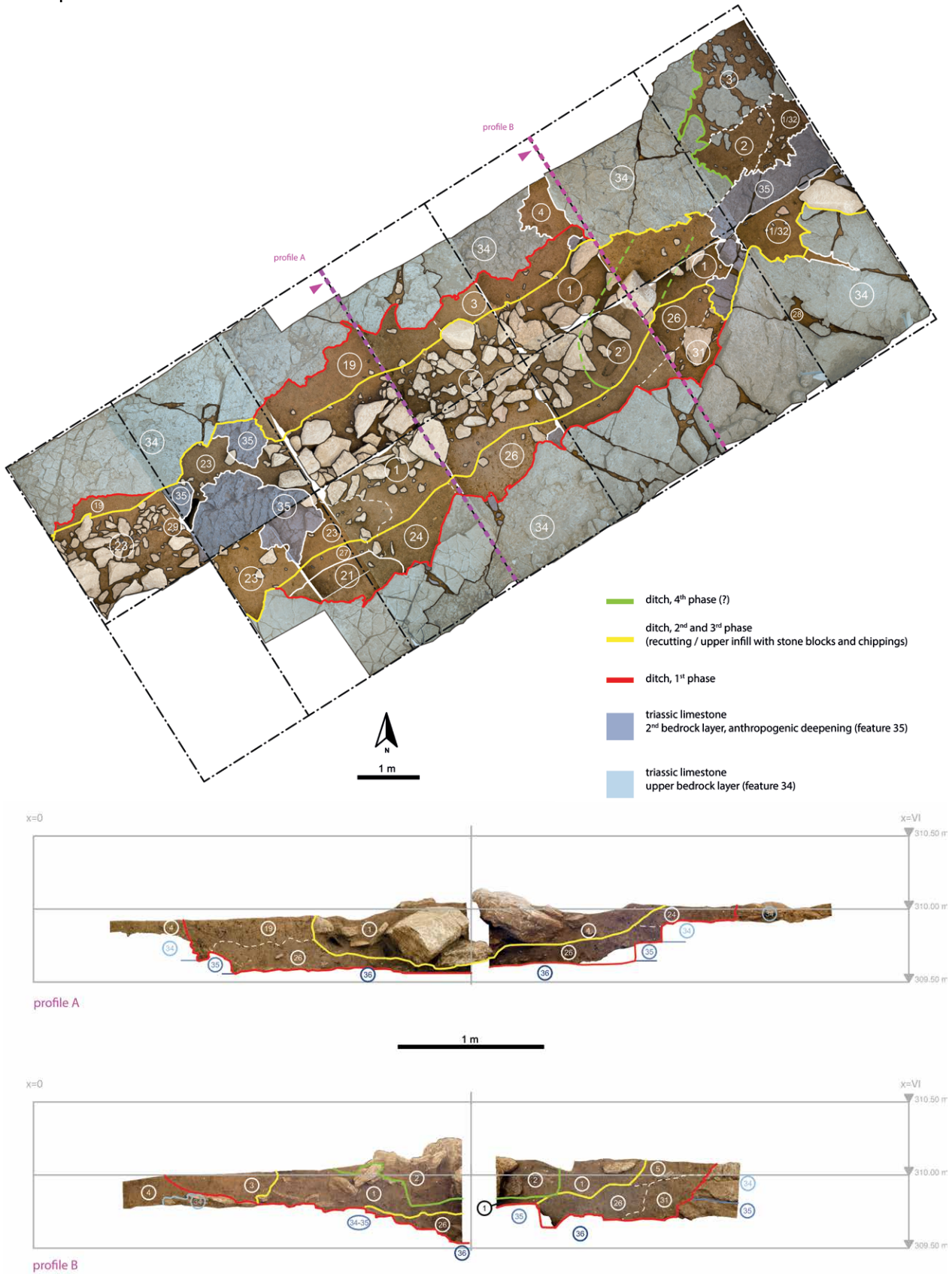
Fig. 7: Photogrammetric plan of planum 2 with highlighted phases of the ditch system and stone features (stones in the backfill/3rd phase coloured white, native limestone coloured blue) (T. Link, University of Würzburg).

## The find material and its cultural context

The sondages in 2013 and 2014 yielded a very high number of finds. In general, the find spectrum is similar to the 1920s excavations, as published by Spennemann (1984). Most of the find material, especially the pottery, is heavily fragmented, however. Only a few larger vessel parts could be refitted from trenches 1 and 3. Despite also being heavily fragmented, the bone and antler has excellent chemical preservation, which is obviously due to the calciferous conditions of the soil.

### Pottery

Most of the pottery shows typical LN/EFN elements. It is predominantly coarse, thick-walled, and strongly tempered with sand and especially crushed local limestone or, less frequently, quartz grit. Surfaces are only roughly burnished in most cases. Because of the high degree of fragmentation, information concerning vessel shapes is very limited; closed, steep-walled shapes with smoothly bent or slightly biconical profiles and flat bottoms seem to prevail. Shoulders are often thickened and sometimes accentuated by plastic or incised ornamentation or a sharply recessed upper part of the shoulder (Fig. 8, 1.2.12; 10,15). In addition, there is often a contrast between the upper and lower parts of the vessels, with the surface decoration being restricted to the lower part only.

The degree of ornamentation is low and its spectrum is quite limited: incised lines, strokes, and only some cord decoration. On the other hand, "functional" decorations such as plastic bands with or without impressions (Fig. 11, 1.5.9; 12,1.2) and – especially surface roughening – are much more common. The latter is an eye-catching characteristic and, in most cases, was created by rolling coiled cord across the vessel's surface (Fig. 8, 12.13; 10,9.12.13.14; 11, 1.5.10; 12, 1.2), which is commonly but misleadingly called "mat roughening" or "textile impression" (cf. Schlichtherle, 2018 for technological detail and critical analysis). Roughening by brushing or barbotine application occurs only rarely (Fig. 8,16; 11,4; 12,3). The spectrum of plastic surface elements is completed by lugs or shorter plastic strips and some handles (a complete band handle from trench 2 and two fragments from trench 1; Fig. 10,16; 11,7).

Probably most remarkable among the pottery finds are two ceramic sieves, which were found close together inside the central pit in trench 1 (Fig. 9,1.3). Both vessels were well preserved and could be restored in large parts. They are slightly conical in shape and open at both the top and bottom. Holes measuring 5–8 mm in width are evenly distributed all over their surface. Typologically, they differ from the sieves of the Bernburg culture, which typically have rows of holes only in two zones near the vessels' upper and lower rims, but they have close parallels in the Cham culture (Matuschik 1990, 176–184, Pl. 146; Spennemann 1984, 129–130). The possible functions of sieves have been discussed frequently and for different cultural, regional, and chronological contexts (cf. *ibid*., with further literature). As no traces of burning or smoking can be identified on the specimens from Burgerroth, their usage as incense burners or fire funnels does not seem very likely. Often, sieves are exclusively associated with milk processing or cheese production, but this interpretation appears unnecessarily restrictive – they could have been used for a multitude of tasks related to food preparation, just as modern household appliances are.

Cord impressions appear on three sherds in total (one each from trenches 1, 2, and 3). One of them is probably ornamented with a cord-filled triangle (Fig. 8,10). The second shows at least three parallel lines of cord impression that are accompanied by a single row of strokes (Fig. 10,7). The third has at least four parallel cord lines (Fig. 11,8). Cord decoration is the eponymous and "classical" ornamentation technique of the Final Neolithic Corded Ware culture (CWC), and the three sherds from Burgerroth fit well into the typological spectrum of CWC beakers or amphorae. But as cord ornamentation does in fact already appear earlier during the LN/EFN (*e.g.* Cham group or Globular Amphora culture: Matuschik 1990, 434–436, 503–519; Beran 1999, *e.g.* Pl. 86,4–5.13–14.20,
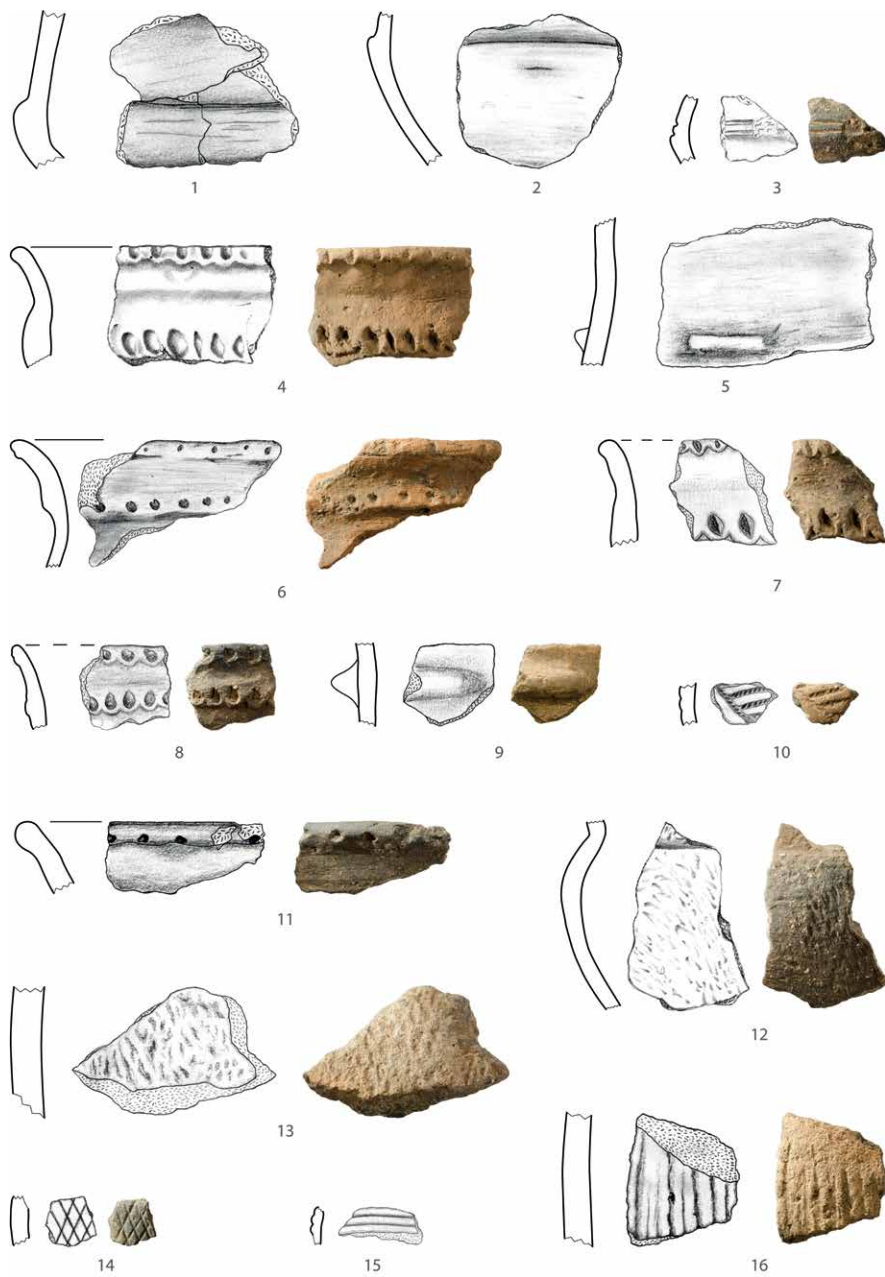
Fig. 8: Pottery from trench 1.
Scale 1:2 (drawings: P. Schinkel,
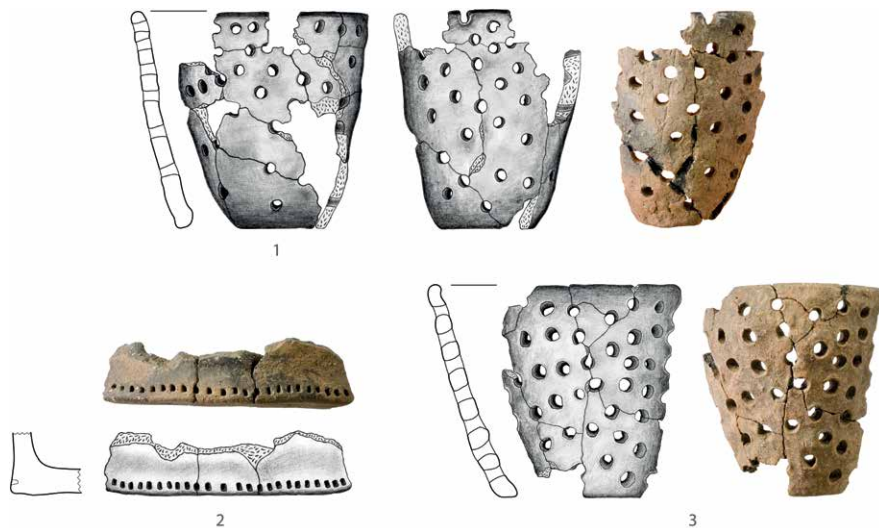photos: T. Link, both University of
Würzburg).

Fig. 9: Pottery from trench 1. Scale 1:3 (drawings: P. Schinkel, photos: T. Link, both University of Würzburg).
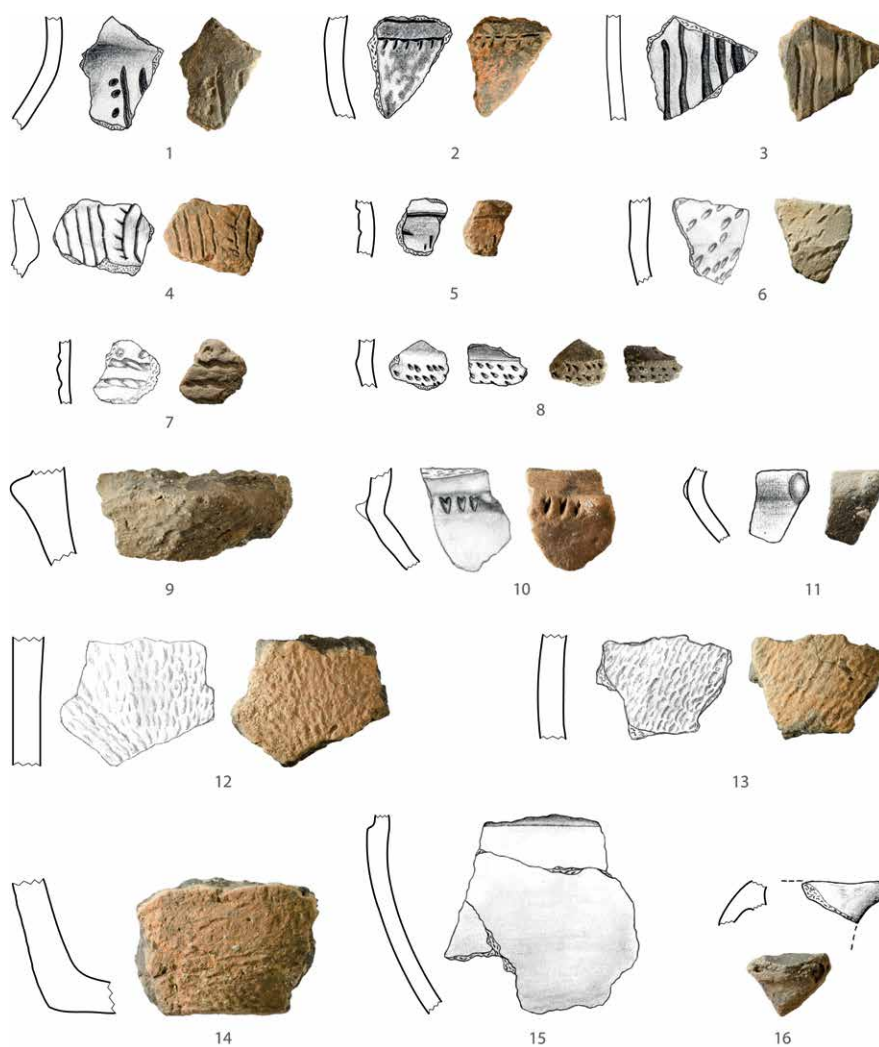


