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Burials in Bytes

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Austria, Bohemia, Moravia and Southern Germany

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i. Preface

This master thesis represents the results of several quantitative analyses of Linear Pottery Culture cemeteries. These investigations involved the use of the archaeological image database Montelius and the software for quantitative evaluations WinSerion, which were developed to complement each other by Dr. Peter Stadler, who is also supervising this study. My special thanks go to Peter himself for constantly modifying and improving on the provided software, so that it fits my similarly constant requests and needs, and of course for mentoring and guiding me towards the successful completion of the thesis. I also like to thank Dr. Nadezhda Kotova for helping me to establish pottery typologies, and Dr. Penny Bickle for giving me access to the Lifeways database, which was of great help and is heavily recommended for use by other archaeologists in this field.

This thesis is structured as follows: The first chapter introduces the Linear Pottery culture, its origins, funerary rites with emphasis on cemeteries, the research history as well as the research issues and aims of the study. The second chapter explains the Montelius database and WinSerion and the applied quantitative methods in general. This is then followed by the classifications and typologies, which were the fundamental parts of these investigations, and include an extensive overview of the material culture of Early Neolithic grave fields. Chapter 4 and 5 include a list of (almost) all known Linear Pottery cemeteries and the results and conclusions of the local and superregional evaluations, while the appendix contains their graphical representations.

ii. Vorwort

Das Ziel dieser Masterarbeit war die quantitative Auswertung linearbandkeramischer Gräberfelder. Zu diesem Zweck wurden die archäologische Bilddatenbank Montelius und die Software für quantitative Auswertungen WinSerion verwendet, entwickelt für einen gemeinsamen Gebrauch von Dr. Peter Stadler, der auch diese Studie betreute. Ihm gilt auch mein besonderer Dank, da er diese Programme ständig modifizieren und verbessern musste, um meinen durchaus fordernden Wünschen und Bedürfnissen nachzukommen, und natürlich für seine Arbeit als Betreuer und Mentor. Ich möchte auch Dr. Nadezhda Kotova danken, die mir bei der Erstellung von Keramikgefäß-Typologien geholfen hat, und Penny Bickle für die Bereitstellung der Lifeways-Datenbank, welche eine große Hilfe war und auch anderen Archäologen auf diesem Gebiet empfohlen werden kann.

Diese Thesis ist folgendermaßen strukturiert: Das erste Kapitel bietet eine Einführung in die Linearbandkeramik, ihre Ursprünge, Bestattungssitten mit Schwerpunkt auf Gräberfelder, Forschungsgeschichte sowie die Forschungsfragen und -ziele dieser Arbeit. Das zweite Kapitel erklärt die Montelius-Datenbank und WinSerion sowie die angewandten quantitativen Methoden im Allgemeinen. Danach folgen die Klassifikationen und Typologien, welche die Grundlage dieser Untersuchungen bilden und einen umfassenden Überblick über die materielle Kultur der frühneolithischen Bestattungsplätze bereitstellen. Kapitel 4 und 5 enthalten eine Liste (fast) aller bekannten linearbandkeramischen Gräberfelder sowie die Ergebnisse und Interpretationen der lokalen und überregionalen Auswertungen, während deren grafischen Darstellungen im Anhang zu finden sind.

1. Introduction

1.1. Linear Pottery distribution and origins

From about 5670 to 4900 cal. BC,¹ the Linear Pottery culture – the earliest archaeological horizon of the Middle European Neolithic – spread across and beyond Central Europe, reaching the Paris Basin westwards of the Rhine and even the eastern Ukraine in the process (Fig. 1). It is distinguished by a relative cultural homogeneity over the whole area of its distribution, visible in its subsistence, architecture, settlement forms, location and landscape choices, and mortuary practices. Nevertheless, both individual regional and chronological developments can be clearly distinguished, such as the Flomborn group on the left bank of the Rhine, or the *Notenkopf* (“Note Head” or “Music Note”) Pottery group of Moravia and Lower Austria.² This mixture of diversity and uniformity is particularly emphasized and also debated by modern research in the context of the Linear Pottery expansion.³

The genetic origins of the Linear Pottery culture trace as far back as southern Central Anatolia around 10,300 BP (8350 BC), where local hunter-gatherers adapted the Neolithic way of life.⁴ From Anatolia and Neolithic Cyprus, pioneering farmers spread via coastal, sea and land routes to Europe, reached Greece and Bulgarian Thrace around 6700 and 6500 BC respectively and then moved further north to the Balkans.⁵ Consequently, numerous regional groups developed. In 6200/6100 BC, the Starčevo culture – often described as part of the Starčevo-Körös-Criș cultural complex – emerged and expanded over the following decades to southwestern Hungary, Serbia, northern Croatia, northern Macedonia and parts of Bosnia.⁶ The Starčevo group is considered to be the cultural predecessor to the Linear Pottery culture, as indicated by their material culture; the pottery of the “Formative Phase” (earliest Linear

¹ For an absolute chronology of the Linear Pottery culture, see LENNEIS, STADLER 1995.

² For Linear Pottery ceramic analyses and chronological developments, see CLADDERS 2001. – LENNEIS 2010b. – LENNEIS, PIELER 2017.

³ BICKLE, ANDERS 2013, 1–3.

⁴ HAAK et al. 2010. – HOFMANOVÁ et al. 2016. – KILINÇ et al. 2016. – LIPSON et al. 2017. – MATHIESON et al. 2018. – SHENNAN 2018.

⁵ It should be considered that the exact circumstances of the Neolithization of Europe are still under debate; numerous models and theoretical approaches exist, which do not necessarily exclude each other, as the expansion of farming may have happened variously in different regions. For a recent thematic overview, see SHENNAN 2018.

⁶ LUCA, SUCIU, DUMITRESU-CHIOAR 2011, 11.

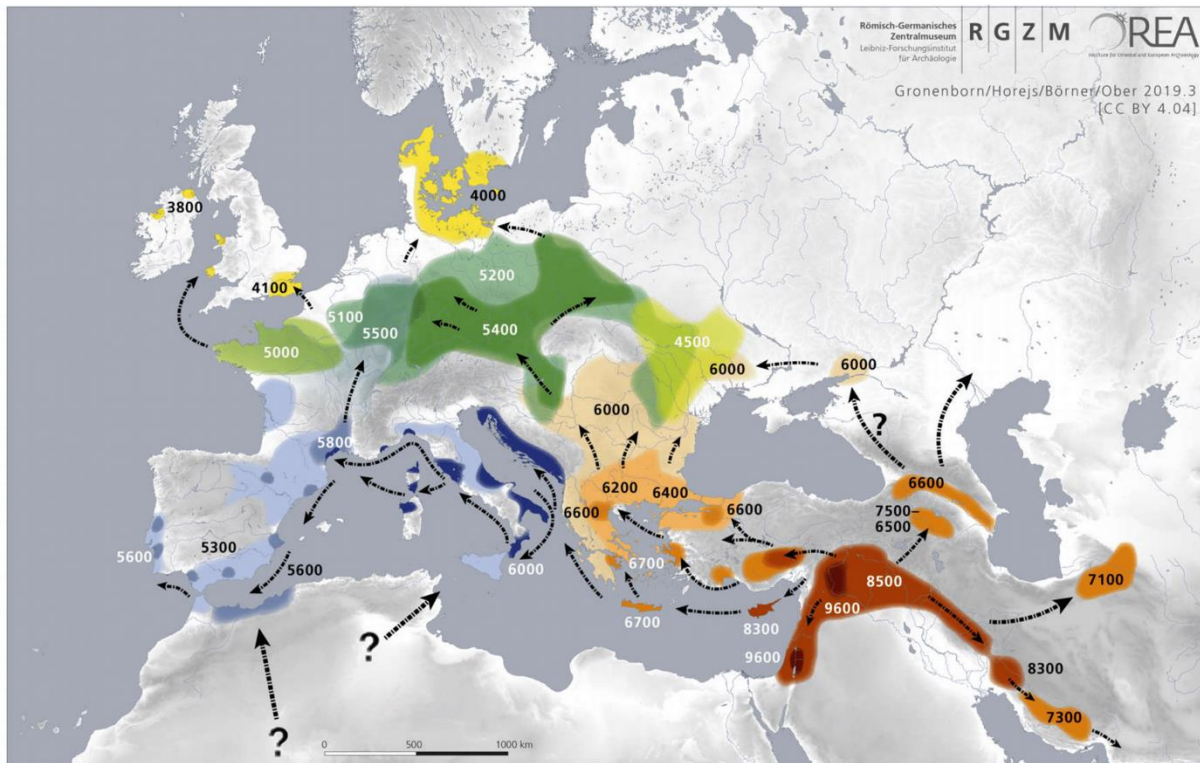


Figure 1: Map of the Early Neolithic expansion to Europe, with years specified as BC (GRONENBORN et al. 2019)

Pottery) as well as a clay flute found at the settlement site *Brunn am Gebirge* in Austria show significant similarities to Starčevo ware.⁷ Such correlations are also observable between the Alföld Linear Pottery culture, which developed in eastern Hungary and Transylvania from the Körös group.⁸ These cultures have most probably spread via the river routes (e. g. Danube, Tisza) or long-established Mesolithic trade channels.⁹ Eventually, around 5650 and 5500 BC respectively, the Linear Pottery as well as the Alföld culture emerged from the Starčevo-Körös-Criş complex.

The genetic evidence of Linear Pottery human remains shows Neolithic Anatolian roots with only small portions of hunter-gatherers, thus further reinforcing migration models for the European Neolithization.¹⁰ However, the actual cultural influence and presence of local hunter-gatherers within Linear Pottery societies are still debated, as demonstrated by publications regarding their material culture and bioarchaeological analyses of human remains. Finds such as trapezoidal chert arrowheads were already present before the arrival of the Earliest Neolithic, while the distribution of red ochre and ornaments made of snail shells

⁷ POMBERGER 2009. – LENNEIS, PIELER 2017.

⁸ BÁNFFY 2006. – BÁNFFY, OROSS 2009.

⁹ DOMBOROZKI 2010.

¹⁰ BRAMANTI et al. 2009.

or limestone as well as cremation rites might have also been of Mesolithic origin.¹¹ Pharyngeal teeth of the pearlfish as excavated from a Linear Pottery grave at Eichendorf-Aufhausen are known from the younger Mesolithic period of the south-west German Danube region and the Late Mesolithic of Vlasac at the Iron Gates.¹² The burial of the dead in a supine position, as opposed to the typical Early Neolithic crouch, are probably also anchored in hunter-gatherer tradition. A combination of isotopic, osteological, aDNA and archaeological research on the Linear Pottery cemetery of Vedrovice “Siroká u lesa” in Moravia indicates the incorporation of local hunter-gatherers.¹³ The most intriguing evidence for Neolithic-Mesolithic-interactions derives from the just mentioned site *Brunn am Gebirge*, where similar investigations of four inhumations revealed hunter-gather-ancestry for one man (individual 2) that was acquired after their ancestors had left Anatolia.¹⁴ Unfortunately, there is no exact dating for those graves yet – one knows only that they were buried after the usage of houses - while the exact circumstances of the intermixture – if it occurred locally or along the journey – are also unknown. However, the high proportion of mesolithic heritage of individual 2 combined with the western European affinity of the hunter-gatherer-related ancestry indicates recent post-arrival sexual intercourse in central Europe. Lithic grave goods which derived from around Lake Balaton in Hungary, where other Formative Linear Pottery settlements are located, and strontium values stating that the man was not born at Brunn, indicate that individual 2 could have migrated from Bakony-Szentgál, where the chert was probably obtained. The unusually high number of approximately 15,000 lithic artefacts at site 2 is also interesting and could be explained by Neolithic farmers having produced these for trading with mesolithic people. Such a production centre would have needed the knowledge of experienced craftsmen, of which some might have been integrated from Mesolithic communities. As demonstrated by these examples, just to name a few, the nature of the Linear Pottery origins is – similarly to European Neolithization in general – a hugely complex issue, whose researchers hopefully expect intriguing revelations for the near future, considering the opportunities of modern technology and methods.

¹¹ LENNEIS 2007.

¹² GEHLEN 2016, 840.

¹³ BRAMANTI 2008. – DOČKALOVÁ 2008. – JAROSOVA 2008. – LILLIE 2008. – LUKES, ZVELEBIL, PETTITT 2008. – NYSTROM 2008. – PETTITT, Paul, HEDGES, Robert 2008. – RICHARDS et al. 2008. – SMRČKA, ERBAN et al. 2008. – SMRČKA, MIHALJEVIĆ et al. 2008. – ZVELEBIL, PETTITT 2008. – BICKLE, ANDERS 2013, 5.

¹⁴ NIKITIN et al. 2019.

1.2. *Mortuary practice*

An important role for exploring Linear Pottery cultural diversity is played by mortuary rites, with its people having had various ways of taking care of their dead. The remains of at least 4000 individuals have been recovered, with cemeteries offering the vast majority of data for analysis. Single inhumations dominate on these sites, whereas multiple burials contain up to three people. In settlements inhumations occur singly or in small groups in pits or ditches near or within the characteristic Linear Pottery longhouses.¹⁵ One of the symbolic roles of these houses was interpreted as burials of ancestors, with a secondary use of buildings as primary deposition of human remains after their abandonment, potentially linked to land ownership and territory control.¹⁶ Rare traces of wooden structures are sometimes explained as coffins; only one tree trunk burial is known among the whole Linear Pottery distribution area.¹⁷ Cremations are the second most common grave type in cemeteries, but haven't been found in settlements so far.¹⁸ Some inhumations additionally hold cremated human remains. A significant proportion of burial pits have been found without a skeleton. These "empty graves" are distinguished from cenotaphs which symbolize an absent deceased person by intentional positioned grave goods.¹⁹ Empty graves, on the contrary, often contain disturbed finds and remains, thus marking the exhumation of the deceased. Grave-like pits without traces of a skeleton and neighbouring regular burials might be indicators of unknown funerary rites. There are some alternatives in Linear Pottery mortuary practices to cemeteries and settlement burials, including the disposal in ritual caves and different kinds of mass graves. One example would be the cave *Jungfernhöhle* (engl.: "virgin cave") at Litzendorf in Bavaria, containing Linear Pottery finds as well as the skeletal remains of at least 40 individuals, of which ten to eleven were adult (including nine young women), four to five juvenile and 23 children or infants. The interpretations of the find situation, comprising of smashed skulls and other post-mortem manipulations, are still partly under debate and range between secondary

¹⁵ For an overview of Linear Pottery settlement burials, see VEIT 1996.

¹⁶ TUREK 08.11.2019.

¹⁷ Traces of wooden structures can be found at, e.g., the cemetery Rutzing in Austria, see KLOIBER, KNEIDINGER 1968, 24. For the tree trunk burial at Dresden-Nickern, see BAUMANN 1960a.

¹⁸ For an overview of Linear Pottery cremations, see TRAUTMANN 2006.

¹⁹ LENNEIS 2010a, 162.

or single-phase burials to cannibalism, although the latter seems outdated.²⁰ Another example represents the cult site of Herxheim, where at least 500 people were buried in enclosure pits alongside animal remains and grave goods, which remains one of the most well-known mass graves in Linear Pottery culture.²¹ Traces of excarnation, comparable to the bones of slaughtered animals, suggest ritual cannibalism.²² Some archaeologists reject this hypothesis in favour of Herxheim being a necropolis to which the deceased were transported for the purpose of reburial.²³ Another interpretation includes ritual decarnalization to feed the human flesh to birds while the bones are buried, a process comparable to Tibetan sky burials.²⁴ Other mass graves are vastly different in nature, as demonstrated by the “Massacre of Talheim”. The Talheim Death Pit contains 34 people killed by Linear Pottery adzes and arrows, strongly suggesting warfare between Early Neolithic communities.²⁵

It is worth noting that the number of discovered burials is just a small amount when compared to the assumed population size of that time. Therefore, some researchers suggest the regular treatment of the dead was a disposal out in the field or in the woods.²⁶ In this case, there would have been an extreme selection for inclusion in archaeologically detectable burial grounds such as cemeteries, which are the focus of this thesis.

²⁰ The most recent review of the site *Jungfernhöhle*, including previous interpretations, is provided by BOULESTIN 2017.

²¹ ZEEB-LANZ.

²² BOULESTIN et al. 2009.

²³ BOWER 04.12.2009.

²⁴ ZEEB-LANZ, 177.

²⁵ WILD et al. 2004.

²⁶ VAN DE VELDE 1997a. – BICKLE, ANDERS 2013, 17.

1.3. Cemeteries

Traditionally called *Gräberfelder* in German-speaking literature (literally meaning “grave fields”), Linear Pottery cemeteries are known as the earliest “extra-mural” sites in Neolithic Europe. There are various definitions for this term; Norbert Nieszery, for example, defines *Gräberfelder* as sites with at least 5 inhumations or cremations.²⁷ They also have to be situated in a limited area with pits exclusively used for funerary rites and separated from the settlement complex. A lack of structural components set them apart from necropoles, although Nieszery sometimes also uses this term when referring to Neolithic cemeteries. This study relies on Nieszery’s definition of *Gräberfelder* when speaking of grave fields or cemeteries.

According to the current state of research, there are around 80 known cemeteries of the Linear Pottery culture, which are unevenly spread across its distribution area from western Slovakia to Alsace. They are mainly concentrated alongside major river routes (f. e. Danube, Rhine), which undoubtedly played an important role for Early Neolithic expansion. However, there is a notable lack of cemeteries in Poland, the Paris Basin, some parts of Central Germany, and Hungary. Additionally, far less cemeteries were discovered in the south-eastern distribution area of Austria, Moravia and Bohemia, than in the western population centres of Germany. This might have various reasons. At first, the distribution focus of Linear Pottery cemeteries corresponds with the areas of intensive archaeological field research; cemeteries in other regions just haven’t been discovered or are not published, which might be the case with Hungary, where the discovery of cemeteries is long awaited.²⁸ Secondly, preservation and the ability to recover human remains strongly depend on environmental conditions, which vary between different regions. Especially erosion caused by modern agriculture threatens archaeological finds and features. While inhumations were often dug deep enough to escape the erosion, cremation pits are shallow and thus far more often lost. Other disturbing activities include construction work and the exploitation of resources, as demonstrated on the partially

²⁷ Original text: „Als Gräberfelder behandle ich in dieser Arbeit die Fundstellen, die fünf und mehr Körper- bzw. Brandbestattungen in separaten, ausschließlich für die Grablegung hergerichteten und benutzten Eintiefungen innerhalb eines relativ eng umgrenzten Areals aufweisen und deren Gleichzeitigkeit mit am selben Ort vorhandenen Siedlungsspuren nahezu ausgeschlossen werden kann.“ NIESZERY 1995, 28.

²⁸ E. g. NIESZERY 1995, 28–31.

or complete destruction of certain cemeteries. Ironically, these activities are often responsible for the discovery of such sites. In chapter 4.2., grave field distribution will be further discussed. The majority of cemeteries were established in the late chronological phases of the Linear Pottery culture, with only few dating earlier. The oldest cemetery appears to be Vedrovice in Moravia (around 5300 cal. BC),²⁹ followed or paralleled by Flomborn in Rhineland-Palatinate.³⁰ The lack of cemeteries in the Earliest or Formative Linear Pottery phases raises the question concerning the origins and formation of separate burial grounds. The broad consensus seems to be that there exist at least no obvious roots in Mesolithic mortuary practices of Central Europe, whereas graveyards outside the Early Neolithic distribution area are unknown. Possible precedents in the nearest South-Eastern Neolithic cultures cannot be considered at the moment either as the current state of research is incomplete at best. It is worth noting that the emergence of *Gräberfelder* from 5300 BC onwards corresponds to a phase of increasing expansion and settlement activity, although the nature of this connection has not been resolved yet.

The size and dimensions of Linear Pottery cemeteries vary. Smaller grave groups of less than ten or some dozen burials were often assumed to be part of more extensive cemeteries or resulted from incomplete investigations or disturbed sites, therefore the actual size is uncertain. The largest known *Gräberfeld* could be Warburg-Hohenwepel. While there were only about 100 burials discovered so far, the director of excavations Dr. Pollmann suggested that the cemetery might have had originally more than 1000 graves.³¹ Such amounts would be far greater than these of previously known large cemeteries, including Wandersleben-Gotha in central Germany (311 graves),³² Merzenich-Morschenich in North Rhine-Westphalia (280 graves)³³ and Schwetzingen in Rhineland-Palatinate (240 graves).³⁴ Most cemeteries do not seem to reach such high quantities; consequently, only few *Gräberfelder* are suitable for extensive quantitative studies. On the contrary, combining the data of grave fields by including those with a small number of burials might still offer new insights into Linear Pottery mortuary practices.

²⁹ PODBORSKÝ 2002a. – PETTITT, Paul, HEDGES, R. E.M. 2008.

³⁰ RICHTER 1969. – JEUNESSE 1997.

³¹ ARCHÄOLOGIE-ONLINE.DE 28.09.2015.

³² BACH 1986.

³³ GAITZSCH, JANSSENS 2010. – CZIESLA, IBEILING, ALTEMEIER 2014.

³⁴ GERLING 2012.

1.4. *Research history and source criticism*

In the following, a short summary of the research history of Linear Pottery cemeteries shall be presented, starting with the post-war period; more extensive overviews would go beyond the scope of this master's thesis, although the source literature mentioned in this subchapter already provide such.

The earliest overview of Linear Pottery cemeteries and graves after the end of the Second World War was carried out by Heinz-Dietrich Kahlke in 1954, which additionally included a first evaluation of the previously excavated grave field Sondershausen (Thuringia).³⁵ Two years later followed an analysis of Neolithic to Bronze Age mortuary rites written by Ulrich Fischer.³⁶ In 1969, a detailed catalogue of the findings of the cemetery Flomborn in Rhineland-Palatinate was finally released by Richter, almost 70 years after a general summary of those grave goods had been provided by Koehl.³⁷ During the Cold War, in 1972, Juraj Pavúk published the report of the cemetery Nitra in Slovakia, in which he mentioned burials of old men being gifted with wealthier grave goods than those of women, contradicting the then Marxist-ideological narratives of a Neolithic matriarchy.³⁸ From the 1970s onwards, sufficient data were collected to investigate regional patterns and relationships between regions, which – among horizontal stratigraphy and grave good distribution – became one of the most significant research issues. The Dutch archaeologist Pieter J. R. Moddermann in particular emphasized Linear Pottery diversity within its uniform character and significantly influenced the archaeological research in the process.³⁹ In Germany, Edith Hoffmann provided an analysis of Linear Pottery and *Stichbandkeramik* (“Stroke-ornamented pottery”) culture inhumations in Saxony-Anhalt, while Storch focused on the Upper Rhine area.⁴⁰ It is worth noting that Hoffmann rehabilitated cremations and proved their existence – as previous research on them turned out to have been faked – with Iris Trautmann succeeding her in analysing cremated human remains in the early 2000s.⁴¹ Socio-historical evaluations with a focus on gender-specific distribution were conducted in 1982 by Olaf Höckmann, and more recently e. g. by Daniela Nordholz and Penny

³⁵ KAHLKE 1954a.

³⁶ FISCHER 1956.

³⁷ KOEHL 1903. – RICHTER 1969.

³⁸ PAVÚK 1972, 55. – LÜNING 2010.

³⁹ MODDERMAN 1988.

⁴⁰ HOFFMANN 1978. – STORCH 1985.

⁴¹ HOFFMANN 1973. – TRAUTMANN 2006, 11.

Bickle.⁴² An extensive study on newly excavated Bavarian cemeteries was carried out by Norbert Nieszery in 1995, followed in the next year by an evaluation of all previously published settlement burials written by Ulrich Veit, who – similarly to Nieszery – included a profound list of Linear Pottery cemeteries.⁴³ In France, Early Neolithic funeral traditions were emphasized by archaeologists such as Christian Jeunesse, who contributed to the research various publications regarding Linear Pottery cemeteries in the Alsace region and in general, and still continues – among others – to do so.⁴⁴

Technological progress as well as an overall improvement of methodology greatly advanced the research on Linear Pottery funerary rites in the 21st century. Cemeteries and graves are now found more frequently and their findings (usually) are published more reliably. The most significant research issues – regional differences and horizontal stratigraphic analyses of various kinds – still remain the same, while quantitative, bioarchaeological and other modern methods become more common, as the data set steadily increases and grows more refined. Recent publications of newly or formerly excavated cemeteries, for example Kleinhadersdorf or Schwetzingen, already included correspondence analyses or seriation, while other grave fields such as Vedrovice received fresh genetical, isotopical and other evaluations.⁴⁵ One of the most ambitious works of modern Linear Pottery research remains the “LBK Lifeways project”, a relational database of around 3000 burials, which contains existing information on almost all published graves, supplemented with some unpublished data.⁴⁶

Considering all this information, it seems that Linear Pottery cemeteries are extensively published and ready for quantitative evaluations. Unfortunately, this is only partially true, as demonstrated by the publication status of some cemeteries. For example, a general summary of the finds and findings of the grave field Flomborn has been published in 1901,⁴⁷ with a detailed catalogue of the find material not having followed until 1969, at which time much information already had been lost.⁴⁸ Other cemeteries, such as Nitra, were only partially

⁴² HÖCKMANN 1982. – NORDHOLZ 2015. – BICKLE 2019.

⁴³ NIESZERY 1995. – VEIT 1996.

⁴⁴ JEUNESSE 1997. – LEFRANC, DENAIRE, JEUNESSE 2014.

⁴⁵ BRAMANTI 2008. – DOČKALOVÁ 2008. – JAROSOVA 2008. – LILLIE 2008. – LUKES, ZVELEBIL, PETTITT 2008. – NYSTROM 2008. – PETTITT, Paul, HEDGES, Robert 2008. – RICHARDS et al. 2008. – SMRČKA, ERBAN et al. 2008. – SMRČKA, MIHALJEVIĆ et al. 2008. – ZVELEBIL, PETTITT 2008. – GERLING 2012. – NEUGEBAUER-MARESCH, LENNEIS 2015a.

⁴⁶ BICKLE, ANDERS 2013.

⁴⁷ KOEHL 1903.

⁴⁸ RICHTER 1969. – NIESZERY 1995, 32.

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excavated and remain so to this day.⁴⁹ Particularly aggravating is the publication status regarding cemeteries in the German federal state of Baden-Württemberg; detailed catalogues of findings of the three larger cemeteries Fellbach-Oeffingen, Stuttgart-Mühlhausen and Vaihingen are unpublished, which accounts to about 400 graves, whose data is thus not included in this study. Considering such issues, only reduced evaluations of Linear Pottery burials are possible at the moment.

⁴⁹ PAVÚK 1972, 5.

1.5. Research issues and aims

With few exceptions such as the Lifeways Database, attempts to quantify an extensive amount of Linear Pottery culture data have been rare so far. Reasons for this might be found in its large-scale distribution; as its archaeological evidence is scattered across a wide area, grasping and analysing all the data is time-consuming and difficult, especially for individual archaeologists. This issue is not merely bound to the Linear Pottery culture, but to any larger cultural complex or era. Modern technology has helped scientists to develop powerful tools which not only provide solutions to these issues, but new opportunities as well. Such tools offer the possibility for archaeologists to accomplish complex analytical calculations, while current PCs (even relatively cheap models) have sufficient processing power to perform them in a short time. As this master's thesis is a quantitative study of cemeteries, I will take advantage of these possibilities to execute a variety of different evaluations, aiming to provide detailed insights into Linear Pottery funerary practices and to discover previously unnoticed patterns.

A quantitative analysis of archaeological finds and features requires the right software; this decision was made in favour of the image database "Montelius" and the program package for quantitative evaluations "WinSerion", which were both programmed to complement each other. Various methods were applied: Seriation (for dating artefacts to place them in chronological order), correspondence analysis or reciprocal averaging (for calculating the relationships of artefacts to each other) and the "Analysis N Next Neighbours", a unique evaluation method exclusively invented for WinSerion. The subjects of these analyses were grave goods (various typologies), anthropological or physical characteristics (e. g. age, sex, positioning) and other features (e. g. grave-pit orientation, burial type). All these traits were designed to fit the research aims for this thesis, which are as follows:

- Create distribution maps and use the Analysis N Next Neighbours to explore topographical patterns on individual cemeteries based on various traits and compare the results to establish possible connections. These traits include:
 - Artefact typologies
 - Presence or absence of preserved grave goods
 - Burial type (inhumation, cremation, empty grave etc.)
 - Anthropology (sex, age)

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- Grave-pit orientation
- Burial position (Line of sight, orientation, arms position etc.)
- Apply a seriation to recognize the chronological development of grave goods based on artefact typologies of the following:
 - Complete data set
 - Local data sets if sufficient data available
- Carry out correspondence analyses to recognize connections and patterns based on the artefact typology of grave goods.
- Generate substantial graphical representations of said tasks to provide a framework for further investigations
- Compare the results to those of earlier studies to confirm or discuss previous interpretations and synthesize the data

As mentioned before, a few thousand burials are known throughout the Linear Pottery distribution area, which includes a solid material foundation for quantitative studies. However, since a complete evaluation of all suitable cemeteries would be too extensive for a master's thesis, a delimitation of the topic is inevitable. The study area will be consequently reduced to the following regions: Austria, Bohemia, Moravia and the southern German federal states of Baden-Württemberg and Bavaria. Unfortunately, as mentioned in chapter 1.4, a significant proportion of cemeteries and burials in these regions are not available. All these limitations considered, 13 cemeteries with at least 700 graves remain for this thesis. The long-term goal to have any available feature analysed and included has to wait for a potential continuation of this study. In order to determine the meaningfulness of such a sequel, and to guarantee a critical confrontation with my own methodology, some final issues have to be considered: Were the quantitative methods applied in this study efficiently carried out and is there room for improvement? Do the results provide meaningful information? In summary, is it appropriate to continue this investigation? If there are strong arguments for the latter, a sequel for this study will be considered.

2. Methods

In order to ensure a basic understanding of the quantitative methodology for archaeologists who are not or hardly familiar with the topic, a brief introduction to the mathematical procedures and the software used and applied in this study is necessary, which will be provided in the following.

2.1. *Image database Montelius*

The image database Montelius, named after Oscar Montelius, obtains its information from archaeological publications, more precisely their figures – preferably of finds and features, but not necessarily – which are categorized and processed for further quantitative evaluations.⁵⁰ The aim of the Montelius project is to provide a complete database of the history and prehistory of Europe. Since the start of Montelius, at least 1.350.000 figures have been

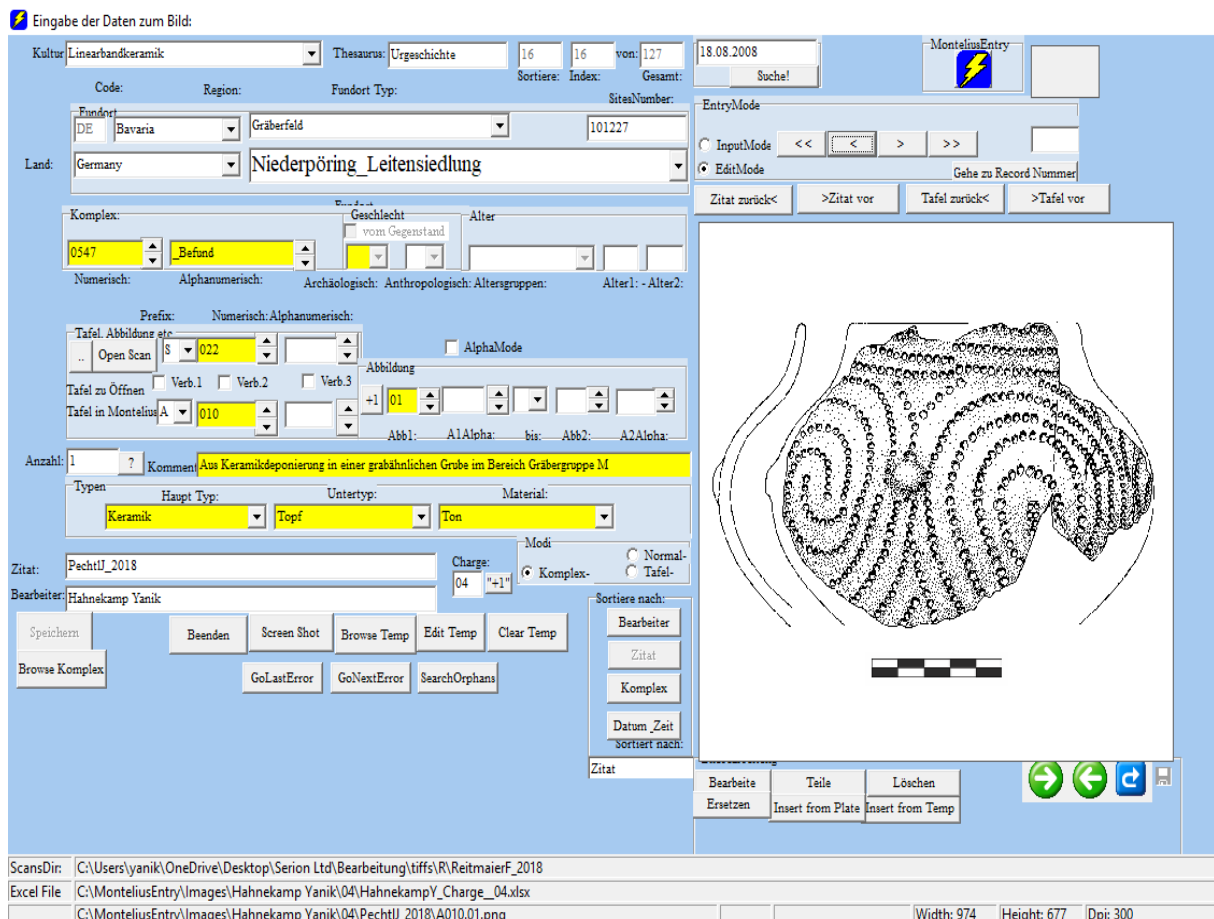


Figure 2: The input mask of the “Montelius Entry” function of the Montelius database. A picture is taken from a publication, a basic typology established, and the information then saved to the database.

⁵⁰ For details and overviews regarding the image database Montelius, see STADLER 2017b. – 2019a.

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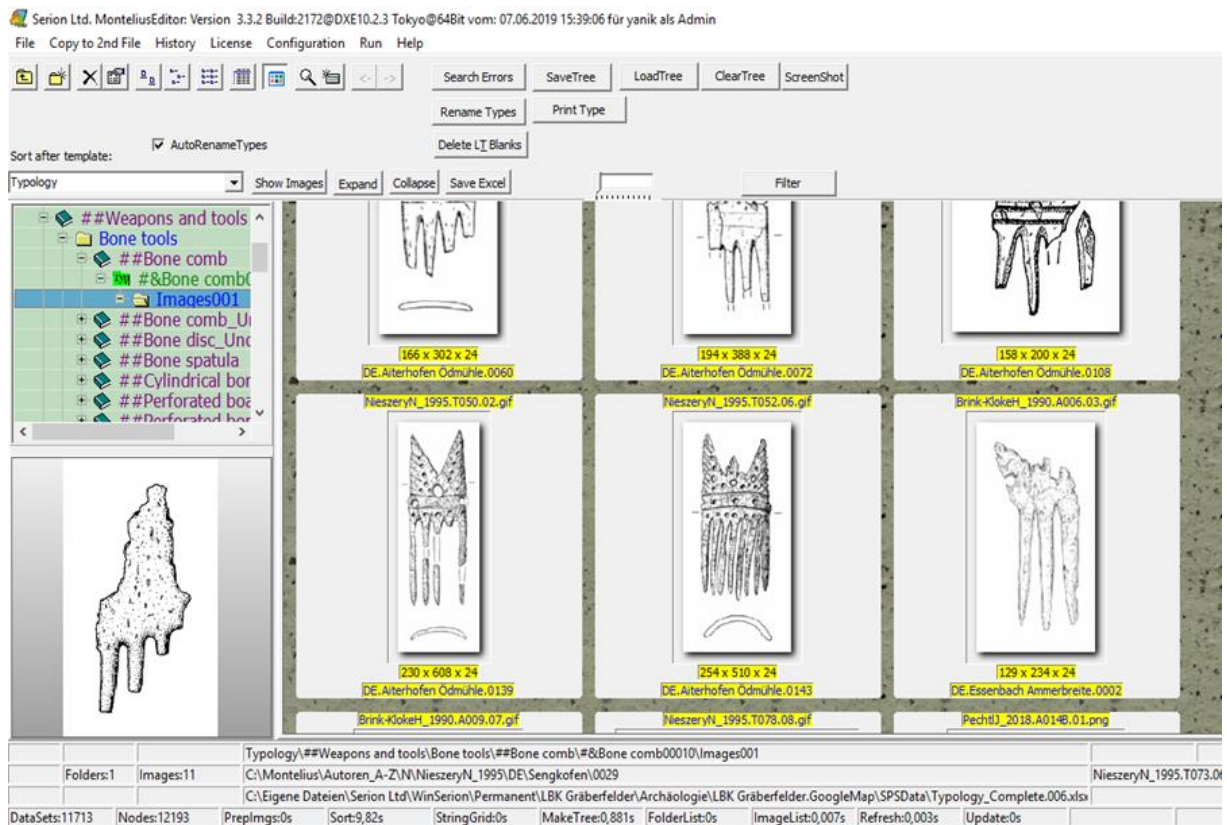


Figure 3: MonteliusEditor, typology of bone combs after being saved to the database via MonteliusEntry. This typology can be adjusted by Drag'n Drop as well as easily renamed or changed, among other functions.

added by various project team members. This enormous data set stores a significant amount of publications regarding Linear Pottery culture; all the information required to perform a quantitative evaluation of cemeteries for the selected study area is available. However, there are a few steps involved before the data can be used.

The data acquisition is carried out by "MonteliusEntry", an application which helps the user to cut out relevant figures to categorize and assign the objects depicted (material, type, culture, corresponding site and features etc.), providing a rudimentary typology in the process (Fig. 2). If this figure represents grave goods or human remains, it can be assigned to the archaeological feature it has been found in. The typology is then saved in a Microsoft Excel table, while both images and excel-files are stored in the database. In this way, the images of finds, features, tables, maps and other types of data are linked with the corresponding data records in Excel and can be called up jointly by Montelius.

As the rudimentary typologies provided by MonteliusEntry are just a means to establish basic overviews of the data, they are most often inconvenient for quantitative evaluations and therefore have to be changed by the investigating archaeologist depending on the typologies needed for the research issue. This task is performed with "MonteliusEditor", an application

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that helps the editor to adjust typologies flexibly and easily by Drag'n Drop (Fig. 3). The possibility to change and improve typologies at any time by using an application is described as “dynamic typologies” and represents one of the distinguishing features of the Montelius database. The typologies established for this thesis can be found in chapter 3.

2.2. Evaluation software WinSerion

WinSerion is basically a program package for the evaluation of archaeological data. All types of seriations from petrification to correspondence analysis are possible. Spatial evaluations are carried out with the Analysis N Next Neighbours. The graphical representations of the results can be found in the appendix of this study. In the following, different types of evaluation relevant to this thesis will be introduced.

2.2.1. Seriation

The term “seriation” derives from the word "series" and refers to a sequence of specific similar or semi-similar things.⁵¹ In archaeology, this method is used to order matrices (frequency tables, combination tables etc.) after the unimodal model. A unimodal model exists when a phenomenon becomes more frequent at first, but less frequent again after reaching maximum frequency until it disappears entirely. The archaeological seriation, applied correctly, describes the development of artefacts and their characteristics and puts them into the right chronological order. It presents the establishment of an element (e. g. the invention of a new type of arrowhead), its progressive increase of quantity, and then decline while being replaced by another element. The assumption that each object has a specific life span and a distinct

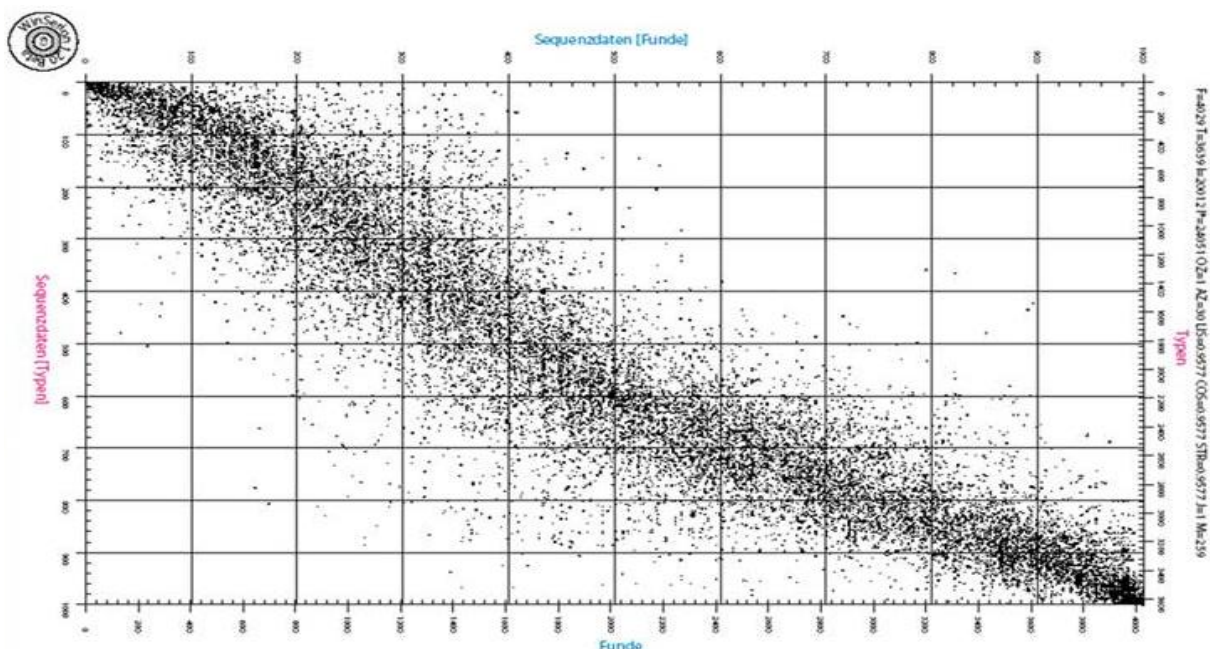


Figure 4: Seriation of Avar male burials performed by WinSerion, showing a clear chronological progression. Each point represents an archaeological object like a buckle. (STADLER 2017c).

⁵¹ For an overview of seriation, see O'BRIEN, LYMAN 2002.

popularity curve assigned to this span is one basic principle of seriation. As a result, each time segment can be characterized by certain types and their relative frequency in the data set.

There are some things to consider before performing a seriation:

- The result of a seriation naturally depends on the selected typologies. By defining certain types, archaeologists try to reflect real-life circumstances of past societies, which might or might not have categorized these objects by the same standards. As our thinking is most certainly vastly different from that of prehistoric people, typologies tend to be arbitrary constructs influenced by modern and subjective perspectives. However, they can still provide meaning information. As Falko Daim once wrote: “If the basic rules are observed, definitions of types cannot be right or wrong, but can only be favourable or unfavourable from a pragmatic point of view.”⁵² Therefore, the task of the editor is to find or establish the most favourable typologies and apply them.
- Each type needs sufficient and representative samples. Should an element only consist of one unit without occurring with other types, it is most often statistically irrelevant or even disturbs the result. As demonstrated on some exceptional finds (e. g. a single ceramic vessel with pedestal found as the only grave good within an inhumation)⁵³, such situations seem unavoidable sometimes. Values that affect the calculation negatively by falling out of line statistically are described as “statistical outliers” and should be eliminated if they distort the evaluation significantly.
- While seriation is used in archaeology primarily to arrange objects chronologically, the inference that seriations create a sequence of units is not unquestionable.⁵⁴ Basically, the linear order only tells us that two adjacent elements are probably more similar to each other than to other elements farther up or down the line, and thus might just show the spatial order of artefacts at sites not necessarily reflecting chronological development.
- The calculation of a seriation depends on the applied algorithm. WinSerion performs different seriation algorithms. The reciprocal averaging is regarded as the optimal

⁵² Original text: „Definitionen von Typen können — beachtet man die Grundregeln — nicht richtig oder falsch, sondern nur vom pragmatischen Gesichtspunkt her günstig oder ungünstig sein.“ DAIM 1987, 28.

⁵³ PODBORSKÝ 2002a, 35.

⁵⁴ O'BRIEN, LYMAN 2002, 60.

evaluation method. More than that the much more complicated correspondence analysis, a potentially multidimensional procedure of which the first solution is identical with the result of a seriation.⁵⁵

For this study, seriations will be performed for the complete data set, meaning all cemeteries selected for the master thesis including the ones with small amounts of graves (e. g. Rutzing) combined. Additionally, the German site “Aiterhofen-Ödmühle” in Bavaria will receive its own seriation based on grave goods combined with burial type (Fig. App. 80), as the site offers sufficient amounts of data for meaningful investigations, in contrast to other cemeteries.

⁵⁵ STADLER 2017c.

2.2.2. Correspondence analysis and reciprocal averaging

Correspondence analysis (abbreviated CA) is a form of seriation that enables the spatial representation of the relationships and variables of a contingency or frequency table.⁵⁶ Column and rows of a table are represented by circles (alternatively as other symbols) in a coordinate system whose axes are formed by their respective characteristics, the so-called Eigenvectors. (Fig. 5). In this way, correspondence analyses allow not only direct comparison between objects, but also the recording of their similarity to each other. The use of multivariate statistical methods, which are performed by the corresponding software in the evaluation of the data, distinguishes the correspondence analysis from the seriation. The term “multivariate” means that more than two variables (e. g. two specific types of grave goods) and their respective relations are calculated, while a seriation is one-dimensional. As with the latter, the quality of such a method no longer depends on the mathematical skills of the archaeologist due to digitalization, but on the algorithm used. Modern correspondence

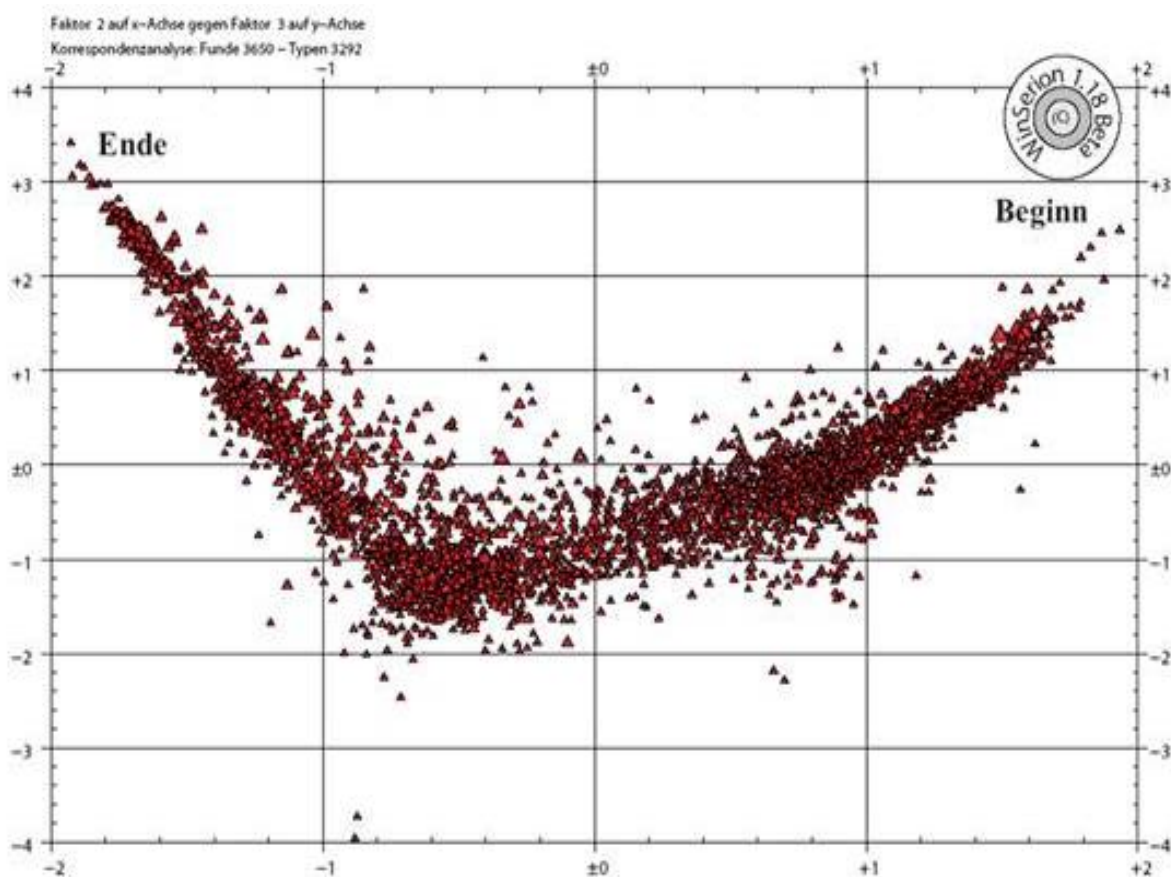


Figure 5: Correspondence analysis of Avar cemeteries performed with WinSerion. Each triangle represents one archaeological feature. Burial pits with similar attributes are near to each other or do even intersect (STADLER 2017c).

⁵⁶ For an overview of correspondence analyses, see SIEGMUND 2014. – 2015.

analyses usually apply an improved version of the reciprocal averaging, which was initially developed by Peter Ihm in 1983.⁵⁷ There are some things to consider before performing a correspondence analysis:

- Most rules corresponding to frequency seriation can also be applied here. The editor seeks to find the most favourable typologies. Unfavourable types – statistically irrelevant objects or statistical outliers – might disturb the evaluation and make the graphical representation of the analysis unreadable.
- The correspondence analysis shows similarities and relations between elements. If objects are closely related (e. g. certain types of grave goods which are commonly buried together), they will assemble in groups or even intersect. Depending on the data, it might even provide a chronological order. Through this method, questions of gender, cultural affiliations, isotope distribution and other categories can also be explored.

For this study, only correspondence analyses of the complete data set of grave goods will be performed, as regional and local data sets do not offer sufficient information for meaningful evaluations, at least with the classifications presented in chapter 3.

⁵⁷ IHM 1983.

2.2.3. Analysis N Next Neighbours

The "Analysis N Next Neighbours" is a method developed by Peter Stadler created in mind for using it specifically in combination with Montelius and WinSerion.⁵⁸ Basically, it performs a cluster analysis of archaeological features and their traits which is then presented on site maps. A cluster analysis is a type of the correspondence analysis in which elements are grouped together in such a way that objects in the same group (called a cluster) are more similar to each other than those in other clusters.⁵⁹ To perform the variant Analysis N Next Neighbours, a vector drawing of a site has to be created and the corresponding elements or types assigned to the individual archaeological features by using MonteliusEntry or MonteliusEditor. WinSerion then calculates the significance of those elements to order similar groups of features and displays them as spatial clusters on the vector-drawing of the cemetery map.

There are different types of this evaluation method: The "Analysis N Next Neighbours regarding one type" determines the significance of all representatives of one single element. If in the vicinity of a complex containing a certain type, other representatives of the same type are found and this distribution is significant (non-random), the complex and its associated neighbours are subjected to reciprocal averaging. Then clusters are calculated and displayed on the AutoCAD-map. The "Analysis N Next Neighbours regarding two types" calculates for each representative of a type whether another type occurs significantly more frequent in the surroundings of the next neighbours. In this way, similar distributions of various types can be detected and compared. As with the former variant of Analysis N, clusters are calculated by reciprocal averaging and then displayed on the map drawing. For this study, the first variant of the Analysis N Next Neighbours will be performed for cemeteries with a sufficient number of graves, including: Aiterhofen-Ödmühle (Bavaria), Kleinhadersdorf (Austria), Nitra (Slovakia), Schwetzingen (Baden-Württemberg), and Vedrovice "Siroká u lesa" (Czech Republic). There will be two different evaluations; one restricted to traits regarding burial position and pit orientation (orientation, line of sight, arm gesture etc.) and another one limited to grave goods combined with burial type, with the latter also adding the trait describing the positive presence of gifts (Code "Grave goods_Yes00010", see chapter 3.2.), as otherwise the

⁵⁸ STADLER 2017a.

⁵⁹ For an overview of cluster analyses, see CARLSON 2017.

reciprocal averaging algorithm might occasionally exclude burials if they contain only one grave good and the type of this gifts does not correspond to other traits, making the graves automatically blocked outliers. This is the case e. g. for grave 1 at the cemetery of Nitra, which is an exceptionally uniform site in its funerary structure.⁶⁰ This burial only includes one vessel, whose type does not match other pottery at the site, while it shares the trait “inhumation” with almost every other grave, thus making it an insignificant outlier according to the statistical process. Grave 9 is the only empty grave at the site and contains a single undecorated pottery sherd and would also be excluded if the trait “Grave goods_Yes00010” was not added, as only then there are sufficient correspondences to other burials to be included. Fortunately, this issue regards very few burials among the selected sites.

⁶⁰ PAVÚK 1972, 6–8.

3. Classifications and typologies

This chapter presents the classifications and typologies generated with MonteliusEditor which are the foundation for the quantitative evaluations carried out with WinSerion. For every type of subtype, there will be a code used in the distribution maps, Analysis N Next Neighbours, seriation and correspondence analysis. Keep in mind that, for various reasons, not every trait or artefact is possible to categorize. If that is the case, the element in question will be treated as undetermined, uncategorized or uncertain and thus named and coded as such.

3.1. Age and sex

For the anthropological determination of age and biological sex, this thesis relies on the data provided by the Lifeways database, the Vedrovice project and the recent publication of the cemetery Kleinhadersdorf by Neugebauer-Maresch and Lenneis. Modifications based on doubts on the stated data – on my part or others – are avoided.

Several things have to be considered when determining and interpreting the age at death and sex of the deceased. First, the long residence time in the soil influences the condition of the human remains and thus the accuracy of the anthropological determination. The type of burial also plays a major role; age and sex of cremations are considerably much more difficult to diagnose than inhumations, as burning changes the most important bones for the identification.⁶¹ Therefore, archaeologist sometimes rely on archaeological-anthropological determination when studying certain graves by considering additional information provided by grave goods, which leads to inferences that are possibly true, but not unquestionable.⁶² When it comes to age, in most cases – if at all – only an approximate duration with earliest and latest age can be given. Subadults often lack diagnostic sexual characteristics distinguished by bones, which complicates sex determination. We also have to keep in mind

Table 1: Classification of stages of age (specified in years) applied in the quantitative evaluations. Phases I and II are alternatively called “early” or “late” respectively (f. e. infant I = “early infant” and infant II = “late infant”) in this thesis.

Neonate	Infant I	Infant II	Juvenile	Adult I	Adult II	Mature I	Mature II	Senile
0-1	1-6	7-12	13-19	20-30	30-40	40-50	50-60	> 60

⁶¹ TRAUTMANN 2006, 81.

⁶² This can be observed with Aiterhofen-Ödmühle, where some of the initial archaeological-anthropological determinations turned out to be incorrect, see HOFMANN et al. 2013, 232.

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that our understanding of the different stages of age possibly varies to the mindset of Linear Pottery people, as we lack substantial knowledge about Early Neolithic social structures and time calculation. This should be considered when investigating possible patterns in cemetery structure based on age at death. However, some biological factors and processes most certainly were important for defining stages of life (e. g. reaching sexual maturity) in prehistoric society as they are today. The age classification for this thesis follows the categories seen in table 1, although there will be further variations depending on approximate age span for every diagnosed individual. For example, if the age of a deceased was identified as ranging between 25 and 35 years, it will be named “Adult I/II” (Code “Age00090”), as this specific individual might have fallen either into the stage “Adult I” (Code “Age00080”) or to “Adult II” (Code “Age00100”). Concerning sex, individuals are categorized as either “male” (Code “Sex00020”) or “female” (Code “Sex00010”) if clearly identifiable, and “uncertainly male” (Code “Sex00050”), “uncertainly female” (Code “Sex00040”) or “uncertain” (Code “Age0030”) if the biological sex cannot be confirmed with certainty.

3.2. *Burial types and archaeological features*

As mentioned in chapter 1.2, there are several types of graves characteristic for Linear Pottery funerary practices in cemeteries. Most frequently appear inhumations (Code “Inhumation00010”), where the body of the deceased is laid down inside the grave. The majority of burial pits possess oval or rounded rectangular to slightly irregular contours while pear-shaped and circular discolorations can also be observed in fewer cases. Pit proportions usually adjust to body size and posture, with the length, width and depth partially varying depending on the site. While the average dimensions for Bavarian cemeteries were 65 to 150 cm length, 30 to 60 cm width and 50 to 80 cm depth,⁶³ the average depth of the inhumations, for example, at the site Elsloo in the Netherlands amounted to 125 cm.⁶⁴ Such inconsistencies presumably arose from the difficult determination of the original depth, as archaeological features frequently lied in the plough horizon or directly below while sedimentation may also distort the calculation. One example is the northern area of Aiterhofen-Ödmühle, where a misleading depth of 140 cm was caused by slope sediments overlaying the graves.⁶⁵ The issue of modern agriculture and erosion already mentioned in chapter 1.3. also remains, further complicating statistical evaluations and interpretation of burial depth. Disturbances caused by excavations are not uncommon either but are unfortunately difficult to avoid. However, some grave-pits seem to have been built far too narrow for those buried in them, while others obtained significantly more space than necessary. Occasionally empty spaces near the head, feet or alongside the body were also found. Such areas were usually used for positioning grave goods and thus indicate missing objects which most probably consisted of unpreserved materials such as wood, meat or textiles.

Grave-pits containing cremated and unurned human remains (Code “Cremation00010”) represent the second most significant type of burials.⁶⁶ They are roundish to oval, with dark brown to deep black discolorations, which can be distinguished from post holes due to the high proportion of charcoal and burned bones. Their diameter varies between 35 and 90 cm while the average depth was quoted to be 55 cm for Elsloo and between 60 and 80 cm for the

⁶³ NIESZERY 1995, 67–68.

⁶⁴ VAN DE VELDE 1997a, 86.

⁶⁵ NIESZERY 1995, 68.

⁶⁶ TRAUTMANN 2006.

Bavarian cemeteries.⁶⁷ As cremations usually locate in shallower depths when compared to inhumations, they are less robust to disturbances and thus the potential loss is greater. Burnt grave goods are frequently discovered, although some pits contained objects untouched by fire.⁶⁸ There are also a few cases of inhumation pits which additionally included cremated human remains (Code “Cremated human remains00010”).⁶⁹

The third biggest class of burials are pits with few, or no human remains (Code “Empty pit00010”), which are sometimes interpreted as cenotaphs. The Greek word “Kenotaph” was originally used to describe the grave of an absent person to whom the funerary rites were dedicated. As mentioned in chapter 1.2, such assumptions might be flawed, as disturbed grave goods and human remains point to the exhumation of the deceased. For this reason, the term “empty grave” has been suggested by Eva Lenneis to describe such archaeological features.⁷⁰ However, due to some unclear situations caused by outdated excavation practices and disturbances, there are empty pits which cannot be definitely assigned to this type of burial and might have had another ritual function. Personal ornaments have not been found in empty graves so far, which indicates that the deceased were wrapped in winding sheets probably made of organic material, and that the time between the primary burial and secondary exhumation was short as the winding sheets would have rotted quickly in Central European soil.⁷¹ The question remains where the dead were relocated to, where sites like Herxheim, already mentioned in chapter 1.2, might offer possible explanations, although Herxheim specifically seems unfitting to be the destination for these bodies due to its dating. In addition to the primary burial types, there will be further secondary categories. Multiple burials, meaning graves containing the remains of more than one deceased individual, are subdivided into double inhumations (Code “Double inhumation00010”) or cremations (Code “Double cremation00010”) as well as triple burials (Code “Triple burial00010”) and “partial burials” (Code “Partial burial00010”). The latter appeared at “Aiterhofen-Ödmühle” and will be explained in the respective chapter (4.3.4.). Another evaluation concerns the presence of grave goods where furnished (Code “Grave goods_Yes00010”) and unfurnished (Code “Grave goods_No00010”) will be distinguished. One should consider that the absence of grave goods

⁶⁷ NIESZERY 1995, 88. – VAN DE VELDE 1997b, 86.

⁶⁸ E. g. Grave 229 at Aiterhofen-Ödmühle. NIESZERY 1995, 304.

⁶⁹ E. g. Grave 54 at Schwetzingen. GERLING 2012, 147–148.

⁷⁰ LENNEIS, BLES 2017, 162.

⁷¹ LENNEIS 2010a, 164.

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might just reflect the decomposition of formerly present objects made of easily decayable materials such as wood.

3.3. *Pit orientation and burial position*

Naturally, cremations, empty graves and heavily disturbed inhumations are not suitable for identifying the burial-pit orientation, as it is based on the direction of head to feet (e. g. “NW-SE” if the head points to north-west). The usually careful documentation makes it possible to determine orientation of burial pits very precisely, allowing them to be recorded on a scale subdivided into 22.5° sections. In this way, basic orientations and deviations on the individual cemeteries as well as on a regional level can be clearly identified. Similarly, the exact measurement of the line of sight is also usually provided in the respective publications. However, there are some issues which have to be considered when evaluating this data. For example, if the deceased is positioned in an east-to-west orientation (E-W) with the body directed to the left, this results in a line of sight to the south within a range of about 100 degrees alone by regular anatomy.⁷² Such a positioning could thus be caused naturally (tilting of the head during the filling of the burial pit, decomposition processes, etc.) instead of intentional reasons. This would mean a focus on uniform orientation of graves and burials with corresponding lines of sight as an unavoidable or coincidental secondary phenomenon. Whether which interpretation is correct, natural processes certainly have influenced the line of sight to some degree. This is especially true for the stretched individuals lying on their back, where the position of the head is much more unstable than with crouched skeletons. Consequently, a more simplistic approach – compared to pit orientations – will be applied by subdividing the line of sight into 45° sections (N, NE, E etc.).

Most commonly, Linear Pottery people buried their deceased in a flexed position with the body laying laterally to the left side. Right-side crouches as well as prone and supine positions occur rarely, which also applies to settlement burials.⁷³ The leg posture of the crouched burials varies greatly and can even be different for both legs of an individual. For both the crouched bodies in the prone and supine position it cannot be clarified beyond doubt whether they are intentional deviations of the regular crouches or if the natural causes already mentioned in chapter 3.3. were responsible. Especially the lateral position combined with stretched thighs must have been significantly unstable, which suggests unintentional prone postures in many cases. However, some of these are difficult to explain by post-mortem shifts due to earth

⁷² NIESZERY 1995, 77.

⁷³ VEIT 1996, 183.

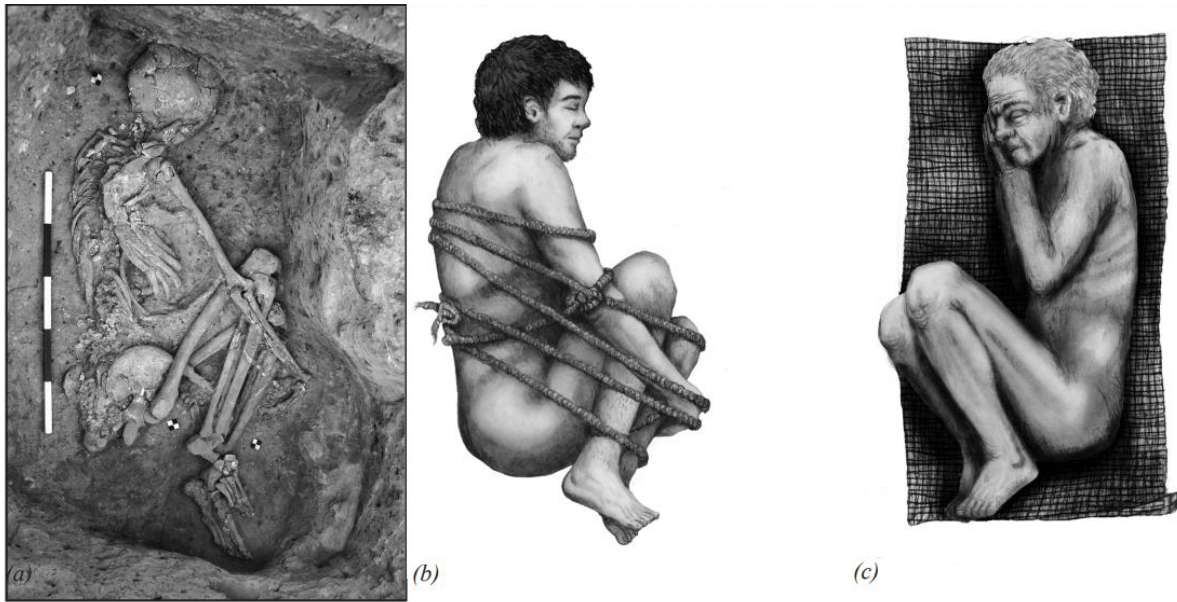


Figure 6: Use of binding, wrapping and matting for interment using plant material in Çatalhöyük: (a) phytoliths (white material) representing pre-interment binding of a young adult male (grave 12875, photograph by Jason Quinlan); (b) reconstruction of young adult (grave 12875); (c) reconstruction of an adult on matting at interment in a sleeping position (illustrations by Mesa Schumacher). (BOZ, HAGER 2013, 422, Fig. 19.14.).

pressure and therefore might be intentional. The regular position of the lower extremities ranges from legs that are almost stretched and only slightly bent in the knees to thighs that are almost 90° tightened with an angle between the thigh and lower leg which can be considerably smaller than 45°. Such tight positions indicate that the legs were laced in some way, whereby in some cases, with the thighs pulled towards the upper body, a lacing of the corpse or a stabilization of the position by sewing in certain materials (e. g. skins or textiles) has to be considered.⁷⁴ Figure 7.b, an illustration of pre-interment binding of a young adult male buried in Çatalhöyük, provides an example of how such a lacing could have looked like.⁷⁵ Clear evidence for bindings on Linear Pottery graves remains absent, as lacking conservation conditions prevent the recovery of organic material.

The typical Linear Pottery left crouch combined with a “sleeping” arms gesture was already used in the predeceasing Starčevo complex and can even be traced back to Neolithic Anatolia (Fig. 6c).⁷⁶ The origins of a rarely occurring supine position with stretched feet, on the other hand, is more difficult to determine. Characteristics include – next to the outstretched lower extremities and the backward-leaning torso – various possible arm gestures comparable to

⁷⁴ NIESZERY 1995, 78.

⁷⁵ BOZ, HAGER 2013, 422.

⁷⁶ E. g. BÁNFFY 2010. – LICHTER 2016.

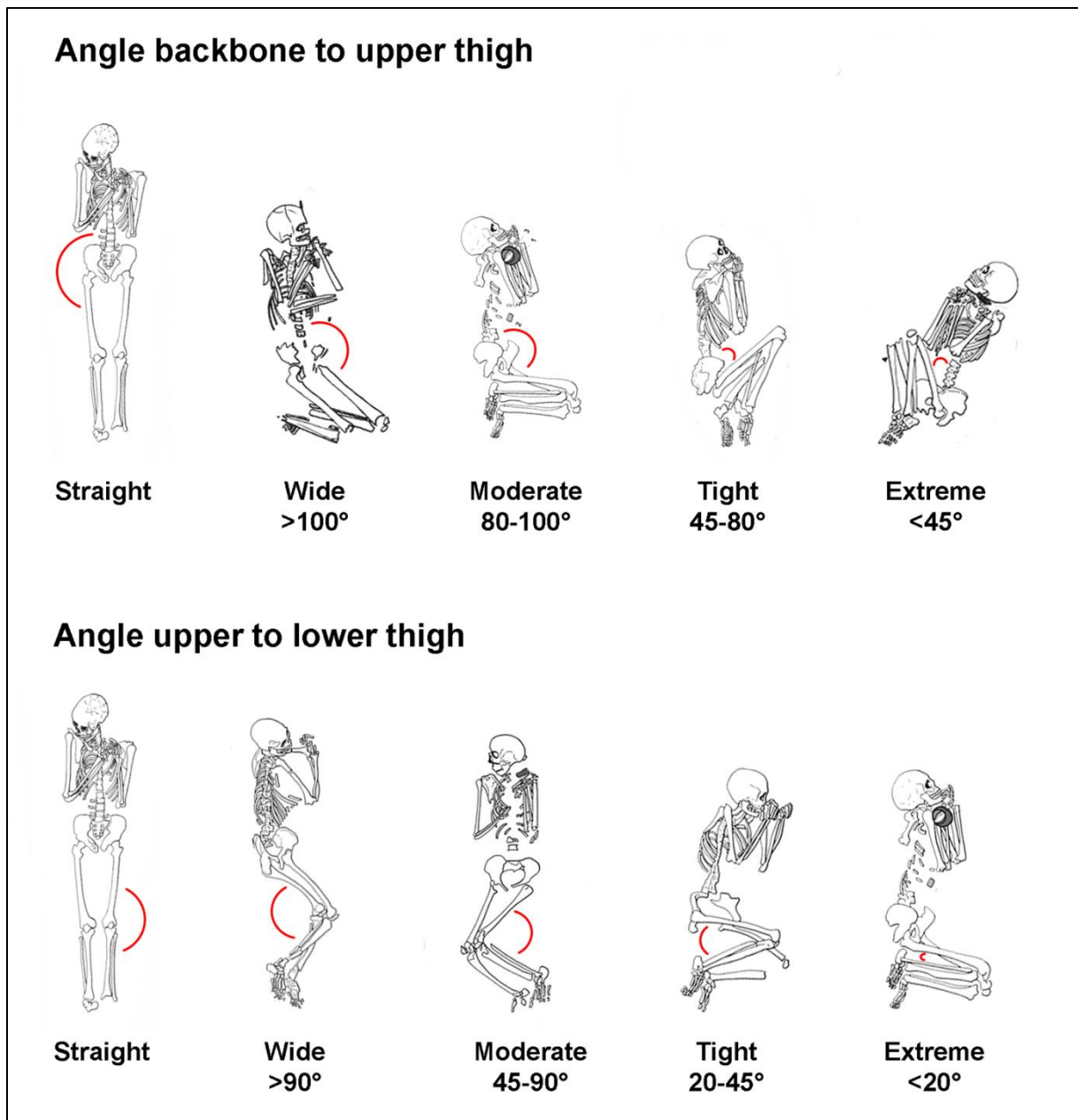


Figure 7: Leg posture classification as applied for this thesis (original graphs taken from NIESZERY 1995; GERLING 2012 and further modified).

the crouched supine position. Such burial positions might be connected to the funerary practices of late hunter-gatherers; the Mesolithic-Neolithic Transitional Phase of Lepenski Vir (Serbia), among other sites, includes burials with sleeping crouched as well as stretched supine individuals, with the latter dating significantly earlier.⁷⁷ However, such assumptions have yet to be confirmed or disconfirmed. Other diverging burial positions can be found among the occasionally appearing deceased which have their arms positioned in an unusual way instead

⁷⁷ BONSALL et al. 2008, 178.

of the typical “sleeper”. These burials should not be seen as “deviant” of some sort, but rather as “special”, as they often received moderate to extensive furnishings, also considering that even unfurnished people must have had some communal standing, given that they were chosen for inclusion in cemeteries.

In summary, there are different factors to consider when determining the pit orientation and burial position. The alignments of the burial pits (Code “Pit_Grave orientation00010 to 00150”) and the lines of sight (Code “Line of sight00010 to 00110”) follow the cardinal directions of 22,5° or 45° sections, respectively. Another main category will be body orientation, subdivided between left-side (Code “Body orientation00010”), right-side (Code “Body orientation00020”), straight-lying (Code “Body orientation00030”) and undetermined (Code “Body orientation00040”). Further differentiations are evaluated through the category torso positioning, with side-lying (Code “Torso position00020”), supine (Code “Torso position00030”), prone (Code “Torso position00010”) and uncertain (Code “Torso position00040”) variants. Crouch intensity derives from a combination of the categories “Angle backbone to upper thigh” (Code “Angle backbone to upper thigh00010 to 00060”) and “Angle upper to lower thigh” (Code “Angle upper to lower thigh00010 to 00060”), with the variations ranging between extreme and wide crouches as well as straight positioned legs and undetermined gestures (Fig. 7). The most extensive typology is represented by “arm gestures”, which has to be subdivided into numerous subtypes (Fig. 8). These are as follows:

- Sleeping (Code: “Arms position00010”): Both hands are positioned upwards with the hands either in front or under the face. Consequently, the deceased makes the impression of a peacefully sleeping, or alternatively, a praying person. Appearing combined with left or right crouches, supine or prone, and within all age classes and sexes. In summary, this study involves 413 individuals which have been assigned to this gesture.
- Diagonally crossed (Code: “Arms position00020”): Both arms are diagonally crossed in front of the torso and point to the shoulder. They are found in crouched or straight supine at Essenbach-Ammerbreite (3) and Schwetzingen (48, 133, 169) as well as straight or crouched prone positions at Vedrovice “Siroká u lesa” (71) and Schwetzingen (126). With the exception of the juvenile and unsexed individual at

Essenbach-Ammerbreite, the deceased individuals assigned to this gesture ranged between adult and early mature stages and were mixed between both sexes.⁷⁸

- Horizontally crossed (Code “Arms position00030”): Both arms are horizontally crossed in front of the torso. An early adult woman at Kleinhadersdorf (Verf. 32) lying in a supine to side position (shifted due to erosion?) as well as an uncertain female (154) and a man (185) at Schwetzingen, both of mature age and supine, correspond to this gesture.
- Right arm horizontally crossed, left arm on left shoulder (Code “Arms position00040”): Only one deceased individual, a 16-18-year old woman without grave goods at Vedrovice “Siroká u lesa” (105), certainly fits this classification. The body was right-crouched and the torso supine lying, which could have been caused by agriculture, as the head was also disturbed. Another burial at Kleinhadersdorf (Verf. 11), a side-lying infant in a left crouch, was also included in this variant, as the left arm nearly aligns to the shoulder and might have been shifted due to erosion.
- On shoulder (Code “Arms position00050”): The right arm vertically points to the right shoulder, the left one to the left shoulder. With 18 individuals assigned to this class, it represents one of the larger groups of diverging gestures.⁷⁹ In Bavaria, there seems to be a tendency of late adult to senile deceased to inherit this gesture, which contrasts the situation at Kleinhadersdorf, where one 12-18-month old infant (Verf. 26), a 17-25-year old (Verf. 81) and an early to late adult man (Ver. 40) were similarly laid down. At Schwetzingen, mostly female adults received this gesture, with the youngest one being a 17-18-year old uncertain woman (12). Burial 33 at Aiterhofen-Ödmühle is especially unusual, as the body was supine combined with an open crouch (see chapter 4.3.4.2., fig. 48.).
- Arms straight down (Code “Arms position00060”): Both arms side vertically down. There are two graves that correspond to this gesture, which both seem unusual in one way or the other. An adult woman at Essenbach-Ammerbreite (13) was right-crouching

⁷⁸ Essenbach-Ammerbreite: 3 (unsexed) – Schwetzingen: 48 (uncertain female), 126 (female), 133 (male), 169 (male) – Vedrovice „Siroká u lesa“: 71 (male).

⁷⁹ Aiterhofen-Ödmühle: 33 (female), 50 (male), 55 (female), 76 (uncertain female), 109 (female), 123 (uncertainly female), 159 (female) – Dillingen: 4 (male), 22 (uncertain male) – Kleinhadersdorf: Verfärbung 26 (infant), Verfärbung 40 (male), Verfärbung 81 (male) – Schwetzingen: 4 (uncertainly male), 12 (uncertain female), 28 (uncertain female), 119 (female), 205 (unsexed).

in a supine position, while a senile woman at Schwetzingen (217) was left-crouching and laying face-to-face to a ca. 18-year old man in a right-side sleeping position, whose burial dates later than the female one as indicated by a partial superposition.⁸⁰

- One arm diagonally, other vertically to shoulder (Code “Arms position00070 to 00080”): Both arms point to the same shoulder, either the right arm diagonally to the left shoulder with the left hand vertically up (Code “Arms position00070”), or the left arm diagonally to the right shoulder with the right arm pointing upwards (Code “Arms position00070”). Both variants occurred relatively often at Schwetzingen, where they were attributed to adult male and infant burials.⁸¹
- Pudicitia (Code “Arms position00080”): Both hands cover the pubic area. Only one of these have been recovered in the selected study area, at Dillingen-Steinheim (9) in Bavaria.⁸² It contained the heavily disturbed skeleton of an early mature man in supine position without grave goods. The grave-pit orientation was E-W, the head turned to north.
- Differently crossed (Code “Arms position00090”): Both arms are crossed over the torso area, one diagonally, the other horizontally. A late mature man at Kleinhadersdorf (Verf. 3) was left-crouching in a supine position, potentially shifted due to heavy disturbances, while an unsexed adult at Schwetzingen (81) was also left-side in a supine crouch.
- Over head or shoulder (Code “Arms position00100”): At least one arm is positioned over the head or the shoulders. All of the bodies assigned to this gesture distributed to Bavarian cemeteries. At Aiterhofen, an unsexed 25-35-year old individual (75) was left-crouching and WSW-ENE-aligned, with the head turned south, which is antipodal to the common east-aligned “stares” of the site. The late adult woman (137) who also inherited the arm gesture, on the other hand, was ENE-WSW-positioned and looking north-east, but similarly right-crouched. Both burials received triangular arrow heads among other grave goods, which seems unusual in the case of the woman. An early

⁸⁰ GERLING 2012, 192.

⁸¹ Arms position00070 distributes to Aiterhofen-Ödmühle: 71_2 (infant/juvenile), 107 (female), 136 (female) – Schwetzingen: 13 (infant), 16 (male), 143 (male), 203 (infant). Arms position00080 appears at Aiterhofen-Ödmühle: 66 (unsexed) – Schwetzingen: 6 (male).

⁸² NIESZERY 1995, 312–313.

mature man at Dillingen (3) was left-crouched and ESE-WNW-aligned, looking to north, and received a chert blade, while two mature and uncertainly identified as male individuals at Essenbach-Ammerbreite (24, 26) were laid in prone position, one to NW-SO-aligned and the head turned west, with his grave including a small lump of graphite at the pelvis (26), the other ESE-WNW-aligned and looking south, with contributions of chert, red ochre and an adze (24). A classification of the latter to “Arms position00110” would also be possible, as one arm points straight down.

- One arm straight down, other one up (Code “Arms position00110 to 00120”): Either the right arm is positioned vertically down with the left arm up (Code “Arms position00110”), or the left arm is positioned vertically down with the right arm up (Code “Arms position00120”). The arm pointing up might be diagonal or vertical. The first variant appeared within a supine-positioned senile woman (150) gifted with six protula and 96 theodoxius danubialis beads at Aiterhofen-Ödmühle, with the left arm diagonally pointing to the right shoulder, while an adult male at Nitra (72) was supine-crouched and left-siding, while the left hand lay at the temple of the skull. The second variant appears combined with a straight supine position at Dillingen-Steinheim in an uncertain female grave (18), with a left-crouching supine alignment in another uncertain female grave at Schwetzingen (65), and in another three graves at Nitra (37, 41, 65).⁸³ This includes two female (37, 65) and one unsexed individual (65), who were all in a supine left-crouch. Overall, there seems to be a tendency of the second variant to appear within female burials, while the small sample of the first variant shows a mixed contribution between the sexes.
- Right arm horizontal, left arm vertically up (Code “Arms position00130”): This gesture distributes to 10 graves divided between Aiterhofen-Ödmühle, Kleinhadersdorf, Sengkofen and Schwetzingen.⁸⁴ The majority of the torsos were supine positioned, with the exception of a side-lying individual (219) and a right-side prone body (19) at Schwetzingen, although the latter might be caused by disturbance or erosion and thus

⁸³ Soil sample investigations of the filling of grave 18 at Dillingen-Steinheim showed the remains of carbonized plant remains, with uncertain significance. NIESZERY 1995, 314.

⁸⁴ Aiterhofen-Ödmühle: 57 (male), 79 (unsexed) – Kleinhadersdorf: Verfärbung 65 (female) – Schwetzingen: 19 (uncertain female), 38 (uncertain female), 97 (male), 104 (male), 163 (female), 219 (female) – Sengkofen: 21 (unsexed).

potentially represent a former side-crouch. Most interestingly, almost all deceased in this category range between late adult and senile age at death.

- Left arm straight down, right arm horizontal (Code “Arms position00140”): An unsexed individual excavated at Regensburg-Kumpfmühl (88) is attributed to this category. The torso was supine, large parts of the legs were missing and either left-side or arranged as an open crouch, while the pit orientation was E-W and the head turned south. Grave goods were absent if some chert objects from the filling are excluded.
- Arms pointing away (Code “Arms position00150”): One or both arms point horizontally away from the body. In Bavaria, an 10-14-year-old individual at Aiterhofen-Ödmühle (30) and an early adult woman at Essenbach-Ammerbreite (8) could be assigned to this variant. Both bodies were right crouching, whereas the crouch intensity of the deceased individual in grave 30 was nearly straight. This is contrasted by an uncertain female adult at Schwetzingen (114) and a male adult at Vedrovice “Siroká u lesa” (50), with the hands pointing to the left. However, the former might have inherited this gesture due to heavy disturbances, as its lower body and parts of the torso and arms were destroyed.
- Hug (Code “Arms position00160”): One deceased hugs another. This gesture only occurred once among the sites selected for this study, at the triple burial 48-50 at Nitra. As later discussed in chapter 4.3.2, the involved individuals were very closely blood-related.
- Undetermined arm gesture (Code “Arms position00170”): This category includes all inhumations which could not be certainly classified due to heavy disturbances or other factors. In summary, there are 247 undetermined arm gestures in this study.



Figure 8: Arm gesture classification as applied in this study (original graphs taken from PAVÚK 1972; BRINK-KLOKE 1990; NIESZERY 1995; PODBORSKÝ 2002a; REITMAIER 2018 and further modified).

3.4. Pottery

3.4.1. Chronological and regional development

Ceramic vessels and sherds with the typical decoration give their name to the Linear Pottery culture and allow the subdivision of its chronological development into several phases as well as to distinct regional differences by analysing pottery shapes and ornamentation.⁸⁵ In the following, the relative chronological development for some of the regions included in the study area for this thesis will be briefly presented, however, there won't be a detailed description of every type and subtype which characterized the respective regional and chronological developments. These can be taken from the cited literature. Instead, the focus will lie on the Late Linear Pottery of Southern Germany and the south-eastern distribution areas of Austria, Bohemia and Moravia due to their relevance to this thesis, more specifically from the 53rd century cal. BC on, when the first Early Neolithic cemeteries were established.

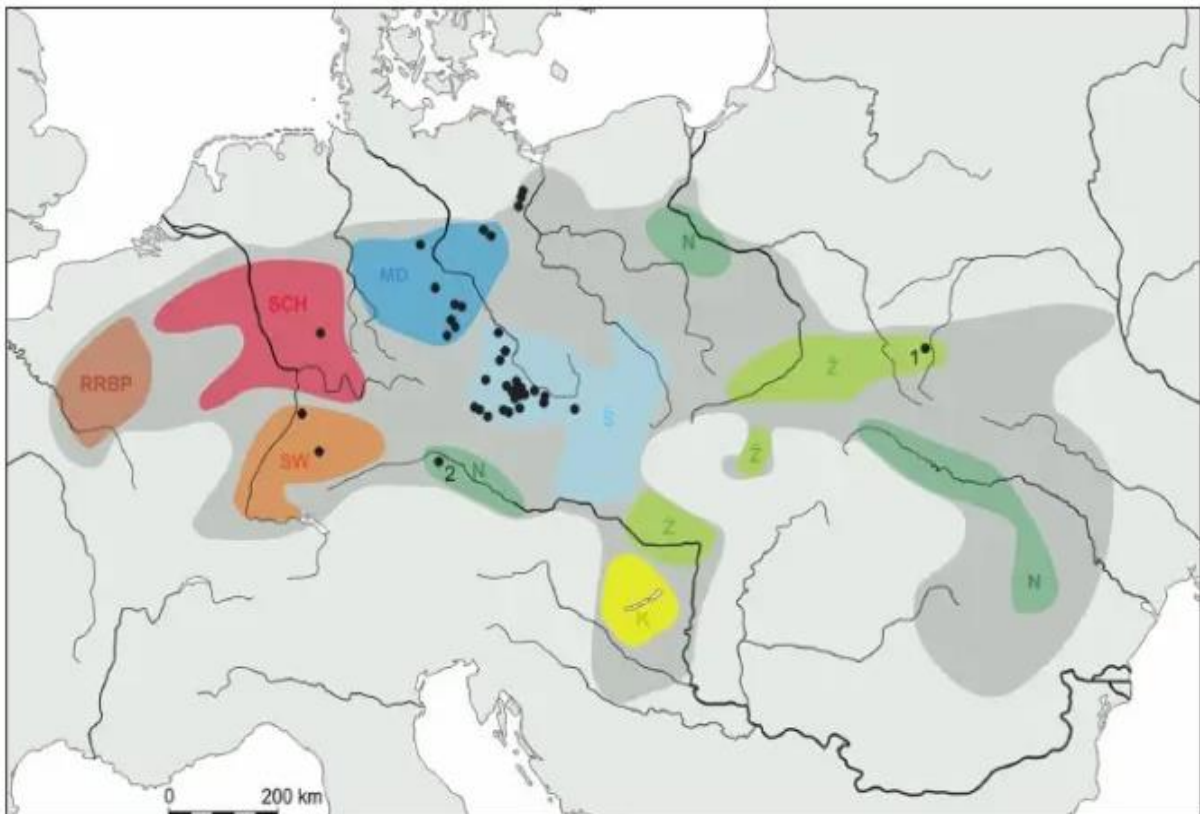


Figure 9: Regional distribution of Linear Pottery vessel decoration styles around the 51st century BC: RRBP = Rubané récent du Bassin parisien (engl.: Late Linear Pottery of the Paris basin); SCH = hatching (ger.: Schraffur); SW = Southwestern German Linear Pottery; MD = Middle German Linear Pottery; Š = Šárka; N = Notenkopfkeramik; Ž = Želiezovce; K = Keszthely. (SAILE, DEBIEC, SEDLMAIER, 27, Abb. 1).

⁸⁵ LENNEIS, BLES 2017, 122–143.



Figure 10: From left to right; *Notenkopfkeramik* vessel (LENNEIS, BLESŁ 2017, 135, Abb. 2.4.1.15); *Želiezovce* vessel (FIEBIG 2012, 191); *Sárka* fragment (PAVLÚ, KVVETINA 2009, 289, Abb. 2).

The earliest phase – named “Formative Phase” – is known through studies on pottery from the settlement *Brunn am Gebirge* in Austria and still resembles the predeceasing *Starčevo* culture in form and shape, although new distinct features can already be recognized.⁸⁶ In contrast to *Starčevo*, it is not possible to distinguish between coarse and fine ceramics; glossy surfaces and colouring are also absent. From the Formative Phase, the classic Linear Pottery emerged; its typical bulbous bottles, bomb-shaped globular vessels, and flat or high bowls increased significantly in number, while the plastic ornamentation decreased in favour of the characteristic linear band decoration.

The Early Linear Pottery is characterized by a relative homogeneity in shape and ornamentation, although some differentiations are still observable, as demonstrated with the *Keszthely* group in Hungary and the *Milanovce* group in Slovakia.⁸⁷ The Late Linear Pottery, on the contrary, is dominated by various distinct regional styles. In Central Europe, a rough distinction can be made between a western and an eastern distribution area according to the predominant vessel shapes and decoration patterns.⁸⁸ In the eastern region, including Bohemia, Moravia, Lower Austria and West Hungary, the *Notenkopfkeramik* (“Note Head Pottery” or “Music Head Pottery”) emerged around 5300 BC. This particular style is defined by round incisions interrupting the decorative lines, which resemble – as the name already suggests – note heads usually found on sheets of music. Generally, the S-shaped curved lines commonly appear in the east, while the carved line band filled with dots dominate in the west.⁸⁹ These two circles overlap in the area of Lower Austria and Moravia. Although the *Notenkopfkeramik* stayed the dominant style in Eastern Austria, in its late phase there were

⁸⁶ LENNEIS, PIELER 2017, 124.

⁸⁷ PAVÚK, FARKAŠ 2013.

⁸⁸ LENNEIS, BLESŁ 2017, 131–143.

⁸⁹ URBAN, WOLFRAM 2000, 66.

influences from the Želiezovce and Šárka types.⁹⁰ Želiezovce pottery succeeded the *Notenkopfkeramik* in South-West-Slovakia and North-West-Hungary and is characterized by long, narrow incisions between the carved lines, which replace the note heads.⁹¹ Another significant element is the occasionally occurring polished and red coloured line band. The Šárka group is mainly found in Moravia and can be recognized by its typical, small horizontal line carvings.⁹² Further characteristic elements are angle motifs in single stitch technique and barbed wire decoration on pear-shaped vessels.⁹³

The pottery of the Late Linear Pottery in Bavaria significantly differs from the south-eastern distribution area in production, shape and decoration and is generally characterized by various regional and divergent stylistic developments which have clearly derived from the *Notenkopfkeramik*.⁹⁴ Two or three line bands with fillings on pottery at Aiterhofen-B20 show connections to Flomborn, with Nieszery describing V-formed score lines at the cemetery of Aiterhofen as “Flomborn-styled”.⁹⁵ There were also connections to the Bohemian-Moravian sequence in southern Bavaria, with barbed-wire motifs typical for the Šárka style, while further west along the Danube, Lech or Ries there were linkings to the Main and Baden-Württemberg.⁹⁶ The latter includes the cemetery Schwetzingen, where *Notenkopfkeramik* is absent and which follows the Pfalz-style of southern Rheinhessen and the area south of the river-branching of the Neckar and Rhine as well as the South-Western German Linear Pottery in general, according to the ornamentation, motives and composition of the clay. Bands filled with incisions were common, while combed decoration was lacking.⁹⁷ One vessel of the earliest phase held Flomborn-ornamentation, another one had designs corresponding to both the local traditions and Cardial ware. The French Cardial ware and the La Hoguette pottery shared some similarities, although the Linear Pottery was vastly different and does not correspond to these groups at least in terms of pottery style, although they still might have influenced the regional development in other ways.⁹⁸

⁹⁰ LENNEIS, BLESZ 2017, 139.

⁹¹ PAVÚK 1969. – FIEBIG 2012, 64–65.

⁹² URBAN, WOLFRAM 2000, 66.

⁹³ SAILE, DĘBIEC, SEDLMAIER, 28. – PAVLŮ, KVETINA 2009, 288.

⁹⁴ HOFMANN et al. 2013, 212–214.

⁹⁵ NIESZERY 1995, 137.

⁹⁶ HOFMANN et al. 2013, 212.

⁹⁷ GERLING 2012, 37, 112–123.

⁹⁸ BENTLEY et al. 2013, 255, 287–288.

3.4.2. Vessel typology

When determining the vessel types for quantitative evaluation, several main forms must first be distinguished, which can then be subdivided into further variants. The definition of the types and variants is thus schematic, to prevent an excessive fragmentation of the classifications. Many of the vessel sherds cannot be classified typologically, as they are usually not sufficiently preserved for an exact determination of the form. The distribution of small, undeterminable sherds on the cemeteries will nevertheless be evaluated in the Analysis N Next Neighbours and associated distribution maps, as their fragmentation and depositing might have been intentional in many cases and could therefore give valuable insights (Code “Uncategorized sherds00010”). It is again worth noting that any material which was part of the filling and therefore might not have been deposited as an intentional grave good will be excluded. Additionally, to my regret, a secondary classification of Linear Pottery based on decoration will not be included, as this would go beyond the size of this study. However, if a continuation of the study is in prospect, such a typology will be carried out.

The classification of the vessel forms was inspired and adapted from various publications with the helpful guidance of Nadezhda Kotova. She further aided me in accomplishing this task. Norbert Nieszery has created a typology for the Bavarian cemeteries, which was partially used, modified and complemented with findings from other cemeteries.⁹⁹ Claudia Gerling’s classification for Schwetzingen is a synthesis of the typologies of Kneipp and Heide respectively, which both adopted Stehli’s typology of Rhineland pottery and expanded on it.¹⁰⁰ For the Austrian cemetery Kleinhadersdorf a seriation and Analysis N Next Neighbours of the ceramic material, among other data, was carried out by Eva Lenneis with the support of Peter Stadler.¹⁰¹ Zdeněk Čížmář provided a detailed chronological and typological development of vessels from Vedrovice in the Czech Republic¹⁰² (which was later compared to radiocarbon-dating),¹⁰³ while the typology for the Slovakian cemetery Nitra was contributed by Juraj Pavúk.¹⁰⁴ Along with the publications regarding the smaller cemeteries, all these have to be

⁹⁹ NIESZERY 1995, 123–131.

¹⁰⁰ STEHLI 1973. – KNEIPP 1998. – HEIDE 2001a. – GERLING 2012, 43–46.

¹⁰¹ LENNEIS 2015e.

¹⁰² ČRŽMÁŘ 2002.

¹⁰³ PETTITT, Paul, HEDGES, R. E.M. 2008, 130–131.

¹⁰⁴ PAVÚK 1972, 39–48.

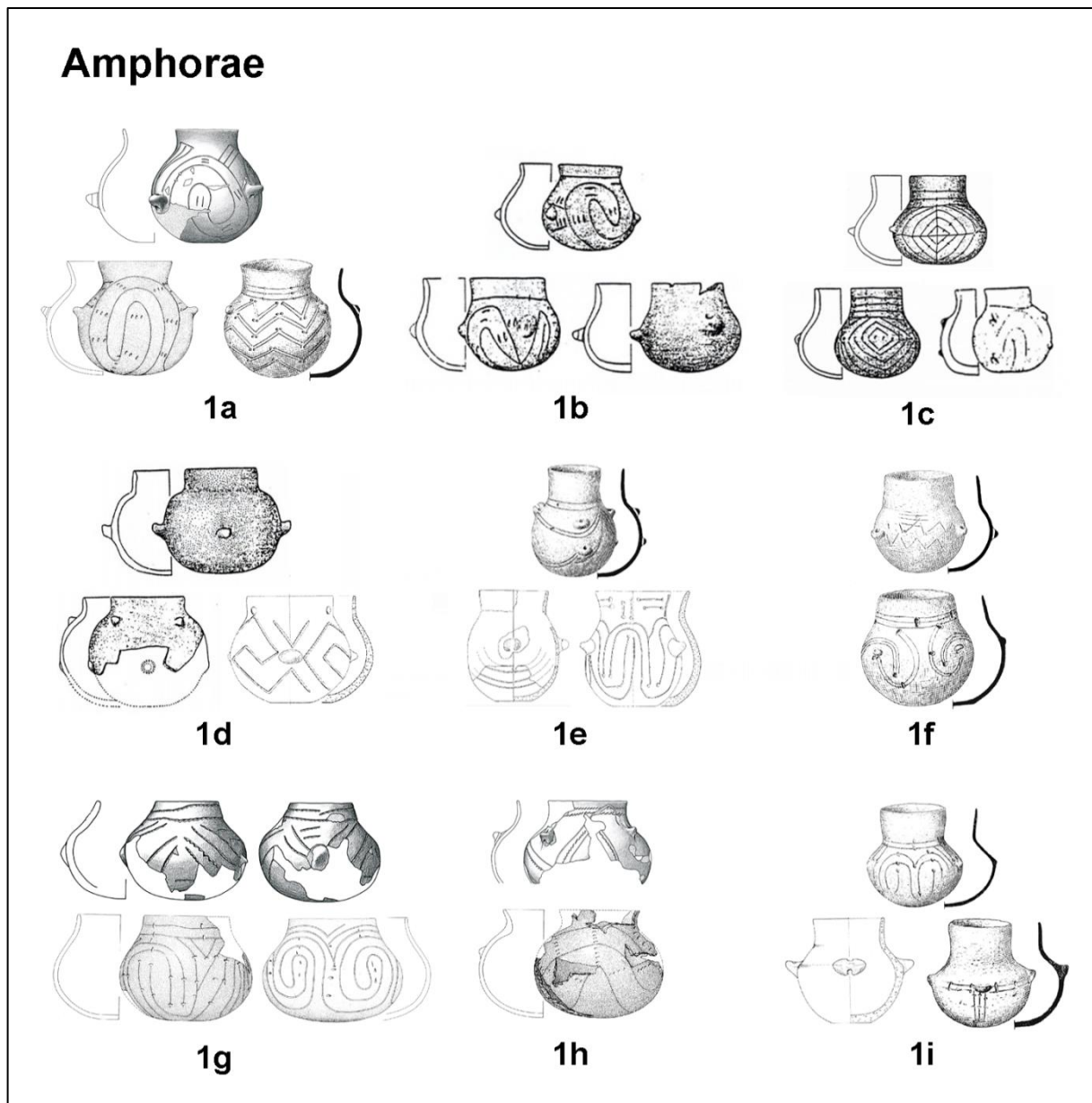


Figure 11: Typology of amphorae as applied in this thesis (original graphs taken from PAVÚK 1972; BRINK-KLOKE 1990; NIESZERY 1995; PODBORSKÝ 2002a; GERLING 2012; NEUGEBAUER-MARESC, LENNEIS 2015a and further modified).

taken into account when trying to establish classes and variants suitable for a quantitative evaluation.

The first main vessel type are amphorae, which can have various definitions. For this thesis, I have selected Maria Cladder's classification, who characterizes bottles as vessels with a pronounced neck.¹⁰⁵ A common feature are the frequently occurring handles or lugs, which are often vertically perforated and might have had a function as part of a suspension device.¹⁰⁶

¹⁰⁵ CLADDERS 2001, 21.

¹⁰⁶ NIESZERY 1995, 124.

Nieszery interpreted them as storage vessels, indicated by the amount of amphorae gifted per grave never exceeding a single unit. The following variants shall be specified:

- Type 1a (Code “Amphora (1a)00010”): Bulbous amphorae with a height of at least 15 cm, a narrow, everted neck and an S-shaped curved profile. Closely resembles Nieszery’s Type 1a. Six vessels in total were assigned to this type, which had the tendency to be gifted mostly to older individuals ranging between late adult and senile age, mixed between the sexes.¹⁰⁷
- Type 1b (Code “Amphora (1b)00010”): Pear-shaped amphorae with a height of less than 15 cm, a narrow and slightly everted to nearly straight neck. Closely resembles Nieszery’s Type 1b. With the exception of one grave, all vessels of this type are attributed to Bavarian sites, mainly Aiterhofen-Ödmühle.¹⁰⁸ The object in the infant grave 2 at Essenbach-Ammerbreite contained a bone comb, an incisor and 150 g of undetermined red earth.¹⁰⁹
- Type 1c (Code “Amphora (1c)00010”): Amphorae with long and narrow, cylindrical neck. Closely resembles Nieszery’s Type 1c. All three vessels in this category are attributed to Aiterhofen-Ödmühle and have been found in an adult female burial (33) and with two men, one being 30-35-years old (119), the other having reached early mature age (153). The amphora of grave 33 was used as a storage vessel, as it included a nephrite bead, some lumps of graphite, and three polished theodoxius danubialis shells.¹¹⁰
- Type 1d (Code “Amphora (1d)00010”): Bulbous amphorae with a short, almost stepped cylindrical neck. Closely resembles Nieszery’s Type 1d. Three vessels contribute to this variant, with one unsexed early adult (63) and one adult woman (91) contributing to Aiterhofen-Ödmühle, while the remaining one belongs to a 18-20-year old women (91) at Nitra.

¹⁰⁷ Aiterhofen-Ödmühle: 68 (female), 115 (male) – Nitra: 34 (male) – Schwetzingen: 122 (female) – Vedrovice „Siroká u lesa”: 70 (female), 86 (female).

¹⁰⁸ Aiterhofen-Ödmühle: 60 (female), 69 (female), 74 (male), 77 (unsexed), 86 (unsexed), 92 (female), 122 (female), 155 (unsexed), 191 (unsexed) – Essenbach-Ammerbreite: 2 (infant), 15 (infant), 30 (uncertain male) – Nitra: 40 (infant) – Sengkofen: 14 (infant).

¹⁰⁹ BRINK-KLOKE 1990, 458.

¹¹⁰ NIESZERY 1995, 271.

- Type 1e (Code “Amphora (1e)00010”): Oval amphorae with a narrow, everted neck and an S-shaped curved profile. This variant mainly distributes to the south-eastern cemeteries of Austria, Bohemia and Moravia, with few exceptions.¹¹¹ Sex and age distributions vary between the sites.
- Type 1f (Code “Amphora (1f)00010”): Amphorae with an inverted, long neck. Only two objects correspond to this category, one gifted to a 50-year old woman (6) and the other to an unsexed individual of unknown age (13), both located at Nitra.
- Type 1g (Code “Amphora (1g)00010”): Bulbous, bomb-shaped vessels with slightly inverted neck. Three units in total attributed to an unsexed individual at Aiterhofen-Ödmühle (81), a juvenile at Essenbach-Ammerbreite (11) and a senile woman at Schwetzingen (217).
- Type 1h (Code “Amphora (1h)00010”): Bulbous, bomb-shaped vessels with everted neck. Both objects of this type, found in grave 87 at Aiterhofen-Ödmühle and grave 11 at Schwetzingen, accompanied male adults.
- Type 1i (Code “Amphora (1i)00010”): Amphorae with long neck and conical shoulder. The three amphorae of this type were given to two men at Nitra (17, 25) and a woman at Vedrovice “Siroká u lesa” (72), with all the deceased identified as late adults.
- Uncategorized (Code “Amphora (Uncategorized)00010”): This includes undeterminable amphorae and some isolated and unusual vessels, which could not be associated to other types. In total, there are 16 uncategorized amphorae.¹¹²

¹¹¹ Aiterhofen-Ödmühle: 196 (unsexed) – Dillingen-Steinheim: 13 (female) – Kleinhadersdorf: Verfärbung 69 (male) – Nitra: 8 (male), 47 (infant), 58 (male), 61 (female) – Vedrovice „Siroká u lesa“: 39 (infant), 54 (male), 66 (male), 69 (male, two vessels), 77 (male), 91 (female).