Fig. 10: Pottery from trench 2. Scale 1:2 (drawings: P. Schinkel, photos: T. Link, both University of Würzburg).
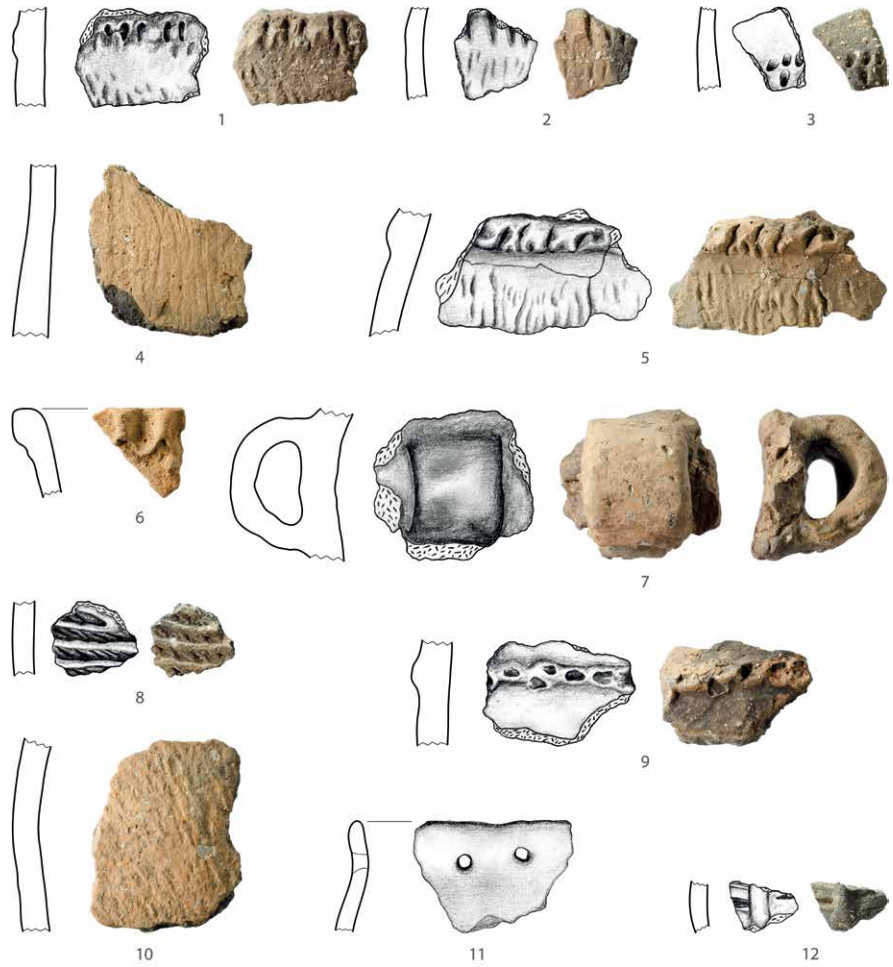
Tab. 89,14), the three small fragments cannot be taken as definitive prove for the presence of the CWC by themselves. However, some more sherds that can be clearly identified as domestic pottery of the CWC were found in the two pit houses. Five sherds from trench 1 (belonging to at least three individual vessels; Fig. 8,4.6–8.11) with impressed plastic ridges on the vessels' necks and lips compare especially well to pottery from lakeside settlements in southwestern Germany and northern Switzerland (Fig. 13; *e.g.* Zürich-Mozartstrasse: Hardmeyer 1992, 180–185, 1993, 328–333). This type of pottery was also found at a much closer distance at the CWC settlement at the Motzenstein in Upper (*i.e.* eastern) Franconia (Fig. 13,3; Seregély 2008, Pl. 23,9). Four sherds from trench 2 (probably belonging to two individual vessels; Fig. 10,1.2.4.5) show incised lines accompanied by dots or short strokes. These can most probably be interpreted as fragments of *Strichbündel* amphorae – another typical form of CWC domestic pottery, which again is mainly known from Swiss lakeside settlements (Fig. 13,1.4; *e.g.* Beran 1999, Pl. 88, 17.20; Hardmeyer 1992, Fig. 2–3, 1993, 296 Fig. 428, 319, Fig. 466).
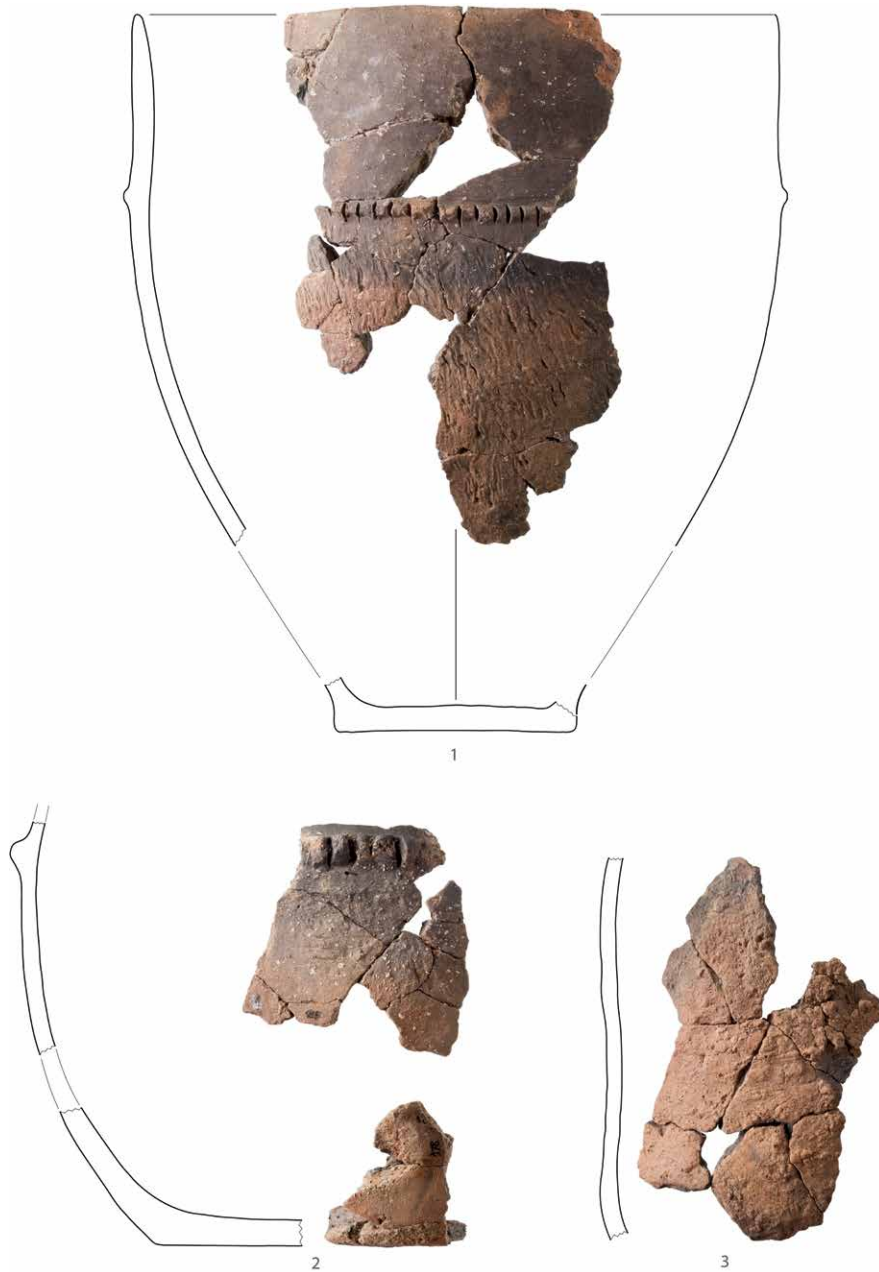
Fig. 12: Pottery from trench 3. Scale 1:3 (drawings: P. Schinkel, photos: T. Link, both University of Würzburg).
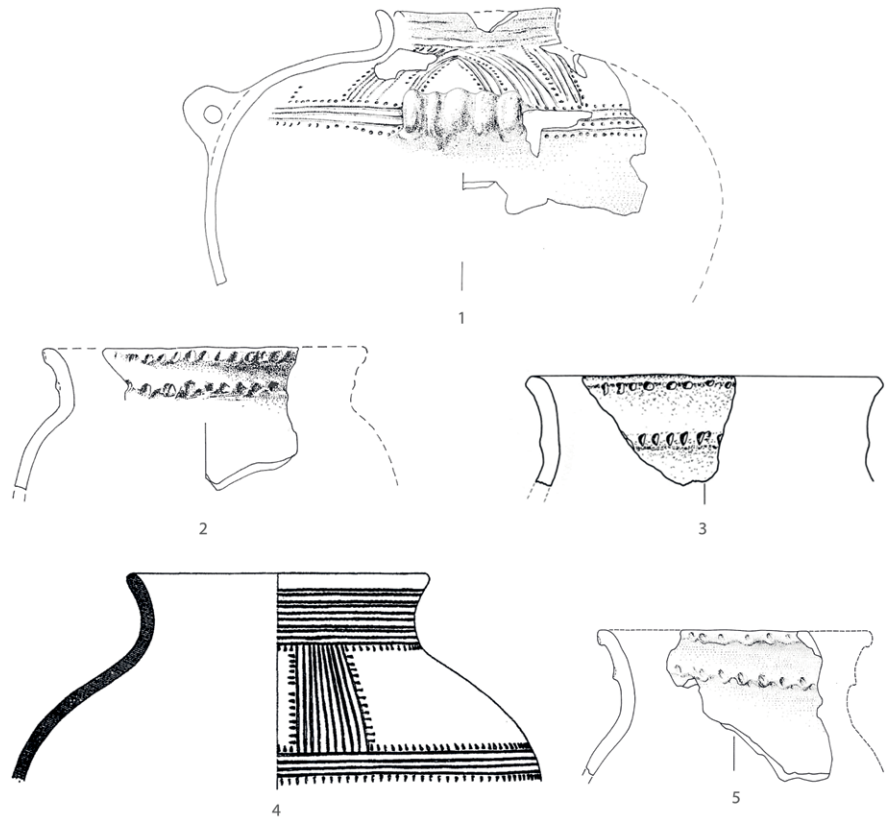
Fig. 13: Corded Ware domestic pottery from: Zürich-"KanSan" (1–2; Bleuer *et al.* 1993, Pl. 73, Pl. 62, 5), Wattendorf-Motzenstein (3; Seregély 2008, Pl. 23,9), Vinelz-"Alte Station" (4; Furholt 2003b, Pl. 186,10), Zürich-Mozartstrasse (5; Hardmeyer 1993, Pl. 104,7).

## Bone and antler tools

Bone and antler finds were abundant and exceptionally well preserved (although, like the pottery, heavily fragmented in most cases). Unfortunately, archaeobiological analysis of the bone material has not been carried out yet. Apart from typical settlement refuse, the find spectrum comprises a lot of bone tools, such as chisels, axes, and various pointed tools (Fig. 14,4–10). Bone tools were more numerous in the pit houses (trenches 1 and 2) than in the ditch system (trench 3).

The most striking artefacts among the tools are seven antler sleeves (three from the pit dwellings and four from the ditch system; Fig. 14,1.2). All of them have a rectangular plug and are of a type that is well known from Goldberg III, Horgen, and CWC contexts in Upper Swabia, at Lake Constance, and in the Swiss Lakes region (Billamboz and Schlichtherle 1985, 164, Fig. 1–2, 9–10; Hafner and Suter 2003, 12–14; Schlichtherle 1999, 42–45). Antler sleeves had already been found in large numbers during the 1920s excavations at Burgerroth (32 specimens in total: Spennemann 1984, 80).

An antler hoe with a rectangular shaft hole from the 2014 excavation in trench 3 (Fig. 14,3) also finds its closest parallels in southwestern Germany and northern Switzerland (cf. *e.g.* Hafner and Suter 2003, 14–15).

## Stone tools

Unlike pottery, bone, and antler, lithic finds were scarce in the 2013–14 excavations. Two triangular chert arrowheads and a fragment of a laterally retouched blade are the most noteworthy pieces among the flint artefacts (Fig. 15,5–7). The latter is made of greyish plate chert with a creamy white cortex, which very probably comes from eastern Bavaria and most likely from the Baiersdorf outcrop.

At least three heavily worn fragments of grinding stones were found in the ditches' backfill, while they are missing from the pit dwellings. They consist of local Upper Triassic (Keuper) sandstone.

Fig. 14: Antler (1–3) and bone (4–10) tools from trench 1 (2, 8), trench 2 (4–7, 9), and trench 3 (1, 3, 10). Scale 1:3 (1–3) and 1:2 (4–10) (drawings: P. Schinkel, photos: T. Link, both University of Würzburg).

1



2



3



4



5



6



7



8



9



10
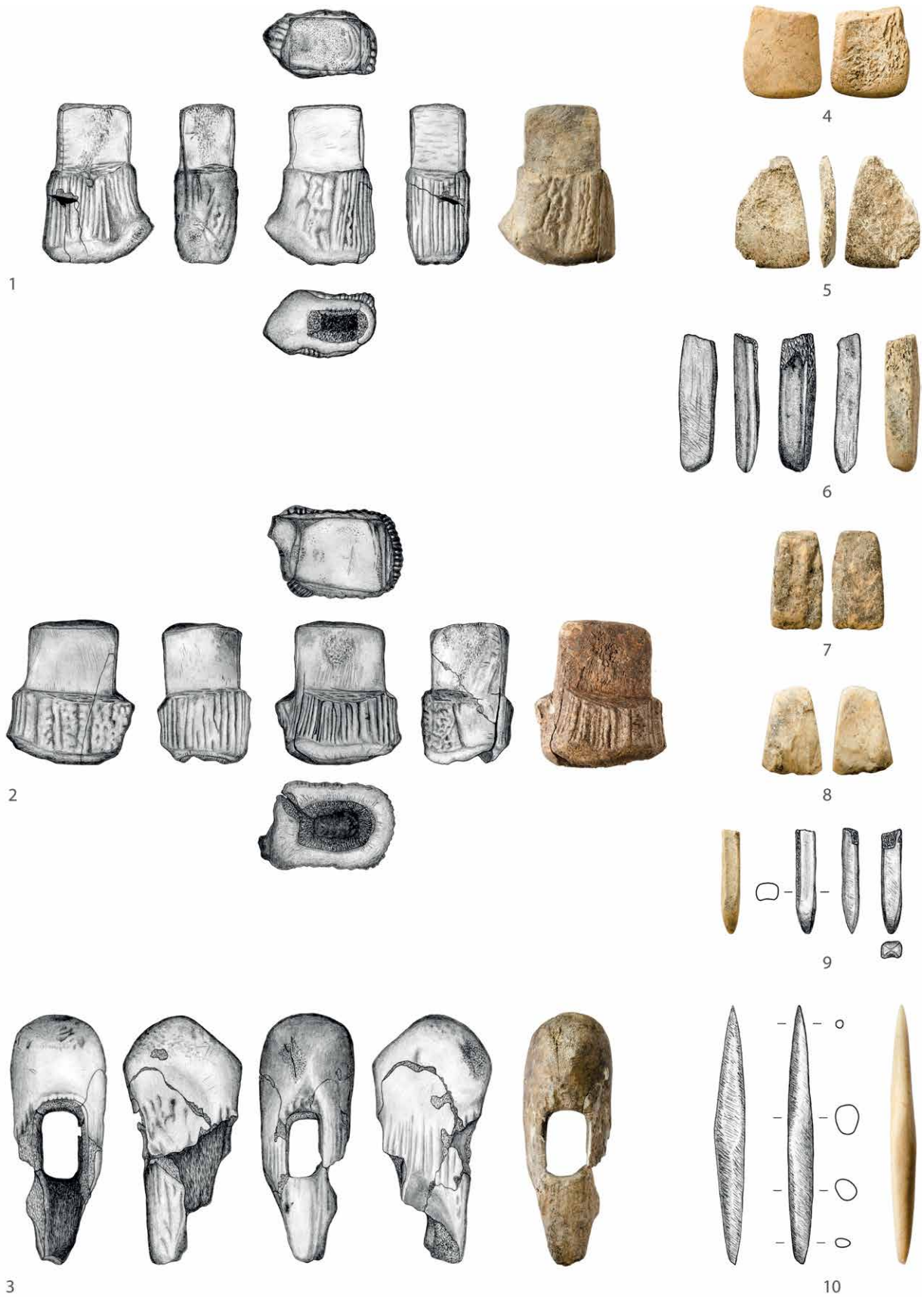
Fig. 15: Burnt daub (1–2), fragment of a loom weight? (2), ground stone (3–4), chert (5–7). Scale 1:2 (1–3, 5–6) and 2:1 (4) (drawings: P. Schinkel, photos: T. Link, both University of Würzburg).

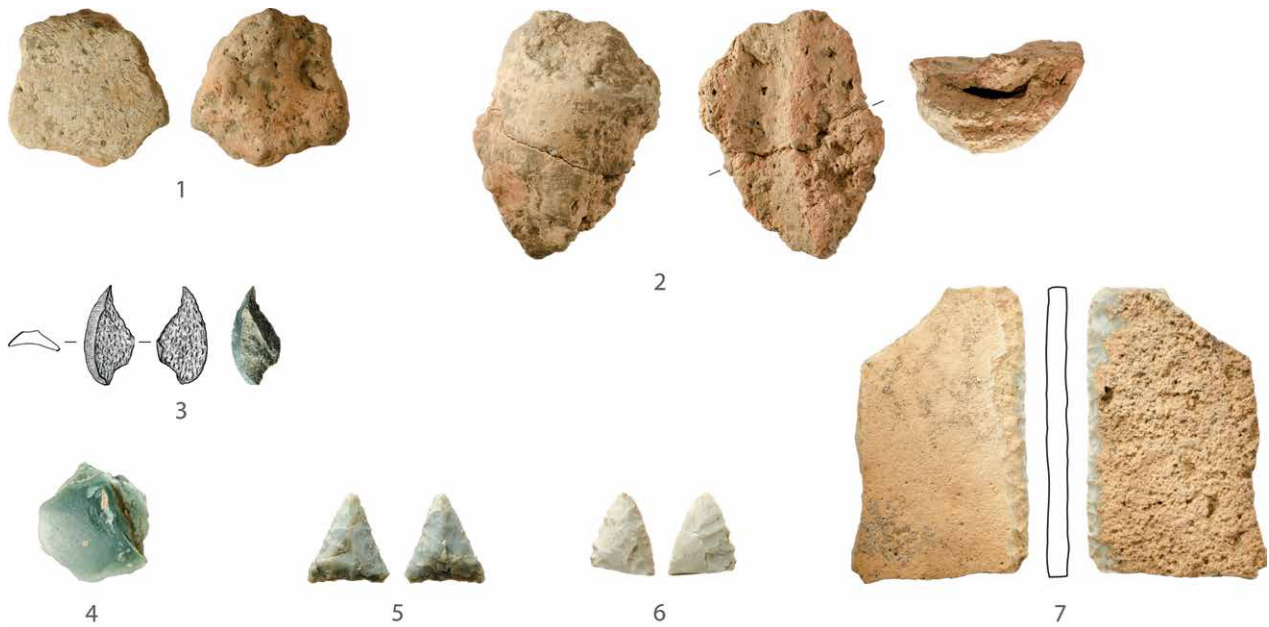Stone axes are represented only by some fragments of metamorphic rock with small areas of polished surfaces, most of them from trenches 1 and 2 (Fig. 15,3). Most interesting among them is a tiny fragment of a nephrite axe from trench 1 (Fig. 15,4; mineralogical analysis courtesy of Ulrich Schüssler, University of Würzburg). The material is light green and slightly translucent at the thin edges. The surface shows traces of polishing and a faint edge between two ground facets. Nephrite was already present within the raw material spectrum of "jade" axes that were widespread in Europe during the Younger Neolithic (cf. Pétrequin *et al.* 2012), some centuries earlier than the LN/EFN settlement at Burgerroth. It seems very possible that a fragment of an older object ended up in the filling of the pit house, especially as Younger Neolithic activities on the site were also indicated by some other findings (see above). However, nephrite was still used as a raw material during the Late Neolithic, especially in southern Germany and Switzerland.

### Burnt daub – and a loom weight?

Fragments of burnt daub were found in some quantities, as well in the two pit dwellings (as in the ditches' backfill). Some of the pieces show impressions of constructional elements or smooth surfaces on one of their faces. In some cases, the smoothened surface has a slightly whitish colour (Fig. 15,1), which might reflect a kind of surface finish.

One of the burnt daub objects deserves special interest: its smooth outer surface is roughly ball-shaped and it is broken along a straight-line perforation that runs through the whole object (Fig. 15,2). The object may be interpreted with some plausibility as a fragment of a loom weight. Loom weights are already known from the fourth millennium BC in central Europe. While the early specimens are mostly cone- or pear-shaped, round or ovoid forms with vertical perforation, such as the object under discussion, are primarily known from EFN contexts, such as settlements of the Horgen group or the CWC in Switzerland (Hafner and Suter 2005, Fig. 5A; Suter, 1987, 142, Pl. 79,6–10, Pl. 81,8–9) or the Cham culture in Bavaria (Matuschik 1990, 190–192, Pl. 29,2, Pl. 149; 1991, Fig. 4,16–17; 1999, 74, Fig. 4,16–17).

## Interregional entanglements

The brief overview of the find material from the 2013–14 sondage excavations can provide some clues about cross-regional relations. As Spennemann has already pointed out (Spennemann 1984, 137–142; 1985, 135), the find material from Burgerroth shows close typological similarities with the neighbouring cultural groups of Bernburg, Wartberg, Goldberg III, Cham, and Řivnáč. On a broader, regional level, connections to the north, specifically to the Bernburg and Wartberg groups, are probably the most apparent element of the LN/EFN in Franconia. Apart from Burgerroth, this is more clearly documented at a small number of other sites: most importantly at Prosselsheim and Schwanfeld in the eastern Main triangle (Lüning 1999; Pescheck 1976), Voitmannsdorf in Upper (i.e. eastern) Franconia (Dürr *et al.* 2004, 27–29), and the collective graves at Großeibstadt in the north of the region (Koch 2014). The latter can be classified as "veritable" Bernburg graves and have their closest parallels in central Germany.

Interregional entanglements are much more complex, though. As has been indicated above, it is hard to identify the criteria for exclusively assigning individual objects to specific super-regional influences or different "cultural groups", as the type spectrum in many regions is very similar in the LN/EFN and mainly differs quantitatively. Some examples may illustrate this.

Surface roughening of the vessels' lower parts by coiled cord impression ("mat roughening") is especially typical for the Wartberg and Goldberg III groups, but also occurs in Cham, Bernburg, and others. Within the chronological development of these groups, it is mainly characteristic for the younger phases. Roughening by brushing, on the other hand, is mainly known from the eastern groups of Cham, Řivnáč, and Jevišovice, but is not common in Goldberg III (cf. Burger 1988, 147–148; Gohlisch 2006, 184; Matuschik 1999, 72–73; Schlichtherle 1999, 44). At Burgerroth, "mat roughening" is by far more common, but brushing also appears.

Plastic ridges are also widespread in different regional groups. The Cham group, particularly in its earlier phase, does have some characteristic features: ridges with deep notches or finger imprints, which are often grouped together to subdivide the vessels' surface horizontally and vertically (cf. Burger 1988, 56; Gohlisch 2006, 174–177; Matuschik 1990, 434–436; 1999, 73, 84–85). Cham style notched or grouped ridges are known from Burgerroth (Fig. 12,2 or Spennemann 1984, Pl. 47, 389), but are a rare type, which might have chronological as well as regional reasons. In the Goldberg III group, on the other hand, ridges are predominantly plain and run horizontally at the vessel's shoulder. Frequently, they mark the border between the roughened lower and the undecorated upper parts of large pots (Schlichtherle 1999, 39, Fig. 5–9). This layout is also frequent at Burgerroth (Spennemann 1984, Pl. 33,236; or Fig. 12,1, but with a notched ridge and a shape that is not typical for Goldberg III but finds better parallels in Cham). However, many pots do not have this kind of bordering ridge; instead, the transition between the roughened lower and the plain upper parts is emphasised by a small offset in the profile (Fig. 8,12 or Spennemann 1984, Pl. 41,310, Pl. 49,438, Pl. 51). This is common in the Goldberg III group, too, but more frequent in the Wartberg group.

Handles and lugs are known from almost everywhere during the LN/EFN. There seems to be a tendency for handles to be more common to the east and to the north; broad band handles – such as the specimen from trench 3 (Fig. 11,7) and several others from the 1920s excavation (Spennemann 1985, 136, Fig. 1–3, 6–10) – are most common in the Bernburg culture (cf. Dirks 2000, 41–67; Gohlisch 2006, 181–182; Matuschik 1990, 491, 495; Torres-Blanco 1994, 161–162, 169–172).

Because of its high degree of fragmentation and general rarity, the decoration of the pottery from Burgerroth provides little evidence with regard to regional styles. Most of the incised lines or stroke decorations are rather unspecific, with only a small number of more "sophisticated" motifs. Cross hatched incised lines, for example (Fig. 8,14 or Spennemann 1984, Pl. 47, 380–381), are a common motif in the Bernburg and Wartberg

regions, but are also known from Goldberg III and to a lesser degree from Cham (Gohlisch 2006, 184; Matuschik 1990, 490, 496; Schlichtherle 1999, 39–40, Fig. 7,10; Spennemann 1985, 148 note 4; Torres-Blanco 1994, 161–162, 171, Pl. 3,13). Cord decoration, as already pointed out, is a characteristic of the CWC but already appears in some of the LN/EFN regional groups. Both examples again show the problems associated with the "cultural" attribution of individual ceramic style elements.

To sum up, the problem with the LN/EFN "cultural groups" is that we cannot find types that are characteristic for only one group and could be clearly classified as foreign elements if found in another region. On the contrary, most features, such as large pots with roughened surfaces on their lower parts, slightly biconical vessels with shoulders accentuated by profile offsets, plastic ridges, rows of perforations below the rim, or band handles, are present in most of the regional groups. They do, however, vary in their frequency, which might provide a starting point for differentiation on a quantitative basis in the future – but this remains to be worked out with larger datasets and on a broader scale.

Aside from pottery, some other elements of material culture illustrate regional entanglements as well. As pointed out above, antler sleeves are an abundant tool type at Burgerroth. This is especially significant, as they are rather uncommon in the neighbouring cultural groups to the southeast (Cham) and to the north (Wartberg, Bernburg) (Matuschik 1990, 206–209, 495–499, Pl. 157,8–11). In the lakeside settlements of the alpine foothills, on the other hand, antler sleeves were abundant during the whole of the Late and Final Neolithic. Burgerroth stands out as the northernmost site where antler sleeves were used in large quantities; this clearly illustrates cultural connections towards the south. Interestingly, the regional contrast in the distribution of antler sleeves remains the same during the CWC period; this means that the presence or absence of antler sleeves reflects a long-standing regional differentiation in the use of a specific tool type and not a distinction between archaeological "cultures".

As pointed out above, "pit houses" or sunken-floor dwellings were widespread in the fourth and third millennia BC. Key features of the two newly excavated examples from Burgerroth are their rectangular shape, flat bottom, and a shallow central pit. These elements, including a diameter of around 3–6 metres, define a specific building type that occurs at many other sites as well. In particular, the central pit seems to be a characteristic trait for a group of LN/EFN pit houses in southern central Europe. The nearest analogies are the pit house in Schwanfeld (Lüning 1999) and the more than 50 houses at the Goldberg (Bersu 1937). Other close analogies of pit dwellings with central pits can be found in Baden-Württemberg at Stuttgart-Stammheim, Stuttgart-Hofen (Matuschik and Schlichtherle 2009, 18–21; Schlichtherle *et al.* 2009), and Mühlheim-Stetten (Lkr. Tuttlingen; Hietkamp and Hanöffner 2005), or in the Middle Rhine region at Ochtendung and Mayen (Lkr. Mayen-Koblenz; Hecht 2007, 138–141; 2008, Fig. 5,1–3.9–10). Most informative are a number of sites in Switzerland: Baar-Früebergstrasse (Kt. Zug), Bramois-Immeuble Pranoé D (Kt. Vallais), Castaneda-Pian del Remit (Kt. Graubünden), Rudolfingen-Schlossberg (Kt. Zürich), Uerschausen-Horn (Kt. Thurgau), and Wartau-Ochsenberg (Kt. St. Gallen) (cf. Mottet *et al.* 2011, 177–180, with further literature). This list could be complemented by an even larger number of pit houses or sunken-floor dwellings without central pits or with irregular shape from a much wider region, including large parts of central Europe.

At some of the mentioned sites, the central pits showed traces of fire or contained burnt daub or stones and were therefore interpreted as hearths (*e.g.* Bramois, Uerschhausen-Horn, Rudolfingen-Schlossberg). In other cases (*e.g.* Stuttgart-Stammheim, Goldberg), charcoal and burnt stones were present in or around the pit, though no direct effects of fire on the pit's surface could be detected, which might indicate that the pit was used for collecting ash from a nearby hearth (Matuschik and Schlichtherle 2009, 18–23). In others, no fire effects could be detected at all (*e.g.* Wartau-Ochsenberg, Mühlheim-Stetten, Schwanfeld). Also, the two pits at Burgerroth did not show any direct traces of fire, although burnt stones were present in some quantity, but

without clear concentrations, throughout the whole dwellings' infill. Although the central pits are a common characteristic, it seems that they did not have the same function in every individual site and building.

To sum up, different aspects of material culture give indications of entanglements with different regions. Within Franconia, there is considerable variation, too: at sites such as Schwanfeld, Prosselsheim, and Großeibstadt, connections to the north are much more predominant, while at Burgerroth, connections towards the north, south, and east are more or less equally present. On the other hand, there are clear connections to the south at Burgerroth, which are missing at other sites in the region, most evidently illustrated by the abundance of antler sleeves.

## Chronological entanglements

As has been shown above, various interregional connections are visible in Burgerroth's material culture. But there is another important point to be made, which concerns chronological rather than regional entanglement: the fact that at Burgerroth CWC domestic pottery appears in association with typologically LN/EFN find material. This, of course, leads to the question of absolute chronology.

### Radiocarbon dating

A first radiocarbon date was already published by Spennemann in the 1980s; however, with its large standard deviation, it only gives a very rough age determination to the first half of the third millennium BC (Fra-86: 2881–2306 cal. BC/95.4% probability). In the course of the new investigations, seven radiocarbon samples have been dated (Tab. 1 and Fig. 16), all of them short-lived plant macro remains (esp. cereals[2]). Two dates from the pit dwellings mainly span the 27th to 24th centuries cal. BC (Beta-372689: 2568–2346 cal. BC/95.4% probability [trench 1]; Beta-372690: 2666–2476 cal. BC/90.9% probability [trench 2]). Another sample from trench 1 dates to 2024–1891 cal. BC (MAMS-25467, 95.4%); the young date suggests that it had probably been contaminated by younger or modern material. Three dates from the ditch system (trench 3) are only slightly older than the dates from trenches 1 and 2 and range from the 29th to the early 25th century cal. BC (Erl-20204: 2640–2469 cal. BC/88.8%; Erl-20206: 2867–2566 cal. BC/91.6%; MAMS-25468: 2857–2569 cal. BC/93.2%). A fourth one, however, is considerably older (Erl-20205: 3762–3534 cal. BC/95.4% probability) and could be related to a hypothetical prior settlement phase dating to the Younger Neolithic, which is also indicated by sporadic finds (see above).

As already pointed out by Dirk Raetzel-Fabian and Martin Furholt, radiocarbon dates cannot be reliably differentiated within the flat plateaus of the calibration curve in most cases, but only between different "wiggle zones" (Furholt 2003a, 4–5; 2003b, 15–18; Raetzel-Fabian 2001a). The dates from Burgerroth mainly span the wiggle zones 2880–2580 cal. BC and 2620–2480 cal. BC. The end of the wiggle zone around 2480 cal. BC shows up very clearly in two of the dates (Beta-372690, Erl-20204), while two others have their main probability ranges within the 2880–2580 cal. BC wiggle zone (MAMS-25468, Erl-20206). Only one date (Beta-372689, trench 1) extends into the following wiggle zone, 2460–2200 cal. BC. Bearing in mind that the other sample from trench 1, which comes from an only slightly higher stratigraphic position in the same archaeological feature, is clearly too young (see above), it seems possible that the sample with the latter date has also been contaminated by younger material. Thus, it remains uncertain if settlement activity at Burgerroth really continued as long as the 25th or even 24th century cal. BC; the other dates rather indicate an end during the 26th century or around 2500 cal. BC at the latest.

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2    Botanical analysis courtesy of Christoph Herbig, Rodenbach.

| Sample | Uncalibrated | Calibrated 1σ (68.2%) | Calibrated 2σ (95.4%) | Context | Feature | Sample material |
|---|---|---|---|---|---|---|
| Fra-86 | 4040±100 | 2856–2467 | 2881–2306 | inner Neolithic ditch (Spennemann 1984) | | charcoal |
| MAMS-25467 | 3598±27 | 2013–1916 | 2026–1891 | trench 1, lower level above central pit | trench 1, D5; Pl. 6–7; feature 13 | 5 cereal grains, 6 fragments Carpinus betulus, 6 fragments uncertain cereal/pulse |
| Beta-372689 | 3950±30 | 2562–2351 | 2568–2346 | trench 1, filling of central pit | trench 1, D5; Pl. 9–10; feature 18 | 6 charred cereal grains |
| Beta-372690 | 4050±30 | 2620–2495 | 2835–2476 | trench 2, lower level | trench 2, E3; Pl. 2–3; feature 14 | 3 charred cereal grains |
| Erl-20205 | 4871±43 | 3697–3638 | 3763–3534 | ditch, fringe area of lower infill layer | trench 3, V-VI/03–04; Pl. 1–2; feature 21 | cereals |
| MAMS-25468 | 4091±27 | 2835–2578 | 2859–2501 | ditch, fringe area of lower infill layer | trench 3, IV–VI/03–04; Pl. 2A–2B; feature 21 | 4 fragments hazel nutshell, 1 cereal grain |
| Erl-20204 | 4036±39 | 2618–2488 | 2836–2469 | ditch, lower infill layer | tench 3, IV/05–06; Pl. 3–4; feature 26 | cereals |
| Erl-20206 | 4098±40 | 2850–2577 | 2870–2497 | ditch, lower infill layer | tench 3, IV/11; Pl. 3–4; feature 26 | cereals |

Tab. 1: Radiocarbon dates from Burgerroth. Calibration: OxCal v4.3.2 (Bronk Ramsey and Lee 2013; Reimer *et al.* 2013).
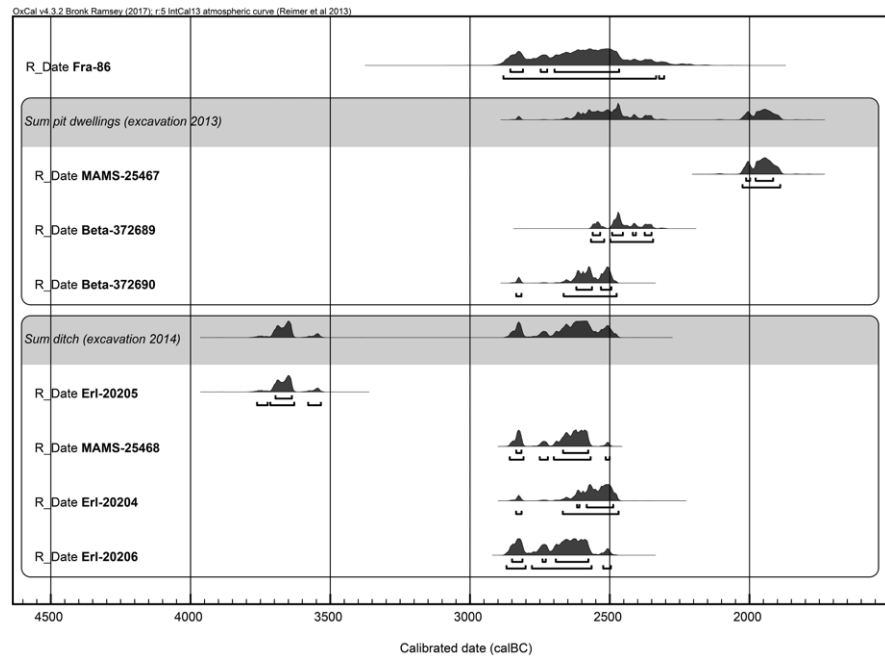


Fig. 16: Calibrated ranges of the radiocarbon dates from Burgerroth (cf. Tab. 1).

The radiocarbon dates from Burgerroth are remarkably young for the typologically LN/EFN material that makes up the largest part of the site's find spectrum. The Goldberg III group in Upper Swabia (southeastern Baden-Württemberg), for example, is dendrochronologically dated to the 30th to 29th centuries BC (Bleicher 2009, 154–157, 166). In contrast, the dates from Burgerroth clearly overlap with the early and middle CWC. A comparably long duration until the second quarter of the third millennium BC can also be assumed for the Cham and Wartberg cultures (Matuschik 1990, 436–445; Raetzel-Fabian 2002, 7–8).

Taking into account the young chronological position and its overlapping with the CWC, Burgerroth (as well as the younger phases of Cham and Wartberg) can hardly be classified as "Late Neolithic" anymore, but rather as "Early Final Neolithic with Late Neolithic traditions". These traditions seem to have survived for a fairly long time into the third millennium BC, and to have persisted while novel CWC elements were emerging or already common within the same region or even the same site. This idea is not new, as shall be pointed out below, but Burgerroth provides important new evidence for the discussion.

## Late Neolithic traditions and Final Neolithic innovations

Some interesting questions arise that, as yet, cannot be answered: How does Burgerroth relate to the contemporary CWC graveyards? Was it a "conservative" settlement that stuck to older traditions longer than others in its neighbourhood? Or was the commingling of CWC with Late Neolithic traditions far more common than we know so far, as we are missing the settlements and only see the graves with their new-style pottery that was deliberately chosen for the novel burial customs? What does this mean for the relations between LN/EFN groups and the CWC in general?

CWC sites are abundant in the Lower Franconian Main and Tauber valleys (Dresely, 2004; Schußmann, 2016). But all of them are graves or stray finds; no settlements are known in the region. The rarity or lacking of CWC settlements is a widespread phenomenon and virtually characteristic of the epoch in many regions. One exception is Upper Franconia (about 100 kilometres east of Burgerroth), where several CWC settlement sites have been discovered over the last two decades and a larger-scale excavation has taken place at the Motzenstein (Seregély 2008). However, the Upper Franconian example shows that the detection of CWC settlement sites is largely dependent on systematic field research in specific types of locations – including peripheral situations on hills or hillslopes with low soil quality, which, at first sight, seem rather unfavourable for prehistoric settlement (*e.g.* the Rothenstein: Seregély 2012).

According to Furholt's analysis, the largest part of the radiocarbon samples from CWC contexts in southern and central Germany post-date 2600 BC, while a few of the earliest dates fall into the wiggle zone of 2880–2580 BC. In accordance with dendrochronological data from Switzerland, the beginning of the CWC in southern central Europe can be dated to the 28th century BC, most probably its second half (Furholt 2003a, 8–17; 2003b, 118–124). In the Tauber valley, close to Burgerroth, the CWC might have started somewhat later, around 2700 BC or during the 27th century at the latest (Furholt 2003b, 77–79). This means that the dates from Burgerroth clearly overlap with the early and probably even middle stages of the CWC on a super-regional as well as on a regional scale.

Chronological overlapping with the early CWC can be assumed for a wider range of LN/EFN contexts. For example, it has been argued that the Cham, Bernburg, and Wartberg cultures lasted well into the second quarter of the third millennium BC (Matuschik 1990, 436–445; Raetzel-Fabian 2001b, 110–116; Seregély 2008, 155). On the basis of radiocarbon dating alone, however, it is hard to argue against cultural succession or in favour of contemporaneity on smaller regional scales, as much statistical uncertainty remains. But also "contact" finds indicating contemporaneity and the coexistence of CWC with LN/EFN groups are known from a considerable number of sites all over central Europe (cf. the compilation by Furholt 2008, 20–27). As a conclusion and in contrast to classical migrationist models, Furholt has pointed out that the early CWC did not replace its regional predecessors right away but evolved as a super-regional semiotic network that coexisted with persisting regional traditions (Furholt 2003a, 13–22, 25–26; 2003b, 124–130; 2004). A similar view is held by Christian Strahm, who argues that the CWC was a novel social and ideological concept that had been formed by a combination of different cultural elements from preceding regional groups and, once established, had a transformative effect on neighbouring groups (Strahm 2010, 321–323). The presence of CWC domestic pottery among the predominantly LN/EFN find material at Burgerroth in association with surprisingly young radiocarbon dates strongly supports these ideas. The evidence suggests that the CWC innovations were not fully adopted as a "cultural package", but were selectively taken over in settlements that otherwise held onto LN/EFN traditions.

However, CWC migration from eastern central Europe cannot be ruled out altogether. The CWC did in fact emerge earlier in the east than in the west. The latest evidence from aDNA analysis (Furtwängler *et al.* 2020) suggests that the genetic impact from eastern Europe first appeared during the first half of the third millennium BC in southwestern central Europe. However, there is no need to turn back to the "steppe invasion" model:

the newcomers did not replace the local population right away, but instead, both genetic lineages seem to have slowly mixed with each other over the course of several centuries. This again is in good accordance with the archaeological evidence as described above: migrant groups from the east may have been a major element in spreading the CWC cultural innovations, but they neither radically pushed local populations away nor completely superseded regional cultural traditions.

## Conclusion

As the analysis of the find material from Burgerroth has shown, it is very hard to give a "cultural" attribution on the basis of single sherds or a small corpus of finds. What is more, it is virtually impossible to define borders between the different "cultural" groups of the LN/EFN. As has been pointed out above, this is certainly due to the poor state of research to some extent, but it might also reflect a characteristic situation during the late fourth and the early third millennia: there were no regionally confined cultural entities, but a "continuum" with gradual shifts in material culture between different regions. Identifying cross-regional entanglements will thus only be possible by analysing large find complexes on a quantitative basis. However, in many regions, no such large find complexes are available so far – for Franconia, future research in Burgerroth could be a good starting point.

Looking at the chronological rather than the regional dimension, the evidence from Burgerroth supports the idea that Late Neolithic traditions survived for far longer than generally expected during the Early Final Neolithic, and in some regions, they persisted even after the CWC was established.