¹¹² Aiterhofen-Ödmühle: 18 (male), 95 (unsexed) – Kleinhadersdorf: grave 1c (female), Verfärbung 79 (male) – Nitra: 10 (unsexed), 12 (unsexed), 28 (neonate), 41 (unsexed), 76 (uncertain female) – Vedrovice „Siroká u lesa“: 15 (male), 18 (infant), 19 (male), 23 (male), 81a (female), 99 (male), 100 (female).

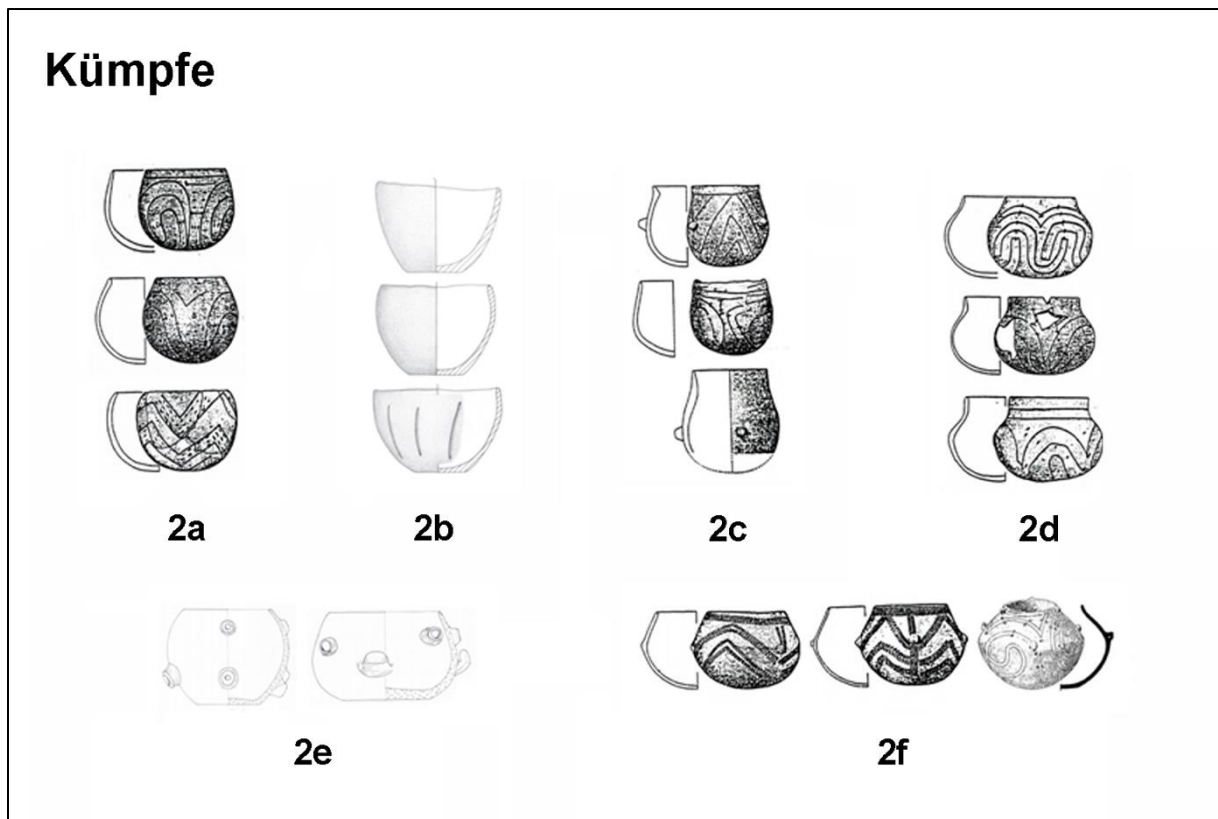


Figure 12: Typology of Kümpfe, bowls and plates, as applied in this thesis (original graphs taken from PAVÚK 1972; BRINK-KLOKE 1990; NIESZERY 1995; PODBORSKÝ 2002a; GERLING 2012; NEUGEBAUER-MARESC, LENNEIS 2015a and further modified).

The German term *Kumpf* (plural: *Kümpfe*) refers to a variety of round-bottomed vessels. Its classical shape is round and bulbous, which led to the alternative term *Bombe*, meaning “bomb”. However, pear-shaped vessels, bulbous ones with pronounced neck (amphora-shaped) and even bowls are also often classified as *Kumpf*. The following variants will be specified:

- Type 2a (Code “Kumpf (2a)00010”): The classical bomb shaped *Kumpf*, which is without neck and has an inverted rim. The width of the vessel varies considerably in some cases. Classical bombs are widespread among the distribution area and associates to any sex and age.¹¹³
- Type 2b (Code “Kumpf (2b)00010”): Slightly inverted, roundish or conical bowls or bombs. This vessel type mostly distributes to the south-eastern regions, with only few

¹¹³ Aiterhofen-Ödmühle: 94 (male), 106 (female), 166 (female), 214 (uncertain female) – Dillingen-Steinheim: 21 (uncertain male) – Kleinhadersdorf: grave 1c (female), grave 3 (unsexed), Verfärbung 32 (female), Verfärbung 57 (male), Verfärbung 79 (male) – Nitra: 3 (unsexed), 4 (unsexed), 21 (male), 27 (male), 36 (female), 52 (uncertain female), 56 (male), 59 (male), 70 (female) – Rutzing: 24 (infant), 31 (infant) – Schwetzingen: 153 (female), 213 (infant), 218 (male) – Sengkofen: 16 (male) – Vedrovice “Siroká u lesa”: 46 (male), 50 (male), 51 (female, two vessels), 66 (male), 85 (unsexed), 98 (unsexed), 106 (female).

objects corresponding to Bavaria and Schwetzingen.¹¹⁴ Almost none of the respective burials contained infants.

- Type 2c (Code “Kumpf (2c)00010”): Slim pear-formed vessels with or without neck. Closely resembles Nieszery’s type 2d for *Kümpfe*, which he describes as “cup-shaped”. This variant was almost exclusively gifted to male or uncertain male burials, with the only exceptions being one infant and an unsexed individual.¹¹⁵
- Type 2d (Code “Kumpf (2d)00010”): Bulbous to pear-shaped bombs with inverted to slightly everted rim. Resembles roughly Nieszery’s types 2e and 2f. This variant mainly associates to the Bavarian sites and Schwetzingen, with only one of the 24 vessels distributing to Vedrovice “Siroká u lesa”.¹¹⁶
- Type 2e (Code “Kumpf (2e)00010”): Bombs, bowls and amphorae with a high number of handles or lugs are often referred to as *Butte*. This variant includes two objects, which were both excavated at Vedrovice “Siroká u lesa”. Grave 72 contained a bomb-shaped *Butte* along with the remains of a late adult woman, while the vessel in grave 83 was gifted to a senile woman and had an ovate form with the diameter of the rim positioned in the lower third of the body.¹¹⁷
- Type 2f (Code “Kumpf (2f)00010”): Biconical bombs without neck, excluding the Alföld vessel of Nitra, which falls in the main category “Special vessels”, as well as the two biconical bombs of grave 229 at Aiterhofen-Ödmühle are associated to the Stroke Pottery culture. Thus, remains only one vessel in this category, which belongs to an adult female at Nitra (1). It was the only grave good and lay behind the back of the left-crouching woman, who was positioned S-N with the head turned west.¹¹⁸

¹¹⁴ Aiterhofen-Ödmühle: 136 (female), 154 (unsexed) – Dillingen-Steinheim: 13 (female) – Kleinhadersdorf: Verfärbung 67-2 (male, three vessels), Verfärbung 81 (male) – Nitra: 35 (uncertainly female) – Schwetzingen: 187 (unsexed) – Vedrovice „Siroká u lesa”: 15 (male), 21 (female), 34 (unsexed), 36 (female, two vessels), 37 (infant), 46 (male), 69 (male, three vessels), 79 (male), 81a (female).

¹¹⁵ Aiterhofen-Ödmühle: 77 (unsexed), 88 (infant, uncertain male) – Mangolding: 1 (male) – Rutzing: 15 (male) – Schwetzingen: 58 (male), 200 (male).

¹¹⁶ Aiterhofen-Ödmühle: 35 (male), 66 (unsexed), 67 (unsexed), 74 (male, two vessels), 81 (unsexed), 89 (female), 106 (female), 131a (infant, uncertain female), 137 (female) – Essenbach-Ammerbreite: 11 (unsexed), 30 (uncertain male) – Schwetzingen: 21 (infant), 25 (uncertain female), 43 (male), 71 (uncertain female), 73 (male), 109 (uncertain female), 155 (infant), 160 (infant), 183 (female), 201 (female) – Sengkofen: 21 (unsexed) – Vedrovice “Siroká u lesa”: 24 (infant).

¹¹⁷ PODBORSKÝ 2002a, 72, 82.

¹¹⁸ PAVÚK 1972, 6.

- Uncategorized (Code “Kumpf (Uncategorized)00010”): This includes undeterminable *Kümpfe* und some isolated and unusual vessels, which could not be associated to other types. In total, there are 17 uncategorized *Kümpfe*.¹¹⁹

¹¹⁹ Aiterhofen-Ödmühle: 80 (uncertain female), 94 (male), 132 (uncertain male, infant) – Essenbach-Ammerbreite: 1 (infant) – Kleinhadersdorf: grave 14 (female), Verfärbung 66 (unsexed), Verfärbung 67-2 (unsexed) – Nitra: 7 (uncertain male) – Schwetzingen: 7 (uncertain male), 20 (infant), 48 (uncertain female), 51 (infant), 146 (female), 154 (male) – Sengkofen: 3 (unsexed) – Vedrovice „Siroká u lesa“: 15 (male), 34 (unsexed), 85 (unsexed).

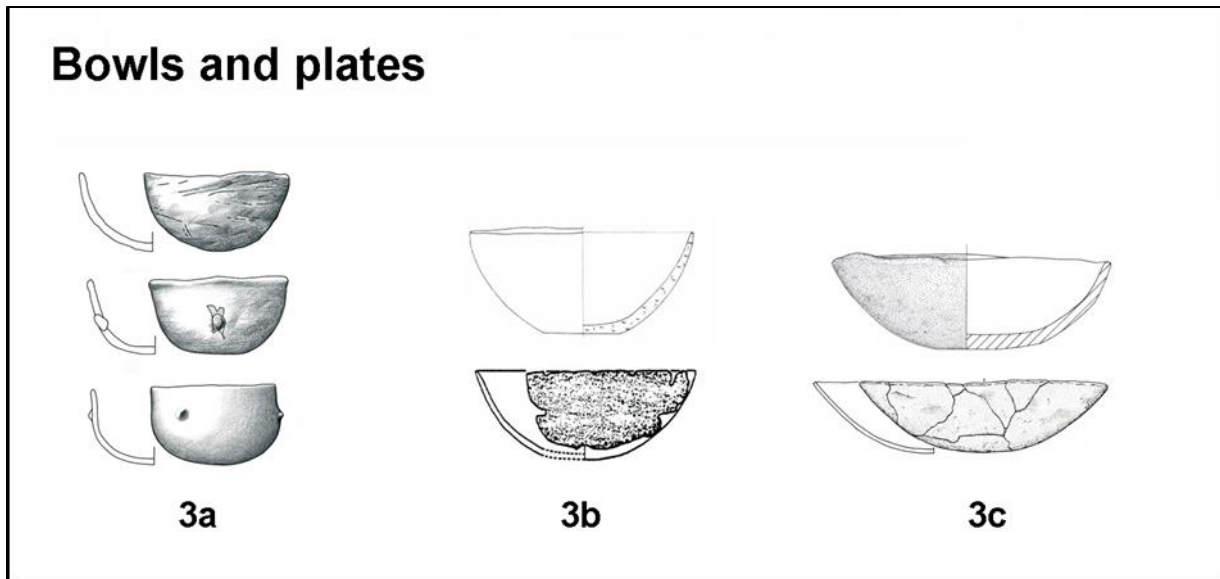


Figure 13: Typology of bowls and plates as applied in this thesis (original graphs taken from NIESZERY 1995, 128, Abb. 72; 333, Taf. 13; PODBORSKÝ 2002a, 71, Abb. 71; GERLING 2012, 251, Abb. 117; 254, Abb. 120; 257, Abb. 123; NEUGEBAUER-MARESCHE, LENNEIS 2015a, 262, Taf. 29 and further modified).

As defined for this thesis, bowls are open vessels without neck and have an everted or vertical rim. The diameter of the rim must exceed its height and width. Bowls are subdivided into the following variants:

- Type 3a (Code “Low bowl (3a)00010”): Low bowls with the diameter of the rim more than two times, but less than three times its height. A late adult and uncertain female individual at Aiterhofen-Ödmühle (76) and a late adult to early mature man at Vedrovice “Siroká u lesa” (71) received a low bowl.
- Type 3b (Code “High bowl (3b)00010”): High bowls with the diameter of the rim less than two times its height. A total of nine vessels fall into this category, whereas there seems to be a relatively high number of infants equipped with high bowls.¹²⁰
- Type 3c (Code “Plate (3c)00010”): Plates with the diameter of the rim more than three times its height. Three vessels of this type in total distributed to a 10-14-year old individual at Aiterhofen-Ödmühle (30) as well as to an adult man (Verf. 40) and an early infant (Verf. 67-1) excavated at Kleinhadersdorf.

¹²⁰ Essenbach-Ammerbreite: 11 (unsexed, 14-years-old) – Kleinhadersdorf: grave 17a (infant) – Nitra: 66 (female), 74 (infant) – Schwetzingen: 145 (female), 180 (infant), 203 (infant) – Vedrovice „Siroká u lesa“: 19 (male), 104 (female).

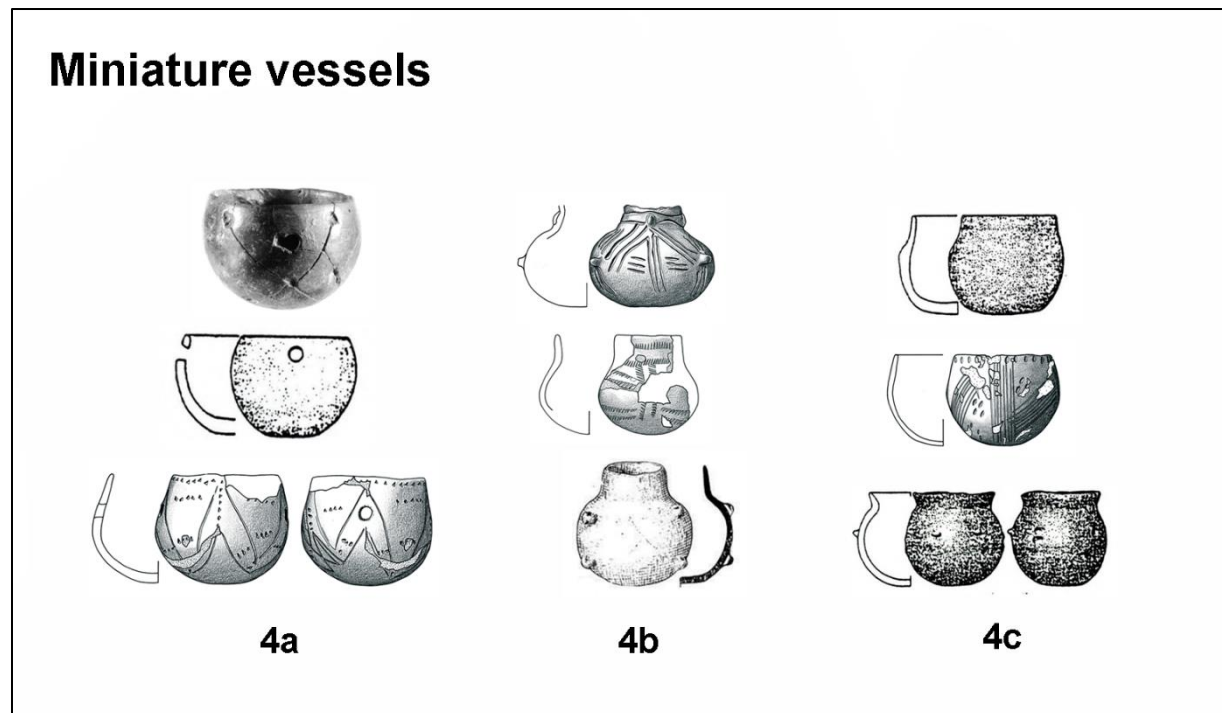


Figure 14: Typology of miniature vessels as applied in this thesis (original graphs taken from KLOIBER, KNEIDINGER 1968, Taf. 6; PAVÚK 1972, 43, Abb. 26; NIESZERY 1995, 128, Abb. 72; GERLING 2012, 229, Abb. 95; 236, Abb. 102; 239, Abb. 105; 242, Abb. 108 and further modified).

Due to their small size, miniature vessels do not fit previous categorizations and thus probably had a special function. They are often associated with the graves of children, although this is only partially correct, as demonstrated with the following:

- Type 4a (Code “Perforated miniature vessel (4a)00010”): Small vessels which are perforated under the rim. These holes could have held a stick made of organic material, providing a possible functional use as dipper or spoon. They have been found within the graves 7 at Rutzing and 132 at Aiterhofen-Ödmühle, which both belonged to early infant children, while grave 39 at Schwetzingen was assigned to an uncertain female adult.
- Type 4b (Code “Miniature amphorae (4b)00010”): Small vessels with pronounced neck which do not exceed a height of 7 cm, basically miniature amphorae. Such objects have been found in five graves, two at Nitra and three at Schwetzingen. The vessel in grave 30 at Nitra was described as *Miniaturbutte* (miniature *Butte*), as it had five lugs, and belonged to a 7-year old infant. The small amphorae at grave 53 was discovered within the burial of a woman around 20-years old. The vessels in graves 2, 72 and 212 at Schwetzingen were all gifted to late infant children.

- Type 4c (Code “Miniature vessel (4c)00010”): Small vessels with a short neck or without a neck, sometimes referred to as “cups”. All objects which are described as miniature or small vessels in the respective publications as well as a few additions on my part will be listed in this variant – with the exception of the cup in grave 77 at Aiterhofen-Ödmühle, which reaches 105 mm and thus is far too high to be listed as a miniature or small vessel.¹²¹ Many other cups also exceed heights of 8 cm, while other vessels of around the same height are often conveniently placed in other categories. The smallest ones reach heights of around 4 to 5 cm. Other issues include the interpretation as grave goods mainly assigned to children; Within an amount of 22 miniature vessels selected for this thesis – or respectively already categorized as such in the original publications – only 4 could be identified as infants.¹²² The remaining burials were either unsexed or belonged to deceased individuals reaching between adult and senile age stages. Almost all sexed individuals were female, pointing to potential mother-child-connections or other links between women and infants, considering that the other miniature vessel types were also given to them.

¹²¹ NIESZERY 1995, 280.

¹²² Aiterhofen-Ödmühle: 36 (unsexed), 70 (unsexed), 106 (female), 129 (infant), 158 (female) – Essenbach-Ammerbreite: 4 (infant), 20 (female) – Kleinhadersdorf: Verfärbung 80 (female) – Nitra: 4 (unsexed), 44 (female), 65 (female), 71 (infant) – Schwetzingen: 51 (infant), 65 (uncertain female), 101 (uncertain female), 131 (uncertain female), 141 (female), 148 (unsexed), 177 (male), 212 (unsexed) – Sengkofen: 10a (male), 21 (unsexed).

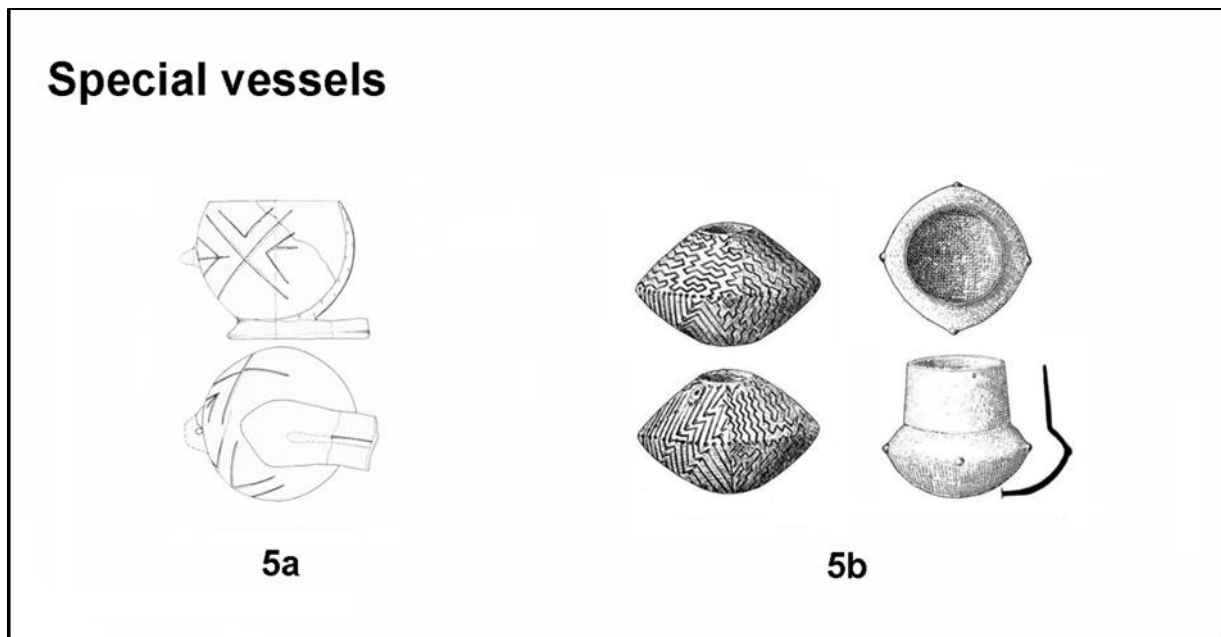


Figure 15: Typology of special vessels as applied in this thesis (original graphs taken from PAVÚK 1972, 41, Abb. 24; PODBORSKÝ 2002a, 35, Abb. 27 and further modified).

The last main category are special vessels, which exist outside the previously mentioned classifications or are deliberately not assigned to them. A distinction is made between the following vessels:

- Type 5a (Code “Vessel with pedestal (5a)00010”): This variant includes a bomb-shaped vessel with pedestal, found in grave 27 at Vedrovice “Siroká u lesa” at the lower torso area of a woman reaching between adult and mature age stages.¹²³ Maria Cladders described vessels with pedestal as characteristic for the Earliest Linear Pottery, although Juraj Pavúk dated the object in grave 27 to the subphase Ib1, representing the earliest occupation of the cemetery.¹²⁴ Unfortunately, this particular grave has not been radiocarbon dated, however, phase Ib seems to fall between around 5300 and 5200 cal. BC.¹²⁵ Other gifts have not been found in grave 27.
- Type 5b (Code “Alföld vessel (5c)00010”): Vessels which were described as being imports from the Alföld Linear Pottery culture (also called Eastern Linear Pottery), including two different vessels excavated at Nitra. The first one is an amphora with biconical body and long, slightly inverted neck found near the head of a 50-year old man (2). The second object is a biconical, lentil-shaped vessel with extensive

¹²³ PODBORSKÝ 2002a, 34–35.

¹²⁴ CLADDERS 2001, 23. – PODBORSKÝ 2002a, 186–188.

¹²⁵ PETTITT, Paul, HEDGES, Robert 2008, 130.

decorations. It was positioned behind the back, approximately around the height of the shoulders, of a left crouched late mature man (17).

3.5. Clothing and personal ornaments

3.5.1. Spondylus

Also known as spiny oyster, *Spondylus gaederopus* is a certain type of mollusc, the shells of which were harvested from the Black Sea, Aegean Sea or the Eastern Adria and then transported to the inner continent in the Early Neolithic.¹²⁶ The chronological distribution of Neolithic sites with *Spondylus* artefacts ranges from 6500 to 3800 BC, although the shell was already used during the Palaeolithic.¹²⁷ Artefacts manufactured of this undoubtedly high-valued material occur in various forms and shapes among Linear Pottery Culture cemeteries. There are beads and pendants appearing as single or multiple pieces, often as parts of necklaces and accompanied by beads made of other materials such as snail shells or stone, bracelets and different versions of closures usually interpreted as belt buckles (Fig. 16). These artefacts differ significantly from the spondylus ornaments found in south-eastern Europe (Fig. 17), with some find types such as annulets (a type of small ring) or amulets being absent in the Linear Pottery distribution area, which leads to the question where their spondylus ornaments were processed and how the Early Neolithic trading networks worked exactly.¹²⁸ Other distinctions between Middle and South-Eastern Europe are observable within the distribution of certain site types. *Spondylus* occurs in the Thessalian-Macedonian and the



Figure 16: *Spondylus* artefacts from Linear Pottery Culture sites; on the left V-shaped buckles, a bracelet and cylindrical beads found at Kadaň, located in the Czech Republic (JOHN 2011, 41, Fig. 4); on the right beads and pendants found at Vedrovice “Siroká u lesa”, also located in the Czech Republic (PAVÚK 1972, 57, Abb. 40).

¹²⁶ MÜLLER 1997, 99.

¹²⁷ WINDLER 2018, 59.

¹²⁸ For examples of South-Eastern European spondylus ornaments of the Early Neolithic, see VEROPOULIDOU, PAPPAS 2011.

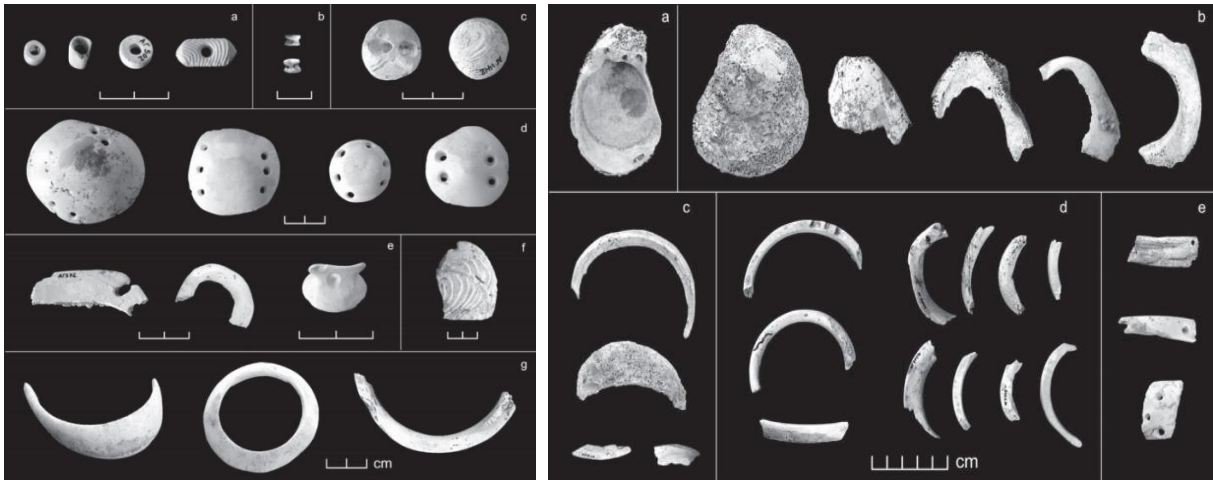


Figure 17: *Spondylus* artefacts from the Neolithic Greek site Makriyalos (VEROPOULIDOU, PAPP, 111, Fig. 6 – 113, Fig. 7).

Eastern Adriatic area in settlements, on the lower Danube in settlements, settlement graves and cemeteries, as well as in the Carpathian basin in settlements and settlement graves and in the Central European area mainly in graves.¹²⁹ While *Spondylus* was used between 6500 and 5500 BC. mainly along the Aegean Sea and in South-Eastern Europe, its distribution shifted to Central Europe between 5500 and 5000 BC and extended into the Paris Basin, and later, in the fifth millennium, to the Carpathian Basin and the Black Sea. The decline of spondylus use around 4800 BC might have been connected to the advent of copper metallurgy and implies its change from a prestige to an ordinary good.¹³⁰

The economic-archaeological approach as applied by Windler, supported by mathematic-statistical methods, suggests the division of Europe into a production, a distribution and a consumption region.¹³¹ After obtaining the mussel in the Mediterranean, it was distributed along various centres in South-Eastern and Central Europe in order to be consumed and/or processed. While initially spondylus was rare and expensive in the Linear Pottery Culture and could only be accumulated in transitional areas, its distribution expanded towards the end of the sixth millennium. These factors could explain the typological differences between Middle and South-Eastern European spondylus ornaments as well as its use as grave goods in Linear Pottery context in contrast to the settlement finds of other regions, as the initial rarity of the mussel shells might have favoured a demonstration of high status of individuals or groups reflected within Linear Pottery mortuary rites, whereas such separations would not have been

¹²⁹ MÜLLER 1997, 94. – WINDLER 2018, 127–128.

¹³⁰ SIKLÓSI, CSENGERI 2011, 57.

¹³¹ WINDLER 2018, 128.



Figure 18: Reconstruction of Early Neolithic belts with spondylus buckles according to Nieszery; on the left V-buckles, on the right medallion-shaped or round buckles (PODBORSKÝ 2002b, 243, Abb. 4 – 245, Abb. 6).

quite as effective in regions where the material, although difficult to harvest, was more common. However, there is still a lack of analyses investigating the origins of these artefacts, which have yet to be clarified. Additionally, if the interpretation of different production centres in the Linear Pottery Culture distribution area would be correct, such production sites still remain to be excavated.

Regarding the funerary rites of the Linear Pottery Culture, the gifting of spondylus artefacts, as previously mentioned, have often been interpreted as markers of high status and sometimes linked to chronological patterns. They appear within both sexes and any age class, although there are differences between certain types of artefacts. For example, V-shaped and medallion-shaped belt buckles, with few exceptions, are separated between male and female graves, which might even reflect symbolically in the production, as one is made of the upper and other of the lower half of the mussel valve and both were worn at the pelvis (Fig. 8), which the Early Neolithic communities could have linked to sex-differences and reproduction or fertility.¹³² For this reason, there is not necessarily a contradiction between the production of typically male bracelets and typically female medallion-buckles from the same spondylus valve, as bracelets have been worn around the arm, a body part most likely not associated to

¹³² PODBORSKÝ 2002b, 253-254. – JOHN 2011, 39–40.

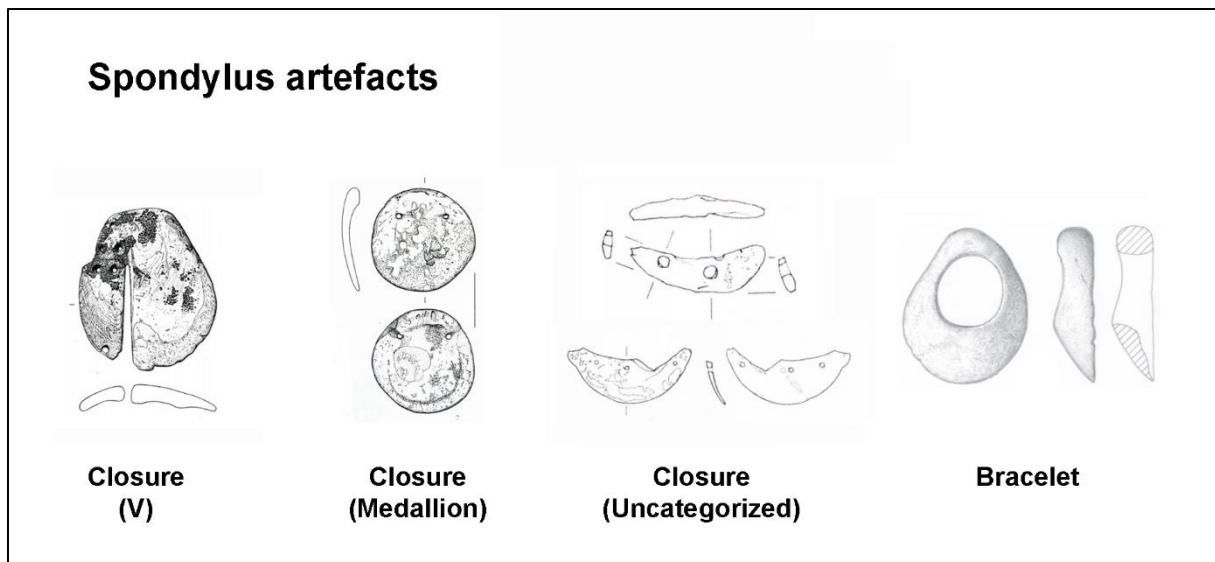


Figure 19: Typology of spondylus artefacts (original graphs taken from NIESZERY 1995, 370, Taf. 50 – 391, Taf. 71; PODBORSKÝ 2002a, 95, Abb. 102 – 108, Abb. 113; NEUGEBAUER-MARESCH, LENNEIS 2015a, 239, Taf. 6 and further modified).

gender. However, the symbolic interpretation of spondylus artefacts would exceed the limits of this study. The variants of these objects as distinguished for the quantitative analyses are described in detail in the following:

- Beads (Code “Spondylus bead00010”): Small pieces of material pierced for threading on a string (or wire) in such a way that they sit tightly within the string. Cylindrical spondylus beads, short or long, are one of the most common grave goods and appear in varying amounts from single pieces up to ensembles of more than a hundred units per grave, most often positioned around the neck, indicating them to originally have been part of necklaces. It is not uncommon for them to be accompanied by beads made of other material such as protula, dentalium, stone or snail shells. The overall distribution of spondylus beads do not show a restriction to a certain sex or age class and are mixed between those categories, although local trends on who inherited spondylus, depending on the cemetery, are observable and discussed in the respective subchapters.¹³³ One bead either produced of limestone or mussel, which could

¹³³ Aiterhofen-Ödmühle: 2 (18 beads), 9 (14 beads), 10 (27 beads), 11 (2 beads), 12 (7 beads), 15 (one bead), 18 (6 beads), 28 (25 beads), 41 (8 beads), 60 (16 beads), 68 (22 beads), 139 (8 beads), 141 (15 beads), 143 (8 beads) – Essenbach-Ammerbreite: 1 (12 beads), 3 (2 beads), 18 (38 beads), 29 (one beads), 30 (one bead) – Kleinhadersdorf: 1a (one bead), 3 (2 beads), 15 (one bead), Verfärbung 22 (7 beads), Verfärbung 29 (13 beads), Verfärbung 55 (5 beads) – Mangolding: 8 (3 beads) – Niederpörling-Leitensiedlung: 1 (40 beads), 3 (13 beads), 5 (17 beads) – Nitra: 2 (one bead), 6 (6 beads), 21 (one bead), 25 (one bead), 35 (one bead), 39 (one bead), 58 (one bead), 70 (3 beads) – Regensburg-Kumpfmühl: 2 (2 beads), 97 (two beads), 138 (3 beads) – Rutzing: 13 (5 beads), 18 (2 beads), 24 (2 beads), 33 (one bead) – Schwetzingen: 99 (one bead), 151 (one bead), 170 (two beads) – Sengkofen: 1 (one bead), 4 (13 beads), 23 (2 beads), 26 (3 beads) – Vedrovice “Siroká u lesa”: 15 (13 beads), 19

potentially be spondylus, has to be listed in another category due to this uncertainty (grave 2 at Regensburg-Kumpfmühl, Code “Bead_Undetermined00010”).

- Pendants (Code “Spondylus pendant00010”): In contrast to the tightly sitting beads, spondylus pendants are hanging ornamental objects, as one suspended from an earring or a necklace. They occur less frequently than beads and are always found as single objects. There is a total of 19 graves containing pendants in the selected study area, with only almost all of them contributing to the south-eastern distribution area of Austria, Moravia and Bohemia.¹³⁴ Two undetermined shell pendants found in grave 5 at Vedrovice “Zva dvorem” and grave Verfärbung 81 at Kleinhadersdorf were presumably produced of spondylus gaedoropus, but have to be listed in another category due to their uncertain material (Code “Mussel shell pendant_Undetermined00010”).
- Spondylus closures: Perforated closures appear in various forms and materials and are usually positioned around the pelvis area of the deceased, but in few cases also at other body parts, and are thus often interpreted as belt buckles or functional predecessors of fibulae.
 - Medallion-shaped (Code “Spondylus closure_Medallion00010”): Somewhat round or medallion-shaped spondylus closures are primarily assigned to female burials with few exceptions.¹³⁵ They were made from the lower half of the spondylus valve.¹³⁶
 - V-shaped (Code “Spondylus closure_V00010”): Spondylus valves formed like a “V” were made of the upper valve of the spondylus shell.¹³⁷ Due to their fragility they were often broken and repaired by using repair perforations or resin, with the former being evidence of long term use. V-buckles exclusively appear in

(23 beads), 36 (2 beads), 39 (11 beads), 42 (2 beads), 46 (one bead), 54 (2 beads), 62 (one bead), 65 (one bead), 69 (12 beads), 70 (20 beads), 72 (one bead), 83 (4 beads), 86 (one bead), 91 (2 beads), 95 (one bead), 100 (2 beads) – Vedrovice “Za dvorem”: 2 (11 beads), 9 (198 beads), 14 (2 beads).

¹³⁴ Kleinhadersdorf: Verfärbung 22 (infant) – Niederpörling-Leitensiedlung: 1 (uncertainly male) – Nitra: 8 (male), 34 (male), 58 (male) – Rutzing: 16 (unsexed) – Vedrovice „Siroká u lesa”: 14 (female), 15 (male), 19 (male), 36 (female), 46 (male), 75 (female), 78 (infant), 79 (male), 81a (female), 86 (female), 90 (female), 93a (female), 100 (female).

¹³⁵ Aiterhofen-Ödmühle: 32 (female), 68 (female), 143 (uncertainly male) – Essenbach-Ammerbreite: 23 (male) – Schwetzingen: 48 (uncertain female) – Sengkofen: 9 (female), 23 (female), 29 (uncertain female) – Vedrovice “Siroká u lesa”: 70 (female), 86 (female) – Vedrovice “Zva dorem”: 9 (female).

¹³⁶ JOHN 2011, 40.

¹³⁷ JOHN 2011, 39.

male graves and were almost restricted to older individuals ranging between late adult to senile age.¹³⁸ Exceptions are one uncertain male and a 15-20-year old individual inside grave 139 at Aiterhofen-Ödmühle, one 25-30-year-old man in grave 13 of Rutzing, and the deceased of grave 4 at Sengkofen, whose skeletal material was lost and thus their age cannot be identified nor can the correctness of the initial sexual determination as man confirmed.¹³⁹

- Uncategorized (Code “Spondylus closure_Uncategorized00010”): This category involves several unusual closures, which could not be assigned to either V- or medallion-shaped buckles. One was hinge-shaped and positioned at the elbow of an early mature and right-crouching woman at Vedrovice “Siroká u lesa” (102), and another one has no picture in its respective publication, thus preventing a classification (Rutzing 31). The remaining objects are shell fragments with perforation holes, also resembling a hinge and limited to the south-eastern distribution area.¹⁴⁰ The closures found at Rutzing both inherited traces of red chalk.¹⁴¹ Most interestingly, almost all objects in this category accompanied subadults.
- Bracelets (Code “Spondylus bracelet00010”): Early Neolithic people produced spondylus bracelets from the lower valve of the shell and often wore them around the left arm.¹⁴² They were carefully polished, especially at the edges and the shell lock, leading the originally slightly irregular shell shape to be changed to an even design. The outer diameter varies between 9 and maximal 12 cm, while the inner diameter ranges mostly between 7 and 8 cm, although it is remarkably narrow in some cases. The bracelets of graves 41 and 139 at Aiterhofen-Ödmühle and grave 21 at Sengkofen do not exceed an inner diameter of 6 cm. As expected, these belong to young individuals ranging between late infant and juvenile. Experiments have shown that it is difficult to impossible to put these bracelets on without damaging them. Therefore, Norbert Nieszery suggested them to be permanently carried ornaments which were applied in

¹³⁸Aiterhofen-Ödmühle: 10, 18, 28, 61, 139, 141 – Nitra: 2 – Rutzing: 13 – Sengkofen: 4.

¹³⁹ NIESZERY 1995, 305.

¹⁴⁰ Kleinhadersdorf: Verfärbung 7 (infant) – Rutzing: 9 (female), 31 (infant) – Vedrovice „Za Dvorem“: 5 (infant), 8 (13-15-years old).

¹⁴¹ KLOIBER, KNEIDINGER 1968, 34.

¹⁴² JOHN 2011, 39.

two life phases: the first time in childhood and the second one around the end of the growth phase.¹⁴³ The majority of bracelets included in this study have been found at Bavarian cemeteries, and were mainly gifted to male individuals, but also to women in a few cases.¹⁴⁴

- Unmodified shells (Code “Spondylus_Unmodified00010”): Unmodified spondylus shells or fragments have been found at the pelvis area of a mature to senile man at Nitra (34), another three in unsexed (Verf. 14, Verf. 18) and early adult female graves (Verf. 32) at Kleinhadersdorf. A slightly perforated spondylus shell fragment with a small artificial perforation assigned to a late adult to early mature man in grave *Verfärbung 17*, which is unmodified apart from the artificial perforation and thus cannot be categorized as ornament or closure, will also be designated to this variant due to its uncertain nature.

¹⁴³ NIESZERY 1995, 185–186.

¹⁴⁴ Aiterhofen-Ödmühle: 2 (unsexed), 10 (male), 12 (male), 13 (uncertain male), 18 (male), 19 (female), 25 (male), 28 (male), 41 (uncertain male), 48 (male), 139 (uncertain male), 141 (male) – Essenbach-Ammerbreite: 30 (uncertain male) – Kleinhadersdorf: 1c (female) – Rutzing: 4 (infant) – Schwetzingen: 48 (uncertain female) – Sengkofen: 4 (male), 10a (male), 21 (unsexed) – Vedrovice „Siroká u lesa“: 15 (male) – Vedrovice „Za Dvorem“: 2 (male), 9 (female).

3.5.2. Shells

This artefact group includes all ornaments produced from mollusc remains other than spondylus, as well as other modified or unmodified shells which might or might not have been intended as part of the Early Neolithic funerary clothing. They can be roughly divided between mussel and snail shells.

Beads produced from saltwater mussels are represented by dentalia (Code “Dentalium bead00010”) and protula (Code “Protula bead00010”) beads, which might have acted as substitute to spondylus beads as implied by their appearance in modified form, looking very similar to the cylindrical spondylus variant (Fig. 20). Dentalium is a large genus of mollusc tooth shells (or tusk shells) widespread across the oceans.¹⁴⁵ Characteristic is the tubular, mostly white shell, which has the shape of an elephant tusk. The term “Protula” describes a genus of marine, tube-building worms including a variety of different species and is also geographically widespread.¹⁴⁶ Dentalium beads usually occur in relatively small numbers, although they were often combined with beads made of other materials. Eight burials with dentalia have been selected in the study area which distribute to Austrian and Bavarian sites, half of them being assigned to infants.¹⁴⁷ Protula beads mostly appeared in Bavaria.¹⁴⁸ At Aiterhofen-Ödmühle

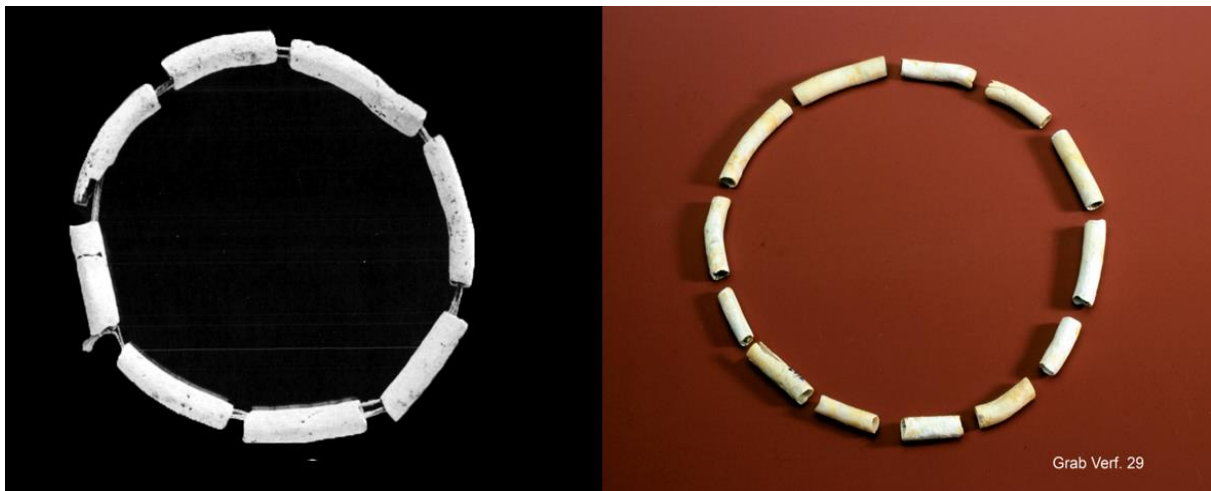


Figure 20: left) Ensemble of dentalium beads found in grave 11 at Rutzing; right) Ensemble of protula beads found in grave Verfärbung 29 at Kleinhadersdorf (KLOIBER, KNEIDINGER 1968, Taf. 5; NEUGEBAUER-MARESCH, LENNEIS 2015a, 295, Taf. 62).

¹⁴⁵ WORMS EDITORIAL BOARD 2020c.

¹⁴⁶ WORMS EDITORIAL BOARD 2020g.

¹⁴⁷ Essenbach-Ammerbreite: 30 (uncertain male, 9 beads) – Kleinhadersdorf: Verfärbung 67-1 (infant, one bead) – Rutzing: 7 (infant, one bead), 11 (female, 8 beads), 16 (unsexed, 4 beads), 24 (infant, 2 beads), 31 (infant, 11 beads) – Sengkofen: 18 (uncertain male, 2 beads)

¹⁴⁸ Aiterhofen-Ödmühle: 28 (male, 5 beads), 32 (female, 4 beads), 111 (female, 6 beads), 146 (female 3 beads), 150 (female, 6 beads) – Kleinhadersdorf: Verfärbung 29 (male) – Mangolding: 4 (unsexed, 4 beads), 6 (male, 2 beads), 8 (female, 2 beads) – Niederpörling-Leitensiedlung: 1 (uncertain male, 5 beads), 7 (uncertain male, 14 beads) – Regensburg-Kumpfmühl: 2 (unsexed, 8 beads), 138 (unsexed, 3 beads).

they are mainly associated with older women (see chapter 4.3.4.), while the sample on other sites is too small to determine specific gender associations. All remaining mussel shell types are listed in the following:

- *Ostreidae* (Code “*Ostraeidae00010_Unmodified*”): This term describes the true oysters, which include most species of molluscs commonly consumed as oysters.¹⁴⁹ Their presence is limited to Kleinhadersdorf, whereat unmodified oysters were discovered in graves 9, 17 and *Verfärbung* 17. The latter could be identified as a late adult man, while the first two were assigned as early infant.
- *Cardiidae* (Code “*Cardiidae00010_Unmodified*”): This species of marine molluscs is known as cockles or true cockles, which are not closely related to the dog cockle.¹⁵⁰ *Cardiidae* live in sandy, sheltered beaches throughout the world. The fragment of the cardium shell excavated at Kleinhadersdorf (*Verf.* 21), which accompanied an unsexed individual, might have been transported from the Adriatic Sea to Lower Austria or originated from the tertiary sediments of the surrounding area.¹⁵¹
- *Glycymeris* (Code “*Glycymeris_Fragmented00010*”): The *Glycymeris glycymeris* is a species of marine clam also known as dog cockle or European bittersweet.¹⁵² It can be found in shelly gravel on the ocean floor at depths up to around 100 m. Three fragments of a dog cockle which might have been polished, although this cannot be said with certainty due to its state of preservation, have been found with the remains of a female individual at Schwetzingen (37).
- *Pseudounio auricularius* (Code “*Pseudounio auricularius_Unmodified00010*”): Also known as *Margaritifera auricularia*, or Spengler's freshwater mussel, the *pseudounio auricularios* is a species of European freshwater mussels.¹⁵³ Two exemplars appeared unmodified and fragmented at Schwetzingen in male graves (154, 200).
- *Unio crassus* (Code “*Unio crassus_Unmodified00010*”): The thick shelled river mussel or *unio crassus* is a species of freshwater mussel distributed to Europe and Western Asia.¹⁵⁴ They were discovered in two male graves: Six unmodified shells in grave 3 at

¹⁴⁹ WORMS EDITORIAL BOARD 2020f.

¹⁵⁰ WORMS EDITORIAL BOARD 2020b.

¹⁵¹ NEUGEBAUER-MARESCH, LENNEIS 2015c, 142.

¹⁵² WORMS EDITORIAL BOARD 2020d.

¹⁵³ WORMS EDITORIAL BOARD 2020h.

¹⁵⁴ WORMS EDITORIAL BOARD 2020i.

Mangolding and one shell fragment in grave 154 at Schwetzingen, which also contained a *pseudounio auricularis* fragment.

- *Unio pictorum* (Code “*Unio pictorum_Unmodified00010*”): The freshwater mussel *unio pictorum*, or painter’s mussel, is commonly found in water bodies and slower streams in Europe.¹⁵⁵ Similar to *unio crassus*, unmodified shells have been found in two male graves at Schwetzingen (142, 177).
- *Margaritifera margaritifera* (Code „*Margaritifera margaritifera_Unmodified00010*”): Also known as freshwater pearl mussel, the *margaritifera margaritifera* occurs on both sides of the Atlantic, from the Arctic and temperate regions of western Russia, through Europe to northeastern North America.¹⁵⁶ There was only one shell of this species in the selected study area, which appeared in the male grave 25 at Sengkofen.
- *Anodonta cygnea* (Code “*Anodonta cygnea_Fragmented00010*”): The swan mussel, *Anodonta cygnea*, is a large species of freshwater mussel with its native distribution being in the Euro-Siberian region, although in modern times it even reaches Africa.¹⁵⁷ A perforated swan mussel which was fragmented at the perforation was excavated around the hand of a male individual at Schwetzingen (142).
- *Anomia ephippium* (Code “*Anomia ephippium_Perforated0010*”): A small perforated shell inside the infant grave Verfärbung 22, which also included spondylus equipment, was identified as the fossil species *Anomia ephippium*.¹⁵⁸ The size of the shell was not sufficient enough for an exact determination of its origin, although such fossils are known to appear around Kleinhadersdorf.
- Undetermined mussel shells (Code “*Unspecified freshwater mussel shell_Unmodified00010*”): Several, undetermined freshwater mussel shells have been found at Aiterhofen-Ödmühle (10, 56), Mangolding (1) and Schwetzingen (106). Although the shells belonged to different species, it is worth noting that all of those graves contained male individuals.

Snail shells appeared unmodified, polished as well as polished and perforated and thus probably functioned in a similar fashion as beads, and as different species depending on region

¹⁵⁵ WORMS EDITORIAL BOARD 2020j.

¹⁵⁶ WORMS EDITORIAL BOARD 2020e.

¹⁵⁷ WORMS EDITORIAL BOARD 2020a.

¹⁵⁸ NEUGEBAUER-MARESCH, LENNEIS 2015, 143.

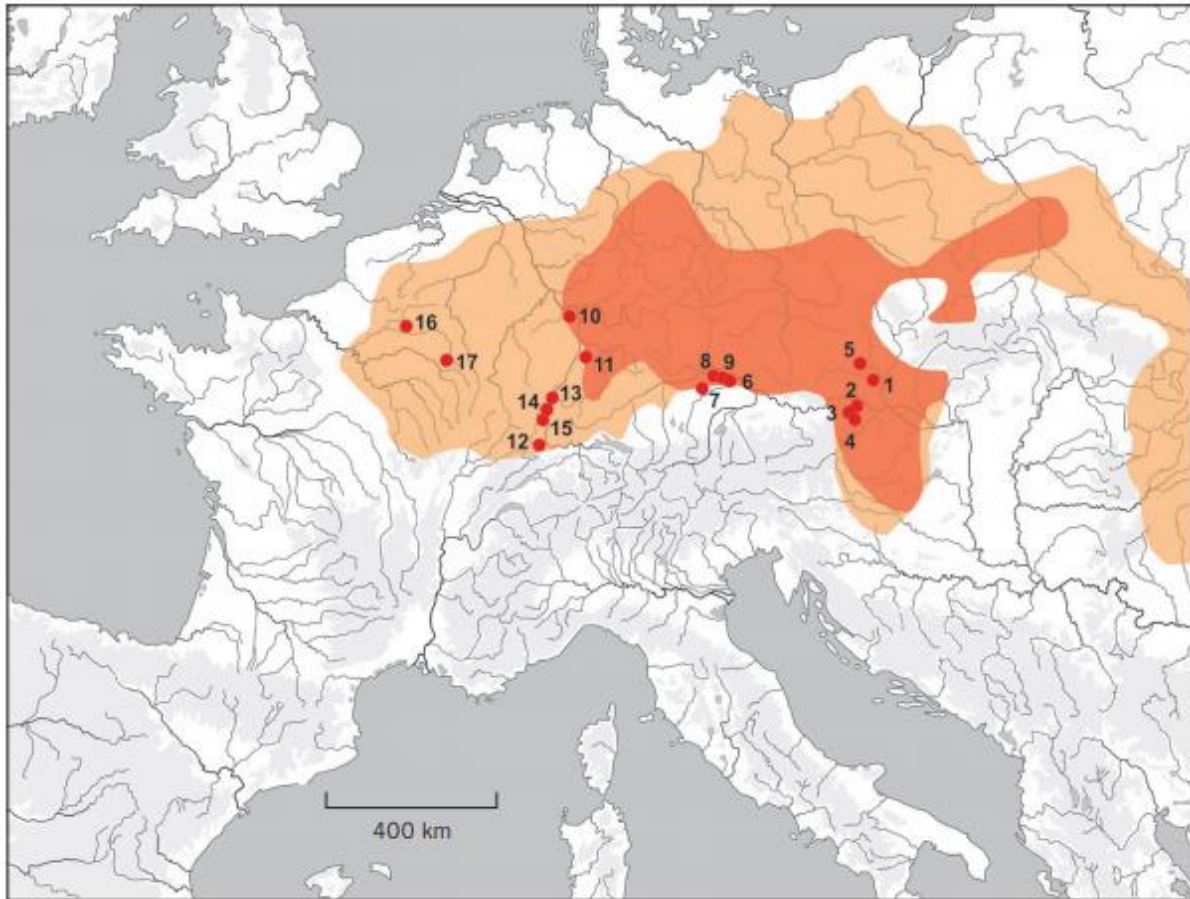


Figure 21: LPC graves in Central Europe with snail shell adornments. 1 Kleinhadersdorf (A); 2 Mitterndorf (A); 3 Ratzersdorf (A); 4 Saladorf (A); 5 Vedrovice (CZ); 6 Aiterhofen (D); 7 Essenbach-Ammerbreite (D); 8 Mangolding (D); 9 Sengkofen (D); 10 Flornborn (D); 11 Schwetzingen (D); 12 Ensisheim (F); 13 Hoenheim (F); 14 Quatzenheim (F); 15 Wettolsheim (F); 16 Cuiry-les-Chaudardes (F); 17 Frignicourt (F); dark orange: distribution of the Earliest LPC; light orange: distribution of the Late LPC (GEHLEN 2016, 839, Fig. 12).

and site. Some species are associated to the Late Mesolithic and indicate cultural influences on the Linear Pottery Culture or integration of hunter-gatherers into the Early Neolithic community. One of them is *theodoxius danubialis*, a species of small freshwater snail living on stony subground in streams such as the Danube. The more common term for this species is the German word *Donaukahnschnecke*, literally meaning “nerite of the Danube”. They were always found around the head area or the neck, parallel to the morphologically similar *theodoxus gregarius* found as head deposits at the Mesolithic site Ofnet Cave.¹⁵⁹ In the selected study area, grave goods produced from this material have been exclusively excavated at Bavarian cemeteries. Polished *theodoxius danubialis* (Code “Lithoglyphus naticoides_Polished00010”) often appeared in high numbers, reaching from 3 to 234 pieces

¹⁵⁹ GEHLEN 2016, 838.



Figure 22: Grave 7 at Niederpörling-Leitensiedlung, skull with in situ preserved *theodoxius danubialis* shells (PECHTL et al. 2018, 38, Abb. 4).

per grave. There are 12 graves in total which maintain polished *theodoxius danubialis*.¹⁶⁰ At Aiterhofen-Ödmühle, they were mainly associated with older women (see chapter 4.3.4.). One of the burials, grave 29 at Sengkofen, additionally contained three *theodoxius transversalis* shells appearing as a necklace together with 50 *theodoxius danubialis* objects. Similar to the simply polished variant, perforated and polished *theodoxius danubialis* (Code “*Theodoxus danubialis_Perforated00010*”) occurred in high quantities.¹⁶¹ A single piece of *theodoxius danubialis* (Code “*Theodoxus danubialis_Unmodified00010*”) which might or might not have been modified, has been described as laying under the head of an unsexed individual in grave 5 at Mangolding.¹⁶² Other grave goods were a macrolithic chert blade as well as a nucleus.

¹⁶⁰ Aiterhofen-Ödmühle: 32 (female, 234 shells), 33 (female, 3 shells), 60 (female, 80 shells), 143 (uncertain male, 34 shells), 146 (female, 10 shells), 150 (female, 96 shells) – Mangolding: 6 (male, 122 shells), 7 (female, 6 shells) – Sengkofen: 18 (uncertain male, 25 shells), 26 (male, 48 shells), 29 (uncertain female, 53 shells).

¹⁶¹ Essenbach-Ammerbreite: 4 (infant/juvenile, 266 shells), 11 (14-years old, 142 shells), 14 (uncertain female, one unit), 18 (uncertain female, 32 units), 27 (female, 217 shells), 29 (unsexed, 10 shells) – Niederpörling-Leitensiedlung: 7 (uncertain male, 246 shells) – Regensburg-Kumpfmühl: 2 (unsexed, 132 shells), 89 (unsexed, 167 shells), 138 (unsexed, 148 shells).

¹⁶² Original text: „1 Schneckengehäuse, unter Schädel. *Theodoxus danubialis*.“ NIESZERY 1995, 310.

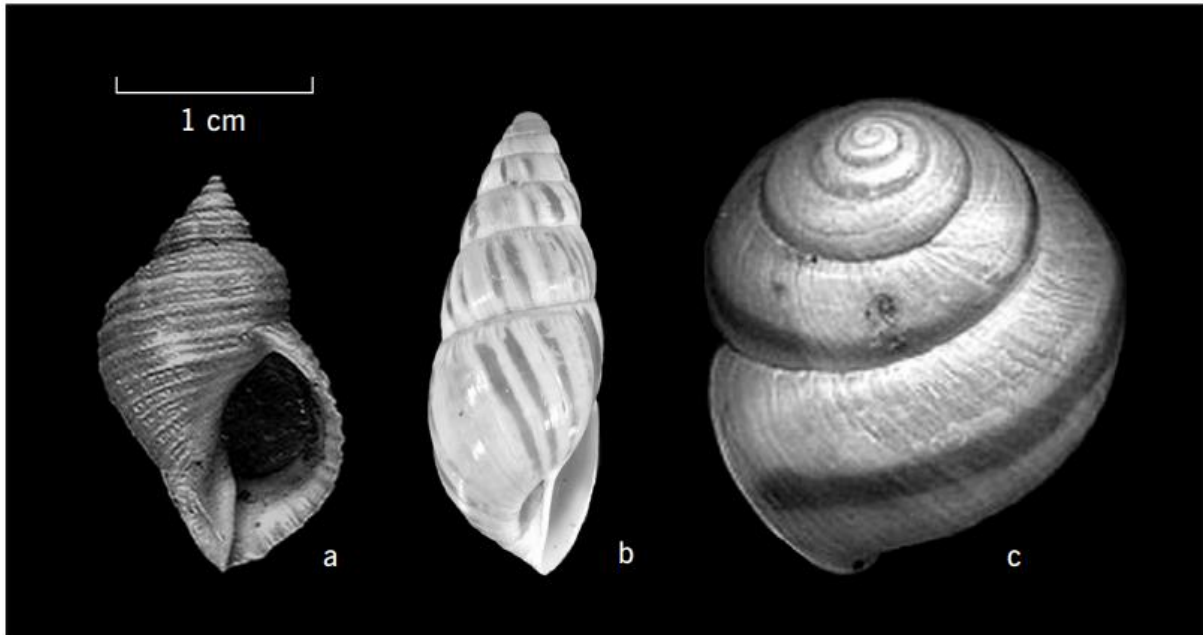


Figure 23: Jewellery snails from LBK burials in western Central Europe. a *Nucella lapillus*; b *Zebrina detrita*; c *Fruticicola fruticum* (GEHLEN 2016, 842, Fig. 17).

Another noteworthy burial with *theodoxius danubialis* – although the shell fragments were assumed to have been part of the filling and are thus not integrated in the evaluations – represents grave 23 at Essenbach-Ammerbreite. This elderly man additionally inherited a medallion-shaped spondylus valve as well as an asymmetrical trapeze, which are linked to the Late Mesolithic or La Hoguette horizons, and thus further implies hunter-gatherer connections.¹⁶³

Another snail species both occurring in Linear Pottery graves and head deposits of the Große Ofnet Cave is *lithoglyphus naticoides*.¹⁶⁴ Also known as gravel snail, *lithoglyphus naticoides* is a freshwater snail of the genus *Lithoglyphus*. Their native distribution includes the Black Sea rivers and the Danube from south-eastern to central Europe, although it has been introduced to other regions as well in the Early Modern Age. Polished gravel snail shells (Code “*Lithoglyphus naticoides*_Polished00010”) have been found in grave 29 of Sengkofen, which has been assigned to an uncertain early adult woman. The 33 pieces were ensembled in two or three rows at the vertex. Other grave goods included one pottery sherd, a spondylus closure at the pelvis, one friction blade fragment of granite, 50 polished *theodoxius danubialis* and three polished *theodoxius transversalis* at the neck and one bone comb at the head. Two graves in total included polished and perforated *lithoglyphus naticoides* (Code “*Lithoglyphus*

¹⁶³ GEHLEN 2016, 840.

¹⁶⁴ GEHLEN 2016, 836.

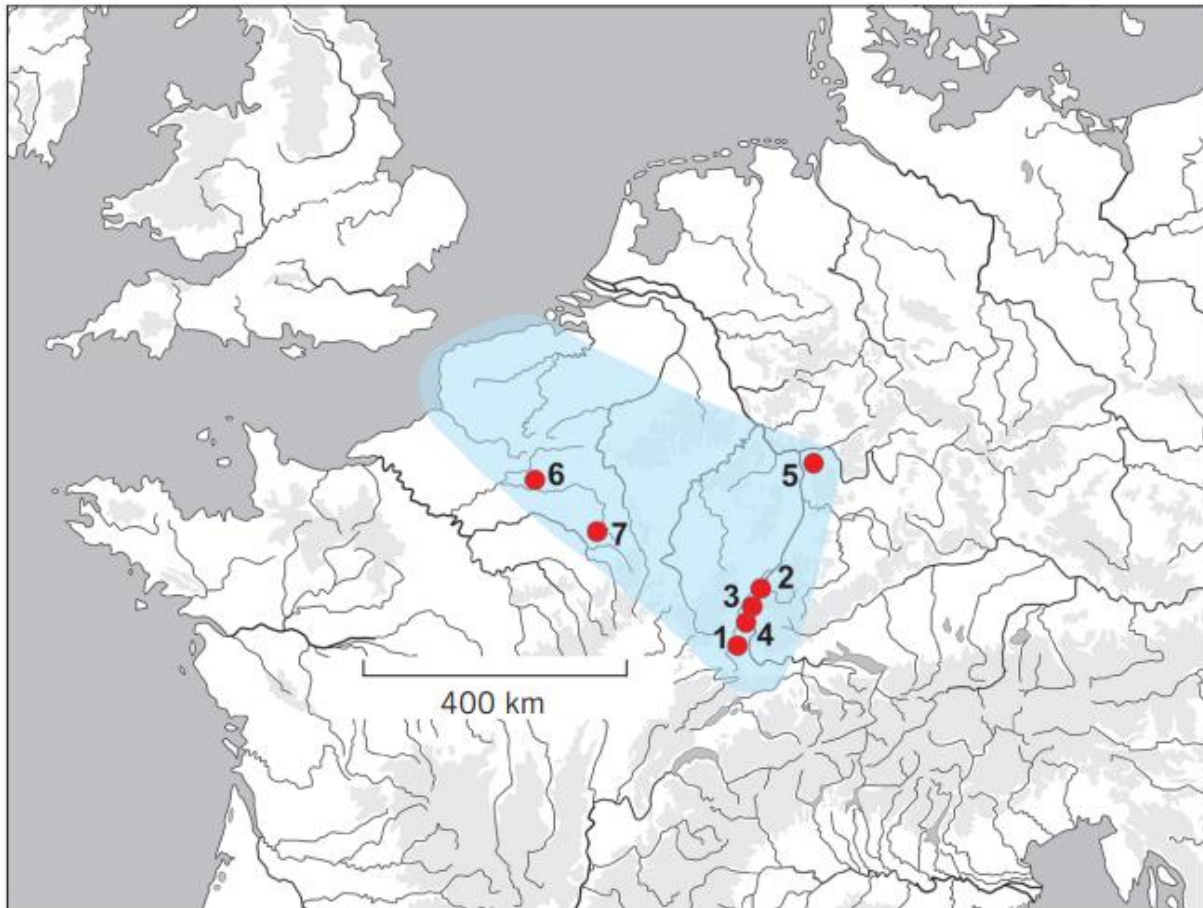


Figure 24: The north-western network of the LBK illustrated by the jewellery snails of *Nucella lapillus* from different burial sites in France and Germany. 1 Ensisheim (F); 2 Hoenheim (F); 3 Quatzenheim (F); 4 Wettolsheim (F); 5 Schwetzingen (D); 6 Cuiry-les-Chaudardes (F); 7 Frignicourt (F). (GEHLEN 2016, 842, Fig. 18).

naticoides_Perforated00010”); 124 pieces were arranged in rows at the head of an 1-1½-year old infant in grave *Verfärbung* 26 at Kleinhadersdorf, which were most probably part of a hood.¹⁶⁵ The second one is the already mentioned, opulently equipped grave 9 at Vedrovice “Za Dvorem” (See chapter 3.7.1.).¹⁶⁶ Similar to the hundreds of marble beads found in this grave, the perforated gravel snails were probably part of a necklace.

The distribution of the shell beads of the species *nucella lapillus*, also known as dog whelk or Atlantic dogwinkle, reveal a communication network that is oriented towards the north-west (Fig. 24) due to them originating from rocky shores in the Atlantic coasts of Europe and North America.¹⁶⁷ 19 perforated dog whelks (Code “*Nucella lapillus*_Perforated00010”) have been found in grave 98 in Schwetzingen around the chin and *foramen magnum* of a 3-4-year-old infant. *Zebrina detrita*, a local land snail species, also appeared in unmodified form (Code

¹⁶⁵ NEUGEBAUER-MARESCH, LENNEIS 2015a, 138.

¹⁶⁶ PODBORSKÝ 2002a, 110–115.

¹⁶⁷ GEHLEN 2016, 841.

“*Zebrina detrina*_Unmodified00010”) at Schwetzingen; a single piece belonged to a 17-18-year old uncertain woman (12), another 35 shells in the shoulder to head area – and few around the hand – of an 11-12-year old infant (36), and three more units around the head of a late adult and uncertain male individual (110). An uncertain woman (25) received both a *zebrina detrina* and a *fruticicola fruticum* shell (Code “*Fruticicola fruticum*_Unmodified00010”). Overall, it seems that Schwetzingen inherited completely different snail ornaments than the cemeteries in the Danube region.

Additionally, there are another two exceptional snail shells worth mentioning; The first one was a *vermetus* bead (*Vermetus bead*00010), a saltwater snail species, belonging to a 30-50-year-old woman at Kleinhadersdorf (Verf. 91A), while the second one was a single, undetermined snail shell (Code “*Snail shell*_Undetermined00010”) lying at the pelvis area of a 5-7-year old individual at Vedrovice “*Siroka u lesa*” (24).¹⁶⁸

¹⁶⁸ PODBORSKÝ 2002a, 33.

3.5.3. Stone

Ornaments produced of stone appeared in various shapes, but were mostly represented by beads, and will be subdivided by material. The variants are as follows:

- Limestone (Code “Stone bead_Limestone00010”): Beads produced from white limestone have been discovered in 4 graves within the selected study area.¹⁶⁹ They appeared in small numbers, only reaching up to four units per grave, but were usually included in ensembles with other materials such as spondylus. Limestone beads might be connected to hunter-gatherers, as perforated limestones also distributed to the Late Mesolithic site Burghöhle Dietfurt, and they are thought to be culturally linked to the Villeneuve – Saint-Germain group, Starčevo and the Early Neolithic in southern Italy as well.¹⁷⁰ As already mentioned in chapter 3.6.1., one bead in grave 2 at Niederpröding-Leitensiedlung was assumed to be either produced of mussel shell or limestone (Code “Bead_Undetermined00010”).
- Chlorite (Code “Stone bead_Chlorite00010”): The grave of an 12-15-year old young man at Niederpöding-Leitensiedlung (1) contained, among other grave goods, a necklace including a total of 58 beads made of spondylus, protula, and nine of chlorite.¹⁷¹
- Marble (Code “Stone bead_Marble00010”): The cemeteries Vedrovice “Siroká u lesa” and “Za dvorem” are the only sites in the selected study area having included marble beads, which appeared in both male and female burials, usually as part of necklaces.¹⁷² An 18-year old woman at “Za Dvorem” (18) inherited an especially high number of 371 marble beads, along with a closure, a bracelet, some pendants and beads all manufactured from spondylus.¹⁷³
- Nephrite (Code “Stone bead_Nephrite00010”): Beads made of nephrite have been found exclusively at Aiterhofen-Ödmühle in five graves.¹⁷⁴ They appeared as single

¹⁶⁹ Aiterhofen-Ödmühle: 32 (female, 4 beads) – Essenbach-Ammerbreite: 3 (unsexed, 2 beads) – Kleinhadersdorf: 17a (infant, one bead) – Niederpöding-Leitensiedlung: 5 (female, one bead).

¹⁷⁰ GEHLEN 2016, 834, 840.

¹⁷¹ PECHTL et al. 2018, 53–56.

¹⁷² Vedrovice „Siroká u lesa“: 15 (male, 2 beads), 69 (male, 16 beads), 72 (female, one bead) – Vedrovice “Za dvorem”: 8 (13-15-year old, 68 beads), 9 (female, 371 beads).

¹⁷³ PODBORSKÝ 2002a, 110–115.

¹⁷⁴ Aiterhofen-Ödmühle: 22 (uncertain female, 5 beads), 33 (female, one bead), 43 (male, 8 beads), 141 (male, 5 beads), 143 (uncertain male, 5 beads).

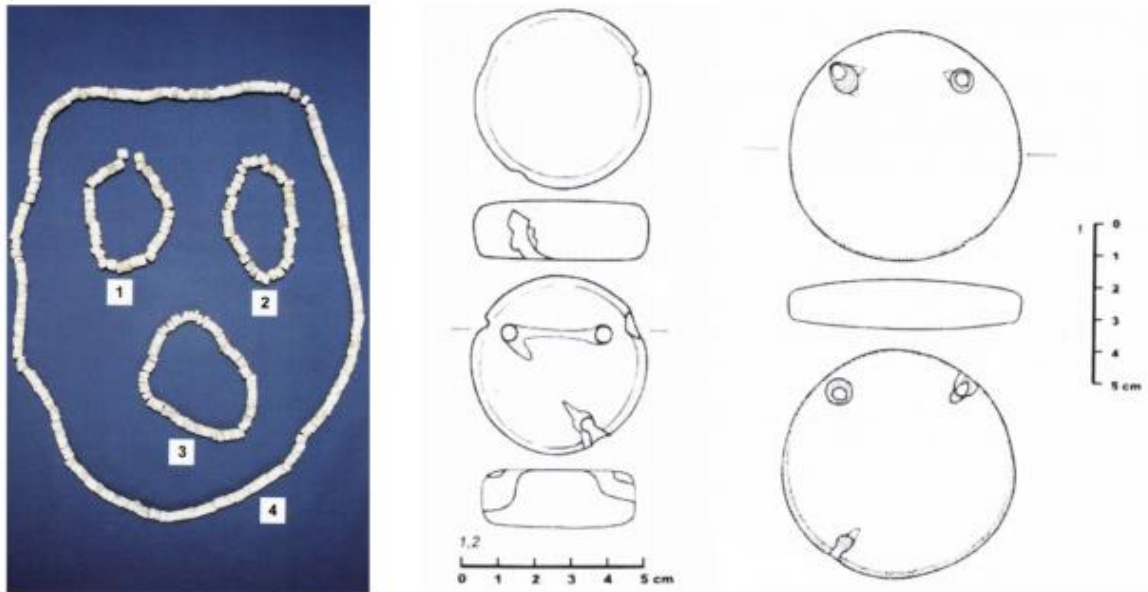


Figure 25: Marble ornaments found at Vedrovice; on the left the marble necklace from grave 9 at “Za dvorem” (PODBORSKÝ 2002a, 147, Taf. 19); on the middle and right side the marble closures from grave 78 and 84 at Vedrovice “Siroká u lesa” (PODBORSKÝ 2002a, 77, Abb. 78 – 83, Abb. 84).

pieces as well as in groups of up to 15 objects. A preference for a certain gender or age class cannot be observed.

- Quartz (Code “Stone bead_Quartz00010”): A single unit made of milky white quartz distributed to grave 94 at Vedrovice “Siroká u lesa”, which contained the skeletal body of a female individual within an age range between 18 and 25 years.
- Soapstone (Code “Stone bead_Soapstone00010”): Green soapstones were discovered in three graves at Bavarian sites. At Aiterhofen-Ödmühle, a necklace of 15 soapstone and 15 spondylus beads accompanied an early adult woman (9), while a late adult man had a single soapstone and two spondylus beads lying around the skullcap, although five other spondylus pieces were certainly part of a necklace. Around the neck of an unsexed individual at Regensburg-Kumpfmühl lay a single soapstone as part of an ensemble consisting of various materials such as spondylus, protula, and undetermined beads and 132 snail shells.¹⁷⁵

Two medallion-shaped bell closures produced from marble (Code “Marble closure_Medallion00010”) have been found in the pelvis area of graves 78 and 84 at Vedrovice “Siroká u lesa”. Although the biological sex could not be identified, the age of both individuals

¹⁷⁵ REITMAIER 2018, 50–51.

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was identified as late infant. These objects looked very similar to medallion-shaped spondylus belt buckles and thus might have been substitutes for the mussel shell variants.

3.5.4. Bone

This subchapter examines all bone objects – also including teeth or antler – thought to be ornaments or part of the Early Neolithic clothing. Bone tools and weapons will be discussed further below (see chapter 3.7.).

As is the case with spondylus, bone artefacts are represented in various shapes. Antler gifts were the most numerous group and represented by 22 bow-shaped closures (Code “Antler closure_Bow00010”).¹⁷⁶ As they have been mostly found around the pelvis area, an interpretation as belt buckles seems obvious. Few exceptions aside, antler bow buckles were restricted to men and mostly associated to late adult to senile individuals. Bone beads (Code “Bone bead00010”) appeared at Vedrovice “Siroká u lesa” as an ensemble of four units around the neck of an early mature man (15) and as a single piece along with the remains of an early infant (96). Bone pendants (Code “Bone pendant00010”) occurred as single pieces and were gifted to an infant at Essenbach-Ammerbreite (1), two adult men at “Siroká u lesa” (19, 88) and an early adult woman at Vedrovice “Za Dvorem” (10). In the latter, the raw material of the bone pendant could be identified as red deer. Flat-shaped bone bracelets have been exclusively found inside the graves of a 14-15-year old juvenile (3) and an early mature man (58) at Nitra.¹⁷⁷ They were made of thick animal bones, had an even rectangular shape (8.5 x

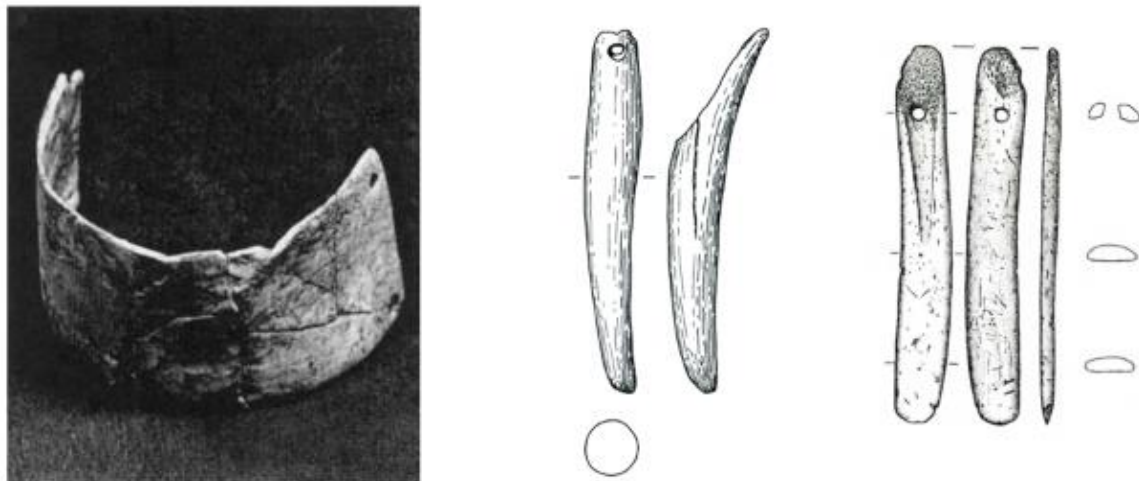


Figure 26: Different bone ornaments; on the left side the bone plate bracelet from grave 58 at Nitra (PAVÚK 1972, 62, Abb. 43); in the middle a bow-shaped antler closure (GERLING 2012, 240, Abb. 106); on the right the long bone pendant of grave 50 at Aiterhofen-Ödmühle (NIESZERY 1996, 339, Taf. 19).

¹⁷⁶ Aiterhofen-Ödmühle: 41 (infant, uncertainly male), 90 (male), 93 (male), 117 (male), 130 (male), 158 (female) – Dillingen-Steinheim: 23 (male) – Kleinhadersdorf: 7 (male), Verfärbung 17 (male) – Schwetzingen: 4 (uncertainly male), 56 (male), 58 (male), 70 (male), 82 (male), 130 (male), 133 (male) – Sengkofen: 19 (male), 24 (male) – Vedrovice “Siroká u lesa”: 71 (male), 76 (male), 77 (male) – Vedrovice “Za dvorem”: 7 (female).

¹⁷⁷ PAVÚK 1972, 7, 20, 62-63.

4.5 cm), had perforations in all four corners for attaching them to the body, and were laid above the wrist. They were also slightly bent in the direction of the longitudinal axis. It is worth noting that bone plates were the only type of bracelets at the cemetery of Nitra due to the absence of the spondylus variant. Taking the thinness of the bone plates into account, Juraj Pavúk rejects the idea of a protective function similar to the arm plates of the Bell Beaker culture, instead proposing a sole use as ornaments.¹⁷⁸ Another unique find is a slightly arched closure made from the long bone of a large mammal (Code “Long bone closure00010”), which has been found in the pelvis area of a senile man in grave 50 at Aiterhofen-Ödmühle.¹⁷⁹ This grave also included four triangular chert arrowheads, a cylindrical bone stick and some pottery sherds.

Personal ornaments made of teeth are included among the most peculiar gifts. A 40-year-old man at Nitra (40) received a necklace of five human (Code “Human tooth pendant00010”) and two dog or fox teeth (Code “Animal tooth pendant_Dog-Fox00010”).¹⁸⁰ Another two fox tooth pendants were part of a necklace along with 120 deer bones described as “*Hirschgrandeln*” (Code “Hirschgrandeln00010”), found within the grave of an early adult man at Rutzing (13), who also inherited a serpentine adze, a triangular chert arrowhead, a chert blade and flake, a V-shaped spondylus buckle as well as five spondylus beads.¹⁸¹ The German word “*Grandeln*” originates from the vocabulary of hunters and usually describes trophies made of wild animal teeth, which makes *Hirschgrandeln* “hunting trophies made of red deer teeth” (although the beads in grave 13 were not explicitly described as teeth, but as made from bone substance). In addition to having been one of the most extensively furnished burials at the site, with 115 cm in depth, grave 13 was one of the deepest pits of Rutzing, a depth only comparable to grave 16.¹⁸² All other burials reached depths between 30 and 85 cm, which makes grave 13 and 16 stand out. This implies a higher social status for those individuals, especially for the man with the *Hirschgrandeln*, as he was more “richly” furnished than grave 16, an 18-months old child who received Spondylus and dentalium ornaments.¹⁸³ In the context of the isotope

¹⁷⁸ PAVÚK 1972, 63.

¹⁷⁹ NIESZERY 1995, 274.

¹⁸⁰ PAVÚK 1972, 11.

¹⁸¹ Original text regarding the deer teeth: „Hirschgrandelkette aus ungefähr 120 imitierten, durchbohrten Grandeln aus Knochensubstanz.“ KLOIBER, KNEIDINGER 1968, 32.

¹⁸² KLOIBER, KNEIDINGER 1970, 23.

¹⁸³ KLOIBER, KNEIDINGER 1968, 32. – 1970, 23.

results of Rutzling, grave 13 becomes even more interesting; two groups of people can be identified, with one being in line with the values common for Linear Pottery communities, and another one gaining their resources more from the nearby woodlands. Both groups originated from the loess areas around the cemetery.¹⁸⁴ Grave 13 has the highest $\delta^{13}\text{C}$ values of the cemetery (but only by slight margins), meaning he probably consumed fewer woodland resources, although the necklace and arrowhead still suggest connections to the forest and hunting. Additionally, the fox teeth and the W-E-alignment of the burial pit – the only one at Rutzling – might link this grave to Bavaria, due to fox mandibles appearing as grave goods at Aiterhofen-Ödmühle and the grave orientation pointing to this region. However, the young adult, possibly a highly respected member of the local Early Neolithic society, did not necessarily have to be personally involved in hunting animals and eating them to receive a burial gift made of hunting trophies. It could also have been a present from the woodland isotope group or personal property inherited by trade, among other possible explanations.

¹⁸⁴ BICKLE et al. 2013, 198–199.

3.6. *Stone industry and mineral resources*

3.6.1. Chipped stone industry

The flaked or chipped stone industry includes all tools, weapons and waste material produced by lithic reduction on chert nuclei. Cherts are siliceous rocks originating in limestone, with the commonly used term “flint” only representing a variety of chert, and thus should be avoided when generally speaking of stone raw materials used in chipped stone industry.¹⁸⁵ In order to have high quality material available for production, Linear Pottery communities relied on certain deposits even when they were hundreds of kilometres away from their homes.¹⁸⁶ Many chipped stone tools have more than one modification, which primarily determine their categorization for this thesis. For this task, several typologies within publications of different authors were consulted, such as the tool classifications provided by Birgit Gehlen or Inna Mateiciucová, or the microlithic flake variations as determined by Stefan Karol Kozłowski.¹⁸⁷ The first main category of chipped stone tools are nuclei (Code “Nucleus00010”), also known as lithic cores or pre-cores, which were used for manufacturing blade blanks as well as for the detachment of flakes when in an advanced stage of reduction, although they were usually discarded after the exploitation of blade blanks.¹⁸⁸ Among the selected sites, they have been found in 22 graves, which distribute primarily – with the exception of a pyramidal-shaped nucleus in grave 58 at Vedrovice “Siroká u lesa” – to Bavarian cemeteries.¹⁸⁹ Cores appeared once per grave and mainly associate to men, but also to female burials in few cases. Their symbolic or functional significance for Linear Pottery mortuary rites is uncertain; Nieszery proposed the nuclei at Aiterhofen-Ödmühle to be involved as hammerstones in the production of polished stone tools and secondarily as part of a fire lighting set after becoming too small.¹⁹⁰

¹⁸⁵ MATEICIUCOVÁ 2008, 44.

¹⁸⁶ E. g. The cemeteries Kleinhadersdorf in Austria and Vedrovice “Siroká u lesa” in the Czech Republic, which both relied on silices imported from the far distanced Krakow Jura Mountains, see chapter 4.3.1. and 4.3.3. or alternatively MATEICIUCOVÁ 2015, 117.

¹⁸⁷ KOZŁOWSKI 1980. – MATEICIUCOVÁ 2008. – GEHLEN 2012.

¹⁸⁸ MATEICIUCOVÁ 2008, 231–232.

¹⁸⁹ Aiterhofen-Ödmühle: 2 (unsexed), 18 (male), 25 (male), 28 (male), 36 (unsexed), 41 (uncertain male, infant), 55 (female), 94 (male), 102 (male), 139 (uncertain male), 142 (male), 158 (female) – Dillingen-Steinheim: 12 (male) – Essenbach-Ammerbreite: 16 (uncertain male), 23 (male), 24 (male) – Mangolding: 5 (unsexed), 9 (male) – Regensburg-Kumpfmühl: 1 (unsexed) – Sengkofen: 1 (unsexed), 21 (unsexed), 25 (male) – Vedrovice „Siroká u lesa“: 58 (unsexed).

¹⁹⁰ NIESZERY 1995, 163.

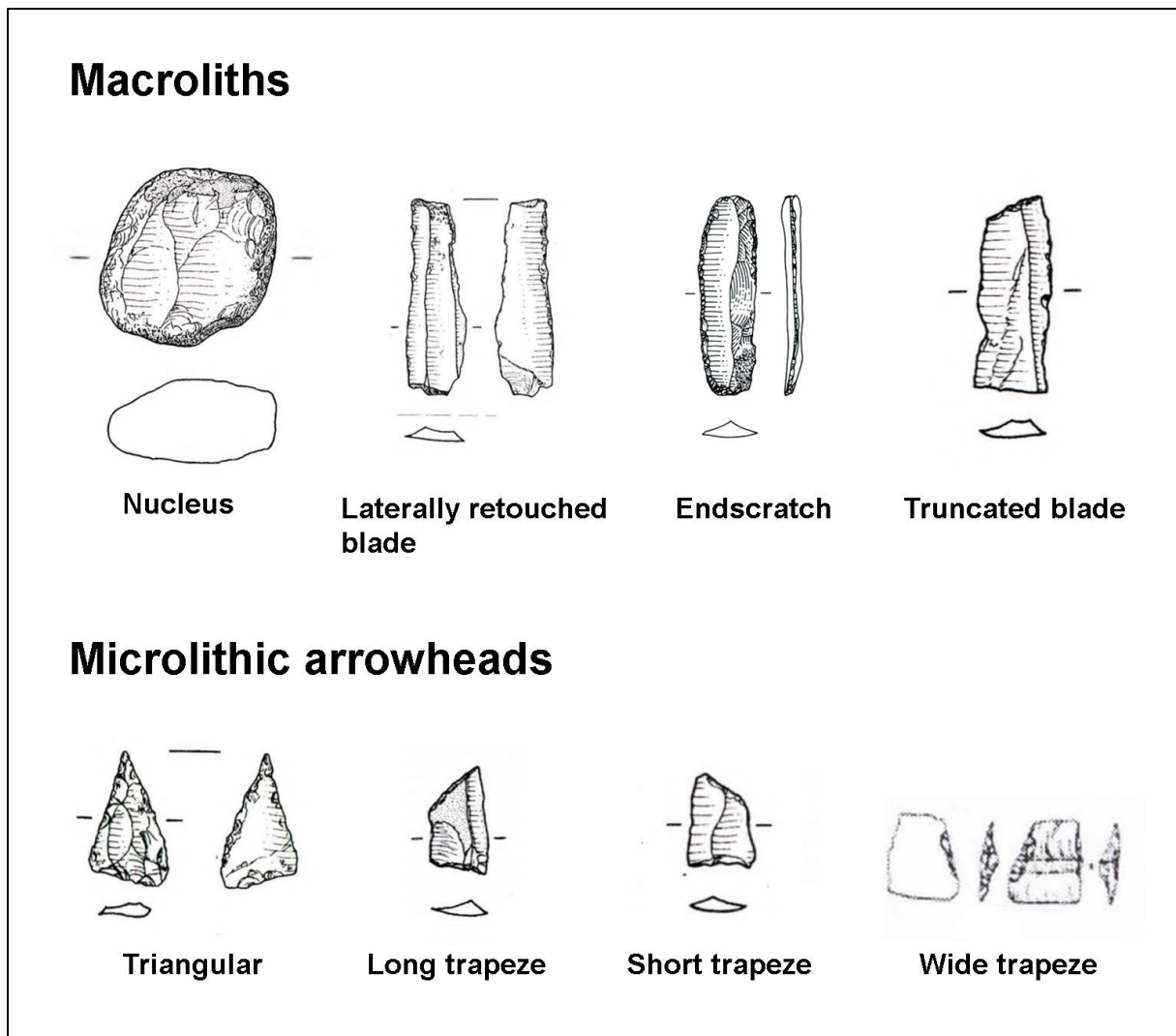


Figure 27: Typology of macro- and microlithic chert tools and weapons (Original graphs taken from NIESZERY 1995; PODBORSKÝ 2002a; GERLING 2012 and further modified).

The second main type are blades. By definition, a blade is any flake the length of which is at least twice its width and has parallel sides.¹⁹¹ There is a great variety of blade types, distinguished by different modifications, which are as follows:

- Laterally retouched blade (Code “Laterally retouched blade00010”): There is a variety of different lateral retouches. They can be steep, semi-steep, stepped or plane and occur continuously or partially on one or both edges. The retouches are usually straight, but perforations, notches and bays also can be found. For WinSerion, only blades with clearly intentional retouches will be included in this category, while blades with usage retouch are listed as non-retouched blades. This variant includes six objects

¹⁹¹ MATEICIUCOVÁ 2008, 66.

in total, mixed between both sexes.¹⁹² Most interestingly, blades with certainly intentional retouches seem to be absent in the funerary rites of Bohemia, Moravia and Austria. Regular, continuous lateral retouching is characteristic for the Starčevo-Körös-Criş culture complex and other Early Neolithic groups of Anatolia and the Balkans and also appear in Late Mesolithic contexts of the Iron Gates.¹⁹³ However, they are essentially absent in Moravia, Lower Austria, Transdanubia as well as the Mesolithic of northern Hungary, while they occur more often in the Alföld Linear Pottery.

- Truncated blades (Code “Truncated blade00010 to 00020”): The term “truncation” describes a straight, concave, oblique or irregular edge at one or both ends of the chipped stone artefact.¹⁹⁴ They are two different subvariants of such tools; the first are regular truncated blades (Code “Truncated blade00020”), which include 12 objects.¹⁹⁵ Potential uses are the engraving of wood and the trimming of blades, while the edge might have served to cut meat, among other possible applications.¹⁹⁶ A blade with a convex truncation is by definition an endscraper or endscraper (Code “Truncated blade00010”). These tools can be used for a variety of tasks, such as scraping, planning or as an adze, to process skin, antlers, wood, and even stone, although the processing of skin is assumed to have been the primary use of endscrapers. A total of four endscrapers belonged to two (and one uncertain) men and one unsexed individual.¹⁹⁷ Truncated blades sometimes appear with sickle gloss, which will be listed in the respective category below.
- Blade with sickle gloss (Code “Blade with sickle gloss00010”): It is generally assumed that gloss on chipped stones within the Linear Pottery culture was obtained during the harvest of cereals.¹⁹⁸ Blades with sickle gloss thus must have, by definition, a clearly

¹⁹² Aiterhofen-Ödmühle: 139 (uncertain male) – Dillingen-Steinheim: 11 (uncertain female) – Essenbach-Ammerbreite: 24 (male) – Schwetzingen: 32 (uncertain female), 209 (unsexed) – Sengkofen: 25 (male).

¹⁹³ MATEICIUCOVÁ 2008, 88.

¹⁹⁴ GEHLEN 2012, 736–740.

¹⁹⁵ Aiterhofen-Ödmühle: 2 (unsexed), 25 (male), 72 (unsexed), 86 (unsexed), 87 (male), 88 (male, infant), 120 (unsexed), 153 (male), 189 (unsexed) – Essenbach-Ammerbreite: (unsexed, infant) – Rutzling: 13 (male) – Schwetzingen: 200 (male).

¹⁹⁶ MATEICIUCOVÁ 2008, 84–85.

¹⁹⁷ Aiterhofen-Ödmühle: 15 (male) – Niederpörling-Leitensiedlung: 2 (uncertain male) – Nitra: 14 (female) – Schwetzingen: 81 (unsexed).

¹⁹⁸ GEHLEN 2012, 727.

visible gloss indicating a functional use as sickle. They appeared in a total of 12 graves spread across every region selected for this study area, mostly assigned to men.¹⁹⁹

- Blade flake/fragment (Code “Silex blade fragment/flake00010”): This variant features macrolithic objects defined as fragments of blades or blade flakes. The 13 graves which maintained such finds were assigned to ten men, one early mature woman and two unsexed individuals, of which one was a six-year-old infant.²⁰⁰
- Non-retouched blades (Code “Non-retouched blade00010”): As the name suggests, this category lists all macrolithic blades which have not gone under any sort of modification as well as blades with unintentional (usage) retouches. With a total of 50 blades, this variant represents the largest group of blades. They are mostly associated with men among the sexed individuals.²⁰¹

The third main group of macrolithic chert tools are flakes (Code “Silex flake00010”), which were, similarly to blades, created by striking from a lithic core and are as long as or shorter than twice its width.²⁰² They have a platform remnant and dorsal and ventral sides. There are only four objects listed in this category,²⁰³ while another six objects, burned and fragmented by cremations or gone missing, were listed as undetermined flakes (Code “Silex flake_Undetermined00010”) due to their original functional use and shape remaining

¹⁹⁹ Aiterhofen-Ödmühle: 65 (uncertain male), 93 (male), 106 (female) – Kleinhadersdorf: 1c (female), Verfärbung 17 (males, two blades) – Mangolding: 3 (male) – Niederpöding-Leitensiedlung: 2 (uncertain male, two blades) – Nitra: 56 (male) – Schwetzingen: 14 (male), 21 (infant), 154 (male).

²⁰⁰ Aiterhofen-Ödmühle: 15 (male), 25 (male), 28 (male), 41 (uncertain male, infant), 55 (female), 68 (female), 85 (male), 120 (unsexed), 142 (male) – Nitra: 14 (female) – Schwetzingen: 138 (infant) – Sengkofen: 21 (unsexed), 27 (male).

²⁰¹ Aiterhofen-Ödmühle: 2 (unsexed), 10 (male), 18 (male, two blades), 39 (infant), 41 (infant), 63 (unsexed), 78 (male), 85 (male, two blades), 94 (male), 158 (female), 202 (unsexed) – Dillingen-Steinheim: 3 (male) – Kleinhadersdorf: Verfärbung 17 (male), Verfärbung 52 (unsexed), Verfärbung 70 (unsexed) – Verfärbung 79 (male, two blades) – Mangolding: 3 (male, two blades), 5 (unsexed) – Niederpöding-Leitensiedlung: 2 (uncertain male, two blades) – Nitra: 4 (unsexed, two blades), 41 (unsexed) – Regensburg-Kumpfmühl: 92 (unsexed) – Rutzing: 7 (infant), 24 (infant) – Schwetzingen: 16 (male), 33 (infant), 54 (uncertain female), 58 (male), 73 (male), 97 (male), 98 (infant), 106 (male), 152 (male), 174 (uncertain male), 187 (unsexed), 189 (uncertain male), 218 (male) – Vedrovice “Siroká u lesa”: 14 (female), 15 (female), 21 (female), 43 (unsexed), 66 (male), 76 (male) – Vedrovice “Za dvorem”: 10 (female).

²⁰² MATEJCIUCOVÁ 2008, 177.

²⁰³ Kleinhadersdorf: 14 (female), Verfärbung 60 (unsexed) – Regensburg-Kumpfmühl: 138 (unsexed) – Vedrovice „Za dvorem“: 2 (male).

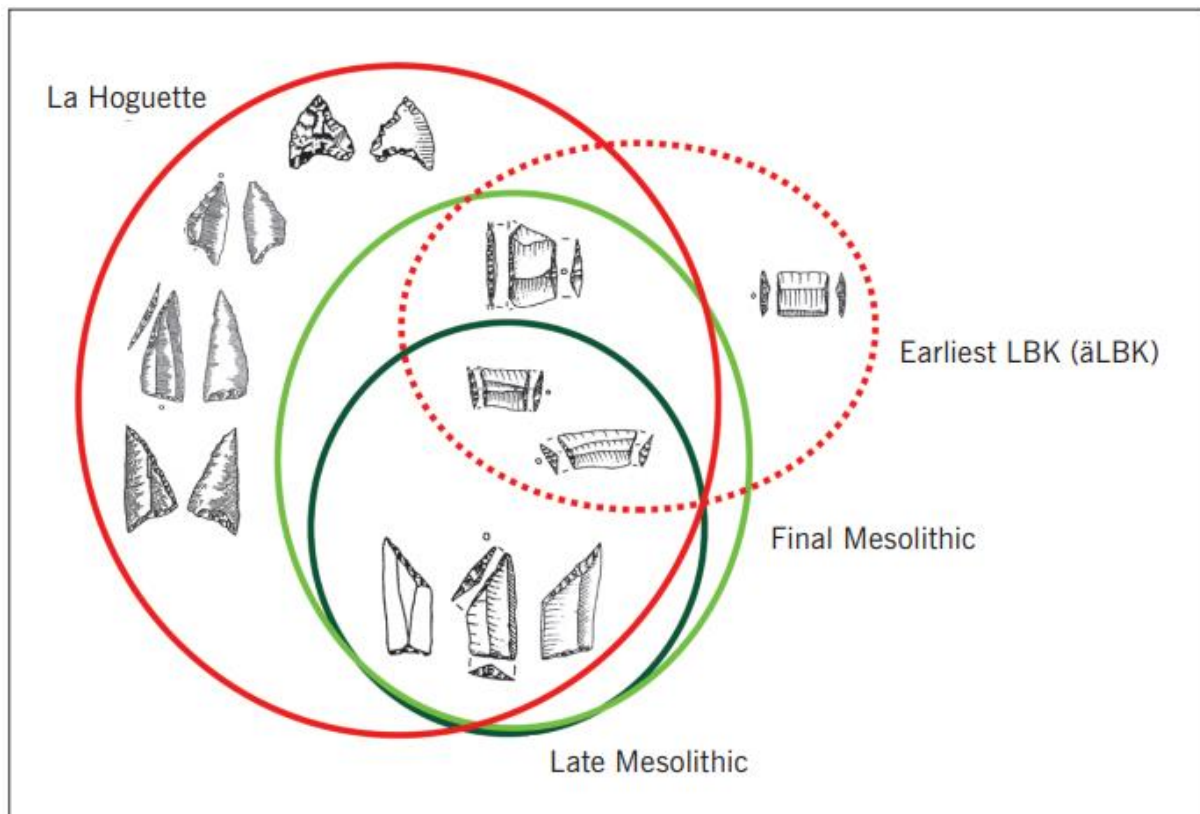


Figure 28: Microlith types from the Late Mesolithic to the Early Neolithic and their cultural assignment (GEHLEN 2016, 839, fig. 13).

uncertain.²⁰⁴ Microlithic flakes, on the other hand, are far more numerous within the Linear Pottery funerary inventory and appear in a variety of forms. They are mostly interpreted as arrowheads due to their positioning in the grave and shape but might also represent lithic waste depending on context and morphology. The variants are as follows:

- Symmetrical trapezes: These are trapezoidal flint blade flakes with two symmetrically located, slightly convergent truncations across the blade.²⁰⁵ They are positioned as single pieces or groups and were initially viewed as sickle inserts before more recent interpretations of them being arrowheads were introduced.²⁰⁶ Symmetrical trapezes, along with trapezoidal blade flakes, are a phenomenon characteristic for Mesolithic and Early Neolithic horizons and seen as evidence of the Neolithic Near East influencing Europe and thus marking the Neolithization of the continent.²⁰⁷ According to experimental arrow-shooting, there seem to be no significant differences of properties

²⁰⁴ Aiterhofen-Ödmühle: 185 (uncertain male), 224 (unsexed) – Regensburg-Kumpfmühl: 1 (unsexed) – Vedrovice „Siroká u lesa”: 40 (infant), 46 (male).

²⁰⁵ KOZŁOWSKI 1980, 16.

²⁰⁶ MATEICIUCOVÁ 2015, 115.

²⁰⁷ TAUTE 1973/74. – KOZŁOWSKI J. K., KOZŁOWSKI 1987. – GRONENBORN 1997. – MATEICIUCOVÁ 2008, 91.

between trapezes and triangles, although the former can potentially inflict greater wounds and faster bleeding to death.²⁰⁸ A total amount of 11 graves with symmetrical trapezes have been found, mostly assigned to male individuals ranging between adult and mature stage, but also to infants. According to Kozłowski,²⁰⁹ symmetrical trapezes can be subdivided into three subvariants; The first group are long trapezes (Code “Symmetrical trapeze00010”), which length to width have to be 1.7 or more to 1. Only one long trapeze has been found in the selected study area, located in Aiterhofen-Ödmühle (88). It contained, among two short trapezes and another two short trapezoidal blade flakes, the remains of an 10-12-year old boy. The second subtype are short trapezes (Code “Symmetrical trapeze00020”), with a length to width ratio between 1.65 and 1.1 to 1. There are five graves containing short trapezes.²¹⁰ Wide trapezes (Code “Symmetrical trapeze00030”) have the same length as width or are shorter. All five graves including wide trapezes were excavated at Vedrovice “Siroká u lesa”.²¹¹

- Asymmetrical trapezes: Although not included in the evaluations, as it is uncertain if the object has been part of the filling or an intentional grave good, it is worth mentioning that one asymmetric trapezoidal microlith was excavated from burial 23 at Essenbach-Ammerbreite. This grave included an old man with spondylus and snail shell ornaments.²¹² Asymmetric trapezes are either associated with Late or Final Mesolithic or to La Hoguette contexts rather than the Linear Pottery culture.²¹³
- Trapezoidal flakes (Code “Trapezoidal flake00010 to 00020”): This category contains all microlithic flakes or blade flakes of trapezoidal form which do not show truncations similar to symmetrical trapezes, retouched or unretouched. They are positioned in groups or as single pieces. Although trapezoidal blade flakes are technologically different from symmetrical trapezes, their proportional resemblances - along with the fact that they often occur in the same graves - indicate a similar functional use as

²⁰⁸ PIEL-DESRIUSSEAU 1990, 157–159. – MATEICIUCOVÁ 2002, 232. – PAULSEN, FANSA 2005.

²⁰⁹ KOZŁOWSKI 1980, 16.

²¹⁰ Aiterhofen-Ödmühle: 88 (male, infant, 2 units), 117 (male, one unit) – Vedrovice “Siroká u lesa”: 37 (infant, one unit), 57 (male, 2 units).

²¹¹ Vedrovice „Siroká u lesa“: 39 (infant, two units), 46 (male, 6 units), 57 (male, 3 units), 65 (unsexed, one unit), 79 (male, 2 units).

²¹² BRINK-KLOKE 1990, 473.

²¹³ GEHLEN 2016, 840.

arrowheads. They were discovered in 16 graves, mainly within men between adult and mature age, although two deceased were identified as infants. Similar to symmetrical trapezes, they can be subdivided into short (Code “Trapezoidal blade flake00010”)²¹⁴ wide (Code “Trapezoidal blade flake00020”)²¹⁵ and long variants using the same requirements as symmetrical trapezes, although long trapezoidal blade flakes are absent in the cemeteries selected for this study.

- Triangular arrowheads (Code “Triangular arrowhead00010”): This category presents retouched, triangular chert arrowheads. Almost all 40 graves with such objects selected for this thesis contained the remains of men,²¹⁶ with few exceptions.²¹⁷ Among the selected sites, Rutzling is the only cemetery in the south-eastern distribution region containing a grave with triangular arrowheads, while all other exemplars distribute to the western distribution areas.
- Irregular flakes: Microlithic blade flakes of irregular form (Code “Irregular blade flake00010”) have been found in 15 graves, frequently along symmetrical trapezes and trapezoidal (blade) flakes, indicating a similar functional use.²¹⁸ This is also true for many flakes of irregular form (Code “Irregular flake00010”), although others might just have been lithic waste. They were discovered in 14 graves.²¹⁹

²¹⁴ Aiterhofen-Ödmühle: 88 (male, infant, two units), 117 (male, two units), 196 (unsexed, one unit) – Kleinhadersdorf: Verfärbung 22 (infant, one unit), Verfärbung 52 (unsexed, one unit), Verfärbung 57 (male, one unit) – Nitra: 76 (uncertain female, one unit) – Vedrovice “Siroká u lesa”: 46 (male, two units).

²¹⁵ Dillingen-Steinheim: 23 (male, one unit) – Kleinhadersdorf: Verfärbung 17 (male, one unit), Verfärbung 40 (male, one unit), Verfärbung 52 (unsexed, one unit), Verfärbung 79 (male, 7 units), Verfärbung 81 (male, 2 units) – Rutzling: 11 (female, one unit) – Schwetzingen: 14 (male, one unit) – Vedrovice “Siroká u lesa”: 39 (infant, one unit), 46 (male, 4 units), 54 (male, one unit), 59 (male, one unit), 66 (male, one unit), 79 (male, two units).

²¹⁶ Aiterhofen-Ödmühle: 18 (2 units), 25 (two units), 29 (one unit), 50 (4 units), 61 (3 units), 78 (two units), 88 (3 units), 102 (5 units), 113 (one unit), 117 (2 units), 153 (4 units), 186 (one unit) – Dillingen-Steinheim: 20 (one unit) – Mangolding: 9 (2 units) – Rutzling: 13 (one unit) – Schwetzingen: 5 (3 units), 8 (one unit), 14 (2 units), 16 (one unit), 26 (4 units), 43 (4 units), 70 (2 units), 73 (2 units), 93 (one unit), 133 (10 units), 139 (one unit), 218 (one unit) – Sengkofen: 17 (one unit), 19 (one unit), 26 (one unit).

²¹⁷ Aiterhofen-Ödmühle: 75 (unsexed, 3 units), 96 (unsexed, 3 units), 98 (uncertain female, 3 units), 137 (female, 2 units), 159 (female, 5 units), 185 (uncertain male, one unit), 196 (unsexed, one unit), 209 (uncertain male, one unit), 224 (unsexed, one unit) – Essenbach-Ammerbreite: 29 (unsexed, 6 units) – Regensburg-Kumpfmühl: 92 (unsexed, 5 units) – Schwetzingen-Schälzig: 15 (unsexed, one unit), 51 (infant, one unit) – Sengkofen: 21 (unsexed, one unit).

²¹⁸ Aiterhofen-Ödmühle: 75 (unsexed, 4 units), 88 (male, infant, 2 units), 158 (female, one unit) – Nitra: 4 (unsexed, two units), 14 (female, one unit) – Schwetzingen: 107 (male, one unit), 182 (infant, one unit), 192 (unsexed, one unit) – Vedrovice “Siroká u lesa”: 19 (male, one unit), 39 (infant, one unit), 46 (male, 2 units), 57 (male, 2 units), 59 (male, one unit), 62 (female, one unit), 69 (male, one unit), 79 (male, 4 units), 86 (female, one unit).

²¹⁹ Aiterhofen-Ödmühle: 36 (unsexed, one unit) – Kleinhadersdorf: Verfärbung 81 (male, 3 units) – Niederpörling-Leitensiedlung: 2 (uncertain male, one unit) – Nitra: 76 (uncertain female, one unit) – Regensburg-Kumpfmühl:

3.6.2. Grinding tools

Grinding stones and querns were introduced to prehistoric Europe within the arrival of the first farmers in the Early Neolithic and are generally associated with agriculture and crop processing. In the context of Linear Pottery funerary rites, they might have been used for pulverising dye, as traces of red chalk or other colours on various grinding tools disposed as grave goods at Kleinhadersdorf have shown (see chapter 4.3.1.). Querns and grinding stones consist of various raw stone materials, such as gneiss, granite and sandstone, which were possibly selected based on their properties for different tasks.²²⁰ Quartz sandstone, for example, is particularly suitable for processing cereals, while regular sandstone is more appropriate for producing dye, but less suited for working with grains.

Grinding stones and querns appeared at every larger cemetery selected for this study and are mainly positioned around the head and less commonly at the pelvis or other areas.²²¹ Among the sexed deceased individuals gifted with grinding tools, there seems to be no preference for a particular biological sex or age within the study area, as they occurred with infant to senile as well as both man and women. At Schwetzingen, three males and one uncertain female individual inherited grinding stones, while querns were distributed between four infants

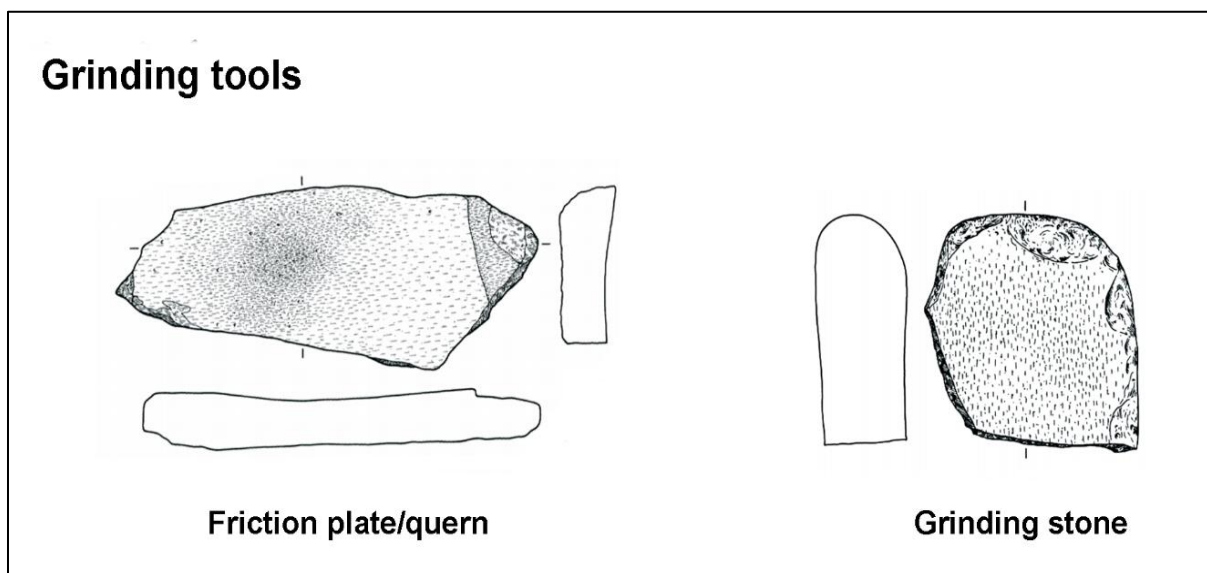


Figure 29: Typology of friction plates/querns and grinding stones (GERLING 2012, 234, Abb. 100; 248, Abb. 114).

92 (unsexed, one unit) – Rutzling: 11 (female, two units), 13 (male, two units) – Schwetzingen: 104 (male, 3 units), 190 (female, one unit) – Vedrovice “Siroká u lesa”: 23 (male, one unit), 39 (infant, 4 units), 73 (male, one unit), 80 (female, one unit), 81a (female, one unit), 91 (female, 3 units).

²²⁰ LENNEIS 2015g, 128.

²²¹ NIESZERY 1995, 161. – GERLING 2012, 103–104.

(stage II), three late-adult-to-mature men, and only one woman.²²² However, this small sample is insufficient to determine certain preferences regarding gender and age in the Rhineland-region, where Schwetzingen is situated.

For this master thesis, there are 47 selected objects in this artefact group, which are categorized as friction plates or querns (Code “Friction plate00010”)²²³, grinding stones (Code “Grinding stone00010”)²²⁴ and uncategorized grinding tools (Code “Grinding tool fragment Not specified00010”), with the latter consisting of undetermined stone fragments found in grave 43 at Schwetzingen. The distinguishing features of grinding stones and friction plates is the convex cross-section typical for querns and the straight-concave longitudinal section characteristic for grinding stones.²²⁵ While friction plates are straight-convex in cross-section and can be concave in longitudinal section, the grinding stones are elongated, partly bread loaf-shaped, have a concave longitudinal section and often a convex cross-section. Their friction surface is sometimes polished. Fragmented querns were often used secondarily as grinding, rubbing and hammer stones.

²²² GERLING 2012, 103.

²²³ Aiterhofen-Ödmühle: 21 (uncertain male), 45 (female), 55 (female), 60 (female), 70 (unsexed), 82 (uncertain male), 112 (female) – Dillingen-Steinheim: 8 (male) – Essenbach-Ammerbreite: 11 (unsexed) – Kleinhadersdorf: 1c (female), 8 (male), 10 (infant), Verfärbung 43 (infant), Verfärbung 44 (unsexed), Verfärbung 63 (male) – Nitra: 25 (male), 31 (infant) – Schwetzingen: 56 (male), 106 (male), 158 (infant), 212 (unsexed) – Sengkofen: 29 (uncertain female) – Vedrovice „Siroká u lesa“: 15 (male), 30 (infant), 36 (female), 69 (male), 101 (female).

²²⁴ Kleinhadersdorf: 1c (female, two units), 7 (male), Verfärbung 40 (male), Verfärbung 44 (unsexed, two units), Verfärbung 54 (unsexed), Verfärbung 67-1 (infant, two units), Verfärbung 79 (male), Verfärbung 80 (infant), Verfärbung 81 (male), Verfärbung 85 (unsexed), Verfärbung 86 (unsexed), Verfärbung 89 (unsexed) – Mangolding: 7 (female) – Schwetzingen: 33 (infant), 105 (uncertain female), 182 (infant).

²²⁵ GERLING 2012, 103.

3.6.3. Polished stone tools

The polished stone industry in the Early Neolithic mainly consists of adzes, the primary function of which is widely assumed to be for woodcutting and further processing of wood for housebuilding, although some types are also well suited for processing skin and meat, as archaeological experiments have shown.²²⁶ They have also been considered ploughshares, although this interpretation is outdated, and weapons. In the selected study area, 200 polished stone objects were found in the grave inventory at Linear Pottery cemeteries. Considering the sexual determination of individuals buried with adzes and wedges – with very few exceptions (discussed in the respective subchapters of 4.3.), all sexed individuals were either identified as male or uncertain male – it is safe to classify them as typically male grave goods. Therefore, the distribution of adzes and wedges might indicate social differences and the display of prestige. In most cases, they appear as single objects in the grave inventory, however, some burials include up to three adzes, with the extensively furnished cremation grave 185 at Aiterhofen-Ödmühle even containing four polished stone tools.²²⁷

For producing adzes and wedges, the Linear Pottery people carefully chose stones which were well-suited for processing and difficult to break. The most common raw material was the grey-green to dark-coloured amphibolite, a metamorphic rock that contains amphibole such as hornblende and actinolite. The precise description of this material is actinolite-hornblende schist.²²⁸ Amphibolite with high proportions of hornblende tends to have more brownish colour tones, while actinolite-amphibolite obtains bright or dark grey and green shades.²²⁹ Other widely used materials for manufacturing polished stone tools are gabbro, micro gabbro (also known as diabase), gneiss, serpentine and different variations of schist such as quartzite schist. Depending on the location of the cemetery, the distribution of these materials might differ, as they were not equally available in every region. Adzes produced from gneiss, for example, distribute mainly to Schwetzingen in the lower Rhineland region, while quartzite schist tools have been found at the Bavarian cemetery Aiterhofen-Ödmühle.²³⁰

²²⁶ ELBURG et al. 2015. – MASCLANS, PALOMO, GIBAJA 2017.

²²⁷ NIESZERY 1995, 229.

²²⁸ CHRISTENSEN et al. 2006, 1639.

²²⁹ NIESZERY 1995, 141–142.

²³⁰ NIESZERY 1995, 141–142. – GERLING 2012, 63–64.

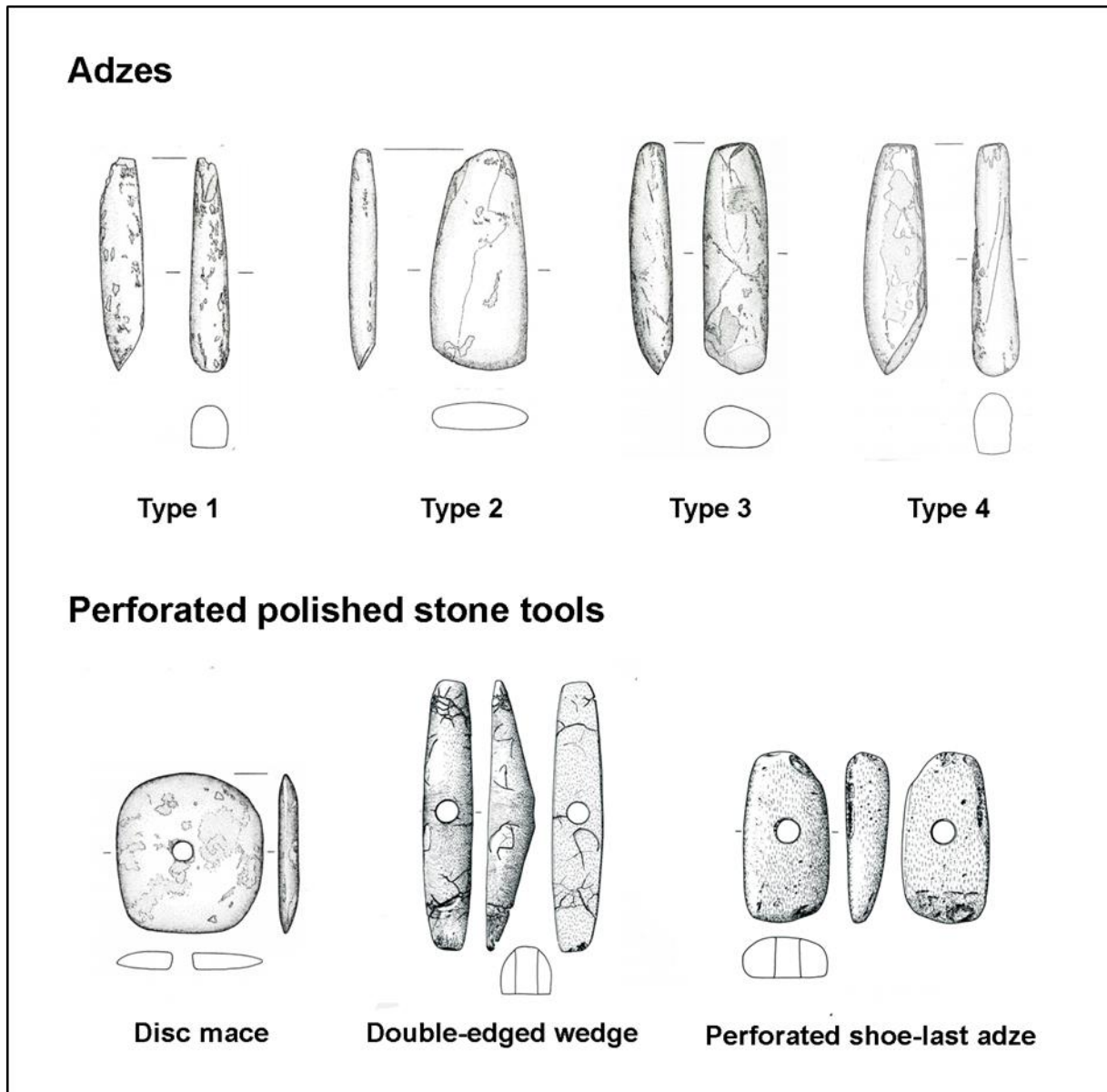


Figure 30: Typology of non-perforated and perforated polished stone tools (original graphs taken from NIESZERY 1995; GERLING 2012 and further modified).

As the wooden handles of adzes or wedges have already perished by the time archaeologists excavate them, only the blades remain for classification and evaluation. Their most important traits and features for categorizing them are perforation or the absence of such, the profile – although the latter is only of secondary interest – and the measurement of length, width and height. For this master thesis, I use the already established and reliable typology of adzes by Britta Ramminger as well as the terminology for perforated wedges provided by Raemaekers et al.²³¹

²³¹ RAMMINGER 2007. – RAEMAEKERS et al. 2011.

The first main type are non-perforated adzes, which were categorized by Britta Ramminger by applying a height-width-index – with the exception of type 1 – meaning the type is determined with dividing the height of the object in question by its width and then multiplying the interim result by a hundred.²³² The length is only of secondary interest, as it was constantly reduced by use and thus shorter adzes might just be worked off versions. This leads to the following variants:

- Ramminger Type 1 (Code “Adze Type100010”): This variant includes adzes with a width of under 2 cm. They have been found in 27 graves, which makes them the smallest group of non-perforated adzes.²³³
- Ramminger Type 2 (Code “Adze Type 200010”): Small, flat adzes with a height-width-index of under 50. Such objects are usually referred to as *Flachbeil* (translated: “flat adze”) in German speaking literature. With a total of 54 objects, they are the second largest group of polished stone tools.²³⁴
- Ramminger Type 3 (Code “Adze Type 300010”): Adzes with a height-width-index between 50 and 100, usually referred to as “shoe-last-adzes” (ger.: *Schuhleistenkeile*). They represent the largest group of adzes as demonstrated by 76 objects.²³⁵
- Ramminger Type 4 (Code “Adze Type 400010”): Adzes with a height-width-index of more than a hundred. Similarly, to type 3, they are known as shoe-last-adzes. There are 29 graves containing adzes of type 4, slightly outscoring type 2.²³⁶

²³² RAMMINGER 2007.

²³³ Aiterhofen-Ödmühle: 2, 10, 12, 15, 18, 24, 28, 29, 41, 48, 61, 88, 102, 120, 141, 185, 189, 227 – Kleinhadersdorf: Verfärbung 57 – Mangolding: 3 – Niederpörling-Leitensiedlung: 1 – Schwetzingen-Schälzig: 17 – Sengkofen: 13 – Vedrovice „Siroká u lesa“: 30, 31, 32 – Vedrovice „Za dvorem“: 8.

²³⁴ Aiterhofen-Ödmühle: 2, 10, 12, 13, 15, 18, 21, 24, 28, 41, 43, 56, 58 (two units), 61, 64, 65, 76, 87, 90, 102, 112, 113, 153, 174, 176, 182, 188, 192, 212, 224 – Dillingen-Steinheim: 14 – Essenbach-Ammerbreite: 1 – Kleinhadersdorf: 3, Verfärbung 37, Verfärbung 40, Verfärbung 64, Verfärbung 68, Verfärbung 71 – Mangolding 4 (two units) – Niederpörling: 2 – Nitra: 27 – Regensburg-Kumpfmühl: 1 – Schwetzingen: 6, 35, 75, 80, 98, 152, 177 – Sengkofen: 19 – Vedrovice „Siroká u lesa“: 18, 36.

²³⁵ Aiterhofen-Ödmühle: 1, 48, 94, 96, 102, 156, 165, 177, 181, 185, 188, 204 (two units), 207, 211, 222, 225 – Dillingen-Steinheim: 7, 12, 16, 20, 23, 28 – Essenbach-Ammerbreite: 2, 16 – Kleinhadersdorf: 1a, 9, Verfärbung 6, Verfärbung 17, Verfärbung 22, Verfärbung 44, Verfärbung 67-2, Verfärbung 79, Verfärbung 81, Verfärbung 87, Verfärbung 89, Verfärbung 90 – Nitra: 2, 8, 25, 26, 34, 40, 58, 76 – Regensburg-Kumpfmühl: 94 – Rutzing: 8, 13 – Schwetzingen: 15, 26, 43, 70, 133, 154, 187, 206, 209, 220 – Sengkofen: 16, 21, 24, 25 – Vedrovice „Siroká u lesa“: 12 (two units), 15, 19, 46, 54, 59, 69, 71, 76, 77, 79, 108.

²³⁶ Aiterhofen-Ödmühle: 10, 15, 25, 36, 56, 61, 93, 115, 117, 139, 149, 153, 158, 159, 161, 167, 176, 185, 190, 196, 213 – Dillingen-Steinheim: 8 – Essenbach-Ammerbreite: 24 – Kleinhadersdorf: 16 – Nitra: 21 – Sengkofen: 2 – Vedrovice „Siroká u lesa“: 57 (two units), 88.

- Uncategorized adze (Code “Adze_Undetermined00010”): This category includes adzes which could not be assigned to any other variant due to conservation status or other reasons, although they could be identified as adzes at least. They divide between an unsexed individual at Aiterhofen-Ödmühle (86; amphibolite), a woman at Nitra (41; undetermined material), a man at Schwetzingen (200; microgabbro), another man at Sengkofen (5; undetermined material) and an unsexed individual at Kleinhadersdorf (5). The object in the latter has been described as a “beautiful black shoe-last-adze” by the excavators in 1931.²³⁷ Unfortunately, the raw material and measurements were not documented.

Considering a suitable terminology for perforated variants of adzes, which represent the second main type of polished stone tools, the term perforated wedges (*durchlochte Keile*) provided by Raemakers et al. as a generic name for this artefact group will be used instead of “axe”.²³⁸ Perforated wedges are associated with the later phases of the Linear Pottery Culture; they can be thought to have been evolved from adzes. The variants are as follows:

- Perforated shoe-last-adze (Code “Perforated shoe-last adze00010”): All perforated, single-edged wedges having a D-shaped cross section are defined as perforated shoe-last adzes. According to Ramminger’s height-width-index, the perforated shoe-last adzes found in grave 16 at Schwetzingen (adult man) and grave 2 at Vedrovice “Za dvorem” (early adult man) – produced of basalt and gabbro respectively – would have been assigned to type 3.²³⁹
- Double-edged wedge (Code “Double-edged wedge00010”): Perforated wedges with edges on both ends rank as one the rarest find types of the Linear Pottery culture; The four objects selected for this evaluation count among the few double-edged wedges discovered in its whole distribution area.²⁴⁰ Burials 161, 185 and 201 at Aiterhofen-Ödmühle contained wedges produced from amphibolite within the remains of cremated men (one certain and two uncertain), while grave 21 at Schwetzingen included a wedge made of *Muschelkalk* (“mussel chalk”) around the pelvis area of an

²³⁷ LENNEIS 2015d, 35.

²³⁸ RAEMAEKERS et al. 2011.

²³⁹ PODBORSKÝ 2002a, 104. – GERLING 2012, 136.

²⁴⁰ NIESZERY 1995, 157–159.

inhumated 7-8-year-old child.²⁴¹ Nieszery suggested a cultic function for double-edged wedges, as their rounded off, dulled, thin, sensitive and thus easily breakable edges might be unsuitable for woodworking or other tasks.²⁴²

Another group of perforated and polished stone tools are disc maces (Code “Disc mace00010”). As their name suggests, disc maces are disc-shaped objects which have their shaft hole at the centre. They might have had a symbolic meaning or a secondary functional use as weapon, as cranial injuries of victims of the “Massacre at Schletz” indicate.²⁴³ There are two burials gifted with disc maces; grave 66 and 78 at Schwetzingen, produced of amphibolite and gabbro respectively, were both assigned to unsexed individuals.²⁴⁴ Grave 138 at Schwetzingen contained a polished stone tool positioned in front of the torso of a six-year-old infant, which – considering its description within the documentation – might have been a disc mace. Unfortunately, as this tool is missing, its function and form remain uncertain and thus has to be classified as another subvariant (Code “Disc mace_Uncertain00010”).

²⁴¹ NIESZERY 1995, 297, 299, 301. – GERLING 2012, 138.

²⁴² NIESZERY 1995, 158–159.

²⁴³ GERLING 2012, 151, 155, 171.

²⁴⁴ BIERMANN 2006, 105.

3.6.4. Colouring stones and red chalk distributions

As already demonstrated with the gifting of grinding tools used for producing red ochre, the addition of colour played an important role for Linear Pottery mortuary rites. Direct archaeological evidence within Linear Pottery grave inventories is provided by solid colouring stones as well as red chalk powder distributions. These stones were commonly positioned around the neck, chest or pelvis area of the deceased. They usually had an irregularly spherical to flat shape, were centrally perforated and had clear abrasion surfaces, which made their surfaces largely faceted. These facets were created by rubbing on a rough surface (e. g. querns) and either testify to the production of powdered colouring or can be seen as signs of wear due to a direct application of paint, observable on the surface of non-perforated dying stones. Depending on material and perforation – or absence of such – dying stones will be categorized into following variants:

- Graphite stones (Code “Graphite stone00010 to 00020”): In Linear Pottery society, graphite was certainly used to apply black colour. Raw graphite and dying graphite are mainly distributed in Bavaria, while they are nearly absent in Austria, Bohemia and Moravia. Graphite stones can be divided into perforated (Code “Graphite stone00020”)²⁴⁵ and non-perforated (Code “Graphite stone00010”)²⁴⁶ subvariants, with the latter including raw material with or without abrasions as well as small remaining chunks of graphite.
- Manganese stones (Code “Manganese stone00010”): This category contains two manganese oxide stones found in graves 131 and 170 at Schwetzingen, and one manganese hydroxide stone discovered in grave 6 at Dillingen-Steinheim. All three were perforated and positioned at the hand or elbow area of adult women. As with graphite, manganese stones were suitable for producing black colour.
- Red colour stones and remains (Code “Red chalk stone00010”): This variant includes three pieces of non-perforated, partially abraded haematite-limonite – the mineral resource for producing red chalk – found at the mouth or chin of an early mature man

²⁴⁵ Aiterhofen-Ödmühle: 10 (male), 31 (male), 70 (unsexed), 71-2 (uncertain male, 12-14-years old), 72 (unsexed), 84 (unsexed), 89 (female), 98 (uncertain female), 104 (uncertain female), 180 (unsexed), 226 (uncertain male) – Essenbach-Ammerbreite: 11 (unsexed) – Regensburg-Kumpfmühl: 92 (unsexed) – Schwetzingen: 98 (infant).

²⁴⁶ Aiterhofen-Ödmühle: 24 (male), 33 (female), 68 (female), 185 (uncertain male), 186 (male) – Essenbach-Ammerbreite: 26 (male) – Kleinhadersdorf: 8 (male), Verfärbung 1 (unsexed), Verfärbung 79 (male), Nitra: 5 (unsexed) – Regensburg-Kumpfmühl: 130 (unsexed), 133 (unsexed).

at Schwetzingen (106), a small chunk of red chalk similarly positioned at the chin of an approx. 30-year-old man at Nitra (64), as well as two pieces of an undetermined red stone (probably red chalk) lying at the hand of a late mature woman at Vedrovice “Siroká u lesa” (74).²⁴⁷

- Chloride stone (Code “Chloride stone00010”): Only one dying stone made of chloride schist has been found in the selected study area, which was positioned at the neck of a 35-40-year old woman at Aiterhofen-Ödmühle (92).²⁴⁸ It was perforated at the centre and showed obvious signs of abrasion around the edges. Chlorite schist belongs to the group of Greenschists and has, as such, an impure green to blackish green colour.²⁴⁹

The second main class in the artefact group of colouring equipment is red chalk powder (Code “Red chalk powder00010”), which is made of clay, chalk and haematite, with the latter being responsible for its characteristic, deep red colour tone. Modern humans produced pigments made of red chalk at least for 100,000 years, as demonstrated by the finds of ochre-processing workshops at Blombos Cave (South Africa).²⁵⁰ There are various possible uses for red chalk discussed by archaeologists, such as applying body paintings for odour suppression when hunting or as protection from environmental influences, or as colour for cave paintings, only to name a few. In Linear Pottery funerary rites, red chalk was mainly distributed on and around the head of the inhumed deceased, with only a few exceptions showing distributions at the hands or legs, and has been suggested to be rooted in Mesolithic rites.²⁵¹ There is a total amount of 49 graves with red chalk powder unevenly spread around the study area.²⁵² Another two graves contain red colour made of undetermined material, and are thus classified as another variant (Code “Red colouration_Undetermined00010”). The burials in question are the infant grave 2 at Essenbach-Ammerbreite, where 150 g of red earth was stored inside a

²⁴⁷ PAVÚK 1972, 20–22. – PODBORSKÝ 2002a, 74. – GERLING 2012, 162–163.

²⁴⁸ NIESZERY 1995, 283.

²⁴⁹ MINDAT.ORG 2019.

²⁵⁰ HENSHILWOOD et al. 2011.

²⁵¹ LENNEIS 2007. – GEHLEN 2016.

²⁵² Aiterhofen-Ödmühle: 18 (male), 78 (male), 102 (male), 113 (male), 115 (male), 139 (uncertain male) – Essenbach-Ammerbreite: 24 (male), 30 (uncertain male) – Kleinhadersdorf: 1a (male), 1c (female), 9 (infant), 17a (infant), Verfärbung 5a (female), Verfärbung 56 (female), Verfärbung 59 (infant), Verfärbung 69 (male), Verfärbung 81 (male) – Mangolding: 11 (unsexed) – Nitra: 36 (female) – Schwetzingen: 176 (uncertain female), 189 (uncertain male) – Vedrovice “Siroká u lesa”: 13 (female), 14 (female), 19 (male), 21 (female), 28 (infant), 30 (infant), 36 (female), 37 (infant), 42 (female), 48 (female), 54 (male), 61 (female), 69 (male), 70 (female), 71 (male), 72 (female), 75 (female), 76 (male), 79 (male), 80 (female), 83 (female), 86 (female), 90 (female), 97 (female), 100 (female), 102 (female) – Vedrovice “Za dvorem”: 7 (female), 9 (female).

vessel, and the female grave 81a at Vedrovice “Siroká u lesa”, where a 2-3 cm thick layer of an unidentified red colour was located below parts of the body.²⁵³ Considering the distribution of red colour powder in terms of anthropology, there are obvious regional differences. In Bavaria, red chalk powder was spread around the bodies of adult to senile men, while there are only a few male individuals in the south-eastern regions which received such treatment. The focus was instead on adult to senile women, with some contributions to infants. Vedrovice “Siroká u lesa” includes an especially high number of graves with red chalk, while Kleinhadersdorf outnumbers Aiterhofen-Ödmühle despite having significantly less burials. Nitra represents an exception, as only grave 36 received red powder.²⁵⁴ On the contrary, black colouring such as graphite stones occurred far less frequently than in Bavaria. At Schwetzingen, both red and black colouring scarcely spread across the site. However, it is worth noting that grave 189, belonging to an 18-year-old man, showed traces of red chalk as narrow bands transversely extending to the burial, which represents a rather rare method within Linear Pottery mortuary rites.²⁵⁵

²⁵³ BRINK-KLOKE 1990, 458. – PODBORSKÝ 2002a, 80.

²⁵⁴ PAVÚK 1972, 63.

²⁵⁵ GERLING 2012, 185.

3.6.5. Hammer stones, nodules and pebbles

This chapter comprises all remaining mineral tools or resources not listed in other stone artefact groups. The variants are as follows:

- Hammer stones (Code “Hammerstone00010”): These are defined by impact marks caused by hammering. The shape can be varied but has usually a roughly spherical form.²⁵⁶ As basic forms, pebbles and debris are suitable as well as fragments of artefacts such as adzes, wedges, fragments of grinding stones or querns, and chert nuclei. Possible uses include the production of chert artefacts, manufacturing millstones and breaking up raw mineral resources, as demonstrated on traces of red chalk on some objects.²⁵⁷ Some hammer stones show abrasive surfaces, along with impact marks, which complicate further functional interpretations. The raw material varies; hammer stones were made of quartz, limestone, sandstone, granite and other fitting stones. There are 20 objects determined as hammerstone for this thesis, which appeared at Aiterhofen-Ödmühle, Kleinhadersdorf and Vedrovice “Siroká u lesa”.²⁵⁸ The unfortunately high number of unsexed individuals with hammerstones at Kleinhadersdorf as well as the small sample of Aiterhofen-Ödmühle prevents revelations regarding sex and age preferences, while the find situation at Vedrovice “Siroká u lesa” leans towards senile women.
- Pebbles (Code “Pebble00010”): Small stones of various materials, such as sandstone, limestone radiolarite or quartz. They have been found in 14 graves, mixed between both sexes.²⁵⁹ This artefact group appears generally unmodified, with only a few pebbles showing traces of wear and tear, although it is difficult to determine if these are artificial or natural.²⁶⁰ An interpretation of pebbles to be utensils for fire making or

²⁵⁶ GAFFREY, LANGENBRINK 2003. – KEGLER-GRAIEWSKI 2007, 77.

²⁵⁷ LENNEIS 2015c.

²⁵⁸ Aiterhofen-Ödmühle: 184 (uncertain female), 200 (uncertain male) – Kleinhadersdorf: Verfärbung 7 (infant), Verfärbung 22 (infant), Verfärbung 43 (unsexed), Verfärbung 44 (unsexed, two hammerstones), Verfärbung 77 (unsexed, two hammerstones), Verfärbung 71 (unsexed), Verfärbung 79 (male), Verfärbung 81 (male), Verfärbung 87 (male) – Vedrovice „Siroká u lesa“: 19 (male), 30 (infant), 83 (female, two hammerstones), 90 (female, two hammerstones), 104 (female).

²⁵⁹ Essenbach-Ammerbreite: 1 (infant) – Kleinhadersdorf: 1c (female), Verfärbung 44 (unsexed), Verfärbung 69 (male) – Schwetzingen: 70 (male, two pebbles), 141 (female), 152 (male), 184 (female) – Sengkofen: 10a (male) – Vedrovice „Siroká u lesa“: 69 (male), 81a (female), 85 (unsexed, two pebbles), 101 (female).

²⁶⁰ GERLING 2012, 109–110.

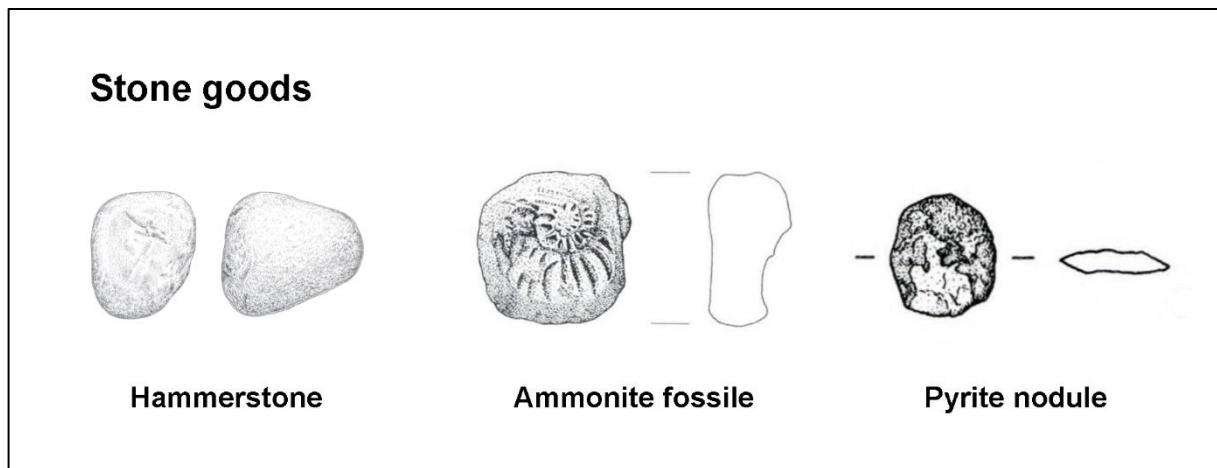


Figure 31: Typology of various stone goods (BRINK-KLOKE 1990, 465, Abb. 9; NIESZERY 1995, 370, Taf. 50; NEUGEBAUER-MARESCH, LENNEIS 2015a, 278, Taf. 45).

polishing bench stones stands in contrast to the absence of wear on most pebbles; however, their shape would be well suited for polishing bench stones.

- Pyrite nodules (Code “Pyrite nodule00010”): Nodules of pyrite, also known as fool’s gold, have been found in 10 graves exclusively in Bavaria.²⁶¹ These burials could be identified as male, ranging between adult and mature age, with the exception being a 15-20-year old man at Aiterhofen-Ödmühle (139).²⁶² As pyrite tends to deteriorate into red coloured goethite – resembling red chalk – or oxidises into limonite, mineral analyses are most often required to prevent false interpretations as dying stones or red chalk distributions. Nieszery suggests them to be part of lighter ensembles, consisting of said pyrite nodules, chert blades and nuclei, pointed bone metapodia and mussel shells.²⁶³
- Fossilized ammonite (Code “Fossilized ammonite00010”): A limonite stone with the imprint of a Lias Ammonite, which is an extinct species of marine molluscs, has been positioned near the head of an adult-to-mature individual at Essenbach-Ammerbreite (12).²⁶⁴ All attempts to interpret the symbolic meaning behind this gift would be highly speculative due to its unique nature.

²⁶¹ Aiterhofen-Ödmühle: 55 (female), 65 (uncertain male), 87 (male), 94 (male), 120 (unsexed), 139 (uncertain male), 142 (male), 153 (male), 158 (female) – Mangolding: 9 (male).

²⁶² NIESZERY 1995, 163, 291.

²⁶³ NIESZERY 1995, 163.

²⁶⁴ BRINK-KLOKE 1990, 464.

- Undetermined nodules (Code “Nodule_Undetermined00010”): There are four nodules in total which could not be identified with certainty.²⁶⁵ The three nodules found at Aiterhofen most possibly consist of pyrite, while a concentration of red coloured powder inside grave 2 at Niederpörling-Leitensiedlung might have been an intact marcasite nodule at the time of the funeral.²⁶⁶ Another, dark-grey nodule with abrasion marks assumed to be graphite was discovered in the female grave 126 at Schwetzingen.²⁶⁷
- Stones with uncertain function (Code “Stone with uncertain function00010”): This category includes worked and unworked pebbles or larger stones which could not be assigned artefact groups due to their elusive nature. An early adult man at Vedrovice “Siroká u lesa” (69) received a larger stone with limestone concretions, while another late adult man (15) inherited a polished amphibolite stone with numerous traces of red ochre, which could have been a hammerstone or an adze. The near-lying site “Za Dvorem” contained an uncertain stone made of marmor assigned to an 18-20-year old man (14). Another polished stone produced of quartzite slate has been found in Aiterhofen-Ödmühle along with the cremated remains of an infant (202), while a burned pebble or hammerstone was distributed to an uncertainly female cremation (163).

²⁶⁵ Aiterhofen-Ödmühle: 25 (male), 36 (unsexed), 48 (male) – Niederpörling-Leitensiedlung: 2 (uncertain male) – Schwetzingen: 126 (female).

²⁶⁶ PECHTL et al. 2018, 58.

²⁶⁷ GERLING 2012, 168.

3.7. *Bone artefacts and remains*

3.7.1. Combs

One of the most impressive testimonies to the earliest artisan craftwork are bone combs carved from a single piece. The raw material is difficult to determine, although certainly antler in most cases.²⁶⁸ The fragile pieces are often severely damaged due to erosion. However, almost all examples show an elaborate decoration of the comb plate, which mostly consists of combinations of bores, perforations, notches, grooves and plastic strips. Usually, the comb plate has a triangular incision, although other variants such as a round oval shape are also possible. The amount of comb teeth varies between four and eight, with a length of 4 to 12 cm and a width of 2 to 4.2 cm.²⁶⁹ For WinSerion, this type is simply classified as bone comb (Code “Bone comb00010”), further subdivisions will not be applied.

In the selected study area, bone combs exclusively appeared in the Bavarian cemeteries. There are 12 in total, which cannot be assigned to a specific sex as they occurred with both male and female individuals within a wide age range from early infant to late mature.²⁷⁰ Another Linear Pottery bone comb has been found in a settlement pit at the Hessian site Friedberg and dates to the end of the sixth millennium BC.²⁷¹ In Aiterhofen-Ödmühle, the combs always lay at the back of the heads of the buried individuals and might have held together a hairstyle, possibly in the form of a hair knot.²⁷² However, they possibly were not simply inserted into the hair, but – as indicated by two eyelets opposite to each other on the outermost edge of the comb plates from graves 139 and 143 of Aiterhofen-Ödmühle – secured by a flexible stick or bar (made of organic, unpreserved material such as wood) inserted transversely into the longitudinal axis. One bone comb was found inside a ceramic vessel along the incisor of the deceased individual and 150 g of undetermined red earth in grave 2 at Essenbach-Ammerbreite, which belonged to a nine-to-ten-year-old boy according to the anthropological sex determination and who additionally received an adze.²⁷³ Nine small-sized and almost

²⁶⁸ NIESZERY 1995, 196–199.

²⁶⁹ RITTER 2015, 482.

²⁷⁰ Aiterhofen-Ödmühle: 60 (female), 72 (unsexed), 108 (male), 139 (uncertain male), 143 (uncertain male) – Essenbach-Ammerbreite: 2 (infant), 14 (uncertain female) – Mangolding: 8 (female) – Niederpörling-Leitensiedlung: 3 (infant) – Regensburg-Kumpfmühl: 92 (unsexed) – Sengkofen: 29 (uncertain female).

²⁷¹ RITTER 2015, 475.

²⁷² NIESZERY 1995, 198.

²⁷³ BRINK-KLOKE 1990, 441.

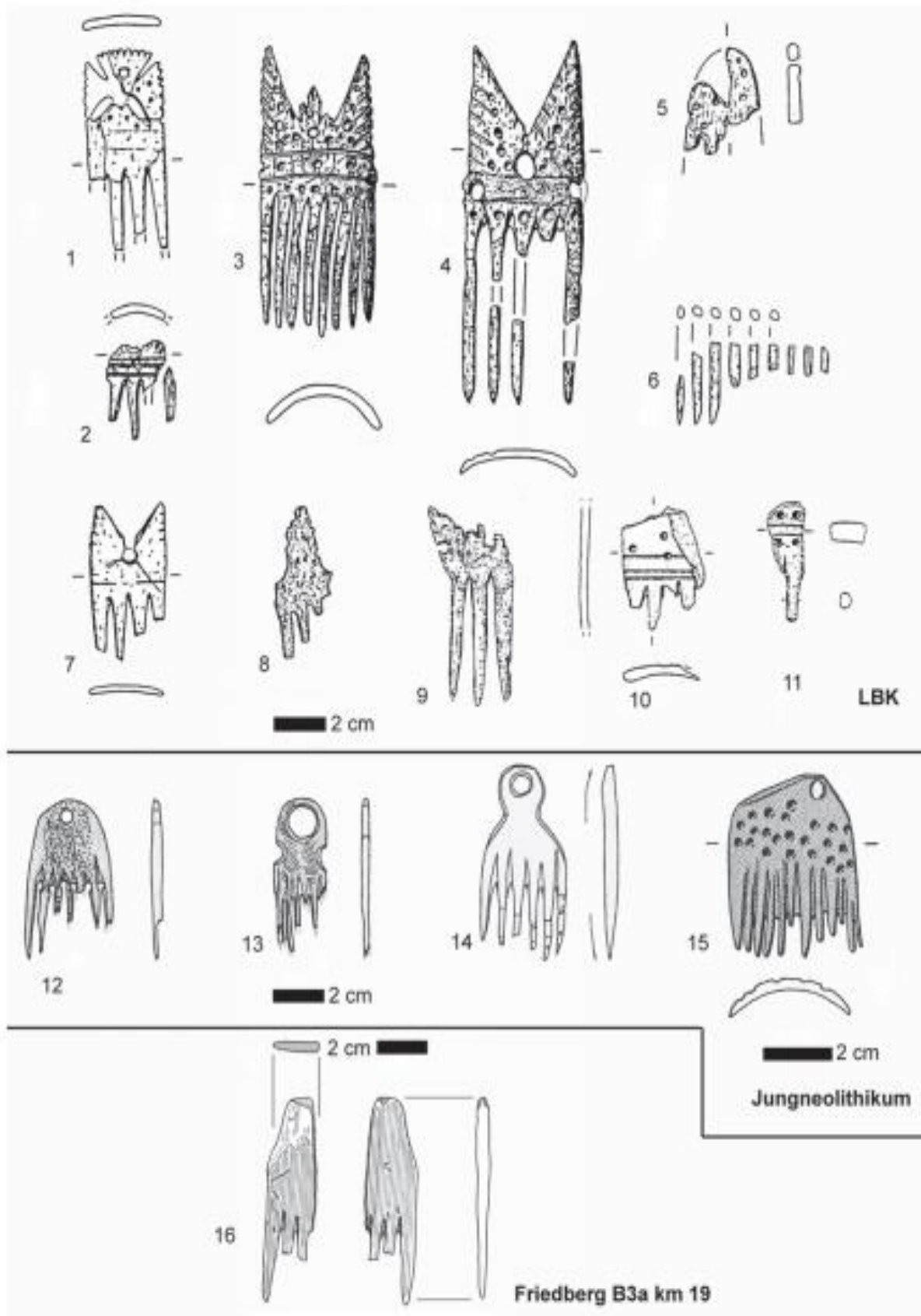


Figure 32: Bone combs excavated from early and late neolithic sites. Aiterhofen-Ödmühle: grave 72 (1), 108 (2), 143 (3), 139 (4), 47 (6), 60 (7); Mangolding: grave 8 (5); Sengkofen: grave 29 (8); Essenbach-Ammerbreite: grave 2 (9), 14 (10); „Hanseles Hohl“ (11); Zürich „Mozart“ (12-14); Zürich „Kleiner Hafner“ (15); Friedberg (16). (RITTER 2015, 481, Abb. 5).

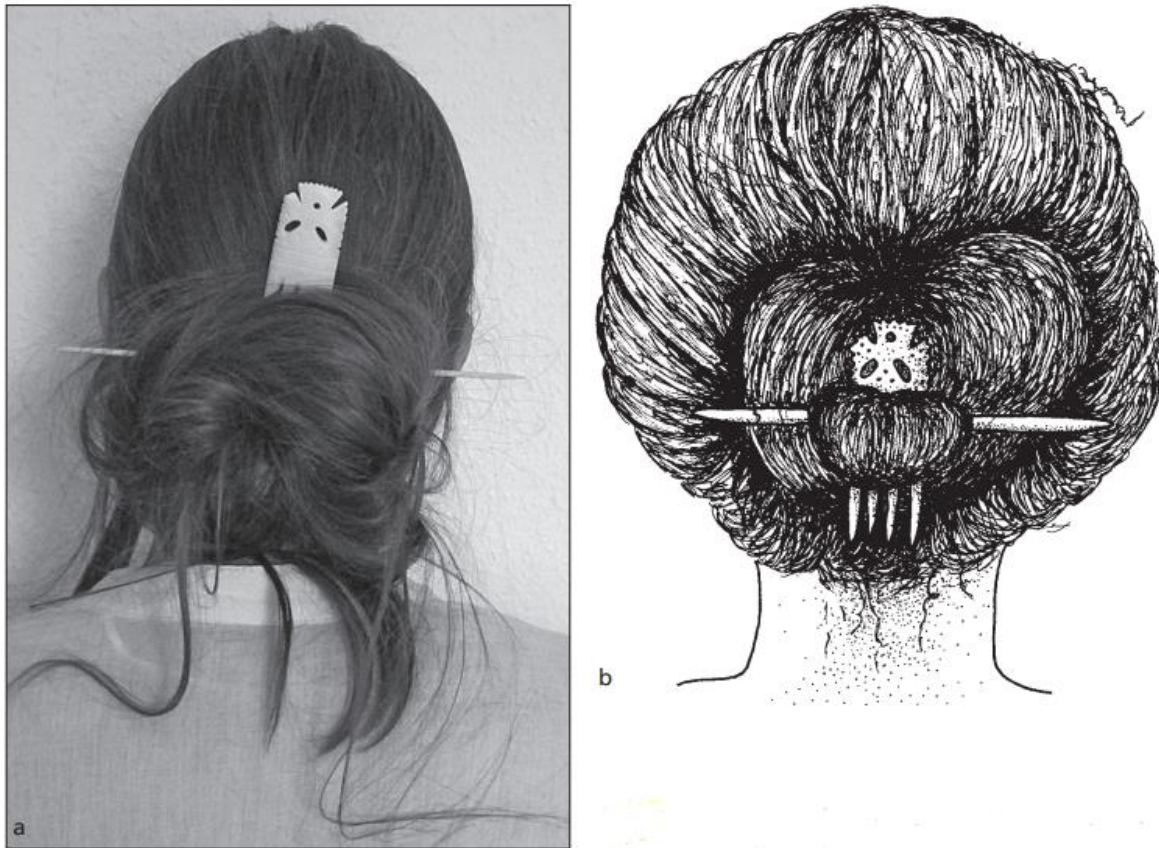


Figure 33: Reconstruction of a Linear Pottery hair style with bone comb (RITTER 2015, 482, Abb. 6).

round fragments found behind the back of an infant inside grave 47 at Aiterhofen-Ödmühle could also be interpreted as a comb due to its shape, assuming the comb plate has been made of organic material such as wood and perished.²⁷⁴ However, the unusual position in the grave contradicts a functional interpretation as a comb; the two bone combs from Essenbach-Ammerbreite were similarly “misplaced”.²⁷⁵ Due to their uncertain nature, the fragments in grave 47 will be included as another variant (Code “Bone comb_Uncertain00010”).

The high craftsmanship demonstrated by their ornamentation, their positioning at the head of the deceased and their frequent distribution to “richly” furnished burials are in favour of an interpretation of hair combs on people with high social standing, whereas it is discussed if there existed unpreserved counterparts made of wood and which hair styles played a role in Linear Pottery communities.²⁷⁶ Experiments have shown that a single comb cannot hold a long hairstyle, while a bun is possible if combined with a stick (Fig. 33). Most interestingly, the comb shape resembles a “crown” inside the hair, and thus highlights its ornamental character. There

²⁷⁴ NIESZERY 1995, 199.

²⁷⁵ BRINK-KLOKE 1990, 441.

²⁷⁶ RITTER 2015, 476–483.

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is also the possibility that the combs have been used for combing the hair or for processing flax, although a usage for hair styles seems the most likely.

3.7.2. Pointed bone tools

The term “pointed bone tools” describes objects with sharp tips, which are almost always the most numerous bone tool type in Linear Pottery cemetery assemblages. They are usually referred to as awls (also known as perforators, pins, borers etc.) used for processing soft materials (e. g. leather), although they could have been utilized for a variety of tasks as their function has not been clarified yet. In the graves of the Southern Bavarian Linear Pottery cemeteries, pointed bone tools are often associated with further components of chert lighter ensembles, which is why Norbert Nieszery suggests a bone lighter (“*Zunderstoche*”) as its primary function.²⁷⁷ For smaller examples, the use as projectile points has also been proposed.²⁷⁸ Additionally, sharply pointed instruments are suitable for ceramics production.²⁷⁹

A large selection of materials and body parts was available for the manufacturing of pointed bone tools, although they were usually made of metapodials and long bone segments, most often medium-sized mammals such as sheep-goats or red deer. It is entirely possible to produce a proper bone point in a few minutes by snapping a long bone and sharpening the tip.²⁸⁰ If more time and work is invested, one could obtain up to four tools instead of one by splitting the long bone longitudinally. Resharpening the tool over time might extend its life and therefore provides an efficient usage of the raw material. For WinSerion, the pointed bone tools will be divided by the body parts from which they are produced, as the species often remains uncertain. The variants are as follows:

- Metapodia (Code “Bone point_Metapodium00010”): This includes the metatarsus, the skeleton of animals (or humans) between the toes and the tarsus, as well as the metacarpus, which is the corresponding skeletal hand part between the fingers and the carpus. From 26 graves having contained metapodia points, 19 can be assigned to certainly and uncertainly identified men and three to certainly and uncertainly identified women.²⁸¹

²⁷⁷ NIESZERY 1992, 364.

²⁷⁸ BARTHEL, TEICHERT 1985, 77.

²⁷⁹ LINDIG 2002, 90. – GERLING 2012, 94.

²⁸⁰ RUSSELL 2016, 126.

²⁸¹ Aiterhofen-Ödmühle: 18 (male), 28 (male), 42 (male), 55 (female), 64 (male), 85 (male), 139 (uncertain male), 142 (male) – Essenbach-Ammerbreite: 1 (infant) – Kleinhadersdorf-Marchleiten: 1a (male), Verfärbung 17 (male), Verfärbung 55 (female), Verfärbung 67-2 (male), Verfärbung 79 (male), Verfärbung 81 (male) – Mangolding: 3 (male) – Niederpörling-Leitensiedlung: 1 (uncertain male), 2 (uncertain male, two bone points) – Nitra: 4

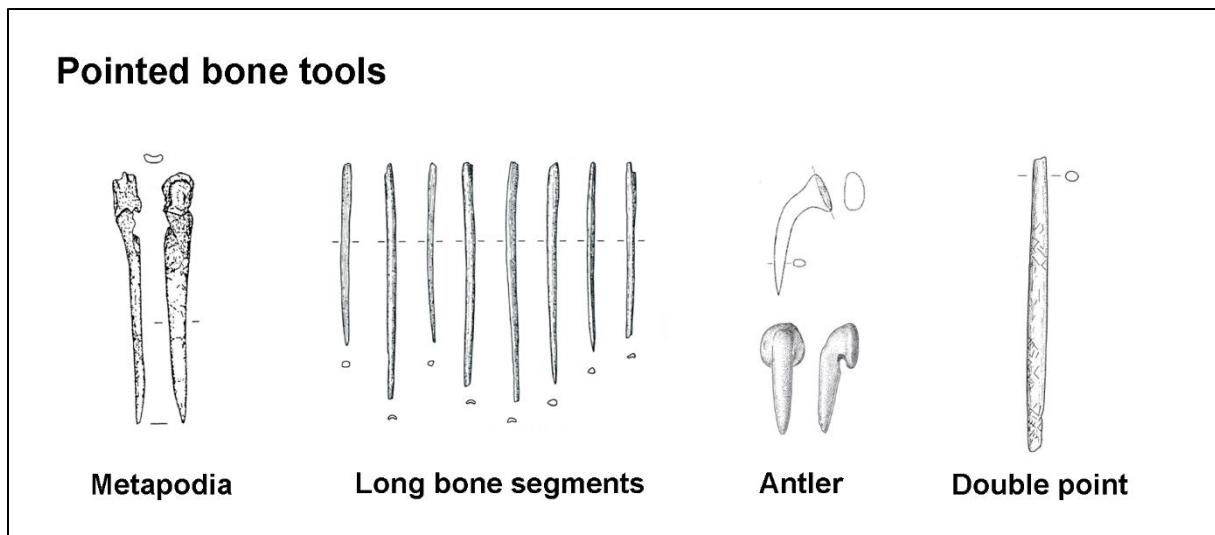


Figure 34: Typology of pointed bone tools (original graphs taken from NIESZERY 1995, 327, Taf. 7,7; NEUGEBAUER-MARESCH, LENNEIS 2015, 243, Taf. 10; PODBORSKÝ 2002a, 110, Abb. 116; GERLING 2012, 236, Abb. 102 and further modified).

- Long bone segment (Code “Bone point_Long bone-long bone segment00010”): Ten points made from long bone segments have been found in three graves.²⁸² Two of them were male, while one female received eight bone points.
- Antler (Code “Bone point_Antler00010”): An uncertainly identified male infant at Kleinhadersdorf (9) and a juvenile man at Vedrovice “Za dvorem” (8) received bone points produced of antler.²⁸³ Both objects look relatively similar and were located near the head of the deceased. Their functional use is elusive, although they could have been part of a hair style or unpreserved head gear, or alternatively ear jewellery.
- Double point (Code “Bone point Double point”): This object has been described as a double point and was made of the compact bone of a cattle sized animal with a polished surface. It was laid upon the upper torso of a late mature to senile woman at Niederpöring-Leitensiedlung (5), who also received a spondylus necklace.²⁸⁴
- Body part not specified (Code “Bone point_Uncategorized00010”): The body part and species of six-pointed bone tools unfortunately cannot be specified with certainty.²⁸⁵

(unsexed), 14 (female, two bone points) – Schwetzingen: 21 (infant), 48 (uncertain female), 67 (uncertain female), 138 (infant) – Vedrovice “Siroká u lesa”: 18 (infant), 69 (male).

²⁸² Aiterhofen-Ödmühle: 10 (male) – Schwetzingen: 37 (female, 8 bone points), 75 (male).

²⁸³ PODBORSKÝ 2002a, 110, Abb. 116. – NEUGEBAUER-MARESCH, LENNEIS 2015a, 243, Taf. 10.

²⁸⁴ PECHTL et al. 2018, 62–65.

²⁸⁵ Aiterhofen-Ödmühle: 41 (uncertain male, infant) – Kleinhadersdorf: 7 (male) – Regensburg-Kumpfmühl: 92 (unsexed) – Sengkofen: 25 (unsexed) – Vedrovice „Siroká u lesa”: 12 (unsexed) – Vedrovice „Za dvorem”: 2 (male).

3.7.3. Triangular bone points

This type was frequently represented at Schwetzingen, although it appeared only sporadically on other cemeteries. While in Sengkofen and Vedrovice only one example each was uncovered, with 32 bone tips or fragments originating from 13 graves in Schwetzingen.²⁸⁶ All determinable examples of the selected study area were made of rib bones from cattle or red deer. They were predominantly gifted to men, mostly mature, with only a few exceptions. For WinSerion, this type will simply be classified as triangular bone point (Code “Triangular bone point00010”) without any subdivisions.

There are several possible interpretations regarding the functionality of triangular bone points. According to Gerling, in disregard of the lack of stock traces and simply faceted edges, certain grave findings of chert and bone tips positioned near each other support the functional interpretation of both the chert and bone triangles as arrowheads being used for hunting smaller animals.²⁸⁷ Strien likewise suggested a function as an arrowhead for a similar bone point from the site Heilbronn-Klingenberg, whereas Heide considers this interpretation to be only partially correct due to the fragility of the thin bone triangles.²⁸⁸ She also points out that the points rarely show signs of wear and are thus more likely to have a symbolic character.

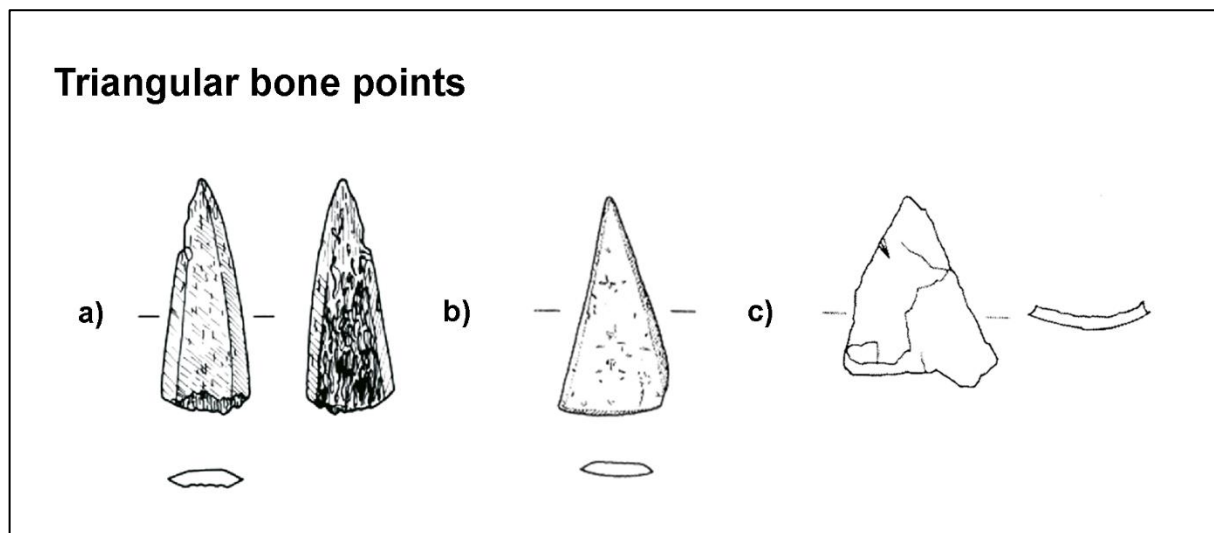


Figure 35: Triangular bone points. **a)** Schwetzingen, grave 23 (GERLING 2012, 257, Abb. 123,3), **b)** Sengkofen, grave 21 (NIESZERY 1995, 390, Taf. 70), **c)** Vedrovice “široká u lesa”, grave 43 (PODBORSKÝ 2002a, 49, Abb. 46,3).

²⁸⁶ Schwetzingen: 6 (male, one point), 14 (male, one point), 16 (male, one point), 17 (unsexed, 3 points), 70 (male, one point), 97 (male, 2 points), 98 (infant, 3 points), 106 (male, 5 points), 142 (male, 3 points), 176 (uncertain female, 2 points), 187 (unsexed, 2 points), 189 (uncertain male, 2 points), 194 (uncertain male, 3 points), 203 (infant, 4 points) – Sengkofen: 21 (unsexed, one point) – Vedrovice “Široká u lesa”: 46 (male, one point).

²⁸⁷ GERLING 2012, 96–98.

²⁸⁸ STRIEN 2000, 205. – HEIDE 2001a, 151.

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Lindig suggested the bone points of Schwetzingen to be ornaments or tools for precision work rather than arrowheads based on the position inside the grave, the processing, the faceting and missing traces of wear.²⁸⁹ Grave 67 in the unpublished cemetery of Stuttgart-Mühlhausen contained a bone point made from a boar tooth with dark spots, which could be interpreted as birch bark pitch for gluing it to an arrow shaft.²⁹⁰

²⁸⁹ LINDIG 2002, 94.

²⁹⁰ GERLING 2012, 98.

3.7.4. Animal bone remains

In the selected study area, there are 21 graves which contained unmodified remains of animals and five burials including human teeth which could have been used as grave goods. While the former represents a typically male gift, human teeth were also given to women. Animal bone remains are often interpreted as meat offerings, meaning provisions for the journey to the afterlife or as a symbolic part of the deceased's funeral meal.²⁹¹ Such grave goods might have been a more common part of Linear Pottery mortuary rites than demonstrated by bones due to meat being easily decomposed and thus not archaeologically traceable if the object in question was boneless. Other possible uses of animal bone remains might be as part of clothing (e. g. necklace) or hunting trophies. For WinSerion, the following variants of animal and human remains will be considered:

- Cow (Code “Bone remains_Cow00010”): A cattle rib in grave 61 at Aiterhofen-Ödmühle laid lengthwise and directly on the vertex of the buried man who was 35 to 40 years old at death. Nieszery discussed the possibility of this object being part of the clothing instead of a meat offering, although he avoids committing himself to one interpretation or another. Grave *Verfärbung 71* at Kleinhadersdorf contained a femur along with the remains of an unsexed individual, while another undetermined individual in *Verfärbung 86* received a rib referred to as Bovidae,²⁹² which could have been a goat-sheep or a cow and thus has to be put into the category “unspecified” due to its uncertain nature.²⁹³
- Dog (Code “Bone remains_Dog00010”): This category includes one object from grave 113 at Aiterhofen-Ödmühle which was positioned on the chin of the deceased adult man (30-35 years old).²⁹⁴ It was referred to as the radial bone of *canis palustris* or bog dog (*Torfhund* or *Torfspitz*), a prehistoric dog species.²⁹⁵ Unfortunately, this object has gone missing. An adult male inside the settlement grave 485 at Mitterndorf was also gifted with dog bone remains.²⁹⁶

²⁹¹ NIESZERY 1995, 199–200.

²⁹² “A large family of ruminants containing the true antelopes, oxen, sheep, and goats, distinguished from the deer family by the polycotyledonary placenta, the hollow nondeciduous unbranched horns, and by the nearly universal presence of a gallbladder.” *THE MERRIAM-WEBSTER.COM DICTIONARY 2019*.

²⁹³ LENNEIS 2015b.

²⁹⁴ NIESZERY 1995, 287.

²⁹⁵ KROLL 2004.

²⁹⁶ BICKLE et al. 2013, 188.

- Fox mandible (Code “Bone remains_Fox mandible00010”): Mandibles of foxes have been found in graves 18, 102 and 141 at Aiterhofen-Ödmühle, who represented extensively furnished men ranging between late adult to senile age. Although perforations are absent, Nieszery assumed on the basis of their positioning - around the neck or chin - that those fox mandibles were carried individually as pendants or as the component of a necklace.²⁹⁷ Such finds are unparalleled yet in Linear Pottery research, although grave 19 at Nitra and grave 13 at Rutzling contained fox teeth accompanied with human teeth or red deer teeth as part of necklaces, as already mentioned. All these men gifted with fox body parts received extensive grave good assemblages, which implies fox remains were markers for high social status in addition to having possible connections to hunting.
- Goat-Sheep (Code “Bone remains_Goat-Sheep00010”): There are three graves containing leg bones of goat-sheeps in Bavaria – the male graves 102 at Aiterhofen-Ödmühle (which also contained the leg bone of a pig) and 20 at Dillingen-Steinheim as well as the uncertainly identified male grave 30 at Essenbach-Ammerbreite.²⁹⁸ Since leg bones are abundant with meat, an interpretation as food offerings can be suggested, also considering that these findings were laid near the head of the deceased.
- Pig (Code “Bone remains_Pig00010”): As mentioned above, grave 102 at Aiterhofen-Ödmühle included the leg bones of a goat-sheep as well as of a pig. Another pig leg bone has been found in grave 2 at Regensburg-Kumpfmühl.²⁹⁹ Similar to goat-sheep-bones, these were positioned near the head and can be considered meat offerings.
- Wild boar (Code “Wild boar lamella00010”): A lamella-shaped bone sherd gifted to an early adult man (79) at Vedrovice “Siroká u lesa”. Both ends have been described as “sharp”.³⁰⁰ It was part of an extensive ensemble of grave goods, including several microlithic arrowheads, which indicates along with the wild boar a connection to hunting.

²⁹⁷ NIESZERY 1995, 200.

²⁹⁸ BRINK-KLOKE 1990, 446. – NIESZERY 1995, 199–200.

²⁹⁹ REITMAIER 2018, 47.

³⁰⁰ Original text: „Lamela z kančího klu, oba konce zahroceny. d 54 mm, š 20mm, tl 3 mm.“ PODBORSKÝ 2002a, 79.

- Rabbit (Code “Bone remains_Rabbit00010”): In the selected study area, only one rabbit bone – more precisely the distal fragment of a tibia – has been excavated. It accompanied an infant between one to three years at Kleinhadersdorf (Verf. 22).³⁰¹ Obviously, the small size of this meat offering could be connected to the young age of the deceased.
- Undetermined (Code “Bone remains_Undetermined00010”): This category includes nine graves with bone remains of which the species could not be determined clearly, all located to Kleinhadersdorf.³⁰² One of these remains have been described as the tibia of a small ruminant (Verf. 85), while another one represents the bones of a bovidae (Verf. 86).³⁰³ The latter was also accompanied by an undetermined rib. A skull fragment not included in the evaluations performed in this thesis has been found at grave *Verfärbung 78* and might be of human origin.
- Human teeth (Code “Human tooth00010”): Those were found in four graves at Aiterhofen-Ödmühle (33, 65, 100, 115) and positioned either on the forehead, under the head, or the position could not be determined as is the case with grave 115. Another one was discovered at Essenbach-Ammerbreite (2) inside a ceramic vessel along with a bone comb and 150g of undetermined red earth. The burials in Aiterhofen-Ödmühle included two males and two females ranging from early adult to senile age, while the individual in Essenbach-Ammerbreite was 9 to 10 years old. Human teeth were also part of a necklace of a male grave at Nitra (19) together with fox-bone-teeth, although these finds are listed in another category (see chapter 3.6.4.).

³⁰¹ LENNEIS 2015b, 135.

³⁰² Kleinhadersdorf: *Verfärbung 19* (unsexed), *Verfärbung 23a* (unsexed), *Verfärbung 57* (male), *Verfärbung 67-1* (infant), *Verfärbung 78* (unsexed), *Verfärbung 85* (unsexed), *Verfärbung 86* (unsexed, remains of two animals).

³⁰³ LENNEIS 2015b, 135.

3.7.5. Unusual finds

The following contains grave goods made of bones which could not be assigned to the previously mentioned categories, with many of them representing unique finds.

An adze manufactured from an antler fragment of a red deer (Code “Perforated bone adze00010”) was the only object gifted to an infant at Schwetzingen (129).³⁰⁴ The 127 mm long piece weighs 94 g and is perforated both horizontally and longitudinally, with the transverse perforation measuring 18 by 13 mm and the longitudinal perforation 18 by 22 mm. It has a completely worn-out beading, is fractured at the earlier perforation at the rear end and was reworked laterally by sloping chip removal, thus meaning it had certainly been used. The old perforation has a rather rectangular shape with rounded edges. It might have held a stone tool, although this – and the functional use of the tool – can only be assumed. Similar finds were discovered in Late Mesolithic contexts and Linear Pottery sites in the Kraichgau region as well as at Herxheim in Rhineland-Palatinate and Eilsleben in Sachsen-Anhalt, while the Middle Neolithic grave field Trebur included a slightly different type of bone-adze, which was also given to an infant as the only gift in this grave.³⁰⁵ The origins of this gift type might be found in the northern margins of the Linear Pottery distribution area. This is supported by finds of Early Neolithic adzes in Mesolithic contexts, with further potential connections indicated by antler fragments decorated with characteristic Baltic Late Mesolithic “drilled pits” found at the Linear Pottery sites Vaihingen and Ditzingen in Baden-Württemberg.³⁰⁶ Another unusual find excavated at Schwetzingen was a bone disc (Code “Bone disc_Uncertain00010”)

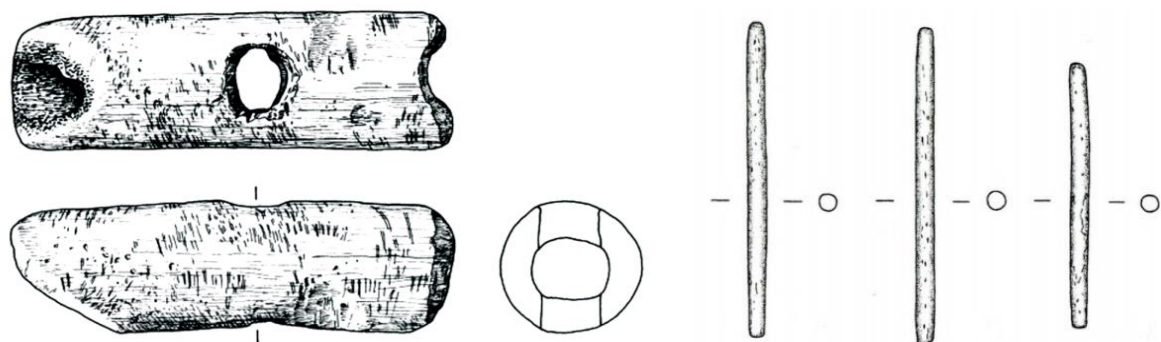


Figure 36: On the left the bone adze found in grave 129 at Schwetzingen (GERLING 2012, 249, Abb. 115); On the right cylindrical bone sticks discovered in grave 85 at Aiterhofen-Ödmühle (NIESZERY 1996, 345, Taf. 34).

³⁰⁴ GERLING 2012, 101-102, 168-169.

³⁰⁵ ZVELEBIL 1994, 55, 60. – SPATZ 1999, 141. – HEIDE 2001b, 152. – GERLING 2012, 101–102. – BENTLEY et al. 2013, 277.

³⁰⁶ GRONENBORN 2009, 536.



Figure 37: Grave good inventory of *Verfärbung 81* at Kleinhadersdorf, including the perforated boar tusk horns (NEUGEBAUER-MARESCH, LENNEIS 2015a, 294, Taf. 61).

belonging to an early adult, uncertain woman (109).³⁰⁷ The bone disc was positioned 10 cm above the torso, which is the only information available about this find as the object has unfortunately gone missing.

The Austrian cemetery Kleinhadersdorf contained several remarkable objects as well. Bone spatulae (Code “Bone spatula00010”) such as the one found in the cremation burial *Verfärbung 54* have not been discovered at other Linear Pottery grave fields in the selected study area.³⁰⁸ Similarly unique are the two perforated boar tusk horns (Code “Perforated boar tusk horn00010”) in grave *Verfärbung 81*, which contained an adult male with a spondylus pendant, one chert artefact, a pointed bone tool, a stone adze and a red chalk distribution around the head.³⁰⁹ Based on the positioning of the boar tusks near the skull, there might be a functional connection to the pointed bone tool and the silex borer instead of an ornamental function. High social status for the deceased and potential connections to hunting can also be assumed.

³⁰⁷ GERLING 2012, 163–164.

³⁰⁸ NEUGEBAUER-MARESCH, LENNEIS 2015a, 53.

³⁰⁹ LENNEIS 2015b, 134. – NEUGEBAUER-MARESCH, LENNEIS 2015a, 55.

Cylindrical bone sticks (Code “Cylindrical bone stick00010”) – not assigned to the family of pointed bone tools – have been found in four Bavarian graves.³¹⁰ The source material of these rare artefacts is difficult to determine; Although they could be regular bones, experiments have shown that antlers are much more suitable for their production. They always have a round cross-section and reach a maximum length of 7.4 cm to 9.2 cm. Their diameter varies between 0.5 cm and 0.6 cm. In total, six cylindrical bone sticks were given to graves 5 and 7 at Sengkofen as well as 50 and 85 in Aiterhofen-Ödmühle, with the latter containing three objects. At Aiterhofen, they were given to senile men, while grave 7 at Sengkofen was also assigned to a male individual. The functional use of cylindrical bone sticks is uncertain; The object in grave 50 lay at the pelvis and thus might have been used as part of a belt, while the one in grave 85 could have been head gear.

³¹⁰ NIESZERY 1995, 195–196.

4. Data sets and results

4.1. *List of Linear Pottery cemeteries*

The supranational investigation of Linear Pottery cemetery distribution requires a list of all known sites, or at least one that is as complete as possible. Hopefully, such is provided by table 2 further below, although I cannot guarantee that every grave field is included, as there most certainly existed cemeteries which were destroyed without being published or even noticed. Additionally, there is always the possibility that a reference was overlooked, although I can assure that an extensive search was carried out to the best of my knowledge and certainty. The majority of entries are taken from the cemetery lists provided by Nieszery and Veit.³¹¹ All other sites and their respective publications were found through annual reports of states and nations, online scientific newspapers and social media such as academia.edu or researchgate.net. It should be noted that not every grave group falls under Nieszery's definition of *Gräberfelder*; some are small extramural burial clusters with less than five graves – often nevertheless listed as cemeteries by Nieszery – while other mentions relied on verbal exchanges between seasoned archaeologists, which were then written down in certain publications. This is the case for a few sites such as Marainville-sur-Madon, and unfortunately indicates an undefined number of unrecorded sites forever lost to archaeological research. There is also the chance of grave fields being found between the final edit and publication of this thesis and thus not making it into the list, which, in this case, I ask the reader to forgive such a gap. Overall, the number of cemeteries found in this list is sufficient for investigating certain trends considering geographical site distribution, which will be discussed in the following chapter.

³¹¹ NIESZERY 1995, 243–246. – VEIT 1996, 77–90.

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Table 2: List of Linear Pottery cemeteries, sorted alphabetically by nation, state/region and then location/name. *sites selected for quantitative evaluations in this thesis.

Location/Name	State/Region	Nation	Short description	Bibliography
Eggenburg	Lower Austria	Austria	3 burials assumed to be the last recovered remains of a cemetery	STIFFT-GOTTLIEB 1939; LENNEIS, BLESL 2017
Kleinhadersdorf „Marchleiten“*	Lower Austria	Austria	57 inhumations recently excavated in addition to small groups of burials found in 1911 and 1931 as well as remains of cremations and empty graves; phase Flomborn (phase I/II according to Tichý) to Šárka and Želiezovce; potential settlement assumed to lie south to the site	NEUGEBAUER-MARESCH, LENNEIS 2015a
Mitterndorf (at Michelhausen)	Lower Austria	Austria	In layer below a roman <i>villa rustica</i> a late LPC/late <i>Notenkopferkeramik</i> cemetery; 27 burials with 28 individuals, one empty grave, and 2 cremations; settlement nearby	NEUGEBAUER 1998; ADLER 2004; HOFER 2005; LINKE, DEUTSCHMANN, MITCHELL 2006; LENNEIS, BLESL 2017
Ratzersdorf	Lower Austria	Austria	20 burial pits, 5 pits without human remains assumed to be burial pits; Note Pottery; settlement nearby	NEUGEBAUER 1998, 2000; LENNEIS, BLESL 2017
Rutzing (at Hörsching)*	Upper Austria	Austria	24 burials, some with <i>Notenkopferkeramik</i> ; settlement nearby; traces of wooden coffins or coffin-like structures inside some graves mentioned	KLOIBER, KNEIDINGER 1968, 1969, 1970; KLOIBER, KNEIDINGER, PERTLWIESER 1971; KIRCHENGAST, WINKLER 1994
Hologne-aux-Pierres	Liège	Belgium	“Cremation place” (roughly translated); 23 so-called „depots“=deposits, one of them a cremation; phase <i>Omalien</i>	THISSE-DEROUETTE, THISSE-DEROUETTE, THISSE J. JR. 1952; TOMBALLE 1956; HÖCKMANN 1982
Blučina	Jihomoravský kraj	Czech Republic	Six graves assumed to be remains of a cemetery	PODBORSKÝ 2002c, 323
Brno (formerly “Brünn”)	Jihomoravský kraj	Czech Republic	Unpublished cemetery	NIESZERY 1995, 246
Moravský Krumlov	Jihomoravský kraj	Czech Republic	Two burials assumed to be remains of a cemetery	PODBORSKÝ 2002c, 323
Těšetice–Kyjovice (“Sutny”)	Jihomoravský kraj	Czech Republic	Group of graves estimated to be part of a necropolis	DOČKALOVÁ, ZDENĚK 2008, 39
Vedrovice „Široká u lesa“*	Jihomoravský kraj	Czech Republic	97 burials; settlement and smaller cemetery „Za dvorem“ nearby	PODBORSKÝ 2002a
Kralický háj (Kralice na Hané)	Olomoucký kraj	Czech Republic	78 burials, of which 69 are cremations	ŠMÍD 2013
Předmostí	Olomoucký kraj	Czech Republic	Three graves assumed to be remains of a cemetery	PODBORSKÝ 2002c, 323
Rybníky “Na dílech”	Středočeský kraj	Czech Republic	Three burials assumed to be remains of a cemetery	KAUFMANN 1954; PODBORSKÝ 2002c, 323
Vedrovice „Za dvorem“*	Jihomoravský kraj	Czech Republic	Small cemetery with 11 burials; settlement and cemetery “Široká u lesa” nearby	PODBORSKÝ 2002a
Charmoy	Bourgogne-Franche-Comté	France	6-7 burials, 2 pits with uncertain function; Late <i>rubanéé</i> /LBC; settlement nearby	BAILLOUD 1964; VEIT 1996, 88
Chichery	Bourgogne-Franche-Comté	France	7 inhumations; Late LPC	JULY 1970; PELLER 1978; VEIT 1996, 88
Vinneuf	Bourgogne-Franche-Comté	France	16 features, 11 of them with skeletal remains; nearby two groups of graves, one of them destroyed; other isolated burials destroyed by gravel workings	CARRÉ 1967; VEIT 1996, 89
Dormans	Grand Est	France	Larger number of burial pits with one or more individuals and finds; Late LPC (Type Plaidt)	BAILLOUD 1964
Ensisheim	Grand Est	France	21 burials; settlement nearby	GALLAY, MATHIEU 1988
Entzheim	Grand Est	France	9 burials; Late LPC (group 2-3 according to Gallay); also traces of settlements	SCHAEFER 1934; KAHLKE 1954a; GALLAY 1970; VEIT 1996, 87
Hoehnheim-Souffelweyersheim	Grand Est	France	51 inhumations, one of them being a male individual with a head trepanation; Late	FÖRRER, JAENGER 1918; ULRICH 1942; RIETH 1943;

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			LPC (group 2-3 according to Gally); also traces of a settlement	ULRICH 1946, 1953; KAHLKE 1954a; GALLAY 1970; HÖCKMANN 1982; VEIT 1996, 87
Ingenheim	Grand Est	France	30 inhumations and 6 cremations; Late LPC; settlement nearby	LEFRANC, ALIX, LATRON 2014
Larzicourt	Grand Est	France	5 burials with 6 individuals; LPC building nearby	CHERTIER 1985; VEIT 1996, 88
Lingolsheim	Grand Est	France	Group of 8 inhumations of LPC origin (group 2 according to Gally); cemetery of Rössen/Roessen culture origin nearby; LPC settlement of same date nearby	SCHAEFER 1934; FORRER 1938; HEINTZ 1957; GALLAY 1970; HÖCKMANN 1982
Marainville-sur-Madon	Grand Est	France	Group of 6 inhumations; Nieszery was told of it by a certain V. Blonet	NIESZERY 1995, 243
Quatzenheim	Grand Est	France	13 inhumations, also settlement pits of same date near this area; Late LPC (group 2 according to Gally)	STIEBER 1951; VEIT 1996, 88
Rixheim (Mulhouse Est)	Grand Est	France	24 burials, around another 20 burials destroyed; Late LPC (group 2 according to Gally); presumed older settlement nearby	GALLAY, SCHWEITZER. R. 1971; SCHWEITZER 1972, 1973; SCHWEITZER. R., SCHWEITZER 1977; GERHARDT, GERHARDT-PFANNENSTIEL D. 1984/85
Vendenheim	Grand Est	France	111 burials; phase <i>Rubanée recent</i>	JEUNESSE 2002; BOES et al. 2005
Wettolsheim	Grand Est	France	Heavily disturbed cemetery; 6 inhumations; assumed to be Late LPC	GLORY 1942; VEIT 1996, 88
Wittenheim	Grand Est	France	Small cemetery of 7 burials	VERGNAUD, MAUER 2014
Maizy	Hauts-de-France	France	3 burials of <i>rubanée</i> LBK, the third one destroyed; despite extensive examination of site no more traces of burials and settlements found	DUBOULOZ, PLATEAUX, LE BOLLOCH 1986
Menneville	Hauts-de-France	France	Outside of settlement group of 7 burials; traces of secondary disturbance and/or exhumation and deprivation of graves as well as of a settlement	FARRUGGIA, HACHEM, GUICHARD 1996
Champcueil	Île-de-France	France	About 12 burials of Paris basin LPC destroyed without close observation	BAILLOUD 1964; VEIT 1996, 89
Fellbach-Oeffingen	Baden-Württemberg	Germany	102 inhumations and 8 cremations; settlement nearby	HOFFMANN 1971; BIEL 1987; SCHMITT, RIEDE 1990
Königschaffhausen	Baden-Württemberg	Germany	7 burials; settlement in 1 km distance	KRAFT, HALTER 1936; KAHLKE 1954a; GALLAY 1970; GERHARDT 1981; STORCH 1985
Mannheim-Seckenheim	Baden-Württemberg	Germany	Mainly cremations, number of burials not mentioned; settlement nearby	GROPENIEßER 1965; HOFFMANN 1971; SANGMEISTER 1983; VEIT 1996, 86
Schwetzingen*	Baden-Württemberg	Germany	202 inhumations, 25 burials destroyed without proper documentation, and 8 cremations	BEHRENDTS 1989; GERLING 2012; FRANCKEN 2016; GERLING, FRANCKEN 2016
Stuttgart-Mühlhausen	Baden-Württemberg	Germany	247 burials and/or remains, 177 of them certainly of LPC origin	BIEL 1982; PRICE et al. 2003; BIEL 2013; unpublished master thesis by M. Seitz in 1989
Vaihingen	Baden-Württemberg	Germany	110 skeletons and/or skeletal remains as well as large number of single bones	RÖSCH 1995; KRAUSE 1996, 1997, 1998
Waiblingen	Baden-Württemberg	Germany	At least 5 inhumations; settlement pits nearby	PARET 1952, 1954; GAEBELE 1970; VEIT 1996, 85
Aiterhofen-Ödmühle*	Bavaria	Germany	160 inhumations, 69 cremations; some settlements nearby	NIESZERY 1995
Dillingen-Steinheim*	Bavaria	Germany	28 burials	NIESZERY 1995
Essenbach-Ammerbreite*	Bavaria	Germany	29 inhumations; settlement nearby; cemetery assumed to be part of a larger grave field	BRINK-KLOKE 1990
Mangolding*	Bavaria	Germany	13 burials, assumed to be part of a larger cemetery	NIESZERY 1995

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Niederpörling-Leitensiedlung (at Oberpörling)*	Bavaria	Germany	Group of 7 inhumations; settlement nearby	PECHTL et al. 2018
Regensburg-Kumpfmühl*	Bavaria	Germany	10 inhumations assumed to be part of larger cemetery	REITMAIER 2018
Sengkofen*	Bavaria	Germany	29 burials with 29 individuals, at least 10 more destroyed without further documentation; assumed to be part of bigger cemetery	OSTERHAUS U., PLEYER 1973; NIESZERY 1995, 245
Stephansposching	Bavaria	Germany	40 burials (25% inhumations, 75% cremations); assumed to be part of larger cemetery	SCHMOTZ 1984, 1986, 1992, 2002
Wallmersbach	Bavaria	Germany	Group of 14 burials; settlement nearby	NADLER 2010, 2011a, 2011b, 2016
Butzbach	Hessia	Germany	21 burials; uncertain if really of LPC origin; settlement nearby in 200 m distance	SANGMEISTER 1951; PREUSCHOFT 1962; ANKEL 1963; MEIER-ARENDT 1964, 1966
Oberweimar	Hessia	Germany	Unpublished cemetery	PESCHEL 1992, 10
Wiesbaden-Biebrich	Hessia	Germany	15-18 burials; heavily disturbed cemetery	MANDERA 1963
Wittmar	Lower Saxony	Germany	14-16 burials of Middle LPC origin, one of Stroke-ornamented and 34 of Rössen/Roessen culture origin	RÖTTING 1983; SCHNEIDER 1983; RINNE, KRAUSE-KYORA 2015
Arnoldsweiler	North Rhine-Westphalia	Germany	229 burials; settlement nearby	CZIESLA, IBEILING, ALTEMEIER 2014
Bergheim-Zieverich	North Rhine-Westphalia	Germany	26-30 burials; settlement nearby	HEINEN, NEHREN 2004
Holz (Jüchen)	North Rhine-Westphalia	Germany	21 burials, another 8 pits without finds assumed to be burials too	RICHTER 2011
Inden-Altendorf	North Rhine-Westphalia	Germany	120 burial pits without preserved skeletal remains; settlement nearby	CLARE et al. 2014
Merzenich-Morschenich	North Rhine-Westphalia	Germany	280 burials; settlement nearby	GAITZSCH, JANSSENS 2010; CZIESLA, IBEILING, ALTEMEIER 2014
Niedermerz	North Rhine-Westphalia	Germany	102 inhumations and up to 11 cremations; phase 1b/c/IIc according to Dohrn-Ihmig	IHMIG 1971; CZARNETZKI, CZARNETZKI 1972; DOHRN-IHMIG 1983; HOYER 2005; HOYER 2009; HOYER 2010
Warburg-Hohenwepel	North Rhine-Westphalia	Germany	Around 100 graves; partially destroyed cemetery assumed to be about one half of a larger grave field	POLLMANN 2012, 2016
Flomborn	Rhineland-Palatinate	Germany	85 burials; phase II according to Meier-Arendt	KAHLKE 1954a; RICHTER 1969; PAVÚK 1972; HÖCKMANN 1982; VEIT 1996, 86
Dresden-Nickern	Saxony	Germany	5 burials; some of them cut by Stroked Pottery culture pits	BAUMANN 1960b, 1962, 1964; KURZ 1994; BARTELS et al. 2003
Derenburg „Meereinstieg II“	Saxony-Anhalt	Germany	Cemetery and two single burials outside of grave field, in summary 43 findings with 49 individuals; settlement nearby	FRITSCH et al. 2011
Grossörner	Saxony-Anhalt	Germany	Group of 5 inhumations	BACH 1978; NIESZERY 1995, 246
Halberstadt „Sonntagsfeld“	Saxony-Anhalt	Germany	37 findings with 40 individuals; settlement nearby	FRITSCH et al. 2011
Halle-Trotha	Saxony-Anhalt	Germany	5 burials, one of them assumed to be from settlement pit	BUTSCHKOW 1935; FISCHER 1956; TOEPFER 1961; HOFFMANN 1973, 1978; VEIT 1996, 81
Naumburg	Saxony-Anhalt	Germany	Group of 6 inhumations	HOFFMANN 1978; NIESZERY 1995, 245
Roßleben	Saxony-Anhalt	Germany	5 inhumations; nearby traces of LPC and Stroke Pottery Culture settlements as well as another 3 burials	NIKlasson 1927; GRIMM 1930; BUTSCHKOW 1935; HEBERER 1940; KAHLKE 1954a; FISCHER 1956; HOFFMANN 1978

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Seehausen	Saxony-Anhalt	Germany	4 inhumations; nearby settlement with another burial	KAHLKE 1956; GRIMM 1964; HOFFMANN 1978
Arnstadt	Thuringia	Germany	14 inhumations and 19 cremations of the LPC and Stroked Pottery culture, 25 of the burials assumed to be LPC graves	NEUMANN, WIEGAND 1940; KAHLKE 1954a; HÖCKMANN 1982
Bischleben	Thuringia	Germany	6 burials, at least another 5 destroyed; settlement findings, which may be illuviated	FLORSCHÜTZ 1926; GERHARDT 1953; KAHLKE 1954b; VEIT 1996, 80
Bruchstedt	Thuringia	Germany	59 inhumations, cemetery assumed to contain up to 75 burials; settlement nearby	KAHLKE 2004
Höngeda	Thuringia	Germany	6 burials; 54. to first half of 51. century BC, according to radiocarbon-dating	KÜBNER 2017
Niederdorla	Thuringia	Germany	2 destroyed LPC cemeteries with inhumations and cremations	WALTHER 1991
Sondershausen	Thuringia	Germany	44-45 burials, another 2-3 destroyed; settlement nearby in 100-120 m distance	KAHLKE 2004
Wandersleben	Thuringia	Germany	169 burials with 216 individuals and 132 cremations	BACH 1986
Elsloo	Limburg	Netherlands	66 inhumations and at least 47 cremations, 130 burials approximately; settlement nearby; phase II c/d according to Moddermann	MODDERMANN 1970; VAN DE VELDE 1992
Giebułtów (formerly "Gebhardsdorf")	Powiat Lwówecki	Poland	7 supposed burial pits, skeletal remains in only 2 of them	DZIEDUSZYCKA 1959; NIESZERY 1995; VEIT 1996
Modlniczka 2	Powiat krakowski	Poland	36 cremation burials	CZEKAJ-ZASTAWNY, PRZYBYŁA 2012
Mlynárce	Nitriansky kraj	Slovakia	About 20 burials; nearby settlement at a distance of approx. 300 m	PLESL 1952; STÉKLA 1956; NOVOTNÝ 1958; TOČÍK 1970; PAVÚK 1972
Nitra*	Nitriansky kraj	Slovakia	75 inhumations, one additional burial assigned to the <i>Baden</i> culture	PAVÚK 1972; HÖCKMANN 1982

4.2. *Distribution of Linear Pottery cemeteries*

The “GoogleMapper” function of the Montelius Database enables the creation of supranational distribution maps of sites. This opportunity was exploited to establish a map of Linear Pottery cemeteries as listed in table 1, which can be found in the appendix (Fig. App. 1). Immediately striking is the limitation of grave fields to valleys and riverscapes, mostly following a narrow route, despite Linear Pottery settlements also appearing in other landscapes and spreading out toward the zones where grave fields were absent, as well as the numerical disproportion between extra-mural grounds and villages, as seen by comparing the distribution map of cemeteries to the one showing settlement finds across Central Europe (Fig. 38). Some areas such as the vicinity of Strasbourg, Stuttgart or the zone east to Cologne consist of close assemblages of cemeteries. This might not be surprising at first, since these regions are well-known centres of Linear Pottery settlement activities, however, an extensive amount of settlement findings has also been found in areas where only a few grave fields were excavated. In the western distribution zones in central France and Belgium and parts of the eastern regions such as Poland, Slovakia and Hungary, only a few sites have been published, despite settlement burials being known in these zones.³¹² Possible explanations include a lack of research and publications or missing information in the Montelius database, as



Figure 38: Distribution of Linear Pottery Culture settlement findings; created with the “Google Mapper” function of the Montelius database (STADLER 2019b, 431, Fig. 22.2)

³¹² NIESZERY 1995, 28.

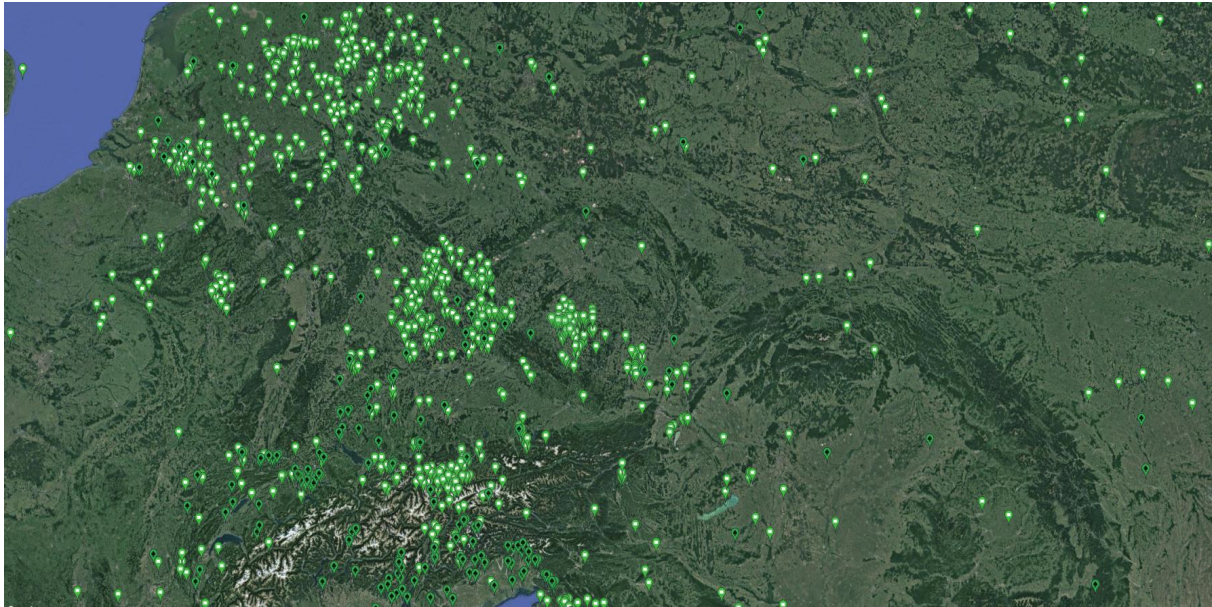


Figure 39: Distribution of Mesolithic settlement findings; created with the “Google Mapper” function of the Montelius database (STADLER 2019b, 430, Fig. 22.1).

demonstrated e. g. by the hiatus around the north-eastern Bohemian Massif at the border between the Czech Republic and Poland, where both settlements and cemeteries should be suspected but scarcely appear, as well as by the absence of long-awaited Hungarian grave fields. This, of course, doesn't explain the limitation of cemeteries to lowlands and river routes, with the high number of overall discovered Linear Pottery sites making it statistically unlikely that this is just a coincidence. It seems likely that grave fields mark the main routes of Early Neolithic expansion, which must have played an important role for communication and trading networks later on. They also could have been territorial markers, as it was suggested for Mesolithic burial grounds.³¹³ In this context the Mesolithic distribution, as shown in fig. 39., should be mentioned. Within the Bohemian Massif as well as an area east of the Upper Rhine in the southern German state of Baden-Württemberg there are zones of extensive Mesolithic settlement activity with only a few traces of Linear Pottery communities. These are suspected to be hunter-and-gatherer territories, where Mesolithic autonomy was maintained either by force or peacefully co-existing with farmers (or something in between), although hard facts other than the distribution maps remain absent.³¹⁴ On the northern limits of Linear Pottery distribution, in Belgium and around Cologne, a group of grave fields seemingly define a “border” between Early Neolithic and Late Mesolithic territory. If hunter-gatherers where

³¹³ ZVELEBIL 2008, 38.

³¹⁴ STADLER 2019b, 434.

seen as potential threats by Linear Pottery people, the establishment of territorial markers would have been a plausible step. Alternatively, cemeteries could have acted as social meeting areas intentionally positioned at central routes, with occasional funerary events where several nearby communities participate. Spatially separated clusters of burial pits, which show isotope divergencies implying different lifeways as well as migration, have in some cases been interpreted as zones for different villages instead of households or clans.³¹⁵ Neolithic cemeteries did not occur until the 53rd century BC, a period of Linear Pottery expansion and growing tension between the early farmers at later stages, as seen with massacre sites such as Talheim.³¹⁶ This situation could have required such meetings to regularly renew the social binding between villages, whereas spatial clusters with different properties still segregated those communities. A functional combination of central meeting points and territorial markers is also conceivable, to avoid monocausal interpretations for certainly complex Early Neolithic funerary rites.

³¹⁵ BICKLE, ANDERS 2013.

³¹⁶ WAHL, KÖNIG, BIEL 1987.

4.3. Local evaluations

4.3.1. Kleinhadersdorf

4.3.1.1. Introduction

The village of Kleinhadersdorf is associated with the municipality Poysdorf in the north-east of Lower Austria, about 15 km south of the Moravian border.³¹⁷ Settlement finds and destroyed graves are known in this area since at least the early 20th century. Soil erosion and ploughing within an extensive viticulture led to the first small rescue excavations in 1931 and 1936, which uncovered 21 graves. However, the results unfortunately provided only a limited amount of information due to insufficient documentation methods at that time. Further

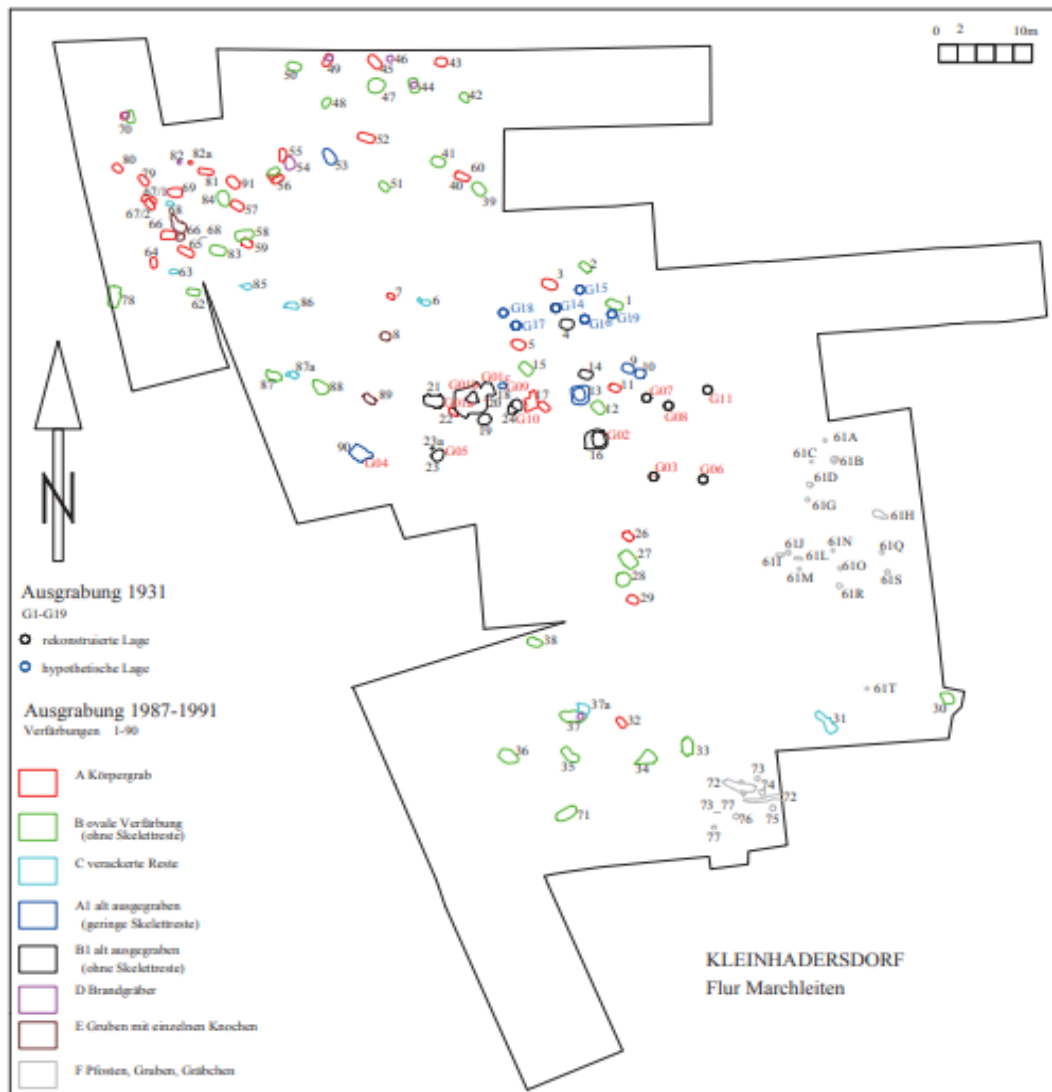


Figure 40: Original map of the cemetery Kleinhadersdorf (NEUGEBAUER-MARESCH, LENNEIS 2015a, 23, Abb. 7.).