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# How wide are social frames of cultural diversity and mutual cultural influences?

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## Abstract

*This paper aims to analyse the mutual influences between archaeological cultures with a greater and lesser degree of diversity, and questions the social framework for these influences. Mutual interactions are considered through the toy model of dynamic cultural development. Despite such an oversimplified picture of the prehistoric past, which represents the probability of interactions based only on the number of elements in a set and their possible combinations (the theory of W. Brian Arthur), the model outcomes are relatively consistent with a number of observed archaeological phenomena. Social frames of cultural diversity and culture change are discussed across the long-term and middle-term perspectives. In the former case, an increase in social complexity results in an increase in cultural diversity. In the latter case, culture change driven by its internal forces may also occur in societies characterised by stable sociopolitical organisation. This raises the issue of the relationship between social complexity and dynamic cultural diversity.*

*Keywords: cultural diversity, influences, interactions, social complexity, Neolithic, culture change*

## Introduction

Over the decades, "archaeological" cultures have been considered one of the most important tools in systemisation and interpretation. From the perspective of data analysis, "archaeological culture" means nothing but a certain degree of similarity between artefacts, funerary traditions, house construction techniques, and so on in a particular place and time period (*e.g.* Furholt 2011). However, since the term was introduced in archaeology, it has caused active debates on ethnic or social integrities beyond similar pots, settlements, and graves (Kossinna 1919; Childe 1929; 1956). For the past century, those connotations framed discourses in European archaeology, in which the concept of "cultures" persisted through processualist ignorance (*e.g.* Binford 1965; Shannon 2002) and post-processualists' reframing as a "common underlying scheme" (Hodder 1982). Several more recent papers suggest the application of ceramic styles, social fields, and networks as alternatives to "archaeological cultures" (*e.g.* Furholt 2011; Kohl 2008; Nakoinz 2013; Wolf 1982; 1984). Other approaches looking for patterns in the archaeological record and human behaviour in the remote past consider "culture" as a reliable analytical tool (*e.g.* Roberts and Vander Linden 2011a). The third science revolution in archaeology, as defined by Kristian Kristiansen (2014), significantly shifted how similarities in material assemblages are considered to focus on their integration with genetic, strontium isotope, and linguistic data (*e.g.* Anthony 2007; Haak *et al.* 2015; Kristiansen 2014; Kristiansen *et al.* 2017; Lazaridis *et al.* 2014; Mathieson *et al.* 2015; 2018; Roberts and Vander Linden 2011b). Meanwhile, the optimism of the explanatory

potential of this approach almost immediately faced scrutiny and critical remarks (*e.g.* Furholt 2019; Heyd 2017; Kolař 2018; Müller 2013; Vander Linden 2016).

Recent studies dealing with the modelling of cultural development and the evolution of artefact types identified cultural systems' complex dynamic behaviour (*e.g.* Bentley and Maschner 2003; Lipo *et al.* 2006; O'Brien and Lyman 2000; O'Brien and Shennan 2010; Shennan 2002; 2008; 2009). The outcomes of these studies raise a number of epistemological issues. To what extent are different aspects of the archaeological "culture debate" caused by trigging culture in its widest sense to mirror economic development, ethnicity, and social life? Can internal complex cultural dynamics be misunderstood for culture changes caused by migrations or social transformation? And if so, do we require more sophisticated approaches to social relations, cohabitation, and political organisation? Contributing to these issues, our paper aims to analyse the mutual influences between greater and lesser diverse archaeological cultures. In this context, we equate diversity with the category of "richness", estimated using Hartley's (1928) entropy and representing the number of system states.

First, we provide examples of mutual influences between different cultures. Second, our paper presents the toy model of the dynamic prehistoric culture. Third, influences of more diverse cultures on less diverse entities will be considered. Fourth, we question the relationship between social organisation and cultural dynamics.

## Two macroregional examples of trans-European debates

Based on a significant amount of empirical evidence, recent "cultural debates" in European Neolithic archaeology mainly occur around two issues. These are the cohabitation of different communities corresponding to weak or one-directional cultural influences, and a search for external sources that influence significant cultural transformations in macroregions. The first issue is exemplified by the spread of early farmers to areas inhabited by hunter-gatherer groups, or economic interactions between pastoralists and early farmers. The second general issue highlights various macroregional debates on mutual influences between populations that have been classified into different archaeological cultures or cultural complexes. In both cases, culture and mutual influences are considered in the broad terms of population groups' subsistence strategies and social organisation. We have chosen two examples from Neolithic central Europe and the neighbouring regions to illustrate these discussions.

Let us begin by addressing the cohabitation of early farmers and hunter-gatherer communities. Early farmers, represented by the Linear Pottery (LBK) culture, arrived in the southern part of present-day Poland around 5600–5500 BC. It took a relatively short time for them to reach the Polish Lowland and the shores of the Baltic Sea. However, the settlement was of an insular nature, limited to productive, fertile soils. The newcomers entered lands inhabited by Mesolithic hunter-gatherers related to post-Maglemosian, Janisławice, and the latest Komornica societies (Czekaj-Zastawny and Kabaciński 2016). Utilising ethnographic observations and a general knowledge of human curiosity, we may assume that the "local" and "stranger" communities were in contact with each other. Evidence for sporadic contact between these societies is present in the results of central European population genetic studies (Bramanti *et al.* 2009). Surprisingly, and contrary to results from other European regions (*i.e.*, southern Germany and Austria – Gronenborn 1997 or France – Lenneis 2002), we do not observe a mingling of Mesolithic and Neolithic materials. Sites in Poland only register a few examples where items typical for Mesolithic populations were found at Neolithic sites and vice versa. Exceptions usually consist of amber nodules, single fragments of LBK vessels, and occasionally stone tools (Czekaj-Zastawny and Kabaciński 2016; Kozłowski and Nowak 2019).
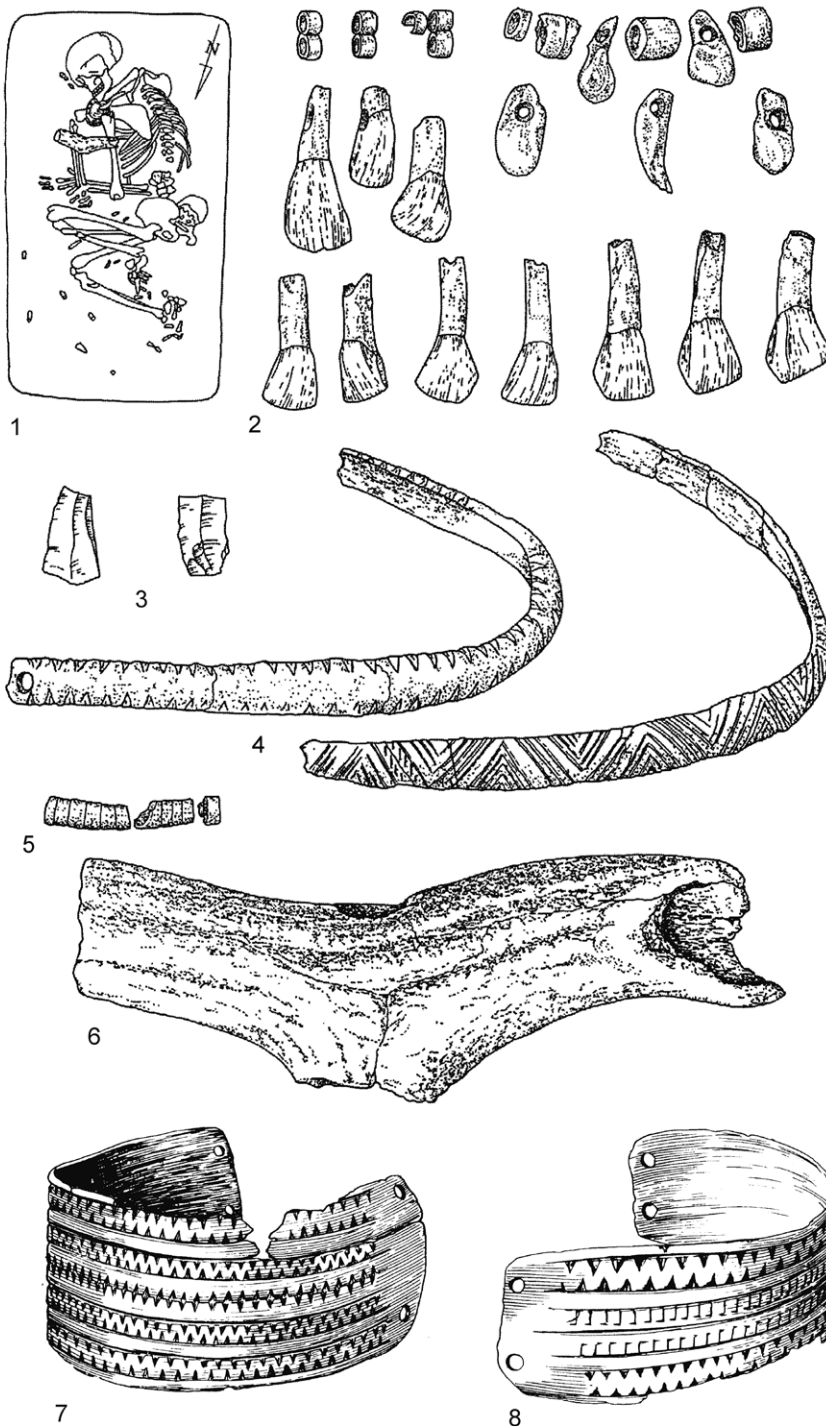
Fig. 1: Brześć Kujawski, site 4. 1, 5, 6 – Grave XXIX, 2–4 – Grave XXV, 7–8 – Grave VI (redrawn from Jażdżewski 1938).

Intensive interactions between early farmers and hunter-gatherers are only observed in the second half of the fifth millennium BC, when the vast area of present-day Poland was settled by Lengyel groups. The results of these contacts are clearly visible in "Maglemosian" ornaments, including bone bracelets and armlets, necklaces made of wild animal teeth, boar tusk pendants, and T-shaped axes crafted from red deer antler given to members of the Brześć Kujawski group of the Lengyel culture as grave goods (Fig. 1; Czerniak 1980). Genetic research further confirms that integration was intensifying

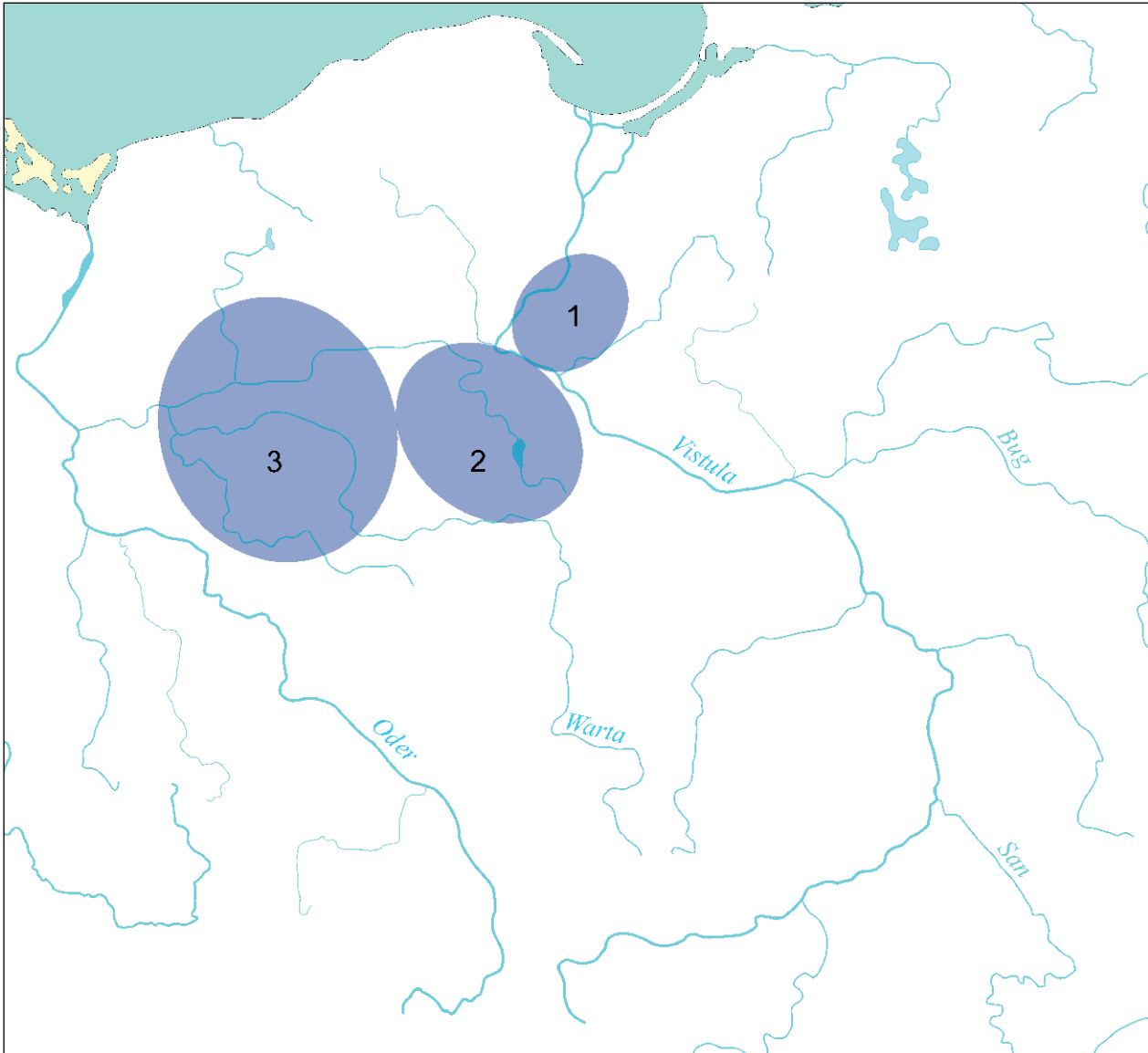Fig. 2. Distribution of the Mątwy cultural component (*MCC*). 1 – Chełmno Land, 2 – Kujavia, 3 – Greater Poland.

(Lorkiewicz *et al.* 2015; Fernandes *et al.* 2018; Mathieson *et al.* 2018). However, these two parallel worlds persisted for almost 1500 years, until the development of the Funnel Beaker (TRB) culture (Kozłowski and Nowak 2019).

The second example seeks external sources of TRB cultural transformations. Around 4000 BC, at the northeastern border of TRB ecumene (Chełmno Land, Kujavia, and Greater Poland), new styles of pottery technology and decoration occur (Fig. 2). It is worth highlighting that Konrad Jażdżewski (1936) was the first person who paid attention to simple pots with porous walls ornamented by band comb, which occurred in the Wiórek phase of TRB development. At that time, he was not able to find any analogies to these vessels.

Forty-five years after Jażdżewski's work, researchers noticed that alongside the original Kujavian TRB technology (use of fine-grained, poorly visible grog as a tempering inclusion, and very careful mixing of the clay paste), in phase IIB/IIIA-IIIA of its development, the occurrence of vessels made of clay paste tempered with shells (Fig. 3; Kośko 1981; 2003). Adding crushed shells increases a vessel's thermal shock resistance, but also makes the walls susceptible to breakage due to the chemical reaction that results from burning calcium carbonate. This technology is characteristic of the Mątwy
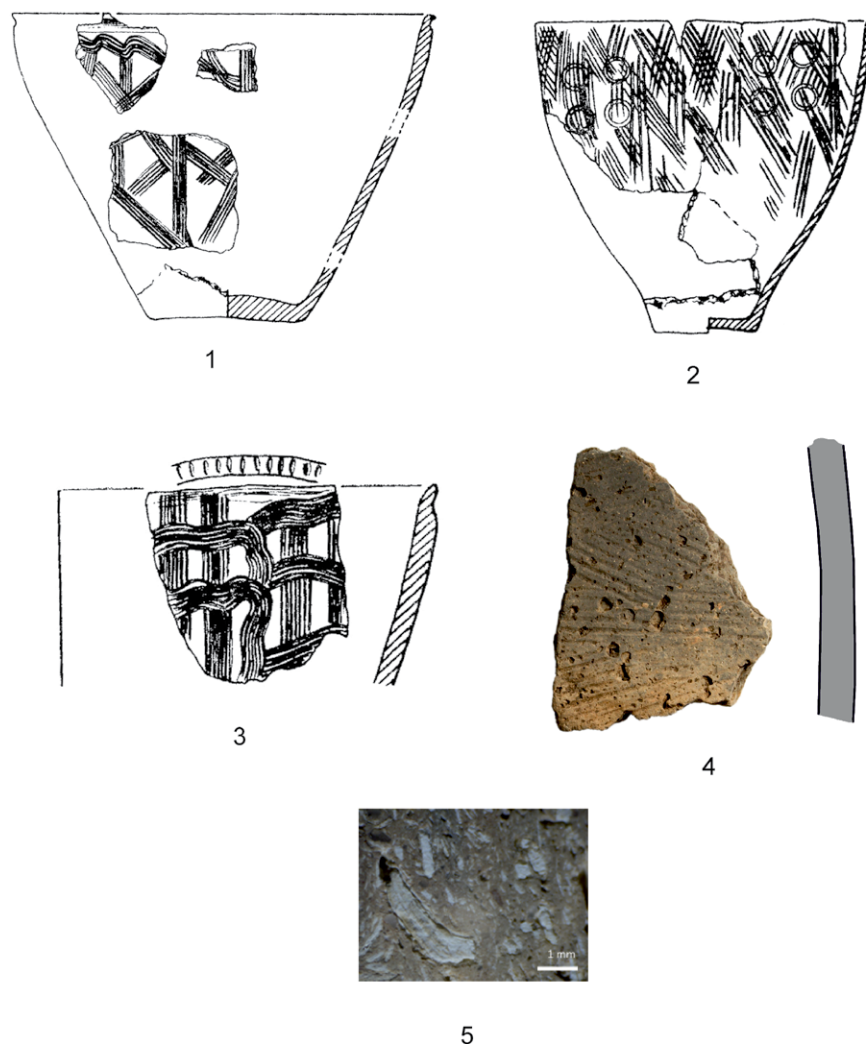
Fig. 3. Pottery ornamented with band comb and microphotography of pottery tempered with crushed shells. 1, 3 – Inowrocław-Mątwy, site 1; 2 – Inowrocław-Mątwy, site 5 (redrawn from Kośko 1988); 4, 5 – Kopydłowo, site 6 (redrawn from Bartkowiak and Sobkowiak-Tabaka 2015).

cultural component (*MCC*) and was mostly used during TRB phases IIIB/IIIC – IIIC/IVA (3700–3150 BC) at Kujavia (Kośko and Łuksza, 2007). Vessels produced in this manner were ornamented with band comb and considered by Aleksander Kośko (1981; 1988) to be the result of interactions with southeastern population groups (from the area of Middle Dnieper and Lower Pripyat), and strongly influenced by the Tripolye cultural traditions. Additionally, vessels painted using black dye or ritual containers richly decorated with cord imprints (again characteristic for Tripolye culture) also appeared. At the same time, items made of Volhynian flint and Volhynian basalt from the territory occupied by the Tripolye populations made their way into the TRB assemblages (Kośko 1988).

Analogous decorated vessels made of clay and tempered with crushed shells also occurred at the Chełmno Land, and were associated by S. Kukawka (1997; 2010) with northeastern influences from the Narva culture. S. Kukawka dates this phenomenon to approximately 3900–2800 BC. Another hypothesis regarding pottery that was ornamented using band combs and crafted from clay with a mixture of crushed shells links these ceramics to migrations from the region surrounding the Black Sea to the Polish Lowland around 5400 BC, as suggested by Danuta Prinke (2008). This explanation, however, remains unlikely, as the first 1500 year stage of this pottery's 2500 year production was not detected in the archaeological material (Kukawka 2010).