³¹⁷ NEUGEBAUER-MARESCH, LENNEIS 2015a, 192–195.

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excavation campaigns in the late 1980s and early 90s revealed another 91 pits, whose results were fully published in 2015 by Christine Neugebauer-Maresch and Eva Lenneis (Fig. 40).³¹⁸

The reasons for the lack of graves in the north-east and east might lie in the highly uncertain preservation of the cemetery and the possibility that the whole area was not investigated. Numerous stray finds located south-east of the site imply a - at least partially - contemporary settlement.

An attempted reconstruction of the chronological phases of Kleinhadersdorf was carried out on the basis of 34 grave-pits (Fig. 41) with suitable pottery as well as the radiocarbon

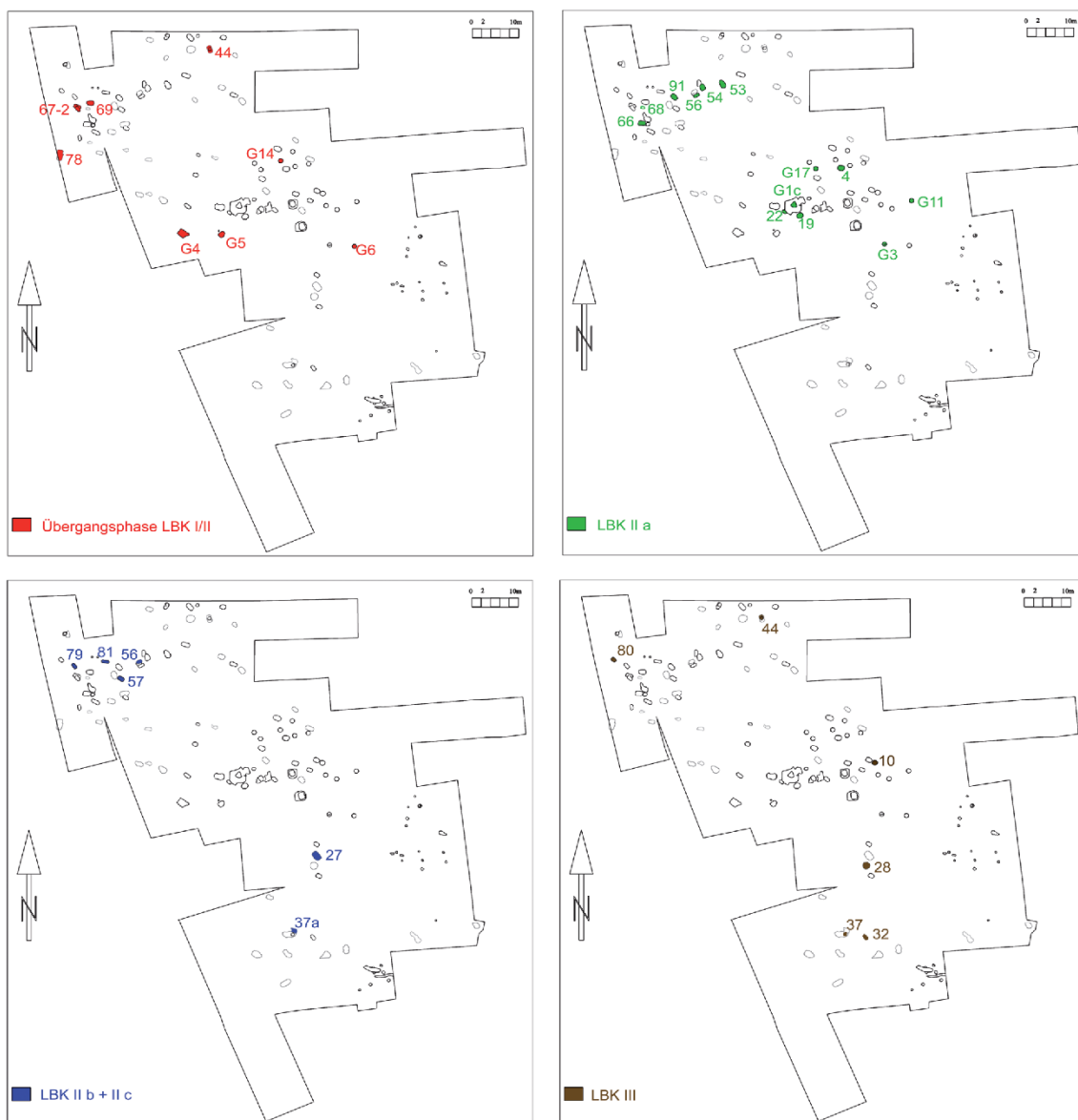


Figure 41: Chronological development of Kleinhadersdorf (NEUGEBAUER-MARESCH, LENNEIS 2015a, 110, Abb.38).

³¹⁸ NEUGEBAUER-MARESCH, LENNEIS 2015a.

information of another 11 burials, which could not be determined archaeologically.³¹⁹ Additionally, Peter Stadler contributed a sequencing of seven graves dated by pottery, for which there is also radiocarbon data, to define the timeframe of the respective phases. The first phase (*Übergangsphase LBK I/II*, translatable to “transitional phase Linear Pottery Culture I/II”) allocates to six graves in the northern area and five burials scattered across the central part of the cemetery. According to radiocarbon dating, grave 55 seems to be the earliest object. The average duration of this period was calculated by Peter Stadler with 25 years between about 5185-5160 BC. Seven graves in the north-west and eight in the central area could be assigned to the second occupancy phase *LBK IIa* (IIa1 and IIa2) based on the Moravian chronology, and approximately lasted for 35 years between 5160–5125 BC. Only ten graves belong to the third phase *LBK II b + c*, whereas object *Verfärbung 29* might also be assigned to the last phase if considering the radiocarbon information. They cluster in the north-west and spread from the northern to the southern area of Kleinhadersdorf. As this period was calculated to have lasted approximately a decade, between 5125 and 5023, it seems certain that many of the undatable objects should fall into this time period. The last occupation phase of the cemetery already belongs to the late phase or phase III of the Moravian Linear Pottery culture. Similar to the third phase, the duration of 48 years (5023–4975 cal. BC) seems too high for just a small number of nine graves. These scatter across the cemetery and do not emphasize one particular area. In summary, it can be stated that the occupation of the area of the cemetery of Kleinhadersdorf most probably began in the north as well as the centre and then extended to the south after 60 years (2-3 generations). The chronological information of the northern part (without the north-west) is the most dubious, as there are only two certainly dated graves, with traces of use appearing in the latest phase within the filling of one grave.

³¹⁹ STADLER, LENNEIS 2015.

4.3.1.2. *Distribution maps*

As the image database Montelius and the software WinSerion was involved in the initial publication of 2015, the distribution maps in this thesis are, for the most part, very similar. The main differences only lie in the typology of grave goods and partially in the classification of the burial positioning, which also resulted in a slightly different outcome of the Analysis N Next Neighbours in the following subchapter. Therefore, the quantitative evaluations provided here could be seen as an extension of the initial investigations.

The distribution of grave goods shows a relatively balanced ratio, with 51 pits without gifts in comparison to 57 furnished burials. Unfurnished objects occur more frequently than furnished ones in the southern third of the cemetery, while they both seem to appear around the same numbers in the northern half. Specific clusters are not observable, although two isolated graves at the south-eastern rim have been found without preserved grave goods. The anthropological information derives from the publication provided by Neugebauer and Lenneis (2015) instead of the Lifeways database, as it is the most recent and reliable data. Considering sex, most of the burials at Kleinhadersdorf unfortunately remain undetermined and thus offer only a limited amount of information. Age distribution shows no particular clusters of certain groups, but it should be noted that a relatively high amount of burials (32% - 18 individuals) are children graves, although that does not reach the proportions of Bruchstedt and Vedrovice, with the latter including 33 infants (phase I and II) and 12 juveniles, which sums up to an proportion of 40.9%.³²⁰ However, Kleinhadersdorf has a particularly larger proportion of infants phase I (10 of 18 graves or 55,5%), which is higher than at Rixheim (50%) and Nitra (54.5%). The age groups infants II and juvenile each comprise three (16.6 %) of the children with two (11 %) neonates, comparable to the proportion of neonates at Vedrovice (5 of 45 children, 11%). Comparing age and sex to grave good distribution, 8 of 10 women and 14 of 17 men received gifts, with older men generally receiving the most complex grave good assemblages, although women received the high-value spondylus more often, as discussed further below. Children are also remarkably well equipped, which is seen as rather unusual for Linear Pottery cemeteries. In terms of variety and complex, the “richest” burials

³²⁰ NEUGEBAUER-MARESCH, LENNEIS 2015a, 194.

overtake the ones found at Nitra, Vedrovice “Siroká u lesa” and Schwetzingen, while Aiterhofen-Ödmühle has similarly well-furnished burials in significantly higher quantities.

Concerning burial type, 87 individuals are assigned to inhumations, excluding another 11 pits with few skeletal remains.³²¹ 26 of 34 pits without human bones³²² are described as empty graves, whereas the similarity in outline, extent and depth to the graves with bodies was used as differentiation criteria between the empty grave-pits and the regular pits.³²³ This high number (29% of all burials) seems unusual, as among the larger cemeteries, only the Bavarian Aiterhofen-Ödmühle reaches such absolute quantities with 36 such graves, although the relative proportion is 13.6%. Empty graves scatter in the middle of the cemetery and seem to assemble more closely in the northern part of the cemetery as well as clearly clustering at the southern area. According to pottery in two graves, this area might not have been occupied before the phases IIc and III. Empty graves were not particularly richly gifted. Eleven unfurnished pits (42%) compare with 13 (50%) burials with at least sparse remains of pottery, of which four can be dated on this basis. *Verfärbung* 27 received three grave good vessels as well as fragments of another seven vessel units and dates to phase IIc. Only two burials are assigned to the first occupation phase I/II (Verf. 44, Verf. 78), while another (Verf. 28) corresponds to the late phase III. The ceramic remains of *Verfärbung* 15 only sufficed for a general assignment to the phases Ib-III. Other finds in empty graves are adzes (Verf. 37, Verf. 71), a grinding tool (Verf. 44), graphite (Verf. 1), animal bone remains (Verf. 15, Verf. 71, Verf. 78) and a hammerstone (Verf. 71). Four cremations (Verf. 37, Verf. 46, Verf. 54 and Verf. 82) have also been found at Kleinhadersdorf, whereas some could have been overlooked due to the outdated methods of the excavations of 1931 and other factors, as the shallow depth of the grave-pits as well as the disturbance and destruction of some grave-pits led to a finding situation which was difficult to interpret.³²⁴ *Verfärbung* 44 and *Verfärbung* 49 included cremated bone remains, but cannot be certainly determined as human or animal due to both being lost. Two cremations can be dated on the basis of pottery: *Verfärbung* 54 contained among other things sherds of the phase LBK II a and it superimposed the inhumation *Verfärbung* 55, which corresponds to the oldest radiocarbon-date of the cemetery.

³²¹ Grave 4, Verf. 8, Verf. 9, Verf. 10, Verf. 11, Verf. 13, Verf. 18, Verf. 51, Verf. 53, Verf. 89, Verf. 90, Verf. 91A.

³²² Verf. 1, Verf. 2, Verf. 4, Verf. 12, Verf. 14, Verf. 15, Verf. 16, Verf. 19, Verf. 20, Verf. 21, Verf. 23, Verf. 24, Verf. 27, Verf. 28, Verf. 30, Verf. 33, Verf. 34, Verf. 35, Verf. 36, Verf. 38.

³²³ LENNEIS 2015f, 72–76.

³²⁴ NEUGEBAUER-MARESCH, LENNEIS 2015a, 68–70.

Verfärbung 37, which has been found inside an empty grave and allocates to the southern part of the cemetery in contrast to the three northern cremations, includes several sherds of phase III, with one vessel showing the characteristic decoration of the middle Želiezovce phase. The remaining cremations lack diagnostic traits necessary for chronological determination.

Considering grave orientation, one might notice the complete absence of pits oriented to SW or S. On the contrary, more than half of the burials (55%) are assigned to SE-NW, while the antipodal NW-SE represents the second largest group (19%), followed by W-E (10%), E-W and NE-SW (both 6%), while N-S occurs two times (4%).³²⁵ SE-NW (and ESE-WNW) also represents the main orientation of Vedrovice (82,5%) and Nitra (50%). The Austrian sites Mitterndorf and Ratzersdorf are unfortunately insufficiently published and thus cannot be taken into consideration, while at Rutzing there is only one SW-NE-burial, with NE-SW and E-W alignments dominating. The distribution maps do not show certain clusters, although the rare orientations are to be found almost only in the central, northern and/or northeastern areas, which probably can be attributed to the larger number of determined orientations in these zones. Most interestingly, all W-E-assignments correspond to subadults and represent 31% in this age class, being only second to SE-NW (57%). One of the generally secondary NW-oriented graves contains an early infant (Verf. 80), while one of the two N-S graves belongs to a neonate (Verf. 64). The 13 determinable male graves are oriented to SE-NW (8 objects, 61%), NW-SE (4 objects, 31%) and E-W (one object, 8%), while alignments to W-E, N-S and NE-SW are absent. Unfortunately, the already small group of ten women is further limited to eight determinable orientations. Four (50%) were buried in the main orientation SE-NW, another two in the antipodal NW-SW and one each to N-S and NE-SW.

All of the deceased at Kleinhadersdorf were laid in a crouched position, with the left-sided crouch being the most common (85%), whereas only few graves include right-side individuals (15%).³²⁶ One right crouch could be determined anthropologically, which is the oldest grave at Kleinhadersdorf (Verf. 55) according to radiocarbon data; an adult woman with strontium-analyses implied her to be an immigrant, who also represents one of the two individuals with extensive spondylus necklaces and the only individual in prone torso position. Another

³²⁵ NEUGEBAUER-MARESCH, LENNEIS 2015a, 59–60.

³²⁶ NEUGEBAUER-MARESCH, LENNEIS 2015a, 64.

unsexed adult was laid in a similar position (Verf. 49). Other right-side crouches include a juvenile (Verf. 67-2), two infants (Verf. 7, grave 17b) and one undetermined individual (grave 2). Crouches with back-laid torsos are observable on twelve burials (35%), divided into two women (Verf. 32, Verf. 65), seven men (Verf. 3, Verf. 15, Verf. 17, Verf. 29, Verf. 40, Verf. 69, Verf. 79, Verf. 81) and three children (grave 17a, Verf. 11, Verf. 26). The intensity of the crouches does not seem to correlate with age or sex, as even children include the full range of variety. Moderate to wide angles between backbone and upper thigh dominate, while between upper and lower thigh tight to extreme angles overweigh, with the moderate and wide variations rarely occurring. As SE-NW is the main alignment and right crouches are absent, naturally most of the 33 determinable individuals looked to the SW (10 individuals, 31%) or S (9 individuals, 27%), followed by NE (5 individuals, 15%), N (4 individuals, 12%) and W (3 individuals, 9%). SE and NW are only represented by one individual, while E-alignments are lacking. Last but not least, concerning the burial position, the arms are mainly represented by the characteristic sleeper, which is also the case for the other cemeteries analysed in this thesis. Even the prone and right-side women in Verfärbung 55 has been found in sleeping position. Diverging positions can be found on a late mature man (Verf. 3) with differently crossed arms, an early adult woman (Verf. 32) with horizontally crossed arms, one child (Verf. 26) and two juvenile to adult men (Verf. 40, Verf. 81) with their hand on their shoulder as well as one child (Verf. 11) and one late adult woman (Verf. 65) with their right arm horizontally positioned to the torso and the left arm up. These “deviants” are scattered across the cemetery and do not assemble in clusters.

Considering pottery distribution, more specifically of intact grave good vessels and fragmented vessel units, one might note the cluster of the former at the north-western corner of the cemetery, while they occur rarely in other areas. Vessel units, on the other hand, appear frequently. In total, 49.5 % of all pits (including the ones without skeletal remains) contain pottery, which are 15% (16 of 110 graves) when excluding finds from the fillings. The pottery typology based on the vessel shape for this thesis differs from the classifications provided by Lenneis (2015) for Kleinhadersdorf. *Kümpfe* dominate within both typologies, with the classic bomb type 2a being the most common with five units, followed by type 2b. While the initial publication identifies 19 *Kümpfe*, there are only 14 in this thesis, which can be explained by these vessels either being assigned to other categories or to the uncategorized sherds, as

there was a lesser tolerance for small fragments to be classified. This effect is even greater with amphorae, which were reduced from eight – of which four were assigned to men – to three examples. High bowls and plates only occur in three graves and one miniature vessel in *Verfärbung 80*. Age and sex related patterns can be recognized with the three graves including Kumpf type 2 being male and the miniature vessel being assigned to a 3-4-year old infant. Possible spatial clusters could be the smaller groups of graves in the north-western corner and the centre where amphorae and Kämpfe assemble, although this corresponds to the general distribution of pottery in Kleinhadersdorf and thus just further highlights the dominance of Kämpfe as well as these areas as the main distribution zones of certain gift vessels, excluding filling sherds. Obvious connections to sex and age are not observable.

There are 14 (12.7% of 110) graves with ornaments, 19 (17.3% of 110) if including unmodified mussel shells.³²⁷ The overall distribution based on age and sex shows spondylus to be slightly more frequent in female graves with antler belt buckles and mollusc shells being common in male and infant burials. Spondylus belt buckles, as seen in various shapes in other cemeteries, are completely absent. Unmodified shells occur as *ostreaeidae* in two infant and one adult to mature male burial (grave 9, grave 17, Verf. 17), as *cardidae* in one unsexed grave (Verf. 21) as well as spondylus in two unsexed burials, one male and one female grave (Verf. 14, Verf. 17, Verf. 18, Verf. 32). Head ornaments are represented by 124 perforated Lithoglyphus naticoides shells in *Verfärbung 26* and potentially by one dentalium bead close to the human skull in *Verfärbung 67-1*, with both graves belonging to early infants. The other ornaments have been found around the neck, the pelvis or the extremities. Necklaces made of multiple spondylus beads have been found in the burials of one infant (Verf.22; 7 beads as well as the only spondylus pendant at Kleinhadersdorf), one early adult male (Verf. 29; 13 beads) and one late adult to early mature female (Verf.55, 5 beads). Any other beads, including the limestone ornament in *Verfärbung 17a* and the Vermetus bead in the adult to mature female grave in *Verfärbung 91a*, appear as single units. Pendants are represented by a spondylus aligned with the necklace in *Verfärbung 22* and one undetermined mussel shell assigned to a juvenile to early adult man in *Verfärbung 81*. An unusual two-holed spondylus shell (Code “Spondylus closure_Uncategorized00010”) lay between the neck and right shoulder of a 6-7-year old

³²⁷ Ornament: G1a, G3, G7, G15, G17a, 7, 17, 22, 26, 29, 55, 67-1, 91A, 81
Unmodified shells: G9, G17a, 14, 17, 21, 18, 32

infant. The perforations were made at a right angle to the edge of the shell, even though they are usually parallel to the edge. Due to the position of the item and the fact that it was only about a quarter of a spondylus valve, it is possible that the still valuable fragment of a spondylus shell was used as a robe decoration for the child. A single spondylus bracelet, the only one of its kind at Kleinhadersdorf, has been found around the arm of a late adult to late mature women in grave 1c.

The spatial patterning of ornaments demonstrates their main distribution to be around the centre with some smaller contributions to the north, while some burials can also be found in the south. Unmodified shells also concentrate in the centre with the southern *Verfärbung 32* being the only exception. Considering the chronological development, spondylus beads appear in the earliest phase I/II (grave 1a, Verf. 55), the second phase IIa (grave 3, Verf. 22) and the third phase IIB/c (Verf.29), with grave 15 being undetermined. The spondylus bracelet (grave 1c) as well as the vermetus (Verf. 91) and limestone beads (grave 17a) count to phase IIa, while the dentalium example (Verf. 67-1) corresponds to the last phase III. Pendants appear in IIa (spondylus, Verf. 22) and IIB/c (undetermined mussel, Verf. 81). The extensive ensemble of lithoglyphus naticoides shells in *Verfärbung 26* date to IIB/c. Antler belt buckles appear in phase IIa and III. Among the unmodified shells, two *ostraeidae* (Verf. 17, grave 17) and one spondylus (Verf. 17) can be assigned to IIa, while another spondylus occurs in the latest phase (Verf. 32). Overall, it seems that ornaments mainly appear in the earlier phases of the cemetery, although they persist until the end of the occupation of Kleinhadersdorf. Spondylus objects are restricted to the central area except for two women, which are statistical outliers according to the strontium isotope data of their bones.³²⁸ One of them is in *Verfärbung 55*, which is allocated to the north western corner and represents the oldest grave according to radiocarbon data, while *Verfärbung 32* in the southernmost cluster is one of the youngest graves at Kleinhadersdorf. Both individuals probably originated from the Bohemian Massif. However, the spondylus shells in the central area all belong to deceased individuals with locale isotope values.

Bone tools are represented by points produced from metapodia, antler and undetermined material as well as by some unique finds, while there are also animal remains. In summary - also including the antler belt buckles – there are eight graves with bone tools (7.3% of 110)

³²⁸ NEUGEBAUER-MARESCH, LENNEIS 2015a, 195.

and nine graves with animal bones (8.2% of 110). Most interestingly, not a single tool appears in the same grave as animal remains. Metapodia are mostly assigned to men between the age range of juvenile and mature (grave 1a, Verf. 17, Verf. 67-2, Verf. 79, Verf. 81) with one exception being the late adult to early mature woman in *Verfärbung 55*. The antler point belonging to a mature male individual (grave 9) as well as one uncategorized point found with an early adult man (grave 7) are the only deviants. A bone spatula has been found in the unsexed *Verfärbung 54* and only occurs at Kleinhadersdorf, which is also the case for the two perforated boar tooth horns gifted to the juvenile to adult man in *Verfärbung 81* (already discussed in chapter 3.8.5.). Animal bone remains appear as the femur of a cow (Verf. 71), a tibia fragment of a rabbit (Verf. 22) and another eight undetermined or uncertain remains within seven graves.³²⁹ The rabbit was gifted to an early infant, which seems coherent with the interpretation as a food offering, given the small size of both the animal and human. Only *Verfärbung 57* and *Verfärbung 81* – with the latter including bones of two different animals – could be determined as juvenile to adult males, while all other graves with animal bones remain unsexed. Overall, bone gifts are focused in the central and north-to-north-western area of the cemetery, with the only deviant being cow remains in the southern area, although – as already mentioned – tools and remains are divided. The relative chronology sees animal bone remains frequently appearing throughout the occupation of the cemetery, while the metapodia are absent in the latest phase III, although the uncategorized point corresponds to this phase. It should also be noted that not every point could be chronologically determined. The spatula is assigned to phase IIa, whereas the boar horns either fit with the earliest I/II or the later IIb/c, as the classification of *Verfärbung 81* is uncertain (Fig. 41).

At Kleinhadersdorf, 17 finds were classified by Lenneis under the main category “Stones (Hammerstones) and raw graphite”, as their functionality was often difficult to determine. A more detailed analysis of these stones – which consist of various materials such as sandstone, radiolarite, quartz or limestone – made it clear that in addition to the impact marks, whose intentional origin is uncertain in individual cases, they had several polished surfaces which defined their shape. The hammerstones on *Verfärbung 7* and *Verfärbung 22* both had traces of red chalk indicating that they were used to process the material. The 17 stones were divided

³²⁹ Uncategorized animal bones occur in Verf. 19, Verf. 23a, Verf. 57, Verf. 67-1, Verf. 78, Verf. 85 and two units in Verf. 86. The tibia in Verf. 85 belongs to a small ruminant, while a rib in Verf. 86 was determined as bovidae.

into 12 hammerstones, four pebbles and three units of raw graphite.³³⁰ The pebbles were either classified on the basis of their initial description, as the objects in *Verfärbung 44* (2 units) and *Verfärbung 69* were both nicknamed “*Kieselsteine*” (meaning “pebble stones”), or not assigned to the hammerstones, which is the case for the radiolarite stone in grave 1c. Raw graphite occurs in grave 8, *Verfärbung 1* and *Verfärbung 79*, and is listed under the main category “colouring” as non-perforated graphite stones (Code “Graphite stone00010”). When looking at the distribution of hammerstones, one might notice that some graves received two hammerstones (*Verf. 47*, *Verf. 79*, *Verf. 81*), while *Verfärbung 44* even had two hammerstones and two pebbles. Considering the anthropological determination, only a few graves could be identified. Among the burials with pebbles, one could be identified as a mature man (*Verf. 69*) and one as late adult to mature woman (grave 1c), while two juvenile to adult men (*Verf. 79*, *Verf. 81*) as well as two infants and one juvenile individual (*Verf. 7*, *Verf. 22*, *Verf. 43*) received hammerstones. As demonstrated by the relative chronology, hammerstones and pebbles seem to appear throughout the occupation of Kleinhadersdorf. Spatial groupings can be observed in two clusters of three graves in the northern rim and the north-western corner of the cemetery, while they occur sparsely in other areas. Only one grave in the southern half (*Verf. 71*) received hammerstones.

The burials at Kleinhadersdorf were unusually richly furnished with friction plates and grinding stones. Both object types probably served in the funeral context primarily for the grinding of red chalk, as demonstrated by traces of such on multiple querns and grinding stones. Overall, there are 22 objects in 16 graves, mostly produced from sandstone or quartz sandstone. Some friction plates are astonishingly thin, reaching heights between 2.5 and even under 2 cm, which almost certainly excludes them from being used as cereal querns. Most interestingly, a different raw material was used for the friction plates than for the grinding stones. While the latter are all made of medium-grain quartz sandstone, which suits the production of flour, the friction plates are made of fine sandstone and are more sufficient for the grinding of colour minerals, but not suitable for that of cereal grains. This means that there probably was a selection of distinct material for certain tasks. Among the few anthropologically determined individuals gifted with grinding tools, there are three infants (grave 10, *Verf. 67-1*, *Verf. 80*),

³³⁰ The graves which received hammerstones are as follows: *Verf. 7*, *Verf. 22*, *Verf. 43*, *Verf. 44*, *Verf. 47*, *Verf. 71*, *Verf. 79* and *Verf. 81*.

one juvenile individual (Verf. 43), six men (grave 7, grave 8, Verf. 40, Verf. 69, Verf. 79, Verf. 81) and one woman (grave 1c), which at least indicates a preference for male graves, although the high number of unsexed burials should be considered. Grinding tools appear in every phase of the cemetery occupation, according to the relative chronology, but seem to be slightly more frequent in the later phases IIb/c and III. They are focused in the northern half of the cemetery without a single contribution to the southern areas, and assemble in small groups in two nearby graves, while a cluster of five graves appears in the north-western corner.

Colouring is represented by the already mentioned graphite stones and the distribution of red chalk powder to nine graves, which was mainly spread around the head of the deceased.³³¹ Raw haematite and other material used for producing the red colour has not been found. While the raw graphite stones were gifted to two men and one unsexed individual, red chalk powder contributes evenly to men (grave 1a, Verf. 69, Verf. 81), women (grave 1c, Verf. 5A, Verf. 56) and infants (grave 9, grave 17a, Verf. 59), with four of six adults reaching late adult to mature age stages. Most interestingly, all male graves seem to correspond to the earliest chronological phase I/II, although *Verfärbung 81* might also belong to phase IIb/c (see Fig. 41), as does the female grave 1c. Every other burial is associated with the second stage IIa, and none contribute to the latest phase III. There is also a spatial absence of red chalk in the southern area connected to the high number of empty graves in this zone. A cluster of four burials is allocated to the centre, with the remaining units assembling in the north-western zone.

Polished stone tools were almost exclusively produced from amphibolite, which is suggested to come from the Giant and Jizerské Mountains in northern Bohemia on the border with Poland, where also the raw material of Vedrovice might originate.³³² A distance of about 360 km to this deposits highlights the importance of high quality stones for production. The high standardization in the processing of the equipment also allows for the possibility of production in the vicinity of the raw material deposits followed by the export of the finished goods. There are 21 adzes in total; perforated wedges have not been found at Kleinhadersdorf. All objects are damaged to varying degrees and/or show signs of use wear. The distribution of polished

³³¹ Distribution of red chalk powder: Grave 1a, grave 1c, grave 9, grave 17a, Verf. 5a, Verf. 56, Verf. 59, Verf. 69, Verf. 81.

³³² LENNEIS 2015a.

stone tools was limited to one adze per grave. Adze Type 3 dominates (10 graves), followed by Type 2 (8 graves), while Type 1 (Verf. 57), Type 3 (Verf. 90) and one undetermined find (grave 5) contributed to one pit each.³³³ The latter was excavated in 1931 and described as “beautiful black adze” but was unfortunately lost. An analysis of the general conditions of 16 selected shoe-last adzes shows four to be non-functional due to use wear. As Lenneis already stated, for the production of flat adzes (Type 2) less valuable materials such as quartz phyllite and Schiefergneiss were used instead of amphibolite, implying distinctions between shoe-last adzes and flat adzes, along with the fact that three of five type 2 units have been found in empty graves, while not a single shoe-last adze was gifted to such. The small number of flat adzes can be compared to Nitra and Vedrovice; in Aiterhofen-Ödmühle the ratio between the different types seems more balanced (see chapter 4.3.4.). All sexually determined individuals with polished stone tools were men, while two early infants (grave 9, Verf. 22), one juvenile (Verf. 67-2) and one neonate (Verf. 64) could also be identified. Graves with more than one adze, as seen e. g. at Aiterhofen-Ödmühle, are absent. Chronologically there seems to be an absence of adzes in phase 3, although that might be due to some burials remaining uncertain. Spatial groupings are once again observed in the north-western corner, but this time most of the objects are assembled in and around the centre. Two adzes of type 2 lie in the southern graves *Verfärbung 37* and *Verfärbung 71*.

Chipped chert artefacts are represented by 27 objects distributed to 12 graves. The raw material deposits originate from the 40-50 km distant Kromauer Forest (Krumlovsky les chert) in Bohemia and the even further away – around 280 to 290 km – southern area of the Kraków-Częstochowa Upland (Silex of the Polish Jurassic) in Poland.³³⁴ The Szentgál radiolarites originate from the Bakony Mountains north of Lake Balaton in Hungary, from a distance of 190-195 km. Some artifacts were burned, with the raw material of others being undeterminable for different reasons. Raw material sources near Kleinhadersdorf are not known. There are possible connections to Vedrovice, where Linear Pottery people most likely relied on the same raw material. The macrolithic artefacts divide into three sickle blades (grave 1c, Verf. 17 with 2 units), five non-retouched blades (Verf. 17, Verf. 52, Verf. 70, Verf. 79) and two flakes (grave 14, Verf. 60). The modified blades with sickle gloss had truncations.

³³³ Distribution of Adze Type 2: grave 3, grave 9, Verf. 22, Verf. 37, Verf. 40, Verf. 64, Verf. 68, Verf. 71; Distribution of Adze Type 3: grave 1a, Verf. 6, Verf. 17, Verf. 44, Verf. 67-2, Verf. 79, Verf. 81, Verf. 87, Verf. 90.

³³⁴ MATEICIUCOVÁ 2015, 112.

Microlithic chert tools are represented by one irregular flake (Verf. 81) and several trapezoidal flakes and blade flakes, which can be interpreted as arrowheads.³³⁵ They are usually laid down as single pieces, although *Verfärbung 79* and *Verfärbung 81* contain eight and three microliths, respectively. Symmetrical trapezes such as in Vedrovice or triangular arrowheads comparable to the ones at Aiterhofen-Ödmühle are absent at Kleinhadersdorf. With the exception of the early adult female in grave 14, the late adult to late mature women in grave 1c, the two unsexed individuals in *Verfärbung 52* and *Verfärbung 70* as well as the infant in *Verfärbung 22*, all individuals with chipped stone artefacts were identified as men ranging between adult and mature age. Only seven graves could be determined chronologically, of which three correspond to IIa and another four to IIb/c, although the latter includes *Verfärbung 81*, which either dates to I/II or IIb/c (Fig. 41). Nevertheless, there seems to be a strong preference for the second and third period of the cemetery. Spatial groupings are once again observable in the north-western corner with some distributions to the northern and central parts as well as a complete absence in the southern half of Kleinhadersdorf.

³³⁵ Distribution of trapezoidal flakes: Verf. 79, Verf. 81 (two units). Distribution of short trapezoidal blade flakes: Verf. 22, Verf. 52, Verf. 57. Distribution of wide trapezoidal flakes: Verf. 17, Verf. 40, Verf. 52, Verf. 79 (seven units).

4.3.1.3. *Analysis N Next Neighbours*

As already mentioned, the most recent revision about the site provided the results of an Analysis N Next Neighbours carried out by Peter Stadler, which used the data for pit orientation, burial position and red chalk distributions.³³⁶ Five spatial clusters could be visualized and will be discussed in the following, although they should be cautiously reviewed due to empty spaces between those groups and as their properties were most likely heavily influenced by erosion. As there is already a major uncertainty factor, which is additionally enforced by the low number of sexed individuals, as well as a detailed report already being available in the original publication, only the most significant points will be mentioned.

The NW-group is densely occupied and includes a remarkably close assembling group of four men, of which Verfärbung 81 is the 17-25-year old man gifted with the boar tusk horns from the earliest phase of Kleinhadersdorf. One of the five empty graves (Verf. 84) as well as one of the cremated remains (Verf. 82) of the NW-cluster also lie within this group of men. One of the heavily disturbed graves (Verf. 66) is a juvenile immigrant, as evidenced by isotope-analyses. The western edge comprises of five subadults with north-oriented burial pits. A small group of graves (Verf. 85, Verf. 86, Verf. 87, Verf. 87a, Verf. 88) between the NW-cluster and the central zone might be the last members of a distinct, unpreserved cluster. Overall, the north western corner represents less homogenous burial positions than the central area of Kleinhadersdorf. The latter also includes a row of north-oriented subadults, while a small

Table 2: Structure of the grave groups (NEUGEBAUER-MARESCH, LENNEIS 2015b, 181, Tab. 40).

Gruppe	Männer		Frauen		Kinder		Brandgräber + n.b.		Leergräber	
	n	Grab/Verf.	n	Grab/Verf.	n	Grab/Verf.	n	Grab/Verf.	n	Grab/Verf.
NW (1)	4 adult 1 matur	57, 65, 79, 81 69	3 adult 1 matur	55, 65, 91-1 56	1 neonatus 3 infans I 1 infans II 1 juvenil	64 67-1, 70, 80 59 67-2	2 Brandgr. 2 n.b.	54, 82 66, 68	5	58, 62, 78, 83, 84
N (2)	1 adult	40			1 juvenil	43	2 Brandgr. 2 Erw. 2 n.b.	44, 46 45, 49 52, 53	6	39, 41, 42, 44, 48, 50
Zentrum (3)	3 adult 3 matur 3 erw.	G. 7, G. 16, G. 19 3, 17, G. 1a 10, 90=G. 4, G. 8	3 adult 2 matur	5-1, G. 14, G. 15 G. 1b, G. 1c	1 neonatus 6 infans I 1 infans II 1 infans II 1 juvenil	5-2 22, G. 3, G. 9, G. 10, G. 17a, b 11 7 G. 18	1 matur n.b. 1 Erw. 3 n.b.	G. 6 G. 11 8, 18, 89	4-5	1, 2, 12, 15
S (4)	1 adult	29			1 infans I	26			2	27, 28
S (5)			1 adult	32					6-7	33-37 38?

³³⁶ NEUGEBAUER-MARESCH, LENNEIS 2015b. – STADLER 2015, 167–168.

group of women contrasts the situation in the north-western corner. It was assumed that the central group was initially even more densely occupied than observed during the excavations, as the empty spaces between the graves presumably contained unpreserved burials. Most interestingly, the $\delta^{15}\text{N}$ -values of three men (8, 16, 19) and one assumedly male infant (9) are significantly lower than in other groups and thus indicate a low-meat diet, which is unusual considering male individuals generally show above-average values. Additionally, the extremely low $\delta^{13}\text{C}$ -values of a woman in *Verfärbung* 5 imply a vegetarian diet. The N-cluster is less densely occupied than both the NW-group and central assemblage and are unfortunately poorly preserved, which prevents the determination of sex or age-based groups. A compact group consisting of one infant (Verf. 26), two empty graves (Verf. 27, Verf. 28) and one man (Verf. 29) lying in a row near the central area represents the southern cluster, which had a short occupancy duration. The most southern cluster mainly contains empty graves as well as the female burial *Verfärbung* 32, while the burial pit *Verfärbung* 31 in the south-eastern corner of Kleinhadersdorf might be the remnant of another, unpreserved cluster.

The conservation status and size of the different clusters only suffices for an analysis and comparison of the north-western and central areas.³³⁷ The age and gender distribution seem

Table 3: Burial position, orientation and red chalk powder distribution within the clusters (NEUGEBAUER-MARESCH, LENNEIS 2015b, 183, Tab. 41).

Gruppe	Orientierung		Hocklage (Karte Abb. 58)	Rötelseuerung (Karte Abb. 60)
	Körpergräber	Leergräber		
NW (1)	2 O-W (81) 5 SO-NW 1 W-O 4 NW-SO 2 N-S 1 NO-SW	3 O-W=W-O 1 SO-NW =NW-SO 1 N-S=S-N 1 NO-SW	11 links 2 rechts (55, 67-2)	2 Männer, 1 Frau, 1 Kind
N (2)	1 W-O 1 NW-SO	1 O-W=W-O 4 SO-NW =NW-SO 1 NO-SW	5 links 1 rechts (49)	0
Zentrum (3)	1 O-W 17 SO-NW 3 W-O 3 NW-SO 1 NO-SW	4 SO-NW = NW-SO	16 links 2 rechts (7, G. 2)	1 Mann, 1 Frau, 3 Kinder
S (4)	2 SO-NW	1 SO-NW = NW-SO 1 O-W=W-O	2 links	0
S (5)	1 SO-NW	3 SO-NW = NW-SO 2 O-W=W-O 1 N-S 1 NO-SW	1 links	0

³³⁷ NEUGEBAUER-MARESCH, LENNEIS 2015b, 182.

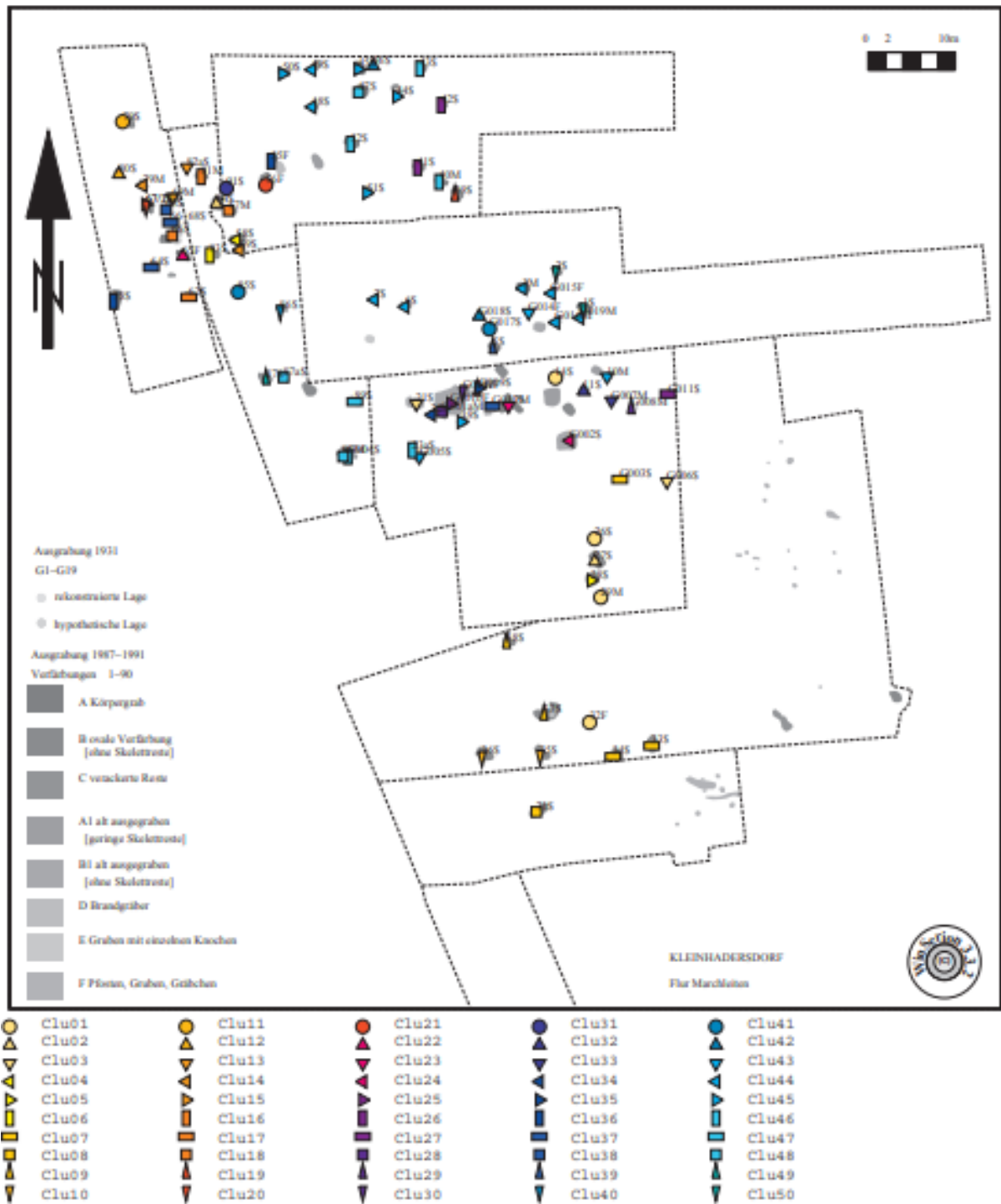


Figure 42: Analysis N Next Neighbours of Kleinhadernsdorf (STADLER 2015, 167, Abb. 69).

to be largely similar within both groups, but the proportion of women is significantly lower in the central zone. A balance would only be possible if all unsexed adults in this group were women. Small groups of men can be observed in both zones of the cemetery, although they do not really seem to be separated from women and children. The north western as well as the central areas were occupied during the total duration of the cemetery. Consequently, due

to the overall structure of Kleinhadersdorf, these areas were interpreted as distinct zones established for larger families or clans. Such explanations were also used for Sondershausen, whereas the distinction through empty spaces was far more pronounced than at Kleinhadersdorf, although the clusters III and IV seem to touch through grave 32, which can be compared with the graves *Verfärbung 54* and *Verfärbung 55* linking the north-western and central area at Kleinhadersdorf.³³⁸ Assemblages where both sexes as well as adults and infants were mixed, with an occasional quantitative dominance of either men or women, can also be observed at Sondershausen. Differences in the grave good ensembles within groups interpreted as “families” due to their spatial proximity can be seen as counter-argument for them belonging to the same clan or tribe, as argued by Podborský for Vedrovice “Siroká u lesa”.³³⁹ Nieszery, on the contrary, interpreted unfurnished or “poorly” equipped grave clusters within the spondylus-heavy southern zone of Aiterhofen-Ödmühle, which generally comprised of the most complex grave good assemblages, as hierarchies within the same clan.³⁴⁰ Such distinctions are also observable within the Analysis N Next neighbours performed for this study. As expected, the outcomes are approximately in line with the results of the initial evaluation by Peter Stadler, although further differentiations could be made within the central zone. Its southwestern corner contains the most varied ornament assemblages as well as more colouring, adzes and bone objects than its north-eastern and northern part. The distinction of the latter regarding pit orientation and burial position is rooted in some traits being undetermined due to disturbance and is thus insignificant.

³³⁸ KAHLKE 2004, 48–50.

³³⁹ PODBORSKÝ 2002c, 336.

³⁴⁰ NIESZERY 1995, 209.

4.3.1.4. *Site summary and discussion*

The overall properties of Kleinhadersdorf, concerning anthropology, material culture, grave types, orientation and burial position seem to be mostly in line with other cemeteries of the south-eastern distribution area of the Linear Pottery Culture with varying degrees, although it also consists of some unique features and patterns distinguishing it from the remaining sites and establishing its individual nature. One of these peculiarities is the relatively high number of empty graves and subadult burials, with infants being especially abundant. Other special features can be found within its grave goods, such as the boar teeth horns and the bone spatula, the unusually frequent occurrence of grinding tools and animal bone remains as well as the presence of an antler bone point similar to an example found at Vedrovice “Siroká u lesa”. The common appearance of bone objects and grinding tools in male burials rather than infant and female graves is seen as unusual, as is the relatively rich equipment of children and the low number of men with spondylus ornaments, with women receiving this precious material more often.³⁴¹ This is contrasted by men generally receiving more complex and diverse grave good assemblages than women, with the most extensively furnished graves outshining the ones in Vedrovice, Nitra and Schwetzingen and being comparably “rich” to Aiterhofen-Ödmühle, although the latter includes significantly more such burials. However, it should be considered that the spare room in some pits at Kleinhadersdorf leave the impression of zones for non-preserved items, and thus the variety and complexity of gift assemblages should be reviewed with caution. Both Vedrovice and Kleinhadersdorf possibly used the same raw material deposits for importing chert for producing blades and microlithic arrowheads. The material for the polished stone tools was supposedly imported from northern Bohemia. The proportion of children receiving adzes (55.5%) is one of the highest known among the Linear Pottery cemeteries. Polished and perforated lithoglyphus shells as seen in the infant grave Verfärbung 26 also occur perforated in a female grave at Vedrovice as well as in an uncertain female burial at Sengkofen, although the shells inside the latter were not perforated. Pottery form and decorations characteristic for the Želiezovce and Šárka groups provide additional connections to the Moravian and Bohemian Neolithic as well as to Slovakia and Poland.

³⁴¹ NEUGEBAUER-MARESCH, LENNEIS 2015a, 194–195.

Erosion and other disturbances aggravate the determination of certain spatial patterns. The emphasis lies on two densely occupied areas in the centre and the north-western corner, while in the south there is a group of empty graves. An Analysis N Next Neighbours already provided by Peter Stadler in 2015 shows small clusters including men, women and children, which never exclude each other within both groups. Grave-rites such as crouch intensity and orientation were more homogenous in the north-western part. Both the central and north-western area show groups of north-oriented children as well as small assemblages where either men or women dominate. The Analysis N Next Neighbours performed for this study confirms most of the previous results, although further differentiation could be made within the central area, which includes its most varied assemblages in its south-western corner, indicating hierarchical structures of families or clans. Most interestingly, spondylus was limited to the centre with the exception of two women in the southern and the north-western area respectively, which are both outliers according to strontium isotope analysis. While the southern individual could be identified as one of the latest burials, the north-western deceased represents the earliest radiocarbon-dated person. Other saltwater shells of the species Cardidae and Ostreaeidae also concentrate in the centre. The frequency of hammerstones at the northern edge imply the presence of a cut-off cluster in this area, although they seem to be less significant at the centre and south. Regarding chert objects, sickle blades are restricted to the centre, while non-retouched blades and arrowheads are more common in the northern third of Kleinhadersdorf. Grinding stone tools appear in the central, northern and north-western parts. All other grave good types are either focused in the central and north-western parts of the cemetery, or scatter across the site, with some subcategories showing preferences for certain areas. Chronological patterns as demonstrated by radiocarbon information show the northern areas and the centre to be the earliest, while the southern part of Kleinhadersdorf was first used in the third occupation phase IIb/c according to the Moravian chronology.

The isotopic results as provided by the Lifeways database stresses uniformity rather than structured variation, as the majority of the community lived and sourced their food in this area and its vicinity, with strontium isotopes showing low mobility when compared to other grave fields. A social hierarchy or distinctions between the different sexes could not be identified by diet, which indicates that access to certain food types was not restricted to some social

groups. However, the more recent investigation as provided by Neugebauer-Maresch and Lenneis shows some particularly low $\delta^{15}\text{N}$ -values for some male individuals in the central group, indicating a low-meat diet unusual for Linear Pottery men, while another woman (Verf. 5) probably ate purely vegetarian food as implied by her $\delta^{13}\text{C}$ -values. The early adult woman in grave *Verfärbung 32* (southern area) represents one of the outliers and further highlights the connection to the Early Neolithic in Moravia and Bohemia, as suggested by pottery gifts in Šárka Style and strontium-data. Other “deviants” such as the elder woman in *Verfärbung 55* (NW-cluster), with her unusual right crouch and north-south-orientation but gifted with a valuable spondylus necklace of multiple beads, demonstrates that being atypical certainly does not equal a lesser status. The contrary might be the case, however, as Neugebauer Maresch and Lenneis proposed, that this elder women could have been one of the founding members of Kleinhadersdorf. As the connections to Vedrovice cannot be overlooked, it may be fitting to follow the interpretations proposed by Zvelebil and Pettitt as well as Whittle et al. for the find situation at the Bohemian site and use it for Kleinhadersdorf; researchers should not regard such burials such as *Verfärbung 32* and *55* as deviant or just narrow individual traits down to particular or defined identities such as social elite or hunter, but should instead “envisage something more fluid, in which lifeways are shaped by both inherited status and the development of a network of contacts”.³⁴² Without a doubt, the people of Kleinhadersdorf and Vedrovice stood much closer to each other than to the more uniform Nitra and the distinct southwestern German cemeteries, where distinctions are observable through the higher emphasis on cremations, different pit orientation and various other traits.

³⁴² ZVELEBIL, PETTITT 2008, 214. – WHITTLE et al. 2013, 127.

4.3.2. Nitra

4.3.2.1. Introduction

The cemetery is situated on the right bank of the river Nitra, on the southern edge of the city of its namesake in Western Slovakia.³⁴³ Its discovery in the year 1964 by building workers was followed by excavations in the same and the following year, which led to the exposure of 76 graves. They were found in two long, parallel trenches reaching up to a length of 50 m and a width of 15m (Fig. 43). Additional small trenches to the north-east and south-west discovered no further burials, whereas it should be noted that some were probably destroyed by building works. The majority of graves have been found in a main concentration at the northern end of the cemetery, with the pits assembling much closer than at Vedrovce “Siroká u lesa”. Burials outside this group were scarcely spread across the cemetery and rarely formed spatial clusters. At least eight groups of cremated human remains accompanied by Late Linear and Želiezovce Pottery were also uncovered by a bulldozer. Unfortunately, additional excavations in the vicinity have not been executed yet, which leaves open the possibility of an accompanying settlement.

The site Nitra generally dates to phase II of the Western Slovakian Linear Pottery. A more detailed attempt at classifying the graves chronologically and specifying certain groups on the basis of vessel ornaments was initially suggested by Pavúk in 1972 and recently supplemented by radiocarbon information from the Lifeways database. However, as pointed out in both

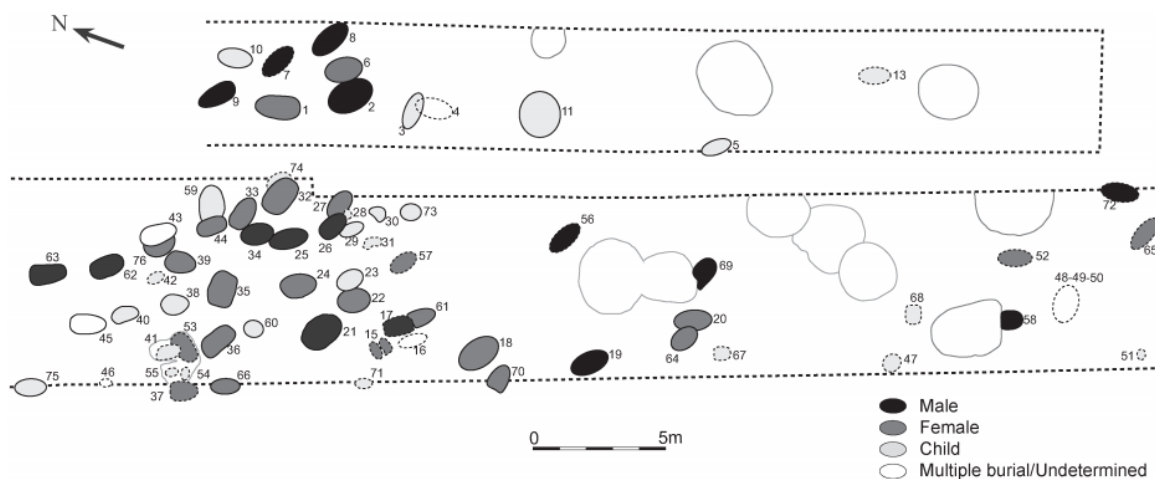


Figure 43: Map of the cemetery Nitra (WHITTLE et al. 138, Fig. 4.20.).

³⁴³ PAVÚK 1972, 5.

publications, the uncertainty of the Western Slovakian chronology (which needs further research), the small amount of 25 vessels with diagnostic traits, and the limited radiocarbon-information only offers preliminary conclusions about the sequential and spatial groupings of Nitra.³⁴⁴ The relative chronology (Fig. App. 49) should thus be considered with caution, as more extensive investigations – hopefully done in the near future – would certainly provide more suitable results. Concerning the isotope values for Nitra, the site lies on the border between the two geologies of the Tribeč Mountains in the north and the Danubian plain in the south, east and west, although the expected strontium values for common loess soils has been presumed for the site.³⁴⁵ Nitra, among other cemeteries, is the object of the investigations for the “Counter Culture” project, which succeeds the Lifeways project and awaits completion in 2020.³⁴⁶ Some of the preliminary results have been presented at the ENE-Conference in Barcelona in 2019 and revealed remarkable insights about the genetic origins of some of the deceased, which will also be discussed in the following.³⁴⁷

³⁴⁴ PAVÚK 1972, 82. – WHITTLE et al. 2013, 143.

³⁴⁵ WHITTLE et al. 2013, 147.

³⁴⁶ BICKLE, PIKE, CRAIG 2018.

³⁴⁷ HOFMANN 8.11.2019.

4.3.2.2. *Distribution maps*

The number of inhumations with preserved burial gifts outweigh the unfurnished ones with a ratio of 44 to 31 (ca. 58.7% to 41.3%), which is not as balanced as the values for Kleinhadersdorf, but average for Linear Pottery cemeteries according to the Lifeways database.³⁴⁸ In the main concentration of the eastern section, almost only furnished graves appear. There are only two burials deviating from the typical Early Neolithic inhumation: Grave 10 was absent of skeletal remains but had an amphora and thus might have been an empty grave or a cenotaph, while grave 12 was not determined due to its destruction, although it also had an amphora. At least eight groups of cremated human remains were uncovered by the bulldozer mostly in the main concentration area and are associated with similar styles of pottery as those found in the graves.³⁴⁹ One particularity are the graves 48-50, representing one triple burial without grave goods and a strongly suggested close relation: The adult female (48) seems to hug the centrally placed child (49), which rests against the skull and back of the second infant (50). They appear in the southern end of the western trench, far away from the densely occupied area. According to DNA-analyses performed within the “Counterculture” project, those three individuals were closely related.³⁵⁰ It should also be noted that both infants had skull traumas, indicating the reason for their death.

The anthropological determination of the 75 bodies at Nitra follows the information provided by the Lifeways database. Among the sexed individuals – not counting the biological data of secondary findings such as teeth – there are 20 certain and 6 uncertain women as well as 11 certain and 4 uncertain men.³⁵¹ According to age determination, the deceased divide into 49 adults, six adolescents, 16 juveniles and four infants. The majority of men and women died as adults, whereas a higher number of female individuals falling into younger age groups (18-35 years) probably relates to increased mortality after childbirth. Whittle et al. estimated the overall proportion of adults and children in particular to be slightly lower than expected for

³⁴⁸ In the original text, Whittle et al. described that “twenty-one of 74 graves had no goods at all (38%), which is average for LBK cemeteries”, although that is just a literal error, as the relative percentage fits more 31 unfurnished burials instead of 21 such features. WHITTLE et al. 2013, 142.

³⁴⁹ PAVÚK 1972, 39.

³⁵⁰ More details about the blood relation of the graves 48-50 have been revealed at the ENE-Conference at Barcelona and will be published in the near future, thus I will not pre-empt the outcome in this study. HOFMANN 8.11.2019.

³⁵¹ *The lifeways database speaks of 27 adult females, as they additionally count identifiable teeth and other objects which appeared as secondary human remains in unsexed graves.* See WHITTLE et al. 2013, 143.

Early Neolithic communities.³⁵² They also noted that the average age at death for infants between one and eight years possibly connects to various childhood deceases as well as an increased risk of gastrointestinal sickness during the dietary change from breast milk to more solid foods. When comparing grave good distribution to sex and gender, there is a ratio of 10 furnished to 2 unfurnished male burials and 13 furnished to 7 unfurnished female burials (both not counting uncertainly sexed individuals), whereas older men received the most extensive assemblages, although those do not reach the level in diversity and variety of the ensembles investigated in Kleinhadersdorf, Vedrovice “Siroká u lesa”, Aiterhofen-Ödmühle and Schwetzingen. Generally, it can be stated that Nitra represents the least well-equipped cemetery among the larger sites selected for this thesis. Considering spatial distribution, subadults focused in the north-eastern and north-western rim of the eastern section, while both adult and mature burials are more widely spread. Although men, women and children appear more or less evenly across the cemetery, three small clusters of female individuals as well as another two concentrations of infant graves were suggested by Pavúk.³⁵³ The high number of undetermined burials aggravates further investigations of possible spatial groupings.

Grave-pit orientation at Nitra shows a clear preference for SE-NW- and SSE-NNW-alignments, followed by significantly less ESE-WNW- and E-W-orientations and only few pits deviating from those directions.³⁵⁴ Some east-aligned burials cluster in the north-eastern rim of the eastern section, the individuals within the triple inhumation are also E-W-oriented. The burial position was predominantly left crouched, with three right-side exceptions (43, 45, 71), the bodies overwhelmingly laid to the side. Grave 69 contained a 20-year old, left crouched and prone-positioned man, while supine torsos were allocated to nine burials (2, 4, 8, 9, 37, 41, 58, 65, 70). The latter seem to be relatively high in the northern part of the eastern cluster, where four of nine graves included supine positioned individuals. Crouches predominately had a moderate angle between backbone and upper thigh combined with either extreme or tightly angled lower thighs. Other variants occurred very rarely; straight and wide angles between upper and lower thigh are absent. The arms were mainly found in a sleeping pose, with deviating positions seemingly not varying as much as in other cemeteries, however, Pavúk

³⁵² WHITTLE et al. 2013, 144.

³⁵³ PAVÚK 1972, 65.

³⁵⁴ 31 SE-NW, 16 SSE-NNW, 1 SSW-NNE, 1 SW-NE, 10 ESE-WNW, 8 E-W and 5 uncertain alignments.

notes a possible limitation of vertically upwards pointing left arms to men (72) and vertically upwards pointing right arms to women (37, 45), although the latter included one grave with undetermined sex (41). Such divisions cannot be confirmed for other cemeteries with certainty: Although the female and uncertainly determined female graves 18 at Dillingen and 65 at Schwetzingen had upwards pointing right arms and the male burial 24 at Essenbach-Ammerbreite the opposite gesture, the left arm of a female body inside grave 150 at Aiterhofen-Ödmühle was pointing up. As the main orientations are south-east- or east-aligned and left crouches dominate, the majority of persons consequently looked either to the west or southwest. Four of the nine individuals whose heads are turned to the south assembled in the north-eastern rim of the western section of Nitra. The only inhumations looking to the east are the three right-side crouched individuals within the graves 43, 45 and 71. The remaining deviant burials align to the NW (53), SE (35) or have their head supine positioned, looking up at the sky (65). Overall, the orientation and positioning at Nitra seems remarkably uniform, making the site one of the most conservative cemeteries of the Linear Pottery Culture.³⁵⁵

The number of intact or recently fragmented vessels clearly outweighed objects broken into sherds as demonstrated by the ratio of 33 grave goods to 9 vessel units (ca. 79% to 21%), which approximately fits the data for Vedrovice “Siroká u lesa” and Kleinhadersdorf, but significantly differs from Aiterhofen-Ödmühle and Schwetzingen. In summary, there were 39 burials containing pottery, with only graves 4 and 17 receiving two instead of one vessel.³⁵⁶ They were mainly placed around the head, most often in front of the face, sometimes behind the back, at the pelvis and at the feet, without obvious preferences according to age and sex. However, in three cases the pottery was placed at the hands of male individuals. Amphorae represent the relative majority of vessels (15 units) and often appear in neighbouring graves or at least in close proximity. The second largest group *Kümpfe* mainly consist of the typical bombs type 2a, with the exception of three graves (1, 7, 35), and are much more spread across the cemetery when compared to amphorae. Although Pavúk mentions globular shaped vessels to appear significantly more often in male than female graves,³⁵⁷ the typology of this thesis as well as the more recent anthropological data does not reflect such rules. High bowls

³⁵⁵ BICKLE et al. 2014, 154.

³⁵⁶ PAVÚK 1972, 67–69.

³⁵⁷ PAVÚK 1972, 68.

type 3b appear in the graves of a late mature woman (66) and an early infant (74). Miniature vessels have been found within the graves of three adult women (44, 53, 65), two approximately 7-year-old infants (30, 71) and one unsexed individual (4). Two male burials contained imported pottery assigned to the Alföld or Eastern Linear Pottery culture by the excavator, with one object being an amphora (2), and the other one a lens-shaped, densely ornamented biconical vessel (17).

The ornamental ensemble at Nitra seems notably less diverse than on other cemeteries. Belt buckles are represented by only one V-shaped spondylus closure belonging to a mature man in grave 2, which also included the Alföld-amphora. Another, unmodified and fragmented spondylus shell has been found in the pelvis area of a mature male individual in grave 34. Spondylus beads and pendants are much more frequently spread and are assigned to both sexes, although they are also limited to individuals that reached at least the late adult age stage. They were most often gifted as single pieces, with the exception of five beads in grave 6 and another three in grave 70. Unique finds are the bone plate bracelets in grave 3 and 58, with the former dating to the second chronological stage, and the necklace produced of human and dog-fox-teeth in grave 19, which were already discussed in chapter 3.8.5. and exclusively appear at Nitra. The only other bone tool type at the site, awls made of metapodia, were gifted as a single piece to a late adult to mature, unsexed individual in the Early Želiezovce grave 4 as well as twice to an adult woman in grave 14. The number of graves with spondylus ornaments at Nitra (10 burials or ca. 13%) counts significantly lower than Vedrovice, while the ones with bone gifts appear only slightly less (5 burials or ca. 7%). Among the few relatively dated graves, spondylus seems to be absent in the latest phase of Nitra, although the small sample size has to be considered.

The low diversity of grave goods can also be reflected within the grinding tool assemblage, with only two querns each assigning to a mature man which died in the Later Linear Pottery phase (25) and an undated 1.5-2-year old infant (31). Colouring gifts also seem underabundant, with red chalk powder occurring as powder around the left arm of an early mature woman in grave 36 – belonging to the latest chronological phase – and as small grains in front of the mandible of another early to mature female in the undated grave 64. Graphite lumps appear between the fingers of the left hand of a juvenile in grave 5 as well as in the grave filling of the previously mentioned Early Želiezovce grave 4. This stands in contrast to

the situation at other cemeteries and especially Vedrovice “Siroká u lesa”, where red chalk played an even more significant role than at other cemeteries, as well as to the abundance of black colouring at Aiterhofen-Ödmühle. Schwetzingen also contains relatively few such items compared to its large number of graves.

Polished stone tools occur as single units in 11 graves (ca. 14%) and mainly consist of the adze type 3, with only three graves deviating. All objects – except the uncategorized adze flake in grave 41, which could not be determined – were produced from amphibolite. Perforated adzes or disc maces are absent. All datable adzes either date to the Later Linear Pottery phase (8, 21, 25, 40) or to the Early Želiezovce (34, 76). A small cluster of polished stones are assembled on the eastern rim of the western section, while the remaining finds appear to be more or less scattered across the cemetery. The emphasis on adult men between the age range of 40 and 60 years, excluding the infant burial 40 and the late adult, uncertainly determined female individual in grave 76, can be expected for traditional Linear Pottery funerary rites.

Macrolithic chipped stone tools were found in four graves and are produced from chert, opale, limnoquartzite and radiolarite. Non-retouched blades appear twice in grave 4 and as single unit in grave 41, with both burials being unsexed. An endscratch and macrolithic flake belonged to an adult female in grave 14, while a blade with sickle gloss was gifted to a late mature man in grave 58. Burials 14 and 4 also included microlithic irregular blade flakes, with the latter containing two units. The remaining microlithic chert goods – an irregular and a trapezoidal flake – were gifted to a late adult to mature uncertainly determined female in grave 76. In summary, there are only 6 burials (ca. 7%) containing chert objects, which once again seems a small proportion when compared to the other cemeteries investigated in this study.

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4.3.2.3. Analysis N Next Neighbours

Despite its unusually distinct uniformity, there are some observable nuances in burial position and grave good distribution observable at Nitra through the Analysis N Next Neighbours. Empty spaces within the densely occupied area imply separated clusters, while burials outside this main concentration should be interpreted individually, as they do not form larger groups. The intercutting of 22 graves also indicate a certain spatial order. These superimposed graves almost exclusively represented adults, and only a few could be anthropologically determined in detail: same-sex successions occur two times (men at 26/27, women at 41/53), while women are superimposed over men four times and men over women once. Such intersections appear rarely in the Early Neolithic, but possible pairings of graves also exist at Elsloo. Based on all these categories, Pavúk proposed several spatial groupings (Fig. App. 50).³⁵⁸ In the southern area, one group consisted of burials 47-52, 58, 65, 78 and perhaps 72, 19, 20, 27, 69, 56 (group A). One group occurred on the northern edge and consisted of 38, 40, 62, 63, 76 and possibly the infant grave 42 (group B) with a second cluster including 39, 42, 43, 44, 59 (group C). In the east we find 2, 3, 8 and perhaps 7, 9 (group D) and 1, 4, 6, 10 and possibly 74 (group E). The clusters D and E distinguish themselves by having different pottery. For the more difficult to determine main concentration, Pavúk suggested a central cluster containing 21, 22, 23, 24, 25, 34 and perhaps 35, 36, 41, 53, 54, 55, 60, 66 (group F) and a western zone formed by 37, 41, 46, 55, 75 (group G). 74 and 32 might have succeeded 59 and 44,

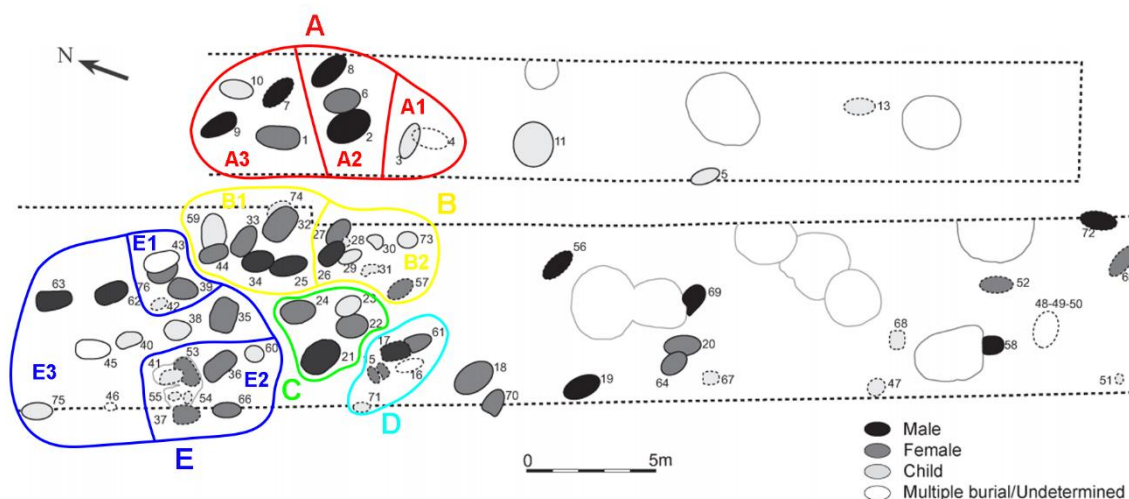


Figure 44: Spatial groupings as recommended for Nitra (original graph taken from WHITTLE et al. 2013, 138, fig. 4.20. and further modified).

³⁵⁸ PAVÚK 1972, 88.

respectively. 41 succeeding 53 and 37 intersecting 54 imply time depth in group G. Considering these suggestions, trait distribution and the outcome of the Analysis N Next Neighbours, the following groupings (Fig. 44) are recommended:

- Area A: Numerous supine bodies, relatively heterogeneous orientations and lines of sight, and an almost absence of unfurnished graves define the main concentration of the eastern section. The juvenile graves 3 and 4 (A1) represent the only burials which inherited bone objects (excluding the teeth necklace in grave 19), with 4 cutting into 3. Three mature graves (A2), of which two are male (2, 8) and one female (6), occur in a row and contain spondylus while lacking pottery in contrast to the other individuals in this area. Most interestingly, the two men lied alongside the woman – which was SE-oriented and looking W such as the majority of bodies at Nitra – with their torso either positioned as supine (8) or prone (2) and both had their heads turned SW. While the men additionally had typical male gifts such as adzes, the female individual was gifted with a comparably high number of six spondylus beads. It should also be mentioned that the western part of her burial pit cut the eastern part of grave 2. All these similarities, peculiarities and connections strongly imply a close relationship between those three graves, possibly defined by high social status, kinship or both. The remaining graves in this cluster (1, 7, 9, 10; A3) are less closely assembled. They are also distinguished from each other by being gifted with different kinds of grave goods and having distinct orientations and lines of sight. The absence of a skeleton in grave 10 while including an amphora implies a secondary removal of the body or a function as cenotaph or empty grave.
- Area B: The eastern edge of the western section is less uniform in its orientation and line of sight than other areas, while including a fair amount of pottery. There are various possibilities for subdividing this zone; The eastern row (27, 28, 30, 32, 33, 59, 73, 74) includes graves deviating from the dominating SE-NW-orientation and contains adzes, in contrast to the western row (25, 26, 29, 31, 34, 44, perhaps 57), which might be an extension of another row lying in the north-western part of the cemetery (43, 53, 62, 76). However, the intercutting between the graves 59 and 44, 32 and 74 as well as the burials 27 to 29 indicate a close relationship between those persons instead of a division based on pit alignment. Instead, a northern (25, 32, 33, 34, 44, 59; B1) and

southern (26, 27, 28, 29 and perhaps 30, 31, 31, 57, 73; B2) area is proposed, with the latter primarily containing subadults. The superimposition of subadults and adult or older individuals as demonstrated on several graves such as 32 and 74 – also considering the family in the triple burial 48-50 – could be interpreted as especially close blood-relations, with the surrounding bodies being the extended family or household.

- Area C: A small group of one male (21), one uncertain (23) and two female burials (22, 24) in the southern part of the main concentration. The man was extensively furnished and had his head turned to SW, while the other bodies did not receive grave goods and looked W. As demonstrated by them intertwining, 23 and 22 are most likely connected, while the slightly distanced 21 and 24 might or might not belong to their group.
- Area D: Another small group of closely assembling burials (15, 16, 17, 61, and perhaps 71), which were either unfurnished or inherited only pottery. The line of sight diverges or is undetermined, while the pit orientations and the overall burial position is quite uniform. Grave 71 contains a right crouched individual who has its head turned to the left; its actual linking to this group thus remains uncertain, as the distance to the other burials in this zone is relatively high.
- Area E: The north-western area of Nitra comprises of dispersed as well as closely assembled burial pits, making it especially difficult in some cases to determine if they belong to the same or different groups. It can also be compared to the eastern edge of the section in terms of subadult quantity. An unsexed individual (43) and uncertain woman (76), which both reached at least adult age, are assembled antipodally and might be linked to graves 39 and 42 (E1). Its southwestern corner (37, 41, 53-55 and perhaps 36, 60, 66; E2) seems slightly less homogeneously positioned in comparison to the rest of the zone and contains primarily subadults. In contrast, the dispersed individuals which remain (35, 38, 40, 45, 46, 53, 62, 75; E3), although being mostly uniform in orientation and burial position, are not as easily connectable due to their relative distance from each other. The two burials 38 and 35 might be part of a row which additionally includes 40 and 45, part of one of the subzones E1 and E2, or isolated graves.

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Overall, due to its low quantity of graves that also have a partially high density in the main concentration, as well as the site's uniform nature and thus few diagnostic deviations, Nitra is difficult to subdivide through the Analysis N Next Neighbours. Individual analysis of closely assembling grave groups or pairs with a focus on genetic investigations, as they are currently performed within the "Counterculture" project, might be more favourable for efficiently researching the site than large scale examinations of traits. Only a few factors such as age and some grave good types – besides spatial distance, intercutting and gaps between possible groups – reveal potential spatial order or separation.

4.3.2.4. *Site summary and discussion*

The remarkable uniformity in grave orientation and burial positions at Nitra makes the site one of the most conservative cemeteries among the Linear Pottery culture. Generally, it seems to follow the traditions seen at the other south-eastern grave fields. The presence of intercutting of burial pits deviates from the characteristic Linear Pottery rites and reveal certain chronological sequences and relations between the deceased. Unique finds include the necklace produced from human and dog/fox-teeth and the bone plate bracelets as well as the pottery with Alföld Linear Pottery decoration. The small depressed pit ornamentation around the middle of the biconical “lense” vessel suggests a blending of Transdanubian Linear Pottery and Alföld culture designs, while the amphora might signify connections to the Alföld regional group Tiszadob Kapušany, although both individuals gifted with these vessels had local isotope values.³⁵⁹ Animal bone remains and stone gifts such as hammerstones and pebbles that frequently occur at Kleinhadersdorf and Vedrovice are absent at Nitra. Obvious Mesolithic heritage in form of shell ornaments are lacking as well, although connections to hunting could be seen in bone objects such as the teeth necklace. Spondylus has been found in slightly fewer graves than at Vedrovice (15% to 18%), but the amounts per grave are significantly less, with beads often appearing as single pieces. In contrast to other sites, they occur predominantly in male graves and are restricted to older individuals, with one spondylus necklace belonging to a mature women in grave 6. Colouring, bone and chert tools as well as grinding stone tools stand out by being almost absent and further distinguish Nitra from the rites at Kleinhadersdorf and Vedrovice “Siroká u lesa”. The most extensive grave good assemblages have been found with older individuals, mainly men and a few women or subadults, which also contrasts with the find situation at Vedrovice, where young adults often received a significant number of gifts. Subadult burials in general were not as extensively furnished as in Bohemia and further west in Bavaria or Alsace. Additionally, the larger gift ensembles do not seem to reach the complexity of the assemblages found at the other large cemeteries, while furnished burials generally appeared in lesser quantities. Pavúk notes that the chronological earlier graves, as demonstrated by the intercuttings and pottery styles,

³⁵⁹ WHITTLE et al. 2013, 155.

represent the “richest” burials, implying a change through time in addition to the reflection of social status through age or success.³⁶⁰

Although most of the graves are focused in the main concentration area of Nitra and the dense occupation also aggravates the determination of certain spatial groupings, some patterns can still be observed. Pavúk suggested certain groups based on similar grave goods and burial position, while the inter-cuttings of pits reveal further relations between the deceased, although there are often significant distinctions between the connected burials. Alternatively, there could have been groups in the shape of rows as suggested for Vedrovice “Siroká u lesa”. Similarities and dissimilarities of traits in certain areas imply some sort of funerary order or preferences, further highlighted by the Analysis N Next Neighbours. For example, the subcluster A2 possibly contains three members of high social status, demonstrated by the advanced ages combined with high value objects such as spondylus and adzes. However, there is a high uncertainty regarding the actual relation between the graves in some of the other clusters recommended for this study, thus further genetical research is needed to investigate these potential connections.

The isotope investigations as provided by the Lifeways database reveals additional information.³⁶¹ A narrow strontium ratio suggests that the Nitra community did not source their food from the nearby uplands in great quantities. Women were distinctly more variable than men and thus probably had more varied origins. Combined with the osteological analysis, it seems that although female and male individuals at Nitra favoured quite similar diets, they were sourcing their food either from different locations or in distinct ways, with men consuming more animal proteins than women. A higher rate of caries for the latter might be connected to the lower animal protein intake and suggests that they consisted of a starchier diet. As teeth mineralise in childhood, Whittle et al. argue for patrilocality due to the female strontium values originating in a wider variety of locations than those for males. The distinct wear marks on female teeth also suggest different daily tasks for both sexes. Some other differences can be connected to certain gift types: The correlation between spondylus goods and high carbon isotopes are in favour of a diet from more open landscapes, which could have chronological meaning, as the landscape is thought to become progressively more open

³⁶⁰ PAVÚK 1972, 72.

³⁶¹ WHITTLE et al. 2013, 153–154.

throughout the Early Neolithic, which contrasts Pavúk's interpretation of "richer" graves being earlier. Individuals buried with polished stone tools also show different, more concentrated strontium values, as seen at other sites.

In summary, concerning the different isotope values based on gender and gift distribution, the blood relation of some of the deceased, the distribution of certain traits and some but not all well-equipped graves to specific areas, the open questions about age and sex being linked to high social status, the contrasting chronological interpretations, as well as the uncertain spatial order (densely occupied versus scarcely spread, rows or clusters?), the find situation at Nitra still remains a highly complex issue. As spatial separations seem to have followed various factors, such as family bindings in the triple inhumation 48-50 in one case, and possibly high social status not necessarily reflecting blood relation in another case (subarea A2), there might have been individual preferences based on lifeways or general funerary rules far more flexible than the uniformity of the site might have suggested.

4.3.3. Vedrovice „Široká u lesa”

4.3.3.1. Introduction

The site of Vedrovice is located approximately 40 km southwest of Brno in the South Moravian Region, and is divided into the settlement area “Sídliště” (including a large enclosure accompanied by settlement traces such as longhouses and ovens) as well as the two extra-mural grounds “Široká u lesa” and the smaller cemetery “Za dvorem”, which are seen in recent archaeological research as being part of the same site.³⁶² The history of Linear Pottery research traces back to the late 19th century, although the most significant investigations occurred between 1961 and 2000. Approximately 97 burials were uncovered at „Široká u lesa” and a further 13 at “Za Dvorem”, which all underwent extensive interdisciplinary research as

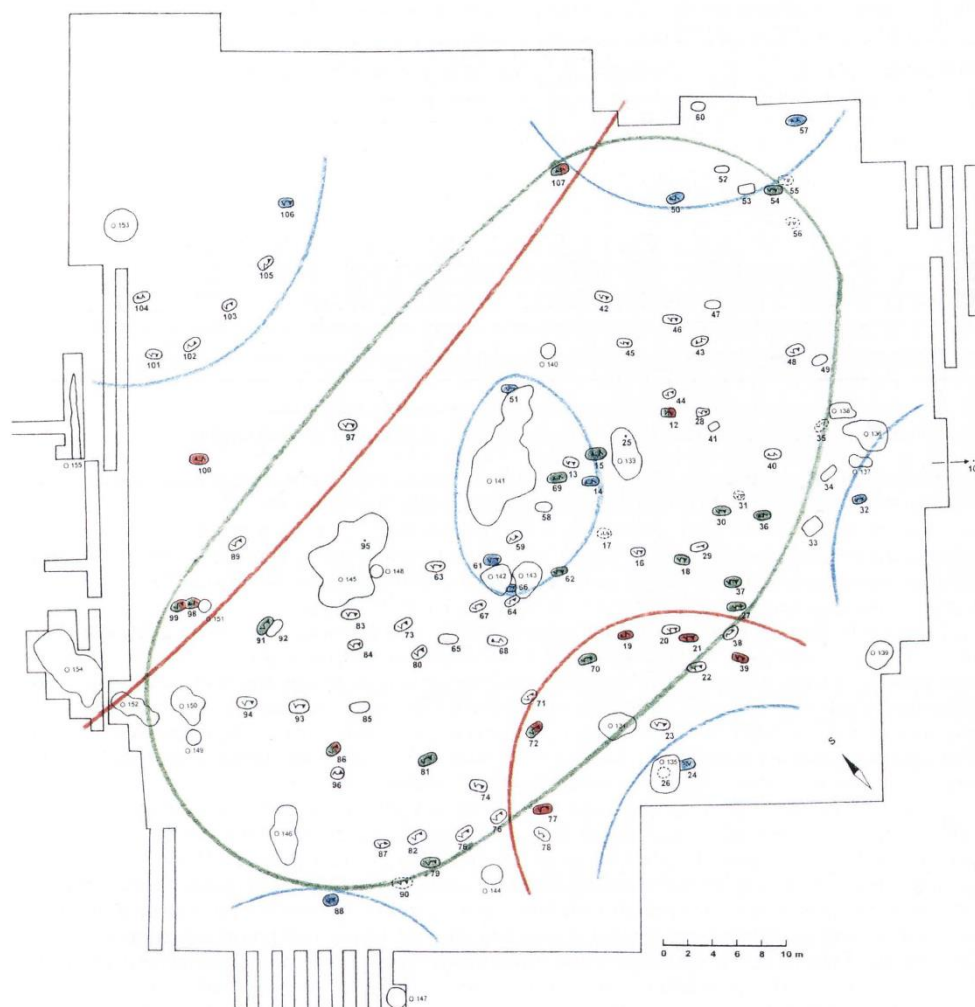


Figure 45: Original plan of Vedrovice „Široká u lesa” with proposed chronological clusters according to the relative chronology of Moravia according to Tichý. Green = subphase Ib1, red = subphase Ib2, combination of green and red = subphase I without further differentiation, blue = phase IIa (ČRŽMÁŘ 2002, 181, Abb. 8).

³⁶² WHITTLE et al. 2013, 114.

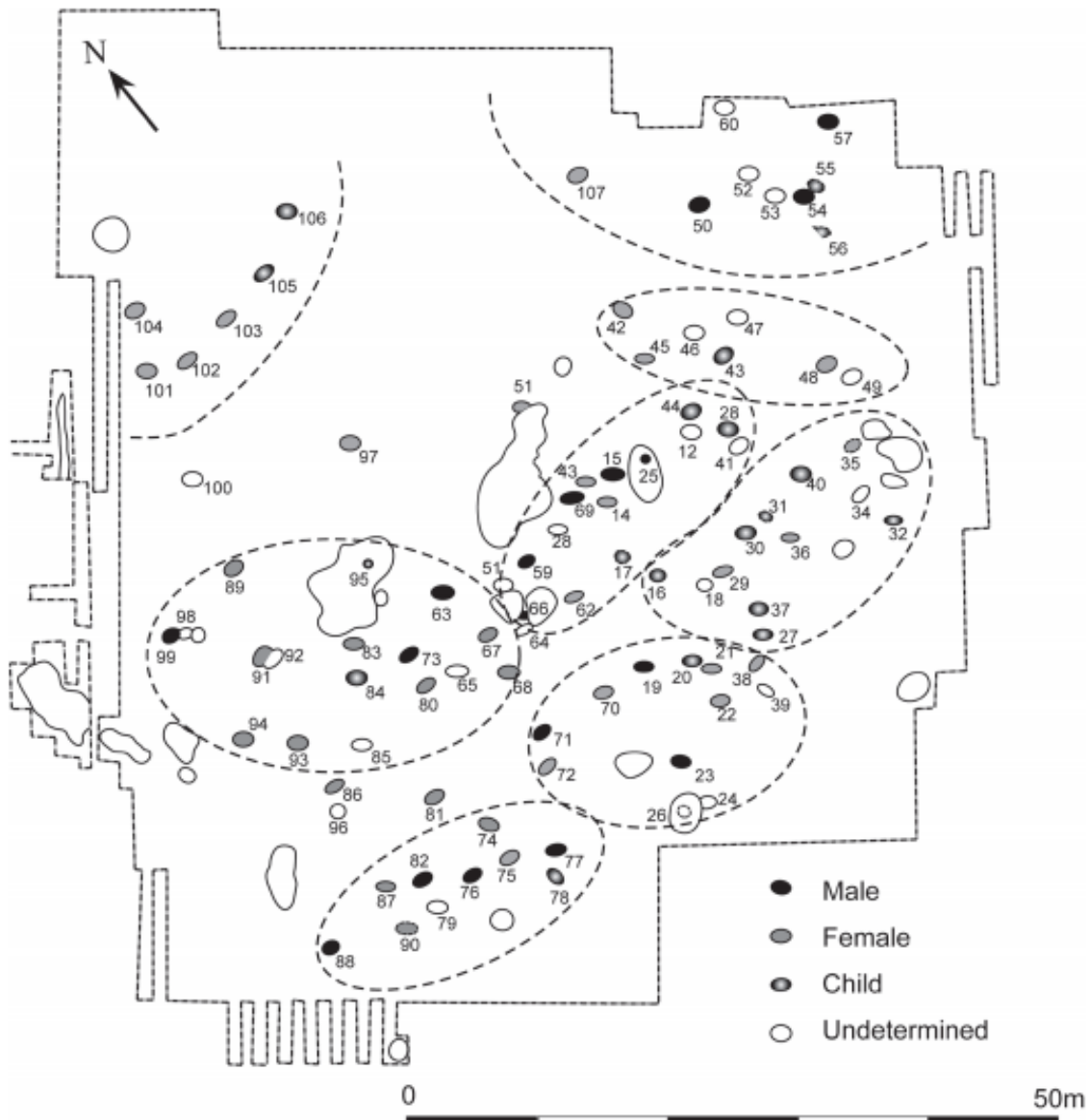


Figure 46: Spatial clusters for Vedrovice “Siroká u lesa” as recommended by Zvelebil and Pettitt (2008, 205).

part of the recent projects “Biological and cultural identity of first farmers: multiple bio-archaeological analysis of a central European cemetery (Vedrovice)” and “LBK Lifeways”. The former included radiocarbon dating and isotopic, osteological, dental, genetic and trace element investigations as well as contextual interpretations,³⁶³ while the Lifeways project expanded on the isotopic investigations and collected general information about the burials in its database.³⁶⁴ On its northern and eastern edges, further parts of “Siroká u lesa” might remain undiscovered. While the burials at other cemeteries were often unearthed in close

³⁶³ BRAMANTI 2008. – DOČKALOVÁ 2008. – JAROSOVA 2008. – LILLIE 2008. – LUKES, ZVELEBIL, PETTITT 2008. – NYSTROM 2008. – PETTITT, Paul, HEDGES, Robert 2008. – RICHARDS et al. 2008. – ZVELEBIL, PETTITT 2008.

³⁶⁴ WHITTLE et al. 2013, 114–127.

proximity to each other, only a few graves touch or intersect, with spaces of 1 to 2 m being frequently found.³⁶⁵

According to radiocarbon-information, „Široká u lesa” dates from 5300 to 5100 cal. BC over approximately five or six generations, thus making it one of the earliest known Linear Pottery cemeteries. Čížmář suggested, on the basis of a pottery analyses according to the relative chronology of the Moravian Linear Pottery by Tichý, the division of certain graves into the phases or subphases Ib1/2 and IIa.³⁶⁶ However, only a relatively small number of graves could be dated this way, which limits the information provided by the chronological distribution map (Fig. 45). Phase Ib seems to end around 5200 BC, although the radiocarbon chronology of IIa remains uncertain and might have started close to the end of phase Ib or in the 51st century. Building on the initial spatial interpretations and more recent isotope investigations, Zvelebil and Pettit proposed further subdivisions in the form of eight spatial clusters, with one consisting of 10 to 15 graves.³⁶⁷ Consequently, these clusters will be considered when discussing the results of the quantitative investigations. The settlement and “Za dvorem” have not been radiocarbon dated yet – the assumption of them being contemporary is based on pottery analysis –, with connections to western Hungary observable within the ceramics of the early development of the village, which is generally associated with phase I.³⁶⁸ It has thus been suggested, also based on radiocarbon and isotope data, that the settlement was founded by migrants from Western Hungary before 5300 BC, and attracted hunter-gatherers mainly from the Bohemian-Moravian uplands and north-east Bohemia, which will be further discussed below.³⁶⁹

³⁶⁵ WHITTLE et al. 2013, 114.

³⁶⁶ TICHÝ 1962. – ČRŽMÁŘ 2002.

³⁶⁷ ZVELEBIL, PETTITT 2008, 205.

³⁶⁸ ZVELEBIL, PETTITT 2008, 213.

³⁶⁹ ZVELEBIL, PETTITT 2008, 213. – WHITTLE et al. 2013, 108.

4.3.3.2. *Distribution maps*

The high presence of grave goods at Vedrovice with a ratio of 72 furnished burials to 24 without preserved items (75/25%) is remarkable, when compared to other cemeteries.³⁷⁰ The anthropological information of the Lifeways database overall shows 40 women and 22 men, with the rest remaining unsexed. The burials of men were slightly larger and deeper on average than those of women.³⁷¹ Subadult burials divide into 15 infants and another 8 individuals that are juvenile or transitioning to the early adult stage. Neonates are represented in the only double burial at Vedrovice (grave 81), consisting of a woman with her child, while another baby (grave 93) died together with her mother before childbirth. 16 individuals range between mature and senile age. Most interestingly, subadult individuals are mainly distributed to the south-eastern parts of the cemetery, while the mature deceased are more common in the central area – where subadults were nearly absent – and dominated the small northern cluster. It is also worth noting that the latter was exclusively reserved for women, including two juveniles, three mature burials and one senile individual. Female graves were more likely to be unfurnished than males (47% to 25% unfurnished burials respectively), while five of eleven child graves also received no gifts. 202 graves goods have been gifted to 25 men, 61 objects to 37 women, and 19 children inherited 37 gifts, with mature men having received the most extensive assemblages.³⁷² All deceased at Vedrovice were inhumed, with the 12 empty pits representing graves already excavated in the 19th century. There were two double inhumations, one including an early adult woman and a neonate (81), gifted with pottery, chipped stone, spondylus and an unworked pebble, while the other (93) received a spondylus pendant and also contained a young woman (between 18 and 25 years) and a baby.³⁷³ Empty graves scatter across the site and assembled in relatively close proximity in the eastern and south-eastern rim. However, these pits are predominantly found without grave goods, which of course questions their function as empty graves.

Considering grave-pit orientation and burial position, there is a clear trend towards ESE-WNW- or SE-NW-alignments, with the latter having been more numerous towards the south-east.³⁷⁴ Diverging pits occurred very rarely, SW- or NE-orientations commonly found in other

³⁷⁰ WHITTLE et al. 2013, 127.

³⁷¹ WHITTLE et al. 2013, 114.

³⁷² WHITTLE et al. 2013, 116.

³⁷³ PODBORSKÝ 2002a, 80-81, 89.

³⁷⁴ 35 ESE-WNW, 3 E-W, 6 NW-SE, 21 SE-NW, 3 SSW-NNE, 1 W-E, 8 WNW-SSE, and 7 uncertain.

cemeteries are even absent. 67 people were aligned on the left side, six on the right (17, 38, 59, 96, 102, 105) and eleven undetermined. The upper bodies were positioned prone in five cases (29, 71, 82, 87, 91) and supine (23, 42) in two cases. Consequently, the majority of the deceased looked to the south to western directions, with southwest being the main orientation, and less often to northeast or north.³⁷⁵ The crouches seem to have been partially less intense in the central to southern/south-eastern zones and the north-western rim. All individuals, whose heads were facing northwest – antipodal to the more common SE-NW-alignment –, “stared” northeast. The right crouches, positioned as SE-NW (17, 59) or ESE-WNW (38, 59, 102) and E-W in one case (105), looked either to the north (38, 59, 102, 105) or north-east (17, 96). While the distribution map shows NE-turned heads mainly in the east and south-east, S-looking deceased were more numerous in the centre and towards the western parts of the site. According to the archaeo-astronomical approach by Rajchl, the line of sight as well as the orientation of the pits and bodies might have related topographically to the Leskoun hill southwest of the site and *Pavlovské vrchy* (Pollauer Mountains) and astronomically towards sunrise and dawn or moonset during the winter and summer solstices, with potential cult performances linked to these factors having happened at Leskoun hill, although this is highly speculative.³⁷⁶ Alternatively, the pit or body orientations and the lines of sight could point to the direction of origin, similar to those proposed for the house alignments.³⁷⁷ Some burial positions were defined by Podborský as atypical, such as the early adult female in grave 42, who lay in a left-sided crouch with the torso on the back and both hands left of the temple.³⁷⁸ However, this represents the characteristic sleeper in the supine variant, which also occasionally occurred in other cemeteries. The heavily fragmented skeleton in grave 27 might have originally also been similarly positioned, although the crouch was probably less intense.³⁷⁹ Three of the determined arm gestures, all identified as men, diverged from the sleeping position: A 35-45-year old individual (71) had its arm diagonally crossed with a prone torso and left crouch with the arms diagonally crossed, the hands of another 17-20-year old man (23) were vertically positioned to his shoulder with a supine torso and left crouch, and one individual (50) was regularly lying on their left side, but had their

³⁷⁵ 5 N, 15 NE, 8 S, 43 SW, 3 W and 10 uncertain.

³⁷⁶ RAJCHL 2002.

³⁷⁷ MATTHEUBER 1991. – BRADLEY 1996. – COUDART 1998. – WHITTLE et al. 2013, 114.

³⁷⁸ PODBORSKÝ 2002c, 327. – WHITTLE et al. 2013, 114.

³⁷⁹ PODBORSKÝ 2002a, 34–35.

arms stretching away from the body.³⁸⁰ One of the two right-crouching individuals in the northern cluster (105), a 16-18-year old woman, had her left arm horizontally lying in front of the torso, while the left arm reached up to the left shoulder.³⁸¹

Pottery was represented with 25 complete or recently fragmented vessels and 42 vessel units (ca. 37 to 63%), with the former having been nearly absent in the south-eastern third of the cemetery. It follows, as earlier mentioned, the Moravian relative chronology according to Tichý, which has been criticized by Stadler as associating to the development of certain ornamentation such as the Note Head style and the slender shape for pots.³⁸² Amphorae were almost absent in the eastern area and the small northernmost cluster. *Kümpfe* appeared across the cemetery, with classical bomb styles (2a) having occurred more in the central to northern half, while bowl-shaped bombs (2b) were allocated to the south-eastern rim. Low bowls and high bowls are limited to three graves (19, 71, 104). One particularity of Vedrovice is the vessel with a pedestal in grave 71, which was already discussed in chapter 3.5.2. and corresponds to the chronological phase Ib1. While the distribution of ceramics remains approximately the same for men across the different age classes, it increases for the women above 40 years (from 30% below 40 years to 52% above).³⁸³

Overall, pottery and especially necked vessels are the most reoccurring grave good at “Siroká u lesa”, followed by spondylus ornaments, which were represented by medallion-shapes and an unusual closure, one bracelet, perforated pendants and numerous beads. V-shaped spondylus buckles have been found in amateurishly unearthed graves in the 19th and early 20th century, but unfortunately not within the more recent excavations, and were thus not included in the quantitative evaluations.³⁸⁴ In summary, 129 spondylus gifts were deposited in 25 burials, including 13 women, eight men and four children. Approximately 29% of all graves contained spondylus ornaments, which is a very high amount considering the average of Linear Pottery cemeteries lies between 10 to 15%.³⁸⁵ According to the relative chronology, they were mostly associated with the early to middle phases Ib1/2. Beads were the most frequently occurring object and mixed between male, female and infant burials. They spread

³⁸⁰ PODBORSKÝ 2002a, 31, 51-52, 71.

³⁸¹ PODBORSKÝ 2002a, 97.

³⁸² TICHÝ 1962. – ČRŽMÁŘ 2002, 190.

³⁸³ WHITTLE et al. 2013, 126.

³⁸⁴ PODBORSKÝ 2002b, 253.

³⁸⁵ PODBORSKÝ 2002c, 333.

across the cemetery but are absent in the northern cluster. The latter included an early adult woman (102), which had the unusual, hinge-shaped closure found at the elbows. Medallion-shaped buckles were gifted to an early mature individual (70) and an early adult woman (86). Pendants appeared as single pieces mainly in the southwestern and western parts of the cemetery, and were given mostly to females (14, 36, 75, 81a, 86, 90, 93a, 100), but also to few male individuals (15, 19, 46, 79) and one infant (78). One of these men (15), dating to the earliest phase Ia1, received the only bracelet found at the site among various other ornament types, demonstrating that the personal ornaments at Vedrovice “Siroká u lesa” were not limited to spondylus. Some of them included the most unique finds within the Linear Pottery material culture, such as the medallion-shaped marble belt buckles gifted to two infants (78, 84), which might have functioned as replacements for their spondylus counterpart. Although these graves did not include pottery with diagnostic features, the radiocarbon information orders one of them (84) as occurring between 5360 BC and 5210 BC, which indicates an earlier dating.³⁸⁶ Other stone ornaments such as 18 marble beads in the form of a necklace were gifted to an early adult man (69), another marble bead occurred in a late adult female burial, and one made of quartz was given to an 18-25-year old woman (94). A snail shell found in an infant grave (94) might have also been a personal ornament.

Only ten graves (ca. 10,4%) contained jewellery, tools or weapons made of bone. Beads or pendants appeared within adult male burials (15, 19, 69, 88) and one infant burial (96). Although this indicates a trend for men to such receive these objects, it should be mentioned that one early adult woman (10) at “Za Dvorem” also received a bone pendant. A bone lamella of a wild boar was part of an extensive ensemble of an early adult man (69). Antler buckles were given to late adult to early mature men in the south to south-western parts of “Siroká u lesa” (71, 76, 77) and to one late adult to early mature woman at “Za dvorem” (7). Metapodia and poorly conserved and thus undetermined points were distributed to an unsexed adult (12), an infant (18) and an early adult male burial (69), of which one dates to phase Ib1 (18) and another generally to phase Ib (12). A triangular bone point – which differs in appearance from the arrowheads found at Schwetzingen and Sengkofen and thus might have had a function other than a projectile – and the remains of an undetermined animal were gifted to an 20-35-year old man in the non-dated grave 46. The antler point found in the grave of a 13-

³⁸⁶ PETTITT, Paul, HEDGES, Robert 2008, 127.

15-year old individual at “Za Dvorem” (8) should also be mentioned, which looked very similar to the one excavated from an infant burial at Kleinhadersdorf (9). The bone points of “Siroká u lesa” contributed to the eastern to central eastern parts of the site.

Hammer stones consisted of quartz, chert or granodiorite, with traces of red colour and impact marks indicating their function in the Early Neolithic. One each were given to a late adult man (19 and one infant (30), while a senile (83) and an adult woman (90) even received two units. The graves with one hammerstone could be dated to either the subphase Ib1 (30) or Ib2 (19). A long-polished amphibolite with traces of red colour that was gifted to a 35-40-year old man (15; phase Ib1) might have been a hammerstone or an adze (Code “Stone with uncertain function00010”). Another stone of unknown function had limestone concretions and was gifted to an early adult man (69), who also received a pebble among other grave goods. These small stones appeared as single pieces in an adult burial (81a) and two mature female burials (101, 104), while an unsexed individual (85) inherited two pebbles. They were collected from limonite, chert and granite sources. Hammerstones and pebbles were scattered across the cemetery and seem to have been absent in the easternmost cluster. Similarly, grinding stone tools were rare, represented by friction plates or fragments of such produced from sandstone, granite or chert. A late adult man (15), an infant (30), one adult woman (69) and two mature women (36, 101) received such goods, with the diagnosed burials dating to subphase Ib1 (15, 30, 36) and some individuals nearly neighbouring each other in two cases (15, 69 and 30, 36).

Traces of colour on some grinding tools in burials which also received red chalk spreading (30, 36) indicate the processing of red chalk for funerary rites instead of – or as secondary application of querns – grinding cereals, highlighting the importance of colour on Vedrovice.³⁸⁷ Although dying stones were absent – maybe with the exception of two small, undetermined red colour lumps in grave 74 –, the high amount of burials with red chalk powder is unmatched by the other sites investigated in this study, both in absolute and relative numbers. There were 26 burials with red chalk in total (ca. 27%), of which 23 range between early adult and senile age, while the remaining three represented infant burials (28, 30, 37). The ratio of female to male graves is 18:5, implying a preference of colour for women. Interestingly, all men that received red colouring (54, 69, 76, 79) represented “rich” burials.

³⁸⁷ PODBORSKÝ 2002a, 36, 41-42.

Red chalk was predominantly put on the head as well on the legs (28, 48) and under the hands (76) in a few cases. The 2-3 cm thick layer of red colour under the body of an early adult female (81) could not be certainly classified as red chalk, instead being coded as “Red colouration_Undetermined00010”. Of all the burials with red chalk or unidentified red colourations, 14 could be diagnosed according to the relative chronology, revealing that most of them correspond to subphase Ib1 (30, 36, 37, 54, 70, 79, 81) and a few to Ib2 (19, 21, 100), Ib (12, 86) or IIa (14, 61). Consequently, there might have been a decline of red colour in the chronologically later occupation at “Siroká u lesa”.

The repertoire of polished stone tools at Vedrovice mainly consisted of Type 3 according to Ramminger, which was deposited in 11 of 18 graves with adzes. The amphibolite used for producing the tools were initially seen as originating from north east Bohemia, while recent analysis narrow down to the Jastremski source in the foothills of the Jazeera range.³⁸⁸ Adzes are usually laid down as single pieces, with the exception of an early mature man gifted with two type 4 adzes (57) and one unsexed individual who received two adzes of type 3 (12). Most interestingly, the only graves with type 1 (30, 31, 32) and the two burials with flat adzes (18, 36) represented women (31, 36) or infants (18, 30, 32), thus diverging from type 3 and 4 given to either male or unsexed individuals. These exceptions gather in relatively close proximity in the south-eastern part of the site, while adzes in general were far-spread and only lacking in the northern and north-western zones. As also seen at other cemeteries, males buried with adzes consisted of tighter strontium isotope values.³⁸⁹ The relative chronology shows two of the three type 1 adzes to be assigned to subphase Ib1 (30) or IIa (32), with the remaining one undated (31). Both polished stones of type 2 corresponded to Ib1, while six of the 11 burials gifted with type 3 adzes dated to Ib1 (15, 54, 79), Ib2 (19, 77) or Ib in general (12). Type 4 correlates with the latest phase IIa (57, 88).