## The toy model of dynamic culture

Let us start the analysis of mutual influences between greater and lesser diverse cultures by examining the dynamics of cultural development. Culture changes may be considered through the toy model, which is based on W. Brian Arthur's (2009) theory and describes the evolution of technology. According to this concept, the evolution of material culture may be triggered by a process of combining and recombining cultural elements. Introducing a new element into a pre-existing set combines this invention with other elements and their further recombination. Therefore, combination is the underlining principle of the hierarchical nature of culture (Arthur 2009).

With a given amount of simplification, such hierarchical structures may be described by exponential equations. For example, let us consider pottery ornamentation. Its basic elements are represented by simple geometrical shapes, further labelled as "components". The combination of several "components" results in a "symbol", while the combination of "symbols" produces "motifs" or "ornamentation schemes". Let us assume that components, symbols, and motifs may be simultaneously used in pottery decoration. Since symbols and motifs are constructed from components, the maximal number of components, symbols and motifs ( $N_{max}$ ) that are used in a particular culture is estimated as follows:

$$N_{max} = 2^n - 1, \text{(equation 1)}$$

where *n* is the number of components.

We should admit that equation 1 excludes the combination of a component with itself. For instance, a symbol consisting of five, 15, or 25 repeated components is typologically treated as a single symbol. Equation 1 also does not account for the order in which components are combined. For example, the initial four components "produce" the maximal number of 15 components, symbols, and motifs. Six of these 15 are combinations of two components; the other four are the combinations of three components; and one is the combination of four components. If both listed restrictions are withdrawn in order to bring the model closer to archaeological reality, the maximal number of components, symbols, and motifs is estimated as the sum of the maximal possible number of combinations of all possible number of components:

$$N_n^k = n^k, \text{(equation 2)}$$

where $N_n^k$ is the maximal possible number of combinations of *k* components in the set of *n* components.

Applying equation 2 to the set "produced" from four initial components gives an estimate of 16 possible combinations composed of two components, 64 possible combinations composed of three components, and 256 possible combinations for four components.

The diversity of culture and its structural components is a quantifiable measure if diversity is considered as entropy. Most recent archaeological studies apply Shannon's entropy (also known as Shannon's diversity index) to estimate cultural diversity (Bevan *et al.* 2012; Crema, 2015; Drost and Vander Linden 2018; Furholt 2012; Gronenborn *et al.* 2017; 2018). In this paper, we apply Hartley's (1928) entropy, also known as maximal entropy, and "artefact richness". Hertley's entropy is expressed as follows:

$$H_{max} = \log S , \text{(equation 3)}$$

where *S* is the number of system states.

Entropy (diversity) increases as the relative frequency of components and their combinations approaches uniform distribution. The increase in the number of components and their combinations also increases the entropy. Let us now implement these probabilities for mutual interactions into the toy model for dynamic culture.

## Approaching cultural influences

Similarly to the theory of Arthur, Homer G. Barnett's (1953) remarkable book *Innovation: The Basis of Cultural Change* considers innovation as the result of a mental process of "combination", namely the linkage or fusion of two or more [existing] elements in a new way. It is also worth highlighting that Barnett (1953) also developed a model for innovative (or interpretative) process. This process constantly creates changes – *innovations* – even if we cannot recognise them and thus call them changes. But before an innovation becomes customary, other people must first adopt and practice it. Thus, innovations as synthetic elements are needed to stabilise the constantly changing world (Godin 2016). Mansfield (1968) presented a sequence of events that leads to change: invention → innovation → imitation → diffusion, where invention (something very new) is adopted by a leader early on, and then by other individuals, then groups, firms, and whole countries; innovation is the commercialisation (spread) of invention; imitation is the use of new technology, and diffusion is the subsequent replacement of the old technology for a new one (also see: O'Brien and Bentley 2019; Shennan 2002). It should also be noted that invention does not necessarily arise as something completely *new*, but may be *new* only to a certain cultural system, which is in fact borrowing from some other cultural set.

Aside from the measure of diversity, entropy can be used as the probability that a new component will be introduced into a cultural set (Shannon 1963). Let us assume that there is an equal probability a new component will be introduced, and any existing component will be reproduced, and a combination of components. Since only the introduced component may be combined with other components, we distinguish the probability for introducing a component from the probability it will be combined with the other components.

Fig. 4 demonstrates the decrease in probability for the introduction of a new component with the increase in pre-existing components in sets composed of between one and ten initial components. This probability (entropy) is estimated by applying equation 3. The probability for the reproduction of already-existing components increases even more rapidly when their number within a set increases. Therefore, when two cultural systems characterised by different degrees of diversity interact with each other, the less diverse system has a higher probability of adopting cultural elements from the more diverse system.

We can now turn to the combination and recombination of components that were already introduced into a cultural system. To estimate the difference ($D$) between the maximal possible number of components enabled by the introduction of a new component and their number prior to the introduction of a subsequent new element, equations 1 and 2 should be rewritten as follows:

$$D = 2^n - 2^{n-1} - 2n + 1 \text{ (equation 4)}$$

$$D = \sum n^k - \sum (n-1)^k - 2n + 1 \text{ (equation 5)}.$$

Fig. 5 represents the entropy estimated with equation 3. Estimations are based on values of $D$ obtained for sets composed of between one and ten initial components (per the values estimated with equations 4 and 5). Since a new component has already been introduced into a set, the probability of its combination with other components increases.

Fig. 4. Probability (entropy) for the introduction of a new component into a cultural set, and the reproduction of an already-existing component.
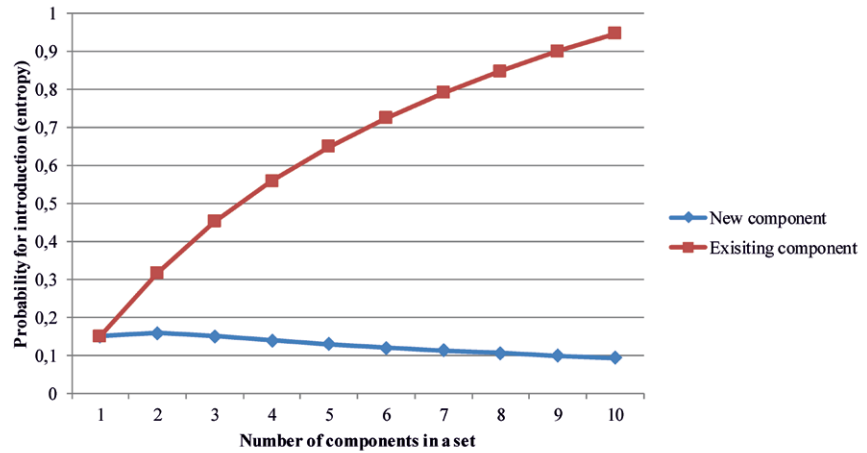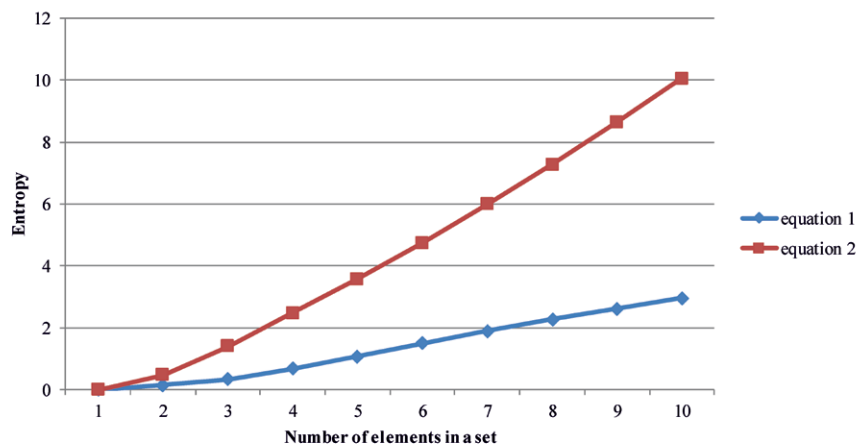


Fig. 5. Maximal entropy caused by probability for combination of a newly introduced component with other components and their combinations (estimated with equations 2 and 3).

## Conclusion and discussion

Of course, the presented toy model produces an oversimplified image of cultural interactions. Despite these limitations, the model outcomes are quite close to a number of observed archaeological phenomena. For instance, the most striking fact concerning LBK development is the great uniformity of cultural features throughout Europe; only small regional differences are observed, which increase during the last stages of LBK development, enabling the further expansion and differentiation of the Danubian system (Kabaciński 2010; Czekaj-Zastawny 2016). This great homogeneity collapsed within the Lengyel-Polgár complex, as is characterised by a greater number of initial components in the cultural set. Diversity is reflected in numerous regional groups; for instance, the Samborzec-Opatowice group, the Malice culture, the Lublin-Volhynia culture, the Jordanów culture, and the Brześć Kujawski group in Poland. Societies related to these units are more open to the influences of other cultures. This is most fully expressed in the Brześć Kujawski group, where Neolithic societies adopted Mesolithic ideas in funerary rites (Czekaj-Zastawny and Kabaciński 2016; Kozłowski and Nowak 2019).

A closer look at the TRB genesis in Poland enables us to distinguish the contribution of elements of the Danubian circle and local Mesolithic substratum, visible in flint processing techniques (*e.g.* similarities in size of artefacts, technology, and typology) and ceramic styles taken from Late Mesolithic societies along the southwestern shores of Baltic Sea (Kozłowski and Nowak 2019). The initial large number of components in

TRB culture resulted in its high internal differentiation, which is evidenced by many distinguished local groups, ceramic types, and even ceramic styles, which reflect contacts with societies in many directions (Nowak 2009).

At first glance, the probability for mutual cultural influences produced by the model are not correlated with past societies' sociopolitical organisation or demographic development. The only factor that impacts the probability cultural elements that are introduced between systems is the number of components already present in different systems (cultures). However, this approach does not explain the differing cultural diversity of synchronous population groups. What factors impact this difference, resulting in varied probabilities for the mutual influences?

Archaeological approaches to analysing long-term cultural development varies from a search for clear-cut formal criteria to relativism. The best example is probably the long-running discussion on the transition from large population agglomerations to early cities, and the transformation of cultures with different degrees of diversity to highly diverse civilisations (see Gaydarska 2016 for a recent overview). Since V. Gordon Childe, Marxist archaeology has considered a population size of over 5000 inhabitants as one of the criteria to identify cities and civilisations (Childe 1950; Kluckhohn 1960). A perspective on the cultural diversity in this discussion may be based on the consideration of culture as the information required to produce, reproduce, and spread knowledge, ensuring a [preferably] sustainable social existence (*e.g.* Aunger 2009). An increase in information storage capacity, which in the prehistoric case was limited to human memory, was enabled through the subdivision of information between population groups within a community or society (Bentley and O'Brien 2012; Johnson 2010). Therefore, the intensification of the internal social complexity supported the increase in cultural diversity (*e.g.* Gronenborn *et al.* 2018). For instance, a significant increase in the variability of material culture, funerary, and settlement complexes is noted in the Sabatinovka culture, representing the Late Bronze Age in Ukraine. The increase in cultural diversity was based on the internal division of labour into activities related to agriculture and stockbreeding (Bunyatyan 2003). Returning to the discussion on the distinction between culture and civilisation, greater population size in itself does not strictly cause an increase in cultural diversity, even when considering the effective population size instead of simple demographic estimations (*e.g.* Powell *et al.* 2010). However, population size frames thresholds for social complexity (*e.g.* Fienman 2013). In other words, 5000 people have a greater potential for internal structuring than 500 people, but this does not necessarily mean that this potential was exploited.

The causal relationship between social complexity and cultural diversity is not always the case in the middle-term perspective. Several recent studies identified Neolithic cultural cycles that represent the transition from more unified to more diverse assemblages, then back to unified. The cultural cycles do not correspond with any significant economic or sociopolitical transformations (Diachenko *et al.* 2020; Gjesfjeld *et al.* 2020). This raises the question of how internally driven forces of cultural behaviour behave when information storage capacity is stable. Considering this perspective, cultural assemblages may be more open to innovation in the phase of a cycle representing the transition from unification to diversity, and more closed to innovation in the phase of transition from diversity to unification (*e.g.* Shennan 2002).

Thus, one of the crucial aspects of further work on the correspondence between cultural diversity and social organisation is distinguishing cultural behaviour driven by internal forces and changes in social organisation, even if both factors result in similar trends. Mathematical simulations based on understanding prehistoric culture through the lens of information theory seem to be an appropriate way to reassess the complex structural connections between the economic development, sociopolitical organisation, demography, and cultural complexity of both prehistoric and (in the case of identifying long-term complex behaviour of the latter) modern societies.

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PART V

# SYNTHESES: AFTERTHOUGHTS, REFLECTIONS AND OUTLOOK

# Purging our approach to Neolithic societies: A critical review of the terms, analytical categories, and cultural concepts applied in research

*Brigitte Röder*

## Abstract

*Empirical research, the integration of methodological and theoretical approaches borrowed from the social sciences, and aDNA and isotope analysis are changing our view of the social conditions in the European Neolithic to a significant extent. Although this change might seem almost imperceptible, it is nevertheless fundamental in terms of both historical interpretation and epistemological approaches. This can be seen, for example, in the integration of new terms and analytical categories, such as "communities of practice". Boosted by the use of new methodological and theoretical approaches, the inventory of terms, concepts, and analytical categories is thus constantly being extended. While this results in a more diverse terminology, it also renders it increasingly incoherent. Therefore, one of the main objectives of this contribution is to reorganise this ever-growing array of tools and to initiate a discussion about whether some could, or perhaps even should, be winnowed out.*

*The second concern is to address the astonishing persistence of certain cultural concepts around the alleged "fundamental forms of human cohabitation". These include, for example, the notion that biological nuclear families are "the germ cells of all societies", and the ensuing tendency to project modern gender stereotypes onto prehistory. Despite the process of change mentioned above, such ideas still shape current research. This is reflected, above all, at the level of historical interpretation, which, as a result of cross-fading with cultural concepts, falls short of the innovative potential of new approaches, questions and perspectives.*

*Against this background, the "rethinking of Neolithic societies" should be accompanied by a "purging of the concept of society", since it is only by carrying out a critical review of the terms, analytical categories and cultural concepts that the current process of change will be allowed to develop its full potential.*

*Keywords: prehistoric societies, epistemology, analytical categories, cultural concepts*

# 1. Introduction

## 1.1 The difficulty in escaping from old ideas

*"The difficulty lies, not in the new ideas, but in escaping from the old ones, which ramify, for those brought up as most of us have been, into every corner of our minds".*
John Maynard Keynes, 1964 [1936]*, viii*

The appearance of this quote on my kitchen tear-off calendar was timely. Reflecting on the paradox of why current research on Neolithic societies is characterised by both dynamic change and tenacious persistence, it raised productive questions: Could the phenomenon described by the British economist John Maynard Keynes in relation to economic theory also apply to social archaeology? Could it be that innovative approaches that have the potential to revolutionise the way we look at Neolithic societies are not coming to full fruition because old ideas are ramifying into every corner of our minds? Are these old ideas the reason for the amazing persistence that slows down and hinders the change that is taking place? Keynes speaks of "a long struggle of escape [...] a struggle of escape from habitual modes of thought and expression" (Keynes 1964, viii). To pursue the questions raised in order to support and accelerate this "struggle of escape" in social archaeology is the background and concern of this contribution, which is intended as a discussion paper. In order to track and identify the old ideas, I will focus on influential heirlooms of research history, specifically on common terms, analytical categories, and cultural concepts, and I will subject them to a critical review so that the new ideas can unfold more freely.

## 1.2 A smorgasbord of terms and analytical categories

The starting point is my perception of recent research on social aspects in the European Neolithic, which is currently developing a strong dynamic. Empirical research, the integration of methodological and theoretical approaches borrowed from social sciences, and aDNA and isotope analysis have the potential to change our view of the social conditions in the European Neolithic to a significant extent. Although this change might seem almost imperceptible, it is nevertheless fundamental in terms of both historical interpretations and epistemological approaches. This can be seen, for example, in the integration of new terms and analytical categories, such as "communities of practice" (Heitz, in this volume; Gleich, in this volume), while other terms and concepts such as "society" or "archaeological culture" are increasingly being questioned (as with this volume) or even avoided, though ultimately not explicitly rejected.

Boosted by the use of new methodological and theoretical approaches, the inventory of terms, concepts, and analytical categories is thus constantly being extended. While this results in a more diverse terminology, it also renders it increasingly incoherent, because concepts and analytical categories are never neutral, but are always situated in a specific epistemological context. This context sticks to them, and thus terms and analytical categories transport and pass on certain theories, cultural concepts, and sometimes even common conceptions of history (*Geschichtsbilder*), which – if they were made explicit – would probably provoke some contradiction. Particular attention will be paid here to the astonishing persistence of certain cultural concepts around the alleged "fundamental forms of human cohabitation". These include, for example, the notion that biological nuclear families are "the germ cells of all societies", and the tendency to project modern gender stereotypes onto prehistory. Despite the process of change mentioned above, such ideas still shape current research. This is reflected, above all, at the historical interpretative level which, as a result of cross-fading with cultural concepts, falls short of the innovative potential of new approaches, questions, and perspectives.

That is why it seems to be high time to reorganise this ever-growing array of tools and to initiate a discussion about whether some could, or perhaps should, even be winnowed out. Such a cleaning out will not only provide more clarity – it may even be an epistemological necessity. For if John Maynard Keynes's observation were also true for archaeology, it could be that our access to innovative approaches to sociohistorical issues have been impeded only by the fact that we are unable to escape from familiar terms, analytical categories, and cultural concepts, some of which have persisted since the 19th century.

## 1.3 Is there such a thing as "Neolithic society"?

Against the background of these considerations, I was intrigued by a call for papers for a sociological conference entitled "Social Sciences – With or Without 'Society'?" (Delitz, Müller and Schäfer 2019; translation B.R.). The fact that sociologists are considering abandoning the primordial subject and the pivotal analytical category of their discipline encouraged me to explore the matter further and to raise the critical question of whether "society" is a useful analytical category in prehistoric archaeology, and even more so in social archaeology. Or, even more fundamentally, is there such a thing as a "prehistoric society" or something like "prehistoric societies"? Therefore, I attended the conference mentioned and presented a paper that was, on the one hand, about the understanding of the term "society" and its semantic field and, on the other hand, about the current pluralisation of concepts of social collectives in prehistoric archaeology.

The conference was very inspiring and encouraged me to go even one step further: as a contribution to the subject "Rethinking Neolithic societies – New perspectives on social relations, political organisation and cohabitation", I would like to propose an epistemological purging cure. To this end, I will first examine the debate on "society" in the social sciences and the resulting conclusions for prehistoric archaeology. On this basis, I will then propose that the elements of the semantic field of society in prehistoric archaeology could be classified into categories ranging from "useful" to "to be discarded" – also including the category "society". In doing so, I hope to initiate a reflection on which epistemological tools are used to fully exploit the innovative potential of current research on social aspects in prehistory.

Because terms in different languages are usually linked to different theoretical concepts and traditions of thinking that would need to be reconstructed, the focus will be exclusively on German-speaking prehistoric archaeology, with which I am most familiar.

# 2. A look outside the box: Social sciences with or without "society"?

## 2.1 A debate as old as sociology

Bruno Latour calls "society" a "beached whale" and a "decaying monster", whose stench has become unbearable (Latour 2010, 283; translation B.R.). Ulrich Beck sees it as a "zombie category" originating in the horizon of experience of the 19th century (Beck 2000, 16; translation B.R.), and Oliver Marchart sees it simply as "the impossible object" to which he nevertheless devotes an entire book of this title (Marchart 2013; translation B.R.). These – in part drastic – metaphors already indicate that one of the central basic concepts of sociology is highly contested. The debate is as old as the discipline itself. What exactly is to be understood by this term, and the question of whether "society" represents a productive analytical category for empirical research, preoccupied prominent founding fathers such as Georg Simmel and Max Weber and has since been controversially discussed from different perspectives (for an overview, see Delitz 2020).

The discussion intensified in the 1980s, when collective terms as a whole were subjected to a fundamental critique in the social sciences and efforts began to dissolve them. At the turn of the 20th and 21st centuries, "the dissolution of collective terms, namely the terms 'society' and 'group,' but also 'culture,' 'cultural' and 'collective identity' [...] gained a new intensity and quality" (Delitz 2020, 160; translation B.R.). Today, collective terms are understood by some researchers "as social-scientifically superfluous, obstructive, and obsolete. It is discussed whether sociology needs collective terms at all or whether it is not rather a 'science of action'" (Delitz 2020, 160; translation B.R.), which does not deal with society as a whole but with the actions of individuals.

Similar debates also took place in British social anthropology. Moderated by Tim Ingold in 1989, four social anthropologists engaged in a controversial discussion on the thesis "The concept of society is theoretically obsolete" (Ingold 1996) within the context of the "key debates" in anthropology. Finally, another example are the reflections of ethnologist Carola Lentz on the collective term "culture" in ethnology, in which she is particularly interested in the relationship between culture/s and society/ies (Lentz 2009). sociologists Klaus Lichtblau (2009) and Andreas Reckwitz (2009) commented on her theses. Many aspects of these debates in the social sciences are also relevant and fruitful for prehistoric archaeology, so I will take up some of them and weave them in at the appropriate place.

## 2.2 The main criticisms of the term and concept "society"

I am unaware of any fundamental debate on the collective term "society" in German-speaking archaeology. Therefore, it seems worthwhile to summarise – albeit in an extremely abbreviated form – the most important criticisms that have been brought against it in sociology since its foundation. Although the understanding of "society" in sociology is manifold, the criticisms move in a similar direction and name the following problematic issues:

a.   The existence of society is taken as a given.

As with all collective terms, there is a danger that they "assume the existence of something that does not exist, that they are hence metaphysical or essentialist" (Delitz 2020, 172; translation B.R.). In other words, the possibility that the concept is a construction because it produces, reifies, and essentialises something that does not exist in this form is problematised.

b.   Society is conceptualised as a homogeneous entity and as an acting collective subject.

Similar to the term "group", the term "society" is assumed (Delitz 2020, 160) to evoke "homogeneous, internally completely linked and externally quasi-hermetically closed social entities" (Fuhse 2006, 253; translation B.R.). This fixes collectives and gives them the status of an acting collective subject – a view that has already been criticised by Max Weber (Delitz 2020, 174).

c.   Society is associated with a fixed, territorial "container" that corresponds to a nation state.

This understanding of society is criticised as methodological nationalism. Ulrich Beck comments: "In the common understanding of sociology, societies are thus organised along the lines of the nation state. [...] Societies are thought of as containers that arise and exist in the powerspace of the state. This view, which equates societies with nation-state societies, which thinks of societies as territorially limited, is deeply ingrained in the understanding of sociology, its concepts, its perspectives, and, one can say, in the

sociological imagination. The nation state has become the perceptual foil of sociology"
(Beck and Willms 2000, 9; translation B.R.).

d.   Society is reduced to human actors

Another problem is considered to be the anthropocentric narrowing of the 'social' to
humans"' (Delitz, Müller and Schäfer 2019, 1; translation B.R.). This anthropocentric
concept of society therefore also implies – according to another frequent criticism – the
separation of nature and society.

## 2.3 Possible solutions: Eliminate the category "society" or reformulate it?

In view of the fundamental criticisms, it could be a liberating blow to abandon the concept
and the analytical category of "society" altogether. This could mean conceptualising
sociology as a science of action and focusing sociological analysis on the micro level. But
the deletion of the category "society" without a replacement is unsatisfactory because,
in "sociologies without society", certain research questions are not asked at all, and thus
explanations and descriptions of certain social phenomena are omitted (Delitz, Müller
and Schäfer 2019, 2). This includes, for example, the question of the social formation of
subjects and the historical transformation of concepts of the subject (Delitz 2020, 161).
Similarly, time-diagnostic social analyses would then also become obsolete, although
they are currently in great demand in view of various diagnosed crises (Rosa 2016;
Nachtwey 2016; Reckwitz 2019, among others).

A similar polarisation is also evident in the conclusion of the debate initiated by Tim
Ingold in social anthropology: "We seem to be at cross purposes, since the proposers of
the motion [the concept of society is theoretically obsolete, B.R.] are really concerned
with an anthropology that tries to understand, in some general way, the condition of
human beings living in relationships, whereas the opposition is looking around for terms
suitable to describe, interpret, and understand specific historical situations which are
going to be different, depending on whether they are in Melanesia, Sri Lanka, West
Africa, or Britain" (Ingold 1996, 91). In this debate, Marilyn Strathern made the point
that society was not needed as a "focus of thinking about social organisation, collective
life, and relationships" (Ingold 1996, 64). For synchronous and diachronic comparisons
of these aspects, however, the category of "society" seems to be indispensable for the
opponents of the motion.

The alternative to abandoning the term "society" is to refer to approaches such as
that of critical theory (see *e.g.* Demirović and Maihofer 2013), which understand society
differently, specifically as a coherent but always unstable whole, or to reformulate it. The
latter is undertaken primarily within the framework of practice-theoretical approaches
"that design new concepts of collectives or groups. They render many critiques obsolete,
since they not only explicitly articulate non-holistic and non-essentialist perspectives,
but also systematically include non-humans" (Delitz 2020, 177; translation B.R.). To be
mentioned here are, for example, Philippe Descola's "collectives of humans and non-
humans" (Descola 2013; Descola and Ingold 2014) and Bruno Latour's "collectives"
and "actor-networks" (Latour 2010; on Latour's "understanding of the social", see
Reckwitz 2009, 413–414).

## 2.4 Conclusion for prehistoric archaeology: Historicising and reformulating "society"

The four main criticisms of the term "society" immediately make sense for prehistoric
contexts – especially because it becomes clear that "society" is inseparably linked to,
and even constitutively entangled with, the "nation state" (Garhammer 2000, 19) as it
was formed in Europe in the 19th century. In this specific historical context, the following
understanding of "society" emerged: "The citizens united on the territory of the state

become society through the 'similarity of their living conditions', and more importantly, through a homogeneous culture that provides their cohesion as a 'nation', which is to integrate diverse and competing individuals and groups into a whole'" (Garhammer 2000, 19; translation B.R.). In this concept, similar living conditions, homogeneous culture, a sense of belonging together, and territory are tied together into a solid package with "society". It is no coincidence that its components are reminiscent of those of the traditional archaeological term "culture", which has already been criticised many times – with arguments similar to those used for criticising the term "society" in the social sciences (see below).

The package contains further components that are also constitutively entangled with this specific concept of society, so that it is ultimately a bourgeois-capitalist and patriarchal society (*e.g.* Demirović and Maihofer 2013; Maihofer 1995). To regard this specific form of "society" as "universally human" and consequently to assume that people had always come together in collectives of precisely this kind in prehistory would be highly anachronistic. Nevertheless, that is exactly what is being done, to which I will return later. Finally, the critique of anthropocentrism must also be considered for the archaeological context: who can exclude that other worldviews existed in prehistory that did not categorise and hierarchise the world into humans and non-humans, and in which the web of relationships also included non-humans (animals, plants, things) as well as ancestors (for ethnographic examples, see Descola and Ingold 2014, 28–33)?

From a pragmatic and theoretical research perspective, there are good reasons to fundamentally reject "society" as a category of analysis (Veling, in this volume). However, if one still wants to use the concept of "society" in prehistoric archaeology, one must historicise it; that is, one must reflect on the "infinite historical wealth" it contains (Adorno 2017, 53), and that it is ramifying into every corner of our minds (Keynes 1964, viii). The result of such a process of reflection is, in my view, clear: "society" in the sense of the package described above is an anachronism for prehistoric contexts and consequently not an adequate concept or category of analysis. If one nevertheless wants to hold on to "society", the content of this term must be reformulated. The aforementioned practice-theoretical approaches from the social sciences are groundbreaking here and have already been partly taken up in prehistoric archaeology. Among these are concepts such as "human-thing entanglement" (Hodder 2016), "communities of practice", (*e.g.* Heitz, in this volume; Gleich, in this volume) or "actor-network" (Berger, forthcoming). The term "network" is likely to become most widespread – a metaphor that perhaps seems so immediately obvious precisely because, in today's world, networks are an important medium of communication due to digitalisation, while, in the course of globalisation, the borders of societies organised as nation states are becoming increasingly permeable.

The process that has helped the term "society" to its "infinite historical richness" (Adorno 2017, 53) is thus not yet completed, but continues. And this is precisely why, according to Theodor W. Adorno, it is not possible to define "society". Quoting Friedrich Nietzsche, he states: "definable is only that which has no history" (Adorno 2017, 53).

## 3. The term "society" and its semantic field in prehistoric archaeology

### 3.1 "Society" *vs.* "archaeological culture" as the actual key concept

What made Nietzsche, and subsequently Adorno, shy away from defining history-laden terms such as "society" is, of course, not likely to be the reason the term does not figure in any of the relevant introductions to, or handbooks of, prehistoric archaeology. At least in German-speaking archaeology, "society" seems to be a kind of common-sense

category, which needs no further determination and is not used as an analytical category in empirical research. Instead of "society", "archaeological culture" is the key reference in prehistoric research. The figures of thought associated with this term lead back to the time of the emergence of prehistoric archaeology in the 19th century, to a contemporary historical context of nation building in which archaeological finds were used to write national history back to prehistory. And it is the same ideas that were associated with the term "society", which also emerged in this context; an archaeological culture was seen as a territorially bound container that included a social collective with a homogeneous culture. The social collective was called "people" by the two founding fathers of the concept of archaeological culture, Gustaf Kossinna (1911) and V. Gordon Childe (1929), and was thus considered an actor – a historically acting collective subject – with Childe increasingly replacing the term with "society" (Angeli, 2013, 263).

The concept, however, has been – for partly similar reasons as the concept of society in the social sciences – hotly disputed since the 1940s. The main issue of the debate was, for a long time, whether archaeological cultures represent social or even ethnic groups. Although this question has repeatedly been answered in the negative on the basis of well-founded theoretical arguments and empirical research (*e.g.* Brather 2004; Furholt 2009; Hofmann 2012; Rieckhoff and Sommer 2007), "archaeological culture" is still used in many contexts as a synonym for "society" or as an implicit denomination of a social collective, in some cases even explicitly as the representation of an ethnic group. Despite all criticism, the implicit or explicit equation of archaeological cultures with social collectives represents a stubborn persistence.

While criticism was initially directed primarily at the homogenised, essentialised, and ethnicised content of the container, the idea of the spatial and temporal closedness of archaeological cultures, by now criticised as methodological territorialism (Schreiber 2018, 63; 401), was not initially questioned. That is, on a classificatory level, in the sense of "space-time units" (Grunwald, Hofmann, Werning and Wiedemann 2018, 14; translation B.R.), on the basis of which findings are subdivided and a basis for understanding is created, the concept continued to be considered not only adequate and meaningful, but also indispensable to many. Proposals for other spatiotemporal classification systems (*e.g.* Hafner and Suter 2005) were not adopted. For some years, however, there has been an increase in empirical studies that show, among others, with the help of statistical and GIS-based spatial analysis, that the assumption of temporally and spatially clearly delimitable distributions of a specific, homogeneous material culture is not maintainable (Doppler and Ebersbach 2011; Furholt 2009; Gross 2017; Heitz, 2023; Nakoinz 2018). The visualisations that are created in this framework no longer show maps reminiscent of nation-state maps: they show, for example, density distributions that are interpreted as contact zones in the course of semiotic and practice-theoretical approaches. Or they visualise the observed heterogeneity of material culture by semi-quantitative representations of the occurrence of different ceramic styles represented at each site on a map (Heitz, in this volume, Fig. 11; Heitz 2017, Fig. 3). Such new visualisations not only create new ways of seeing, but also stimulate new ways of thinking.

It is not yet possible to foresee where the current pluralisation of the concept of culture in archaeology will lead. The correlation of archaeological cultures with social collectives, some of which are even interpreted ethnically and as historical collective subjects, has recently been allegedly scientifically confirmed by genetic analysis of prehistoric human remains. It is currently receiving massive support, which even critical objections, especially from archaeology, have so far hardly been able to curb (*e.g.* Eisenmann *et al.* 2018; Furholt 2018; Heyd 2017). The maps produced by genetic history evoke and reproduce the 19th-century notion that history unfolds primarily through migrating peoples, seemingly lending this idea scientific evidence. As in social anthropology (Ingold 1996, 91), it seems difficult to imagine how to reconstruct historical processes in an archaeological context without having actors in the form of social collectives before the inner eye. Indeed, we are used to thinking of history organised in

| Term | Phenomenon | Related ideas |
|---|---|---|
| communities (mostly in plural) | designation of human groups | • immediate social surroundings / face to face groups (e.g. Palaeolithic foragers, Neolithic village communities) |
| societies (mostly in plural) | | • collectives extending beyond the immediate social surroundings<br>• tends to be used from the Neolithic onwards; always for the Bronze and Iron Ages |
| hunter-gatherer societies | mode of subsistence and related way of life → collective mode of existence | foraging economy, mobility, small groups |
| peasant societies | | peasant economy, sedentarism, bigger groups |
| urban societies | | urban economy and lifestyle (e.g. urban settlement, social and economic diversity) |
| egalitarian / acephalous / heterarchic societies | political organisation | not very complex, based on kinship, free of rulership |
| social structures | horizontal stratification | age and gender as (possible supplementary) categories of difference |
| | vertical stratification | primarily based on differences in economic power and the resulting political positions of power (metal as a trigger) |
| | political organisation | • strong fixation on the reconstruction of hierarchies, elites and patriarchal power structures<br>• analogies from social anthropology and history |
| societal structure | formation of collectives | bourgeois society as canonical model of analogy:<br>• nuclear family = germ cell of every society<br>• family = household = economic unit<br>• bourgeois gender and family model<br>internal structure of prehistoric societies:<br>familiy → village community → settlement area → archaeological culture |
| | | residence rules (patrilocality and matrilocality via mobility patterns based on isotope analyses) |
| network | connections between individuals (and things) | new way of conceptualising the connections between people (and things) |
| | internal contacts of collectives | based on (biological) kinship |
| | external contacts of collectives | based on communication and economic exchange |
| collective identities | in-groups | materialisation of collective identity |
| (genetic) groups / populations | genetic relations | • biological kinship is usually viewed as the basic structure of social relations<br>• equation of genetic groups with social collectives |

Fig. 1: Terms in the semantic field of "society". The terms are classified by means of a colour code: Green stands for "useful", orange for "useful if freed from certain ideas and cultural concepts" and red for "to be discarded". The left column includes terms that are currently in use. The middle column specifies the phenomenon and the right column lists related ideas. The table and the corresponding explanations in the text are intended to invite reflection and discussion.

social units – and here we are back to the old idea of "society", which is implicitly equated with "archaeological culture" and hinders all attempts to analyse and describe historical change differently.

## 3.2 Terms in the semantic field of "society"

It goes without saying that, although society is not an explicit analytical category, prehistoric research nevertheless employs terms that belong to its semantic field. I shall now explore this field by means of a table (Fig. 1), which does not claim to be exhaustive.[1] At the same time, I will classify the terms by means of a colour code: green stands for "useful", orange for "useful if freed from certain ideas and cultural concepts" and red for "to be discarded". The left column includes terms that are currently in use. The middle column specifies the phenomenon and the right column lists related ideas that can only be briefly addressed here. The table and the following remarks are to be understood as an invitation to reflection and discussion.

The terms "**communities**" and "**societies**" are commonly used in the plural and serve on a very general level as a designation of human groups. Communities tend to be linked to social proximity in the sense of face-to-face contacts, specifically to small collectives. Societies, on the other hand, refer to larger collectives that go beyond the close range. Against the background of evolutionist presuppositions, communities are classified as "older", societies as "younger" (for the conceptual history of "community" and "society" in

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1     The contents of the table are essentially based on my reading experience as well as on research by Maurus Camenisch (student assistant), who combed through relevant introductions and handbooks. My own reading experience and the search results were congruent, so the following tables can claim a certain representativeness.

sociology, see Delitz 2019). Therefore, in the context of the Bronze and Iron Ages, there is always talk of "societies". The two terms are problematic when they are linked to ideas that are criticised in the concepts of "society" and "archaeological culture", such as similar living conditions, a homogeneous material culture, homogeneous social practices, sense of identity, and territorial location (see above).

The terms "**hunter-gatherer**", "**peasant**", and "**urban societies**" refer to specific modes of subsistence and constitutively entangled ways of life that are so formative they are understood as a collective mode of existence. However, it should be borne in mind that there are also fluid transitions here and the dichotomy of mobile hunter-gatherers *vs.* sedentary peasants must be broken down. And the urban and the peasant mode of existence are not absolute opposites, either, because within urban settlements, there is sometimes also evidence of arable land and pastures.

While collective modes of existence such as "hunter-gatherer societies" can be retraced on the basis of the archaeological record, this is not the case for terms and concepts that refer to systems of political and social organisation. Common terms used here are "**egalitarian**", "**acephalous**", "**heterarchic**", and "**stratified societies**", with the idea that egalitarian societies are "evolutionarily older" than stratified ones. Usually borrowed from social anthropology, they are very helpful on the one hand because they widen the horizons of archaeological reasoning that is strongly influenced by one's own world of experience. On the other hand, these borrowings from a discipline that deals with living people come with a series of problematic aspects that decisively influence archaeological research. There are two central issues: the first is that archaeologists adopt concepts without taking sufficiently into account the criticism to which they have previously been submitted. The second problem is that there is usually no theoretical reasoning about the crucial question of whether social phenomena are linked in an unambiguous manner with the archaeological record and, if so, how.

The same is true for a large field of topics subsumed under the term "**social structures**". This includes phenomena such as horizontal and vertical stratification and political organisation. At the same time, the term also serves as a diffuse designation for everything that has to do with "social" and "society" in the broadest sense. This is why it is by far the most common term in the literature. This careless equation is possibly no coincidence, because social phenomena are often reduced to vertical social structures and to political organisation, above all to the question of the form of rulership. In fact, social archaeology is very much concerned with the identification of elites, resulting in a narrowing of the archaeological perspective to what is effectively a very small part of a much bigger whole. In other words, (mainstream) prehistoric archaeology, at least as far as the periods from the Neolithic onwards are concerned, is obsessed with hierarchies, power structures, and elites, and ignores the fact that social life entails so much more than building hierarchies and gaining political power on the basis of economic strength. Gender archaeology here takes a far more holistic approach, starting with its social reconstructions from sex and age and examining their intersections with other categories of difference, such as class or origin.