The raw material of the chipped stone tools at “Siroká u lesa” strongly resemble the ones at Kleinhadersdorf. According to Mateiciucová, Krakow Jurassic silicite predominates (37 %), followed by Krumlovsky les chert and then radiolarite mostly from the Bakony mountains.³⁹⁰ Macrolithic chert tools emphasized on the central-eastern part of the cemetery, with a few units also having contributed to south, eastern and western zones. Non-retouched objects

³⁸⁸ WHITTLE et al. 2013, 113.

³⁸⁹ WHITTLE et al. 2013, 126.

³⁹⁰ MATEICIUCOVÁ 2008, 256.

have been found in six graves (14, 15, 21, 43, 66, 76) and represent the majority of the chert blades at Vedrovice. A single nucleus appeared in an empty grave (58). Two blades (40, 46) might have been burned and thus are not determinable. In summary, there were ten graves which contained macrolithic chert objects, assigned to five men ranging between the early and late adult stage (15, 46, 66, 76, 79), two late adult women (14, 21), a 14-year old adolescent (43), a late infant (40) and an unsexed person (58). Certain chronological trends are not observable, as macroliths appeared throughout the occupation. Microlithic flakes and fragments were more widespread than their macrolithic counterparts, although they seem to have prioritized the central, and southern to western areas. They occurred as single pieces or up to ten objects per grave. Symmetrical trapezes and trapezoidal flakes compensated for the total absence of triangular arrowheads at Vedrovice and resembled the ones excavated at Kleinhadersdorf in size and shape.³⁹¹ There were 16 burials with flakes in total, of which half were assigned to men (46, 54, 57, 59, 62, 66, 69, 79), five contained female remains (62, 80, 81a, 86, 91), two included infants (37, 39) and another one remains unsexed (65). Three graves fall into phase Ib1 (54, 62, 79), with one being dated to Ib2 (39) and two to IIa (57, 66).

³⁹¹ MATEICIUCOVÁ 2008, 259.

4.3.3.3. *Analysis N Next Neighbours*

As mentioned earlier and seen in fig. 46, a possible explanation for the heterogenous distribution of grave goods is offered by Zvelebil and Pettit, which expanded on the clusters provided by Podborský and supplemented their proposed groupings with bioarchaeological data.³⁹² They noted that these clusters were structured similarly, with each group having at least one outstanding individual, either marked with rich grave goods and/or a particularly high amount of exotic or imported objects, or the presence of an individual who migrated to Vedrovice. Therefore, each of the spatial groups might have represented families or clans with equal status and access to valued objects. Their north-western group (63, 65, 67-68, 83-85, 89, 91-95) seems particularly interesting due to the high number of female graves (eight), two of which were extensively furnished, as well as the absence of polished stone tools and imported lithics and shell within the three male graves. Zvelebil and Pettitt thus suggested a

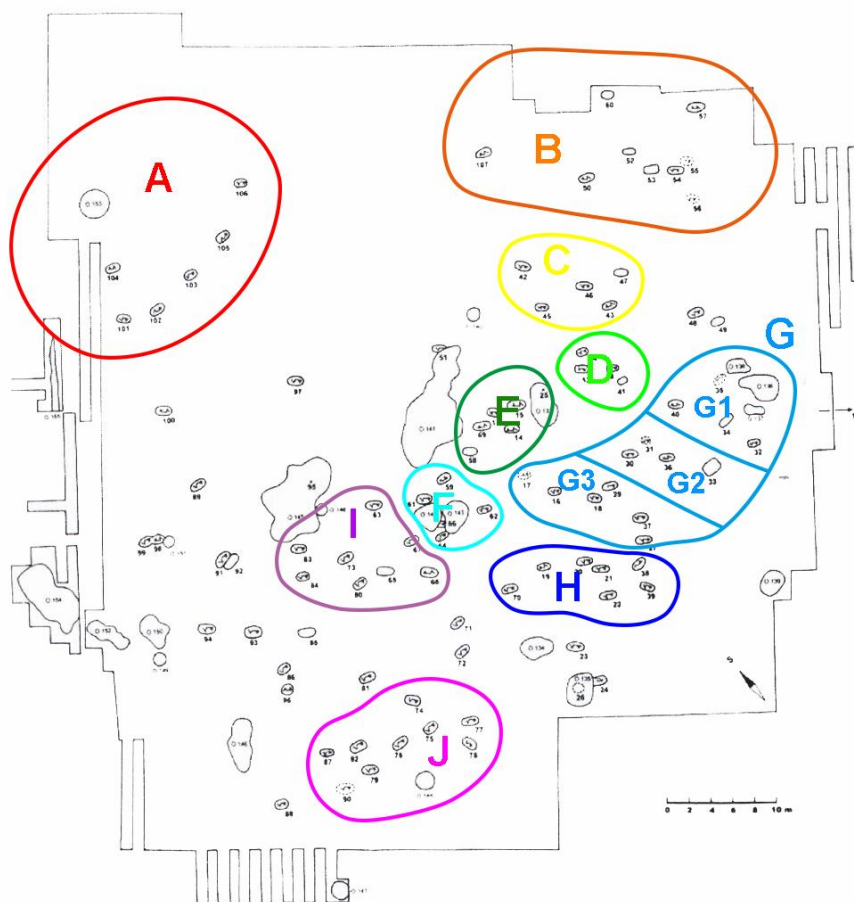


Figure 47: Recommended clusters for Vedrovice „Siroká u lesa” (Original graph taken from Podborský 2002a, 16, Abb. 7 and further modified).

³⁹² ZVELEBIL, PETTITT 2008, 204–205.

matrilineal group within an otherwise patrilineal community, although Whittle et al. argued that the importance of those “rich” female burials should not be exaggerated, as the occurrence of imported shells in their graves is nothing out of the ordinary.³⁹³ As for the Analysis N Next Neighbours and general trait distribution, there are various matches to the proposed spatial groupings, although few distinctions and variations can be observed, which manifests in the following recommended clusters:

- Area A: The northernmost group (101-106) can be adopted from Zvelebil and Pettit without any doubts due to its distance to the other zones as well as its uniformity in sex, as there are two subadults and four mature women. Pit orientation and line of sight is mixed, as is crouch intensity, with two right-side bodies further emphasizing a heterogeneity in burial position. One of the right crouches (102) received the hinge-shaped spondylus closure lying at the elbow and red chalk powder around the head, while the other (105) was ungifted and had the right arm horizontally positioned in front of the torso and the left hand touching the shoulder. Isotope values show 101 to have been a local, while 102 was not born at Vedrovice.³⁹⁴
- Area B: Similar to area A, the easternmost zone (50, 52-57, 60, 107) is synonymous to the formerly suggested cluster. However, the relatively far distance of 57, 60 and 107 to the much closer clustering of 50 and 52-56 spreads some doubts about the actual linking of these burials, also taking into consideration that three discolorations (52, 53, 60) are empty pits with elusive function. Sex and age are mixed between infants and adult or subadult men or women, while only one reached mature age (57). The determined pit orientations were one NW-SE-, ESE-WNW- and SE-NW-alignment each and two WNW-ESE-side bodies, with the line of sight having three NE- and one SW-turned head, which differs from the predominant SW-looking position in other clusters. The crouches are left-sided, with one adult man (50) in a position where his arm stretches away from his body but does not stand further out as there is only one vessel positioned at the head. Extensive assemblages had been given to an adult man (54), who received two spondylus pearls, a trapezoidal flake, an adze and an

³⁹³ ZVELEBIL, PETTITT 2008, 207. – WHITTLE et al. 2013, 127.

³⁹⁴ ZVELEBIL, PETTITT 2008, 205.

amphorae, while an early mature man (57) received two adzes positioned at his knees and seven microliths in front of his torso/arms.

- Area C: A small, dispersed group of four inhumations and one empty grave (42, 43, 45-47) in the east of the cemetery. None of the bodies align to ESE-WNW, instead there are two SE-NW- and one NW-SE and W-E-orientation each, with the heads of all but one individual (43), who looks to the north and is turned southwest. The juvenile individual with NW-SE-orientation (42) was laid in a supine position and received two spondylus beads. The most extensive burial represented a 20-35-year old man (46), who received two vessels, a bead and a bow-shaped pendant produced of spondylus positioned at the head and elbow respectively, 15 microliths distributed behind the back and at the feet, an adze also found at the back/pelvis area, the bone remains of an undetermined animal, and the only triangular bone point excavated at the site. The pair of burials 48 and 49, an ESE-WNW-aligned woman gifted with red ochre and an empty grave, were not included due to their distance to area C.
- Area D: Three inhumations and one empty grave (12, 28, 41, 44) lie below area C, from which they slightly differ by having had ESE-WNW-orientations and being more closely assembled. Unfortunately, the inhumations and especially grave 12 were disturbed by the dredger, thus the burial position was undeterminable for the most part, although two lines of sight to SW and one sleeper position could be identified.³⁹⁵ Grave 12 also contained extensive furnishings along with the remains of an unsexed adult, including two adzes, a bone point and the sherds of various vessels. The other two inhumations were an 10-14-year old female (44) with pottery sherds and a 4-5-year old infant (28) without preserved grave goods.
- Area E: No infants are found in this zone of densely occupied inhumations (14, 15, 25, 43, 69), with one empty pit (28) lying on its western edge and one being completely destroyed (25) and thus all its traits undetermined. Pit orientations varied between WNW-ESE (15, 69), the antipodal ESE-WNW (43), and NW-SE (14), although all but burial 43, an unsexed juvenile of 14 years who looked to the SW and received a chert blade, had their heads turned to the NE. Otherwise, their burial position seemed relatively uniform. Three graves received personal ornaments and were partially

³⁹⁵ PODBORSKÝ 2002a, 21–22.

extensively furnished, with the “poorest” of them being a 35-40-year old woman (14) gifted with sherds, a spondylus pendant, a macrolith and red ochre. A 35-year-old man (15) received an adze, a friction plate, 19 spondylus beads and one pendant, a blade, and a polished stone with uncertain function (Code “Stone with uncertain function00010”), which had traces of red colouring on it. According to isotope values, the woman in grave 14 was not born at Vedrovice and migrated to the site.³⁹⁶ The most expressive ensemble was given to an early adult man (69), having contained five vessels, 18 spondylus beads, a metapodia point, a friction plate, an unworked pebble, a heavy stone with unknown function (Code “Stone with uncertain function00010”), and red ochre around the head, but interestingly no adze. This area might have been a spot for high-esteemed community members.

- Area F: Two large ditches disturbed some burials in the central cluster (51, 59, 62, 64, 66), which were all ESE-WNW-aligned. The heads are turned SW (51, 62), S (64, 66) and N (59). The burial position is otherwise relatively uniform except one right crouch (59) and some variation in crouch intensity. One female burial (64) was unfurnished, while another 45-55-year old woman (51) received the sherds of two bomb style vessels. Another grave of a 30-35-year old man also received two vessels (a bowl-shaped Kumpf and an amphora) along with a chert blade and a microlith. The arguably “richest” burials in this cluster were the right-crouched 25-30-year old male (59) gifted with an adze, sherds of one vessel and two microliths and a late adult woman furnished with a spondylus bead, a chert blade and sherds of one vessel. However, it could be debated whether the presence of a single personal ornament or a polished stone actually signify a higher social status such as grave 59, which could also be seen as moderately furnished. Colouring was absent. Generally, it can be stated that the individuals in this cluster were not as well-equipped – at least regarding preservable grave goods – as the neighbouring area E.
- Area G: The south-eastern zone (16-18, 27, 29-37, 40) should not be seen as a large-scale, certainly linked cluster of graves; they were either far too dispersed for certain associations or appeared in pairings or small groups. They were also partially dissimilar in their orientation and line of sight, although they shared some interesting traits such

³⁹⁶ ZVELEBIL, PETTITT 2008, 205.

as the exclusive distribution of type 1 and 2 adzes to this zone as well as the presence of generally rarely appearing grinding tools. Consequently, this area will be subdivided into several subgroupings. G1 (32, 34-35, 40) contains a 12-14-year old juvenile (32) gifted with an adze and sherds, an 8-10-year old infant with a macrolith (40), an unfurnished adult burial (35) and an empty grave (34) which contained sherds of two vessels. G2 (30, 31, 33, 36) included better equipped individuals and also an empty grave (33) with the remains of two vessels in it. A 10-12-year old infant (30) received an adze, a friction plate, a grinding stone, a worked pebbled which might have been a hammerstone, sherds and red ochre around the head, while a female adult (31) received a flat adze. Not only was the gifting of polished stones to women unusual, but another 45-50-year old female (36) in this subgroup also received a flat adze, along with two beads and one pendant made of spondylus, a friction plate and the sherds of two bowl-shaped Kämpfe, making it the “richest” funeral of this zone. Subgroup G3 comprises two pairings (18, 29 and 27, 37) and two graves (16, 17) which might be associated, but could also represent isolated pits due to their moderate distance to each other. The latter represented a 3-4-year old individual (16) and a ca. 1-year old infant (17), which both only had pottery sherds in the filling. One burial pair included a 6-7-year old infant (18) with a flat adze, an amphora and bone point lying near a heavily disturbed 18-20-year old woman (29) with only pottery sherds, while the other pairing comprised an adult female (27) who had a vessel with a pedestal and a 11-12-year old infant (37) with a microlith and a cup-shaped *Kumpf*. Overall, there were significant and partially unusual similarities in grave goods combined with sex (G2) and relatively high numbers of subadults (G1) or pairings of such (G3). There were also some closely associated burials that fell into the same phase (27, 37 and 30, 36). By taking these elements into consideration, it can thus be stated that all these factors indicate intentional assemblages around the same generation.

- Area H: Neighbouring area G, the bodies of the southern cluster (19-22, 38-39, perhaps 70) mostly consisted of ESE-WNW or SE-NW-alignments (one pit each) to SSE-NNW and W-E-orientations, while the heads were predominantly turned to the SW and in few cases to the N, W, or NE. Grave 26 is assigned to the Lengyel Culture and thus has to be excluded. The burials of a 3-4-year old infant (20) and two late adult to early

mature women (22, 38) were unfurnished, with another early adult female (21) having received a cup-shaped Kumpf and a chipped stone. More extensive grave goods were given to a 25-35-year old man (19), whose burial contained a bowl, an amphora, 23 beads and one pendant made of spondylus, another pendant produced of bone, an adze and a chert pebble, while a 45-50-year old woman (70) received a significant but less impressive gift of 20 beads and a medallion-shaped belt buckle of spondylus as well as an amphora, and last but not least a 3-4-year old infant (39), who received 8 microliths, 11 spondylus beads and sherds of an amphora. One “rich” female grave (70) was assigned to the earliest subphase Ib1, and three other pits (19, 21, 39) had diagnostic features of Ib2 and might thus be of the same generation. Two graves (38, 70) contained individuals who were not born at Vedrovice.³⁹⁷ Not included in area H were the burials of a 35-45-year old man (71) gifted with a bowl, an antler pendant and an adze and a late adult woman (72), which corresponds to Ib2 and had an amphora, a bomb-shaped *Butte* and two spondylus beads. Two other burials in the southern corner of the site, an infant (24) assigned to the latest phase IIa who held an undetermined snail shell and a necked pot, as well as a 17-20-year old man with the sherds of a possible amphora and a chipped stone, were also excluded due to their distance to the main assemblage.

- Area I: This cluster (65, 67, 68, 73, 80, 83, 84, perhaps 63) neighbours area F and comprises one empty grave (65) gifted with a spondylus bead and a microlith, as well as six inhumations, which were mostly aligned as ESE-WNW (63, 67, 73, 80, 84) and one each as SE-NW (84) and antipodally NW-SW (68). As all bodies were left-crouching, their heads were consequently turned to the SW (63, 65, 67, 73, 80, 84), NE (68) or S (83). Two women (67, 68) and one man (63) ranging between late adult and late mature age had unfurnished graves and were allocated to the eastern rim of the cluster. The latter represented an immigrant, as does the near-lying grave 95 which was not included in this cluster.³⁹⁸ An early adult man (73) and a 35-45-year old woman (80) both received chipped chert, and could be seen as a pairing due to their distance to each other and similar grave goods. The most extensive burial represents a senile

³⁹⁷ ZVELEBIL, PETTITT 2008, 205.

³⁹⁸ ZVELEBIL, PETTITT 2008, 205.

woman accompanied by four spondylus beads, two worked pebbles and a *Butte*, while the 9-year old infant in grave 84 was one of the two individuals who received a medallion-shaped belt buckle. The latter two individuals might have also been closely connected.

- Area J: The westernmost area of the site fits Zvelebil's and Pettitt's classification (74-79, 82, 87, 90), with the exception of the late-dating grave 88 being excluded. As with other groupings at the site, the main orientation was ESE-WNW and the majority of bodies looked to the SW. The torso of a late mature man (82) and an adult woman (87) were prone positioned and both burials unfurnished, while a late mature to senile woman (74) only inherited two small lumps of ochre. All other graves were in general moderately equipped, often with single spondylus beads or pendants and red ochre, but not nearly as well-gifted as the most extensive assemblages of Vedrovice. An early to late adult and male immigrant (79) was accompanied by an adze, pottery, arrowheads and blade fragments, a spondylus pendant, and a lamella-shaped boar bone, while an adult female (90) was gifted with a pebble showing traces of ochre, a spondylus pendant, a piece of unworked granodiorite and red chalk powder, both burials of which represented the "richest" furnishings.³⁹⁹ The only subadult of this zone, a 7-8-year old infant, received the second medallion-shaped marble buckle and a spondylus bead.

As commonly proposed for spatial groupings at Linear Pottery cemeteries, the recommended clusters might have represented families or kin groups. As Zvelebil and Pettit noted for their suggested areas, each had one or two of the very rich graves, meaning that they had equal access to high value objects without much differentiation in status or concentrations of elite graves to certain zones.⁴⁰⁰ Not included in the recommended clusters was a 45-55-year old immigrant (51) gifted with *Kumpf* sherds in the upper centre of the cemetery.⁴⁰¹ However, there are some observable distinctions, such as the exclusive presence of women in the north, a higher concentration of extensive furnishings in the centre, or of subadults in some areas (e. g. G1). Often occurring pairings of graves outside (e. g. 48, 49 or 98, 99) or within the suggested

³⁹⁹ ZVELEBIL, PETTITT 2008, 205.

⁴⁰⁰ ZVELEBIL, PETTITT 2008, 204.

⁴⁰¹ WHITTLE et al. 2013, 110.

areas (G3) and the smaller size of the latter compared to the ones by Zvelebil and Pettitt, densely assembling and showing significant matches of traits, are more in favour of small scale groups instead of larger household conglomerations. The north-western part of the site (63, 65, 67, 68, 73, 80, 83-85, 89, 91-95, 98, 99) with its relatively “poor” male burials unaccompanied by adzes or shell ornaments as well as the presence of female graves with spondylus objects and generally dominated by women, has been suggested to represent a matrilineal group within an otherwise patrilineal community.⁴⁰² Although Whittle et al. mentioned that the importance of those well-equipped woman might be exaggerated, given that generally ca. 40% of female graves have received spondylus and thus having three (81a, 83, 91) of eight woman receiving such is nothing out of the ordinary,⁴⁰³ and considering the differences between the recommended areas of this study, this further highlights that there could have been various rites and preferences at different zones of the cemetery.

⁴⁰² ZVELEBIL, PETTITT 2008, 205.

⁴⁰³ WHITTLE et al. 2013, 127.

4.3.3.4. *Site summary and discussion*

According to a radiocarbon range between 5300 and 5100 cal. BC, Vedrovice “Siroká u lesa” represents the earliest or at least one of the earliest Linear Pottery Culture cemeteries excavated. The site follows similar rites to other south-eastern grave fields such as Kleinhadersdorf and Nitra in terms of grave-pit orientation, although it is less uniform than the latter. The pottery blends in with the Moravian Linear Pottery as established by Tichý and thus allows the relative dating of a significant number of graves as well as connects the site to Kleinhadersdorf and Nitra.⁴⁰⁴ Further connections to Kleinhadersdorf can be observed within the microlithic trapezes resembling the ones at Vedrovice as well as both sites supposedly having shared the same raw material deposits for producing stone tools. Peculiarities include the increased occurrence of spondylus and red chalk powder, with both being distributed to about a third of all graves, as well as some unique findings such as the medallion-shaped belt buckles produced of marble and a bomb-shaped vessel with a pedestal. Lithics, polished stone tools, spondylus shells as well as the most extensive grave good assemblages in terms of variety and quantities belonged to individuals between early and late adult age, while pottery remained roughly the same for men throughout the different age stages but increased within older female burials. As about half of the females did not receive preservable grave goods and child or mature ensembles were less extensive than adult ones, Whittle et al. consequently argued for a pattern where grave goods increased from infancy to early adulthood and then decreases with maturity, with pottery being the exception.⁴⁰⁵ This stands in contrast to other sites, where the most complex grave good assemblages are mainly associated with mature to senile or at least late adult graves. This does not mean that there were no “rich” graves of old people – there were –, but that their significance might have been overemphasized in the past.⁴⁰⁶

Zvebil and Pettitt expanded on the interpretation by Podborský and proposed spatial clusters including at least one rich grave per group.⁴⁰⁷ If this proposal reflects the actual lifeways at Vedrovice, these groups would have had equal access to valued items across the site. They also suggested the north-western cluster to represent a matrilineal group within a

⁴⁰⁴ TICHÝ 1962.

⁴⁰⁵ WHITTLE et al. 2013, 126–127.

⁴⁰⁶ KVĚTINA 2004, 389. – WHITTLE et al. 2013, 127.

⁴⁰⁷ ZVEBIL, PETTITT 2008, 204–205.

patrilineal community, as this area contained two rich female graves as well as poor male graves unaccompanied by spondylus, polished stones and imported lithics. However, as women generally often received personal ornaments at this site, the location of three of eight spondylus-gifted women in the north-western part might be nothing out of the ordinary. Generally, neither these spatial groups nor possible linear patterns from north-east to south-west could be identified isotopically, which does not exclude this arrangement to have played a role within the funerary rites.⁴⁰⁸ However, the isotope analyses still suggest individuals buried in different areas of Vedrovice having varied diets, while individuals which were assembled together shared similar diets. The different mobility patterns for men and women as indicated by their strontium ratio imply virilocal or patrilocal practices. Although this fits Zvelebil's and Pettitt's interpretation of variability, the individuals sampled from the settlement are likely to have been local, with strontium values elevated out of the loess range by the local geology.⁴⁰⁹ Adult men buried with adzes show tighter strontium isotope values already determined in infancy, which might signify a pattern of the childhood of certain individuals determining the future mortuary situation, thus indicating a "intergenerational transfer of potential lifeways or status".⁴¹⁰

The cluster as recommended in this study partially fit the ones formerly proposed by Zvelebil and Pettitt, but generally show small-scale groupings with few exceptions. These suggest small family or kinship groupings rather than larger household conglomerations, as well as pairings outside these clusters, which is strengthened by closely clustered graves having similar isotope values in addition to other similarities. Some deviations can be seen e. g. zones being reserved for woman or mainly assigned to subadults, which indicates flexible rites or preferences shaped by life- and death ways (e. g. an unlucky family reserving a spot for their dead children or friends sharing the same burial zone). Other more isolated cases of "deviating" graves in terms of burial position or grave goods demonstrate that individuals which stand out in one particular way were also unusual in other elements of burial rites or accompanying objects.⁴¹¹ As these individuals often received well-equipped furnishings, such as three of four burials having a NW-orientation, to regard them as "deviant" instead of "special" certainly does not

⁴⁰⁸ WHITTLE et al. 2013, 126–127.

⁴⁰⁹ ZVELEBIL, PETTITT 2008, 214.

⁴¹⁰ WHITTLE et al. 2013, 126.

⁴¹¹ WHITTLE et al. 2013, 127.

match the actual social standing of these people. This study thus follows the interpretation of Whittle et al., who propose lifeways and burial rites as being shaped by complex relations between inherited status and a network of contacts rather than symbolising fixed identities such as “hunter-gatherer”,⁴¹² further adding that there might have been various other factors determined by intercommunal relations and events linked to death, manifesting in variation within horizontal stratification, burial positions and grave goods.

⁴¹² WHITTLE et al. 2013, 127.

4.3.4. Aiterhofen-Ödmühle

4.3.4.1. Introduction

The cemetery Aiterhofen-Ödmühle is located in southern Bavaria, on the right bank of the Aiterach stream, which flows into the Danube around 4 km north of the site.⁴¹³ Field surveys on the left bank revealed ten Linear Pottery settlements, which was used as an argument for the cemetery to be shared by several communities, although it was discussed as to whether some of those villages are in fact the same sites.⁴¹⁴ Only one settlement, “Aiterhofen B20” on the left bank, has been revealed so far, and predates the establishment of the burial ground. The excavations unearthed two badly preserved houses as well as five settlement burials, which contained the remains of two children and three adults, diversely orientated and left crouched.⁴¹⁵ One adult burial included pottery and an adze, while the other received several chert tools. The cemetery itself – more specifically the first 8 graves – was found during the construction of a loam pit in 1978, which led to multiannual excavation campaigns up to 1980. A total amount of 157 single and three double inhumations, as well as 56 single and nine potential double cremations were excavated. Along with a further nine individuals represented by isolated bones, the human remains of Aiterhofen-Ödmühle show 240 individuals. Another three cremations, one double cremation and one single inhumation are possibly of middle Neolithic origins.⁴¹⁶ A few graves might have been missed in the north-western and south-eastern corners, while others could have been destroyed during the construction works. Although the definition of *Gräberfelder* by Nieszery defines them as extra-mural sites without settlement finds, some traces of such were found in the cemetery itself as well as further south of the site in addition to Middle, Late and Final Neolithic, Hallstatt and La Tène features, which might also have destroyed some Linear Pottery graves. The Linear Pottery settlement traces are focused on the south of the area and comprise pits and pit complexes, 21 of them dubbed “grave-like pits” (empty graves?), as well as the uncertain remains of a house and parts of a ditch. A 25m stretch of this ditch runs east-west and seemingly divides the settlement and the cemetery, although some burials lie south of the ditch. Its functional use could have been to delimit the cemetery, although the chronological

⁴¹³ NIESZERY 1995, 53–56.

⁴¹⁴ REINECKE 1978. – NIESZERY 1995, 56. – HOFMANN et al. 2013, 219.

⁴¹⁵ REINECKE 1978, 76–79.

⁴¹⁶ NIESZERY 1995, 89.

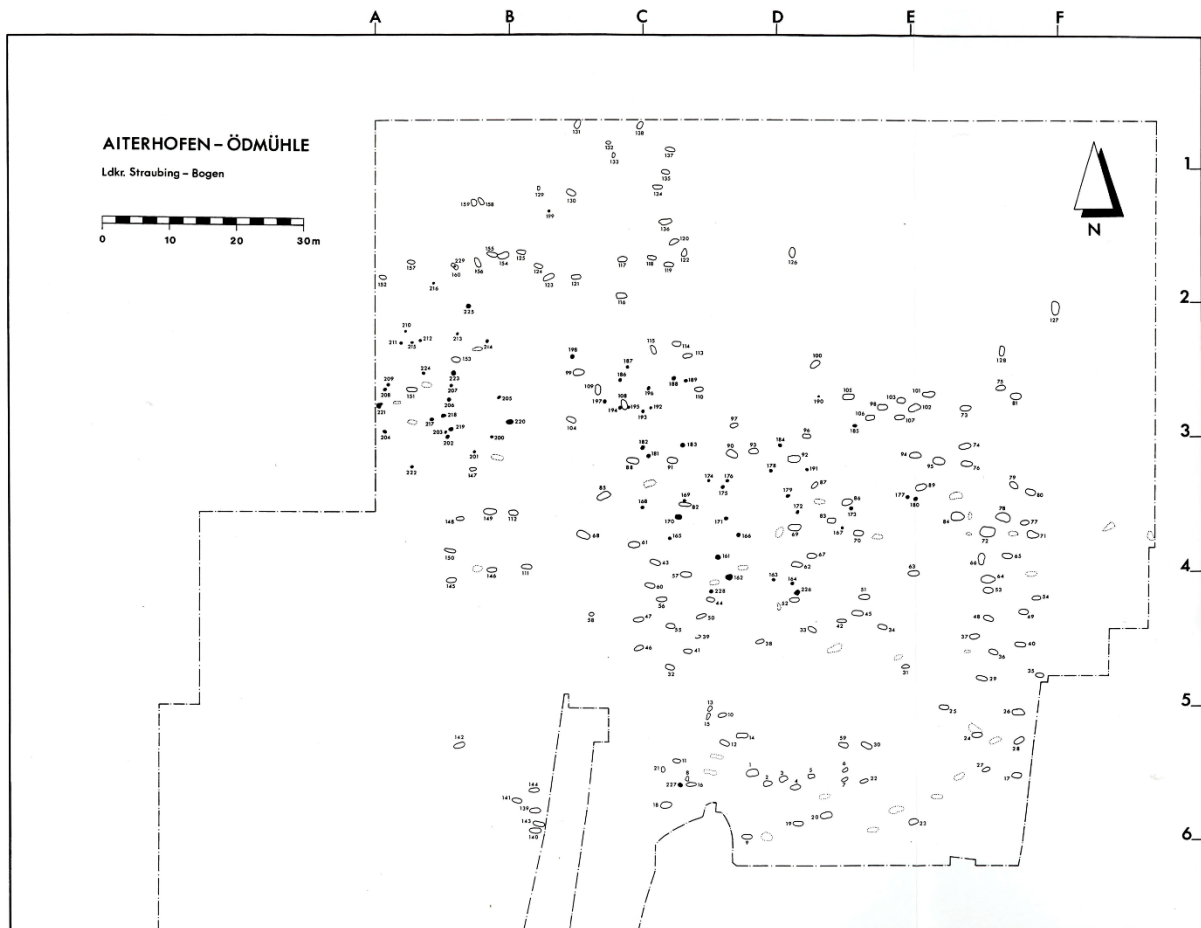


Figure 48: Original map of the cemetery Aiterhofen-Ödmühle. The black points represent cremations (NIESZERY 1996, 54, Abb. 19).

relation to the graves needs further exploration due to the uncertain nature of the relative chronology.⁴¹⁷ Radiocarbon data is absent, and consequentially the researchers had to rely on diagnostic features such as pottery style and grave good seriation. However, different investigations resulted in partially contrasting outcomes, while some finds such as double-edged wedges in cremation burials might be of Middle Neolithic origin. The inhumation grave 30 cuts into a second ditch thought to be of Middle Neolithic origin, but is not definitely datable. Only the cremation grave 229 will be excluded from the evaluation, as it contained Stroke Pottery sherds.

Nieszery originally divided the cemetery into five clusters on the basis of empty spaces separating larger groups of graves, although these empty spaces might have been the result of previous destruction due to construction work.⁴¹⁸ As part of the LBK Lifeways project, Nieszery's initial groupings were synthesized with later research and then reimagined (Fig.

⁴¹⁷ HOFMANN et al. 2013, 219.

⁴¹⁸ NIESZERY 1995, 64. – HOFMANN et al. 2013, 220.

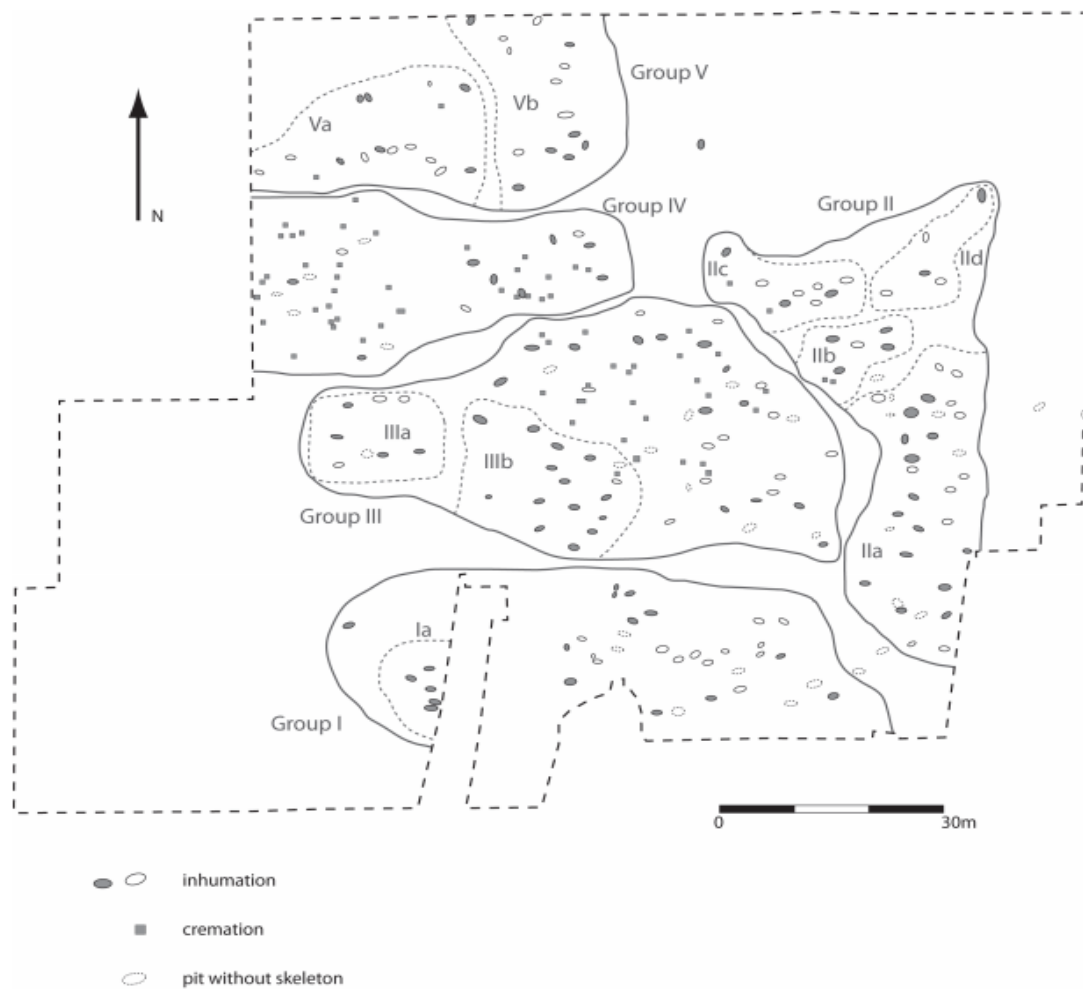


Figure 49: Burial groups according to Nieszery, reimagined as part of the LBK Lifeways project (HOFMANN et al. 2013, 220, Fig. 6.4.)

49). Anthropological information, burial type, burial position, pit orientation and grave good distribution all demonstrate the difference between these clusters, while chronological distinctions could also be made. However, it should be considered that the empty areas dividing the graves into clusters might be due to erosion and destruction by construction work, making it ill-advised to over-rely on the proposed spatial groupings. I will nevertheless at least partially reuse them as they are still useful for communication purposes.

4.3.4.2. *Distribution maps*

Considering the distinction between graves with or without grave goods, no significant grouping of either trait can be recognized, except a relatively high number of burials without grave goods in the clusters Va (9 of 16) and I (13 of 31). It is worth noting that the majority of burials were supplemented with goods, in contrast to other cemeteries; 230 burials divide into 140 furnished pits and 90 without gifts (around 60.9% to 39.1%). 58 of 161 inhumations (ca. 36%) and 32 of 69 cremations (ca. 46%) did not receive preservable grave goods. The centre, north and east of Aiterhofen-Ödmühle have fewer complex ensembles than the southern and south-central parts, which also contained the high-valued spondylus ornaments. However, unfurnished inhumations and graves with fewer gifts cluster in the eastern part of the otherwise well-equipped south. Hofmann et al. mentioned the possibility of a chronological north-south-progression from simpler grave good assemblages to more complex ones, with the model of a trend to greater differentiation in later stages already suggested by Jeunesse and Farruggia.⁴¹⁹ Comparing this to the anthropological information of the Lifeways database – with 37 (and 18 uncertain) furnished male graves compared to 7 (and 16 uncertain) men without preserved gifts, as well as 26 (and 14 uncertain) women receiving grave goods against 8 (and 12 uncertain) unfurnished female burials – there is a trend of men, especially older individuals in the south, having the most complex grave good assemblages. However, there were also a few women who received extensive ensembles as well as spondylus or other mussel or snail shell ornaments. Younger individuals were more likely to receive no preservable grave goods.⁴²⁰ A total of 36 empty graves have also been described, but unfortunately not included in the find catalogue, and were mostly unfurnished.⁴²¹ Ten contained ceramics and clustered on the southern edge of the site.

Generally, concerning sex and age distributions, a total of 33 females and 16 uncertainly identified females as well as 33 males and a further 30 probable males were identified within the inhumations, while cremations divide into 15 uncertain women and 15 possible men. The distribution map of biological sex shows female and uncertain female individuals throughout the cemetery, although they seem to be rarer in the north to north-western areas as well the eastern to south-eastern rim of the cemetery. However, the reasons for this could lie in the

⁴¹⁹ JEUNESSE 1997. – HOFMANN et al. 2013, 239.

⁴²⁰ HOFMANN et al. 2013, 230.

⁴²¹ NIESZERY 1995, 87–88.

high number of undetermined graves in these areas, which might at least partially contain female individuals. Women seem to dominate cluster IIIa, a small group of graves in the western area of Aiterhofen-Ödmühle. Age-related patterns are observable regarding the inclusion of young individuals, with early infants being less likely to be included, while older children above six years more common, and infants under three years often occurred as parts of double burials.⁴²² Age thresholds vary at other, smaller Bavarian sites: While younger children also appear at Sengkofen, the minimum age at Essenbach-Ammerbreite was six years. This might have depended on different regional views and societal rules on when to include children, possibly relating to significant physical and social developments. As smaller children were buried in more shallow graves, erosion could have also been responsible for this situation. For Aiterhofen-Ödmühle, a possible connection to weaving has been suggested, as there is a high incidence of enamel hypoplasias which formed between the ages of three and four and thus could coincide with the age minimum of three years. Spatial groupings regarding age can be seen in the distribution of infants and juvenile individuals, as they are nearly absent in the eastern and northern areas of Aiterhofen-Ödmühle, with infants being especially rare. However, there is a group of infants that closely assemble in cluster V, which is synonymous with the north-western area of the cemetery. Adults are frequently found, as expected, while mature to senile individuals – with the exception of parts of the central, eastern and southern areas – can also be observed throughout the cemetery.

The distribution of burial types shows cremations mainly in the north-western and central areas, especially in group III (excluding IIIa and IIIb) and IV, indicating these graves to be younger, as it is generally assumed for cremations to be of Later Linear Pottery origin.⁴²³ The eastern part of cluster IV, found in the north-western area of the cemetery, contained almost only cremation burials, while they also predominated in the central part (cluster III without IIIa/b). The relative absence of cremations in the southern areas could be explained by preservation preconditions, although Nieszery rules this explanation out, as cremations are found at unusual depths at Aiterhofen-Ödmühle and thus should have been unearthed in cluster I, where only one was excavated.⁴²⁴ In zone III and IV, the cremation burials occurred deeper than the inhumations, while in cluster V the cremation burials were significantly

⁴²² HOFMANN et al. 2013, 232.

⁴²³ JEUNESSE 1997, 59. – TRAUTMANN 2006. – HOFMANN et al. 2013, 221.

⁴²⁴ NIESZERY 1995, 88–89.

deeper. This stands in stark contrast to previous supra-regional analyses of Linear Pottery cremation burials, as demonstrated by e. g. the grave field of Stephansposching, which is only 15 km distant to Aiterhofen-Ödmühle: There, 32 cremation burials (although only 25 objects could be certainly interpreted as such) that were assumedly of Linear Pottery origins – with two exceptions – were all excavated in the humic top layer.⁴²⁵ For this reason, Nieszery suspects that not all cremation burials in Aiterhofen-Ödmühle are of Linear Pottery origin, which is further indicated by only four objects (214, 221, 224, 227) including Linear Pottery stray sherds, the certainly identified Early Stroke Pottery grave 229 and the earlier mentioned perforated double-wedges within three cremation burials (161, 185, 209), which might date to the Middle Neolithic.⁴²⁶ However, one of those also appeared in the inhumation burial 16 at Schwetzingen in Baden-Württemberg.⁴²⁷ Cremations with more than two categories of gifts are the exception.⁴²⁸ This does not necessarily indicate a lesser social status for cremated members of the Linear Pottery society, as the burning itself might have been a significant act, thus decreasing the importance of extensive assemblages to signify the social status of the deceased and instead focusing on fewer but meaningful grave goods. This is further indicated by the cremation pits being relatively deep. Alternatively, a variety of organic material could have been burned at the funeral, thus being absent in the grave-pit.

As pits without human remains are not listed or described in detail in the appendix of Nieszery's publication for the Bavarian cemeteries, I will refer to his written explanations as well as the discussions provided by the Lifeways project.⁴²⁹ It should also be noted that the traces of settlement activity complicated the determination of empty graves, although only pits that were both shaped and oriented like graves were included. Among the 36 grave-like pits of Aiterhofen-Ödmühle only 10 could be safely assigned to the Linear Pottery Culture due to the ceramic find material. Some contained sherds, animal bones and in a few cases even calcinated bones and a complete pot, which are both unfortunately lost. As they spread farther to the north than the majority of the settlement traces, they are more likely to be associated with funerary rites. Empty graves mainly occur on the south-eastern edge of the cemetery in zones I and II. Their distribution thins out noticeably towards the centre, and in

⁴²⁵ SCHMOTZ 1992, 15.

⁴²⁶ NIESZERY 1995, 89.

⁴²⁷ GERLING 2012, 136.

⁴²⁸ NIESZERY 1995, 112.

⁴²⁹ HOFMANN et al. 2013, 231–232.

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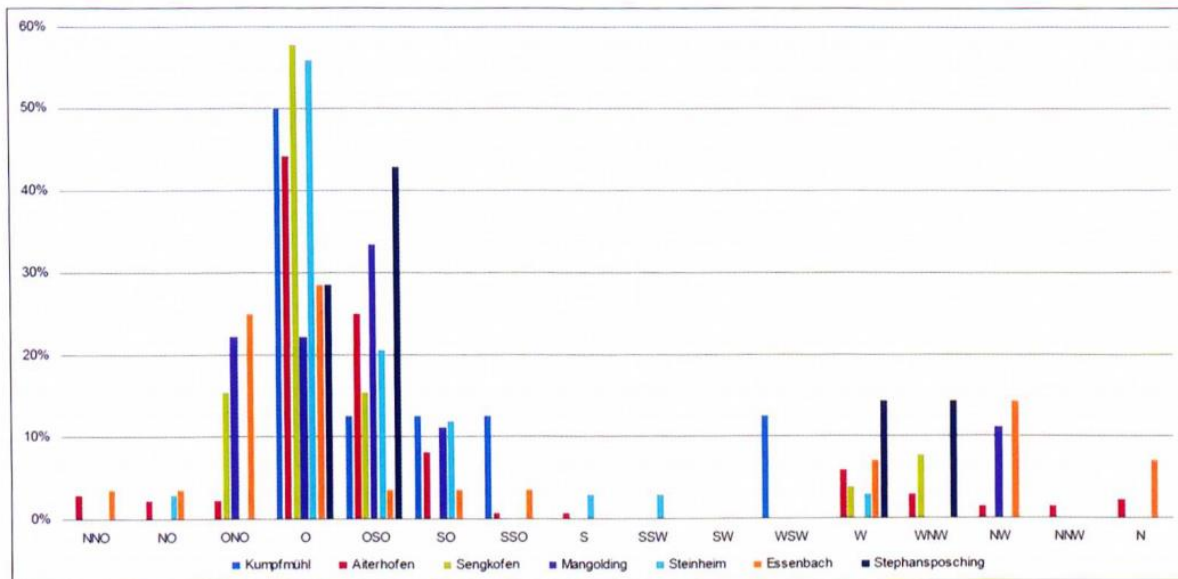


Figure 50: Comparison of Bavarian cemeteries on the basis of grave orientation (REITMAIER 2018, 28, Abb. 6).

the west some grave-like pits can still be found in the areas characterised by a high proportion of cremation graves (zone IV). In the north (zone V), however, they are completely absent. Possible interpretations include multi-stage funerals and lootings by graverobbers, although Hofmann et al. pointed out that the total absence of bones would have been unusual in such cases, instead suggesting that these pits might have contained the residue of commemorative rituals.

The vast majority of the inhumations were – if determinable – oriented to the east, with only a few pits positioned to the north, south or west, which also applies to the other Bavarian cemeteries (Fig. 50).⁴³⁰ The E-W-alignment occurs most frequently, especially in the southern parts of the site as well as in the clusters IIb/c. The central and northern zones are less uniform, with graves being more often oriented as ESE-WNW, which dominates the western group IIIa and the eastern cluster II. As the most common burial position at Aiterhofen-Ödmühle was the left crouch, with 94 individuals (67% of the inhumations) of them having an east-west orientation, most inhumated persons naturally looked to the south, south-east or south-west.⁴³¹ However, there are some diverging individuals, of which the most noticeable are the ones looking to the north or northwest, as they are sometimes found in “pairs”, meaning two were buried near to each other, or otherwise at least in relatively close proximity. It is unclear

⁴³⁰ 70 E-W, 2 ESE-WSW, 35 ESE- WNW, 16 ENE-WSW, 4 N-S, 2 NW-SE, 1 NE-SW, 4 NNW-SSW, 4 NNW-SSE, 1 S-N, 1 SE-NW, 1 SSE-NNW, 1 SW-NE, 4 W-E, 2 WSW-ENE, 4 WNW-ESE and 10 uncertain alignments.

⁴³¹ HOFMANN et al. 2013, 221.

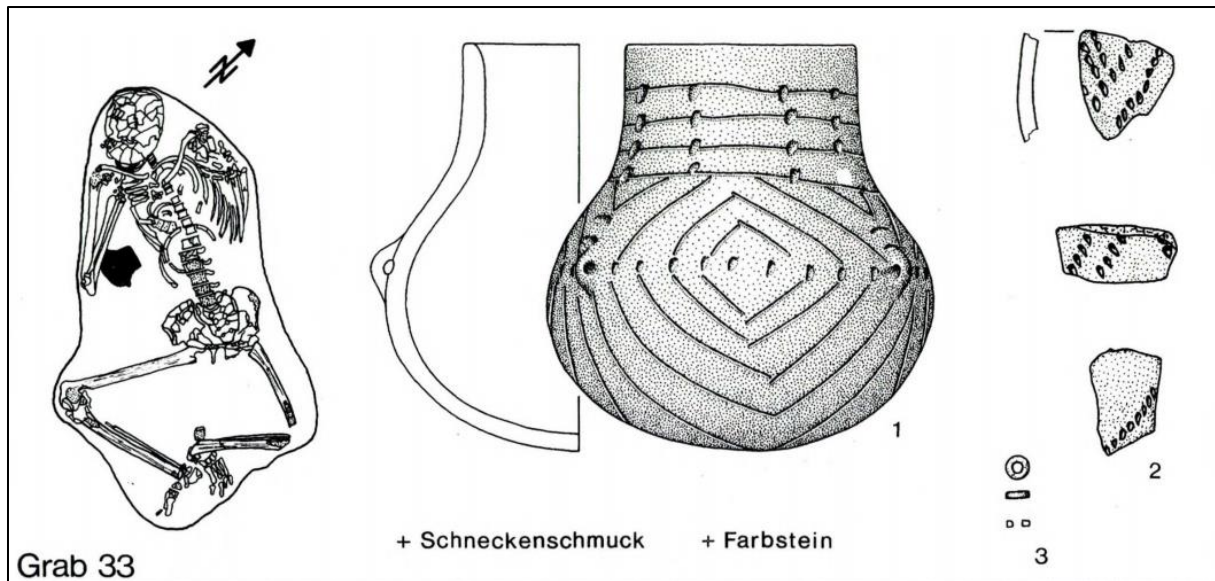


Figure 51: Contents of grave 33 at Aiterhofen-Ödmühle. Three *theodoxius danubialis* shells and one graphite stone also contained in the grave were not depicted. (NIESZERY 1995, 334, Taf. 14).

if this signifies familiar bonds or other kinds of structure. Most interestingly, of those 23 persons looking to the north, northeast or northwest, eight reached at least mature age. Generally it could be concluded that a “deviant” line of sight or grave-pit orientation did not necessarily equal a lesser societal status, as many of these graves contain grave goods (with the absence of grave goods also not necessarily meaning a low status), and some are even well-equipped, as demonstrated by e. g. grave 32.⁴³² This also applies to east- or west-looking individuals. Non-left-crouches are rare, although they can be found in relatively high numbers in cluster V and the northern parts of group III. A few supine or prone individuals are scattered throughout the cemetery, with the most noteworthy being the neighbouring graves 158 and 159, which lie isolated on the most north-western rim (cluster V). Grave 158 contained the remains of a 30-40-year-old woman in prone position, richly gifted with pottery, an adze, two silex blades and one nucleus, one antler belt buckle, and a pyrite nodule. In contrast, the senile woman in grave 159 was supine positioned and buried alongside an adze and five arrowheads. As the pit orientation of 158 was SSE-NNW with the line of sight to SW, in contrast to 159 which orientates NNW-SSE and looked to the east, those two burials act antipodally in various categories. Additionally, both are anthropologically determined as woman, although such grave goods are usually regarded as typically “male”.

⁴³² This grave contained a senile woman gifted with 234 polished snail shells (*theodoxius danubialis*), 4 limestone and 4 protula beads as well as a spondylus belt buckle. See NIESZERY 1995, 270–271.

The intensity of the crouches falls within the expected values for the Linear Pottery funerary rites. The angle of the backbone to the upper thigh is mostly identified as either “moderate” or “wide”, which both need more space inside the grave than their tighter variants. The angle of the upper to the lower thigh sees more variation. Extreme and tight crouches predominate, although moderate angles are also common and are especially present in cluster V. Unfortunately, poor preservation conditions – particularly in the southern area - prevent more satisfactory analyses. One unusual example can be found at grave 33, which contained an adult woman with her legs drawn up in a rhomboid position (Fig. 51).⁴³³ She was placed in a supine position and her arms flipped back with her hands touching her shoulder. As already pointed out by Hofmann et al., burials in strikingly similar positions have also been recovered from Ensisheim and Vendenheim in Alsace and from Wittmar in Lower Saxony, suggesting that this position held some significance.⁴³⁴ Considering arm gestures, only a few identifiable positions differ from the sleeper, which often mark older individuals with extensive grave good assemblages or at least high-valued gifts such as shell ornaments. The senile women in grave 150 (Code “Arms position00110”) in cluster IIIa received protula beads and an abundance of theodoxius shells. Individuals with their hands laid on their shoulders (Code “Arms position00040”) have been mainly identified as late adult to senile women, with the only men in this group also being senile.⁴³⁵ Other diverging positions, on the other hand, occasionally occur within subadult and younger adult burials.⁴³⁶

The ratio of grave goods to vessel units is 34 to 42 (ca. 45:55%). Among all sexed burials, 13 (and 6 uncertain) women and 12 (and 4 uncertain) men received ceramics.⁴³⁷ Generally, it seems that younger individuals were more likely to receive pottery, although older individuals were also buried with such.⁴³⁸ Vessels have been found across the cemetery, although exceptionally few units contribute to cluster I. These consist of one plate (30), an amphora

⁴³³ NIESZERY 1995, 334. – HOFMANN et al. 2013, 221.

⁴³⁴ RÖTTING 1983. – JEUNESSE 1997. – 2002. – BOES et al. 2005. – FIBIGER, BENTLEY, BICKLE 2013. – HOFMANN et al. 2013, 221.

⁴³⁵ 33 (female, adult), 50 (male, senile), 55 (female, early adult), 76 (uncertain female, late adult), 109 (female, late adult), 123 (uncertain female, mature I/II), 159 (female, senile)

⁴³⁶ Arms position00060: 71-2 (uncertain male, infant II/juvenile), 107 (female, early adult), 136 (female, early mature); Arms position00070: 66 (unsexed, adult); Arms position00100: 75 (unsexed, adult), 137 (female, late adult); Arms position00130: 57 (male, late adult), 79 (unsexed); Arms position00140: 30 (infant/juvenile).

⁴³⁷ Female: 33, 38, 60, 68, 69, 91, 92, 106, 109, 112, 136, 137, 158; uncertain female: 22, 39, 76, 80, 131a, 214; Male: 15, 18, 35, 74, 87, 88, 94, 113, 115, 119, 153, 166; uncertain male: 132, 185, 200, 226.

⁴³⁸ HOFMANN et al. 2013, 230.

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(uncategorized; grave 18) and some undetermined sherds (15, 18, 227). The central and northern parts held significantly more ceramics, particularly the western area, with group IIb/c/d and northern IIa as well as the western rim of group III having contained remarkably large amounts of pottery in relation to other clusters, especially *Kümpfe*. The latter were absent in group I and only scarcely represented in the central and north-western areas. Amphorae, with the exception of the already mentioned unit in grave 18, were also not present in the southern area of the cemetery. They seem to be most common in the north-eastern part of group II, where four units of type 1b and one example of type 1h cluster near each other. The perforated miniature vessel was found along with the remains of a 4-year-old infant (grave 132), while the other cups came from infant to late mature graves.

As only 49 vessels were recovered from 37 inhumations, and not all of those were suitable for chronological analyses, dating the pottery of Aiterhofen-Ödmühle through seriation remains challenging. Nieszery modified Brink-Kloke's scheme for Bavaria and proposed Aiterhofen-Ödmühle to start in the Flomborn phase of the Middle Linear Pottery and to continue into the Middle Neolithic, although he remains ambiguous about a possible hiatus between the Linear and Stroke Pottery phase.⁴³⁹ Consequently, the earliest burials would be near the centre and north-west. Another approach was provided by Pechtl, who linked six pottery-rich graves to his chronological scheme for Bavaria, which contained – according to Hofmann et al. – the

Table 4: Chronological scheme for southern Bavaria and its relation to adjacent regions, according to Pechtl 2009, figs 43 and 44. (HOFMANN et al. 2013, 212, Tab. 6.1.).

Lower Main (Meier-Arendt 1966)	Württemberg (Strien 2000)	Southern Bavaria	Stephans- posching	Type inventories	Upper Austria (Grömer 2001)	Bohemia (Pavů 1986)
GG	GG	IIa	IIa	Osterhofen- Schmiedorf	Lengyel / Bavarian MNL	SBK IVa
HST II	HST II	Middle Neolithic	IIb	Atting-Rinkam Aiterhofen	?	SBK III
V	HST I	IIb IIa	?	gr. 229		SBK II
IV	8 7	late LBK	6 5	Aiterhofen gr. 33	Šarka	IVb IVa III/IV
III	6 5	mid LBK	4 3	Aiterhofen gr. 66, 74, 81, 106, 131		IIIb IIIa
	4 3	IIc IIb IIa	2 1	Lerchenhaid enclosure Aiterhofen B20	Notenkopf	IIId IIc IIb IIa
II	2A	IIc?		Altdorf	developed Vornotenkopf	I/II Ic
I	1	Vor- notenkopf		Kösching	?	Ib (Ia)

⁴³⁹ NIESZERY 1995, 131–138.

most extensive assemblage in 2012 and should thus be reliable for inter-regional comparisons.⁴⁴⁰ Therefore, vessels from the graves 66, 74, 81, 106 (northern area of group III) and 131 (northern rim of cluster V) would date to Stephansposching phase 3 or 4, while grave 33 (southern group III) corresponds to the younger phase 5. Nevertheless, the chronological development of Aiterhofen-Ödmühle is still being discussed and unfortunately cannot be estimated through pottery analyses alone.

Various kinds of clothing pieces and ornaments only occur in the southern areas of the cemetery, with the exception being bow-shaped antler closures, which can be found in the central and north-western parts. Medallion-shaped spondylus closures were buried with three women, one senile, one early mature and one juvenile, while V-shaped belt buckles have been unearthed in six male graves, with age-ranges between juvenile and senile. Spondylus closures are represented in ten male and one female (grave 19) burials in the clusters I and southern IIa. Beads made of various kinds of stone, protula and spondylus are also distributed to the southern and southwestern areas of the cemetery. Polished theodoxius danubialis shells have been found in five female and one sexually undetermined burial and contribute to cluster IIa and III, while perforated examples were absent at Aiterhofen-Ödmühle. The Bavarian cemeteries Mangolding and Sengkofen also only included polished theodoxius danubialis, while perforated examples were excavated at Essenbach-Ammerbreite. Most interestingly, although the supra-regional seriation provides a negative result (see chapter 4.4.), the seriation of the local data set of Aiterhofen-Ödmühle (Fig. App. 80) assigns shell ornaments to one end of the reciprocal averaging, meaning they are either chronologically late or early. Only two cremations existed in the south – one of them being the Stroke Pottery grave 229 – and they did not correspond to the clothing ornaments associated with clearly younger artefact groups such as perforated double-wedges that occur on the opposite end of the seriation. This suggests that these types – with the exception of antler belt buckles – and with them large parts of the southern cemetery areas, can be dated to the earliest phase of Aiterhofen-Ödmühle. Additionally, the empty space between the clusters Ia and IIIa/b – and thus the absence of further graves there – could be due to construction work and erosion, with the conservation conditions being especially poor in southern Aiterhofen-Ödmühle.⁴⁴¹ Thus, the

⁴⁴⁰ PECHTL 2009, 94. – HOFMANN et al. 2013, 220.

⁴⁴¹ NIESZERY 1995, 61–62.

beginnings of the cemetery might have occurred in the southwestern area consisting of the clusters Ia, the central part of I, IIa/b and included burials which possibly existed in the empty space between them. However, this is contradicted by the already mentioned chronological scheme by Pechtl, who associates grave 33, which contained theodioxius danubialis and a nephrite stone bead among other grave goods, with the Late Linear Pottery (Tab. 4). Nieszery, on the contrary, described the only decorated vessels within spondylus-gifted graves as “certainly flomborn-dating or a little bit younger” and thus argued for the occupation to have started in the southern area.⁴⁴² Assuming the earlier dating of spondylus gifts at Aiterhofen-Ödmühle to be correct, their absence in later stages could be due to an interruption of the trade-routes to South-Eastern Europe or the Mediterranean region, as was implied by Kahlke for the cemetery Bruchstedt.⁴⁴³ It should also be remembered that a grave good seriation basically shows the spatial relations between artefact types, and not necessarily a chronological development.

Grave goods produced from bones and antler are presented by points, cylindrical sticks, combs as well as the previously mentioned antler belt buckles. Pointed tools were gifted to the graves of five males, one uncertain male and one female and mainly contributed to the southwestern area of the cemetery, while few examples were also distributed to the central and eastern parts. Cylindrical sticks belonged to the male graves 50 and 85 in the central area, with the former also receiving a long bone closure. Combs are included among the unique features of the Bavarian cemeteries and also appeared (as already mentioned in chapter 3.8.1.) at Essenbach-Ammerbreite, Mangolding, Niederpörling-Leitensiedlung, Regensburg-Kumpfmühl and Sengkofen. They were distributed to six graves and were not limited to one particular gender. Their unusual placement at the head of the deceased implies an emphasis on hair styles in the Early Neolithic society and thus an ornamental function, as already discussed in chapter 3.8.1., as do head ornaments such as the ones produced from theodioxius danubialis. Animal bone remains occurred as fox mandibles (18, 102, 141), a dog radius (113)

⁴⁴² Original text: „Bedenkt man andererseits, daß es im Verlaufe der jüngeren Bandkeramik zu einem deutlichen Rückgang des Spondylusimportes im gesamten westlichen Bereich dieser Kultur kam, dann ist nicht auszuschließen, daß auch die Siedlungsgemeinschaft in Aiterhofen und Umgebung davon betroffen gewesen sind. Sollte diese Annahme zutreffen, könnten wir zumindest Aussagen über die von Süden nach Norden verlaufende Belegungsrichtung der Nekropole von Aiterhofen treffen. Dies scheinen die beiden einzigen Spondylusgräber mit verzerrten Keramikgefäßen zu bestätigen, die sicher flombornzeitlich bzw. etwas jünger sind.“ NIESZERY 1995, 178.

⁴⁴³ KAHLKE 2004, 39.

and potential meat offerings such as goat-sheep (94) and pig (102), while the rib of a cow around the head of a man in grave 61 is difficult to interpret and might have been part of the clothing.⁴⁴⁴ The most remarkable of these animal remains occurred in grave 102, a generally very well-equipped burial of a senile man, which contained both a fox mandible and pig bones. Of the other five burials one is at least in the adult stage, with the other four ranging between late adult and early mature age. It should also be noted that none of the 25 graves gifted with animal bone goods (ca. 11% of all burials) are cremations, meaning that such were either not preserved or indeed limited to inhumations. Human teeth count among the more unusual types of grave gifts. In the case of grave 33 (woman), 65 (early adult uncertain man) and 100 (early mature woman), they were taken from the dentition of the deceased and then placed on the head. Grave 115 contained among the remains of a senile man four teeth and parts of the mandible of a second individual, which probably should not be interpreted as a burial gift and will be thus excluded from the evaluations.

Silex nuclei have been found mainly in the southern half of Aiterhofen-Ödmühle and were almost absent in the north. On the contrary, the majority of the truncated blades as well objects with sickle gloss occurred in the northern half. The latter were excavated from grave 65 (uncertain man, 25-30-years old), 93 (50-55-year old man) and 106 (50-55-year old woman). One laterally retouched blade appeared in grave 139 (uncertain man, 15-20-year old), while truncated - or laterally retouched and truncated – blades were mainly distributed to the northern half. An endscratch occurred in grave 15 (group I), which contained a late adult man. Microlithic chert stone tools or arrowheads appeared as triangular, trapezoidal and irregular shapes in 23 graves. The individuals with microlithic flakes were mainly identified as men ranging between late adult and senile age (12 graves), with only one single inhumation (88) and two single cremations (196, 224) containing children. One irregular blade flake in grave 158 and triangular arrowheads in graves 137 and 159 were gifted to women. Grave 186, a double cremation buried with a triangular arrowhead and two small lumps of graphite gneiss, contained the remains of a juvenile to adult man and one infant. The amount of microlithic chert artefacts usually varied between one and five pieces, with the exception of the adult male in grave 75 (seven units) and the richly gifted boy in grave 88 (ten units). The latter was, along with one early mature man in grave 117, the only examples of burials with

⁴⁴⁴ NIESZERY 1995, 107.

trapezoidal blade flakes and symmetrical trapezes. The grave good seriation shows arrowheads to be chronologically late, with the exception of the triangular point in grave 18, which dates to the early phase and is allocated to the southern cluster I. It is the only grave with arrowheads in this cluster, while the remaining units – mainly triangular points – frequently occurred in the other areas and were generally common in the northern half. In Schwetzingen, triangular arrowheads made of bone or silex were mainly associated with chronologically late graves. If this were also the case for Aiterhofen-Ödmühle, it would fit the interpretation of an early southern and a later northern half. One possible explanation could be increasing violent conflicts in the Late Linear Pottery as demonstrated by massacre sites, which might have led to a greater importance of arrowheads.⁴⁴⁵ Alternatively, there is always the possibility for a connection of arrowheads to hunting, which can be certainly made in the cases of graves 18, 102, 117 and 158 due to them being accompanied by either fox mandibles or antler belt buckles. This might also apply to grave 113, where bones of *canis palustris* have been found, assuming that Early Neolithic dogs played a role in hunting, although it could have simply been the pet of the deceased or symbolically significant in other ways.

The presence of grinding stone tools at Aiterhofen-Ödmühle is limited to friction plates, which spread over the central area. In some cases, traces of crushed paint were found on the work surfaces, either from haematite (60) or a black colour (82).⁴⁴⁶ These derived from perforated or non-perforated graphite, chloride stones and red chalk, which have been unearthed throughout the cemetery, although they were notably absent in the northern and western rim and seemed to cluster in the eastern part of the cemetery. Colouring stones were gifted to both men and women, while red chalk occurred in six male burials, of which four had the powder spread around the head. The dominance of the black colour in the grave field of Aiterhofen-Ödmühle stands in stark contrast to the use of colour in the cemeteries of the Western Linear Pottery, where apart from isolated manganese nodules, haematite was the most common and graphite was absent.⁴⁴⁷ The preference for graphite by the people of Aiterhofen-Ödmühle was probably related to the relative proximity to the raw material deposits, with Nieszery having suggested the vicinity of Passau to include the raw material

⁴⁴⁵ Arrow shots are confirmed e. g. for the Massacre of Talheim (5050 cal. BC) in Baden-Württemberg, which is – among other sites such as Asparn Schletz – seen as an indication of increasing social tensions in the Late Linear Pottery. WAHL, KÖNIG, BIEL 1987, 129–165. – Eva-MARIA WILD et al. 2004, 381–383.

⁴⁴⁶ NIESZERY 1995, 161.

⁴⁴⁷ NIESZERY 1995, 161–162.

area. Not to be confused with colouring stones are pyrite nodules, which often oxidise to rust-coloured goethite or to limonite during longer soil storage and thus occasionally appear as red powder. Similarly, regarding silex nuclei, they were often interpreted as parts of fire-lighting kits, together with blades, arrowheads, bone points and sometimes mussel shells. Hammerstones were represented by only two units and were allocated to the two cremation burials 163, and 184 as well as one fragment in grave 200, although the example from 163 was lost and thus not included as hammerstone in the evaluation, as its functional interpretation cannot be confirmed with certainty.⁴⁴⁸ Two quartz pebbles with unknown function (163, 202; see chapter 3.6.5.) might have been hammerstones or regular pebbles. The 20 graves described as containing fire lighting utensils were mostly identified as male, with eight individuals having reached at least mature age, including four senile individuals.⁴⁴⁹ An early adult man was diagnosed with a shortened right leg, which possibly led to limping. Fire lighting kits are distributed throughout Aiterhofen-Ödmühle, although they seem to be emphasized in the southern half of the cemetery. While Nieszery tried to avoid overinterpreting the importance and possible reasons for using them as grave goods on the basis of distribution, he viewed their gifting to elderly or disabled men as an indicator for allocation of responsibilities within an Early Neolithic society, as fire making is still a doable task for disabled people.⁴⁵⁰ However, he still considered it problematic to interpret the implied distribution of tasks or specialization as an indication of a community-determined hierarchy within the Linear Pottery society, as it was suggested e. g. by Van de Velde and Modderman.⁴⁵¹

Adzes as well as perforated double-wedges and disc maces represented the polished stone tools at Aiterhofen-Ödmühle. They were mainly produced by brown Hornblende amphibolite or dark grey-green to greenish grey Actinolite amphibolite, with a few examples also made of quartzite chlorite schist, gabbro or micro gabbro.⁴⁵² The distribution map shows Ramminger's Type 1 to have been more common in the southern half, while Type 2 appeared across the

⁴⁴⁸ NIESZERY 1995, 162–163.

⁴⁴⁹ In addition to chert and pyrite nodules, metapodia points, mussel shells and silex blades and points were listed as parts of fire lighting sets. The graves containing potential fire lighting sets are the following: 2 (unsexed), 10 (male), 18 (male), 25 (male), 28 (male), 36 (unsexed), 41 (uncertain male), 42 (male), 48 (male), 55 (female), 65 (uncertain male), 85 (male), 87 (male), 88 (uncertain male), 94 (male), 102 (male), 120 (unsexed), 139 (uncertain male), 142 (male), 153 (male), 158 (female).

⁴⁵⁰ NIESZERY 1995, 168.

⁴⁵¹ VAN DE VELDE 1979a. – 1979b. – MODDERMANN 1985. – VAN DE VELDE 1990.

⁴⁵² NIESZERY 1995, 141.

cemetery. Furthermore, Type 1 was notably absent in the western part in group IV and represented by only one unit in group V. A small number of adzes appeared in the north-western part of Aiterhofen-Ödmühle, as there were generally fewer grave goods. The neighbouring female graves 158 and 159 with “male” gifts, which occur isolated in cluster V, both contained adzes. Considering the perforated units, a disc mace has been found with an inhumated person in grave 66, while three double wedges belonged to uncertain male cremations (graves 161, 185, 209). As already mentioned, Nieszery suspected them to be of possible Middle Neolithic origin, which could not be confirmed by grave good seriation, as additional data of younger cultures would have to be included to investigate this aspect. However, they order at the chronological end opposite to the spondylus gifts, which at least indicates them to be one of the latest types of burial gifts. Perforated adzes appeared sporadically in the groups II, III and IV and were absent in the southern and northern ends. Particularly interesting about the distribution of polished stone tools at Aiterhofen-Ödmühle is the frequently occurring, unusually high number of two or three, and in the case of the cremation grave 185 even four, polished stone tools per individual. Similar quantities have not been found at the other cemeteries selected for this study, which further highlights the special standing of Aiterhofen-Ödmühle among Linear Pottery grave fields. Concerning the distribution between the burial types, there were about 24 of 37 furnished cremations (ca. 65%)⁴⁵³ which contained at least one adze or perforated wedge, while polished stone tools were gifted to only 43 of 103 furnished inhumations (ca. 42%).⁴⁵⁴ Additionally, 19 cremations received either one or two adzes, but no other types of grave goods. As cremations generally received less preservable gifts than inhumations and given the fact that the relative proportion of burials with polished stone tools was significantly lower in the latter case, it seems that cremations primarily received adzes or perforated edges. These were burnt together with the deceased, as the marks on the objects demonstrate. Polished stone tools must have been essential for processing wood for the burning rituals, potentially leading to a ritual connection between funerary preparations and adzes. Following this interpretation, the polished stones inside the cremation graves might have been given to the deceased after being used for the

⁴⁵³ 165, 167, 174, 176, 177, 181, 182, 185, 188, 189, 190, 192, 196, 197, 204, 207, 211, 212, 213, 222, 224, 225, 227.

⁴⁵⁴ 1, 2, 10, 12, 13, 15, 18, 21, 24, 25, 28, 29, 36, 41, 43, 48, 56, 58, 61, 64, 65, 66, 76, 86, 87, 88, 90, 93, 94, 96, 102, 112, 113, 115, 117, 120, 139, 141, 149, 153, 156, 158, 161.

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preparations. Therefore, potential funerary rules or preferences distinct to inhumations – outside of the obvious difference in taking care of the body – can be observed. This might also be an indicator for male individuals being chosen more often for cremations than women, although bioarchaeological investigations should be awaited before coming to such conclusions.

4.3.4.3. *Analysis N Next Neighbours*

Immediately noticeable when analysing the graphical presentation of the Analysis N Next Neighbours on the basis of inhumation orientation and burial position is the obvious heterogeneity of the southernmost clusters, although this is assumed to be due to erosion and other disturbances, as many traits in this area are classified as “undetermined”. Overall, excluding the uncategorized traits, cluster I seems to be uniform, characterized by E-W-alignments and heads oriented to the south, with almost only left crouches (with one exception in prone position), whose determinable variants show relatively similar intensity, as well as the typical sleeping position. The Analysis N Next Neighbours on the basis of burial types and grave goods, as expected, separates the south from the remaining zones of the cemetery, as the majority of ornaments and the most complex grave good assemblages are located there. Additionally, a small part of the central cluster in the south (IIIb) seems to be linked to cluster I due to spondylus and other ornaments that are also located there. This of course fits an explanation of these groups initially being connected, with the empty spaces once having contained further burial pits. The southern part of the eastern area (cluster II) might have also been affiliated with this zone, as indicated by similar orientation and the more complex ensembles with spondylus and multiple adzes, while the upper area of the east can be distinguished from the south by the high number of ENE-WSW-alignments. Parts of the easternmost area of cluster I stand out due to them being less extensively gifted or even unfurnished, as mentioned earlier.

A relatively heterogenous group is the small cluster IIIa in the western part of Aiterhofen-Ödmühle, which contains two right crouches and whose members are antipodally laid in WNW-ESE or ESE-WNW-alignments, while also having varying crouch intensity. The women who predominated in this group included some of the few individuals gifted with both protula and theodoxius danubialis beads. One of the right crouches, a senile women in grave 150, was extensively furnished with 6 protula and 96 theodoxius shells. She was placed in a supine position and with her head to the east, while also receiving an unusual arm position. Slightly above average carbon isotopes and strontium values of the second and third molar suggest that she immigrated to Aiterhofen as a teenager.⁴⁵⁵ All these deviations combined with an extensive grave good assemblage might be linked to the older age at death associated with

⁴⁵⁵ HOFMANN et al. 2013, 250.

notions of success, as older men at this site also often deviate by having higher nitrogen values and being richly furnished. The importance of patrilocality with female mobility leading to the creation of kinship, additionally maintaining long-distanced social networks in the process and thus being rewarded with prestige, has been recently discussed and could have also shaped the funerary rites of the woman in grave 150.⁴⁵⁶

The upper areas of the cemetery, excluding the already discussed IIIb and the southernmost part of II, contains significantly more ESE-WNW-alignments than the south, where those are nearly absent. This is especially true for the eastern cluster II (without IIa/b/c), which also includes more intensive crouches than the neighbouring group III and is thus represented as a distinct zone by the Analysis N Next Neighbours on the basis of orientation and burial position. A complete absence of cremations further distinguishes this area from the centre. The subcluster IIa on the northeastern edge of Aiterhofen-Ödmühle comprises untypical burial pit alignments as well as some of the few individuals looking to the east, while half of its members are right crouched. Grave goods are nearly absent aside from pottery in grave 81 and some microliths in grave 75. The individual inside the latter had one of its arms thrown over the skull, although this could have happened through disturbances instead of intentional reasons, while grave 81 was nearly destroyed and most of its body traits thus unidentifiable. Overall, cluster IIa seems rather unusual, although its diverging nature should probably not be overestimated, as erosion probably distorted the picture. Its neighbouring subclusters IIb/c are uniformly oriented as WNW-ENE in contrast to the main zone of II, while the line of sight and crouch intensity slightly differs when comparing both subclusters. As they share the main concentration of pottery with the upper part of the central cluster III along with similarities in burial position and orientation, they might once have been connected.

Group VI in the northwest and the northernmost parts of group III are characterized by a high number of cremations accompanied by scarcely spread inhumations, which decrease in number the farther they are located to the west. The farther west part of group IV consists of almost only cremation burials. As there is no clear spatial distinction between cremations and inhumations, it is difficult to determine if they existed at the same time and thus represented social differentiations within one cluster, alternatively chronologically changing funerary traditions from the centre to the west which culminated in a progressing number of

⁴⁵⁶ BICKLE 2019, 13.

cremations, or if they are an entirely different group cutting into the inhumed clusters. The inhumations accompanying the cremations at the centre seem more homogenous in terms of orientation and burial position than the small sample of internments in cluster IV, while both burial types in the centre and northwest were similarly equipped with few grave goods. However, differences can be seen with the higher emphasis of cremations with polished stones as well as the more pronounced variety of inhumations in terms of preserved grave goods. The Analysis N Next Neighbours with a basis of orientation and burial position recommends the upper part of group III and the western area of group IV to belong to the same zone, although clear spatial distinctions cannot be made.

The northernmost group V contrasts with the interpretation of inhumations progressively decreasing in favour of cremations with the chronological changes proceeding from south to north, as this zone lies north of group III and IV and, due to graves 160, 199 and 216, represents the only cremations in this zone. Its inhumations are characterized by heterogeneity especially considering the varying orientations and lines of sight with the number of WNW-ENE-alignments being remarkably small. Instead, WSW- and ENE-graves as well as more unusual orientations predominate in this area. Subadult graves are nearly absent, although some infant graves closely are clustered on the northern edge, one of them being a double inhumation containing two children (131), while a neonate is allocated to the southern rim. Inhumations without grave goods are more numerous in group V than in the other clusters. Considering these significant differences in addition to the empty gaps between the clusters, its classification as a distinct zone seems plausible. The earlier discussed pair of graves 158 and 159, which were anthropologically identified as female but gifted with typically “male” gifts, are also placed in this group, although they are located some distance from the other graves and thus might be an isolated group without obvious ties to a specific cluster.

It generally can be stated that Aiterhofen-Ödmühle includes several distinct zones with significant differences in burial types, pit orientation, grave good assemblage and burial position. At first glance, these could easily be defined by segregating empty spaces, however, some of those probably existed due to erosion and agriculture instead of being intentional

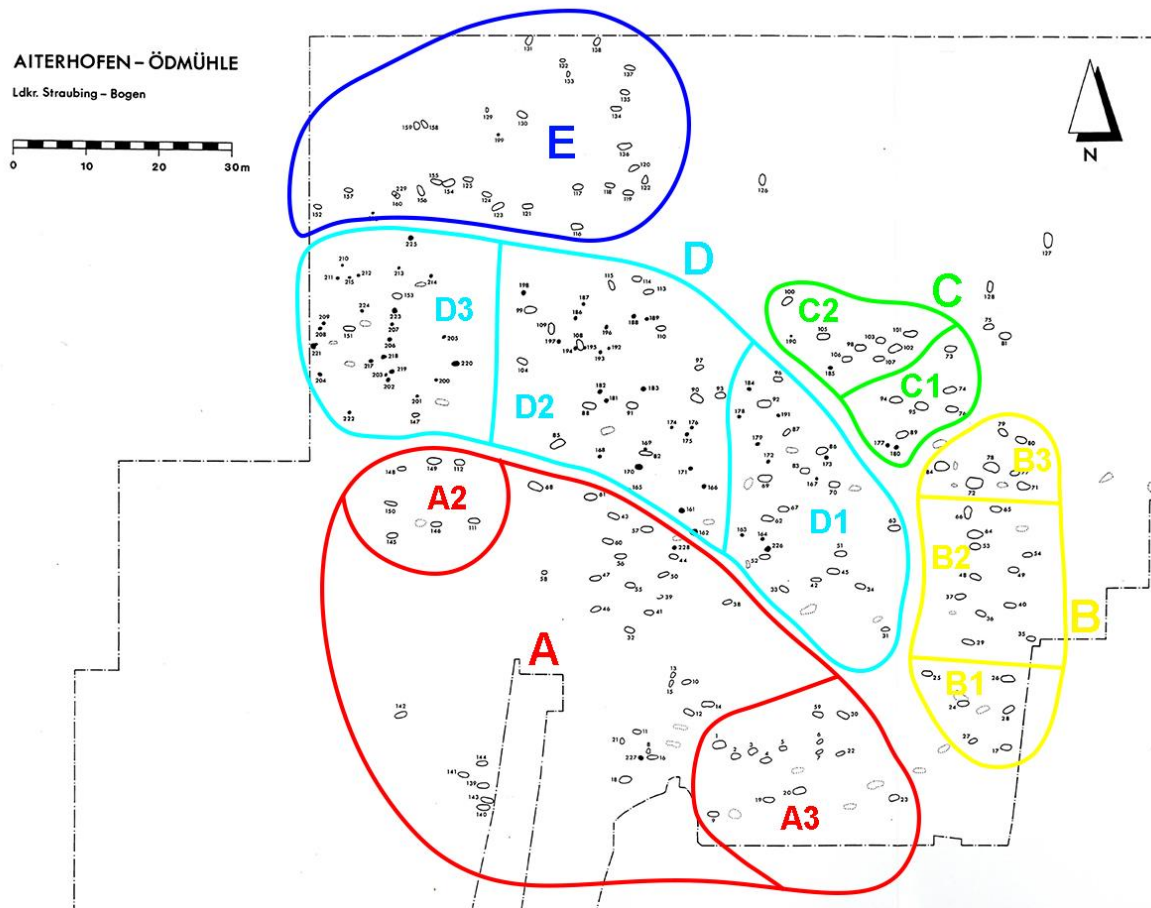


Figure 52: Clusters as recommended for Aiterhofen-Ödmühle (original graph taken from NIESZERY 1996, 54, Abb. 19 and further modified).

zones defined by Linear Pottery people. Earlier attempts to classify these areas were often based around these gaps, among other properties, while the Analysis N Next Neighbours combined with the various distribution maps recommend a different approach, at least to some extent. Consequently, the following clusters were defined:

- Area A: This zone is characterized by the presence of mussel, stone and snail shell ornaments such as spondylus bracelets and theodoxius beads as well as relatively uniform pit orientations and burial position. It includes the southernmost group I as well as IIa and IIb. Empty spaces between the southern and central areas were most probably linked before erosive damages took place, meaning that this area could have been significantly larger than archaeologically observable. The subcluster A2 is synonymous with group IIIa and slightly differs by the predominance of the ESE-WNW-alignment and the absence of spondylus in favour of other jewellery such as protula and teodoxius beads, which also occurred in the south and thus connects this zone to area A. Another subcluster (A3) contains a group of unusually “poorly” equipped or even

unfurnished burials in the eastern area of cluster I, which, in relation to the spondylus-heavier graves, could be thus less pronounced than indicated by their close proximity to each other.

- Area B: The easternmost zone of Aiterhofen-Ödmühle is defined by the abundance of ESE-WNW-orientations slightly differing to the otherwise dominant E-W-alignment, which can still be found in its southernmost part, as well as by having more intense crouches than the neighbouring central area D1. An (almost) absence of subadults and cremations further distinguishes the area. However, the internal structure of this cluster leaves some questions open in terms of actual affiliations to other groups; the southernmost part (B1) includes E-W-alignments similar to area A, in addition to spondylus and protula ornaments and two burials gifted with multiple adzes (24, 28). Therefore, it might have been linked to the better equipped south of Aiterhofen-Ödmühle. In the central subzone (B2) lay some mature individuals, often gifted with adzes and oriented ESE-WNW. Pottery becomes slightly more frequent than at B1, while spondylus is allocated to only one grave (48), which also received two polished stone tools. A small group of three unfurnished burials – or alternatively one pairing and one somewhat distanced pit, depending on the interpretation – were allocated to the western rim. The northernmost group (B3) lacks mature individuals, spondylus ornaments and adzes, among other traits, while graphite stones, which were almost absent in B1/2, become significantly more frequent.
- Area C: This cluster lies in the northeastern part of the cemetery and mainly includes E-W-alignments in contrast to area B, while both share an almost absence of infants. The distribution of cremations – some of them potential double cremations – start in the eastern part, although they might relate more to area D than B. The vessel type *Kümpfe* appears more often than in other zones. Subarea C2 includes more unfurnished burials, mature individuals, triangular arrowheads, a slightly more diverse line of sight and different crouch intensity than C1, which contains more pottery. Both contain a nearly similar number of burials with adzes, although C2 contains two remarkable graves gifted with three (102) or even four (185) polished stone tools, although the latter represents a cremation and thus might be linked rather to the

centre than area C. Alternatively, its diverging burial rites combined with the high number of grave goods could symbolize a high social standing within this group.

- Area D: This group is characterized by the frequent occurrence of cremations and should be seen as showing the (chronological?) progression from a high number of inhumations in the west to an almost exclusive presence of cremations in the east rather than distinct clusters reserved for certain social groups. It can be divided into three subzones: D1 lies in the eastern centre and includes E-W alignments and relatively moderate crouch intensity, which both separate it from area B, while the absence of spondylus contrasts the find situation of the south, although one inhumation (33) in its southernmost corner contains nephrite and theodolite beads along with graphite, all found inside an amphora. Towards the northern half of the subarea were more adzes and amphorae as well as a significant number of subadults. D2 contains only a few inhumations, which are difficult to group due to the small sample. Similar to D1, subadults mainly appear in its north, which could be argued for an alternative classification of the southern parts of both subareas to represent another cluster. D3 comprises even more children and adolescents, while inhumations have declined and most of the burials were either unfurnished or received single adzes.
- Area E: The northernmost cluster of Aiterhofen-Ödmühle, where inhumations once again dominate in contrast to the central and western zones. Crouch intensity and pit orientation slightly differ from the main orientation E-W by having WSW- and ESE-alignments instead with some more variation in the eastern part of the cluster. Right crouches occur relatively often, while furnished graves are less numerous than burials with preserved gifts. The only subadults were some infants clustering on the northern edge and one foetus (grave 116; 7-8 months along in a pregnant mature woman) allocated to the southern rim.

As demonstrated by the subareas D1-3, the recommended clusters do not necessarily represent distinct groups clearly separable by their traits and reserved for certain clans or families. Properties might overlap, as is the case e. g. by friction plates occurring only in A and D. As the gaps between zones are also not sufficient for dividing the site due to erosion distorting the picture, the proposed groups should rather be viewed as assemblies of

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significant similarities and dissimilarities to other zones than clearly distinct entities, with various possibilities of interpretation.

4.3.4.4. *Site summary and discussion*

Aiterhofen-Ödmühle is one of the most representative sites of Early Neolithic Bavaria, which can be distinguished by regionally characteristic traits and properties such as east-aligned burial pits or bone combs. The site itself shows spatial groupings definable by burial types, shown in the significant amount of cremations (and non-documented empty graves), as well as by grave good assemblages, pit orientation, burial position and empty spaces separating the areas, although the latter might exist due to erosion or other heavy disturbances. The southern and southern-central areas contain the most extensive grave good assemblages, with almost all spondylus shells and other ornaments produced from molluscs or stone. Burials in the northern half seem to cluster in smaller ensembles, often consisting of only two grave good types, with grave 185 standing out as an extensively furnished cremation containing a remarkable number of four polished stone tools, among other gifts. Although cremation burials were significantly less often furnished than inhumations and had fewer preserved grave goods, a higher focus on the polished stone tools than in the latter can be observed, which might be linked to adzes being important for processing the burning wood essential for the funerary rite. Older men and occasionally women received more diverse grave good assemblages than younger individuals, indicating sex- and age-based hierarchy as implied for other sites. The neighbouring graves 158 and 159 contained older women with typically “male” gifts, further highlighting the significance of age.

Multiple attempts at defining spatial patterns for Aiterhofen-Ödmühle led to a variety of suggestions for clusters as well as their chronological development or social meaning. According to Nieszery, they are indicators for clan assemblages, whereas there can be social differentiations within one group as demonstrated by some graves in the southern area having less grave goods than others or even being unfurnished.⁴⁵⁷ Alternatively, there might have been individual reasons independent of social status. The south is also seen as the chronologically earliest phase of the cemetery, with the hierarchy having primarily older men and then older women and even some subadults receiving the most complex grave good assemblages compared to the north. Nieszery thus concluded that the hierarchical organisations at Aiterhofen-Ödmühle were led by mostly older men, with the southern zone

⁴⁵⁷ NIESZERY 1995, 212.

containing a founding elite.⁴⁵⁸ The grave good seriation is in favour of such interpretations, suggesting the spondylus as occurring early and the arrowheads (mainly found in the northern half) along with the perforated wedges as late, although it has to be noted that a seriation might reflect the spatial distribution of these traits instead of an actual chronological progression. Cremations are another indicator for a south-north-progression, as they are generally thought to have developed in later stages, which is also implied by the cremation burial 229 cutting into inhumation 160, although it should be noted that the former includes Stroke Pottery and thus just might be an anomaly.

Differences between north and south can also be observed by isotope investigations as performed within the Lifeways project. The results from Aiterhofen-Ödmühle indicate several exploitation strategies probably practised at the same time.⁴⁵⁹ Men are divided into two arrays, showing a higher strontium ratio from childhood diets within one group. The possession of more than two polished stone tools correlates with higher $\delta^{15}\text{N}$ values. Indifferent values with no overall patterning for women suggest several food sources during childhood, implying they came from different communities and have moved to Aiterhofen-Ödmühle at later age stages. Female individuals buried at the northern half of the site might have exploited a broader spectrum of environments in the years before their death. The differences in grave good distribution are interpreted by Hofmann et al. as a chronological change from north to south, from simpler to more complex gift ensembles in contrast to earlier suggestions, with varied carbon isotope values in the northern half being seen as indicators for a progressive opening of the landscape, which leads to more similar values in the south. However, as already mentioned, a chronological interpretation based on spatial groups remains problematic, as cremations might date later and the more recent pottery analysis – which contrasts with the initial pottery investigation by Nieszery – do not seem to correspond to a conclusive north-south progression. Additionally, the two distinct male arrays seem to have existed through the occupation time of the site. An alternative suggestion for the Linear Pottery community at Aiterhofen-Ödmühle sees different dietary strategies and grave good preferences co-existing already from the beginning.

⁴⁵⁸ NIESZERY 1995, 212.

⁴⁵⁹ HOFMANN et al. 2013, 239.

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The outcomes of the Analysis N Next Neighbours, distribution map and seriation, also considering all previous investigations for Aiterhofen-Ödmühle, indicate a chronological progression from south to north, whereas the southern area – defined by inhumations gifted with extensive grave good assemblages including shell ornaments and positioned in relative homogeneity – was probably larger than the empty spaces imply due to erosion likely having destroyed a high number of graves. Within the northern areas, there might be a development with few cremations and numerous inhumations in the east to an almost exclusive presence of cremations in the west. The easternmost areas B and C distinguish themselves by a relative absence of subadults and cremations, among other traits, with the former including three graves gifted with spondylus and some extensive assemblages more typical for area A, which could be seen as a further indicator for an east-west-progression. In the northernmost area E, cremations seem to decline in favour of inhumations, potentially reflecting communal structures – maybe more than one village using the burial grounds instead of various clans – or a return to inhumations in later stages. Although the recommended clusters are based on relatively similar properties, some of the traits overlap among neighbouring zones, highlighting the elusive nature of these groups and aggravating the investigation of their actual meaning, assuming that these recommendations are at least partially correct. Overall, Aiterhofen-Ödmühle represents a remarkable cemetery, outstanding through its pronounced multi-ritual nature – defined by the presence of inhumations, a high number of cremations and potential empty graves –, unique and regional-specific grave goods, insightful isotope values and numerous possibilities for defining and interpreting spatial clusters. However, these classifications as well as the chronological development of the site is still an issue causing headache and will continue to be that way at least as long as sufficient radiocarbon dates and genetic information are unavailable. Until then, the preciseness of any past or future interpretation remains highly uncertain.

4.3.5. Schwetzingen

4.3.5.1. Introduction

The cemetery of Schwetzingen lies in the German federal-state of Baden-Württemberg on the eastern bank of the Rhine in the Rhine-Neckar Metropolitan Region, sometimes referred to as Rhine-Neckar Triangle.⁴⁶⁰ It was excavated in 1988 with its vicinity being further investigated in the late 1980s and 1990s, with pottery finds implying nearby settlement areas that have not yet been found. It remains uncertain whether one or more settlements used this cemetery, as these ceramic sherds date earlier than the cemetery. In 2012, a comprehensive publication including the feature and find data was released by Gerling and in the following

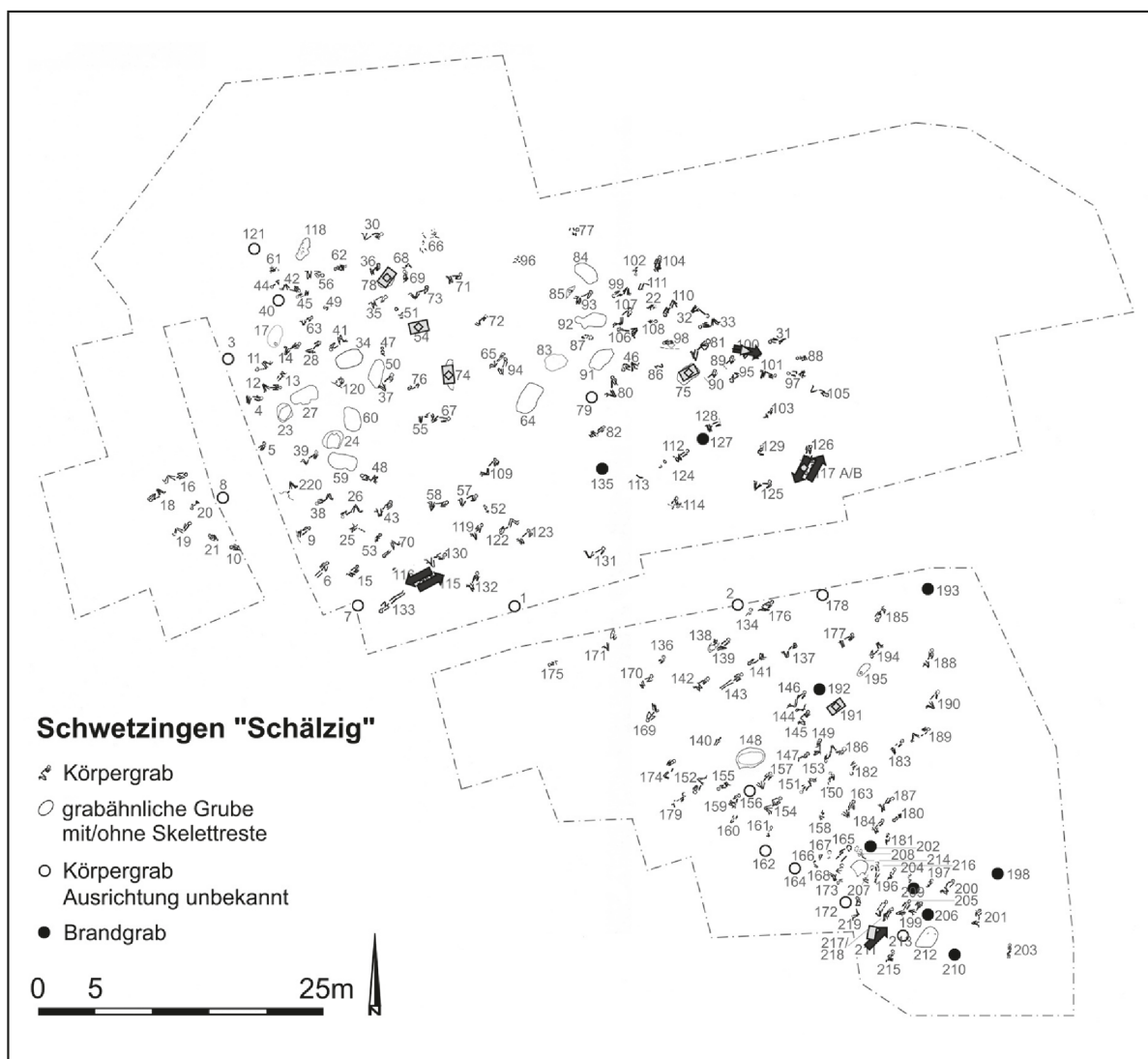


Figure 53: Original plan of the cemetery Schwetzingen Schälzig. Skeleton = inhumation; white circle = inhumation with uncertain pit orientation; white pits = grave-like pits without or with few human remains; black circle = cremation; black arrow = double inhumation pointing in the direction of the orientation of the respective body (GERLING 2012, 25, Abb. 7).

⁴⁶⁰ GERLING 2012, 9–15.

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year supplemented by bioarchaeological analyses provided by the Lifeways database, which put the grave field into a regional and supra-regional context.⁴⁶¹ This is particularly gratifying when considering that Schwetzingen is the only cemetery in Baden-Württemberg where data is sufficiently published and can be included in quantitative evaluations. Therefore, when comparing the cemetery to Stuttgart-Mühlhausen, Fellbach-Öffingen and Vaihingen as well as to the smaller grave fields in this region, a heavy reliance on works other than this thesis cannot be avoided. Schwetzingen counts among the largest Linear Pottery burial sites, with 203 inhumations (of which at least four were part of multiple burials), 15 cremations and 15 empty graves or cenotaphs (Fig. 53). The density of the burials varies, as they seem to be the

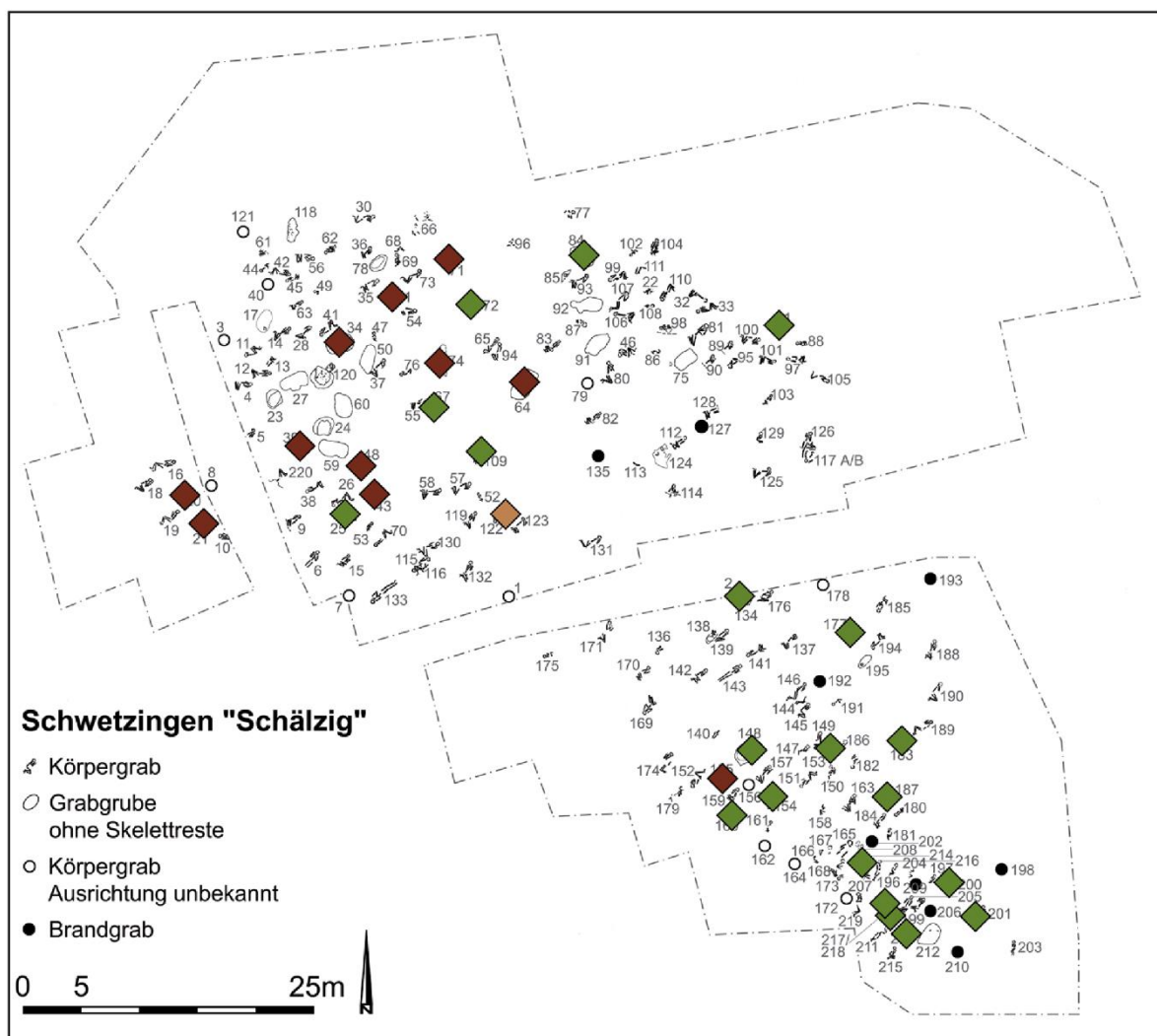


Figure 54: Occupation of the cemetery according to the distribution of the band fillings (complete vessels and partial profiles): orange = Flomborn/start Middle LBK, green = Middle/start Late LBK, dark red = advanced younger/transition Latest LBK, bright red = 14C-dated graves (GERLING 2012, 117, Abb. 60).

⁴⁶¹ GERLING 2012. – BENTLEY et al. 2013.

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Table 5: Radiocarbon dates for Schwetzingen (GRIFFITHS 2013, 445, Tab. B2).

Lab number	Sample no.	Material	Radiocarbon age	$\delta^{13}\text{C}$	Calibrated date range (95.4% confidence cal BC)	Posterior density estimate (95.4% probability; cal BC)
OxA-23200	Stz-006	Human bone	6142±37	-19.9	5220–4980	5210–5060
OxA-23201	Stz-021	Human bone	6228±37	-19.8	5310–5050	5230–5060
OxA-23202	Stz-026	Human bone	6233±37	-19.7	5310–5060	5230–5060
OxA-23203	Stz-037	Human bone	6133±37	-19.9	5220–4950	5210–5060
OxA-23204	Stz-048	Human bone	6243±38	-19.7	5320–5060	5180–5060 (87.8% probability) Poor individual agreement index (A=54.7%)
OxA-23205	Stz-129	Human bone	6162±36	-20.0	5220–4990	5210–5060
OxA-23206	Stz-133	Human bone	6202±36	-19.7	5300–5040	5220–5060
OxA-23207	Stz-145	Human bone	6183±36	-20.2	5290–5010	5220–5060
OxA-23208	Stz-155	Human bone	6187±37	-20.1	5290–5020	5220–5060
OxA-23209	Stz-200	Human bone	6208±34	-19.6	Weighted mean 6190±25 (T=0.6; T*5%=3.8; v=1) 5220–5050	5220–5060
OxA-23210			6171±35	-19.5		
OxA-23211	Stz-220	Human bone	6141±37	-19.6	5220–4980	5210–5060

closest together at the southern, north-eastern and north-western edges of the cemetery. Although various pottery seriations performed by Gerling with the software WinBasp led to negative results, a rough chronology could still be provided by comparing her typologies to Strien's relative chronology of Linear Pottery in Baden-Württemberg.⁴⁶² Additionally, eleven radiocarbon dates were obtained during the Lifeways project (Tab. 5).⁴⁶³ According to these data sets, Schwetzingen-Schälzig estimates to approximately 5200 to 5000 cal. BC. The earliest grave might be grave 122, which contained an adult female gifted with an amphora decorated in Flornborn style. The majority of the burials are assigned to the beginning of the Late Linear Pottery and the transition to the Latest phase, without recordings of the chronologically-latest ceramic styles. The earlier graves are suggested to be in the south-eastern part of the cemetery and the later towards the north-west, although grave 122 is allocated to the latter, implying that earlier parts of the cemetery could have been used at later dates (Fig. 54).⁴⁶⁴ Additionally, some graves with advanced Early Linear Pottery or ones transitioning to the Late phase occur scattered in the north. This is nothing unusual for Linear Pottery grave fields, considering e. g. cremations found in areas suggested to belong to older phases in Aiterhofen-Ödmühle, as earlier mentioned. A progressive westwards expansion of the cemetery occupation could also be possible.⁴⁶⁵

⁴⁶² STRIEN 2000. – GERLING 2012, 112.

⁴⁶³ BENTLEY et al. 2013, 276. – GRIFFITHS 2013, 445.

⁴⁶⁴ GERLING 2012, 116–117.

⁴⁶⁵ BENTLEY et al. 2013, 276.

4.3.5.2. *Distribution maps*

The presence/absence ratio of grave goods per pit – excluding the second or third bodies of multiple burials – at Schwetzingen is 97 (ca. 44%) to 121 (ca. 56%), whereas an unusually small number of objects furnished the graves.⁴⁶⁶ Even the most extensive grave good assemblages, of which many were distributed in the north-eastern area, were unable to compete with the “rich” ensembles of other sites. Generally, it can be stated that the more complex burials at Schwetzingen are mostly associated with older men, while a trend to fewer gifts can be identified amongst the female graves, although the most ornamentation has been found within the burials of young women or infants. Infants also received remarkable finds which were certainly high valued such as shell ornaments, an antler adze and a disc mace. This parallels the find situation at Aiterhofen-Ödmühle, where subadults and elder men received larger amounts of grave goods with the exception of a few older women.⁴⁶⁷ Small groupings of graves with and without goods were observable across the cemetery, whereas the north-western area is considered especially well equipped. One cluster consisting of approximately 15 unfurnished graves in the southern part is particularly remarkable, while in the northern to north-western rim there was also a larger group of ungifted burials. A closer look at the distribution map reveals that unfurnished pits were often assembled in rows at Schwetzingen. However, one should not forget that these could have included organic goods at one point. The vast majority of graves were inhumations, as usual. Cremations or cremated human remains found in the fillings of inhumations were distributed to both halves of the cemetery, although only two clear cremations were allocated to the north, which might be due to less optimal preservation conditions than in the south. Burials without human remains are mainly situated in the northern half, with some of them clustering in the north-western area, and another two (148, 214) occurring in the south. These empty pits were subdivided into four classes⁴⁶⁸: the first group contains pits without traces of grave goods (27, 29), or alternatively with only sherds from the filling (24, 29). The second type comprises grave-shaped pits with sherds from the filling (23, 54, 50, 59, 60, 64, 91), while the third one includes a single grave-shaped pit with filling finds and bone fragments (83). The fourth group is represented by possibly disturbed graves without bone remains, but which contain grave goods (84, 148, 214;

⁴⁶⁶ BENTLEY et al. 2013, 277.

⁴⁶⁷ NIESZERY 1995, 209. – GERLING 2012, 199.

⁴⁶⁸ GERLING 2012, 27.

Gerling describes 148 as empty grave). Empty graves or pits with few human remains are, as previously mentioned, often implied to be part of multi-stage burials. This is probably applicable to grave 78, which contained traces of an inhumation as well as cremated human remains, a disc mace and pottery sherds.

Multiple burials appeared in various formations. The unsexed individuals in graves 115 and 116 were antipodally positioned to each other, with one right-crouching and east-western-oriented juvenile individual contrasting to a left-crouching and west-eastern oriented infant. The graves 117a/b contained a male adult and an infant (stage II) as well as cremated human remains. Another multiple burial might have been grave 211, which included an adult woman and an early infant, although they could not be definitely assigned to double inhumations due to an uncertain documentation status. The status of grave 100 is also unresolved, where an adult woman and (supposedly) her baby were incorporated, meaning they died at the same time before or at childbirth. Three skeletons, two at least late mature women and one undetermined individual, were excavated in grave 3, implying a triple burial. The previously mentioned graves with cremated and inhumed remains (74, 75, 78, 117, 191) represented either traditional double burials, pars-pro-toto-skeleton gifts to the inhumation or secondary burials. Alternatively, protraction of the cremated bones might have also been responsible, which along with the worse conservation conditions in the north could also explain the relative absence of cremations in the northern section.⁴⁶⁹

The information of sex and age determination were once again taken from the Lifeways database.⁴⁷⁰ A significantly larger number of 34 (ca. 16%) women and 30 (ca. 14%) uncertainly female skeletons contrast with only 43 (ca. 20%) men and 8 (ca. 4%) uncertainly determined male remains, with another 97 (ca. 54%) graves – including the cremations – that could not be determined with certainty. This relatively balanced ratio of men to women indicates the absence of a sex preference, although the high rate of undetermined graves has to be considered. The map of sex distribution shows a relative uniformity, but also shows some conspicuous features: Female graves seem to have occurred occasionally in clusters in the south-eastern AREA, whereas uncertain women mainly lay in the north-west. On the contrary, men were more often found in the north-western, “richly” gifted area, where only a few

⁴⁶⁹ GERLING 2012, 28-29.

⁴⁷⁰ BENTLEY et al. 2013, 269–275.

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Table 6: Body position and orientation of inhumations at Schwetzingen according to the Lifeways database. Only burials where orientation and body position had survived are included here (BENTLEY et al. 2013, 276, Tab. 7.4.).

	Left-crouched	Right-Crouched	Crouched	Supine	Prone	Irregular	Totals
E-W	13	3	0	0	0	0	16
SE-NW	3	0	0	0	0	0	3
S-N	1	1	1	0	0	0	3
SW-NE	22	2	0	1	0	0	25
W-E	10	0	0	0	0	0	10
NW-SE	3	0	0	0	0	0	3
N-S	11	6	0	2	0	1	20
NE-SW	49	8	2	2	0	0	61
Totals	112	20	3	5	0	1	141

women and children appeared. They are underrepresented in the south, which is dominated by female and subadult individuals. The northern and north-eastern parts showed a roughly equal distribution of the two sexes. The number of children and juveniles (36.5% subadults or 30.3% not including juveniles) amounts relatively high when compared to approximately 28% on average for Linear Pottery cemeteries as a whole, and corresponds to the expected population share for the Early Neolithic.⁴⁷¹ Another third (33.6%) died between 20 and 40 years, while 38 individuals (18%) reached mature to senile stages. Most interestingly, subadult individuals seem to have accumulated in the south, north and northeast, while they were relatively absent in the central to north-western areas, where the well-equipped men remained. Generally, a tendency can be discerned towards a southern part with a high number of women and children and a north-western part consisting mainly of male burials.

Considering pit orientations and burial position, the cemetery consists mainly of north-oriented burials, followed by south-alignments, with NE-SW or SW-NE dominating.⁴⁷² This contrasts the majority practice of the other sites investigated in this study, where burials were either mostly oriented to the east (Aiterhofen-Ödmühle) or the south-east (Kleinhadersdorf, Nitra, Vedrovice). E- and W-positioned bodies were fewer in number and contributed to the north and northeast, while having been nearly absent in the southern section, where N-alignments appeared more often. Assuming this has a chronological bearing and the interpretation of a progressive northwards expansion to be correct, this would imply greater orientation diversity at later stages and a decline of N-S-orientations in favour of E-W-

⁴⁷¹ GERLING 2012, 32. – BENTLEY et al. 2013, 277.

⁴⁷² 2 ENE-WSW, 2 ESE-WNW, 16 E-W, 73 NE-SW, 11 NNE-SSW, 11 N-S, 6 NW-SE, 3 SE-NW, 3 S-N, 3 SSW-NNE, 31 SW-NE, 10 W-E, 1 WNW-ESE, 2 WSW-ESE and 24 uncertain alignments.

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Table 7: $\delta^{15}\text{C}$ -values for Schwetzingen by orientation category (BENTLEY 2013, 280, Tab. 7.7.)

Orientation category	Orientations	$\delta^{13}\text{C}$ ‰ mean	% of burials in category (where orientation could be identified)
Dominant	N–S, NE–SW and E–W	–20.14	67
Secondary	SW–NE and W–E	–20.20	24
All others	SE–NW, S–N and NW–SE	–19.95	9

alignments. Overall, there is less variation in pit orientation than at other cemeteries, despite Schwetzingen having two main directions instead of the usual one.⁴⁷³ The isotope investigations should also be mentioned; although no overall correlations between the stable isotopes and orientation and burial position were observed, a small sample of six burials shows a tendency of unusual orientations having higher $\delta^{13}\text{C}$ -values (Tab. X).⁴⁷⁴

According to Gerling,⁴⁷⁵ the vast majority (129; 63.9%) of bodies were left crouches or at least oriented to the left (2/0.9%), followed by right crouches (26; 12.9%) or right oriented bodies (3/1.5%). Seven (3.5%) inhumations were straight positioned and another 35 (17.3%) undetermined. Bentley et al., on the other hand, accounted the left crouches to represent 80% of all bodies at Schwetzingen, which would be in line with the Linear Pottery average.⁴⁷⁶

The data of this study only marginally differs from the initial information offered by Gerling that ties to varying classifications and grave selection depending on the respective author. Right orientations appeared across the cemetery and clustered more closely in the southern half of the cemetery, although this might be due to the generally denser occupation in this area. A variation can be seen between different age classes, as children and older individuals were more often positioned in left crouches, while juvenile and early adults are more equally aligned to either the right or left side.⁴⁷⁷ The crouch intensity showed the bulk of the deceased – excluding the undetermined individuals – to be positioned in either wide or moderate angles, with tighter positions having occurred significantly less frequently. The angle of the upper to the lower thigh were predominantly tight or extreme, whereas moderate crouches occasionally appeared and wide angles were limited to five features, of which three were

⁴⁷³ BENTLEY et al. 2013, 277.

⁴⁷⁴ BENTLEY et al. 2013, 282.

⁴⁷⁵ GERLING 2012, 19.

⁴⁷⁶ BENTLEY et al. 2013, 277.

⁴⁷⁷ BENTLEY et al. 2013, 277.

located to the southernmost part of the cemetery. One particularity is found in grave 120, which – according to grave documentation, as the lower part of the body was disturbed by a pit dating to the Iron Age – was found in a “sitting” crouch. Although it differed greatly in shape and colour from the younger settlement pit, it cannot be certainly assigned to the Linear Pottery culture due to the absence of gifts.

The typical left crouch and pit orientation led to SE having been the main line of sight, followed by N- and E-turned heads.⁴⁷⁸ N-, NE- and NW-lines of sight were nearly absent in the most southern area, where the ratio of W-looking deceased was relatively high. Once again, the northern half seems to be more diverse, especially in the utmost north, with the SE-orientation less dominating than in the south. Individuals with diverging torso position amounted in comparable numbers to other cemeteries. Three crouches have been found in prone position and six in supine position, while seven individuals were buried in a straight prone or supine position. Straight positioned individuals were scattered and were not focused in certain distribution areas, with grave 6 and 133 in the north-western part having been the only ones which were relatively near to each other. A scarceness of grave gifts in straight positioned graves, as Nieszery detected for Bavarian cemeteries, is not applicable for Schwetzingen, as demonstrated with the well-equipped graves 6 and 133.⁴⁷⁹ It is worth noting that prone burials were limited to one grave in the southern half and the north-western area (216 and 220 respectively), while they were more commonly distributed in the north- and north-eastern parts of the cemetery. This stands in contrast with supine graves, which scarcely occurred in the north and north-east area and frequently appeared in the other parts, especially in the south, where they lay in close assemblages.

There were 27 determined arm gestures which deviated from the characteristic sleeper.⁴⁸⁰ Although all gender and age distribution for the respective classes is difficult to determine due

⁴⁷⁸ 22 E, 22 N, 7 NE, 18 NW, 13 S, 38 SE, 5 SW, 11 W and 59 uncertain lines of sight.

⁴⁷⁹ NIESZERY 1995, 83.

⁴⁸⁰ Diagonally crossed: 48 (uncertain female, late adult), 126 (adult, female), 133 (male, adult), 169 (male, adult) – Horizontally crossed: 154 (male, mature), 185 (male, mature) – On shoulder: 4 (uncertainly male, adult), 12 (uncertain female, 17-18-years old), 28 (uncertain female, adult/mature), 119 (female, adult), 205 (unsexed, adult) – Arms straight down: 217 (female, senile) - Right arm diagonally positioned up to shoulder, left arm vertically to same shoulder: 13 (infant), 16 (male, adult), 143 (male, adult), 203 (infant) - Left arm diagonally positioned up to shoulder, right arm vertically to same shoulder: 6 (male adult) - Differently crossed: 19 (uncertain female, mature), 81 (unsexed, adult) – Right arm horizontally positioned to torso, left arm vertically up: 38 (uncertain female, senile), 97 (male, mature), 104 (male, mature), 163 (female, adult), 168 (unsexed, adult/mature), 219 (female, adult) – Arms pointing away from body: 114 (uncertain female, adult).

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to the small samples, a general trend to older individuals receiving unusual positions can be observed. Two infants (13, 203) represent the exception to this rule, as they both had their right arm positioned diagonally to the left shoulder and the left arm vertically to the same shoulder, together with two male adults (16, 143). Horizontally crossed arms occurred within two mature men (154, 184). The only senile individual had her arms laid straight down to her pelvis area and was gifted with a ceramic vessel. The uncertain female adult with the arms pointing away from her body (grave 114) could have received that gesture via grave disturbance. It is worth noting that the closely assembled graves 4 and 12, an uncertain adult man and a 17-18-year old uncertain woman, both had their arms vertically positioned on their

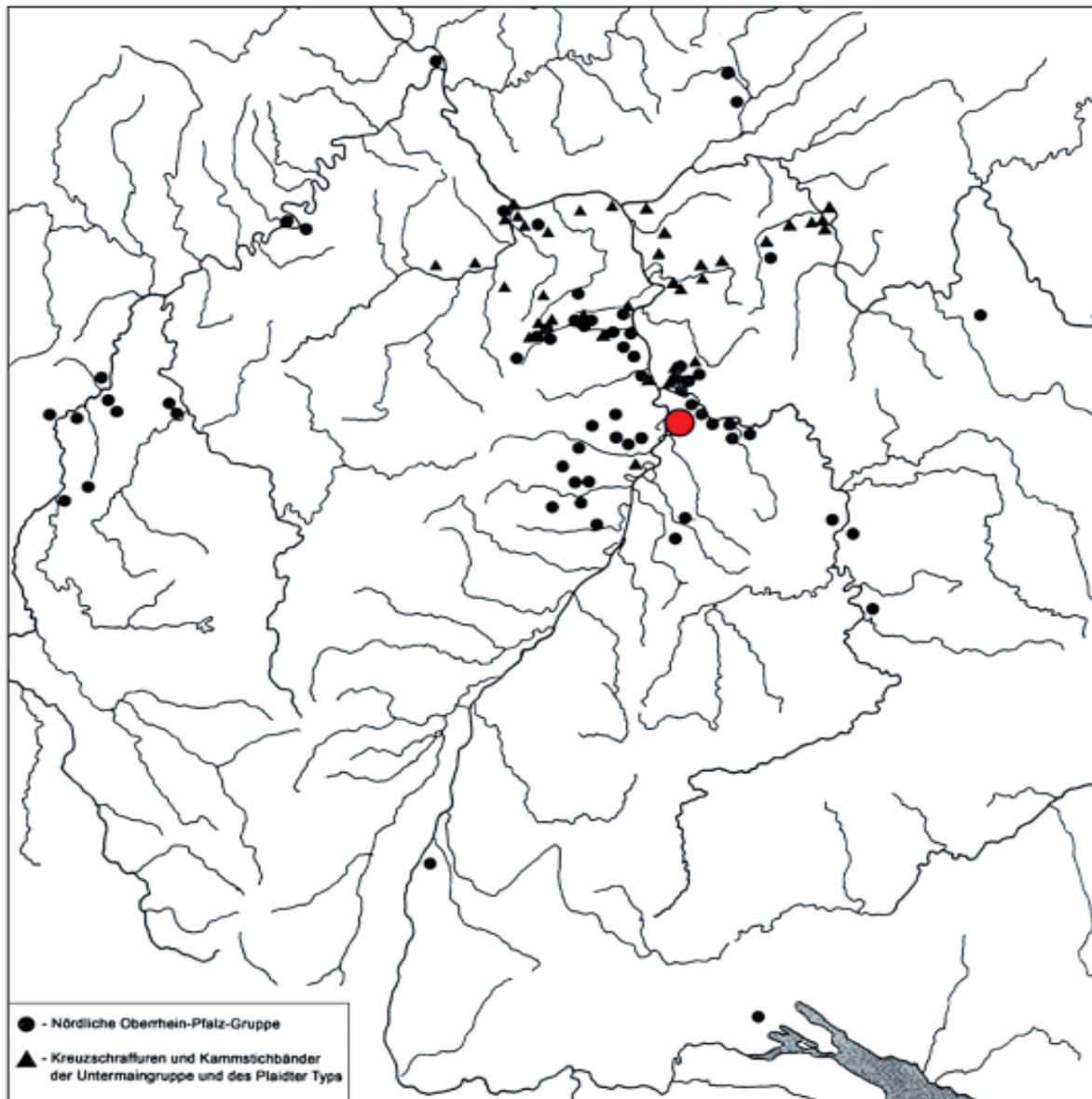


Figure 55: Distribution of the Pfalz-Pottery-Style-group, according to Lindig 2002, 79, Abb. 57. Schwetzingen is marked with a red circle. Black circles are occurrences of the northern Upper Rhine-Pfalz-group, while black triangles represent crosshatches and comb stroked ornaments of the Lower Main group and the Plaidt type (GERLING 2012, 123, Abb. 62).

shoulder. The latter was right crouched with its torso supine positioned and gifted with an unmodified shell of *zebrina detrita*, while the individual in grave 4 was left crouched with its torso laid sideways, almost in prone position, along with an antler closure. All other types of arm gestures were either mixed between male and female or could not definitely be assigned to potential patterns due to uncertain sex determinations and/or too small samples.

According to pottery style distribution as provided by Gerling and as shown earlier (Fig. 54), the earliest vessels were mainly allocated to the southern half, whereas later pottery was found in the north- to north-western area. The ornamentation, motives and composition of the clay corresponds to the Pfalz-style, which was distributed in and between the southern

part of Rheinhessen and south of the riverbranching where the Neckar river flows into the Rhine and the Pfalz (Fig. 55). A vessel found in grave 200 shows designs corresponding to the Cardial Ware in the south as well as to the local Linear Pottery.⁴⁸¹ Therefore, this object was probably not imported and could have reflected an inspirational take on the Cardial ware by a local potter, or alternatively, on basketry and rope work which were widespread at that time.⁴⁸² Overall, imported pottery seems completely absent, while the poor quality of the pottery indicates that it had been produced specifically for the funerary context.⁴⁸³ After eliminating sherds from the grave fillings, the ratio of complete (or probably complete vessels at the time of burial) to fragmented vessels is 31 to 33 (ca. 48 to 52%), although poor conservation conditions might have led to a distorted view. However, Gerling assumed that no more than 25% of sherds could have been lost at the excavation.⁴⁸⁴ Amphorae and high bowls were the smallest groups, each limited to three units, with the latter having been limited to the southern half. *Kümpfe* showed a diversity of shapes and were clustered in the southern half and north-western area, while they were absent in the north and north-eastern parts. According to shape typology, they seem to be more diverse in the south. The most dominant class was Type 2a, which occurred across the cemetery and was the only type of *Kumpf* which appeared in the north- and north-eastern area. Amphorae and *Kümpfe* were almost exclusively gifted to women reaching between late adult to senile age stages. The second largest group were small or miniature vessels, totalling to 12 units. A perforated small bowl belonged to an uncertain female adult in grave 39 in the north-western part, while the three miniature amphorae were all gifted to late infants (2, 36, 72). Type 4c was distributed to one certain (141) and three uncertain (65, 101, 131) women between adult and senile age, one adult to mature man (177), one unsexed juvenile to adult individual (212) and one empty grave. This typology, and within the distribution of small vessels, differs from the initial classifications provided by Gerling, as demonstrated e. g. on two high bowls (2, 118), which were described by her as miniature vessels and interestingly gifted to infants, consequently leading to a slightly lesser number of 12 miniature vessels instead of the 14 (47.6% of the complete vessels) defined by Gerling.⁴⁸⁵ This represents an extraordinary amount of such

⁴⁸¹ LEFRANC 2007, 274. – BENTLEY et al. 2013, 277.

⁴⁸² CROMBÉ 2009.

⁴⁸³ GERLING 2012. – BENTLEY et al. 2013, 277.

⁴⁸⁴ GERLING 2012, 37.

⁴⁸⁵ GERLING 2012, 46.

small pottery in comparison to the Bavarian and south-eastern cemeteries, with the sex and age data showing a trend for gifting these mostly to older women and infants.

A medallion-shaped closure, beads and a bracelet made of spondylus, antler belt buckles, polished and perforated *nucella lapillus* as well as a variety of unmodified mussel and snail shells represent the personal ornaments at Schwetzingen. A late adult woman (48) in the north-western area received both the spondylus belt buckle and bracelet and dates to the advanced younger/transition Latest Linear Pottery according to the relative chronology and radiocarbon analyses. Spondylus beads only occurred singly (99, 151) or as two units (170) in adult female graves. The modest furnishing and the low number of burials with *spondylus gaedoropus* implies a lesser role of this material at Schwetzingen than at other sites, which could be due to the great distance to spondylus collection areas and thus longer trade routes. However, due to their rarity, one might refrain from interpreting graves with only a few spondylus ornaments as poorly gifted. It generally can be assumed that regional and chronological reasons might relate to this situation, as spondylus is thought to decrease in later phases and seems to be less frequent in Baden-Württemberg when compared to other regions. This could also mean that Schwetzingen only had a sporadic long-distance net of communications, as suggested by Gerling.⁴⁸⁶ The bow-shaped antler buckles contributed mainly to the north-western, chronologically late area and were exclusively allocated to men. Only two of those seven graves (4, 56, 58, 70, 82, 130, 133) were also gifted with arrowheads (70, 133), and none of them received determinable game or other meat offerings. The 19 perforated *nucella lapillus* shells – native to the north Atlantic and North Sea – all belonged to a “richly” gifted 3-4-year old infant (98) in the north-eastern part of the cemetery, which additionally received one small adze, three bone arrowheads and a graphite colouring stone with traces of usage.⁴⁸⁷ Unmodified mussel and snail shells usually appear as single pieces. The freshwater mussel species *pseudunio auricularis*, *unio pictorum*, *unio crassus* as well as one uncertainly modified *anodonta cygnea* all belonged to men in the southern half of the cemetery. Six unmodified *unio crassus* shells have also been found in the male grave 3 at Mangolding, which does not necessarily indicate a connection due to the small sample.⁴⁸⁸ An unmodified mussel shell in the male grave 106 and one uncertainly modified *glycymeris* shell

⁴⁸⁶ GERLING 2012, 124.

⁴⁸⁷ WORMS EDITORIAL BOARD 2020h.

⁴⁸⁸ NIESZERY 1995, 310.

(dog cockle) in the female grave 36 were distributed in the northern half. *Zebrina detrina* were also unearthed in this area; one single piece belonged to an 17-18-year old uncertain woman (12) and three have been found around the head of a late adult, uncertain man (110). The largest ensemble of *zebrina detrina* consisted of 35 units and appeared around the shoulder, mandible and partially the right hand of a 10-11-year old child (36), along with ceramic sherds and a miniature amphora.

Bone objects appear in 13% of all graves, which is significantly above the Linear Pottery average of 4% and only matched by Kleinhadersdorf (also 13%).⁴⁸⁹ They were mainly made from ribs of deer and cattle, although smaller objects have been produced from smaller animals such as sheep-goats or pig.⁴⁹⁰ Apart from the already mentioned antler belt buckles, they appeared as long bone and metapodia points, triangular arrowheads, one perforated adze and a bone disc. The latter two have already been described in detail in chapter 3.9.5. and were allocated to the infant burial 129 and the female grave 109, which both lay in the north-eastern part of the cemetery. The antler bone adze indicates potential connections to Mesolithic and Early Neolithic contexts across Europe.⁴⁹¹ Long bone segment points were discovered as a single, now missing piece with the remains of an uncertain mature man (75), which also contained a small adze and the cremated remains of another person, as well as an ensemble of eight pieces at the hand (clutching it?) of a late adult woman in grave 37, which also included the glycymeris shell. Two uncertain woman (48, 67) and an infant (21) in the north-western area as well as another infant (138) in the northern rim of the southern half inherited metapodia points. Most interestingly, the children were both gifted with perforated polished stone tools, which will be discussed further below. Triangular bone points or arrowheads appeared as single or multiple objects in 14 graves, mostly certain (6, 14, 16, 70, 97, 106, 142) or uncertain men (189, 194), but were also given to uncertain female (176), infant (98, 203) and unsexed (17, 187) individuals. The high amount of bone objects at Schwetzingen as well as their distribution in chronologically younger sites such as Herxheim implies a rising importance of these objects in the Late and Latest Linear Pottery, as already argued by Gerling.⁴⁹²

⁴⁸⁹ BENTLEY et al. 2013, 278.

⁴⁹⁰ GERLING 2012, 93–102.

⁴⁹¹ ZVELEBIL 1994, 55, 60. – SPATZ 1999, 141. – HEIDE 2001a, 152. – GRONENBORN 2019, 536 – GERLING 2012, 101–102. – BENTLEY et al. 2013, 277

⁴⁹² GERLING 2012, 93.

Grinding stones, querns and one undetermined grinding tool fragment, which were all produced from sandstone, were scattered in seven graves across the cemetery.⁴⁹³ Three were identified as adult (56) or mature (43, 106) men, one as an uncertain adult woman (105), three represented infants/children ranging between four and thirteen years (33, 138, 158) and another one was an unsexed juvenile or older individual (212). Pebbles occurred even less frequently than grinding tools. A late adult (141) and an early mature (184) woman each received a stone of unknown material, whereas both also received a miniature vessel and were located in the southern half of the cemetery, meaning they share a significant number of characteristics. A sandstone pebble was found with a senile man (152), while another two sandstones and a *Kieselschiefer* pebble were part of the relatively extensive equipment of an adult man (70) in the north-western area, additionally having included an adze, two chert arrowheads, one triangular bone point and an antler belt buckle. It seems that pebbles were limited to older individuals ranging between late adult and senile age, although the small data sets of five pebbles in four graves has to be considered. However, it could be argued that this rarity further highlights the special status of pebble gifts.

Colour distributions within *Schwetzingen* mortuary rites are represented by red chalk powder and dying stones of red chalk, graphite and manganese oxide. Additionally, one undetermined nodule with abrasion traces gifted to an adult woman (126) might have consisted of graphite. Red chalk powder has been found under the head of an uncertainly female adult (176) and in a narrow stripe transverse to the burial of an 18-year old uncertain man (189), which were both allocated to the southern half of Schwetzingen. Three red chalk stones were placed at the opened mouth or mandible of an early mature man (106), who received an extensive ensemble of grave goods consisting of triangular arrowheads, a chert blade and mussel shells in addition to the colouring. It was located in close proximity to the previously mentioned, “richly” gifted infant burial 98, who received a perforated graphite stone among other goods such as *nucella lapillus shells*. Two perforated manganese oxide stones were placed with two adult women and were accompanied by either a miniature vessel (131) or spondylus beads (170). The burials were found in the central area of the cemetery, each near the gap that divided the sections of Schwetzingen. In general, a comparably lesser significance of colouring to other cemeteries can be observed.

⁴⁹³ GERLING 2012, 102–103.

Polished stone tools were slightly less frequent than on average, with about 11% of graves having polished stone compared with 15% for the LBK as a whole.⁴⁹⁴ They were mainly produced of amphibole and Hornblendegneiss as well as other gneiss, gabbro, basalt and *Muschelkalk* (literally translated: “mussel chalk”).⁴⁹⁵ The remarkably low amount of the otherwise more common amphibolite might be due to a limited access to raw material deposits, suspected to be the Jistebsko source in the Czech Republic, which led to a more frequent use of local or nearby material. The other materials probably derived from the uplands and lowlands near the site (e. g. Black Forest, Odenwald), but could also have arrived via long trade routes. Basalt dominates in the southern half, while the north-western area mainly consisted of amphibolite and Hornblendegneis, which means that qualitatively better materials were provided to the areas with more extensive grave good assemblages. The majority of individuals gifted with adzes were men ranging between adult and senile, whereas the adzes were preferentially placed on the upper body of older men. Significantly higher $\delta^{13}\text{C}$ -values for men buried with polished stone indicate subtle differences in the diet of males without adzes.⁴⁹⁶ Unsexed individuals with polished stones were represented by an infant (98) two juveniles (15, 17), two adults (206, 209) and one mature individual (187). The distribution map of polished stones shows Schwetzingen to be less diverse than other cemeteries. This is demonstrated by the absence of type 1 and 4, with the exception of grave 17 in the northern area, which includes type 1 and three bone arrowheads along with the remains of a 17-18-year old man. The ratio of type 2 to 3 shows roughly equal numbers (9:7), although type 2 dominated the southern and north-western area, while type 3 clustered in the north-eastern part. Perforated wedges were represented by two-disc maces (78 and 138, although the disc mace in the latter was stolen and thus cannot be certainly determined as such)⁴⁹⁷, one double-edged wedge (21) and one perforated shoe-last adze (16). In contrast to Aiterhofen-Ödmühle, the double-edged wedge as well the other perforated tools have not been found with

⁴⁹⁴ BENTLEY et al. 2013, 277.

⁴⁹⁵ GERLING 2012, 66.

⁴⁹⁶ BENTLEY et al. 2013, 282.

⁴⁹⁷ GERLING 2012, 171.

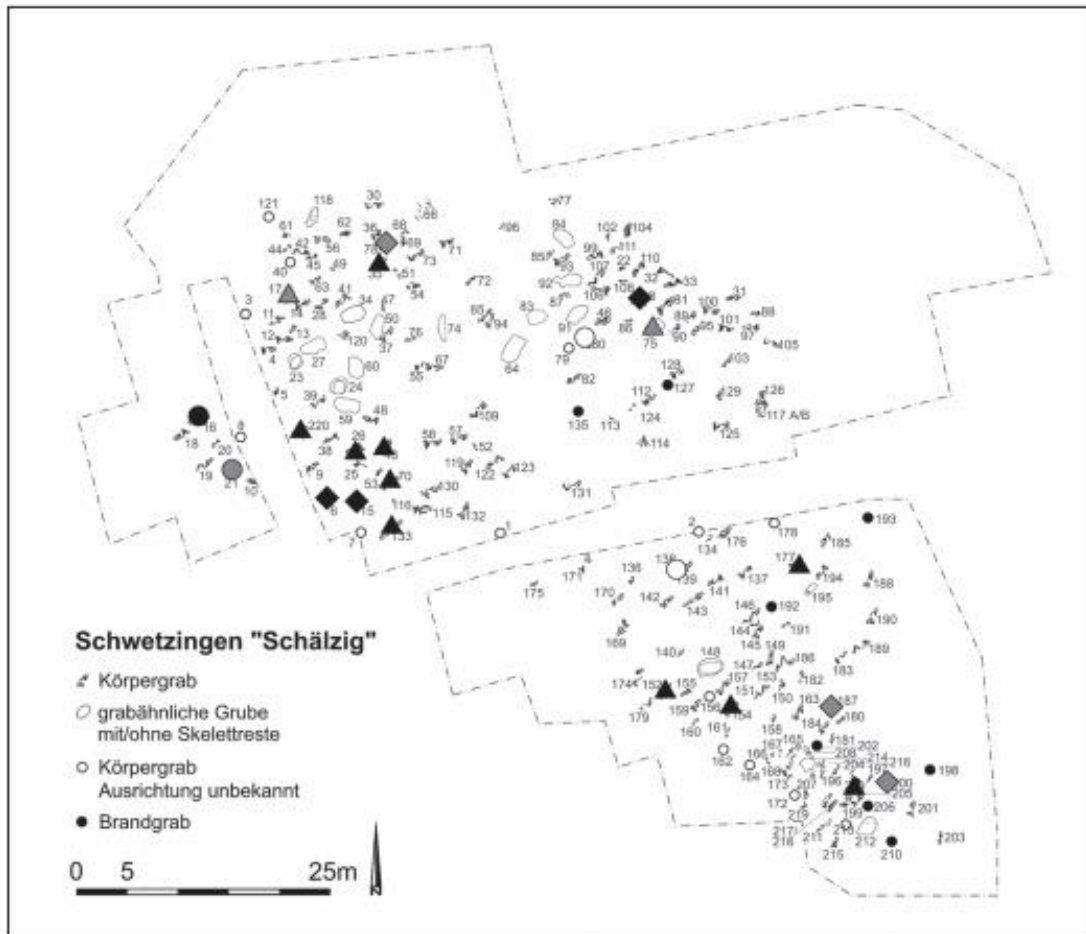


Figure 56: Distribution of polished stone tool materials. Black triangle = Hornblendegneiss, grey triangle = gneiss (other), black rhombus = amphibolite, grey rhombus = micro gabbro, black circle = basalt, grey circle = Muschelkalk, white circle = undetermined (GERLING 2012, 65, Abb. 32)

cremations. The certainly identified disc mace was produced from micro gabbro and is smaller, though significantly larger than the object from grave 66 in Aiterhofen-Ödmühle.⁴⁹⁸ Most interestingly, grave 138 and 21 belonged to infants, which is in favour of an interpretation of children inheriting a high social status from their family or clan. The presence of perforated wedges in the north-western area further strengthens the argument of this zone being chronologically later. Concerning the conservation status of the polished stone tools, most of the objects seem to have been produced for the funerary context.⁴⁹⁹ Only three adzes showed traces of wear and tear, with two additional adzes and a perforated wedge possibly being used before the respective burial.

⁴⁹⁸ Schwetzingen, grave 78: width = 71 mm, height = 26 mm, length = 82 mm. GERLING 2012, 78–79.

⁴⁹⁹ GERLING 2012, 76.

Chert blades mainly consist of the non-retouched variant, which make up 13 of 21 burials. Three graves belonged to infants (33, 98, 138) and another two were identified as adult (32) or mature (54) women, with the remaining being either male (14, 16, 58, 73, 97, 106, 152, 154, 189, 218) or unsexed (174, 187, 209). They mostly contributed to the southern half and the north-eastern area but seem to become less frequent across the central as well as the north- and north-western part of the cemetery. Long and unmodified blades were often gifted to older men, while subadults commonly received blade fragments. Triangular arrowheads represented the vast majority of microlithic chert tools, with only six of 19 graves containing other types such as irregular flakes or blade flakes. The only trapezoidal blade flake (wide variant) has been found alongside triangular arrowheads in grave 14, thus implying a function as projectile. As can be expected for Linear Pottery burials, almost every microlith was assigned to men, although a mature woman (190) and several subadults (15, 51, 182, 192) also received small flakes. Most interestingly, triangular arrowheads appear significantly more often and in higher quantities in the northern section, and the north-western area in particular, than in the southern half, which most certainly has chronological bearings and indicates an increased importance of arrowheads in the Late and Latest Linear Pottery, as already suggested for Aiterhofen-Ödmühle. Although the massacre site of Talheim is located closer to the cemetery Stuttgart-Mühlhausen than Schwetzingen, the relative proximity to Early Neolithic conflict zones could be seen as further connection to the significance of projectiles in younger Linear Pottery funerary rites.

4.3.5.3. *Analysis N Next Neighbours*

The graphical representation of the Analysis N Next Neighbours shows a relative heterogeneity of burial position and orientation in the southernmost part of Schwetzingen, which is partially associated with heavily disturbed inhumations preventing the determination of their original position, although it should be noted that most of the cremations as well as a higher number of right crouches, supine bodies and N-S-alignments can be found in this zone. Additionally, an abundance of subadults are clustered in the southern corner. Generally, it seems that the site, despite having a clear preference for certain cardinal directions, was shaped by an intermixture of different burial position traits especially concerning the line of sight. E-W- and the antipodal W-E-alignments as well as prone bodies appear significantly more often in the northernmost and the north-eastern zones. The grave good distribution, on the other hand, shows various assemblages and rows of unfurnished burials in the north-, north-eastern groups and the southernmost corner. In the north-western part of Schwetzingen, most of the triangular arrowheads, adzes of type 3, antler belt buckles and overall the most extensive grave good assemblages remain, while colouring, miniature vessels, grinding tools and spondylus ornaments are (almost) absent, although the latter generally rarely occurs. Subadult individuals also appear significantly less often than in the other clusters.

A small group of burial-shaped pits intertwine with the north-western and northernmost cluster but could also be seen as separating those two zones. Both share a high number of later-dating burials and the absence of colouring, while arrowheads, adzes and ornaments appear in lesser numbers and subadults and burials without preserved grave goods occur more often in the north. The north-western rim of the latter distinguishes itself by having different pit orientations and being especially scarcely equipped or unfurnished. On the eastern edge of this cluster lies another group of empty graves also potentially functioning as a transition zone between the northern and the north-eastern part of the site. The northeast could be separated in different subclusters: the eastern edge includes SW-NE, W-E and other orientations not appearing in the southern part of this cluster, and further contains two exceptionally well-equipped graves of a mature man (106) and an infant (98), which were near each other and thus this area could be reserved for highly-esteemed members of the family which founded the clan, if following the interpretation for the Vedrovice “Siroká u lesa”

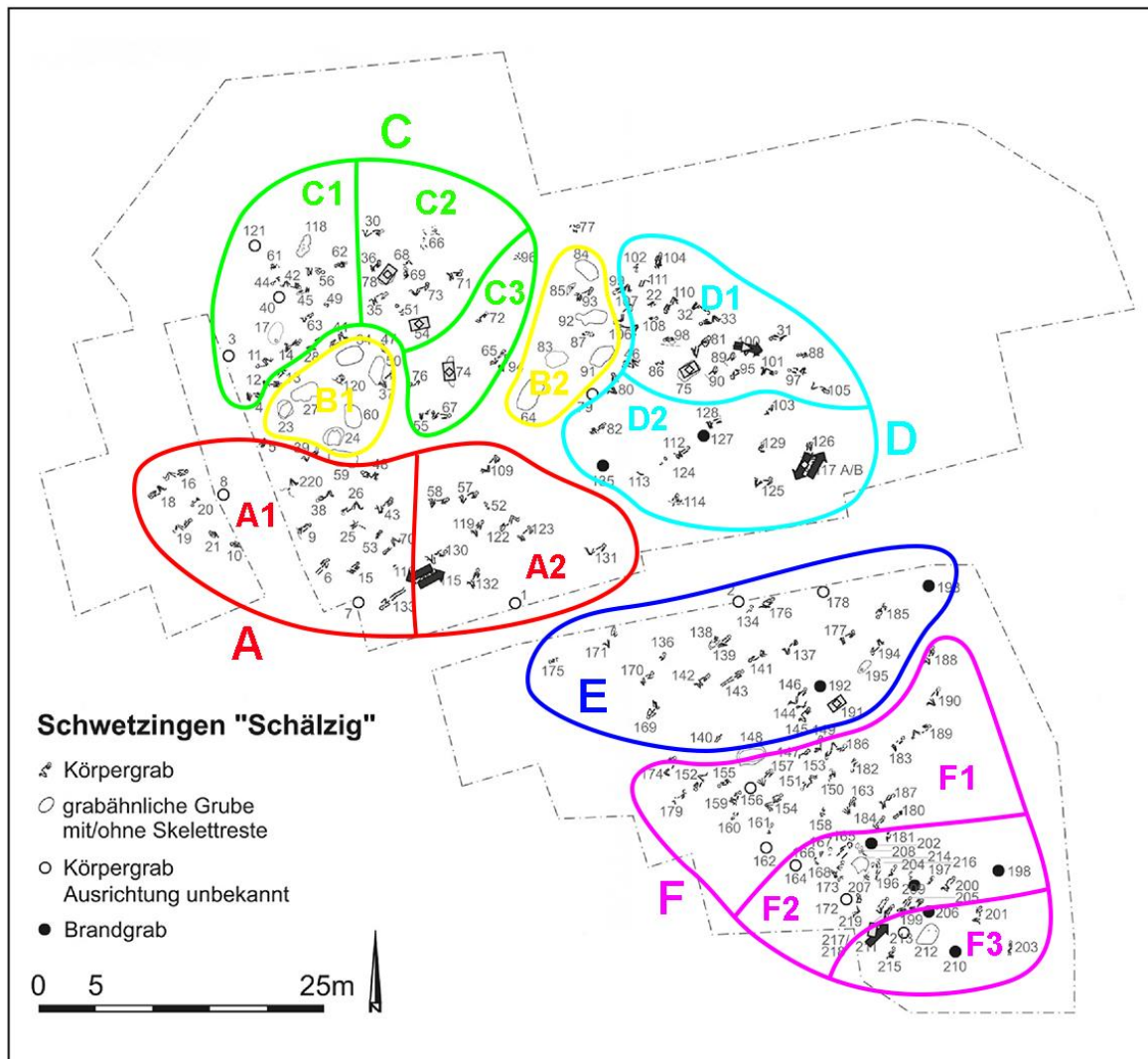


Figure 57: Clusters as recommended for Schwetzingen Schälzig (original graph taken from GERLING 2012, 25, Abb. 7 and further modified).

groups. The southern rim is less densely occupied and includes a row of unfurnished graves (with one exception) and another small group of mostly furnished graves, which includes a closely assembled group of 3 individuals, two of them placed in a double burial, implying family connections. Here too is an infant (129), which was listed as one of the moderately “rich” burials due to it receiving the antler adzes, although no other grave goods were found. Considering these factors, and generally according to the Analysis N Next Neighbours and distribution maps, the following clusters are suggested:

- Area A: This represents the chronologically earlier, north-western group of the cemetery, defined by the high occurrence of ornaments, adzes, arrowheads and accompanied by the almost absence of subadults, prone bodies, miniature vessels, colouring and chert blades, while the crouch intensity also differs to other zones. The

most extensive grave good assemblages are distributed in this cluster. The southwestern corner (A2) of this area, on the other hand, consists mainly of unfurnished graves and further contrasts with the north-western part (A1) through the absence of SW-NE-alignments. This situation is somewhat similar to subarea A3 of Aiterhofen-Ödmühle, which also includes a group of lesser equipped or even unfurnished burials closely neighbouring the most extensive gift ensembles.

- Area B: Two small groups of empty graves, seemingly separating area A and C (B1) or C and D (B2) at their edges, were intertwined with these groups and through neighbouring inhumations at the same time, which speaks for transition instead of clear distinction. However, the funeral context of these pits is highly uncertain, as many of the discolorations might not have functioned as empty graves (see chapter 4.3.5.2.).
- Area C: The northernmost zone distinguishes itself from area A by containing a higher number of subadults, E-W-alignments, prone bodies (but less supine inhumations) and more intense crouches, while including less arrowheads, ornaments, bone tools and adzes. An absence of colouring is shared with both. Unfurnished graves seem especially abundant in the westernmost area (C1), where pottery is absent, and a small group of adults are clustered on the northern edge. The eastern area (C2) includes slightly different orientations and lines of sight as well as more furnished pits and vessels, while some loosely assembled graves (C3) are allocated between the subclusters B1 and B2.
- Area D: Concerning their properties, area C and D share various traits such as the frequent occurrence of prone inhumations, subadults, E-W-alignments and less graves with ornaments or adzes – with the three graves with polished stones all containing flat adzes – than the north-western cluster. Chert projectiles are almost absent, although bone arrowheads appear moderately often. It is further distinguished from area C by including more colouring and chert blades as well as less pottery other than uncategorized vessel units, which spread over several burials. Furnished and unfurnished graves alternate in the shape of small row-clustered groups. Potential subareas could be seen in a more heterogeneous upper part regarding orientation (D1), where the two well-equipped burials (98, 106) occur, as well as in the southern,

less densely occupied edge (D2), where a row of pits without gifts and a small cluster of furnished burials are located, including a double inhumation (117A/B) and the infant (129) gifted with the antler adze. It is thus uncertain how and if these graves are really connected, or alternatively, if they might have been actually associated with the central area E.

- Area E: The central zone (E1) is characterized by its loosely assembled burials and its uniform pit orientations, with the bodies almost exclusively aligned either to NE-SW or the antipodal SW-NE. An early mature male (142) and the infant (138) which received the missing disc mace were the most well-equipped individuals in this group. Miniature vessels occur slightly more often than in area F and significantly more frequently than in A or D.
- Area F: The southern to south-central parts of Schwetzingen distinguish themselves from area F by a dense occupation, an abundance of subadults combined with a trend towards fewer adults above early adult stages to the south, and a higher amount of *Kümpfe*. Its northernmost zone (F1) include two rows of unfurnished graves seemingly marking the conversion to area E. Another subcluster of burials without preserved gifts and with significant size (F2) includes the unusually high numbers of subadults also found in the southernmost corner (F3). The high number of cremations supplement the relative chronology generally dating this cluster to the later phases of the cemetery.

Generally it can be stated that although gaps, groups of empty graves (cluster B), as well as differences in occupation density and an already established relative chronology for a high number of graves help distinguish the funerary structures at Schwetzingen, there are some significant but partially obscure contrasts between and within these clusters, which is observable through trait distribution and the Analysis N Next Neighbours and allows various interpretation possibilities.

4.3.5.4. *Site summary and discussion*

There are some significant distinctions between Schwetzingen, and other grave fields selected for this thesis. Juvenile individuals were buried more often than usual for Early Neolithic cemeteries and fits the expected population share for this time. The predominating NE-SW and antipodal SW-NE-orientations differ from the usual E-W and SE-SW-alignments commonly found at the majority of Linear Pottery cemeteries. Although there are two main directions instead of the usual one, there is less variation than observed at other cemeteries. According to the Lifeways database, the number of left crouches (approximately 80%) is in line with the Linear Pottery average, although the classifications of Gerling and this study (63-65%) sees a lower amount of left-side bodies.⁵⁰⁰ The small sample of adolescents and early adults shows a higher number of right crouches than for infants and elder individuals. Grave good distribution reveals further differences and peculiarities. The pottery is associated with the Pfalz groups west of the site and the Rhine, while a vessel found in grave 200 shows designs corresponding to the Cardial Ware in the south as well as to the local Linear Pottery and thus might have been produced by a local pottery inspired by the Cardial style, or alternatively, by basketry and rope work widespread in the Early Neolithic.⁵⁰¹ Different affiliations are observable within the stone tools; the raw material deposits probably originated from the uplands at Baden-Württemberg south and east of Schwetzingen and can be compared to Stuttgart-Mühlhausen and Fellbach-Oeffingen, although the amphibolite might have been brought from the Jistebsko source in Czechia.⁵⁰² Perforated wedges or disc maces as seen in Schwetzingen have also been found at Vedrovice “Siroká u lesa” and Aiterhofen-Ödmühle, and have been sometimes gifted to infants, implying that a high social status could be inherited. The poor quality of pottery and the lacking use-wear of most adzes implies them to be produced exclusively for funerary context.⁵⁰³ Spondylus occurred unusually scarce, although there is a variety of different snail species found as shell ornaments in seven graves. Most of them could have been gathered locally, while the dog whelks in grave 98 might originate from the North Atlantic or North Sea.⁵⁰⁴ Whether the absence of spondylus has chronological or regional reasons remains uncertain. Following the classification of cemeteries

⁵⁰⁰ GERLING 2012, 19. – BENTLEY et al. 2013, 277.

⁵⁰¹ LEFRANC 2007, 274. – CROMBÉ 2009. – GERLING 2012, 123. – BENTLEY et al. 2013, 277.

⁵⁰² GERLING 2012, 66.

⁵⁰³ GERLING 2012. – BENTLEY et al. 2013, 277.

⁵⁰⁴ WORMS EDITORIAL BOARD 2020h.

by Jeunesse, this reduced emphasis on personal ornaments would order Schwetzingen with the Tradition II sites.⁵⁰⁵ Bone objects appear in significantly more graves than the Linear Pottery average, only matched by Kleinhadersdorf, although the latter lacks bone arrowheads. These triangular points represent one of the unique finds of Schwetzingen, with Vedrovice “Siroká u lesa” being the only other site in this study which also included one burial (46) with such an object, although this single piece might have had another function.⁵⁰⁶ In contrast to their chert equivalents, bone arrowheads occurred equally in both male and female burials. Another peculiar artefact is an antler bone adze in the infant burial 129, similar to those found across Europe at Mesolithic or Neolithic sites, and with possible connections to Linear Pottery finds in Mesolithic contexts as well as to the Baltic Late Mesolithic as implied by characteristic decorations on antler fragments at the Early Neolithic sites in Baden-Württemberg.⁵⁰⁷ For the high occurrence of bone objects in general, Gerling proposed a shifting emphasis from spondylus and polished stones to bone items as high status objects. In this context, the decrease of triangular chert arrowheads might have been linked to the increase of their bone counterparts, with the former having been replaced by the latter. Additionally, as there are only a few imported items, a far reaching but hardly pronounced trade network has been suggested. The relative quantities of gifts at Schwetzingen was significantly lower than usual for Early Neolithic cemeteries, with not even the most extensive ensembles reaching the “rich” assemblages of other sites, which partially relates to the small number of spondylus objects. Old men were more likely to receive complex furnishings, while women received fewer objects and were more often ungifted.

According to relative and absolute chronology, later burials appear in the south-east and the earliest ones towards the north-west, although some of the younger graves can also be found in this area and thus imply a partial return to the older areas in later phases.⁵⁰⁸ There could have also been a progressive westwards spreading instead. Cremations appear more in the supposedly later clusters and especially frequently in the southernmost corner, which is in favour of the relative chronology. As Bentley et al. mentioned, fewer distinct clusters than at other large grave fields can be detected, emphasizing on the increased density of burial pits

⁵⁰⁵ JEUNESSE 1997.

⁵⁰⁶ PODBORSKÝ 2002a, 48–49.

⁵⁰⁷ ZVELEBIL 1994, 55, 60. – SPATZ 1999, 141. – HEIDE 2001a, 152. – GRONENBORN 2019, 536 – GERLING 2012, 101–102. – BENTLEY et al. 2013, 277

⁵⁰⁸ GERLING 2012, 112–116.

at the southern, north-eastern and north-western edges of the cemetery.⁵⁰⁹ However, there are more numerous differentiations observable through trait distribution and the Analysis N Next Neighbours. The most obvious are, of course, the contribution of the most extensive graves to the northwest, where arrowheads, adzes, and ornaments can also be found in greater numbers than in other zones. Subadults, on the other hand, appear in the northernmost and north-eastern area and especially towards the southern corner, but less often in the northwest. Pit orientations seem more diverse in the northern section. As triangular bone points occur mostly in the eastern and southern areas, they might have replaced chert arrowheads in later chronological phases. Colouring is absent in the north-western and northernmost cluster. Further distinctions can be seen through the other properties of the recommended groups and subgroups, which also take the density of the grave occupation into account and demonstrate various differences even within closely assembled graves. Also considering the empty pits between group A and C as well as C and D with uncertain ritual function, interpretations of spaces reserved for families or clans might be too reductive or at least only a part of the full picture.

The isotope analyses of the Lifeways database show differentiate outcomes and suggest two possible mobility patterns related to distinct sources for different diet components, which is similar to the interpretations of the Baden-Württemberg settlement site Vaihingen, where different “clans” might have exploited varied landscapes in its vicinity.⁵¹⁰ However, it should be considered that the settlement (or settlements) connected to Schwetzingen remain unknown, and of course that cemeteries were most certainly selective. The two groups as identified by oxygen and strontium results are divided into a main cluster consisting of most of the sampled individuals and a smaller group including seven individuals who used both lowland and upland resources. While more variable strontium values for women imply varied origins and suggest patrilocality, both sexes were equally found within the two arrays, potentially representing two different community groups rather than distinct diets between men and women. This is in contrast to the stable isotope data, which indicates a similar protein intake for most samples at Schwetzingen and thus implies consistent diets within some variations of source areas. Correlations between funerary rites and isotopes are once again

⁵⁰⁹ BENTLEY et al. 2013, 276.

⁵¹⁰ BENTLEY et al. 2013, 286.

found in adze distribution, with men buried with adzes having significantly less strontium variation and slightly elevated nitrogen values, which fits the interpretation that males sourced most of their diet from loess areas and were less mobile. As old men received the relative majority of polished stones, the gifting of such might have been linked to a high social status reached in later age stages. As the strontium isotope values derive from teeth already mineralised in childhood, the correspondence between old men and adzes might also be determined by geographic origin at birth and a loess-based diet. Recent investigation on multiple teeth at the 80 km distanced cemetery Stuttgart-Mühlhausen came to a different outcome, showing that young men must have been away from the lowland loess areas during the time in which their second molars mineralised (approximately at 3-8 years of age), but that otherwise the population was fairly uniform in their mobility.⁵¹¹ Knipper rejected transhumance of cattle over the summer as explanation for these ratios and instead argued that the herds were kept close to the settlement year round, leaving the strontium ratio in molars unexplained and emphasizing the variety in the geology of the vicinity of the site.⁵¹² As the strontium and oxygen outcome of premolars at Schwetzingen indicate varied mobility of both women and men using the upland and both sites overlap chronologically, there seems to have been diverse communal Lifeways in Baden-Württemberg, which is further supplemented by Talheim having more similar strontium and oxygen values to Schwetzingen than Stuttgart-Mühlhausen, despite the latter being geographically closer to Talheim.⁵¹³ Overall, Schwetzingen stands out by including a variety of differences to other cemeteries, having ventured far from the earliest cemeteries in the south-eastern regions both geographically and also traditionally in some cases, although many similarities in social structure, e. g. giving more gifts to elder people and different diets for men with adzes, can still be observed. It seems very likely that deviations toward the western Linear Pottery link to the regional context, as the development of the La Hoguette culture and continuing hunter-gatherer lineages and rites might be intertwined with the Schwetzingen traditions. According to the Lifeways investigations, the hunting of wild animals continued in Baden-Württemberg at a seemingly higher rate than other regions – except maybe Bavaria –, while the isotope data shows no clear separation between groups but has significant differences related to mobility

⁵¹¹ KNIPPER, PRICE 2010. – KNIPPER 2011.

⁵¹² KNIPPER 2011.

⁵¹³ BENTLEY et al. 2008. – BENTLEY et al. 2013, 287.

and landscape exploitation.⁵¹⁴ As there is also a lack of correlation between isotopes and most funerary practices at Schwetzingen, Bentley et al. argued against the rigid reflection of Neolithic or Mesolithic identities in the graves, instead suggesting more nuanced statements about the presentation of the dead body. This complexity also echoes in the recommended groups, where a multi-ritual nature is seen in occasional cremations or clusters of empty graves, and a general variety in anthropology, burial position and grave good distribution between and within densely clustered burial groups can be found, as well as a trend of preferences of certain traits for specific areas. Uniform rules for specific groups, if having existed, are difficult to determine. Therefore, clan or family associations for specific clusters as well as chronological developments, as the contribution of younger graves in the earlier north-western zone shows, might also be too simple answers for this complex issue and could have only been a part of the current funerary rules at Early Neolithic Schwetzingen.

⁵¹⁴ BENTLEY et al. 2013, 288.

4.4. *Correspondence analysis*

The superregional correspondence analysis of the complete data set of grave goods provides a positive result, without a single significant statistical outlier distorting the outcome. As shown on the graphical representation (Fig. App. 142), the majority of types assemble in an amorphic cluster, with different branches pointing up, down or left. Frequently assigned objects which often accompanied other grave goods, such as regular adzes or V-shaped spondylus belt buckles, are allocated more closely to the centre. V-shaped closures would probably be even more central if the unfortunately lost examples of Vedrovice “Siroká u lesa” could be included (see chapter 4.3.4.2.). Objects commonly appearing in higher quantities, such as beads, and types which often appeared as the only grave goods or accompanied with only a few or other specific rare gifts are more likely to be placed at the outer branches by the algorithm. Considering these factors, it is possible to observe certain trends in grave good distribution within the reciprocal averaging.

At the upper edge of the graph lie the traits “Spondylus closure_Uncategorized00010” and “Mussel shell pendant_Undetermined00010”, which contributed to the Austrian sites Kleinhadersdorf and Rutzing as well as to Czech Vedrovice “Siroká u lesa” and “Za Dvorem”. “Bone point_Antler00010” occurs one time each at Za Dvorem and Kleinhadersdorf and further highlights the connection between Austria and Czechia. “Alföld vessel (5b)00010” limits to Nitra, while „Amphorae (1i)00010“ appears at Nitra and “Siroká u lesa”. Objects made of marble such as “Stone bead_Marble00010” as well as “Kumpf (2e)00010” occur at Vedrovice. Two of the 20 hammerstones are distributed to the Bavarian Aiterhofen-Ödmühle, with the remaining ones dividing between Kleinhadersdorf and “Siroká u lesa”. Overall it seems that the upper branches strongly relate to the Austrian, Bohemian and Moravian sites and connects them, meaning that the topmost part of the central cluster, including objects such as spondylus pendants, red chalk powder and symmetrical trapezes, are more numerous and significant in the south-eastern regions than in Bavaria and Schwetzingen.

The left-pointing branch contains types mainly corresponding to the Bavarian cemeteries Aiterhofen-Ödmühle, Dillingen-Steinheim, Essenbach-Ammerbreite, Mangolding and Sengkofen. Most of the traits found at this branch are limited to this region, while of 12 “Spondylus closure_Medallion00010” units three appeared at “Siroká u lesa” and one at Schwetzingen. Spondylus beads were also scarce at the Baden-Württemberg site. Bavarian-

exclusive fox mandibles as well as traits also occurring at Schwetzingen and the south-eastern regions are located on the central right. Singular examples of the „Perforated shoe-last adze00010“ were excavated at Schwetzingen and “Siroká u lesa”, with the neighbouring “Perforated miniature vessel (4a)” similarly occurring once at Aiterhofen-Ödmühle, Rutzing and Schwetzingen. These are particularly interesting, as they represent rare types still appearing at sites very distant to each other, indicating that these peculiarities might have been more significant for the Linear Pottery material culture than demonstrated by their occasional occurrence in grave good assemblages. It thus seems very likely that more of them will be excavated at Early Neolithic cemeteries in the future.

Towards the bottom of the central cluster and the lower branch, grave goods mainly correspond to Bavaria and Schwetzingen, with few contributions to the other regions. There were 22 “Miniature vessel (4c)00010” mostly being distributed to Bavaria and Schwetzingen, with one example excavated at Kleinhadersdorf and another four at Nitra. “Pyrite nodule00010” and “Cylindrical bone stick00010” are characteristically Bavarian gifts similar to “Amphorae (1b)00010”, although one of these 12 vessels were located at Nitra. Perforated and non-perforated or raw graphite also has just a few occurrences at Baden-Württemberg and Austria, Bohemia or Moravia. Triangular chert arrowheads were limited to Bavaria and Schwetzingen, with their bone counterparts almost exclusively appearing in Baden-Württemberg. In contrast, a total of 10 “Bone point_Long bone-long bone segment00010” were divided between one burial at Aiterhofen-Ödmühle and another two at Schwetzingen, with grave 37 at the latter having contained eight units. Double-edged wedges, suspected to potentially be of Middle Neolithic origin,⁵¹⁵ occurred in three burials at Aiterhofen-Ödmühle and one at Schwetzingen. The grave good types “Unio pictorum_Unmodified00010”, “Pseudounio auricularius_Unmodified00010” as well as “Zebrina detrita_Unmodified00010”, located in the lower left corner, are all associated with *Schwetzingen* funerary contexts. “Amphorae (1g)00010”, „Kumpf (2c)00010“ and „Kumpf (2d)00010“ overwhelmingly appeared at Bavaria and Schwetzingen, although one vessel of type 2c contributed to Rutzing and another one of type 2d to Vedrovice “Siroká u lesa”.

Generally, the correspondence analysis or reciprocal averaging of grave goods demonstrates not only the similarities, but also the differences between the different sites and regions in

⁵¹⁵ NIESZERY 1995, 157–159.

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terms of gift preferences. These distinctions manifest locally and regionally and highlight the individuality of various Linear Pottery communities. At the same time, they also share many core similarities, but are more or less pronounced depending on region and site. The complexity and differences of burial rites between individual graves, clusters, sites and regions have been suggested to be due to various possible reasons, which will be elaborated in this thesis' conclusion (see chapter 4.6.). For now, it shall be noted that this analysis should be reviewed as a preliminary result, already demonstrating certain trends but overall lacking data from some insufficiently published cemeteries and other regions as well as some sites which did not make it into this study for other reasons.

4.4. *Seriation*

The supra-regional seriation unfortunately yields a negative result, which could not be improved by discarding types (Fig. App. 143). The chronological order shows a chaotic sequence relatively unsuitable for interpretation. Various reasons – or a combination of such – might be responsible, with one being the relative homogeneity of Linear Pottery material culture on the one hand, and on the other the short period of cemetery burials from around 5300 BC on to the end of the Early Neolithic in 5000 to 4900 BC, with an individual grave field only lasting for several hundred years at the most. Certain object types such as spondylus beads have existed before Linear Pottery cemeteries and for a long time in Neolithic Europe without obvious typological changes, while not even a seriation of Linear Pottery ornaments, in all their diversity, guarantees well-arranged sequences, as observable with Schwetzingen and Kleinhadersdorf. Claudia Gerling, who used the software WinBasp for analysing the pottery of Schwetzingen, traced this back to the small number of two decorated vessels per grave at most, the low number of *Schwetzingen* ornaments and the commonly applied combination of the same motifs.⁵¹⁶ The addition of sherds from the grave fillings displayed similarly poor results, although the decorations often showed a simultaneity of grave goods and sherds from the fillings. The seriation of pottery at Kleinhadersdorf, which was performed by Peter Stadler and Eva Lenneis by using WinSerion, faced similar issues.⁵¹⁷

Contrary to previous evaluations of Kleinhadersdorf and Schwetzingen, there are numerous examples of successful seriations of Linear Pottery material. The unsatisfactory results of a seriation of Early Linear Pottery ceramics at the settlement site *Vaihingen an der Enz*, which included the content of around 1600 findings, were significantly improved by Hans-Christoph Strien by adding further data from other sites as well as by modifying the typology.⁵¹⁸ One of the most recent pottery seriations were performed by Nadezhda Kotova and Peter Stadler on the ceramic finds of the settlement site *Brunn am Gebirge*. One evaluation contained 1812 vessels among only 189 findings, which led to 254 types of vessels, 44 types of knobs and 63 types of decoration.⁵¹⁹ As compared to these mentions, the sample selected for this thesis,

⁵¹⁶ GERLING 2012, 112.

⁵¹⁷ STADLER, LENNEIS 2015.

⁵¹⁸ STRIEN 2014.

⁵¹⁹ STADLER, KOTOVA 2019, 203.

comprising of around 1550 grave goods (not including small, undetermined pottery sherds) within approximately 700 graves or pits, of which many did not have any goods, seems rather small. This issue becomes even more obvious with regional evaluations, where the samples vary between 200 and 300 burial pits, with many of them lacking grave goods. Even the far more extensive dataset provided by Strien was described as insufficient to grasp the distinct chronological beginnings of Balaton and Danube ware in the Early Linear Pottery period.⁵²⁰

Naturally, another issue regards the efficiency of typologies. There is always the possibility that categorizations might be lacking in some regard, which is strongly dependant on the experience and professional competence of the archaeologist creating these variants as well as the current research status. Even highly appraised typologies might – and most probably will – become insignificant due to future discoveries and methods, which would then provide classifications more suitable for seriation. As already mentioned in chapter X, it should also be considered that our understanding of Early Neolithic material culture most certainly differs from the Linear Pottery mindset, meaning incorrect functional interpretations for certain artefact groups might exist. For this thesis, I have mostly selected either acclaimed and commonly used typologies (e. g. RAMMINGER 2007 for non-perforated adzes or KOZŁOWSKI 1980 for trapezoidal arrowheads) or the ones already established by the original publications of the respective grave fields, while regional pottery classifications were synthesized as previously explained (see chapter 3.4.2.).

In summary, considering these issues and other concerns mentioned in chapter 2.2.1., the following might be responsible for the negative outcome:

- Minor or absent chronological progression of artefact types
- Insufficient quantities within the data set, especially regional and local data
- Unfavourable typologies
- Seriation showing the spatial, but not the chronological order
- Evaluation algorithm potentially unfavourable

As I personally trust in the method and algorithm, which already showed positive results in recent research, as well as in the typologies – acclaimed or newly established for this thesis – and due to the fact that chronological changes are recognizable within pottery according to

⁵²⁰ STRIEN 2014, 145.

relative chronologies, but not as easily determined within other artefact groups, the most plausible explanations seem to be a lacking of chronological progression of certain types, the absence of vessel decoration classification in this study and an insufficient quantity of material. Although the image database Montelius offers one of the largest data sets of Linear Pottery culture information, it does not change the fact that only a relatively small number of available cemeteries and graves have been found when compared to the research status of younger Early Neolithic cultures. This is especially aggravating when focusing on regional distribution. Only one large cemetery was published in Austria, Baden-Württemberg, Bavaria, Bohemia and Moravia, respectively. Consequently, new discoveries and excavations are fundamental requirements for potentially improving quantitative evaluations of Early Neolithic grave fields. Another significant issue is that the seriation might depict the spatial order instead of a chronological one. For this reason, the distribution of certain types to one or the other end, as seen with e.g. triangular chert arrowheads or polished theodoxius danubialis shells, cannot be fully trusted. Additionally, despite my trust in the applied typologies, I am most certain that these can be improved and supplemented in future evaluations by additional data (e.g. by adding ceramic decoration typologies), which will be considered for a possible continuation of this study. For now, the preliminary results of the seriation seem problematic.

5. Summary and conclusions

5.1. Abstract

This study presents the results of various investigations carried out by using the image database Montelius and the software for quantitative evaluations WinSerion. Data was collected from numerous cemeteries in Austria, Bohemia, Moravia and Southern Germany. The typologies as established for this thesis include anthropological information, burial rites, pit orientation, burial position as well as grave good presence and distribution. This data was incorporated for questions of social patterns at local, regional and supra-regional scale, and the outcome of previous research considered and extended.

Although there are clear core values or rites identifiable at Linear Pottery cemeteries, regional and local variability in how the body was treated and equipped were clearly observable. The dominant orientation of the inhumations depends on the region. At Kleinhadersdorf, Vedrovice and Nitra, it was SE-NW, while at Bavaria the E-W-alignments were the most numerous. Schwetzingen even had two main orientations with SE-NW and the antipodal NW-SE. At Kleinhadersdorf, the antipodal NW-SE represented the second most occurring alignment (19%), while Aiterhofen-Ödmühle as well as Nitra and Vedrovice on the other hand contained far less significant secondary deviations. Certainly correct explanations for the preference of burial pit orientations remain absent, although they might be connected to specific geographical markers or events such as sunrise or solstice, as it has been recommended for “Siroká u lesa”.⁵²¹ As already explored within the Lifeways investigations, in regions where east-aligned pits dominate (Hessen, southern Bavaria, Palatinate, Lower Saxony), only a few burials diverge from the dominant or antipodal patterns (less than 1%, while dominant orientations account for 70%).⁵²² At Moravia, Lower Austria and Basse-Alsace there is more variation, with approximately 10% of burials falling into the two most dominating orientations. Sites with predominating NE- or NW-alignments (Baden-Württemberg, Thuringia and Upper Austria) had 20% of burials outside of the dominant orientation and more equally represented different alignments. However, in Saxony-Anhalt where west-orientations were frequent, and Haute-Alsace, where north, north-east and east

⁵²¹ RAJCHL 2002.

⁵²² BICKLE, ANDERS 2013, 376–377.

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Table 8: Correlation between orientation and body position. For variability in body position, Low=0–20%; Medium=20–50%; High=50%+ of burials not left-crouched. For variability in orientation, Low=1–10%; Medium=10–20%; High=20%+ of burials not in either the dominant or secondary orientation. (BICKLE, ANDERS 2013, 377, Tab. 9.9.)

Region	Dominant orientation	Variability in orientation	Variability in body position
Eastern Hungary	East and south-east	Low	Low
Western Hungary	North-east	Low	Medium
Slovakia	East, south-east and south	Low	Low
Moravia	East and south-east	Medium	Low
Lower Austria	East and south-east	Medium	Low
Upper Austria	North-east	High	High
Southern Bavaria	East	Low	Low
Baden-Württemberg	East and north-east	High	Medium
Basse-Alsace	East and south-east	Medium	High
Haute-Alsace	North-east	Low	Medium

dominate, only 5% of burials are antipodally positioned. Similar to western Slovakia, Hungary lacks such secondary orientations. The Lifeways investigations also showed variation with age at death, as late infants (7-13 years) were more likely to be buried antipodally (dominant orientation: 112 burials; secondary orientation: 143), while on average two thirds of any age group corresponds to the dominant and a third to the secondary category. Most interestingly, this was not the case for settlement burials, where late infants are frequently found, and orientations varied (dominant orientation: 62 burials or 40%; secondary orientation: 92 or 60%). Connections between origin or lifeway and direction of burials thus have been seen as unlikely.

The characteristic main gesture was the left-sided crouches and the hands aligned to the head as if the deceased were sleeping, while the crouch intensity varies, indicating that bodies might or might have not been wrapped with something. Right crouches and diverging arm gestures signify social differentiations, the latter representing one of the most diverse classifications of this thesis. These “deviating” gestures are often combined with a supine body and variations sometimes potentially linked to sex, but overall, there seems to be a tendency for older individuals (but not exclusively) to receive them. They can also show close blood relations, as demonstrated e.g. by Vedrovice “Siroká u lesa” grave 48-50 containing a family of one woman and two children. Unusual arm gestures in general often correspond to other diverging categories as well, whereas they are occasionally combined with moderate to extensive furnishings, further highlighting their special nature. Regional differences can be observed as well through burial position. The high number of right crouches at Rutzing in Upper Austria probably derives from the small sample of graves, which might not be representative of the whole cemetery (and which is responsible for the high values for Upper

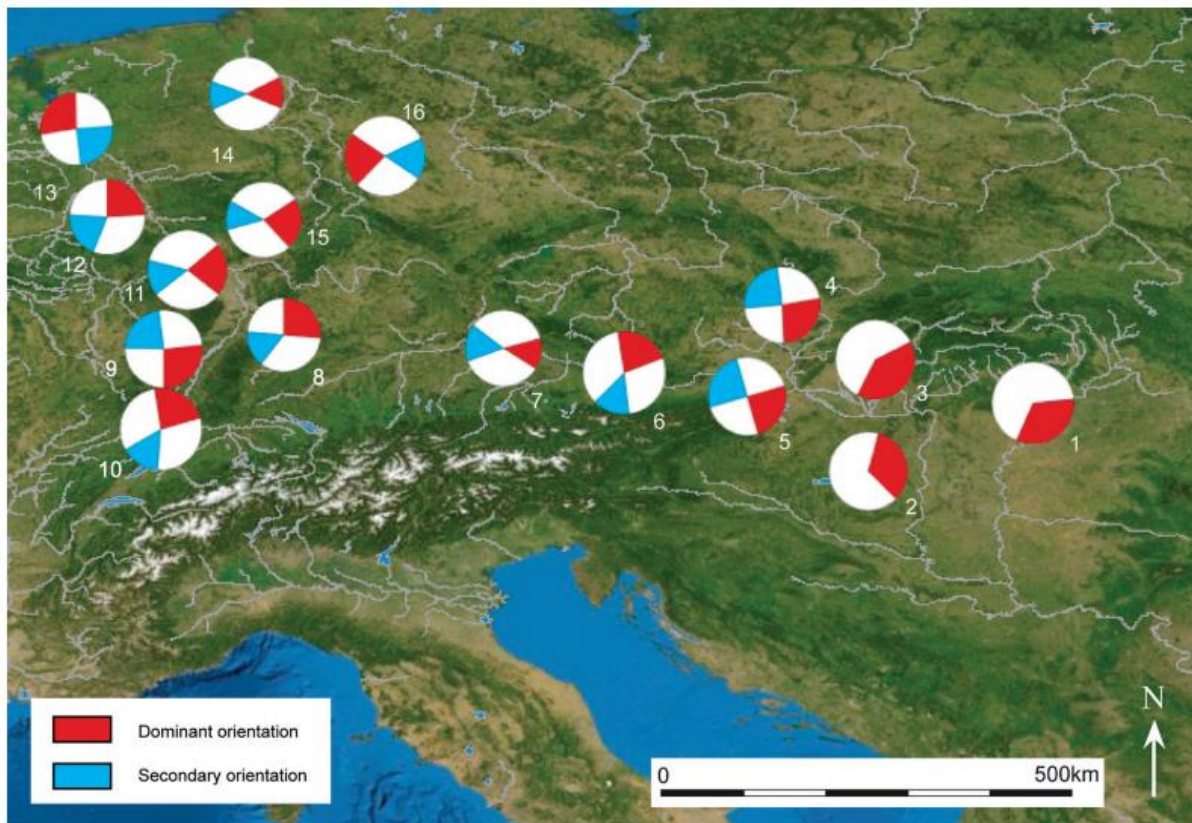


Figure 58: Dominant and secondary (or ‘antipodal’) orientations of burials by region according to the Lifeways database. 1) Eastern Hungary, 2) Western Hungary, 3) Slovakia, 4) Moravia, 5) Lower Austria, 6) Upper Austria, 7) Lower Bavaria, 8) Baden-Württemberg, 9) Basse-Alsace, 10) Haute-Alsace, 11) Palatinate, 12) Lower Rhine, 13) Netherlands, 14) Lower Saxony, 15) Thuringia, 16) Saxony-Anhalt (BICKLE, ANDERS 2013, 366, Fig. 9.10.).

Austria in tab. 8). Nitra is especially uniform in its inhumations and diverging traits in general seem more significant at Baden-Württemberg and France than in the east (Tab. 8). Bickle et al. pointed out that right-crouches were more often unfurnished (59% furnished compared to 72% of left-crouched burials), received 10% less pottery than other gestures and 5% less personal ornamentation, but not polished stone and chert.⁵²³ The Lifeways database also shows a higher frequency of furnished supine bodies (60% of female graves, 85% of male graves), and 10% higher rates of polished stones and chert tools as well as 3% higher rates of grinding stones, although these values derive from the high numbers of well-equipped supine burials in Basse-Alsace. This pattern could be explained by the regional transition to the middle Neolithic, where supine burials increase and grave good assemblages change.⁵²⁴ Overall, this study follows the interpretation that the expression of community cohesion is observable through patterns of orientation and burial position.⁵²⁵ Therefore, the main

⁵²³ BICKLE, ANDERS 2013, 377.

⁵²⁴ JEUNESSE 1997, 67. – BICKLE, ANDERS 2013, 377.

⁵²⁵ BICKLE, ANDERS 2013, 377.

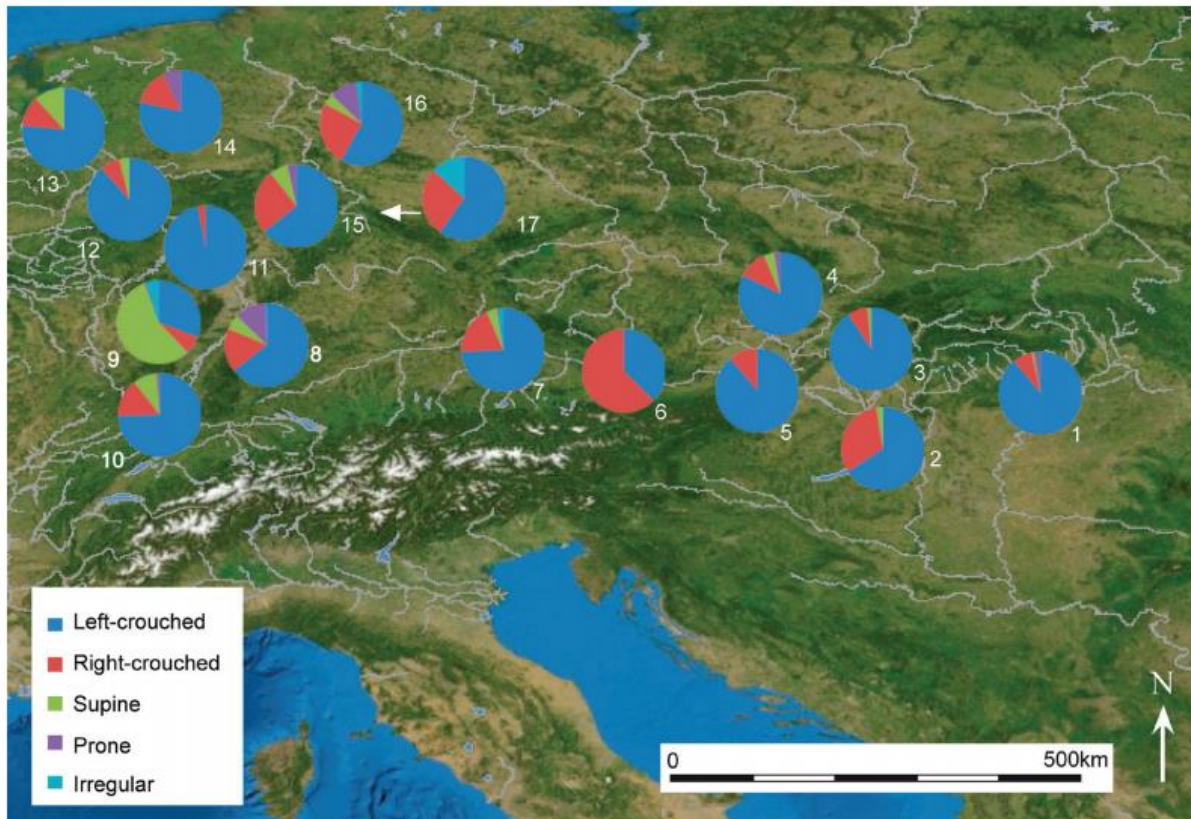


Figure 59: Frequency of body positions by region according to the Lifeways database. 1) Eastern Hungary, 2) Western Hungary, 3) Slovakia, 4) Moravia, 5) Lower Austria, 6) Upper Austria, 7) Lower Bavaria, 8) Baden-Württemberg, 9) Basse-Alsace, 10) Haute-Alsace, 11) Palatinate, 12) Lower Rhine, 13) Netherlands, 14) Lower Saxony, 15) Hessen, 16) Thuringia, 17) Saxony-Anhalt (BICKLE, ANDERS 2013, 366, Fig. 9.11.).

orientations of relative uniform sites would represent regularised funerary rites, while higher variation at Baden-Württemberg and Basse-Alsace reflect more local scales of community. Bickle et al. also argued that differences of variability between cemeteries and settlements depended on such communal scales or were rooted in particular contexts of burial. Mesolithic influences should also not be disregarded prematurely due to supine burials potentially being rooted in hunter-and-gatherer-traditions.

Although cremations were far less numerous than inhumations, they still occurred in significant numbers depending on region and site, and thus must have played an important role in Linear Pottery funerary rites and might have reflected changes in Early Neolithic notions of the afterlife. At Vedrovice, Kleinhadersdorf and Nitra as well as Schwetzingen, cremations are scarce to absent, while they predominated in sites such as Stephansposching and Kralický háj. Approximately a third of the preserved burials at Aiterhofen-Ödmühle represented cremations, potentially due to chronological reasons (further discussed below). Naturally, as

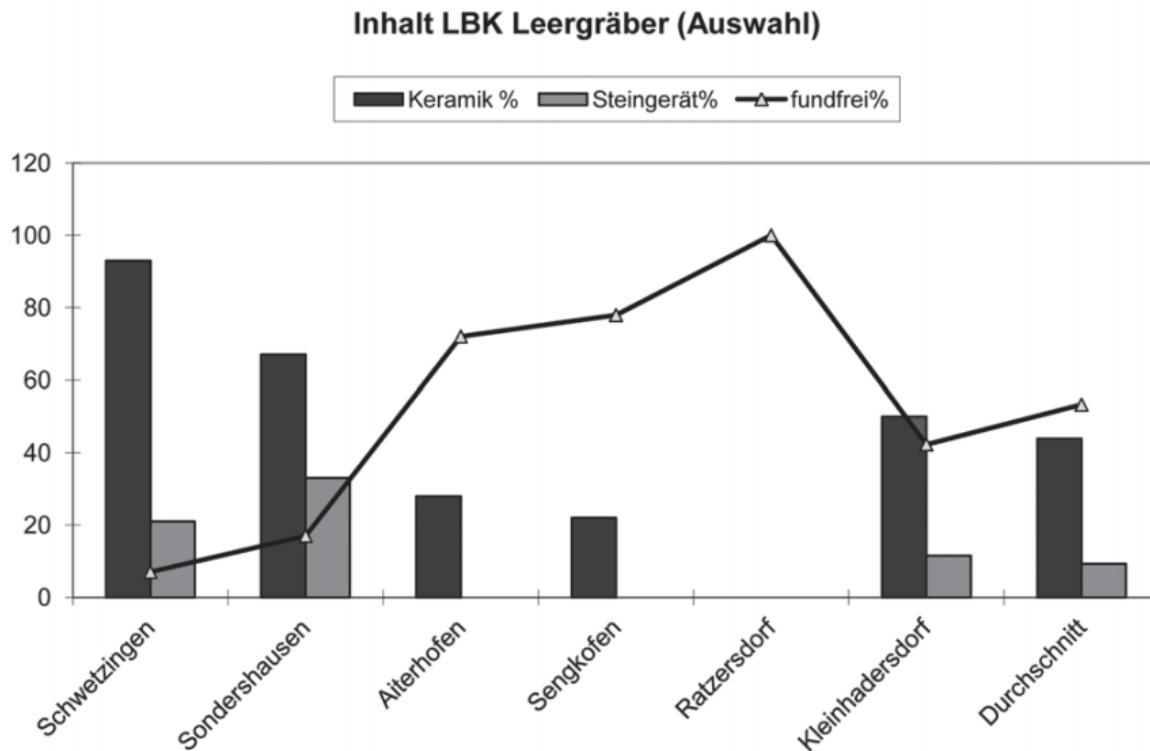


Figure 60: Distribution of finds in empty graves. „Keramik“ = ceramic; „Steingerät“ = stone tool; „fundfrei“ = unfurnished (LENNEIS 2015f, 75, Abb. 27).

the bodies were burnt, age and sex determinations are missing for the most part, although the higher frequency of polished stones in cremations at Aiterhofen-Ödmühle indicates a predominating presence of men, with half of the furnished ones being restricted to adzes as the only gift. However, this find situation could have also reflected the symbolic connection between the adzes used for processing the wood, which was needed for the cremation, and the following burning of the body. Burials with the remains of more than one burned deceased have been suspected for Aiterhofen-Ödmühle, although this could not be confirmed with certainty.

Empty graves are the third largest class of burial-pits and appeared in almost every larger cemetery included in this study, calling further attention to the multi-ritual nature and thus complexity of Early Neolithic funerary rites. Not every empty pit could be regarded as a grave with certainty, as gifts and skeletal remains were often lacking. The absence of personal ornaments points to the wrapping of the deceased and their removal shortly after the primary burial, as the winding sheets must have left evidence in the soil otherwise. At Aiterhofen-Ödmühle, 36 empty pits (13.6% of burials) have been mentioned and are shown on the site maps, but unfortunately had to be excluded from the quantitative evaluations due to them

being missing in the feature catalogue. Nevertheless, it should be mentioned that empty graves with ceramic furnishings were assembled at the southern edge of the site. Nitra contained only one empty pit (10), which had complete vessels. At Kleinhadersdorf, 26 of the 35 pits with few or without human remains were described as empty graves, which is an unusually high number (29%).⁵²⁶ Their main orientations were SE-NW or NW-SE, similar to inhumations, although the amount of those two alignments combined was higher within the latter. These pits were scattered throughout the cemetery, although they predominated in the southernmost zone, which was associated with the chronologically latest stages of the site. Schwetzingen contained 15 empty pits (6.9%), of which most had ceramic, two graves contained chert artefacts and one even a disc mace. This is unusual, as empty graves generally seem to receive few gifts if any at all (Fig. 60). Most interestingly, two groups of empty pits divided several clusters of inhumations at this site. Another 12 empty graves (12.5%) at Vedrovice “Siroká u lesa” existed due to the human remains having been excavated already in the 19th century.

Pottery in general appears in about a third of all graves included in the Lifeways database and unfragmented or slightly fragmented vessels in approximately 20% of all or respectively 40% of furnished burials.⁵²⁷ Women received whole pots more often than men, but Bickle et al. point out that the associations are much weaker than the ones between men and polished stone and chert tools, arguing that pottery was not a typical female gift per se. Ceramics become more frequent within late infants, with both sexes increasing the amount at middle age stages and then decreasing in old age. Regional difference can be observed in women receiving more pottery than men in the western regions (Haute-Alsace across to Upper Austria), while in Lower Austria, Moravia and Eastern Hungary there is a more equal distribution. The rates for Slovakia are more in favour of men, although these values mostly deviate from the sample of Nitra. Concerning the quantitative evaluations for this study, only the shape and, in a few cases, some other features such as perforations were considered for establishing types and subtypes. Some of these could be assigned to a certain sex or age (e. g. 1a, 2e) or region (2d), although this should be reviewed with caution due to the relatively

⁵²⁶ LENNEIS 2015f.

⁵²⁷ BICKLE, ANDERS 2013, 379.

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Table 9: Changes in grave goods over the lifecourse (all regions). Items in italics decrease in the oldest age class (45 years and older). (BICKLE, ANDERS 2013, 379, Tab. 9.11.).

Frequency of grave goods	Male	Female
Increase with age	Atlantic shell ornaments Firelighting kits Bone tools and toggles Flint tools <i>Pottery</i> <i>Polished stone</i>	Atlantic shell ornaments Ochre and other colours <i>Pottery</i> <i>Polished stone</i> <i>Flint tools</i>
Do not change	<i>Dentalium</i> beads River shell ornaments Stone ornaments	<i>Dentalium</i> beads River shell ornaments Stone ornaments Grinding stones Bone tools and ornaments
Decrease with age	<i>Spondylus</i> ornamentation Shell ornamentation (overall) Ochre Grinding stones	<i>Spondylus</i> ornamentation Shell ornamentation (overall)

small sample of most variants. The most obvious correspondence to these factors showed miniature vessels, with an almost exclusive distribution of the 30 examples to either early adult to senile woman and infants. Three of them were perforated and globular shaped and contributed to Rutzing, Aiterhofen-Ödmühle and Schwetzingen with one grave each. There were also a few unique types such as the vessel with a pedestal at Vedrovice “Siroká u lesa” or the Alföld vessels at Nitra, with the latter demonstrating close relations between the Western and Eastern Linear Pottery.

Regional as well as sex and age differences of personal ornament distribution have already been investigated numerous times. Ornaments appear in 10-12% of graves according to the Lifeways database, depending on which boar tusks and animal teeth are counted, and slightly occurs more frequently in female graves than male.⁵²⁸ The small sample of 11 of 67 sexed burials in Slovakia which contained ornamentation showed more men than women. Baden-Württemberg and Basse-Alsace had an extremely low presence of personal ornaments (less than 5% of graves). Concerning age, jewellery does not vary significantly in the supraregional context, although there seems to be a slight decrease with increasing age. In Bavaria, on the other hand, ornaments are primarily distributed to older individuals, mostly men, but also more frequently to women than at other cemeteries. The classifications divide personal ornamentation first by material and then by shape, with spondylus being the most recurring gift, although it becomes very rare at Schwetzingen. Beads appear in high numbers and twice as frequently with women than men in the supraregional context, while pendants are limited

⁵²⁸ BICKLE, ANDERS 2013, 379–380.

to single pieces per grave in Austria, Bohemia and Moravia, with varying sex associations depending on the site. Medallion- and V-shaped belt buckles are typically male or female gifts respectively, while a third category involves hinge-shaped closures found at Vedrovice, Rutzing and Kleinhadersdorf in mostly subadult burials. One has been found at the elbow of an adult woman at “Siroká u lesa” (102), indicating a function other than a belt buckle. Bracelets were primarily gifted to men. Protula and dentalia beads probably acted as a substitute for spondylus due to their similarity and correspond almost exclusively to Bavaria, while other shell ornaments vary depending on the site and include local snails or mussels or imported ones. Some of them could have been linked to Mesolithic contexts, which might also be true for some of the stone jewellery. Limestone, chlorite, nephrite, quartz, and soapstone beads were excavated at Bavaria and marble objects at Vedrovice “Siroká u lesa”. Two unique finds represented the marble belt buckles inside infant graves (78, 84). They looked similar to their medallion-shaped spondylus counterparts and thus could have also acted as substitutes. Much variation also appears within bone or teeth ornaments. The most reoccurring are the typically male – and mostly associated to older individuals – bow-shaped antler buckles of Bavaria and Vedrovice, where bone beads and pendants are similarly distributed. An object made of the long bone of a large mammal lying in the pelvis area of a senile man at Aiterhofen-Ödmühle (50) could have been a buckle or a pendant. Other peculiar finds are the bone plate bracelets (3, 58) and the human-fox-teeth-necklace (40) at Nitra as well as the deer teeth (“*Hirschgrandeln*”) necklace at Rutzing (13). Bone combs restricted to Bavaria might have been tools or ornamentations and most likely were worn as part of a hair style, given that most of them have been found behind the head. Overall, personal ornamentation includes more variation, indicating a sphere where innovation was explored,⁵²⁹ but also signifying the importance of individuality and maybe even fashion and associated social classes reflected through the funerary clothing. Questions remain regarding where ornaments were manufactured. Although spondylus seems to derive from the Mediterranean, the shape of the Linear Pottery jewellery varies widely from the ones at Early Neolithic Greece.⁵³⁰

Stone tools divide between chipped chert and cores, polished adzes or perforated wedges, grinding tools, colouring, pebbles, hammerstones and nodules. Chert appears more frequently

⁵²⁹ BICKLE, ANDERS 2013, 380.

⁵³⁰ VEROPOULIDOU, PAPPA 2011.

in male than female graves, especially with older men. Regional variation is observable within arrowheads, as trapezoidal blade flakes occur commonly in Austria, Bohemia and Moravia and triangular examples in Bavaria and Schwetzingen. The distribution of arrowheads might have had chronological meanings at some sites, as they appeared in the older (or younger?) parts of Aiterhofen-Ödmühle, where spondylus was nearly absent, as well as at Schwetzingen, where they might have been replaced by their bone counterparts at later stages. Trapezoidal flakes were already present in Mesolithic contexts, while a general connection to hunting might be seen through the combination of arrowheads and bone objects or remains.

Polished stones were restricted to male burials with a few exceptions; they increase with age and are seen as markers of high social status. Adzes were used for cutting wood, but experiments have shown different potential meaningful uses depending on the shape and size of the object such as skinning and processing meat.⁵³¹ Similar raw material deposits of Kleinhadersdorf and Vedrovice demonstrate that communities were willing to accept long distance trade to get the best quality amphibolite for manufacturing tools. Traces of wear and tear were common, but occasionally they could have been produced for funerary context explicitly, as was the case at Schwetzingen. At Aiterhofen-Ödmühle, an emphasis on adzes of furnished cremations indicate a higher frequency of men in these graves or maybe a symbolic connection with firewood and processing tools. According to the Lifeways investigations, 45% of burials with chert and 76% of firelighter sets appeared with polished stones.⁵³² Higher and less variable strontium values for adze burials implies an emphasis on subsistence from loess areas and thus an intake of grains from manufactured soils, explainable by heritage of fields and consequently social inequality. Burials with multiple adzes at some sites, especially at Aiterhofen-Ödmühle where one cremation (185) even received four examples, had higher average $\delta^{15}\text{N}$ values with uncertain significance. However, male burials with adzes do not cluster isotopically aside from more diverse strontium values, meaning they did not share similar diets in childhood but rather went variable possible routes, interpreted by Bickle et al. as notions of male identity and their presentation at death reflected through diet and the gifting of polished stones. Chronological meanings had rarely occurring perforated wedges

⁵³¹ MASCLANS, PALOMO, GIBAJA 2017.

⁵³² BICKLE, ANDERS 2013, 368-369, 378-379.

and disc maces, which correspond to later Linear Pottery stages or even Middle Neolithic contexts and transitions.

Grinding stones occur in about 6% of cemetery burials and are equally distributed between both sexes.⁵³³ Kleinhadersdorf stands out by involving high amounts of these tools when compared to other sites. Depending on the material and observable traces of ochre, either grains or raw colouring stones were processed. Colouring varies heavily between the region in shape and material. Powdered red chalk appeared frequently at Vedrovice (29%), in moderate amounts at Kleinhadersdorf (ca. 8%) and occasionally at Aiterhofen-Ödmühle (ca. 4% if excluding the empty pits) and was scarce at Nitra and Schwetzingen. It was mostly spread around the head, but sometimes also around other body parts. Grave 106 at Schwetzingen contained some lumps of red ochre. A storage vessel at Essenbach-Ammerbreite (2) included 150g of undetermined red earth. Black colour in the shape of raw or processed graphite was mostly associated with Aiterhofen-Ödmühle and other Bavarian sites, while manganese was gifted to two burials in Schwetzingen (131, 170) and another one in Dillingen (6).

Hammerstones were located at Kleinhadersdorf, Aiterhofen-Ödmühle and Vedrovice and are determined by abrasion marks and occasional traces of red colour. While the high number of unsexed individuals at Kleinhadersdorf and Aiterhofen-Ödmühle prevents revelations about sex and age, the small sample at Vedrovice leans towards senile women, but not exclusively either. Pebbles are stones that lack abrasion marks or showed ones which could have had natural causes. Their (symbolic) function is unknown and they are mixed between both sexes. Pyrite nodules belong to male adult or mature graves in Bavaria and could have been parts of firelighter sets. It can be mistaken for red chalk powder as pyrite tends to deteriorate into red coloured goethite or oxidizes into limonite. A limonite stone with the imprint of a Lias Ammonite at Essenbach-Ammerbreite (12) is unmatched across the Linear Pottery culture. Its symbolic meaning is unknown, although it could have been owned by the deceased or represents a present from a friend or family, thus showing individual preferences to play a role in Linear Pottery rites.

Bone tools and remains in general appeared more often in male than female graves. Nieszery suggested the function of points manufactured of metapodia, long bones and other body parts to be lighters (*Zunderstoche*) and thus parts of firelighter sets. Alternatively, sharp variants

⁵³³ BICKLE, ANDERS 2013, 379.

are suitable for ceramics production and smaller points might have been projectiles. Triangular bone arrowheads were restricted to Schwetzingen and one example each to Sengkofen and Vedrovice “Siroká u lesa”. At the former, and as previously noted, they might have replaced chert projectiles at later chronological stages. Animal bone remains derive from different species such as cow, pig and goat-sheep, and have been interpreted as leftovers from the funeral feast or meat offerings. The high number of unsexed graves at Kleinhadersdorf prevents sex associations, while the small sample of sexed graves at Aiterhofen-Ödmühle shows a tendency towards men. Unusual finds are the radial bone of a bog dog (113) and three fox mandibles (18, 102, 141) gifted to late adult to senile men at Aiterhofen-Ödmühle, a wild boar bone “lamella” accompanying an early adult man with microlithic projectiles at “Siroká u lesa” (79), and the fragment of a rabbit tibia given to an early infant at Kleinhadersdorf (Verf. 22). The small size of the latter might be connected to the young age of the deceased. Human teeth possibly intended as a grave good, other than the ones included in the necklace of grave 19 at Nitra, were discovered at Aiterhofen-Ödmühle (33, 65, 100, 115) often around the head and at Essenbach-Ammerbreite (2) inside a storage vessel.

The GoogleMapper function of the Montelius database allowed the creation of a supra-regional distribution map of Linear Pottery cemeteries. According to the current state of research, they seemed to be limited to valleys and riverscapes, seemingly following a certain route for the most part despite settlements appearing outside these paths, while some were located on the northern edge of the Early Neolithic on the “border” to Mesolithic territory.⁵³⁴ Gaps in these routes exist along the Danube, the Rhine, around the Bohemian Massif and France, pointing to areas for new potential sites. This find, if the situation is not just reflecting a lack of research, can be explained by cemeteries marking the main routes of Early Neolithic expansion, communication routes as well as their territory, while also being central meeting points for funerary events where more than one community might be involved. In a period of growing tension in later chronological stages such events could have been important for renewing the social binding of different villages and would fit previous interpretations of spatial clusters at grave fields reflecting multiple communities.

The Lower Austrian cemetery Kleinhadersdorf stands out with an abundance of subadults and grinding tools as well as the extensive furnishings of children in addition to the previously

⁵³⁴ STADLER 2019b, 434.

mentioned unique grave goods. Connections to Vedrovice are observable through the same raw material deposits of stone tools and Želiezovce and Šárka pottery, and of course burial pit orientation. An Analysis N Next Neighbours was already carried out by Peter Stadler in 2015 with a very similar outcome to the ones performed for this study.⁵³⁵ The recommended cluster show men, women and children with no groups excluded within the north-western and central group, with grave-rites such as crouch intensity and orientation being more homogenous in the former. Both include north-oriented children as well as small assemblages where either men or women dominate. Further differentiation of the central group, which includes the most varied furnishings and almost all spondylus objects, indicate hierarchical structure within the same clan or family. The only two individuals gifted with spondylus outside these clusters, both female, are statistical outliers according to strontium isotope values. According to the radiocarbon dating, one of these represent the earliest, the other one of the latest burials according to the radiocarbon data. The southern cluster mainly consisted of empty graves and was first used in the third occupation phase IIb/c according to the Moravian chronology, while the centre and north were earlier. Isotope investigations indicate that the community lived and sourced their food in close proximity and had a low mobility when compared to other sites. Some men in the centre might have had an unusual low-meat diet as signified by low $\delta^{15}\text{N}$ -values. Other deviations include a vegetarian woman (Verf. 5), an early adult female (Verf. 32) possibly originating from Moravia or Bohemia due to Šárka Style vessels and strontium information, and the well-furnished and atypically positioned elder woman (Verf. 32) who might have been one of the founding members of Kleinhadersdorf, being one of the earliest dated graves. Overall, Kleinhadersdorf seems relatively uniform in its isotopes with some variation, while spatial structuring allows for social differentiation. Intercommunal relations most likely occurred significantly closer to Vedrovice than the more uniform Nitra and the Bavarian and Baden-Württemberg sites.

Pit orientation and burial position mark Nitra as the most uniform larger cemetery excavated, with the absence of some grave good types and their relatively low number contrasting the find situation of other sites, while the SE-alignments follow the traditions of the south-eastern Linear Pottery distribution area. Two Alföld-styled vessels reveal links to Hungary. Older men and a few women and subadults received the most extensive grave good assemblages,

⁵³⁵ NEUGEBAUER-MARESCH, LENNEIS 2015a, 194–195.

although these are not as “rich” as furnishings of other grave fields and appeared in less quantities. Pavúk’s interpretation of well-equipped burials being earlier due to burial intercutting and some additional factors contrasts with the explanation by Whittle et al. that high carbon values of spondylus graves might have been connected to more open landscapes in later stages.⁵³⁶ Isotope values and osteological analyses suggest more animal protein for men and more varied and starchy diets for women, indicating patrilocality, which was also suggested for other sites. The close clustering of most graves aggravates the determination of specific spatial funerary orders, although intercutting and certain differences in trait distribution and occupation density make some differentiations observable. Considering the recommended clusters and alternative possibilities of row-shaped orders, as well as the family binding of the triple burial 48-50, while other groups were likely based on social status and not necessarily blood relation, the general funerary rites at Nitra might have been far more flexible than the uniformity of the cemetery initially implied.

Vedrovice “Siroká u lesa” was one of the earliest cemeteries according to radiocarbon data and follows Kleinhadersdorf and Nitra in grave-pit orientation, but is less uniform than the latter and shares similarities to the former through microlithic trapezes and the same raw stone deposits, with the Moravian Linear Pottery allowing further connections to both sites. It also had unique finds such as marble objects and a high amount of red ochre and spondylus as well as more frequent well-furnished graves for younger individuals in addition to the usual old men. Spatial patterns as recommended by Zvelebil and Pettitt showed groups with at least one rich grave and thus equal access to valued items across the site.⁵³⁷ They also suggested a matrilineal north-western group within a patrilineal community due to two rich females gifted with spondylus near poor male graves, although this might be overexaggerated as women relatively often received personal ornamentation at Vedrovice in general.⁵³⁸ Neither these spatial groups nor rows were identified isotopically, although the deceased in different areas had varied diets, and more closely clustering individuals shared similar diets. Different mobility patterns in terms of sex suggest virilocality or patrilocality. The groups as proposed in these clusters are partially similar to the ones suggested by Zvelebil and Pettitt but differ in a few regards, including the favouring of small kinship groupings instead of large household

⁵³⁶ PAVÚK 1972, 72. – WHITTLE et al. 2013, 154.

⁵³⁷ ZVELEBIL, PETTITT 2008, 204–205.

⁵³⁸ WHITTLE et al. 2013, 127.

conglomerations with isolated parings outside these clusters. Zones reserved or almost restricted to specific traits, such as female or subadults, as well as atypical and still well-furnished burials indicate flexible rites or preferences shaped by lifeways, intercommunal relations and maybe events leading to the death, adding to previous interpretations of complex relations between inherited status and a network of contacts rather than symbolising fixed identities.

Aiterhofen-Ödmühle follows different traditions than the south-eastern region and Baden-Württemberg as demonstrated by east-determined pit-alignments and characteristic Bavarian grave goods such as bone combs. Other peculiarities are the high number of cremations in the northern half and of burials with multiple adzes – including some perforated wedges –, with one cremation burial (185) even containing four examples. Old men and a few women received the most complex furnishings, indicating sex- and age-based hierarchy, while there were also some unusual find situations such as the neighbouring female graves (158, 159) with typical “male” grave goods. Generally, the site shows spatial patterns in the shape of a spondylus-heavy southern third, where the majority of extensive assemblages are also located, and a less-equipped north, where most of the cremations occurred. Gaps divide Aiterhofen-Ödmühle into different zones, although erosion probably heavily distorted the picture in the south.⁵³⁹ Isotope investigations further highlight these differences, with varied carbon values in the north and more similar ones in the south. Men are divided into two arrays, with one showing a higher strontium ratio from childhood diets, while indifferent value with no overall patterning for women suggest several food sources at childhood, implying that they migrated to Aiterhofen in adult age stages.⁵⁴⁰ These aspects, the lack of radiocarbon data, and the fact that various pottery investigations came to different conclusions regarding the relative chronology make the dating of the site complicated.⁵⁴¹ The seriation of grave goods and burial type dates the spondylus (among others) in the south to the early phase and triangular arrowheads along with perforated wedges to the later phases, which fits initial interpretations and the conclusion that cremations were younger. Hofmann et al., on the other hand, suggest a progressive opening of the landscape from south to north, or alternatively, that different dietary strategies and grave good preferences co-existed already

⁵³⁹ NIESZERY 1995, 61.