Analogies from social anthropology and history are used to reconstruct hierarchies, power structures, and elites. Neo-evolutionist social typologies from social anthropology (*e.g.* Service 1962) are a frequent basis for argumentation. Although they have for a long time been critically questioned there, and although they are only used in exceptional cases and specific contexts, they are still widely used in archaeology. All classification systems are based on an evolutionist view of history, which understands human history as a universal and unilinear process of increasing complexity. Against this background, all systems postulate a development from less complex, kinship-based, and egalitarian societies (*e.g.* "big man" societies) via stratified societies (*e.g.* chiefdoms) to complex states and advanced civilisations. Apart from fundamental objections to the idea of classifying prehistoric social collectives according to these few types of societies and thus being able to "recognise" their political organisation or form of rulership (Röder 2012), its application to specific

archaeological contexts also proves problematic because it does not yield coherent results. A notable case in point is the never-ending debate surrounding the political roles of the Hallstatt princes. Referring to the very same finds and features and the usual evolutionistic classification systems, the options range from "elders and village chiefs to big men and paramount chiefs to princes, dynastic rulers, and priest-kings" (Schweizer 2012, 463; translation B.R.). The reconstructed social organisation and political systems cover the broad spectrum from "small regional segmentary groups to larger territorial units with centres of power to archaic states or large-scale kingdoms with urban or proto-urban centres" (Schweizer 2012, 463; translation B.R.). Quite obviously, there is no methodological basis and no consensus in prehistoric research on how social complexity, as well as forms of power and rulership, materialise in the archaeological record. It is all the more astonishing that, despite this finding, the optimism that it can nevertheless be done cannot be curbed.

The next item in the table is "**societal structure**". This refers to the internal structure of societies, to the question of how social collectives constitute themselves. Here, we delve into the universe of 18th and 19th century bourgeois society, which ultimately became a cipher for the alleged "natural", "primordial", and "fundamental" forms of human cohabitation. Therefore, bourgeois society serves as the canonical model of analogy for prehistoric social collectives (Röder 2013; 2015). The bourgeois narrative is as follows: Men and women – all heterosexual and monogamous – entered into a long-lasting relationship and started a family, which would be the nucleus of society. The couple lived together under one roof; they formed a household and an economic unit with a patriarchal gender hierarchy and a fixed gender-specific division of labour: he was the breadwinner and head of the family, she was the spouse, housewife, and mother.

Against this background, it is logical that the assumption prevails that prehistoric collectives were normally patriarchal. Prehistoric archaeology thus contributes significantly to the archaisation, naturalisation, and universalisation of the bourgeois gender and family model in science and society. Archaeology consolidates the idea that these institutions of bourgeois society represent the "elementary forms of human cohabitation" and are therefore "universally human".

In the logic of the bourgeois analogy model, societies are constituted by families that join together in village communities. Several village communities form a settlement area, and several settlement areas finally form an archaeological culture. A completely different, empirically based approach to the question of how prehistoric collectives were constituted is made possible by scientific analysis of human remains: recently, it has been possible to reconstruct mobility patterns by means of isotope analysis, which is interpreted as an expression of (mostly patrilocal) residence rules.

Not quite so new, but currently of rapidly growing importance, is the iridescent term **"network"**. The term is iridescent because it is seldom defined and very different ideas are associated with it. From the perspective of new materialism, networks are a completely new way of conceptualising the connections between humans and things. They therefore represent a counter-concept to the idea of fixed social collectives. Outside this theoretical context, however, the network metaphor is also used in connection with social collectives – for example, to designate a particularly close web of relationships within a collective. According to the problematic idea that biological kinship is the elementary basis of social relations (Röder 2012), kinship is often mentioned as the basis of networking in these cases. In parallel, there is the idea that networks are media through which collectives organise their external relations – be it for the procurement of raw materials and goods, for the transfer of technologies and innovations, or for securing rulership.

A big issue currently is the identification of "**collective identities**", such as in-groups. Again, we encounter the unsolved question of whether and how social phenomena are reflected in the material culture. Given the polysemy of material culture and the complex and fluid entanglements of things and social phenomena, I am convinced that questions concerning perceived or ascribed collective identities cannot be solved merely from an etic perspective.

The last items in the table, "**(genetic) group**" and "**population**", are found in genetic studies that aim to reconstruct the population history of vast regions. With the big pictures that genetic history draws of the population history of Eurasia, for example, it claims interpretive power for prehistory and maintains it. That is why these studies are very influential. The insights they provide into population history are indeed fascinating, sometimes surprising, and open up completely new perspectives as well as innovative archaeological research questions. Despite all the euphoria, however, it should not be overlooked that these studies also have some "side effects". The issue that the mapping of the movements of genetic groups is reminiscent of 19th- and early 20th- century maps of migrating archaeological cultures and peoples has already been addressed. Another challenge is the Eurocentric idea that biological kinship is the basic structure of social relations. In this respect, it is tempting to equate genetic relationships with social relationships and genetic groups with social collectives. This would, however, not only promote biologistic views, but would also run the risk of catapulting us back into old and fundamentally condemned concepts, such as the equation of biological structures with social collectives, languages, ethnicity, and historical actors. Last but not least, these scenarios revive the idea that genetic relations are the universal basis upon which social collectives are formed. Is this not a paradox? The most up-to-date methods bring us back to some of the oldest and most harshly criticised concepts of prehistoric research.

## 4. The balance of the purging cure

### 4.1 To be discarded: Zombie ideas from the 19th century

The results of the purging cure can already be seen with a cursory glance at the semantic field of "society" compiled in the table (Fig. 1); there is only one term that should be discarded – "collective identities" – because it is beyond archaeological knowledge opportunities. Yet, only three terms seem useful or at least unproblematic, namely, "hunter-gatherer", "peasant", and "urban societies"; however, this is only the case if "society" is here understood as a neutral "designation of humans", so that these terms ultimately stand for modes of collective existence. The vast majority of terms were placed in the category "useful if freed from certain ideas and cultural concepts".

In fact, it is primarily the ideas associated with the terms as well as the (Eurocentric) cultural concepts and images of the history behind them that prove problematic upon closer examination. They are heirlooms of research history and history of ideas from the early days of the discipline. However, they are predominantly not perceived as legacies of earlier (research) generations and as old traditions of thought that still exist today. Rather, they are regarded as "self-evident truths", sometimes even as anthropological constants. Ulrich Beck has outlined for sociology how strongly its self-image, its forms of perception, and its concepts, which go back to the 19th century, continue to have a lasting influence on the discipline. In this context, he coined the term "zombie categories" and expressed the suspicion that sociology methodically works with zombie categories. By this, he means "living-dead categories that haunt our minds and adjust our vision to realities that are increasingly disappearing. [...] Zombie categories originate from the horizon of experience of the 19th century, the – as I say – First Modernity, and, because they control this experience analytically apriorically, they make us blind to the experience and dynamics of the Second Modernity" (Beck 2000, 16; translation B.R.). Starting from the 19th century, Beck directs our gaze to the future, to our present day, whose realities are becoming increasingly distant from those of the 19th century. From this point of reference, however, we can also look back into the past and postulate an analogous phenomenon: the further back we go, the more the realities of the 19th century disappear and the more blind we become to the experience and dynamics of earlier times. From this perspective, it seems downright absurd to want

to examine social aspects of the Neolithic with concepts that originated in 19th century Europe. In short, before filling the archaeological toolbox, one should historicise the terms and concepts one wants to work with and consider whether they make any sense at all for prehistoric contexts. To a particularly high degree, this applies to the term "society", which is an especially large heirloom with numerous individual components that ramify into every corner of our minds.

## 4.2 Prehistoric archaeology: With or without "society"?

So, should "society" also be removed from the toolbox and banned from archaeology? At any rate, this would be the most time-saving solution if one does not want the work of deconstructing this term and situating it historically in order to subsequently reformulate it for the archaeological context – which is what would actually be required. Another equally quick solution would be to use the term consistently in the plural. This would also make sense from a pragmatic research perspective, because it is still an open question as to how, for example, "a Neolithic society" materialises in the archaeological record: Where does it begin? Where does it end? Considering that even sociologists dealing with "living societies" cannot get to grips with this problem of demarcation then, against this background, the plural solution seems absolutely plausible and indeed, in the meantime, almost only the plural form is used in the literature; up to now, I have also used this trick to save myself from the dilemma. But the trick does not work, because the plural implies that there is also a singular in the sense of a definable "society" that, however, we cannot grasp empirically. Another very common solution is to speak of "archaeological cultures" but actually mean "societies" as in "social collectives". Admittedly, this is mislabelling and, actually, there is (mostly) a consensus that archaeological cultures are merely constructs of archaeologists who serve as a means of communication (Steuer 2007, 260) – pure pigeonhole systems into which we sort our findings and put them into order. There does not seem to be a quick solution to the problem.

So, should "society" be removed after all? What would be lost? Considering how unspecifically, indeed downright nebulously, the plural form in particular is used, abandoning it should not cause any substantial loss. In archaeology, too, there seems to be "a kind of unitary concept of society, which is a kind of '"hotel sauce' that is poured evenly over every meat" (Adorno 2017, 54; translation B.R.). As in social anthropology, the term "society" is most likely to be missing (see above) when synchronous and diachronic comparisons are to be made or historical processes of change are to be traced. It is clear that, in the Neolithic, life was very different on the Orkney Islands, on the Swiss Plateau, or in the Balkans. And it is also clear that there were historical changes during the Neolithic, and life was quite different in the time of Linear Pottery than in the time of Corded Ware. But is the term "society" really needed to analyse and describe these differences? I think it would even be productive not to use it, because then one would be forced to name precisely and in detail what the differences, similarities, and observed processes are. And that would undoubtedly be a gain.

Alternative categories of analysis here could be "lifestyle", "way of life", or "mode of existence", which would still have to be defined for the respective context. Such questions could be pursued with case studies, for which it is ultimately irrelevant whether there was anything at all like "society" at the time. What would also be gained with this approach is that it would be easier to get away from the idea that history is the product of historical actors in the sense of social collectives. This in turn would reduce the temptation to view archaeological cultures as the materialised expression of collective subjects and thus as historical actors.

All this would imply thinking and writing history differently: instead of striving for a big picture, which in view of the highly fragmented and partial archaeological record must necessarily always remain highly speculative, one could build up a spatially and temporally open puzzle, a kind of "historical network", of case studies in a large collaborative effort. These would illuminate different aspects of prehistoric life and, in

each case, those that are empirically easy to grasp on the basis of the specific sources. At the same time, this would mean not looking everywhere for the "hotel sauce social structures", but thinking about "the social" more broadly and, above all, differently.

## 5. Conclusion: Thinking about "the social" differently

A different, more differentiated, and more source-based view of the social is opened up by practice theories that conceptualise "the social as a field of practices" (Kienlin and Bußmann 2020, 1). "Social" here is very broad and actually means "sociocultural", especially since opinions about what is "cultural" and what is "social", and whether the two can be separated at all, are very diverse (Lentz 2009; Moebius, Nungesser and Scherke 2019a; 2019b). Practice-theoretical approaches assume that "sociality crucially depends on practices; that is, on arrays or bundles of organised human activities linked by shared practical understandings". The key terms are "the essential recursiveness of social life, its permanent reproduction in social practice [...] and – as such – its fundamental situatedness in time and space. We must not, therefore, try to identify timeless structures or types of society governed by abstract norms, but rather trace social reproduction and specific practices through time and space" (Kienlin and Bußmann 2020, 2). Practice theory establishes a connection between the material and the social, because it "takes an interest in the social process as it unfolds in the interplay of human action and the material world [...]" (Kienlin and Bußmann 2020, 3).

Defining the social as a field of practices is immediately obvious in several respects: this conception gets by entirely without the history-laden research and intellectual-historical heirlooms from the 19th century problematised above, which are overloaded with numerous cultural concepts and ideas. On the contrary, it is quite neutral and open because it does not itself contain any normative concepts and does not specify the kinds of practice. The danger of projecting current cultural concepts onto prehistory with this approach therefore seems low. Moreover, the approach can be easily operationalised for archaeological sources. With appropriate analysis of findings, features, and human, animal, and plant remains, it is possible to identify patterns that operate as an interface between the material and the social, because they are the result of recurrent, habitualised actions. What exactly lies behind the recorded patterns – everyday routines, shared technological knowledge, common cognitive schemata, the display of status, or ideological concepts – must be examined for each individual case, and often cannot be decided with certainty. Nevertheless, the reconstruction of practices offers fascinating insights into the social dimensions of human existence (*e.g.* Heitz; Gleich in this volume), which can be further illuminated in their diversity and change through synchronic and diachronic comparisons.

Finally, to think of the social as a field of practices also goes hand in hand with a productive change of perspective: instead of speculatively searching for "types of society" or "social structures" on the macro level, the micro level comes into view, for which – as in the lakeshore Neolithic – partly excellent and temporally high-resolution data are available. Therefore, I would like to suggest that we explore and capitalise on the sociohistorical potential of the micro level, which is far from exhausted. Here, among the alleged banalities and daily routines of everyday life, is the place where social relations, political organisation, and cohabitation were constituted.

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# Abandoning Neolithic societies: A practice-based approach

*Alexander Veling*

> We are in 2030 AD. Science has made great progress and there is a new technology: time travel. Using this new possibility, an expedition is planned to what is known as "the Neolithic". An interdisciplinary team is formed consisting of volunteer geographers, biologists, geologists, ethnographers, and – of course – archaeologists. After some research, they choose their preferred time and place and enter the machine to travel into the past.
>
> Everything goes surprisingly well; they arrive as planned and the team leaves the machine to start their research. The geologists climb up the nearest mountain. The geographer and the botanist hike to a nearby swamp, and the archaeologist and the ethnographer start searching for people. They see some smoke on the horizon and finally find a small village.
>
> The archaeologist is amazed. She takes her camera and starts to take photos of everything she can see. She recognises stuff she knows from her former excavations everywhere – tools, ornaments, artefacts. She is fascinated by the actual outline of the buildings, how the villagers produce ceramics. She follows people in their daily business, asks all kinds of questions, and – she is lucky somebody died just the day before she arrived – even attends a burial. She will find out so much and everything starts to make sense to her – she is totally amazed. The only thing she will look for without success is "the Neolithic".

This story came to my mind when I started my own expedition into Neolithic archaeology. I was at first sceptical because I have no expertise in this field of research – my own research is focused on historical archaeology – but I soon began to like the idea exactly because I have no expertise. Being an outsider and not knowing the material record and what was discussed in the last couple of decades is an opportunity to ask naive and uninformed questions and to take a look from the outside. Being a stranger is an analytical tool – a tool that soon is lost when you start to get socialised into a field of research.

When my expedition began, the first thing I particularly noticed was the use of macro concepts in Neolithic archaeology, for example "society", "culture", and "period". The purpose of these concepts is still not completely clear to me. Is "the Neolithic" a spatial or a temporal concept, or is it a social, economic, or cultural one? Is it a descriptive concept, a narrative concept, an analytical concept, or a didactical one; a concept to structure discourse, or a label to gather a scientific community or communicate with the public? What I have learned so far is that, nowadays, a bottom-up approach is preferred. From my perspective, the central question is where to go "up there".

Traditionally, the concept of "culture" was used for this operation in archaeology. The search for coherences, often understood as resulting from shared understandings of socialised individuals, is a main methodological consequence of this approach. Humans are primarily understood as carriers of those cultures, which they reproduce and modify. This fundamental theory has today lost much of its convincibility, since it was often used to separate the archaeological record into distinct groupings that were interpreted as

representing exclusive historical peoples, which today is seen as too simple.[1] Therefore, the concept today seems to be reduced to descriptive purposes of structuring the diverse archaeological record into units. In this regard, it is used in a way that is comparable to jars that are to be filled up with structured information extracted from the diverse material record based on association and similarity.

The concept of "society" is seen as less problematic by many archaeologists but shares similar conceptual problems as "culture" and even creates new ones because it assumes a specific variant of social organisation. The theoretical ballast becomes clear, if we keep in mind other concepts of social organisation, such as community, group, horde, kinship, formation, organisation, formal institutions, or non-organised forms of social life.[2] Used in archaeology, "society" thereby implies a specific form of social structure as constitutive for the archaeological record or extractable from it.

The third macro concept that seems to be influential is "epoch" (or "period"). This is used to structure the archaeological record temporally and to explain its elements and structures through simultaneity.[3] This intersects with the other two concepts of "culture" and "society", as all three focus on an emergent level beyond archaeological sites and features to explain their characteristics.

The theoretical problem of "the Neolithic period", "Neolithic cultures", or "Neolithic societies" is therefore, first and foremost, a scalar one, and their internal difference is mainly the specific kind of connection they expect or presume, which is understood primarily as a temporal, spatial, or social one. They focus on an emergent sphere beyond the material record of archaeology and thus imply a jump of analytical scale that is difficult to perform empirically from an archaeological point of view.

What we excavate are specific sites – not societies, cultures, or periods – which has far-reaching implications for the way we should understand archaeological research. No matter how much we excavate, analyse, and condense our record, no matter how much we try to fill up the labelled jars using archaeological methods for collecting the ingredients, they will never get full. They will not get full because the problem is not the amount of information available to us, but its scalar structure. Empirically, we operate on the micro level of what people have done and are doing in their daily business and its material consequences. Therefore, a bottom-up approach is problematic because it is not possible to switch analytical scales just by the ordering, addition, abstraction, reduction, or condensation of micro-level observations.

There are alternative ways to structure the material record and carry out research. Instead of concepts of macroscopic emergence, the micro level of situated practices itself could be focused upon. Instead of an accumulative approach, I suggest an analytical one that takes the complexity, the particularity, and the situatedness of the archaeological record into account. As a consequence, we need other research concepts and narrative elements instead of "society", "culture", or "period". I see a particular potential in the concept of practice.

The concept of practice that is discussed today is a very detailed and complex one. In modern practice theories – one can speak of a second generation of practice theories to illustrate the difference to what was discussed, for example, by Anthony Giddens and Pierre Bourdieu in the 1970s and 1980s[4] – phenomena are understood as fundamentally practical, which integrates the ephemerality and situatedness of daily life. Present-day practice theories are not theories of society but theories of the social and have been developed further in different disciplinary contexts to theories of the cultural, the historical, or the archaeological. The historical, for example, is not considered to be a sequence of different epochs, or political, social, or economic organisation, or cultural

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1    Tylor (1871), Frobenius (1898), or Benedict (1934) shaped the understanding of culture significantly; an early transfer to archaeology was made by Childe in 1929.

2    Influential for this debate were, for example, Tönnies (1887), Durkheim (1893), or Parsons (1971).

3    See Cellarius (1702), Thomsen (1836), or Childe (1936).

4    Bourdieu (1979), Giddens (1984).

discourses, but as something that is existing, constituted, and accomplished on the level of practices and is to be approached and perceived accordingly.[5]

This is of interest especially for archaeology. What we will reveal when we excavate is the result of practices. It is found because material practices have been executed before; for example, practices of design, production, and building, practices of use, maintenance and modification, and practices of deposition or abandonment. There is a scalar overlap of theories of practices and of archaeology – analytically, they operate on the same level.

Instead of focusing on "cultures", "societies", or "periods", this perspective focuses on "practices". When we carry out research, we can "follow" practices in a historical perspective through time. As archaeologists, we can follow practices of land use, dwelling, or settlement organisation, practices of nutrition, body modification, or clothing, or practices of gendering, subjectivation, or identification. Instead of an accumulative approach or performing scalar jumps, the idea is to use the level of practices itself for research. The focus of this perspective is not on histories of societies, periods, or cultures, but histories of material practices. This perspective is challenging at first because it requires a new kind of narration, but it is suitable for archaeology because it is much more compatible with our record.