⁵⁴⁰ ZVELEBIL, PETTITT 2008. – HOFMANN et al. 2013, 239.

⁵⁴¹ NIESZERY 1995, 131–138. – PECHTL 2009, 94. – HOFMANN et al. 2013, 219–220.

from the beginning.⁵⁴² The clusters recommended in this thesis unite parts of the central zone and the south, which were probably connected pre-erosion, and thus extended the southern area. Nieszery defined these burials as “elite” kinships which most likely founded the community, with some differentiation and hierarchy implied by the “poorly” furnished subgroup A3 or the different values within A2.⁵⁴³ The north is characterised by the cremation-dominated centre D and the neighbouring groups E in the north and B/C in the east. B/C share a relative absence of subadults and cremations as well as other traits, while B contained some graves with spondylus and extensive furnishings more typical for A. This could be seen as an indicator of an east-west progression in the northern two thirds, assuming that D represents a developing increase of cremations to the west. However, the northernmost group E again contains more inhumations, which could be explained by the clusters at least partially reflecting spots reserved for different communities, or a return to body graves in later stages. Some traits overlap between different zones. In conclusion, the interpretation of the chronological development and funerary order at Aiterhofen-Ödmühle unfortunately still remains problematic but could be facilitated with radiocarbon and genetic data, which is long overdue.

Schwetzingen significantly differs from the other sites selected for this study due to the two main directions NE-SW and SW-NE as well as the almost absence of spondylus and powdered ochre – which puts it into tradition II according to Jeunesse – and a high amount of triangular bone arrowheads.⁵⁴⁴ Pottery and polished stones were at least partially specifically produced for mortuary rites as suggested by their poor quality and their lack of wear and tear.⁵⁴⁵ These deviations probably link to the development of the La Hoguette culture and its involvement in Schwetzingen traditions.⁵⁴⁶ Older men received the majority of extensive grave good assemblages, although even those did not reach the same complexity of “rich” furnishings of other cemeteries. The relative chronology of the Pfalz-styled vessels showed parts of the centre and the north-western area to be chronologically early, while towards the south the burials become younger.⁵⁴⁷ Some late dating graves in older zones indicate an occasional

⁵⁴² HOFMANN et al. 2013, 239.

⁵⁴³ NIESZERY 1995, 212.

⁵⁴⁴ JEUNESSE 1997.

⁵⁴⁵ GERLING 2012. – BENTLEY et al. 2013, 277.

⁵⁴⁶ BENTLEY et al. 2013, 288.

⁵⁴⁷ GERLING 2012, 117.

return to those spots. The Analysis N Next Neighbours revealed some interesting patterns, the most obvious being of course the distribution of the well-equipped graves mostly to the northwest. Subadults appear more frequently in the other areas and especially often towards the southernmost corner. Triangular bone points increase in chronologically later stages and might have replaced their chert counterparts. Empty graves, rows of unfurnished graves, changing occupation density and significant similarities and contrasts in trait distribution between zones enable the establishment of numerous spatial groups, of which some allow further inner differentiation. Isotope analyses suggests two different patterns related to varied diets, suggesting varied exploitations of the landscapes.⁵⁴⁸ Both sexes were equally distributed into both arrays, and while strontium was more diverse with women – again in favour of patrilocality –, this potentially represents two different communities rather than just varied diets. Outside of the usual isotope differences with men buried with adzes, correlations between isotopes and funerary contexts are lacking. This situation, combined with the complexity and variation of and within the spatial clusters as well as the varied mobility, speak against a rigid reflection of identities, simple kinship groups or just chronological development, but rather for far more nuanced and complex mortuary rites.

The complete data set of grave goods was evaluated through applying a correspondence analysis and a seriation, with the former pronouncing regional differences, peculiarities and similarities, while the seriation unfortunately provided a negative outcome for several potential reasons. This concerns the final research issues of this study, regarding the efficiency of the applied method, the information value of the gathered data and the meaningfulness of a sequel. Both seriation and correspondence should be seen as preliminary results, as they include only grave good data within sites limited to a few Linear Pottery distribution regions. For better results, the data would have to be extended by the data of the remaining sites, and other variants of the reciprocal averaging could be included (e. g. sex-age-gift analysis), which would have gone beyond the scope of this master's thesis. The Analysis N Next Neighbours and trait distribution in general, on the other hand, allow detailed insights into the complex nature of Early Neolithic funerary rites, which could also be supplemented by further data such as isotope values, pottery ornamentation elements, or injuries and diseases. Consequently, the classifications as established for this study should then be revisited and

⁵⁴⁸ BENTLEY et al. 2013, 286–288.

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improved if necessary, by using the dynamic typology approach of the MonteliusEditor function. In conclusion, the methods and typologies applied in this study already provide meaningful information but should be extended by using the complete supraregional dataset and other categories of data. A sequel seems thus necessary to reach the full potential of Montelius and WinSerion and uncover further mortuary patterns.

5.2. Zusammenfassung

Diese Studie stellt die Ergebnisse verschiedener Untersuchungen vor, welche mit Hilfe der Bilddatenbank Montelius und der Software für quantitative Auswertungen WinSerion durchgeführt wurden. Die erforderlichen Daten stammen von verschiedenen Gräberfeldern in Österreich, Böhmen, Mähren und Süddeutschland. Die für diese Thesis erstellten Typologien umfassen anthropologische Informationen, Bestattungsriten, Grubenorientierung, Todesgestus sowie die Präsenz und Verteilung der Grabbeigaben, und wurden einbezogen für Fragen über soziale Strukturen auf lokaler, regionaler und überregionaler Ebene, wobei die Ergebnisse früherer Forschungen berücksichtigt und infolgedessen erweitert wurden.

Obwohl gewisse einheitliche Leitwerte bzw. -riten auf linearbandkeramischen Gräberfeldern beobachtbar sind, können auch regionale und lokale Unterschiede in Behandlung und Ausstattung des Leichnams festgestellt werden. Die Hauptausrichtung der Grabgruben ist regional geprägt. In Kleinhadersdorf, Vedrovice und Nitra war sie SO-NW, während in Bayern die O-W-Orientierung am zahlreichsten auftrat. Für Schwetzingen konnte mit SE-NW und der antipodischen NW-SE sogar zwei Hauptorientierungen festgestellt werden. NW-SE war auch die zweithäufigste Ausrichtung in Kleinhadersdorf (19%), wobei Aiterhofen-Ödmühle sowie Nitra und Vedrovice weitaus weniger häufig abweichende Orientierungen enthielten. Für derartige Bevorzugungen gibt es nach wie vor keine eindeutigen Erklärungen, obwohl sie mit spezifischen geographischen Markierungen oder Ereignissen wie Tagesanbruch oder Sonnenwende in Verbindung gebracht werden könnten, wie etwa für "Siroká u lesa" empfohlen.⁵⁴⁹ Wie bereits im Rahmen des Lifeways-Projekts festgestellt, weichen in Regionen mit nach Osten ausgerichteten Hauptorientierungen (Hessen, Südbayern, Pfalz, Niedersachsen) nur wenige Bestattungen von den dominanten oder antipodischen Mustern ab (weniger als 1%, während die dominanten Orientierungen 70% stellen).⁵⁵⁰ Mehr Variation besteht in Mähren, Niederösterreich und im Unter-Elsaß, wobei etwa 10% der Bestattungen in die beiden dominierenden Orientierungen fielen. Fundorte mit vorherrschender NE- oder NW-Ausrichtung (Baden-Württemberg, Thüringen und Oberösterreich) enthielten etwa 20% der Bestattungen außerhalb der Hauptorientierung und gleichmäßiger verteilte

⁵⁴⁹ RAJCHL 2002.

⁵⁵⁰ BICKLE, ANDERS 2013, 376–377.

Nebenausrichtungen. In dem von der Westorientierung dominierten Sachsen-Anhalt und in Ober-Elsaß, wo Nord-, Nordost- und Ostausrichtung vorherrschten, lagen nur 5% der Bestattungen antipodisch. Derartige häufige sekundäre Orientierungen fehlten sowohl in der Westslowakei wie auch in Ungarn. Die Lifeways-Untersuchungen stellten eine Variation in Verbindung mit den Sterbealter fest, da Kinder in der Phase „Infans II“ (7-13 Jahre) eher antipodisch bestattet wurden (dominante Orientierung: 112 Bestattungen; sekundäre Ausrichtung: 143), während im Durchschnitt zwei Drittel jeder Altersgruppe der dominanten und ein Drittel der sekundären Kategorie entsprechen. Dies trifft allerdings nicht auf Siedlungsbestattung zu, bei denen Infans-II-Individuen häufiger auftraten sowie Variation in der Ausrichtung der Gruben bedeutender war (dominante Orientierung: 62 Bestattungen oder 40%; sekundäre Ausrichtung: 92 oder 60%). Eine Verbindung zwischen Herkunft oder Lebensweise und Bestattungsausrichtung gelten daher als unwahrscheinlich.

Der typisch linearbandkeramische Totengestus war der Linkshocker und die Hände zum Kopf gerichtet, als ob der Verstorbene schläft, wobei die Intensität der Hockung variiert, was darauf hindeutet, dass die Leichen in irgendeiner Weise umhüllt oder nicht umhüllt gewesen sein könnten. Abweichende Rechtshocker und vielfältige Arten von Armgesten deuten soziale Differenzierung an. Letztere treten oftmals gemeinsam mit Rückenlagen oder anderen ungewöhnlichen Merkmalen auf, manchmal mit potenziellen Verbindungen zu Geschlecht, mit einer Tendenz zu älteren Individuen (aber nicht ausschließlich). Ein ungewöhnlicher Totengestus kann auch Blutsverwandtschaft kennzeichnen, z. B. Grab 48-50 von Vedrovice „Siroká u Lesa“, das eine Familie bestehend aus einer Frau und zwei Kinder enthielt. Eine moderate bis reiche Ausstattung mancher „abweichender“ Todesgesten unterstreicht ihren besonderen Charakter. Auch hier gibt es regionale Unterschiede. Der hohe Anteil von Rechtshockern in Rutzing in Oberösterreich ist auf die geringe Anzahl von Gräbern zurückzuführen, die möglicherweise nicht repräsentativ für den gesamten Friedhof ist (und die für die hohen Werte für Oberösterreich in Tab. 8 verantwortlich ist). Nitra war besonders einheitlich, und divergierende Merkmale scheinen in Baden-Württemberg und Frankreich im Allgemeinen bedeutender zu sein als im Osten (Tab. 8). Laut Bickle et al. erhielten Rechtshocker generell weniger oft Grabbeigaben (59% mit Beigaben im Vergleich zu 72% der Linkshocker) sowie 10% weniger Keramik und 5% weniger Schmuck, wobei dies nicht auf

geschliffene Steingeräte und Hornsteinwerkzeuge zutrifft.⁵⁵¹ Die Lifeways-Datenbank zeigt auch eine höhere Häufigkeit von mit Beigaben ausgestatteten Rückenlagen (60% der Frauengräber, 85% der Männergräber) und einen 10% höheren Anteil von geschliffenen Stein- und Hornsteingeräten sowie 3% mehr Mahlsteine bzw. Unterlieger, obwohl diese Werte von der hohen Anzahl gut ausgestatteter Rückenlagen im Unter-Elsaß beeinflusst sind. Dieses Muster könnte durch den regionalen Übergang zum mittleren Neolithikum erklärt werden, da in dieser Periode im Unter-Elsaß die Zahl der Rückenbestattungen zunimmt und die Beigabenausstattung Veränderungen unterworfen wird.⁵⁵² Diese Studie folgt der daraus abgeleiteten Interpretation eines beobachtbaren Ausdrucks von Gemeinschaftszusammenhalts durch Orientierungsmuster und Todesgesten, welche durchaus schlüssig wirkt.⁵⁵³ Demnach stellen die Hauptorientierungen relativ einheitlicher Fundorte reglementierte Bestattungsrituale dar, während die signifikanteren Variationen in Baden-Württemberg und im Unter-Elsaß lokale gemeinschaftliche Strukturen widerspiegeln. Des Weiteren argumentieren Bickle et al. für eine Beeinflussung von Unterschieden zwischen Gräberfeldern und Siedlungen durch solche kommunale Ordnungen bzw. durch den spezifischen Kontext der Bestattungen. Mesolithische Einflüsse sind auch vorstellbar, da Rückenbestattungen möglicherweise in Jäger- und Sammler-Traditionen wurzeln.

Obwohl Brandbestattungen weitaus weniger zahlreich waren als Körpergräber, kamen sie je nach Region und Ort immer noch in beträchtlicher Zahl vor und spielten daher eine wichtige Rolle in den linearbandkeramischen Bestattungssitten. Desweiteren spiegelten sie möglicherweise einen Wandel der frühneolithischen Vorstellungen vom Leben nach dem Tod wider. In Vedrovice, Kleinhadersdorf und Nitra sowie in Schwetzingen traten Kremationen selten bis gar nicht auf, während sie an Fundorten wie Stephansposching und Kralický háj dominierten. Etwa ein Drittel der erhaltenen Bestattungen in Aiterhofen-Ödmühle waren Brandgräber, möglicherweise aus chronologischen Gründen (weiter unten besprochen). Die Verbrennung der Leichen erschwert die Alters- und Geschlechtsbestimmungen gravierend, obwohl der hohe Anteil von geschliffenen Steinen bei den Brandbestattungen in Aiterhofen-Ödmühle auf eine vorherrschende Präsenz von Männern hinweist, wobei die Hälfte der mit Beigaben versehenen Kremationen Dechseln oder durchlochte Beile als einzige Ausstattung

⁵⁵¹ BICKLE, ANDERS 2013, 377.

⁵⁵² JEUNESSE 1997, 67. – BICKLE, ANDERS 2013, 377.

⁵⁵³ BICKLE, ANDERS 2013, 377.

enthielten. Alternativ könnte auch ein symbolischer Zusammenhang zwischen der Bearbeitung des für die Bestattung benötigte Holz durch Dechseln und der Verbrennung des Leichnams bestehen. Einige Brandbestattungen von Aiterhofen-Ödmühle enthielten vermutlich die Überreste von zwei Individuen, dies konnte allerdings nicht mit Sicherheit bestätigt werden.

Leergräber sind die drittgrößte Klasse von Bestattungsgruben und traten auf beinahe allen größeren Gräberfeldern auf, deren Daten in dieser Studie ausgewertet wurden, und unterstreichen die Mehrritualität und somit Komplexität der frühneolithischen Bestattungsriten. Nicht jede leere Grube konnte mit Sicherheit als Grab bestimmt werden, da Beigaben und Skelettüberreste des Öfteren fehlten. Die Abwesenheit von Schmuck deutet auf die Umhüllung des Verstorbenen und Entfernung kurz nach der Primärbestattung hin, da die erforderlichen Decken längere Zeit im Boden nicht überstanden hätten. In Aiterhofen-Ödmühle wurden 36 leere Gruben (13,6% der Bestattungen) erwähnt und auf der Karte des Fundortes eingezeichnet, mussten aber leider aufgrund fehlender Angaben im Befundkatalog von den quantitativen Auswertungen ausgeschlossen werden. Dennoch sollte erwähnt werden, dass sich die Leergräber mit keramischer Ausstattung am südlichen Rand des Gräberfelds befanden. In Nitra gab es nur eine leere Grube (10), die ein vollständig erhaltenes Gefäß enthielt. In Kleinhadersdorf wurden 26 der 35 Gruben mit wenigen oder ohne menschliche Überreste als Leergräber bezeichnet, was eine ungewöhnlich hohe Zahl (29%) darstellt.⁵⁵⁴ Ihre Hauptausrichtung war, ähnlich wie bei den Körpergräbern, SO-NW oder NW-SO, obwohl der Anteil dieser beiden Ausrichtungen zusammengenommen innerhalb der Körpergräber höher war. Diese Gruben waren über das gesamte Gräberfeld verstreut, wobei sie die südlichste Zone dominierten, welche mit der chronologisch jüngsten Phase von Kleinhadersdorf in Verbindung gebracht wird. Schwetzingen enthielt 15 leere Gruben (6.9%), von denen die meisten mit Keramik, zwei mit Hornstein und eine sogar mit einer Scheibenkeule ausgestattet waren. Dies ist ungewöhnlich, da Leergräber im Allgemeinen wenig oder gar keine Beigaben erhielten (Abb. 59). Interessanterweise bildeten in Schwetzingen zwei Cluster von nebeneinander liegenden Leergräbern eine Grenze bzw. einen Übergang zwischen Gruppen von Körpergräbern. Weitere 12 leere Gruben (12.5%) in

⁵⁵⁴ LENNEIS 2015f.

Vedrovice "Siroká u lesa" existierten wohl aufgrund der Entfernung des Inhalts in Folge von Ausgrabungen im 19. Jahrhundert.

Etwa ein Drittel aller Gräber, welche in der Lifeways-Datenbank erfasst sind, enthielten Keramik, wobei unfragmentierte oder leicht fragmentierte Gefäße in etwa 20% aller Bestattungen bzw. 40% der mit Beigaben ausgestatteten Gräber auftraten.⁵⁵⁵ Frauen erhielten öfter ganze Gefäße als Männer, allerdings wiesen Bickle et al. darauf hin, dass die Assoziationen viel schwächer sind als die zwischen Männern und geschliffenen Stein- und Hornsteinwerkzeugen, und bezeichneten Gefäße als eine nicht zwangsläufig typische Frauenbeigabe. Keramik tritt überdurchschnittlich häufig bei Infans-II-Individuen auf, danach folgen beide Geschlechter einem Muster vom Anstieg in mittleren Altersstufen und Rückgang im hohen Alter. In den westlichen Regionen (Ober-Elsaß bis Oberösterreich) sind regionale Unterschiede bei Frauen sichtbar, welche mehr Keramik erhielten als Männer, während in Niederösterreich, Mähren und Ostungarn eine gleichmäßigere Verteilung beobachtbar ist. Der Anteil für die Slowakei liegt eher zugunsten der Männer, wobei diese Werte von der geringen Anzahl von Gräbern bei Nitra stammen. Bei den quantitativen Auswertungen dieser Studie wurden nur die Form und in wenigen Fällen einige andere Merkmale, wie z. B. Durchlochung zur Bestimmung von Typen und Subtypen berücksichtigt. Einige davon konnten einem bestimmten Geschlecht bzw. Alter (z. B. 1a, 2e) oder einer Region (2d) zugeordnet werden, allerdings sollte dies aufgrund der kleinen Anzahl vieler Typen mit Vorsicht betrachtet werden. Die offensichtlichste Übereinstimmung mit anthropologischen Merkmalen zeigten 30 Miniaturgefäße, welche fast ausschließlich Frauen zwischen frühem Erwachsenen- bis senilen Alter sowie Kindern mitgegeben wurden. Drei von ihnen waren perforiert und Kumpf-förmig und traten jeweils einmal in Ruzing, Aiterhofen-Ödmühle und Schwetzingen in Erscheinung. Weitere einzigartige Typen stellten das Gefäß mit Sockel in Vedrovice "Siroká u lesa" und die Alföld-Gefäße in Nitra dar, wobei letztere enge Beziehungen zwischen der westlichen und östlichen Linearbandkeramik implizieren.

Regionale sowie geschlechts- und altersmäßige Unterschiede in der Verteilung von Schmuck bzw. Kleidungsbestandteilen sind hinreichend bekannt. Diese erscheinen in etwa 10-12% der Gräber laut der Lifeways-Datenbank, je nachdem ob Typen wie durchlochte Eberhauer oder Fuchsunterkiefer miteinbezogen werden, und kommen generell in Frauengräbern etwas

⁵⁵⁵ BICKLE, ANDERS 2013, 379.

häufiger als bei Männern vor.⁵⁵⁶ Die kleine Anzahl von 11 von 67 geschlechtsbestimmten Gräbern in der Slowakei, die Ornamente enthielten, enthielt mehr Männer als Frauen. In Baden-Württemberg und im Unter-Elsaß betrug der Anteil von Gräbern mit Kleidungsbestandteilen weniger als 5%. Betreffend des Sterbealters unterschied sich die Schmuckverteilung im überregionalen Kontext nicht wesentlich, obwohl mit zunehmendem Alter ein leichter Rückgang erkennbar ist. In Bayern hingegen wurden Kleidungsbestandteile vor allem an ältere Personen, meist Männer, aber auch häufiger an Frauen verteilt als in anderen Regionen. Typologisch wurde der Schmuck zunächst nach Material und dann nach Form bestimmt, wobei Spondylus die am häufigsten vorkommende Beigabe war, mit Ausnahme von Schwetzingen. Perlen kommen in hoher Zahl und doppelt so häufig bei Frauen wie bei Männern im überregionalen Kontext vor, während Anhänger in Österreich, Böhmen und Mähren sowie ein Stück pro Grab beschränkt sind, mit je nach Fundort unterschiedlichen Geschlechtsassoziationen. Frauen erhielten medaillen-förmige, Männer V-Gürtelschnallen, eine dritte Kategorie umfasst scharnierförmige Verschlüsse, die in Vedrovice, Rutzing und Kleinhadersdorf bei meist subadulten Bestattungen gefunden wurden. Eine lag am Ellbogen einer erwachsenen Frau in "Siroká u lesa" (102) und hatte aus diesem Grund keine Funktion als Gürtelschnalle. Armbänder wurden mehrheitlich Männern mitgegeben. Protula- und Dentalia-Perlen dienten aufgrund ihrer Ähnlichkeit zu Spondylus wahrscheinlich als deren Ersatz und verteilten sich fast ausschließlich in Bayern, während andere Mollusken Spezies je nach Fundort variierten und lokale oder importierte Schnecken oder Muscheln umfassten. Bestimmte Arten sowie ein Teil des Steinschmucks stammen möglicherweise aus mesolithischen Traditionen. Kalkstein, Chlorit, Nephrit, Quarz und Specksteinperlen wurden in Bayern und Marmorobjekte in Vedrovice "Siroká u lesa" ausgegraben. Letzteres Gräberfeld enthielt zwei einzigartige marmorne Gürtelschnallen aus Kindergräbern (78, 84), welche wohl als Ersatz ihrer Spondylus-Gegenstücke gedient haben. Auch innerhalb der Knochen- oder Zahnschmuckstücke gibt es viele Variationen. Am häufigsten kamen die typisch männlichen – und meist mit älteren Individuen assoziierten – bogenförmigen Geweihschnallen von Bayern und Vedrovice vor, wo auch Knochenperlen und -anhänger auftraten. Ein Objekt gefertigt aus dem Langknochen eines großen Säugetiers, welches im Beckenbereich eines senilen Mannes in Aiterhofen-Ödmühle (50) lag, könnte eine Schnalle oder ein Anhänger gewesen sein.

⁵⁵⁶ BICKLE, ANDERS 2013, 379–380.

Weitere eigentümliche Funde sind die Knochenplattenarmbänder (3, 58) und die Mensch-Fuchszahnkette (40) in Nitra sowie die Hirschgrandeln-Halskette in Rutzing (13). Die auf Bayern beschränkten Knochenkämme könnten Werkzeuge oder Ornamente gewesen sein und wurden höchstwahrscheinlich als Teil einer Steckfrisur getragen, da die meisten von ihnen hinter dem Kopf lagen. Die Vielfalt innerhalb der Kleidungsbestandteile deuten darauf hin, dass in diesem Bereich mehr Innovation stattfand und experimentiert wurde im Vergleich zu anderen Typen,⁵⁵⁷ und impliziert die Bedeutung von Individualität und Mode und der damit verbundenen sozialen Schichten, sichtbar an der Totentracht. Die Frage bleibt offen, wo die Herstellungszentren des Schmucks lagen. Obwohl Spondylus aus dem Mittelmeerraum zu stammen scheint, unterscheidet sich die Form der linearbandkeramischen Typen stark von denen des frühneolithischen Griechenlands.⁵⁵⁸

Die Steinwerkzeuge teilen sich in Klingen, Mikrolithe und Nuclei aus Hornstein, geschliffene Dechseln oder durchlochte Beile, Mahlwerkzeuge, Farbsteine und -pulver, Kieselsteine, Hammersteine und Knollen auf. Hornstein kommt in Männergräbern häufiger vor als in Frauengräbern, vor allem bei älteren Männern. Innerhalb der Pfeilspitzen sind regionale Unterschiede zu beobachten, da trapezoide Klingenabschläge in Österreich, Böhmen und Mähren und dreieckige Exemplare in Bayern und Schwetzingen häufig vorkamen. Eine chronologische Bedeutung der Verteilung von Pfeilspitzen wird für Aiterhofen-Ödmühle, wo diese in den älteren (oder jüngeren) sowie spondylus-armen Arealen auftrat, sowie für Schwetzingen vermutet, wo sie in den vermutlich späteren Phasen von ihren knöchernen Gegenständen ersetzt wurden. Trapezförmige Abschläge bzw. Pfeilspitzen waren bereits in mesolithischen Kontexten vorhanden, während die Kombination von Pfeilspitzen und Knochenobjekten oder -resten in manchen Gräbern eine generelle Verbindung zur Jagd andeutet.

Geschliffene Steine waren bis auf wenige Ausnahmen auf männliche Bestattungen beschränkt, wurden mit ansteigendem Alter häufiger und gelten als Kennzeichen für einen hohen sozialen Rang. Dechseln wurden wahrscheinlich zum Verarbeiten von Holz verwendet, wobei Experimente unterschiedliche sinnvolle Verwendungsmöglichkeiten je nach Form und Größe des Werkzeugs zeigen, wie z. B. das Häuten und die Verarbeitung von Fleisch.⁵⁵⁹ Die

⁵⁵⁷ BICKLE, ANDERS 2013, 380.

⁵⁵⁸ VEROPOULIDOU, PAPPA 2011.

⁵⁵⁹ MASCLANS, PALOMO, GIBAJA 2017.

Inanspruchnahme der gleichen Rohstoffvorkommen für Kleinhadersdorf und Vedrovice beweisen, dass die linearbandkeramischen Gemeinschaften weite Handelswege in Kauf nahmen, um Amphibolit der besten Qualität für die Herstellung von geschliffenen Steinwerkzeugen zur Verfügung zu haben. Diese weisen häufig Abnutzungsspuren auf, allerdings weniger oft in Schwetzungen, was eine Herstellung für den Bestattungskontext impliziert. Brandspuren auf Dechseln in Brandbestattungen in Aiterhofen-Ödmühle sprechen für die gleichzeitige Verbrennung von Mensch und Werkzeug, wobei das häufige Auftreten in Kremationen möglicherweise eine erhöhte Präsenz von Männern in diesen Gräbern oder auch eine symbolische Verbindung von Brennholz und Verarbeitungswerkzeug bedeuten. Laut den Untersuchungen des Lifeways-Projekts enthielten 45% der Bestattungen mit Hornsteingeräten sowie 76% mit Feuerzeug-Bestandteilen geschliffene Steinwerkzeuge.⁵⁶⁰ Höhere und weniger variable Strontium-Isotopenwerte bei den Dechsel-Bestattungen können mit einer Ernährung mit Fokus auf Getreide aus bearbeiteten Böden erklärt werden, welche eine Vererbung von Getreidefeldern und folglich soziale Ungleichheit andeuten. Bestattungen mit mehreren geschliffenen Steinwerkzeugen, insbesondere in Aiterhofen-Ödmühle, wo eine Brandbestattung (185) sogar vier Exemplare enthielt, wiesen höhere $\delta^{15}\text{N}$ -Werte mit ungewisser Bedeutung auf. Männliche Bestattungen mit Dechseln korrespondieren jedoch nicht isotopisch, abgesehen von vielfältigeren Strontiumwerten, d.h. sie ernährten sich in der Kindheit unterschiedlich und folgten mehreren möglichen Lebenswegen. Bickle et al. interpretierten dies als frühneolithische Vorstellungen von männlicher Identität und deren Darstellung beim Tod, welche sich in der Ernährung und der Beigabe von Dechseln widerspiegelt. Das Auftreten von durchlochtem Beilen und Scheibenkeulen unterstreichen chronologische Entwicklungen, da sie erst in späteren Stufen der Linearbandkeramik oder sogar mittelneolithischen Kontexten bzw. Übergängen zu diesen auftraten.

Mahlsteine und Unterlieger befanden sich in etwa 6% der Gräberfeld-Bestattungen und waren zwischen beiden Geschlechtern ähnlich verteilt.⁵⁶¹ Kleinhadersdorf wies eine ungewöhnlich hohe Menge dieser Geräte im Vergleich zu anderen Fundorten auf. Diese wurden nicht nur zur Verarbeitung von Getreide, sondern auch zur Herstellung von Farbe verwendet, wie Kolorierungen auf mehreren Exemplaren belegen, wobei vermutlich je nach

⁵⁶⁰ BICKLE, ANDERS 2013, 368-369, 378-379.

⁵⁶¹ BICKLE, ANDERS 2013, 379.

Verwendungszweck verschiedene Arten von Gestein für die Herstellung von Mahlwerkzeugen zum Einsatz kamen. Die Verteilung von Farbe variiert in Form und Material regional teilweise beträchtlich. Rötelpulver kam in Vedrovice (29%) häufig vor, weniger oft in Kleinhadersdorf (ca. 8%), gelegentlich in Aiterhofen-Ödmühle (ca. 4%, ohne Leergräber) und selten in Nitra und Schwetzingen. Meist wurde es um den Kopf gestreut, manchmal auch um andere Körperteile verteilt. Grab 106 in Schwetzingen enthielt einige Klumpen Rötel. Ein Gefäß in Essenbach-Ammerbreite (2) barg 150g unbestimmte rote Erde. Schwarze Farbe in Form von rohem oder verarbeitetem Grafit ist eng mit Aiterhofen-Ödmühle und Bayern im Allgemeinen verknüpft, während zwei Bestattungen in Schwetzingen (131, 170) und eine weitere in Dillingen (6) Mangan bzw. Manganoxid erhielten.

Klopfsteine sind durch Abnutzung und gelegentlichen Spuren von roter Farbe erkennbar und wurden in Kleinhadersdorf, Aiterhofen-Ödmühle und Vedrovice gefunden. Während die hohe Zahl anthropologisch unbestimmter Individuen in Kleinhadersdorf und Aiterhofen-Ödmühle Verbindungen zu Geschlecht und Alter kaum zulässt, ist für Vedrovice eine Tendenz zu senilen Frauen (aber nicht ausschließlich) identifizierbar. Kleine Steine ohne oder mit natürlichen Abnutzungen werden als Kieselsteine bezeichnet. Diese kamen bei beiden Geschlechtern vor, ihre (symbolische) Funktion ist unbekannt. Pyritknollen wurden erwachsenen bis senilen Männern in Bayern mitgegeben und könnten Bestandteile von Feuerzeugen gewesen sein. Verwechslungsgefahr besteht mit Rötel, da Pyrit dazu neigt, zu rot gefärbtem Goethit zu zerfallen oder zu Limonit zu oxidieren. Ein Limonit-Stein mit dem Abdruck eines Lias-Ammoniten in Essenbach-Ammerbreite (12) stellt einen einzigartigen Fund innerhalb der Linearbandkeramik dar. Seine symbolische Bedeutung ist unbekannt, wobei er sich im Besitz des Verstorbenen befunden haben oder ein Geschenk eines Freundes oder seiner Familie gewesen sein könnte, und unterstreicht die Bedeutung von individuellen Präferenzen für frühneolithische Bestattungsriten.

Knochenwerkzeuge und -Überreste im Allgemeinen finden sich häufiger in Männer- als Frauengräbern. Nieszery schlug für Knochenspitzen, welche aus Metapodien, Langknochen und anderen Körperteilen hergestellt wurden, eine Funktion als „Zunderstoher“ und somit als Bestandteil von Feuerzeugen vor. Spitze Exemplare sind des Weiteren für die Verzierung von Gefäßen geeignet, kleinere Spitzen als Projektile. Dreieckige Knochenpfeilspitzen waren auf Schwetzingen und je ein Exemplar auf Sengkofen und Vedrovice "Siroká u lesa"

beschränkt. Bei ersteren könnten sie, wie bereits erwähnt, in späteren chronologischen Phasen als Ersatz für Hornsteinprojekte gedient haben. Tierknochenüberreste stammen von verschiedenen Arten wie Rind, Schwein und Ziege/Schaf und wurden als Überbleibsel des Leichenschmauses oder als Fleischbeigaben (Proviand?) interpretiert. In Kleinhadersdorf konnte das Geschlecht von Gräbern mit Tierknochen oftmals nicht gedeutet werden, während einige anthropologisch bestimmte Gräber in Aiterhofen-Ödmühle eine Tendenz zu Männern aufweist. Ungewöhnliche Funde waren der Radialknochen eines Torfhundes (113) und drei Fuchsmandibeln (18, 102, 141) in Gräbern von spätadulten bis senilen Männern in Aiterhofen-Ödmühle, eine Wildschweinknochen-"Lamelle" kombiniert mit u. a. mikrolithischen Geschossen zusammen mit den Überresten eines frühadulten Mann (79) in „Siroká u lesa“ sowie das Fragment eines Hasenschienbeins im Grab eines Infans-I-Kindes (Verf. 22) in Kleinhadersdorf. Die geringe Größe letzterer Beigabe könnte mit dem jungen Alter des Verstorbenen zusammenhängen. Möglicherweise als Grabbeigabe vorgesehene menschliche Zähne, abgesehen von der Halskette von Grab 19 in Nitra, wurden in Aiterhofen-Ödmühle (33, 65, 100, 115) meist nahe des Schädels und in Essenbach-Ammerbreite (2) in einem Vorratsgefäß entdeckt.

Die GoogleMapper-Funktion der Montelius-Datenbank ermöglichte die Erstellung einer überregionalen Verbreitungskarte der linearbandkeramischen Gräberfelder. Nach dem derzeitigen Publikationsstand sind diese auf Täler und Flusslandschaften beschränkt und scheinen Großteils bestimmten Routen zu folgen, obwohl Siedlungen auch außerhalb dieser Pfade zahlreich vorkommen, während sich einige am nördlichen Ende des Frühneolithikums, sozusagen an einer „Grenze“ bzw. am Übergang zu mesolithischen Gebieten befinden.⁵⁶² Lücken in diesen Routen bestehen entlang der Donau, des Rheins, um das Böhmisches Massiv und in Frankreich, wobei hier nach potenziellen Fundorten zu suchen sein könnte. Falls dies nicht einfach an einem mangelhaften Forschungsstand liegt, könnten Gräberfelder eine funktionale Bedeutung als Marker von Kommunikationswegen oder des Territoriums innehalten sowie zentrale Treffpunkte für Bestattungsriten darstellen, an denen mehrere Gemeinschaften beteiligt waren. In chronologisch späteren Phasen wachsender Spannungen könnten solche Treffpunkte wichtig für die Erneuerung der sozialen Bindung verschiedener

⁵⁶² STADLER 2019b, 434.

Dörfer gewesen sein, und würde mit früheren Interpretation von räumlichen Clustern auf Gräberfeldern als Zeichen der Beteiligung mehrerer Gemeinschaften übereinstimmen.

Das niederösterreichische Gräberfeld Kleinhadersdorf besticht neben den bereits erwähnten einzigartigen Grabbeigaben durch eine hohe Anzahl an subadult Verstorbenen und Mahlgeräten als auch durch die umfangreiche Ausstattung der Kinder. Verbindungen nach Vedrovice sind durch die gleichen Rohstoffvorkommen für die Herstellung von Steinwerkzeugen sowie Keramik aus Želiezovce und Šárka und natürlich durch die Ausrichtung der Grabgruben zu beobachten. Eine Analyse Nächster Nachbarn wurde bereits 2015 von Peter Stadler durchgeführt, mit einem sehr ähnlichen Ergebnis wie die für diese Studie durchgeführte Auswertung.⁵⁶³ Männer, Frauen und Kinder innerhalb der nordwestlichen und zentralen Gruppe schließen sich nie gegenseitig aus, wobei der Totengestus in ersterer homogener ist. Beide Cluster umfassen sowohl nordorientierte Kinder als auch kleine Grüppchen, in denen entweder Männer oder Frauen dominieren. Weitere Differenzierungen innerhalb des zentralen Clusters, welcher die größte Variation hinsichtlich der Grabbeigaben und fast alle Spondylusobjekte des Gräberfelds umfasst, weisen auf hierarchische Strukturierung innerhalb derselben Sippe bzw. Familie hin. Die einzigen beiden Verstorbenen mit Spondylus außerhalb dieses Cluster repräsentieren statistische Ausreißer laut den Strontiumisotopenwerten für Kleinhadersdorf. Eine dieser Frauen befand sich im ältesten ¹⁴C-datiertem Grab, während die andere als eine der spätesten Bestattung bestimmt wurde. Der südliche Cluster bestand hauptsächlich aus leeren Gräbern und wurde erstmals in der dritten Phase des Gräberfelds – IIb/c nach der mährischen Chronologie – verwendet, während das Zentrum und der Norden früher datierten. Laut Isotopenuntersuchungen lebten die Verstorbenen und beschafften ihre Nahrung in unmittelbarer Nähe, wobei eine nur geringe Mobilität bestand. Niedrige $\delta^{15}\text{N}$ -Werte einiger Männer im Zentrum weisen auf eine ungewöhnlich fleischarme Ernährung hin. Weitere besondere Befunde sind eine sich vegetarisch ernährende Frau (Verf. 5), eine frühadulte Frau (Verf. 32), welche aufgrund von Gefäßen im Šárka-Stil und abweichenden Strontium-Werten womöglich aus Mähren oder Böhmen stammt, als auch die reichlich mit Beigaben versehene senile Frau (Verf. 32) mit atypischen Totengestus, welche sich in einem der frühest-datierenden Gräber befand und daher die Gemeinschaft in Kleinhadersdorf mitbegründet haben könnte. Insgesamt waren die

⁵⁶³ NEUGEBAUER-MARESCH, LENNEIS 2015a, 194–195.

Isotopenwerte relativ einheitlich mit einer gewissen Variationsbreite, während die räumliche Strukturierung soziale Unterschiede zulässt. Im Allgemeinen scheint die Beziehung zwischen den frühneolithischen Gemeinschaften bei Kleinhadersdorf und Vedrovice enger gewesen zu sein als mit Nitra oder den Linearbandkeramikern in Bayern und Baden-Württemberg.

Eine relativ homogene Graborientierung und ein ebensolcher Totengestus kennzeichnen Nitra als das einheitlichste bzw. konservativste größere bis jetzt ausgegrabene Gräberfeld, wobei die Abwesenheit einiger Beigabentypen und ihre allgemein vergleichsweise geringe Anzahl im Gegensatz zur Fundsituation anderer Grabstätten stehen, während die SE-Hauptausrichtung den Traditionen des südöstlichen Verbreitungsgebietes der Linearbandkeramik entsprechen. Zwei Gefäße im Alföld-Stil zeigen Verbindungen nach Ungarn. Ältere Männer sowie einige Frauen und Subadulte wurden umfangreiche Beigabenensembles mitgegeben, welche allerdings bei weitem nicht so groß sind wie die Ausstattung „reicher“ Individuen anderer Gräberfelder, und auch nicht so zahlreich. Pavúks Deutung gut ausgestatteter Gräber als älter aufgrund von sich schneidenden Gruben und einigen anderen Faktoren steht im Gegensatz zur Interpretation von Whittle et al., welche hohe Karbon-Isotopenwerte von Spondylusgräbern mit offeneren Landschaften in späteren Stadien verbinden.⁵⁶⁴ Für Patrilokalität, welche auch für die anderen Gräberfelder vorgeschlagen wurde, spricht eine eiweißhaltigere sowie abwechslungsreichere und stärkehaltigere Ernährung von Männern als von Frauen, wie es Isotopen- und osteologische Analysen implizieren. Die dichte Anordnung der meisten Gräber erschwert die Bestimmung spezifischer räumlicher Bestattungsordnungen, obwohl durch Überschneidungen und gewisser Unterschiede in der Merkmalsverteilung und Dichte einige Differenzierungen sichtbar werden. Zieht man die empfohlenen Cluster oder auch die alternative Möglichkeit reihenförmiger Strukturen sowie die familiäre Bindung der Dreifachbestattung 48-50 in Betracht, während andere Gruppen möglicherweise auf sozialem Status und nicht zwangsläufig auf Blutsverwandtschaft basierten, könnten die allgemeinen Bestattungsriten in Nitra weitaus flexibler gewesen sein, als die Uniformität des Gräberfelds ursprünglich vermuten ließ.

Die ¹⁴C-Methode bestimmte Vedrovice „Siroká u lesa“ als eines der ältesten Gräberfelder, welches in der Hauptorientierung der Grabgruben Kleinhadersdorf und Nitra ähnelt, wobei es jedoch weniger einheitlich als letzteres ist und Verbindungen mit ersterem durch typologische

⁵⁶⁴ PAVÚK 1972, 72. – WHITTLE et al. 2013, 154.

Gemeinsamkeiten der mikrolithischen Trapeze und gleichen Rohstoffvorkommen sowie des Mährischen Keramikstils aufweist. Einzigartige Funde wie Marmorobjekte und ein hoher Anteil an Röteln und Spondylus als auch die relativ häufigen Verteilungen von gut ausgestatteten Kindergräbern (zusätzlich zu den üblichen älteren Männern) unterstreichen den besonderen Status des Gräberfeldes. Die von Zvelebil und Pettitt vorgeschlagenen Cluster beinhalten mindestens ein „reiches“ Grab und deuten somit Gleichberechtigung im Zugang zu wertvollen Beigaben an.⁵⁶⁵ Des Weiteren schlugen sie eine matrilineare Nordwestgruppe innerhalb einer patrilinearen Gemeinschaft vor, basieren auf zwei umfassend ausgestatteten Frauen mit Spondylus und „arme“ männliche Gräber, wobei die ohnehin häufige Verteilung von Schmuck auf weibliche Verstorbene dagegen spricht.⁵⁶⁶ Weder diese räumlichen Gruppen noch alternative Reihemuster stimmten mit etwaigen Isotopenmustern überein, obwohl eine unterschiedliche Ernährung bei weit auseinanderliegenden und eine ähnliche bei nah beieinanderliegenden Toten festgestellt werden konnte. Unterschiedliche Mobilitätsmuster in Bezug auf das Geschlecht deuten auf Virilokalität oder Patrilokalität hin. Die hier vorgeschlagenen Cluster gleichen teilweise denen von Zvelebil und Pettitt, unterscheiden sich jedoch in einigen Punkten und zeigen eher kleine (verwandtschaftliche?) Gruppierungen anstelle von großen Haushalten sowie isolierte Grüppchen außerhalb dieser Cluster. Zonen definiert durch spezifische Merkmale wie z. B. einen hohen Anteil weiblicher oder subadulter Verstorbener sowie reichlich ausgestattete Gräber mit atypischen Totengestus deuten auf flexible Riten oder Präferenzen hin, welche durch individuelle Lebensweisen, interkommunale Beziehungen und möglicherweise durch die Ereignisse, welche zum Tod führten, geprägt sind und frühere Interpretationen komplexer Beziehungen zwischen ererbtem Status und einem Netzwerk von Kontakten erweitern, anstatt auf durch die Bestattungsweise sichtbare fixe Identitäten wie „Jäger und Sammler“ zu beharren.

Aiterhofen-Ödmühle folgt anderen Traditionen als der Südosten und Baden-Württemberg, wie die O-W-Hauptausrichtung und charakteristische bayrische Grabbeigaben wie z. B. Knochenkämme. Weitere Besonderheiten sind die hohe Anzahl von Brandbestattungen in der Nordhälfte sowie die Mitgabe von mehreren geschliffenen Steingeräten – darunter einige durchlochte Beile – pro Grab, wobei eine Kremation (185) sogar vier Exemplare enthielt.

⁵⁶⁵ ZVELEBIL, PETTITT 2008, 204–205.

⁵⁶⁶ WHITTLE et al. 2013, 127.

Ältere Männer und einige Frauen erhielten die aufwendigste Ausstattung, was auf eine geschlechts- und altersbedingte Hierarchie hinweist, während auch einige ungewöhnliche Fundsituationen wie z. B. zwei benachbarte Frauengräber (158, 159) mit typisch „männlichen“ Beigaben existierten. Generell scheint die offensichtlichste räumliche Ordnung von Aiterhofen-Ödmühle die Aufteilung in ein spondyluslastiges südliches Drittel, welches auch die Mehrzahl der umfangreichen Beigabenensembles aufwies, sowie eines weniger gut ausgestatteten und von Brandbestattungen geprägten nördlichen Teils zu sein. Lücken in der Belegung trennen das Gräberfeld in verschiedene Zonen, wobei diese insbesondere im Süden wohl durch Erosion und Ackerbau verursacht wurden.⁵⁶⁷ Diese Trennung wird von Isotopenanalysen weiter verdeutlicht, da die Karbonwerte im Norden und im Süden unterschiedlich hoch sind. Männer unterteilen sich in zwei Gruppen, wobei ein Cluster höhere Strontiumwerte in der Ernährung im Kindesalter zeigt, während unterschiedliche Werte ohne Gesamtmuster für Frauen auf mehrere Nahrungsquellen in der Kindheit hinweist, was für Immigration im Erwachsenenalter spricht.⁵⁶⁸ Unterschiedliche und sich widersprechende Schlussfolgerungen in der relativchronologischen Bestimmung der Keramik sowie das Fehlen von ¹⁴C-Daten erschweren die Datierung von Aiterhofen-Ödmühle.⁵⁶⁹ Die Seriation von Grabbeigaben und -typ ordnen die Spondylusgräber des Südens und dreieckige Pfeilspitzen sowie durchlochte Beile zu unterschiedlichen Enden der Sequenz, was mit Interpretation eines älteren Südteils und dem jüngeren Alter von den nördlicheren Brandbestattungen im Allgemeinen übereinstimmt. Hofmann et al. hingegen vermuteten eine fortschreitende Öffnung der Landschaft von Süden nach Norden, oder alternativ unterschiedliche Ernährungsstrategien und verschiedene Vorlieben hinsichtlich Grabausstattung bereits in den Anfängen der Gräberfeldbelegung.⁵⁷⁰ Die hier empfohlenen Cluster vereinen Teile des Zentrums und des Südens, welche vermutlich erst durch Erosion getrennt wurden, und erweitern somit den südlichen Bereich. Dieser wurde von Nieszery als Zone für einen elitären Gründerclan bzw. -sippe interpretiert, wobei innerhalb dieser gewisse soziale Differenzierungen und eine Hierarchie sichtbar durch die "ärmlich" ausgestattete Untergruppe A3 oder allgemein unterschiedliche Werte innerhalb von A2 impliziert wird.⁵⁷¹

⁵⁶⁷ NIESZERY 1995, 61.

⁵⁶⁸ ZVELEBIL, PETTITT 2008. – HOFMANN et al. 2013, 239.

⁵⁶⁹ NIESZERY 1995, 131-138 – PECHTL 2009, 94 – HOFMANN et al. 2013, 219–220.

⁵⁷⁰ HOFMANN et al. 2013, 239.

⁵⁷¹ NIESZERY 1995, 212.

Der Norden enthält das von Brandbestattungen dominierte Zentrum D und die benachbarten Cluster E im Norden sowie B/C im Osten. Die geringe Anzahl bzw. Abwesenheit von Subadulten und Brandbestattungen wird von B/C geteilt, während B einige Spondylusgräber und umfangreiche Beigabenensemble enthielt, welche eher für A charakteristisch wären. Dies könnte als Indikator für eine Ost-West-Progression in den nördlichen zwei Dritteln gewertet werden, falls die Gruppe D eine fortschreitende Zunahme von Kremationen nach Westen darstellt. Der nördlichste Cluster E enthält jedoch wieder mehr Körpergräber, potenziell erklärbar durch für verschiedene Gemeinschaften reservierte Zonen oder eine Rückkehr zu Körpergräbern in späteren Phasen. Einige Merkmale überschneiden sich zwischen unterschiedlichen Cluster. Zusammenfassend lässt sich sagen, dass die Interpretation der chronologischen Entwicklung und der Bestattungsriten in Aiterhofen-Ödmühle immer noch ein Problem darstellen, dieses jedoch Großteils durch längst überfällige ¹⁴C- und genetische Untersuchungen lösbar wäre.

Die beiden Hauptorientierungen NO-SW und SW-NO anstelle nur einer dominierenden Grabausrichtung, die beinahe völlige Abwesenheit von Spondylus und Rötelstreuungen – charakteristisch für ein Gräberfeld der Tradition II nach Jeunesse – sowie eine hohe Anzahl dreieckiger Knochenpfeilspitzen unterscheidet Schwetzingen von den östlicher gelegenen Fundorten.⁵⁷² Schlechte Qualität der Tonware und fehlende Abnutzungsspuren auf mehreren geschliffenen Steingeräten deuten auf eine Herstellung speziell für Bestattungssitten hin.⁵⁷³ Diese Eigenheiten können mit der Entwicklung der La-Hoguette-Kultur und ihrer Einbindung in die Schwetzingen Traditionen in Zusammenhang gebracht werden.⁵⁷⁴ Ältere Männer erhielten wie üblich den Großteil der umfangreichen Beigabenensembles, wobei selbst diese nicht die gleiche Komplexität der "reichen" Bestattungen anderer Gräberfelder erreichten. Die relative Chronologie, basierend auf der Verzierung der Gefäße typisch für die Pfalz-Region, ordnet Teile des Zentrums und den Nordwesten in die älteste Phase des Fundorts, während nach Süden hin die Gräber jünger werden.⁵⁷⁵ Einige spät-datierende Gruben in älteren Zonen weisen auf eine gelegentliche Rückkehr zu diesen Arealen hin. Anhand der Analyse N Nächster Nachbarn konnten einige räumliche Strukturen erkannt werden, wobei die offensichtlichste

⁵⁷² JEUNESSE 1997.

⁵⁷³ GERLING 2012. – BENTLEY et al. 2013, 277.

⁵⁷⁴ BENTLEY et al. 2013, 288.

⁵⁷⁵ GERLING 2012, 117.

natürlich die Verteilung der reichlich ausgestatteten Gräber vor allem im Nordwesten ist. Subadult Verstorbene befanden sich in anderen Zonen und besonders häufig im Süden. Knochendreiecke nahmen in chronologisch späteren Phasen zu und dienten wohl als Ersatz für Hornsteinpfeilspitzen. Leergräber, Reihen von beigabenlosen Gräbern, eine sich wechselnde Belegungsdichte sowie allgemein signifikante Ähnlichkeiten und Unterschiede in der Merkmalsverteilung zwischen den Zonen heben weitere Besonderheiten hervor, wobei weitere Differenzierungen innerhalb der empfohlenen Cluster erkennbar sind. Isotopenanalysen legen zwei verschiedene Muster nahe, welche eine unterschiedliche Ernährung sowie Nutzung der Landschaft andeuten.⁵⁷⁶ Auf diesen sind beide Geschlechter gleichmäßig verteilt, und obwohl Strontium innerhalb der Frauengräber vielfältiger war – ein Indikator für Patrilokalität –, repräsentiert diese Aufteilung möglicherweise zwei verschiedene Gemeinschaften und nicht nur unterschiedliche Ernährungsweisen. Abgesehen von den üblichen Isotopenunterschieden bei Männern, die mit geschliffenen Steingeräten begraben wurden, gibt es kaum Zusammenhänge zwischen Isotopen und Bestattungsritus. In Anbetracht dieser Komplexität und Variation von und innerhalb der Cluster sowie unterschiedlicher Mobilität reichen die Darstellung fixer Identitäten, einfacher Verwandtschaftsgruppen oder chronologische Entwicklung durch den Grabritus als Erklärungen nicht aus, stattdessen scheinen weitaus komplexere und nuancierte Bestattungssitten und -regeln schlüssiger zu sein.

Eine Auswertung des vollständigen Datensatzes der Grabbeigaben erfolgte sowohl durch Korrespondenzanalyse als auch Seriation, wobei erstere regionale Unterschiede, Besonderheiten und Ähnlichkeiten aufzeigte, während die Seriation aus mehreren potenziellen Gründen ein negatives Ergebnis lieferte. Es muss jedoch zukünftig eine Auftrennung in zwei Seriationen, eine für Männer und eine für Frauen, ins Auge gefasst werden, was das Ergebnis positiv gestalten könnte. Diese Resultate sind relevant für die abschließende Forschungsfragen hinsichtlich der Effizienz der angewandten Methoden, des Informationswerts der gesammelten Daten und der Sinnhaftigkeit einer Fortsetzung dieser Studie. Sowohl die Seriation als auch die Korrespondenzanalyse sollten dabei als Zwischenergebnisse betrachtet werden, da die betreffenden Daten auf wenige Fundorte und Regionen der linearbandkeramischen Verbreitung beschränkt sind. Um bessere Ergebnisse zu

⁵⁷⁶ BENTLEY et al. 2013, 286–288.

erzielen, müssten die Untersuchung um die Daten der übrigen Fundorte erweitert werden, wobei weitere Varianten des Reciprocal Averaging (z. B. Analyse der Verbindungen zwischen Geschlecht, Alter und Beigabentypen) einbezogen werden sollten, welche den Rahmen dieser Masterarbeit gesprengt hätten. Die Analyse N Nächster Nachbarn und die Merkmalsverteilung im Allgemeinen erlauben hingegen bereits detaillierte Einblicke in die komplexe Natur frühneolithischer Bestattungsriten, könnten aber ebenfalls durch weitere Informationen wie Isotopenwerte, Verzierungselemente der Tonware oder Verletzungen und Krankheiten ergänzt werden. Folglich sollten die für diese Studie erstellten Klassifikationen überprüft und, falls nötig, durch die Anwendung der „Dynamischen Typologie“-Methode der MonteliusEditor-Funktion verbessert und modifiziert werden. Um es auf den Punkt zu bringen: Die in dieser Studie angewandten Methoden und Typologien liefern bereits aussagekräftige Informationen, sollten jedoch um den vollständigen überregionalen Datensatz und andere Klassifikationen erweitert werden. Eine Fortsetzung scheint daher notwendig, um das volle Potenzial von Montelius und WinSerion zu erreichen und weitere soziale Strukturen in den linearbandkeramischen Bestattungssitten aufzudecken.

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7. Appendix

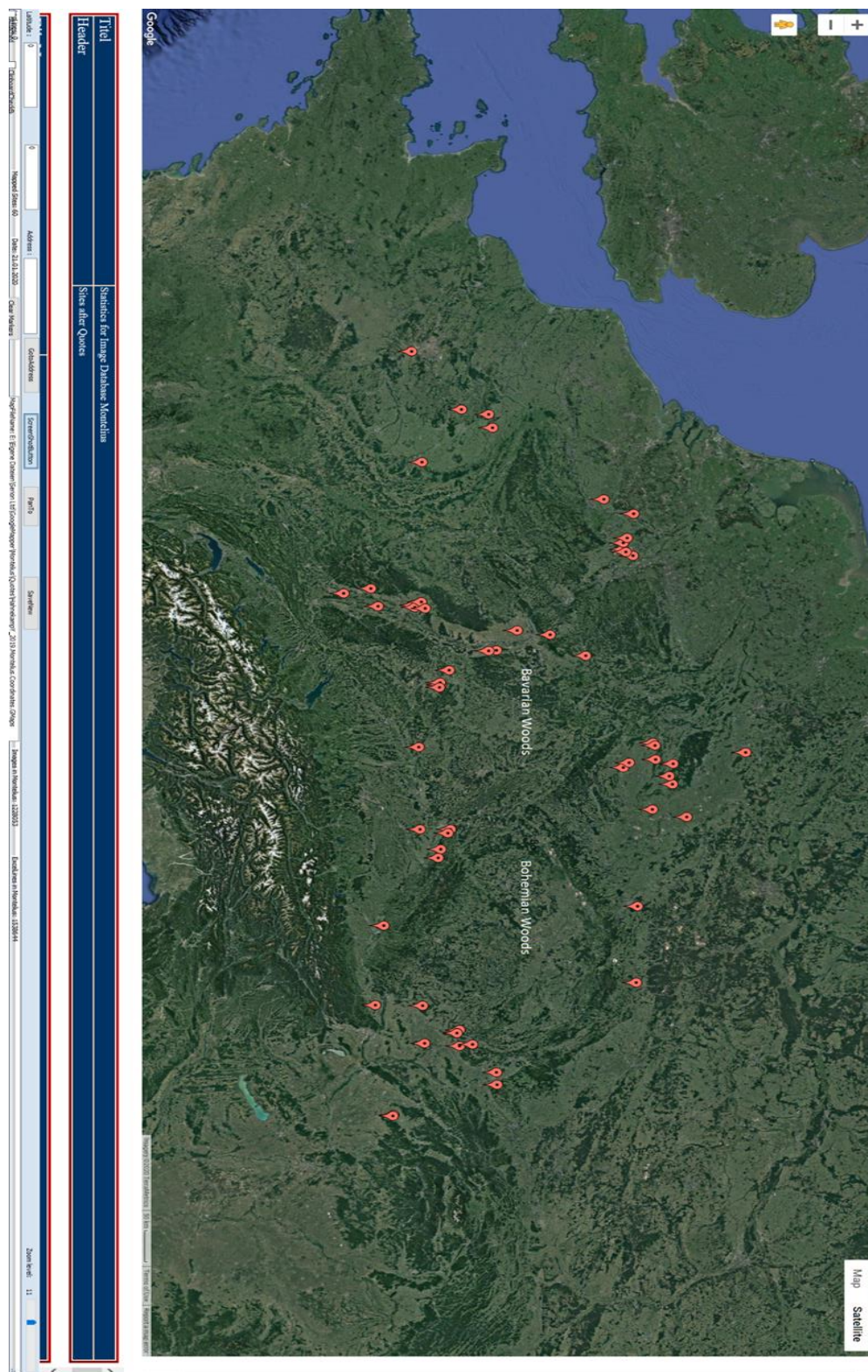


Figure Appendix 1: Supra-regional distribution map of Linear Pottery cemeteries as listed in chapter 4.1., created by the GoogleMapper function of the Montelius database.

Burials in Bytes – A Quantitative Study of Linear Pottery cemeteries

F:\116 B\127 Next\Net\15 Konf\N\N=3 Norm\coord=0 Freq=On
Map01, Grave good presence
Hahnekamp Yanik
Kleinhadersdorf Marchleiten
LBK Gräberfelder

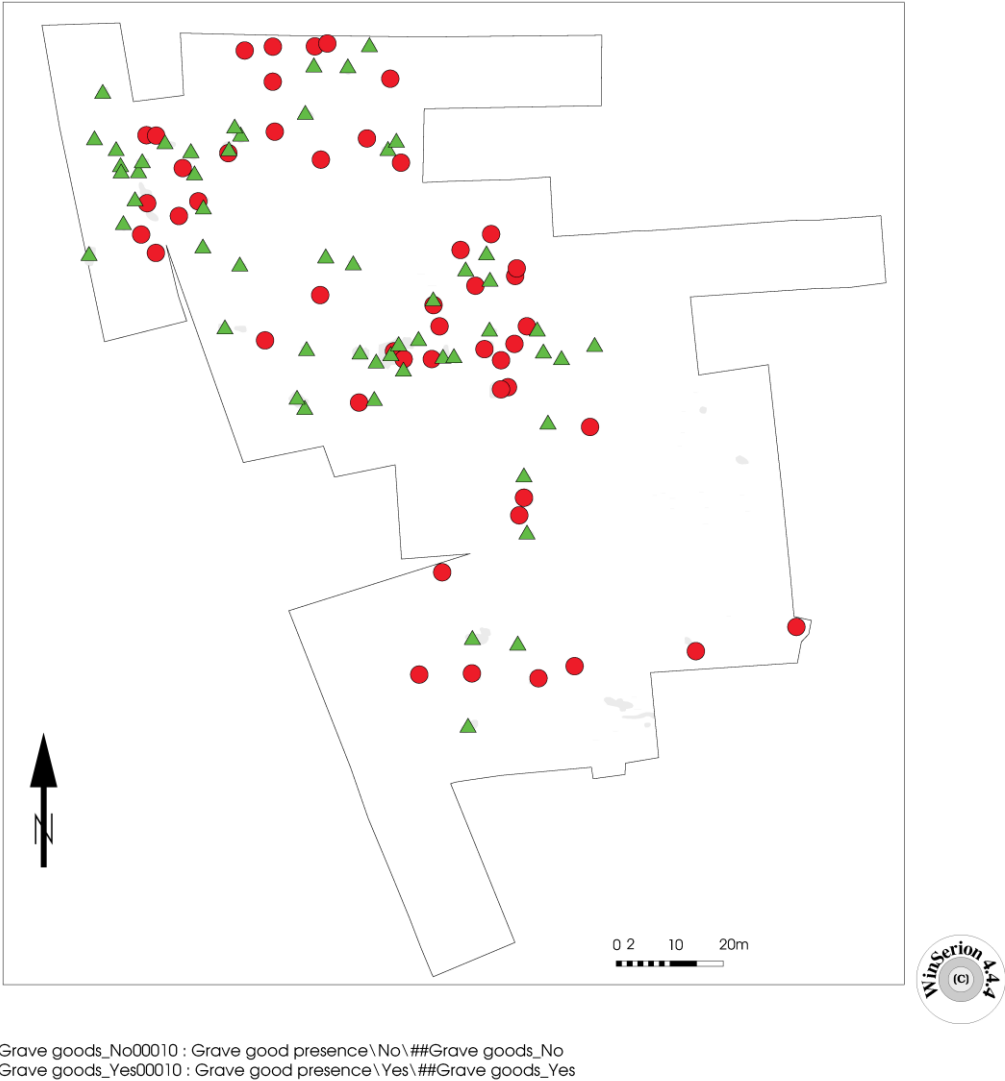


Figure Appendix 2: Distribution map 1 of Kleinhadersdorf.

Burials in Bytes – A Quantitative Study of Linear Pottery cemeteries

F=116 B=127 NextNei=15 KonfN=3 Normkoor=0 Frequ=On
Map02, Biological sex
Hahnekamp Yanik
Kleinhadersdorf Marchleiten
LBK Gräberfelder



Figure Appendix 3: Distribution map 2 of Kleinhadersdorf.

Burials in Bytes – A Quantitative Study of Linear Pottery cemeteries

F=11.6 B=127 NextNeib=15 KonfNiv=3 Normkoor=0 Freque=On

Map03, Age (subadult)

Hahnkamp Yanik

Kleinhadersdorf Marchleiten

LBK Gräberfelder

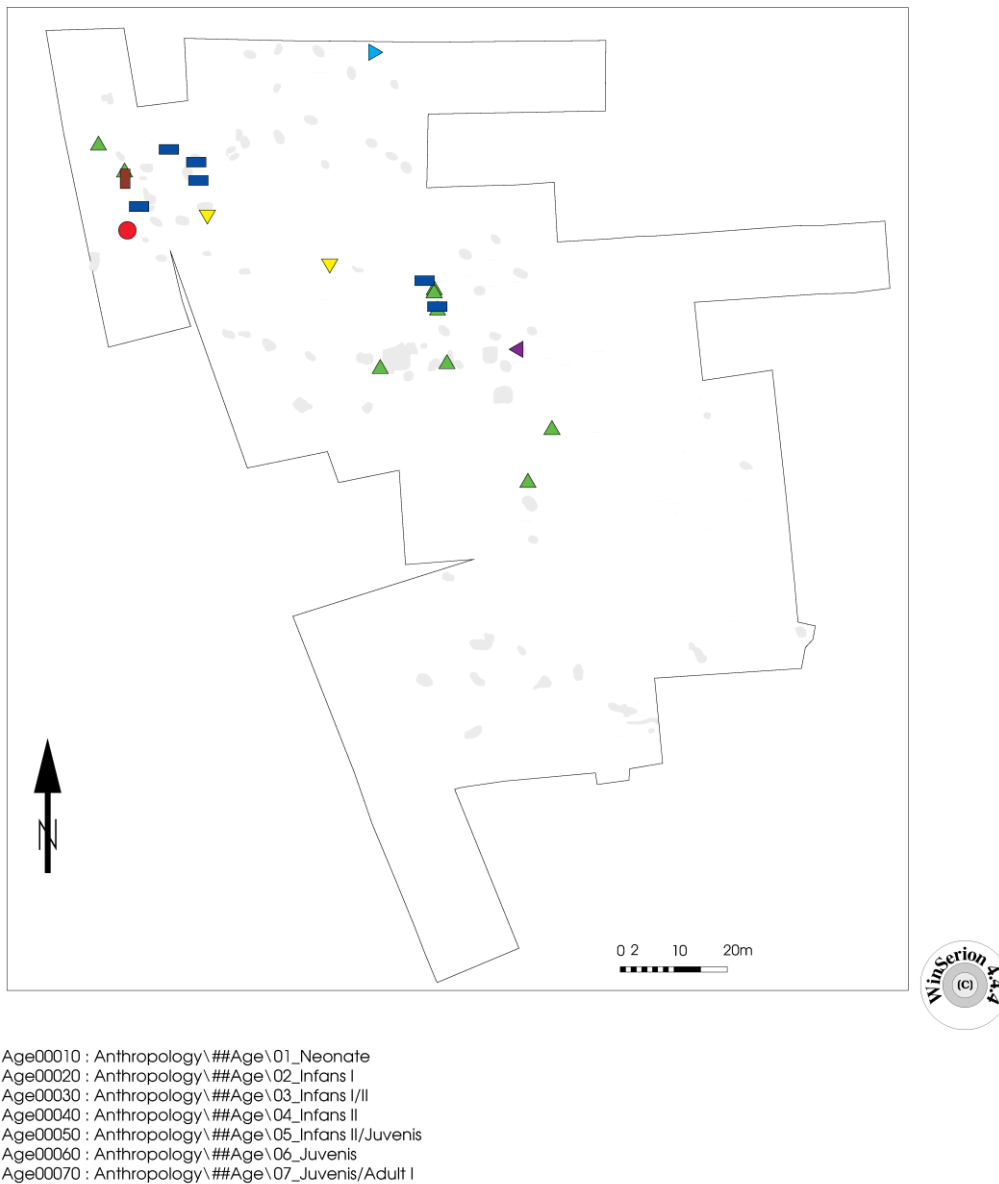


Figure Appendix 4: Distribution map 3 of Kleinhadersdorf.

Burials in Bytes – A Quantitative Study of Linear Pottery cemeteries

F=116 B=127 NextNeib=15 KonfNiv=3 Normkoor=0 Freq=On
 Map04, Age (adult)
 Hahnekamp Yanik
 Kleinhadersdorf Marchleiten
 LBK Gräberfelder

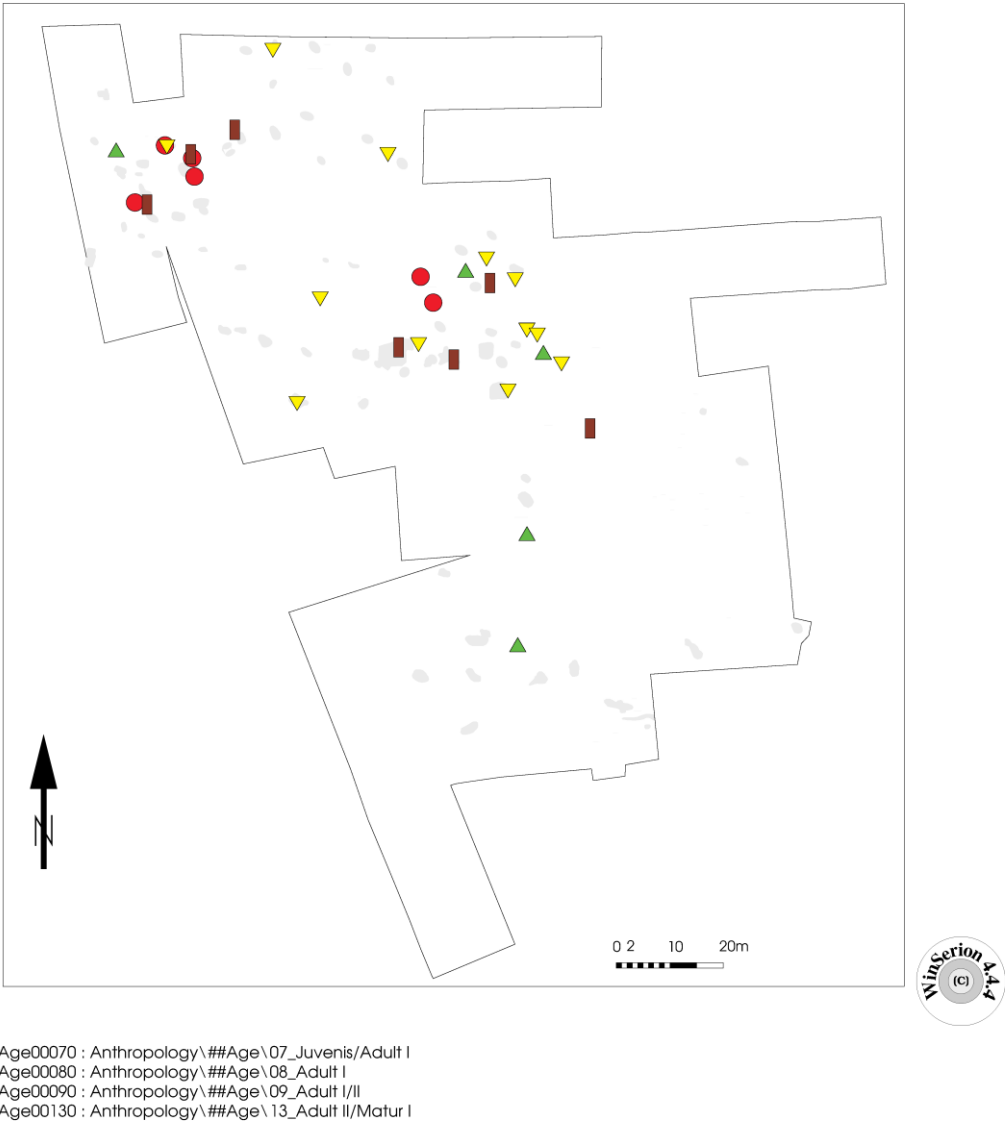


Figure Appendix 5: Distribution map 4 of Kleinhadersdorf.

Burials in Bytes – A Quantitative Study of Linear Pottery cemeteries

F=116 B=127 NextNeib=15 KonfNiv=3 Normkoor=0 Freque=On
 Map05, Age (mature to senile)
 Hahnekamp Yanik
 Kleinhadersdorf Marchleiten
 LBK Gräberfelder

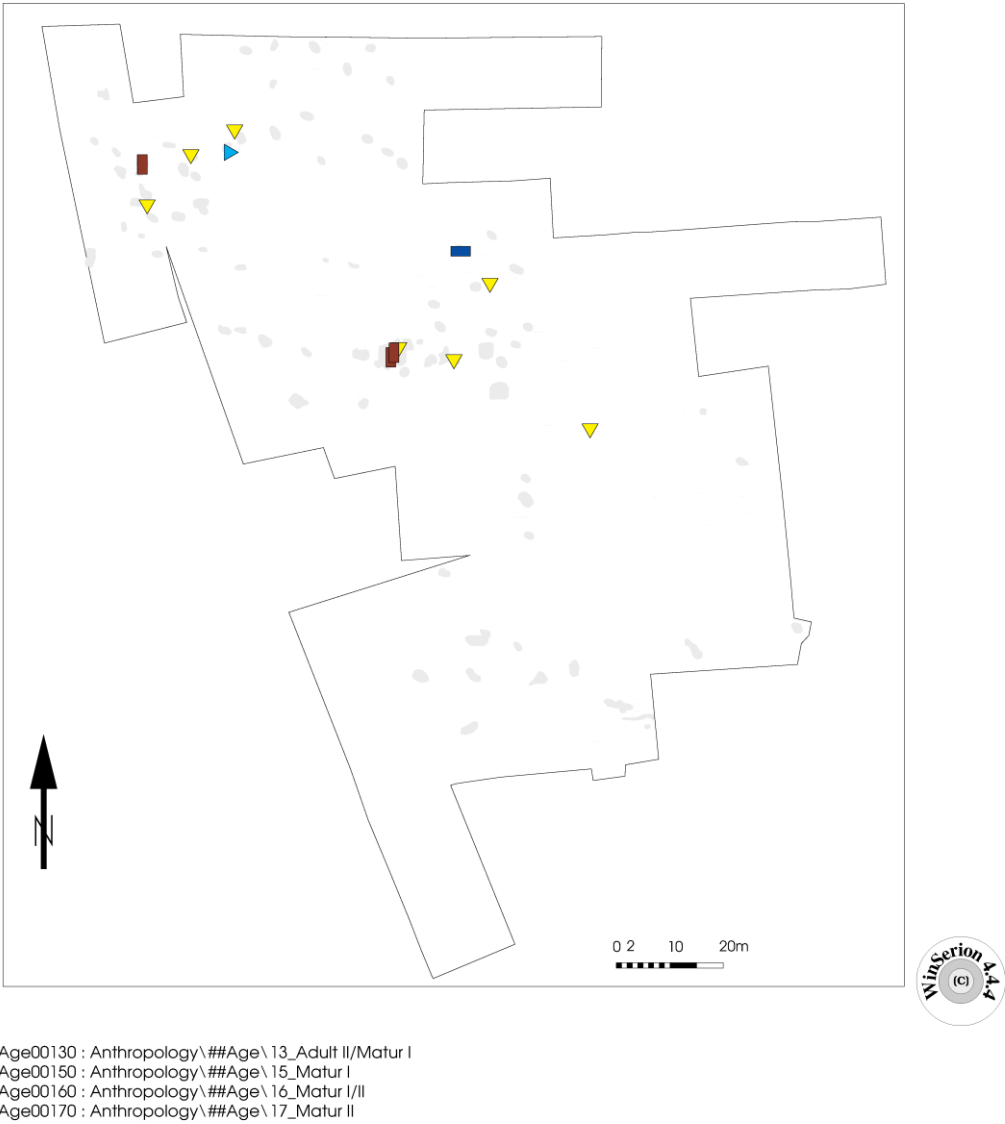


Figure Appendix 6: Distribution map 5 of Kleinhadersdorf.

Burials in Bytes – A Quantitative Study of Linear Pottery cemeteries

F=116 B=127 NextNeiN=15 KonfN=N=3 Normkoor=0 Frequ=On

Map06, Burial type

Hahnekamp Yanik

Kleinhadersdorf Marchleiten

LBK Gräberfelder

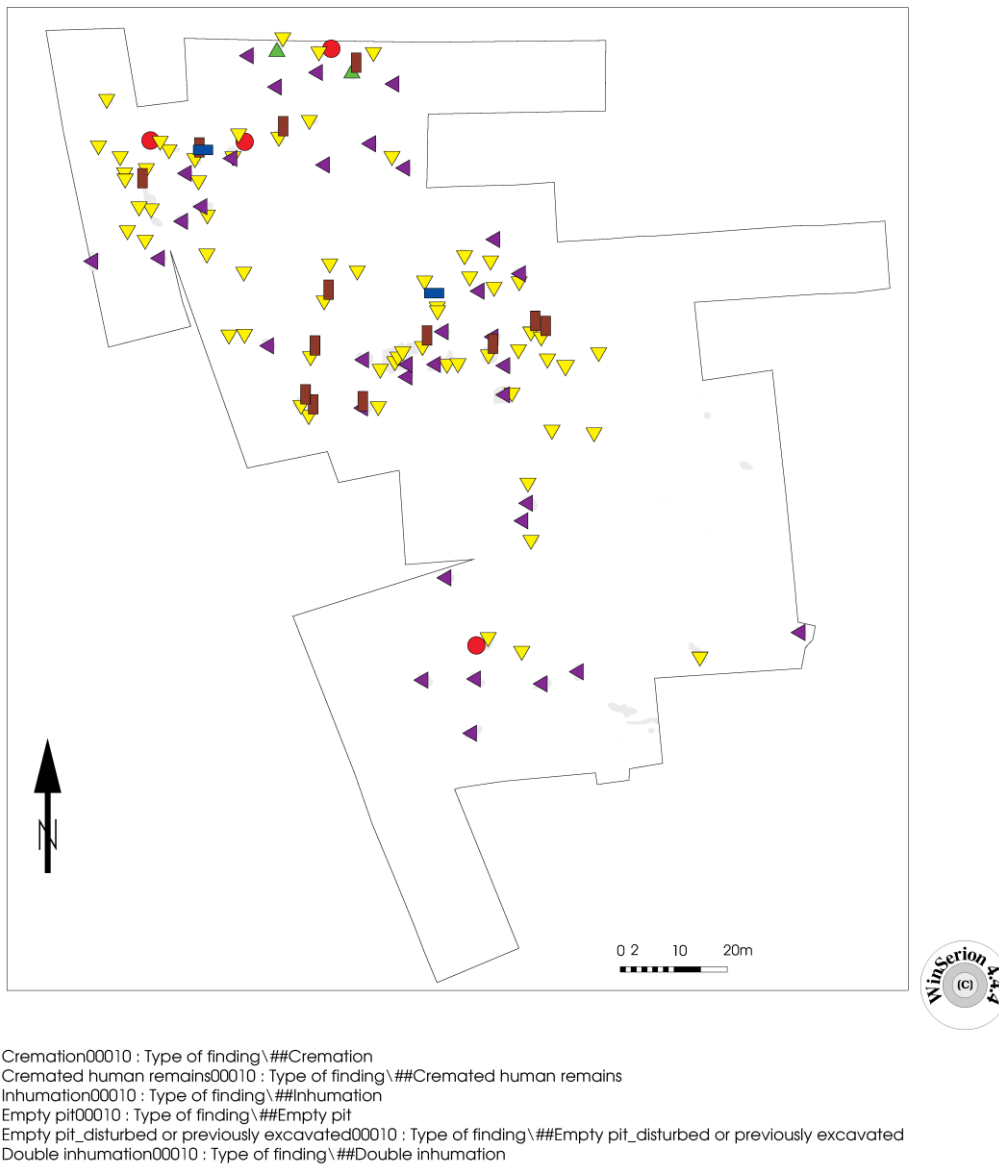


Figure Appendix 7: Distribution map 6 of Kleinhadersdorf.

Burials in Bytes – A Quantitative Study of Linear Pottery cemeteries

F:\116_B\127_Next\NetN=15_Konf\N=3_Norm\koo=0_Freq=On

Map07, Burial pit orientation
 Hahnekamp Yanik
 Kleinhadersdorf Marchleiten
 LBK Gräberfelder



- Pit_Grave orientation00010 : Inhumation\##Pit_Grave orientation\E-W
- ▼ Pit_Grave orientation00030 : Inhumation\##Pit_Grave orientation\ESE-WNW
- ▲ Pit_Grave orientation00050 : Inhumation\##Pit_Grave orientation\N-S
- Pit_Grave orientation00060 : Inhumation\##Pit_Grave orientation\NE-SW
- Pit_Grave orientation00070 : Inhumation\##Pit_Grave orientation\NNE-SSW
- ▲ Pit_Grave orientation00090 : Inhumation\##Pit_Grave orientation\NW-SE
- ▼ Pit_Grave orientation00100 : Inhumation\##Pit_Grave orientation\NWN-SES
- ▲ Pit_Grave orientation00120 : Inhumation\##Pit_Grave orientation\SE-NW
- ▼ Pit_Grave orientation00160 : Inhumation\##Pit_Grave orientation\Uncertain
- ▲ Pit_Grave orientation00170 : Inhumation\##Pit_Grave orientation\W-E
- ▼ Pit_Grave orientation00180 : Inhumation\##Pit_Grave orientation\WNW-ESE

Figure Appendix 8: Distribution map 7 of Kleinhadersdorf.

Burials in Bytes – A Quantitative Study of Linear Pottery cemeteries

F=116 B=127 NextNei=15 KonfN=N=3 Normkoor=0 Freque=On
 Map08, Line of sight
 Hahnekamp Yanik
 Kleinhadersdorf Marchleiten
 LBK Gräberfelder

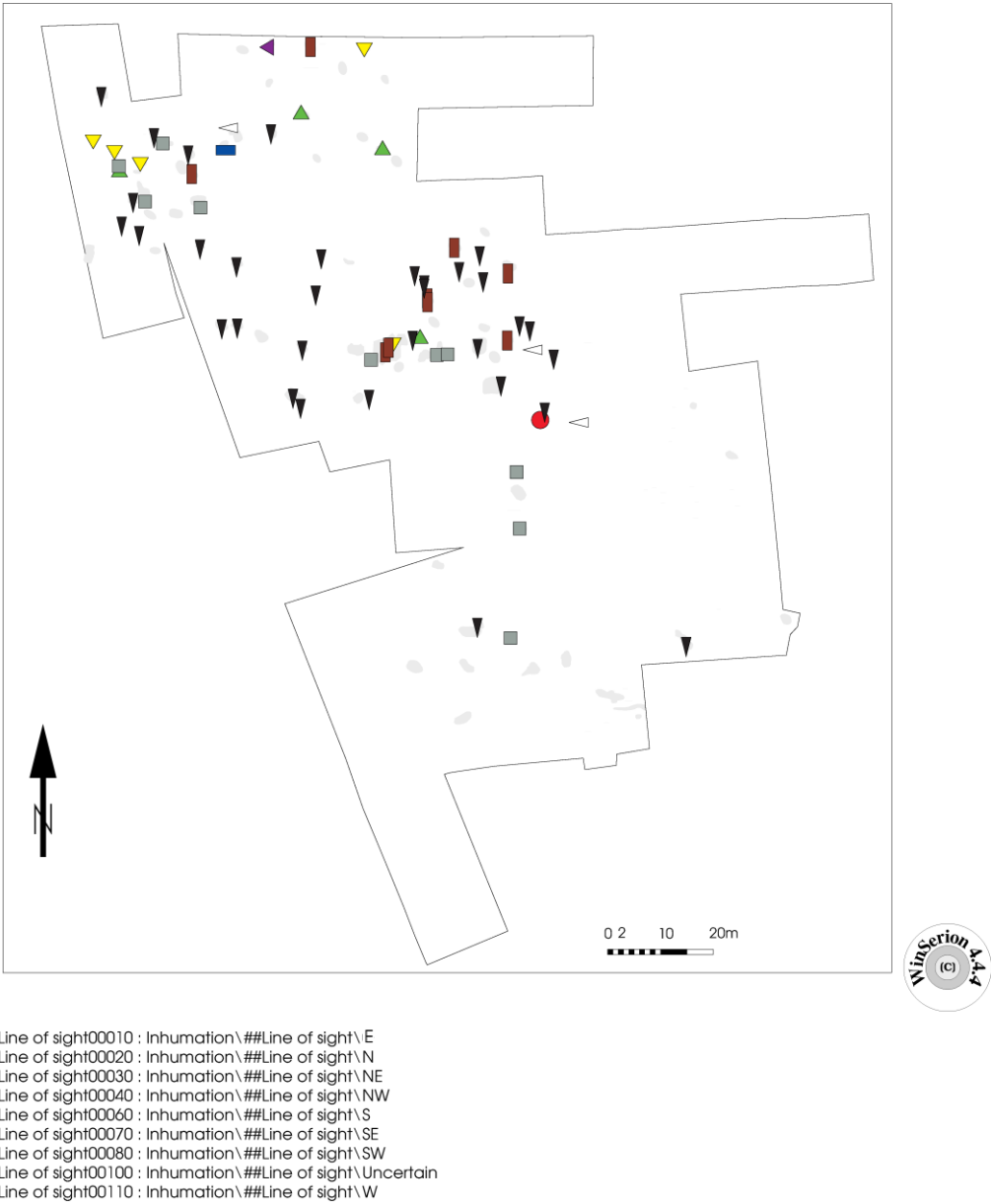
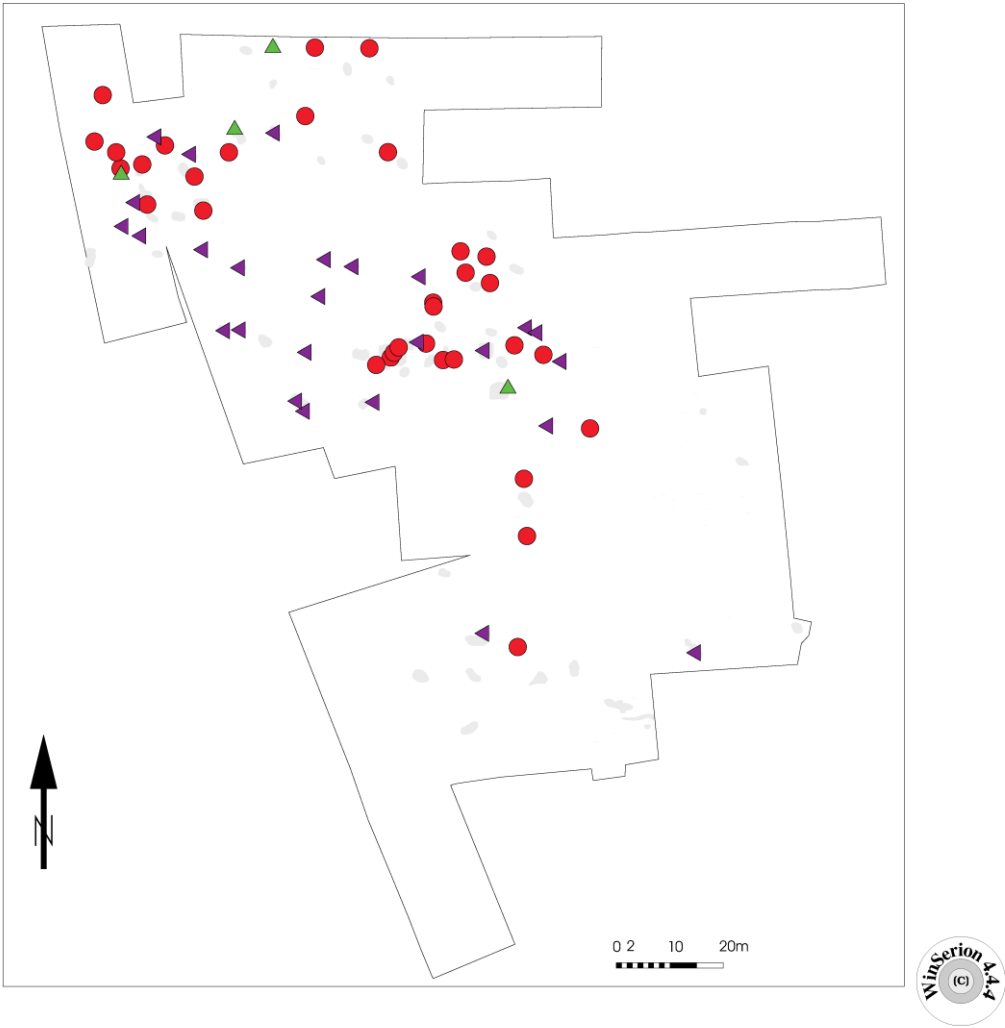


Figure Appendix 9: Distribution map 8 of Kleinhadersdorf.

Burials in Bytes – A Quantitative Study of Linear Pottery cemeteries

F=11.6 B=127 NextNeib=15 KonfNiv=3 Normkoor=0 Frequ=On
 Map09, Body orientation
 Hahnekamp Yanik
 Kleinhadersdorf Marchleiten
 LBK Gräberfelder



- Body orientation00010 : Inhumation\##Body orientation\Left
- ▲ Body orientation00020 : Inhumation\##Body orientation\Right
- ▼ Body orientation00040 : Inhumation\##Body orientation\Uncertain

Figure Appendix 10: Distribution map 9 of Kleinhadersdorf.

Burials in Bytes – A Quantitative Study of Linear Pottery cemeteries

F:\116_B\127_Next\NetN=15_Konf\N=3_Norm\kocor=0_Freq=On
 Map 10, Torso position
 Hahnekamp Yanik
 Kleinhadersdorf Marchleiten
 LBK Gräberfelder



Figure Appendix 11: Distribution map 10 of Kleinhadersdorf.

Burials in Bytes – A Quantitative Study of Linear Pottery cemeteries

F=11.6 B=127 NextNeiN=15 KonfNivN=3 Normkoor=0 Frequ=On

Map11, Angle backbone to upper thigh
 Hahnekamp Yanik
 Kleinhadersdorf Marchleiten
 LBK Gräberfelder



- Angle backbone to upper thigh00010 : Inhumation\##Angle backbone to upper thigh\Moderate
- ▼ Angle backbone to upper thigh00030 : Inhumation\##Angle backbone to upper thigh\Tight
- ▲ Angle backbone to upper thigh00040 : Inhumation\##Angle backbone to upper thigh\Uncertain
- ▲ Angle backbone to upper thigh00050 : Inhumation\##Angle backbone to upper thigh\Very tight
- Angle backbone to upper thigh00060 : Inhumation\##Angle backbone to upper thigh\Wide

Figure Appendix 12: Distribution map 11 of Kleinhadersdorf.

Burials in Bytes – A Quantitative Study of Linear Pottery cemeteries

F=116 B=127 NextNeib=15 KonfNiv=3 Normkoor=0 Frequ=On

Map12, Angle upper to lower thigh
 Hahnekamp Yanik
 Kleinhadersdorf Marchleiten
 LBK Gräberfelder



- Angle upper to lower thigh00010 : Inhumation\##Angle upper to lower thigh\Extreme
- ▲ Angle upper to lower thigh00020 : Inhumation\##Angle upper to lower thigh\Moderate
- ▼ Angle upper to lower thigh00040 : Inhumation\##Angle upper to lower thigh\Tight
- ▶ Angle upper to lower thigh00050 : Inhumation\##Angle upper to lower thigh\Uncertain
- Angle upper to lower thigh00060 : Inhumation\##Angle upper to lower thigh\Wide

Figure Appendix 13: Distribution map 12 of Kleinhadersdorf.

Burials in Bytes – A Quantitative Study of Linear Pottery cemeteries

F=116 B=127 NextNeib=15 KonfNiv=3 Normkoor=0 Freque=On

Map13, Arm gesture
 Hahnekamp Yanik
 Kleinhadersdorf Marchleiten
 LBK Gräberfelder

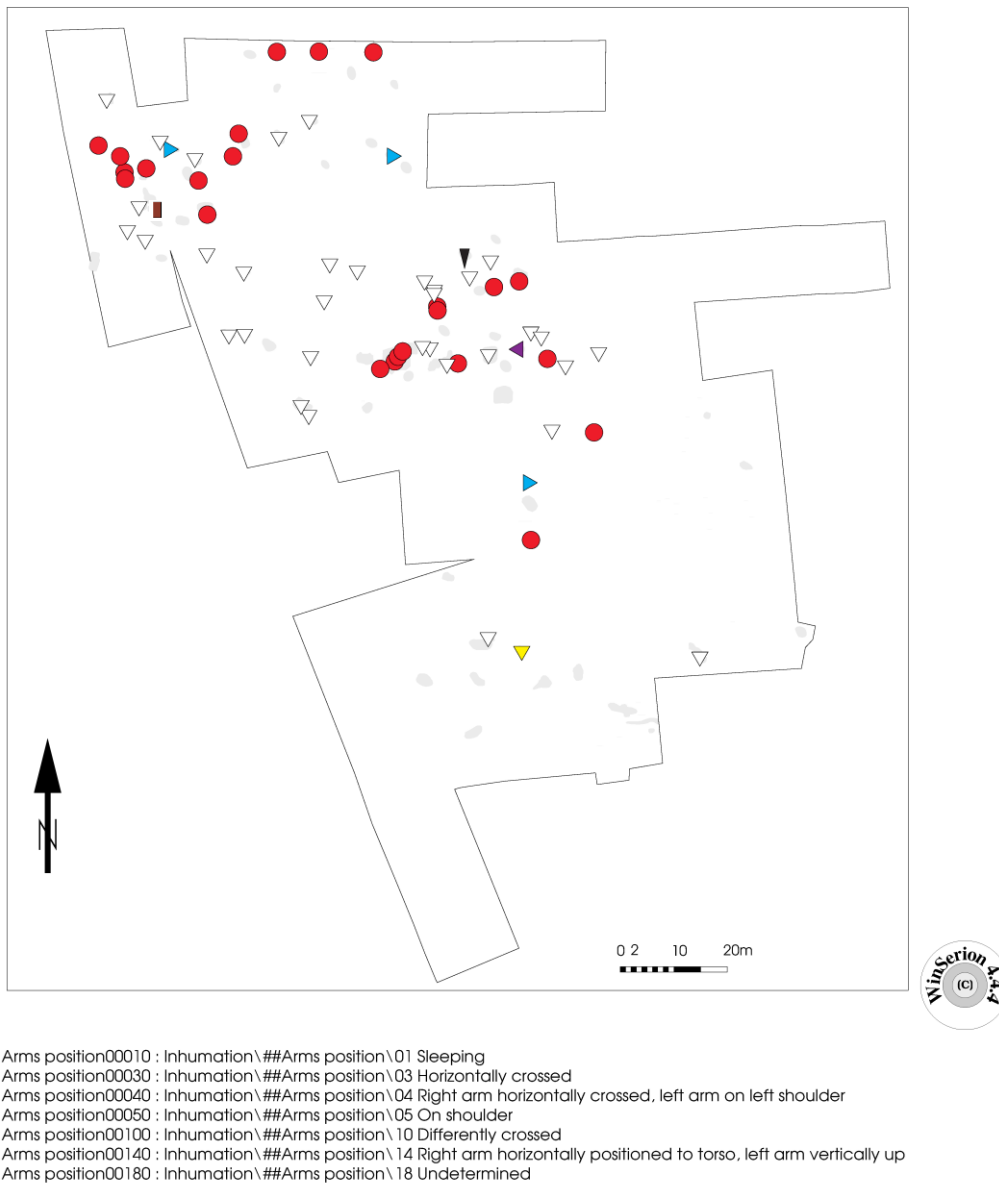


Figure Appendix 14: Distribution map 13 of Kleinhadersdorf.

Burials in Bytes – A Quantitative Study of Linear Pottery cemeteries

F=116 B=127 NextNeib=15 KonfNiv=3 Normkoor=0 Freque=On

Map14, Vessel condition
Hahnekamp Yanik
Kleinhadersdorf Marchleiten
LBK Gräberfelder



Figure Appendix 15: Distribution map 14 of Kleinhadersdorf.

Burials in Bytes – A Quantitative Study of Linear Pottery cemeteries

F=116 B=127 NextNei=15 KonfNiv=3 Normkoor=0 Frequ=On

Map 15, Amphorae and Kämpfe

Hahnekamp Yanik

Kleinhadersdorf Marchleiten

LBK Gräberfelder



- ▶ Amphorae (1e)00010 : Ceramic\Pottery\1 Amphorae and Pots\##Amphorae (1e)
- ▼ Amphorae (Uncategorized)00010 : Ceramic\Pottery\1 Amphorae and Pots\##Amphorae (Uncategorized)
- ▽ Kumpf (2a)00010 : Ceramic\Pottery\2 Kämpfe\##Kumpf (2a)
- ▽ Kumpf (2b)00010 : Ceramic\Pottery\2 Kämpfe\##Kumpf (2b)
- △ Kumpf (Uncategorized)00010 : Ceramic\Pottery\2 Kämpfe\##Kumpf (Uncategorized)

Figure Appendix 16: Distribution map 15 of Kleinhadersdorf.

Burials in Bytes – A Quantitative Study of Linear Pottery cemeteries

F=116 B=127 NextNei=15 KonfNiv=3 Normkoor=0 Freque=On
 Map 16, Other vessel types
 Hahnekamp Yanik
 Kleinhadersdorf Marchleiten
 LBK Gräberfelder



- Uncategorized sherds00010 : Ceramic\Pottery\##Uncategorized sherds
- ▲ High bowl (3b)00010 : Ceramic\Pottery\3 Bowls\##High bowl (3b)
- Miniature vessel (4c)00010 : Ceramic\Pottery\4 Miniature vessels\##Miniature vessel (4c)

Figure Appendix 17: Distribution map 16 of Kleinhadersdorf.

Burials in Bytes – A Quantitative Study of Linear Pottery cemeteries

F=116.8=129 NextHe=N=15 KonfN=N=3 Normkoo=0 Freque=On

Map 17. Ornaments and unmodified shells

Hahnkamp Yanik

Kleinhadersdorf Marchleiten

LBK Gräberfelder

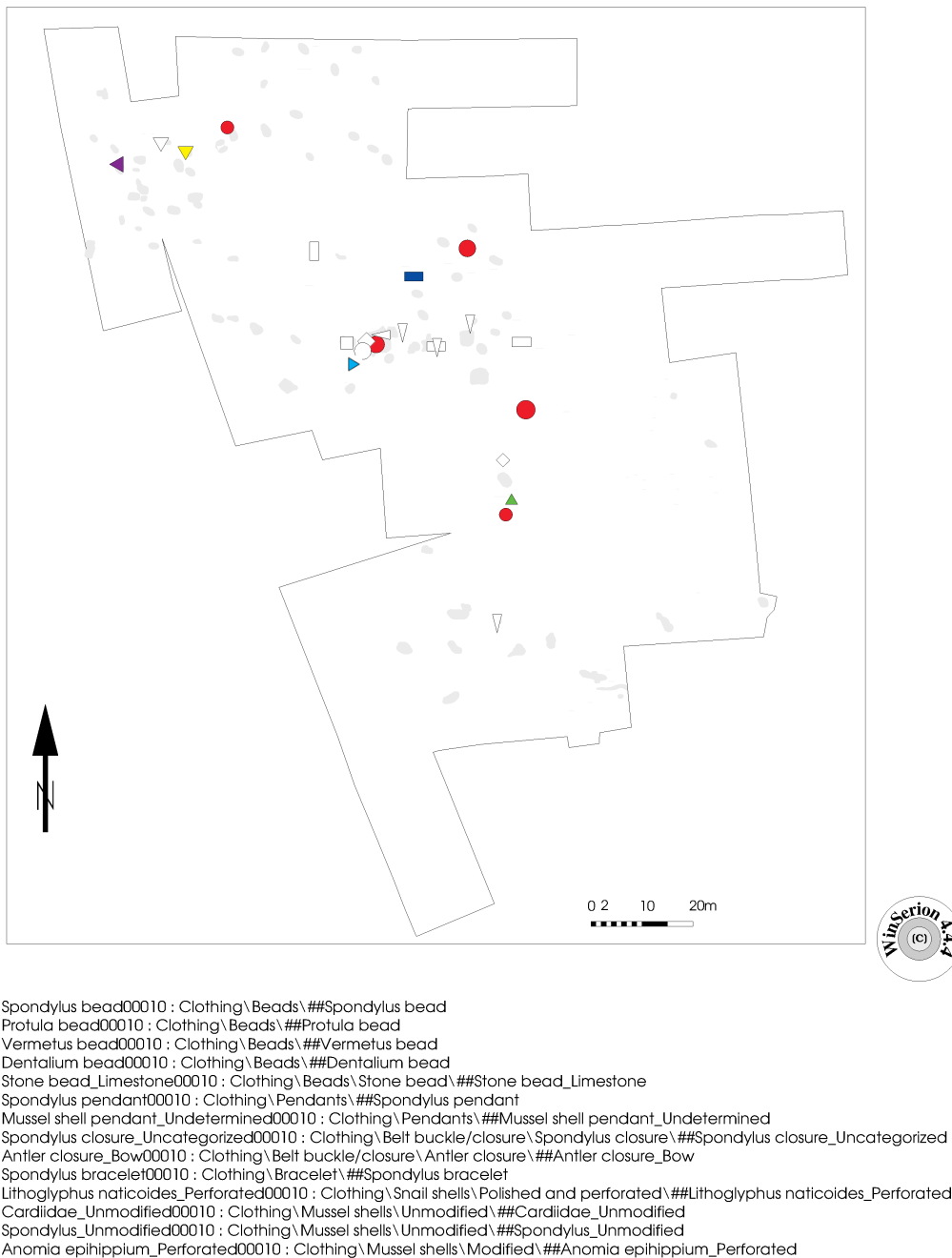


Figure Appendix 18: Distribution map 17 of Kleinhadorsdorf.