This brings us back to our team of time travellers. It is of course not enough to travel back in time – they will have to do extensive research over there. We rejoin the team of the ethnographer and archaeologist working together. It makes total sense for them to work together because both are carrying out field research. Both follow the idea of being present in the field to carry out the research. No matter what tools they use – field notes, film cameras, drawing sheets, drones, microscopes, or their trowels – they will never find "Neolithic societies", they will never find "Neolithic cultures", and they will never find "the Neolithic period". Macro concepts are not accessible to them empirically; they are neither observable nor can they be dug up. They will stay somewhere behind their disciplinary horizon. And, like the horizon, they will never reach them, no matter how far they walk. Even if we send thousands and thousands of time-travelling research teams, they will never find "Neolithic society" because it is not appropriate for our sources and it is not suitable for our methodologies.

So, do we need these concepts? Do we need concepts like "culture", "society", or "period"? From my perspective, they are false friends. They do not help us as archaeologists and they even hinder us, because they motivate us to accumulate and condense our record in a way that is not useful analytically and they make us tell stories that are not suitable for our discipline. They let us forget the scalar structure of our record and make us dismiss the complex and rich field of material information that is accessible to us empirically. These concepts do not describe what we are approaching and do not help us to understand our subject. Therefore, I suggest abandoning them and instead carrying out research that deals with the material practices whose outcomes are empirically available to us.

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5    See Veling (2019) and Veling (2022) for a comprehensive discussion of an "archaeology of practices."

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# Theory versus data: Dealing with the interpretive dilemma in the biomolecular era

Maxime N. Brami

## Abstract

*This thematic afterword was written at the invitation of the editors, whom I thank heartily. Following up on three of the themes of the volume, namely the relationship between agriculture and sedentism, mobility as an epistemological entry point, and the relevance of the "Neolithic" concept, this article discusses the interpretive process and its limitations. Rethinking Neolithic societies means integrating traditional models with new data, such as those emerging from aDNA and other biomolecular approaches. What these data can do is eliminate theories or visions of the past that are no longer sustainable. But each individual proxy remains open to ambiguity of interpretation and comes with limitations depending on, for instance, the scale of the observations. A genuine synthesis of the past requires a fine balance between theory and data, expectations, and observations.*

*Keywords: archaeology, science, interpretation, mobility, migration, Neolithic*

## Introduction

The publication of this volume coincides with an important juncture in archaeology. The history of the discipline is punctuated by relevance crises when new scientific methods have appeared. During the radiocarbon era, archaeologists expressed concern that they were being sidelined by nuclear physicists on matters of chronology (Childe 1958, 2). Sixty years later, the advent of whole-genome aDNA analysis and other biomolecular approaches confronts us with a similar dilemma. Is archaeology about to abandon responsibility for mobility to population geneticists?

The contributions in this volume provide a wonderful illustration of why archaeology is bound to retain the lead and emerge stronger from the biomolecular revolution. In particular, they highlight the discipline's unique ability to span the spectrum from social to biological anthropology. A biologistic view of history, determined by migrations, for instance, is a very narrow one indeed. The archaeology challenge, if there is one, is to balance the different approaches and results to reach a synthesis. Why use this approach rather than another? How do we combine results that do not fit?

In this context, there is need for archaeological theory to integrate traditional models with new data. Subscribing to the widely trumpeted death of archaeological theory is self-defeating and risks accepting as facts assertions that are still open to ambiguity of interpretation (Bintliff and Pearce 2011). If archaeology is no longer theory-driven, as some scholars are arguing, what is it driven by? Do the data ever speak for themselves?

Here, I make the case for a strong interaction between data and theory, and I illustrate my point by following up on three of the themes explored in the volume: (1) the relationship between sedentism and agriculture, (2) mobility as an epistemological entry

point, and (3) the relevance of the "Neolithic" concept. I show that archaeology has not weaned itself from reliance on proxies that are not individually conclusive. Only through top-down *and* bottom-up approaches can archaeology contemplate a genuine synthesis.

## Agriculture and sedentism

I would first like to return to one of the initial statements of this volume, that "traditional ideas about Neolithic societies were shaped by questionable premises [… Farming] was, in most archaeologists' minds, associated with sedentariness rather than with mobility" (Wunderlich *et al.*, chapter 1).

On the face of it, there are good reasons to expect agriculture to impede residential mobility. Farming takes effort and investment. The system of production hinges on return and entails risks. Why leave fields untended? Can surplus be moved around in the absence of pack animals? In feudal societies, including parts of 19th century Russia, serf labourers were often sold with the land that they cared for (an account of this in Nikolai Gogol's 1842 *Dead Souls* [Gogol, 1998 (1842)]). There are many historical, poetic, and religious accounts describing the deep spiritual bond between peasant societies and the earth itself (Gimbutas 1989).

The esoteric field of evolutionary economics, which influenced V. Gordon Childe's (1892–1957) conception of industrial growth (Childe 1936) – and by extension, our own view of the "Neolithic revolution" – has long imagined a unilinear shift from nomadic life to pastoral life and settled agriculture (Brami 2019). In "domestic" or "household economies" – the lowest possible stage of production – those who produce food are also those who consume it (an early version of this narrative can be found in Karl Bücher's *Industrial Evolution* [Bücher 1901]). There is no mutualisation of risk beyond the family unit. The fundamental role of houses in "household economies" comes from them being the loci of both production and consumption, with each family member effectively involved in the chain of production.

Martin Furholt has rightly challenged key preconceptions of this model, in terms of scale of production and power interactions (Furholt, this volume, chapter 3). A single family is rarely a self-sufficient unit, hence the importance of feasting, feuding, and other practices that hold kin-based segmentary societies together, even in the absence of a chief or centralised authority.

Nevertheless, the European Neolithic to some extent matches traditional expectations regarding "household economies". For instance, the system of production remains domestically bound and, with some exceptions, such as the procurement of obsidian and other valuable resources, goods appear to be mainly consumed where they are produced. The low-scale intensive nature of early European food production systems, sometimes described as "intensive mixed farming" and "garden agriculture", is often seen as removing the incentive for settling elsewhere (Bogaard 2005). There is a place for domestic animals in this system, which relies on manuring to enhance crop yields, as indicated by high nitrogen isotope ratios in cereals (Bogaard *et al.* 2013).

Commitment to place is further indicated by the ubiquity of houses in the Anatolian and southeast European Neolithic record. Each house appears to have facilities for cooking and storage, supporting notions of household autonomy (though internal storage facilities are generally small, see Brami 2017). Early farming sites in Anatolia and part of the Balkans are typically perched on mounds, consisting of accumulations of debris that rise several metres above the surrounding landscape. Settlement mounds project an image of stability that may or may not be real (Bailey 1999). Whether Neolithic houses were used year-round or only seasonally is difficult to establish, but the distribution of seasonal birds and other animals in the bone record of some early Anatolian sites (Baird *et al.* 2018) hints at a largely unbroken occupation throughout the year (though not everyone may have lived there at one time).

That sedentism is to some extent entangled with agriculture is thus relatively uncontroversial. The question is whether agriculture *de facto* implies sedentism, and vice versa. Here, we find some exceptions in the ethnographic literature. Evans-Pritchard's masterly description of the Nuer in Sudan provides just such an example (Evans-Pritchard 1940). The Nuer are a largely pastoralist society that engaged in farming without permanent homesteads. These are people, in Evans-Pritchard's words, who have "no government, and their state might be described as an ordered anarchy" (Evans-Pritchard 1940, 5–6). Conversely, the Northwest Coast and California Indians provide an example of a stratified sedentary society without agriculture (Testart *et al.* 1982). A particularly effective exploitation of aquatic resources allowed these communities to store and accumulate food in large, permanent villages.

There is a case to be made that sedentism actually preceded agriculture in southwest Asia, where early forms of agriculture are small-scale and relatively unproductive (Baird *et al.* 2018). The sequence of transformations collectively described as the "Neolithic revolution" – if it can be serialised as such – consists of nomadic foragers first becoming settled foragers, then settled farmers (Harris 1990). But even the adoption of agriculture does not preclude other forms of subsistence or modes of adaptation, such as nomadic pastoralism in desert belts and the local survival of hunting and/or foraging practices. In sum, there is no reason to assume that only one mode of subsistence existed at one time in one place, nor that the transition to farming was necessarily a one-way street.

If there is a takeaway from the preceding volume and this discussion, it is to be prepared for the unexpected. Traditional evolutionary models, postulating a unilinear scale with clear stages of production from simple to complex, starting with private wealth accumulation in the Neolithic, are only useful up to a point. Their assumption that agriculture and sedentism are correlated in a domestic sphere of production makes intuitive sense and, to some extent, matches what we observe in the archaeological record, but there are exceptions. This relationship is best looked at as an entanglement with a "tipping point". Once a society has become sedentary and started growing food, it presumably becomes costly to shift to another lifestyle and mode of subsistence (Hodder 2012).

## Migration, mobility, and non-mobility

We now come to a directly related issue, which is the significance of mobility among early agricultural communities. In her contribution, Caroline Heitz suggests we take mobility as an epistemological entry point, and writes of a "mobility turn" in research in social sciences and humanities around the new millennium (Heitz, this volume, chapter 4). Interestingly, this turn has coincided with the explosion of biomolecular (stable isotopes, aDNA) approaches in archaeology, though social and natural scientists do not see eye to eye on mobility and migration.

Is mobility the right epistemological framework to conceive interactions in prehistory? The answer to this question partly hinges on what is meant by "mobility". One concern, ever present in archaeological theory, is that mobility only describes the exception and not the rule. Most early farmers, as already discussed, presumably stayed in one place for the best part of their lives (once post-marital residence practices and other demographic processes are accounted for) to tend the fields and look after their houses. The question boils down to this: were all early farmers mobile? Can we identify different scales of mobility, from the very local up to the interregional level?

It would be tempting to respond in the affirmative in light of recent genome-wide aDNA studies, which show a series of migrations and large-scale admixture events in prehistory (Fu *et al.* 2016; Mathieson *et al.* 2018; *etc.*). The impression created is that of an almost uninterrupted flow of migrants, making their way into Europe, often replacing

local populations. But that narrative is only true as far as allele frequencies are changing. Migration is not the only population genetics process that causes allele frequencies to change: there is also drift and selection if one population produces more offspring that survive to maturity. A drastic reduction in population size – a bottleneck – may result in a rapid drift of specific alleles.

It is usually more convenient, and statistically more correct, in population genetics to think of "no migration" as the starting or null hypothesis, and assume isolation by distance (the mixing of genetic material is inversely correlated with geographic distance). A statistically significant deviation allows us to reject the null model. How we interpret palaeogenomic data highlights the importance of theory. The interpretive dilemma – for example, the equifinality problem of different demographic models producing the same observed statistics – is not resolved by the data themselves. The problem may be mitigated when high-quality genomes are available and allow for more sophisticated analysis, such as haplotype-based approaches, but the problem fundamentally remains, and archaeology should be used almost as a guide to test specific hypotheses and compare observed and expected values.

The "non-mobility" hypothesis is easily falsifiable in archaeology. We have yet to find a single human society that lived in complete demographic or economic isolation for extended periods of time (Wawruschka 2014). But networks can be small or large, intensive or extensive, and so on. Not everyone is mobile. Both kinship and non-kinship factors, such as sex, age, and social status, may be associated with intrasite variations in mobility patterns, for instance, if only women are locationally mobile and end up living with the husband's family (patrilocal residence).

For a long time, archaeology only had limited insight into mobility patterns of different segments of a population, such as men and women. The picture has been rapidly changing thanks to biomolecular approaches, especially strontium isotope analysis. The division between "locals" and "non-locals" in these approaches is somehow fictitious, as only specific periods of the life of the individual are captured in tooth enamel and bone collagen, and the same geological baseline typically occurs in more than one location (Plomp *et al.* 2020). Still, these approaches suggest genuine differences in mobility patterns across time and space, depending on post-marital residential practices and other activities.

To wrap up, I share the editors' concern that too much attention has focused on production in Neolithic studies and this has given a false impression of "immobilism" and economic self-sufficiency (on this question, see Sherratt 1999). The question is no longer whether early farmers were mobile or not, but who exactly was moving.

The concept of "translocalism", explored in several of the volume's contributions, provides a useful analytical framework to address interactions beyond the purely local. In the past, archaeology has often worked from the assumption that similarities in the material record, for instance, between ceramic types, indicate common descent from a single archaeological culture and/or ethnic group. Translocalism turns the problem of similarities on its head. Cultural uniformity in this model is caused not by the influx of people from outside sharing the same material assemblage, but by socially autonomous groups maintaining high levels of residential mobility and communities of practice (Furholt 2018). The focus is on individuals within networks of interaction, not society as a whole.

## Is there a "Neolithic"?

In view of the myriad changes that took place in Europe between 7000 and 2000 BC, there is a broader discussion to be had regarding the relevance of the Neolithic concept itself. As Brigitte Röder puts it (this volume, chapter 13), why use the same concept to

refer to, say, Neolithic societies "on the Orkney Islands, on the Swiss Plateau, or in the Balkans"? Do these societies have anything in common besides agriculture, which is also found in urban and industrial settings? Would it not be easier to abandon the Neolithic concept altogether and focus instead on data (Veling, this volume, chapter 14)?

These questions have perhaps not received as much attention as they deserve recently, because a more scientific archaeology tends to be less rigorously concerned with terminological precision (see debates in archaeogenetics [Eisenmann *et al.* 2018] and Karl Popper on "precision" in science [Popper 1976]). Yet, how we choose to define categorical concepts such as "Neolithic" directly influences our perception of the data. To give an example, a major palaeogenomic study recently described the "Neolithic transition in the Baltic [as] not driven by admixture with early European farmers" (Jones *et al.* 2017). On closer inspection, it transpires that the "Neolithic" in the region is not exactly as we would describe it elsewhere in Europe. In short, "agriculture was not adopted as a primary subsistence economy until the Late Neolithic/Bronze Age" (Jones *et al.* 2017, 576). By choosing to follow the eastern European definition of the Neolithic, which emphasises pottery production instead of agriculture, the authors have sidetracked the central issue, which is the presumed co-dispersal of people with agriculture.

The western European or Childean definition of the Neolithic, as an economic shift from an appropriative to a productive economy with a tipping point (Childe 1936), still has its merits, which I shall briefly outline here. For this discussion, it may be useful to return to the original, uncapitalised spelling of the adjective "neolithic", referring to a technological stage and not a specific time period or culture. In this definition, the polished stone tools that characterise the new stone age are merely tools for survival or, to be more precise, instruments of production, involved in the processing of cereals and the clearing of forest for agriculture.

What is the lowest common denominator between all neolithic societies if not food production itself? Food production is, so to speak, necessary but it is not in itself enough to define the "neolithic" category, which is polythetic (that is, defined by attributes that are not individually sufficient for the existence of the class [Zvelebil and Lillie 2000, 60]). A valid objection, already raised above, is that more technologically advanced societies also practice farming, even though farming is no longer central to the system of production. But that assumes that the scale or system of production is not included in the definition of the Neolithic. Unlike an urban or industrial economy in Childe's scheme, a neolithic economy relies on domestic production – meaning that goods are essentially consumed by the people who produce them, usually members of the same household.

The finding of "translocal vessels" and non-local goods changes our vision of neolithic economies as purely domestically bound. Whether they herald a true shift to market-based interactions with consumers and producers remains an open question and something worth investigating in the future. Scale and intensity of production are important factors to consider. So is the nature of the goods exchanged. Andrew Sherratt has drawn attention to "cash crops", crops that are grown purely for the purpose of trade (Sherratt 1999) – is there any evidence of this in the Neolithic period?

Archaeology is starting to pick up complex interaction networks that are not unlike those observed by, for example, Malinowski during his ethnographic fieldwork among small-scale agricultural communities in New Guinea (Malinowski 1922). Heirloom-exchange networks such as the Kula ring, which periodically linked island communities in the Trobriand archipelago, potentially provide an idea of the sort of interactions that occurred between early farming communities, such as in the Aegean. Without extrapolating too much, we can see that gift-giving is a strategy to maintain kin ties without an outright shift to a capitalist system of extraction and profit.

When does a society cease to be neolithic? For V. Gordon Childe and others, the neolithic stage of production was "homotaxial", meaning that it repeated itself everywhere on the planet like a geological layer, though not at the same absolute date

(Childe 1944). Childe repeatedly hinted at Australia and New Zealand being the latest regions in the world to transition away from neolithic production, around 1800 AD, when indigenous communities started to be overwhelmed by industrially produced goods from European colonies (Childe 1936, 98).

Archaeology no longer subscribes to simple evolutionist models of history. Yet, they do raise interesting questions. Are low-scale household economies a good proxy for a neolithic stage of production? Or are they already too engaged in the world economy to serve as a valid analogy? If we accept this analogy, one solution to Alexander Veling's time-travel conundrum (this volume, chapter 14) might simply be to visit a low-level food-producing economy, such as the Trobrianders of New Guinea. There, he will not find people "from the stone age" (Harrer 1964), but I suspect that he will be able to observe (and even participate) in some of the practices that formed the basis of the neolithic pattern of existence.

## Outlook: Towards an archaeological synthesis of the past

Archaeology, as it is practised today, is about weaving together different strands of archaeological and scientific evidence to address larger questions of the past. The coherence of the archaeological process derives not so much from the methods used as from the questions asked. There are incredible benefits in archaeology becoming more data-reliant, such as the ability to confirm or (more likely) falsify hypotheses that were formulated long ago but which were never explicitly tested.

Yet, reliance on hard science and big data does not "[lift the] interpretative burden from archaeology" (*contra* Kristiansen *et al.* 2017, 335). The proxies on which archaeology relies are still open to ambiguity of interpretation. Small initial biases can become self-reinforcing when results from other disciplines are accepted without scrutiny (Halstead 2014). Equifinality, for instance, remains an issue in biomolecular studies. This volume outlines the conditions for a true archaeological synthesis: critical interdisciplinary dialogue with a fine balance maintained between data and theory.

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# Rethinking Neolithic Societies

Traditional archaeological ideas about Neolithic societies were shaped by questionable premises. The modern concept of social and cultural coherence of residence groups as well as the ethnic interpretation of 'archaeological cultures' fostered ideas of static and homogeneous social entities with fixed borders. Farming – as the core of the Neolithic way of life – was associated with sedentariness rather than with spatial mobility and cross-regional social networks. Furthermore, the widely used (neo-)evolutionist thinking universally assumed a growing social complexity and hierarchisation during prehistory. After all, such 'top-down'-perspectives deprived individuals and groups of genuine agency and creativity while underestimating the relational dynamic between the social and material worlds. In recent years, a wide array of empirical results on social practices related to material culture and settlement dynamics, (inter-)regional entanglements and spatial mobility were published. For the latter the adoption of the relatively new scientific methods in archaeology like Stable Isotope Analysis as well as aDNA played a crucial role. Yet the question of possible inferences regarding spatial and temporal differences in forms of social organisation has not been addressed sufficiently.

The aim of this volume is therefore to rethink former top-down concepts of Neolithic societies by studying social practices and different forms of Neolithic social life by adopting bottom-up social archaeological perspectives. Furthermore, the validity and relevance of terms like 'society', 'community', 'social group' etc. will be discussed. The contributions reach from theoretical to empirical ones and thematize a variety of social theoretical approaches as well as methodological ways of combining different sorts of data. They show the potential of such bottom-up approaches to infer models of social practices and configurations which may live up to the potential social diversity and dynamism of Neolithic societies. The contribution shed light on spatial mobility, social complexity, the importance of (political) interests and factors of kinship etc. We hope that this volume, with its focus on the Neolithic of Europe, will contribute to the ongoing critical debates of theories and concepts as well as on our premises and perspectives on Neolithic societies in general – and the practices of social archaeology as such.