Burials in Bytes – A Quantitative Study of Linear Pottery cemeteries

F=11.6 B=127 NextNeib=15 KonfNiv=3 Normkoor=0 Frequ=On

Map 18, Bone artefacts and remains

Hahnekamp Yanik

Kleinhadersdorf Marchleiten

LBK Gräberfelder

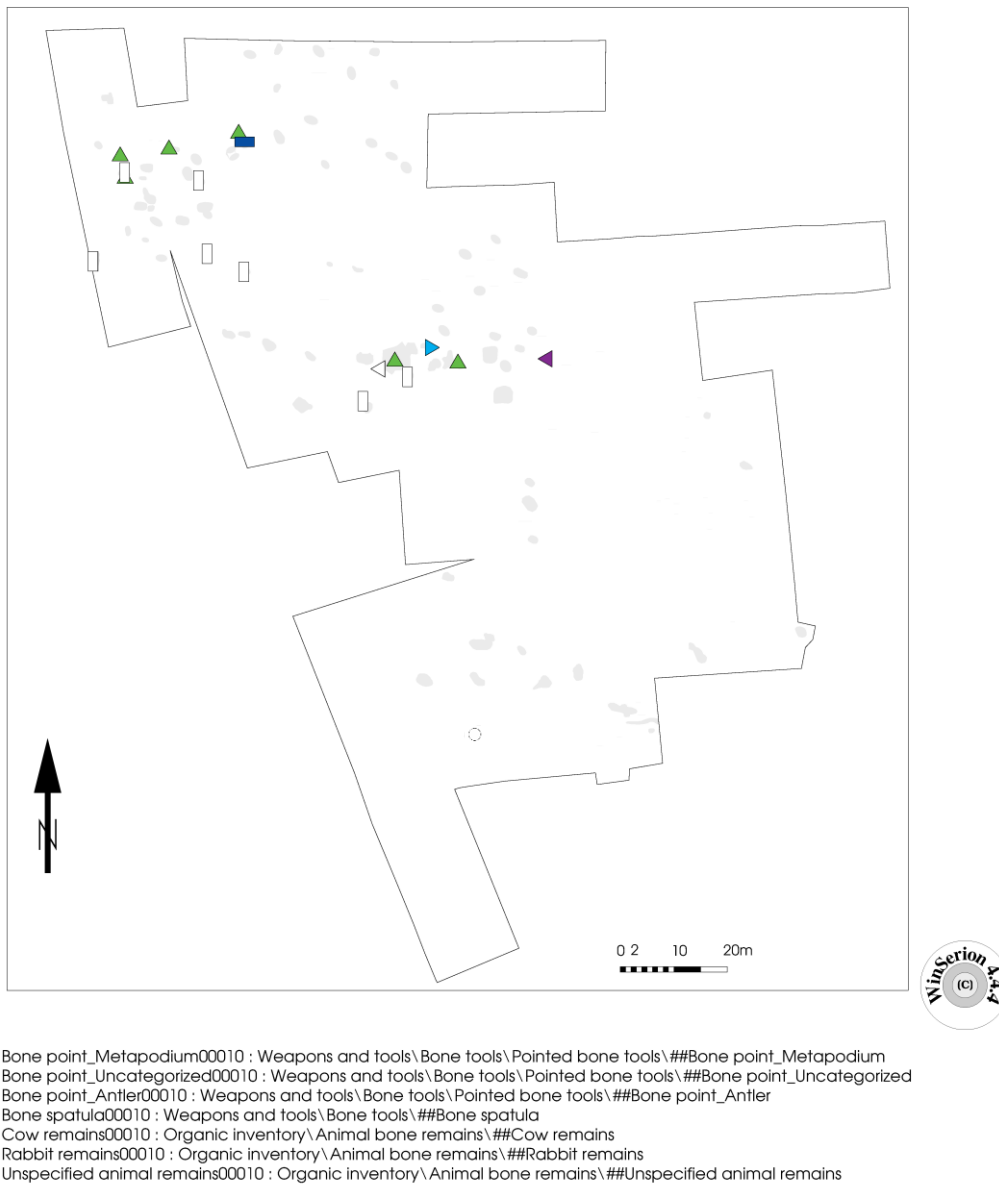


Figure Appendix 19: Distribution map 18 of Kleinhadersdorf.

Burials in Bytes – A Quantitative Study of Linear Pottery cemeteries

F=116 B=127 NextNei=15 KonfNiv=3 Normkoor=0 Frequ=On

Map 19, Hammerstones, nodules and pebbles
Hahnekamp Yanik
Kleinhadersdorf Marchleiten
LBK Gräberfelder



Figure Appendix 20: Distribution map 19 of Kleinhadersdorf.

Burials in Bytes – A Quantitative Study of Linear Pottery cemeteries

F=116 B=127 NextNeib=15 KonfNiv=3 Normkoor=0 Frequ=On

Map20, Grinding tools
Hahnekamp Yanik
Kleinhadersdorf Marchleiten
LBK Gräberfelder

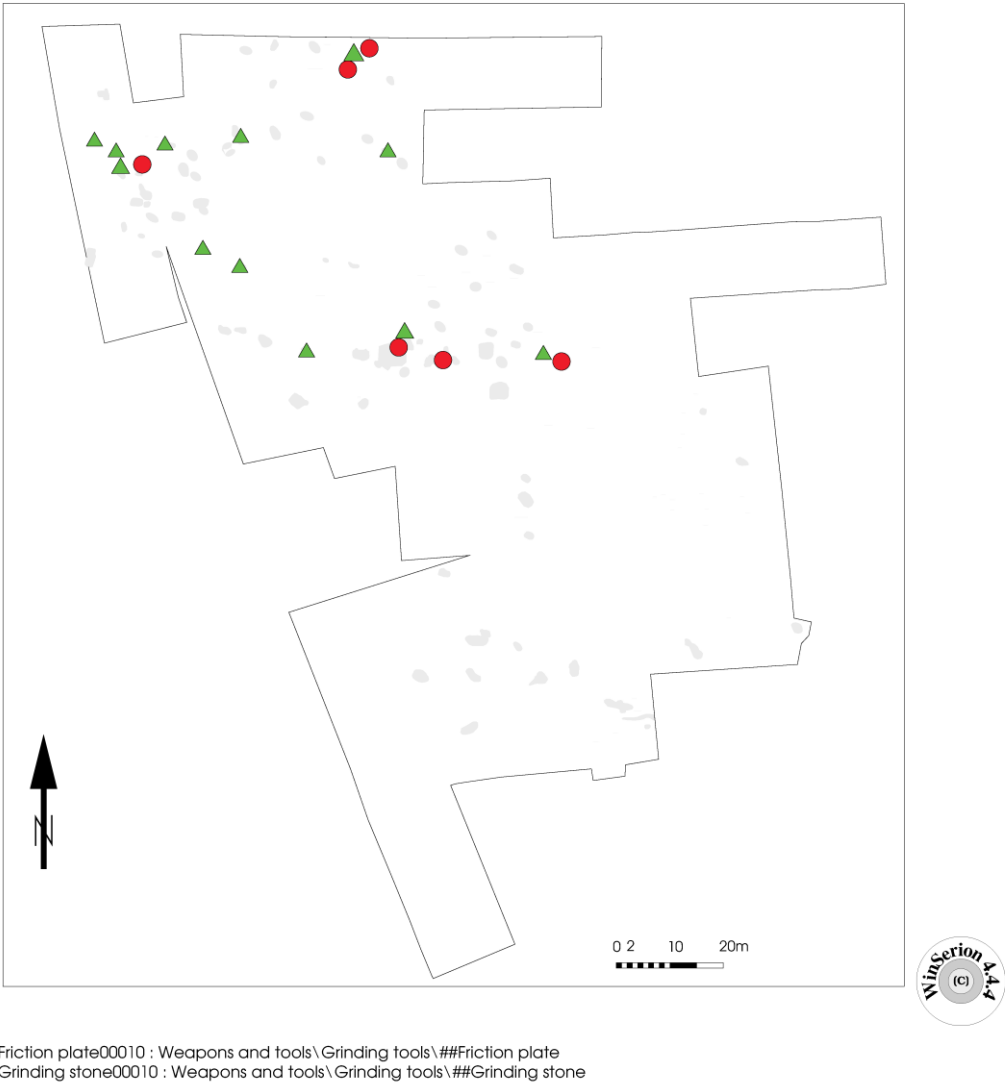


Figure Appendix 21: Distribution map 20 of Kleinhadersdorf.

Burials in Bytes – A Quantitative Study of Linear Pottery cemeteries

F=116 B=127 NextNeib=15 KonfNiv=3 Normkoor=0 Freque=On
Map21, Colouring
Hahnekamp Yanik
Kleinhadersdorf Marchleiten
LBK Gräberfelder



- Red chalk powder00010 : Mineral resources\Colouring\###Red chalk powder
- ▶ Graphite stone00010 : Mineral resources\Colouring\###Graphite stone\Not perforated

Figure Appendix 22: Distribution map 21 of Kleinhadersdorf.

Burials in Bytes – A Quantitative Study of Linear Pottery cemeteries

F=116 B=127 NextNeiN=15 KonfNivN=3 Normkoor=0 Freque=On

Map22, Polished stone tools

Hahnekamp Yanik

Kleinhadersdorf Marchleiten

LBK Gräberfelder

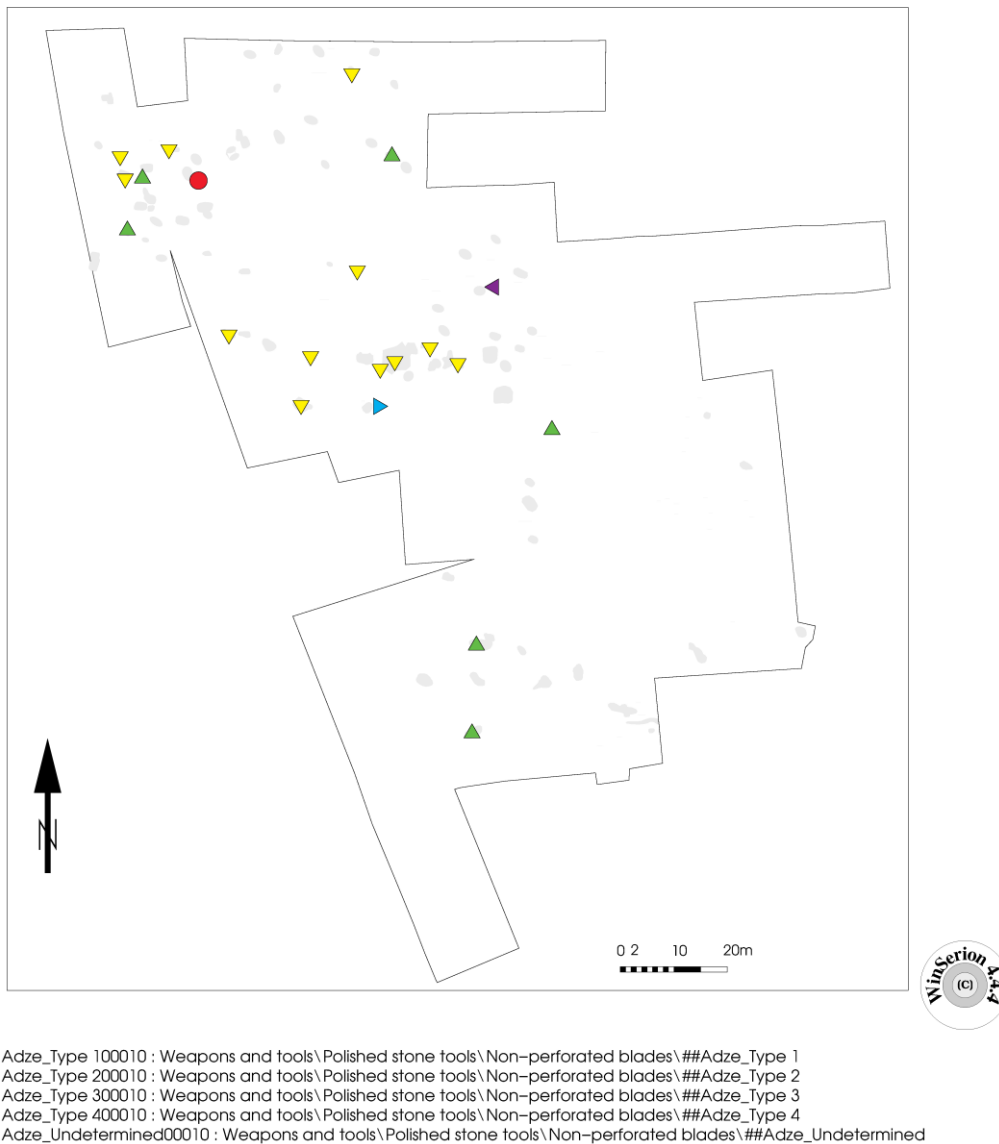


Figure Appendix 23: Distribution map 22 of Kleinhadersdorf.

Burials in Bytes – A Quantitative Study of Linear Pottery cemeteries

F=116 B=127 NextNeib=15 KonfNiv=3 Normkoor=0 Frequ=On

Map23. Chert tools and arrowheads

Hahnekamp Yanik

Kleinhadersdorf Marchleiten

LBK Gräberfelder



Figure Appendix 24: Distribution map 23 of Kleinhadersdorf.

Burials in Bytes – A Quantitative Study of Linear Pottery cemeteries

LBK Gräberfelder

Archäologische Daten, Kleinhadersdorf Marchleiten, ANN1

Bearbeitung: Hahnekamp Yanik 2020

monovariate Clusteranalysis with Eigenvectors

Reciprocal Averaging,

Analysis of N Next Neighbours by 1 Type

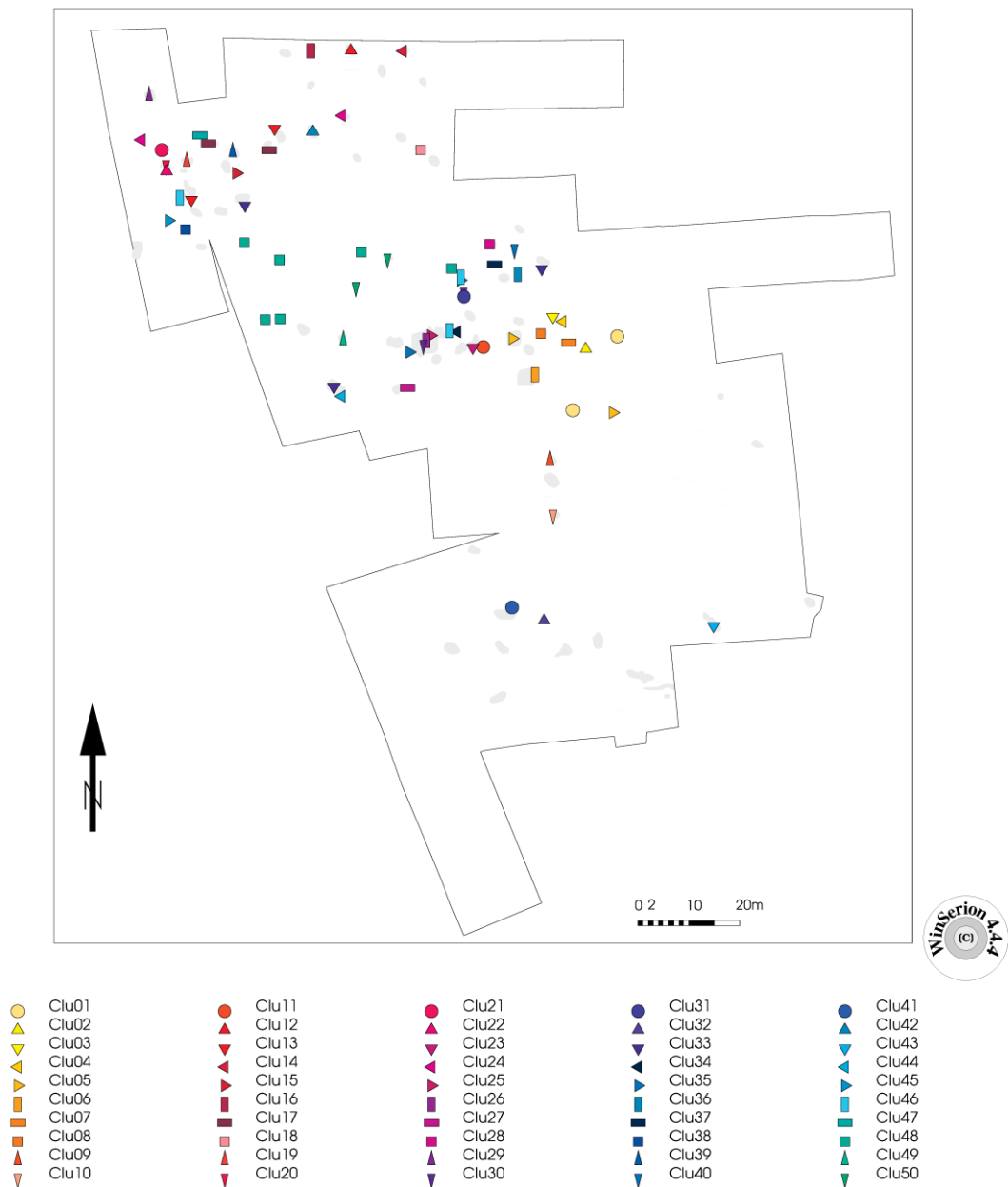


Figure Appendix 25: Analysis N Next Neighbours of pit orientation and burial position at Kleinhadersdorf.

Burials in Bytes – A Quantitative Study of Linear Pottery cemeteries

LBK Gräberfelder

Archäologische Daten, Kleinhadersdorf Marchleiten, ANN1

Bearbeitung: Hahnekamp Yanik 2020

monivariate Clusteranalysis with Eigenvectors

Reciprocal Averaging,

Analysis of N Next Neighbours by 1 Type

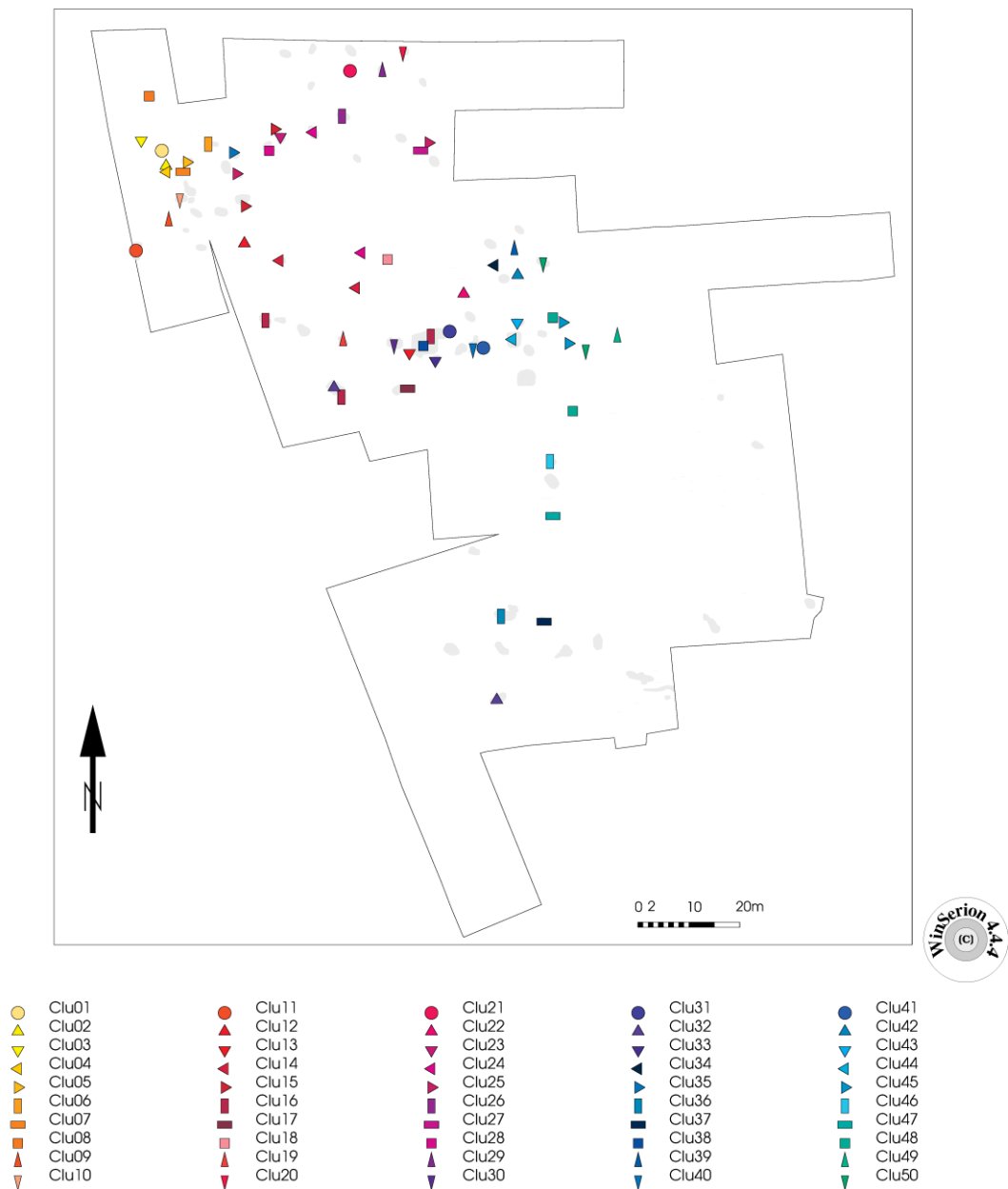


Figure Appendix 26: Analysis N Next Neighbours of grave goods and burial type at Kleinhadersdorf.

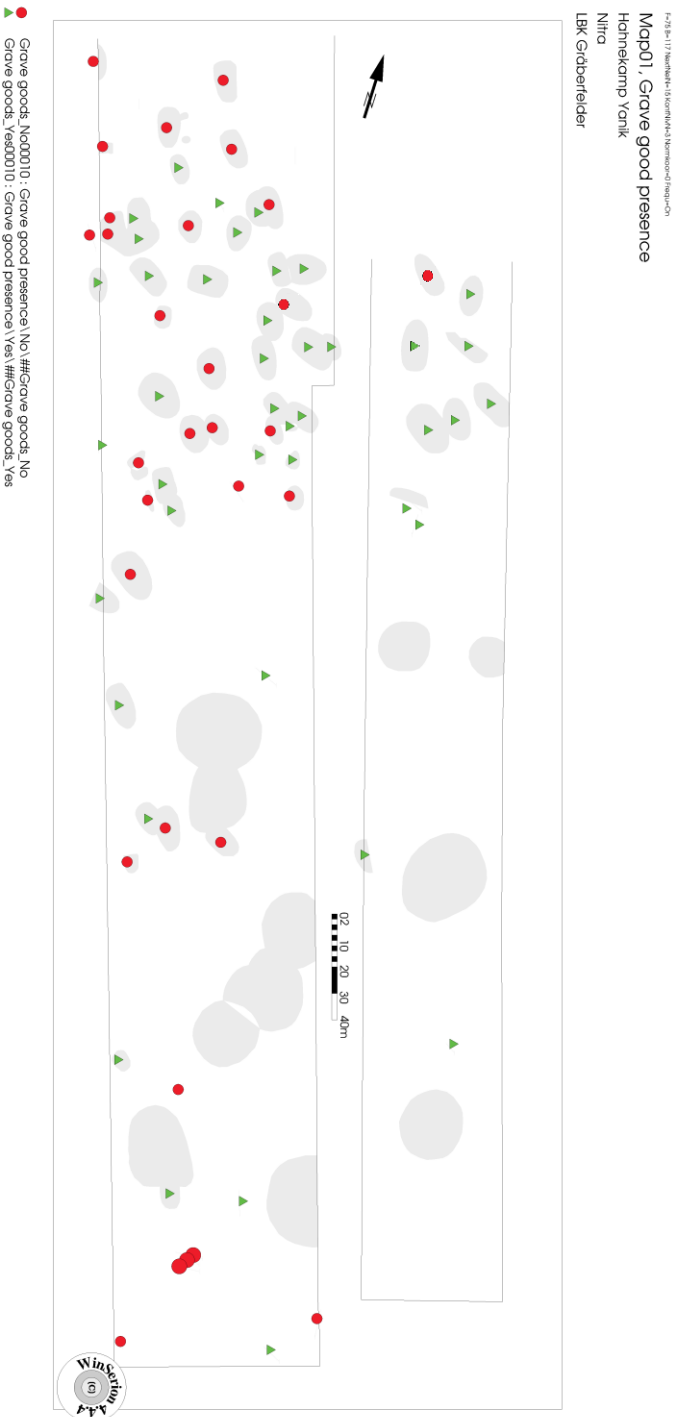


Figure Appendix 27: Distribution map 1 of Nitra.

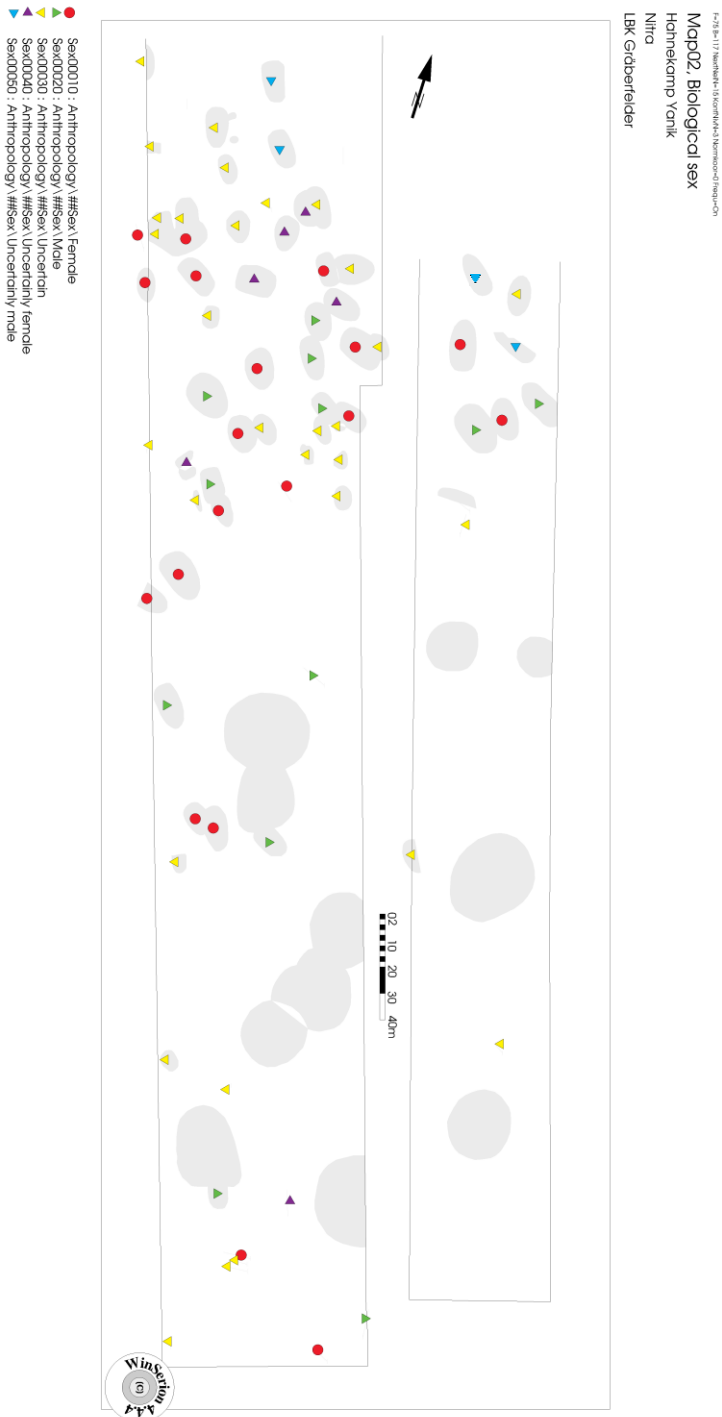


Figure Appendix 28: Distribution map 2 of Nitra.

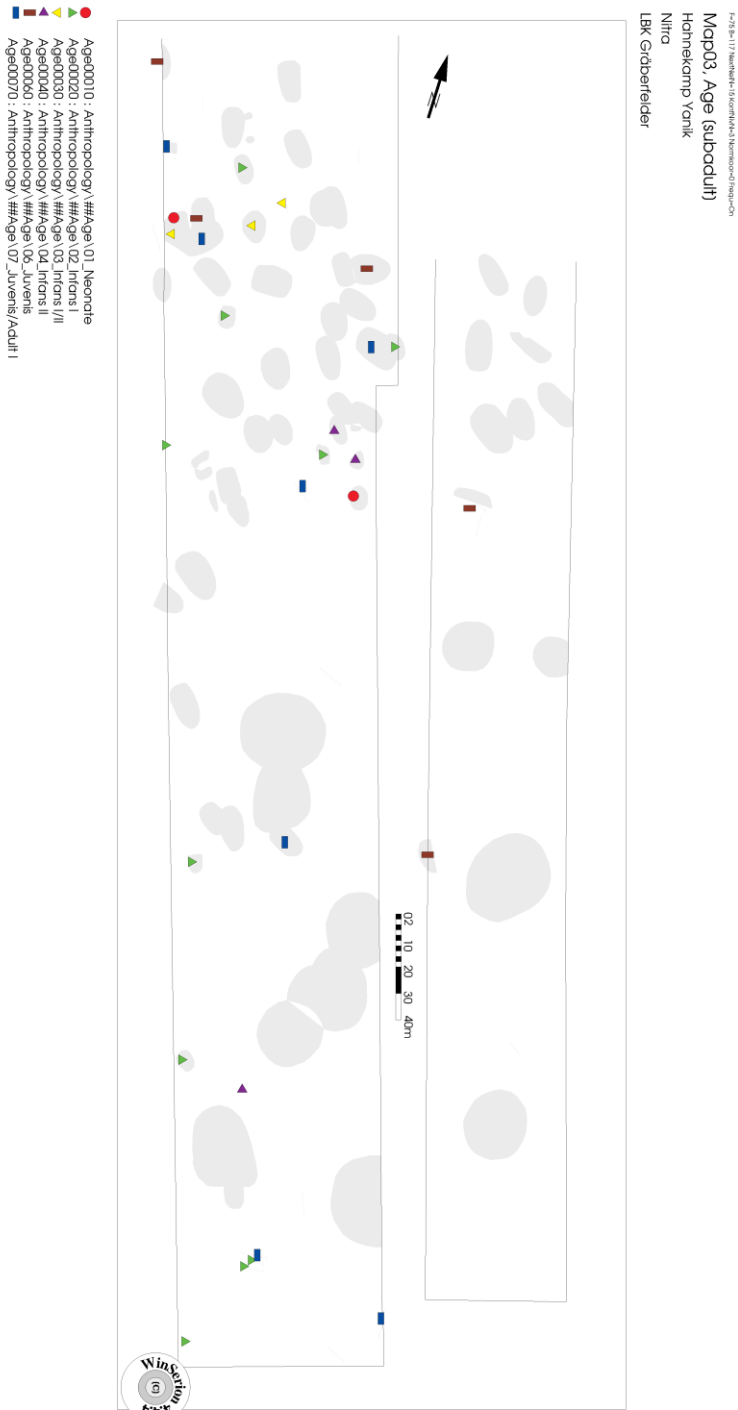


Figure Appendix 29: Distribution map 3 of Nitra.

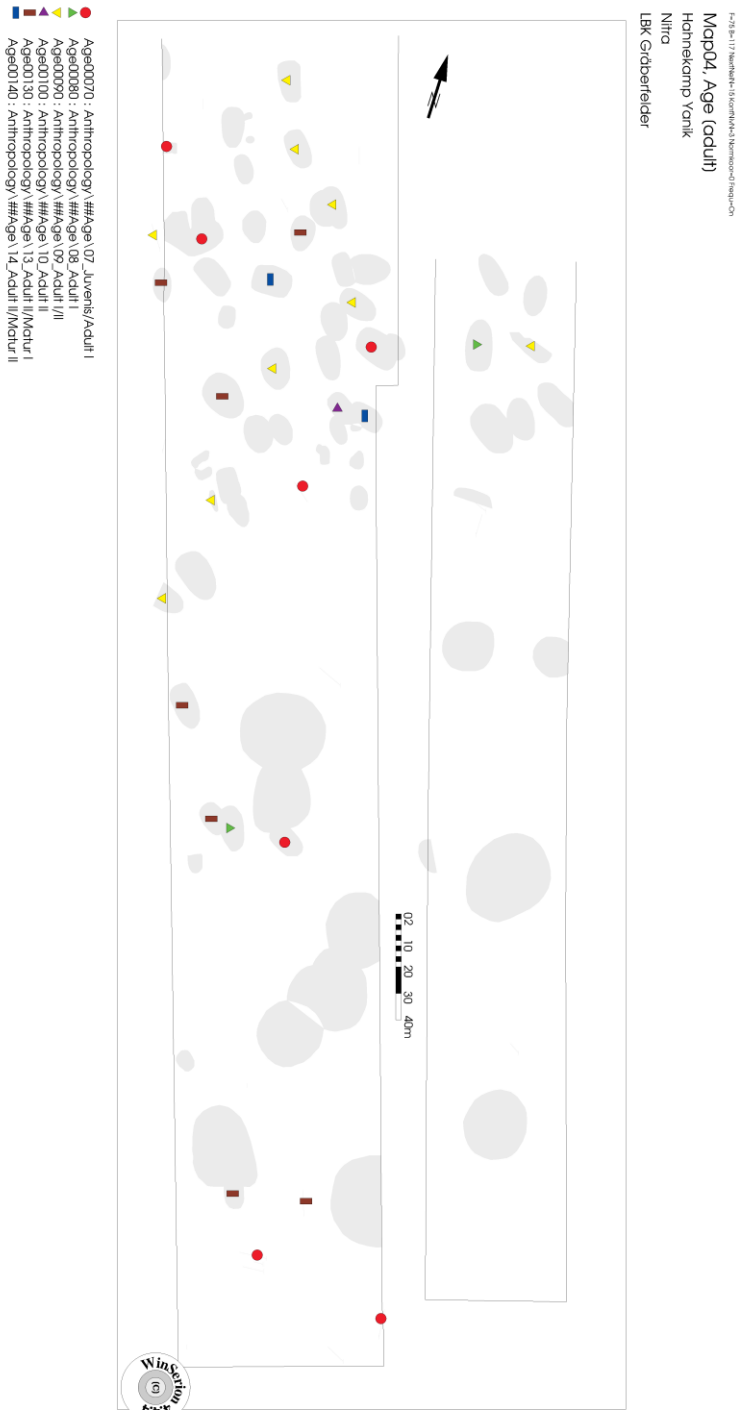


Figure Appendix 30: Distribution map 4 of Nitra.

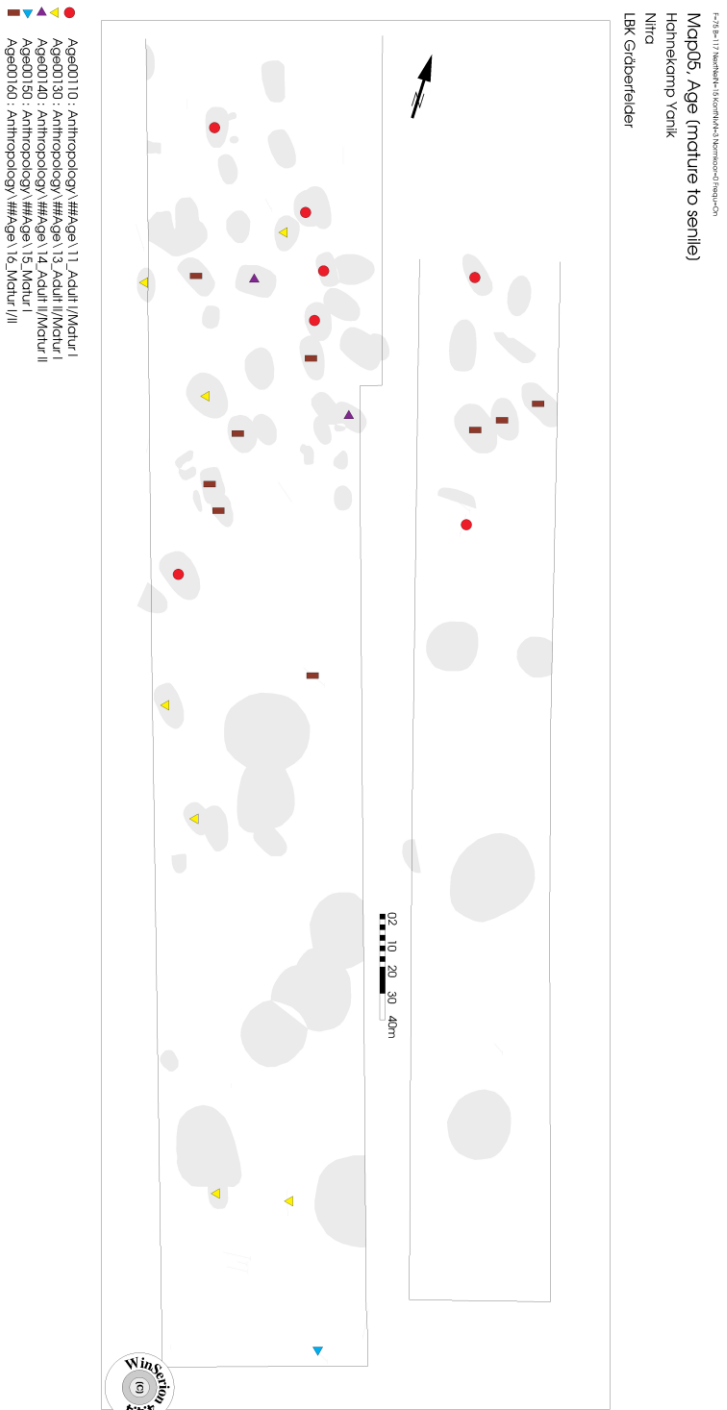


Figure Appendix 31: Distribution map 5 of Nitra.

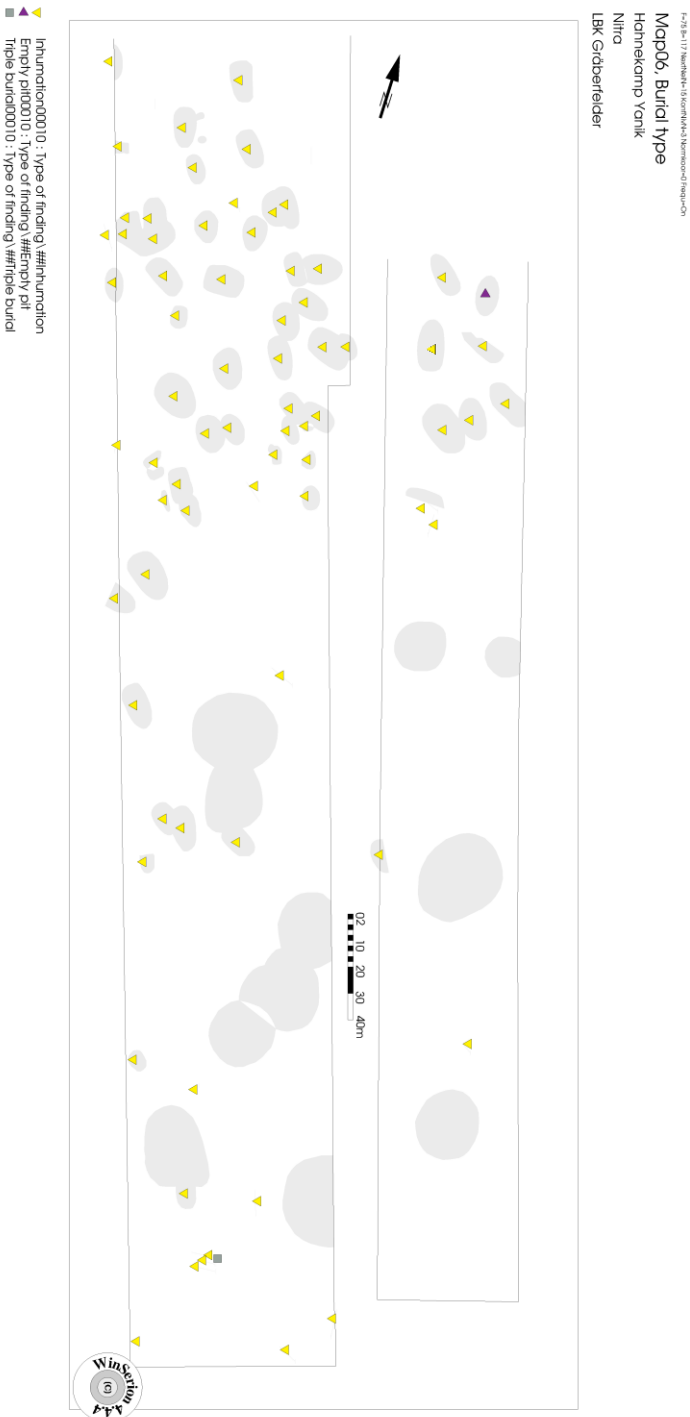


Figure Appendix 32: Distribution map 6 of Nitra.

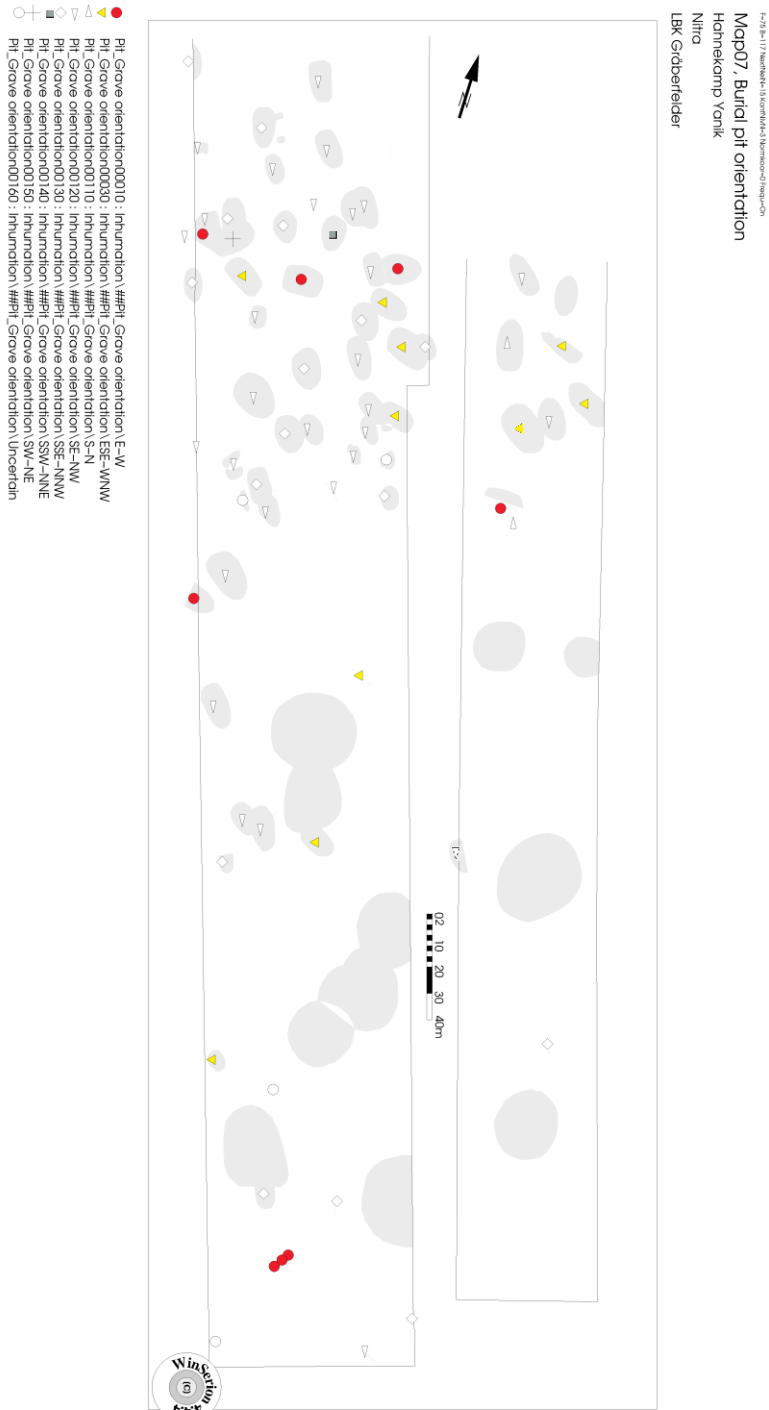


Figure Appendix 33: Distribution map 7 of Nitra.

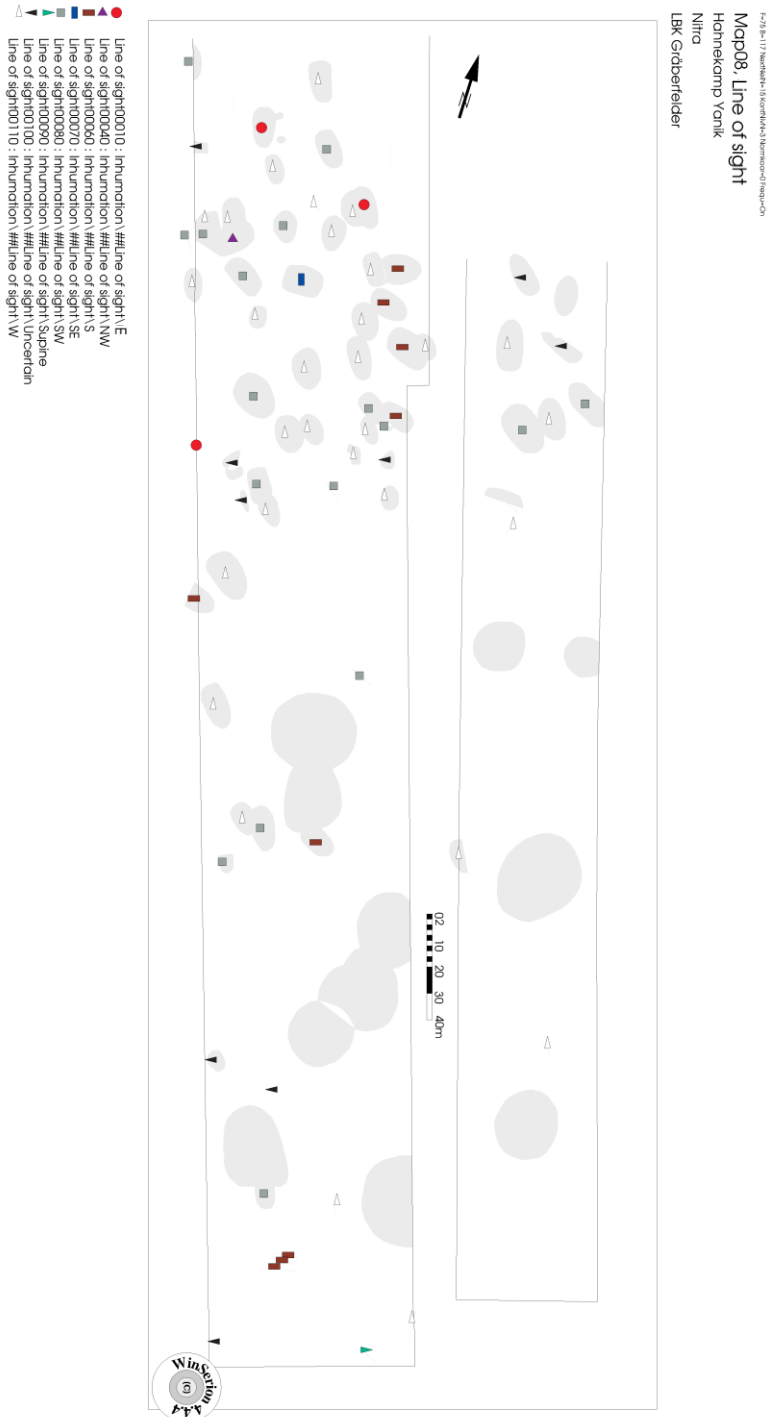


Figure Appendix 34: Distribution map 8 of Nitra.

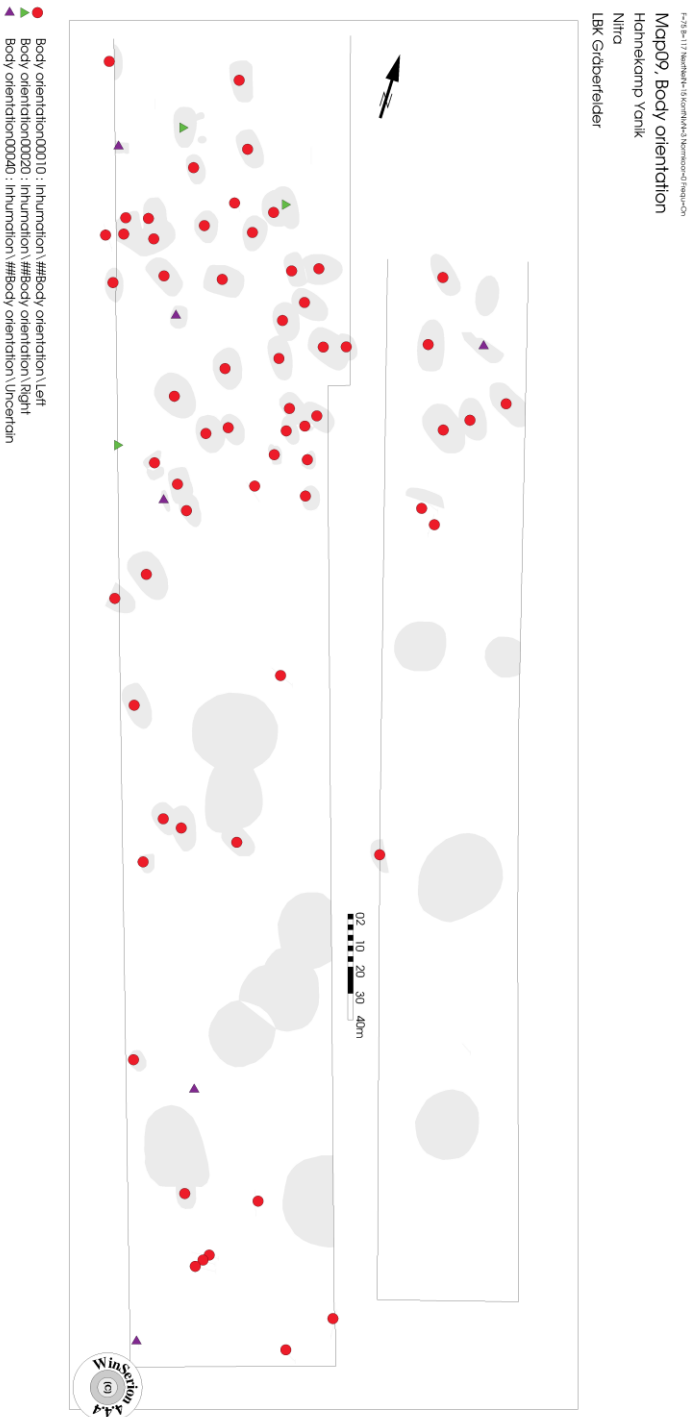


Figure Appendix 35: Distribution map 9 of Nitra.

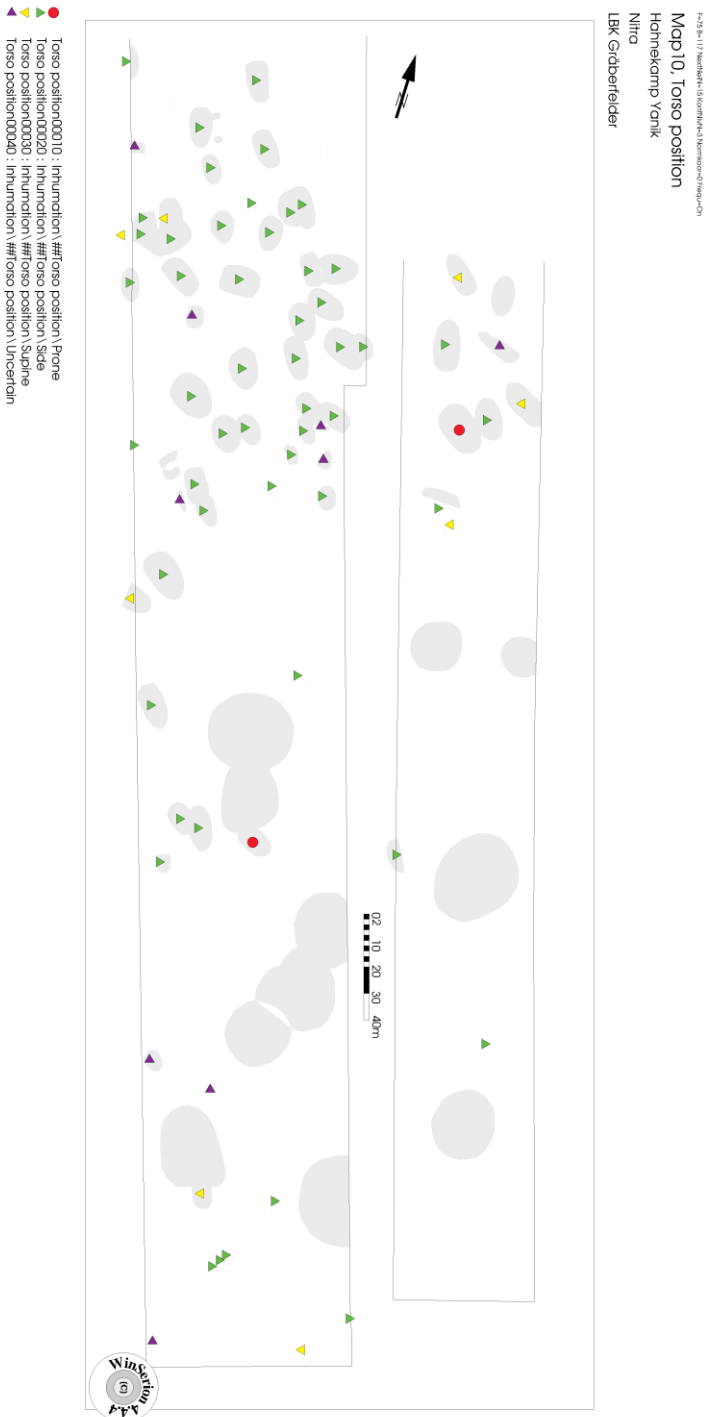


Figure Appendix 36: Distribution map 10 of Nitra.

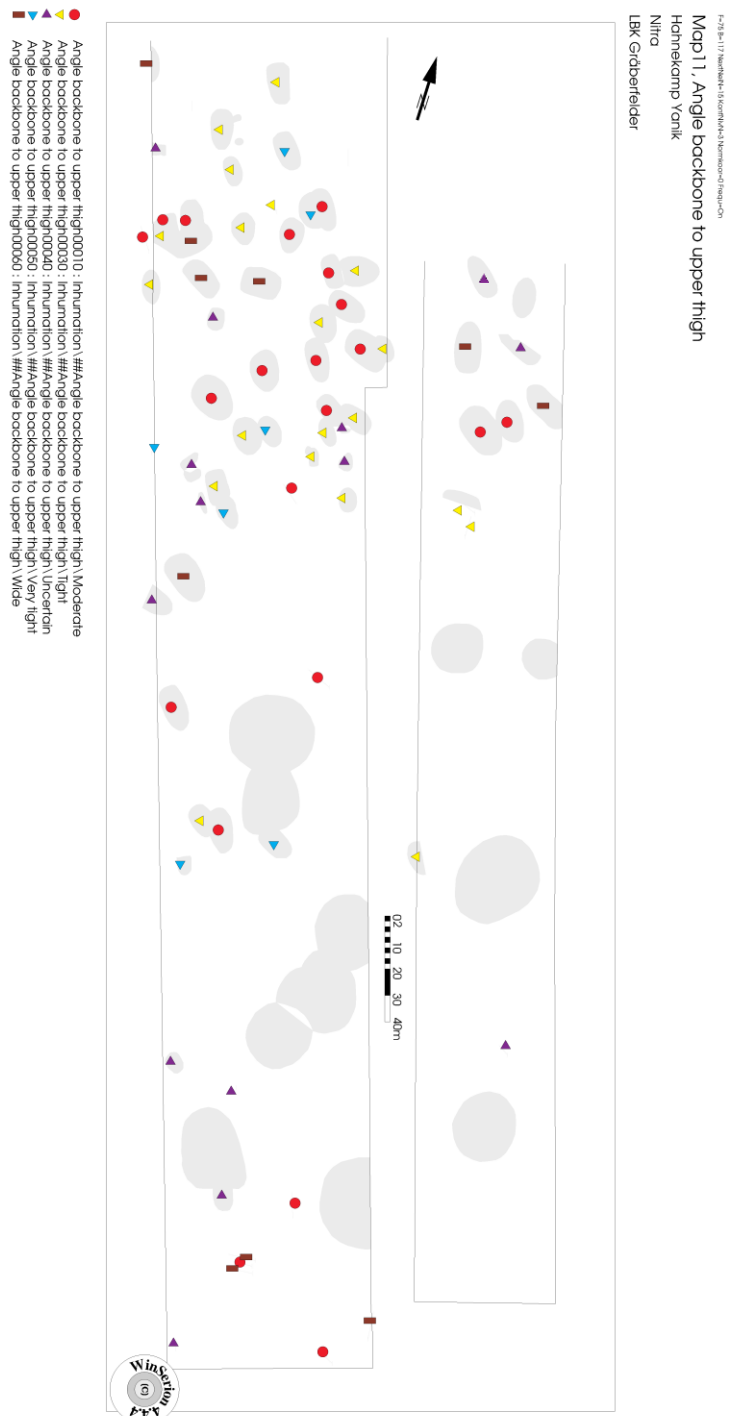


Figure Appendix 37: Distribution map 11 of Nitra.

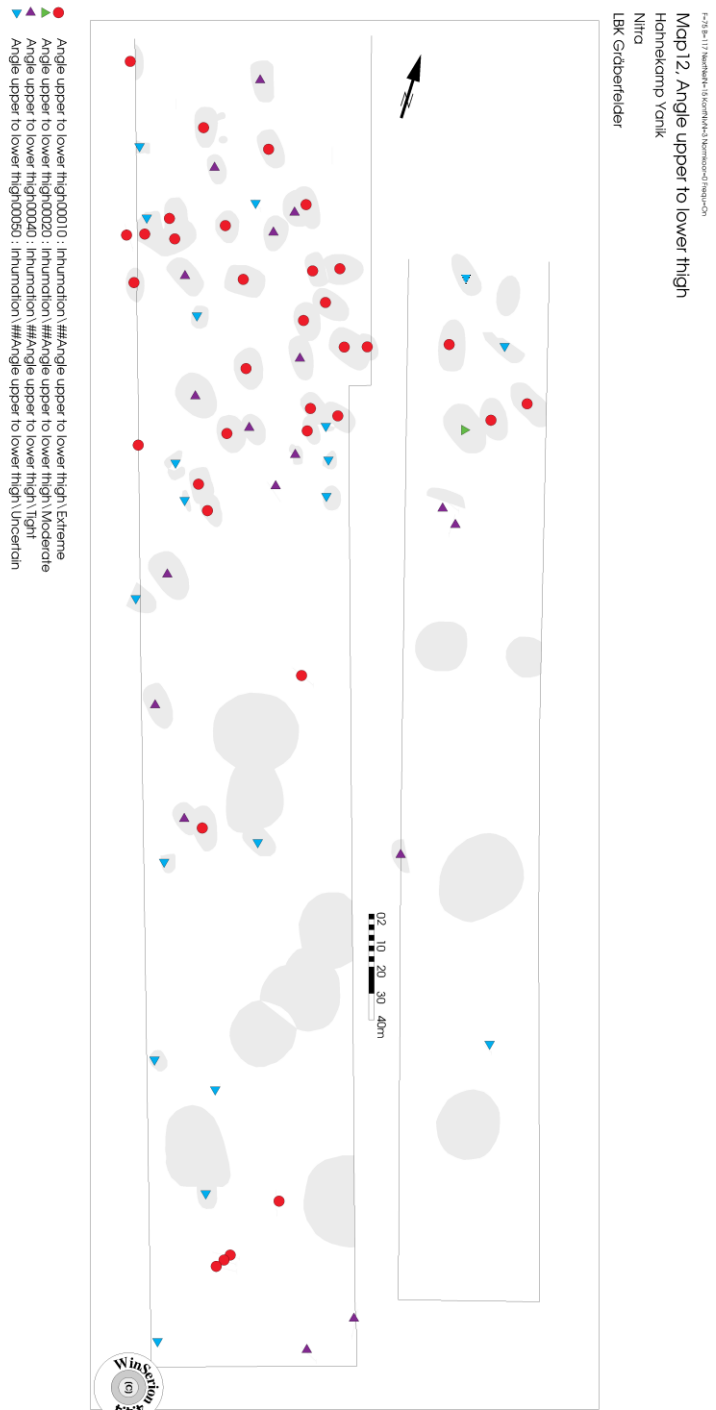


Figure Appendix 38: Distribution map 12 of Nitra.

Burials in Bytes – A Quantitative Study of Linear Pottery cemeteries

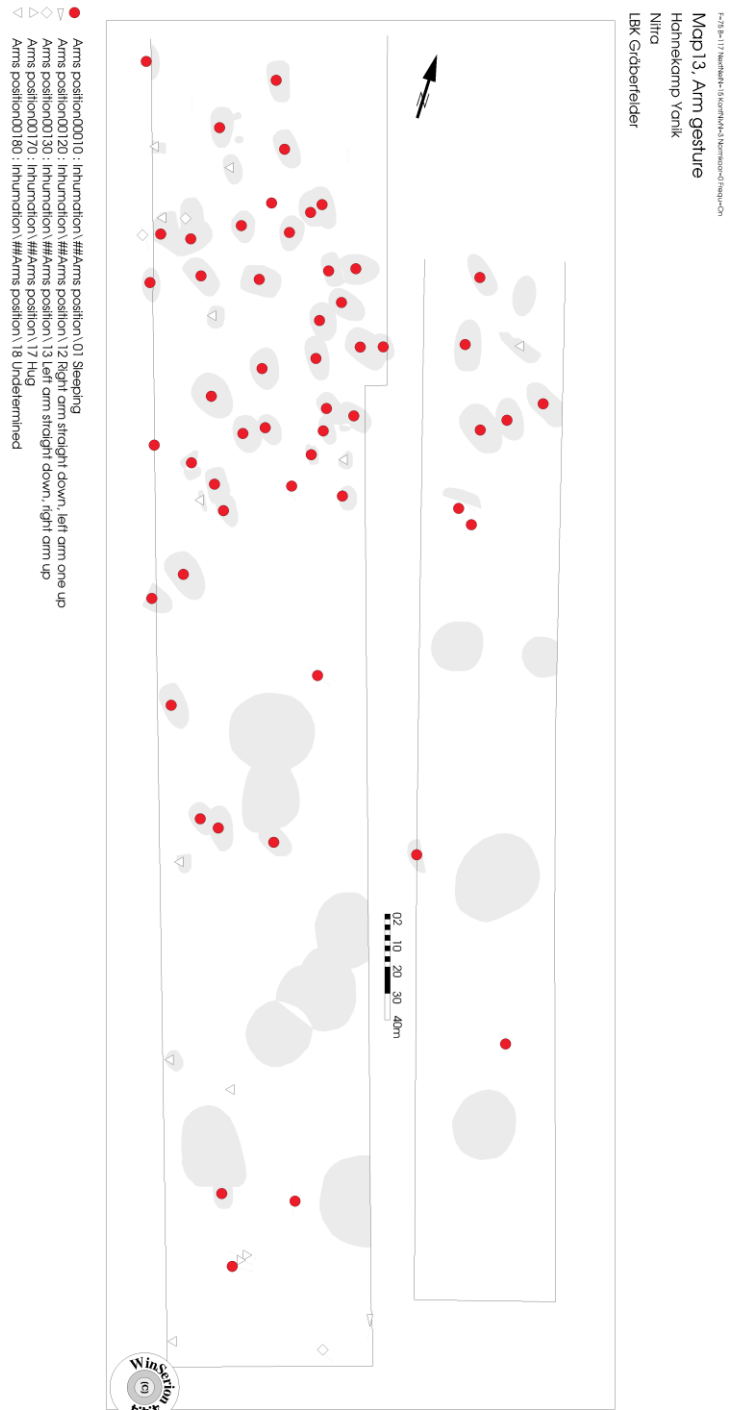


Figure Appendix 39: Distribution map 13 of Nitra.

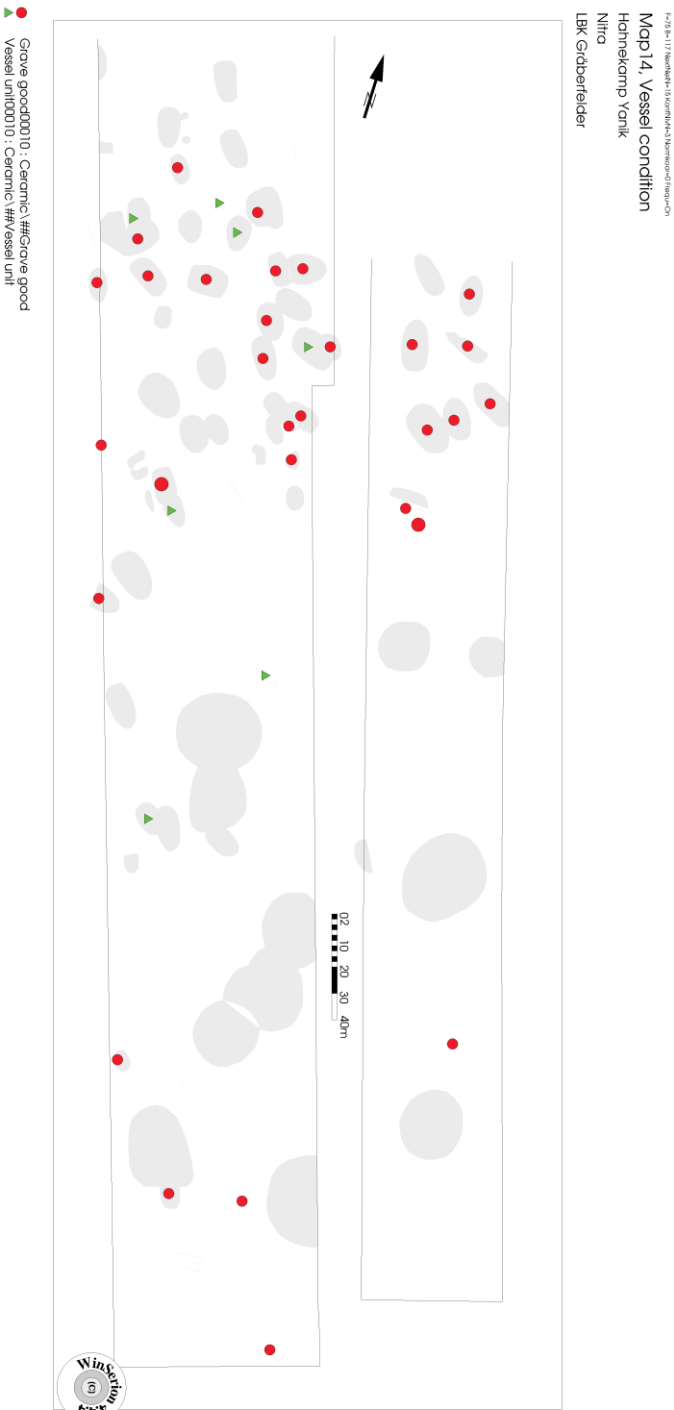


Figure Appendix 40: Distribution map 14 of Nitra.

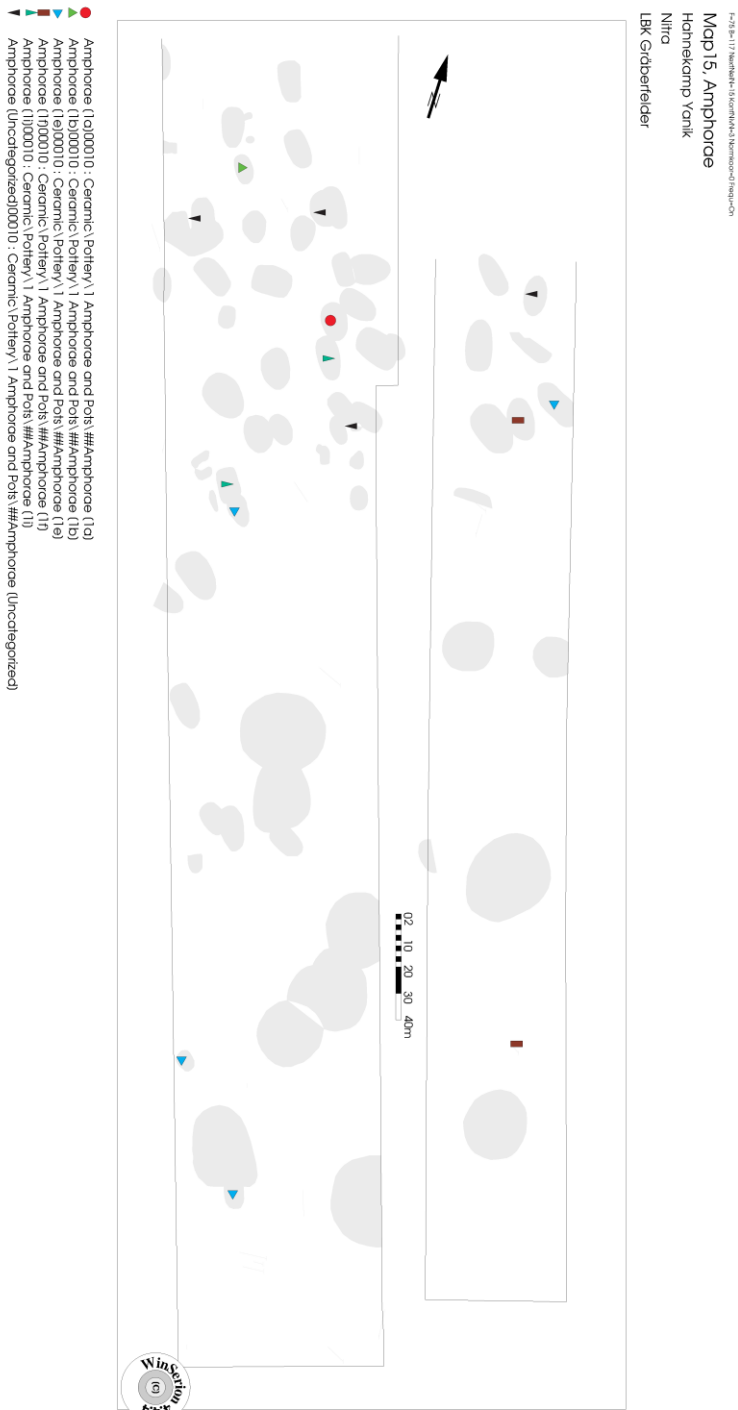


Figure Appendix 41: Distribution map 15 of Nitra.

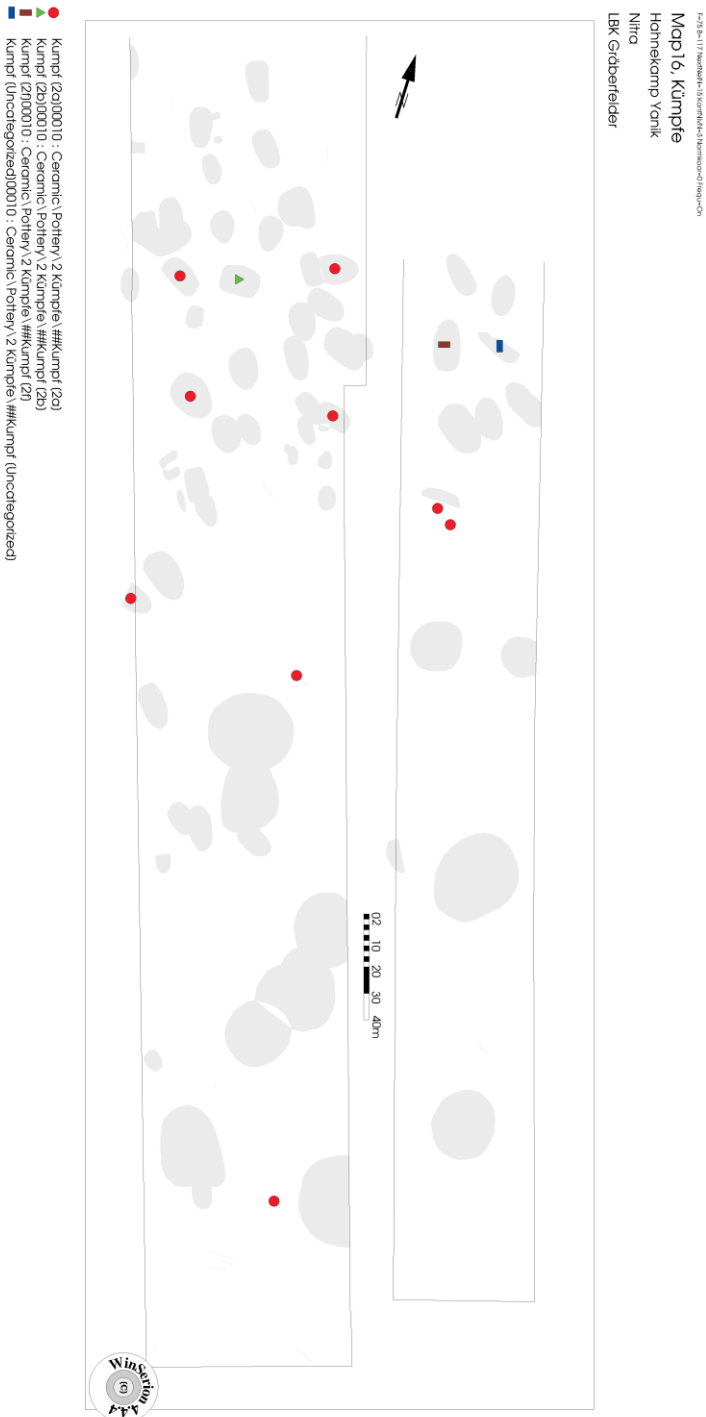


Figure Appendix 42: Distribution map 16 of Nitra.

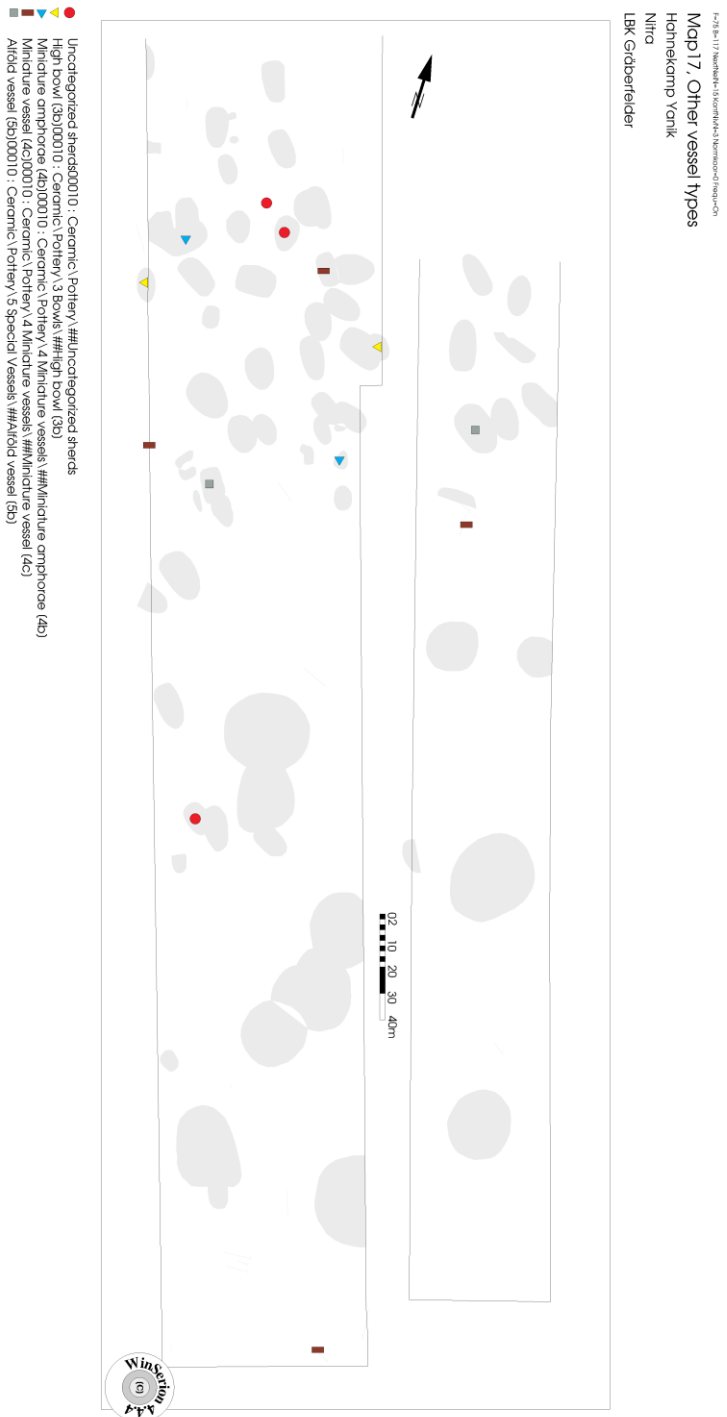


Figure Appendix 43: Distribution map 17 of Nitra.

Burials in Bytes – A Quantitative Study of Linear Pottery cemeteries

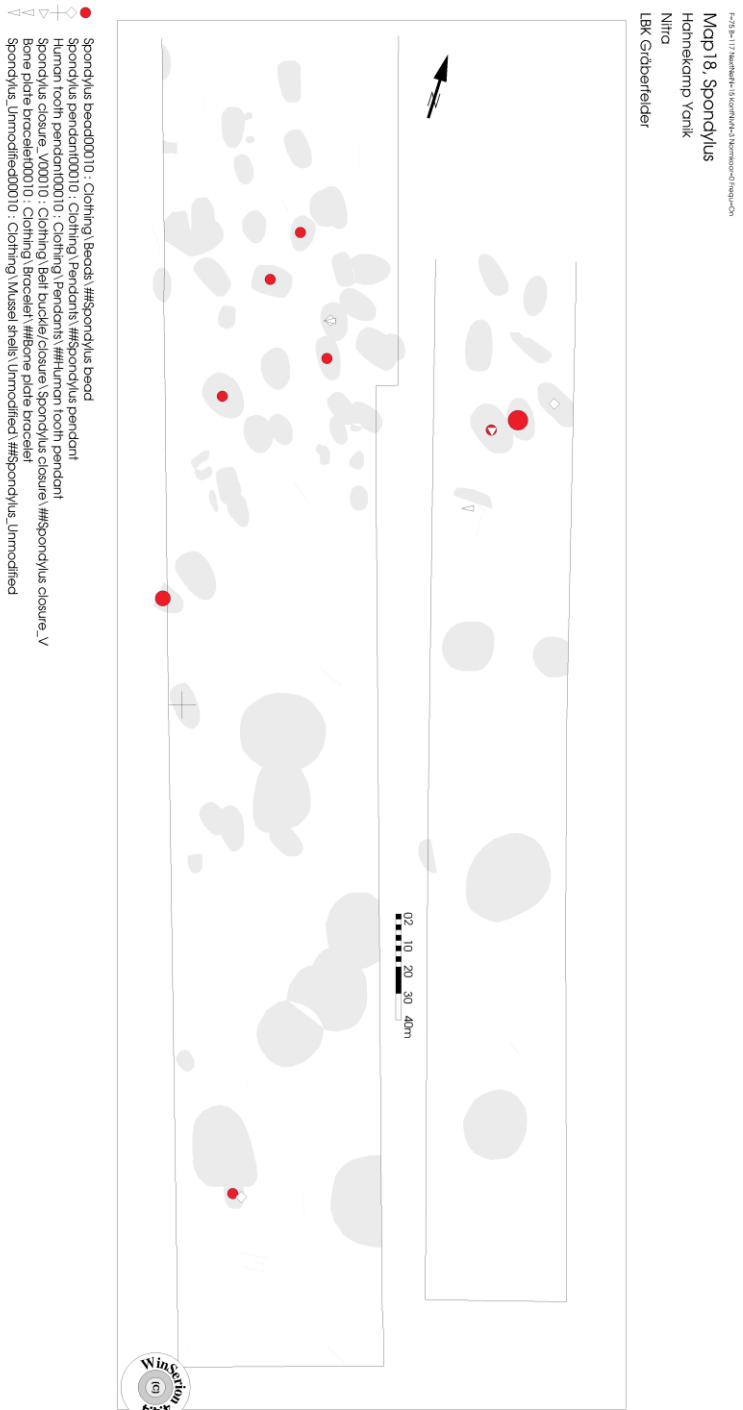


Figure Appendix 44: Distribution map 18 of Nitra.

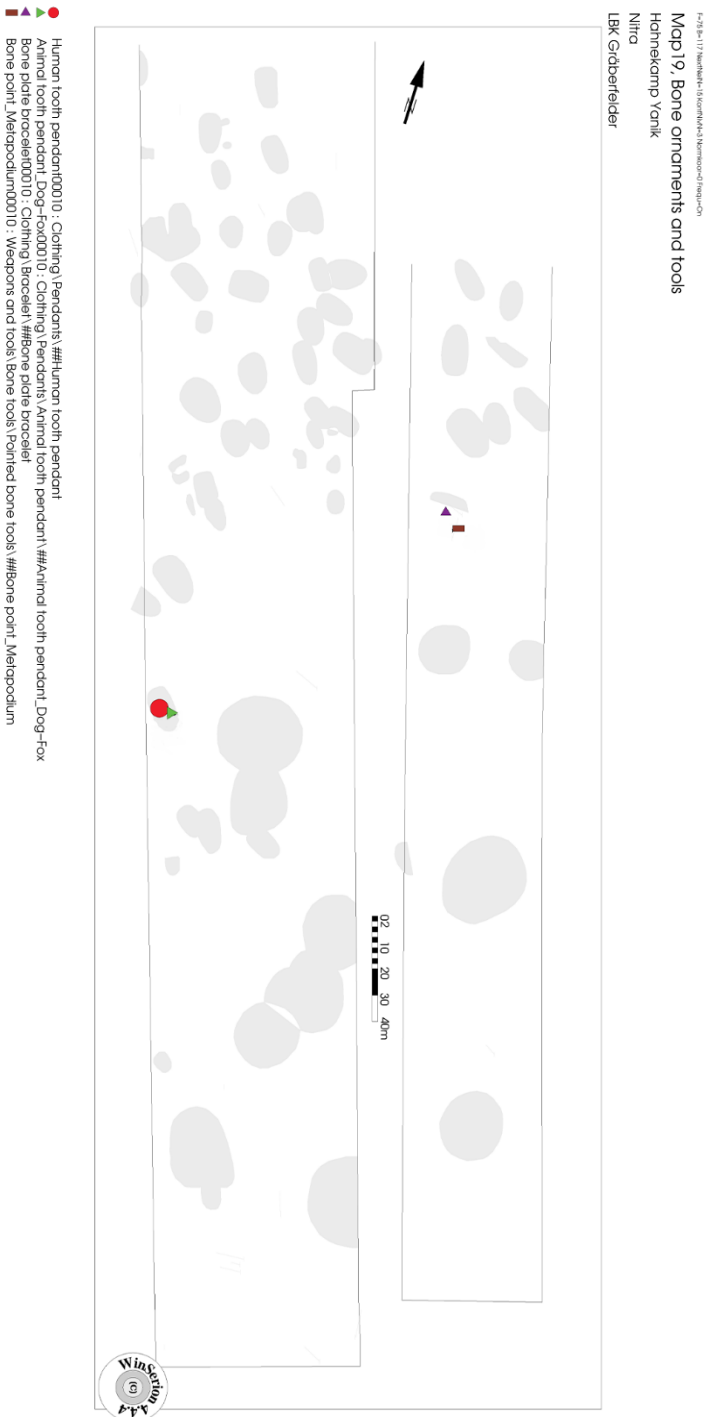


Figure Appendix 45: Distribution map 19 of Nitra.

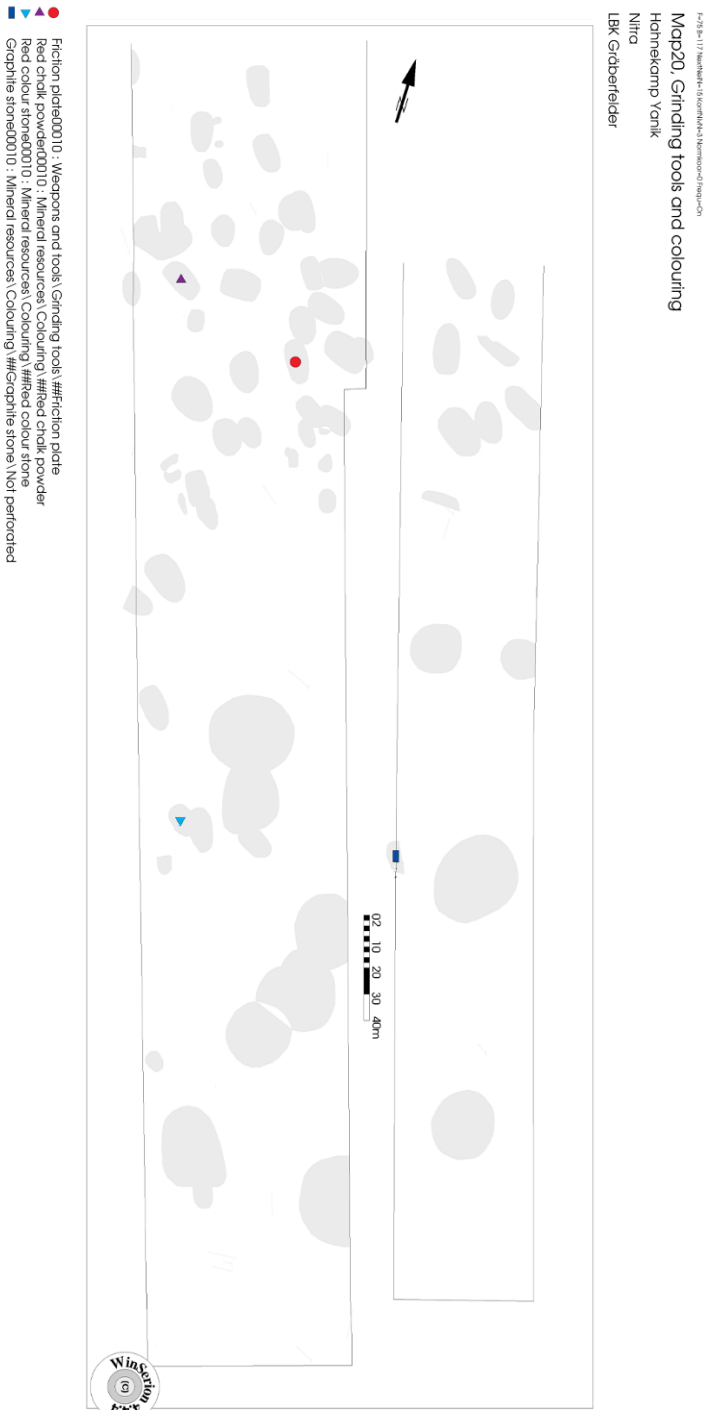


Figure Appendix 46: Distribution map 20 of Nitra.

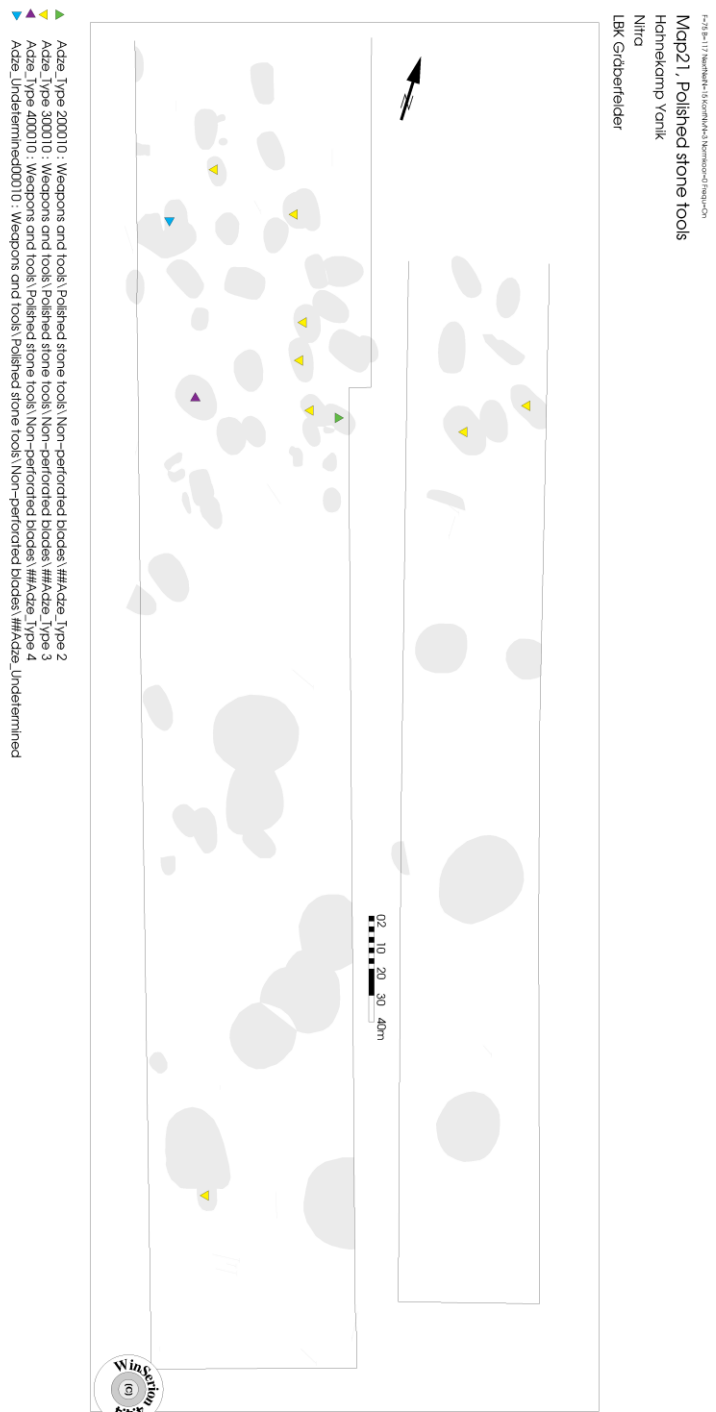


Figure Appendix 47: Distribution map 21 of Nitra.

Map22: Chert tools and arrowheads
Hahnemann Yanik
Nitra
LBK Girdberfelder

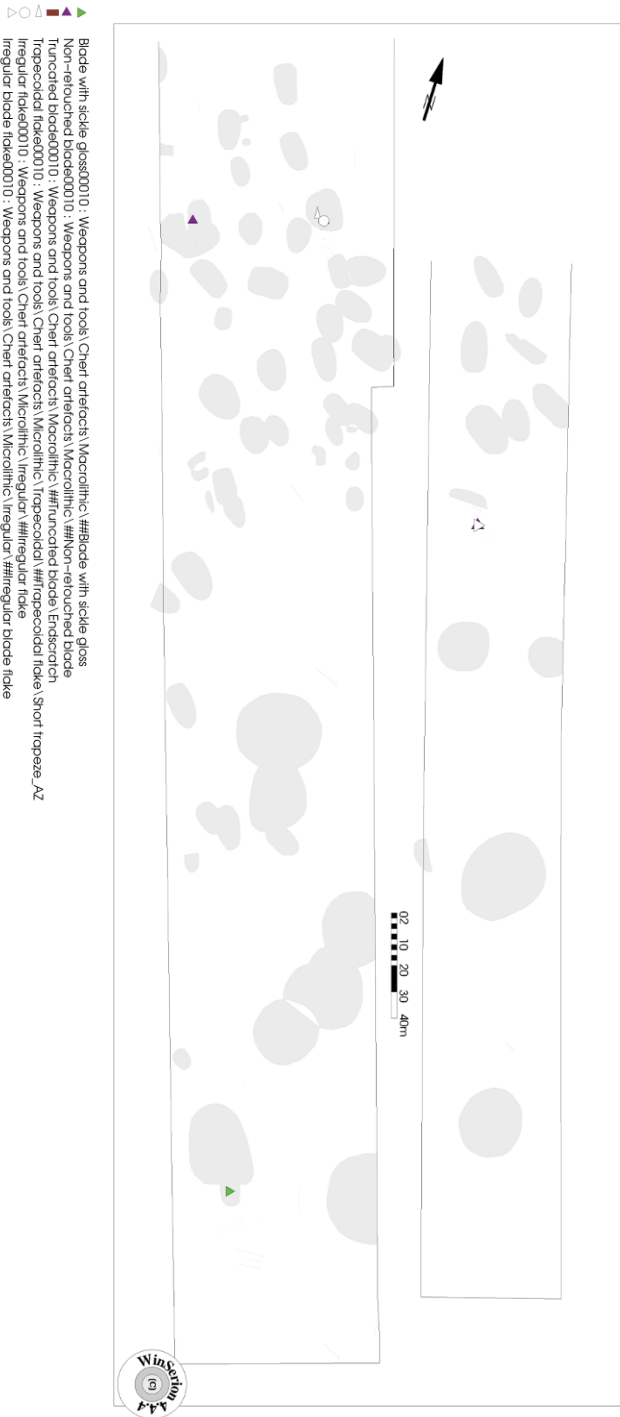


Figure Appendix 48: Distribution map 22 of Nitra.

Map23: Relative chronology
Hahnemann Yanik
Nitro
LBK Girdberfelder

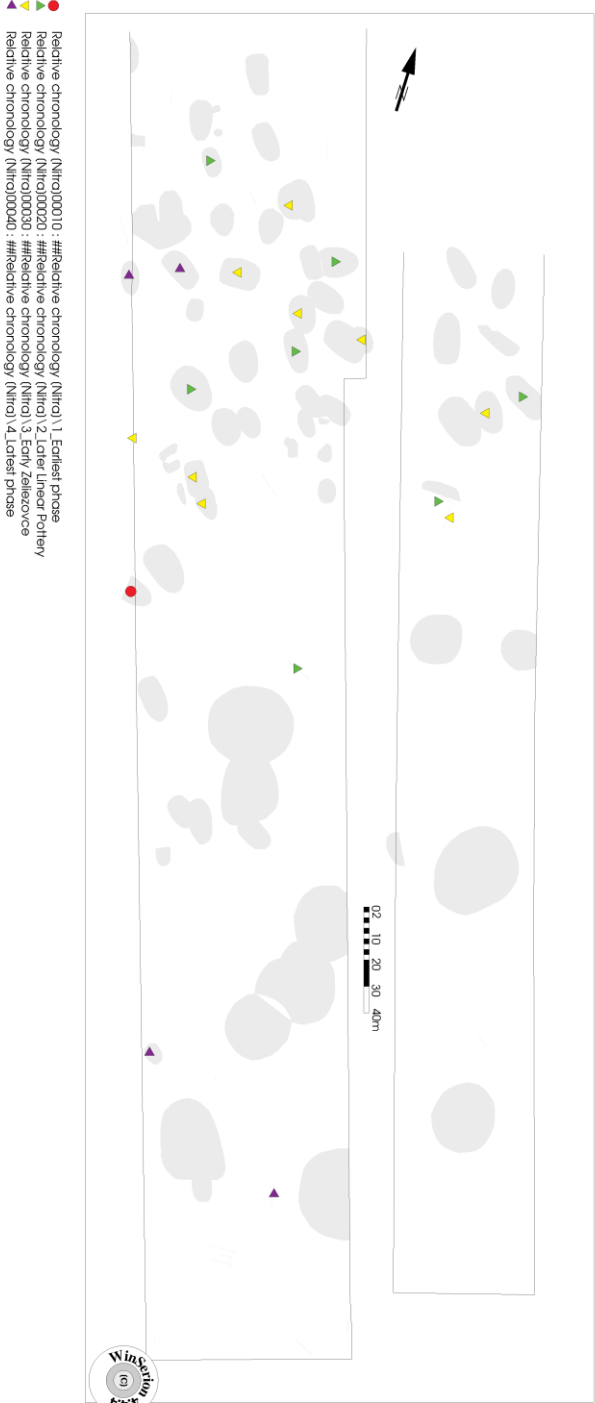


Figure Appendix 49: Distribution map 23 of Nitra.

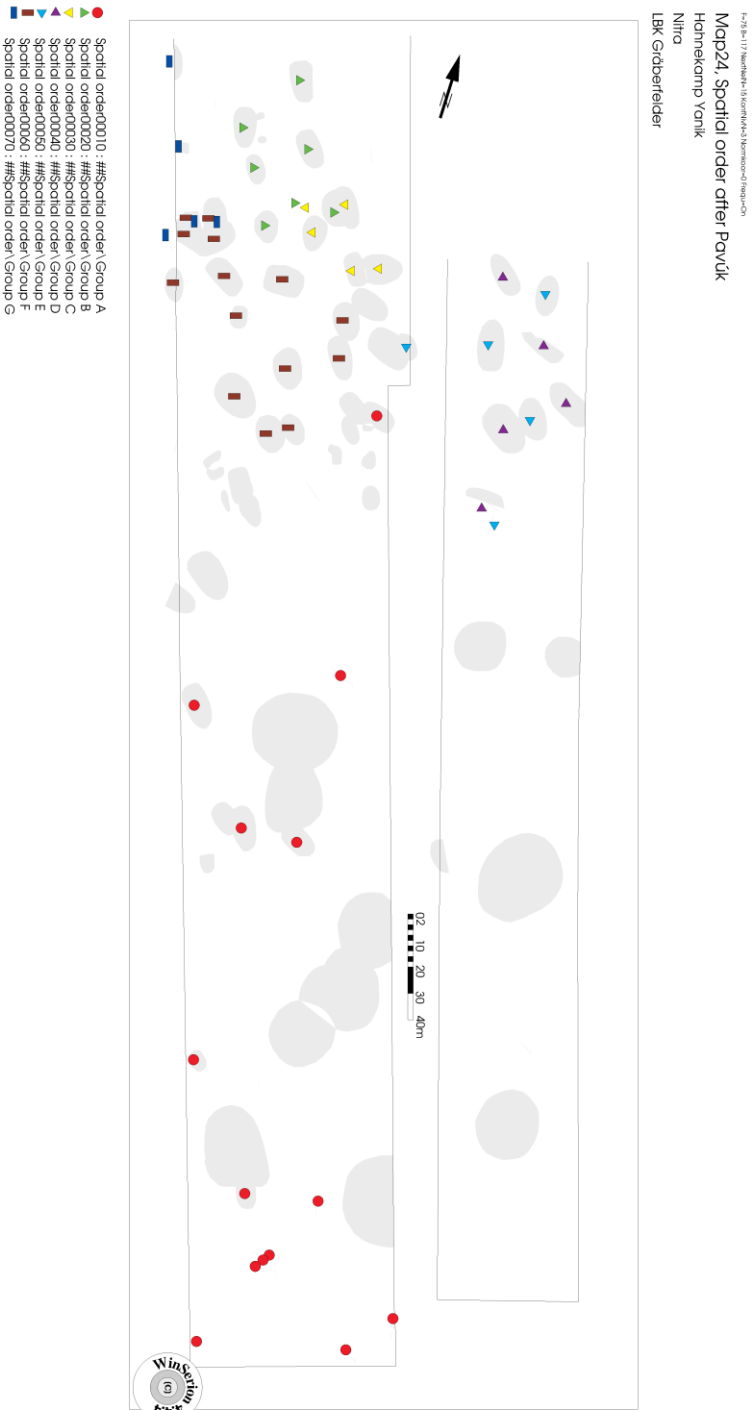


Figure Appendix 50: Distribution map 24 of Nitra.

Burials in Bytes – A Quantitative Study of Linear Pottery cemeteries

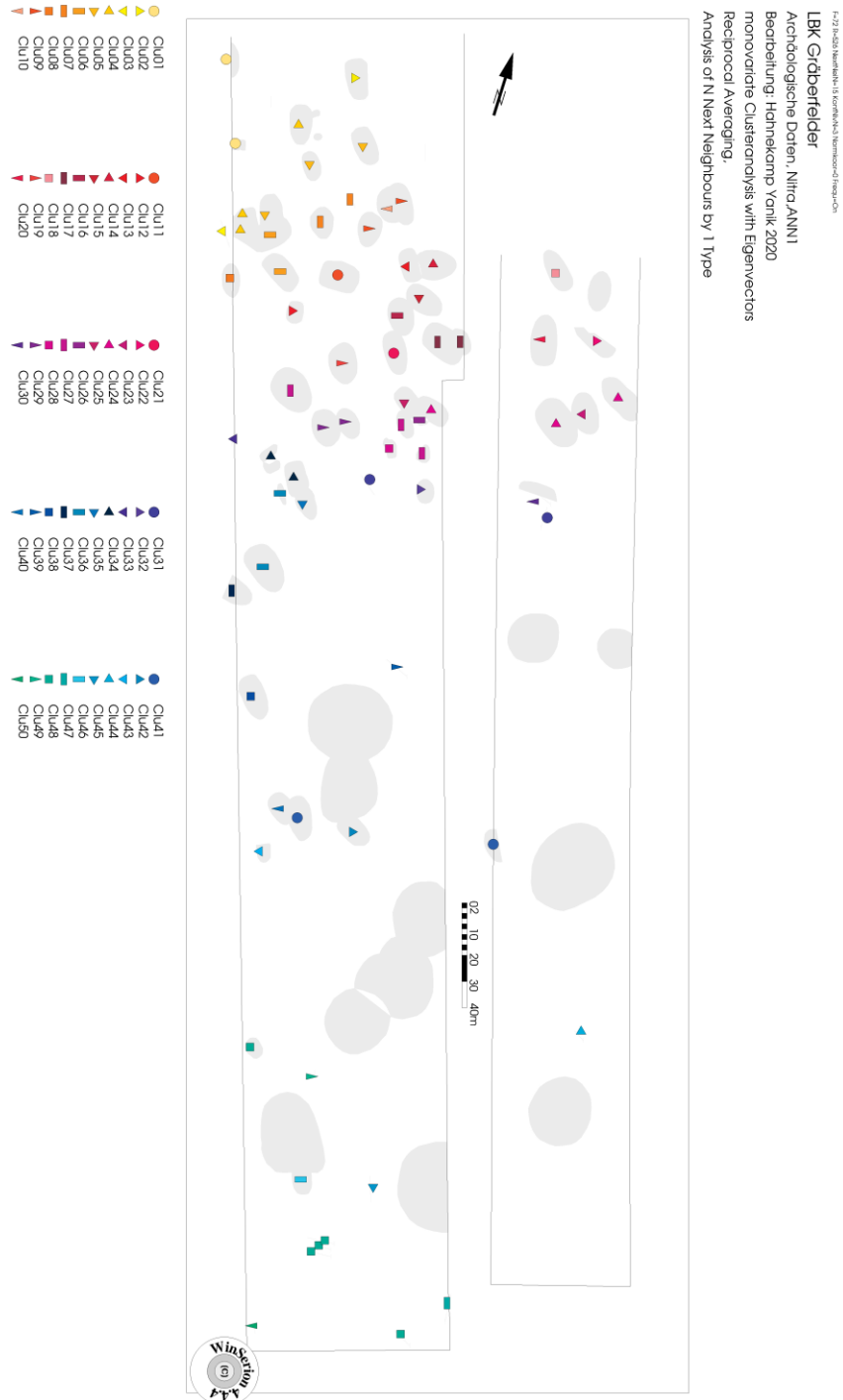


Figure Appendix 51: Analysis N Next Neighbours of pit orientation and burial position at Nitra.

Burials in Bytes – A Quantitative Study of Linear Pottery cemeteries

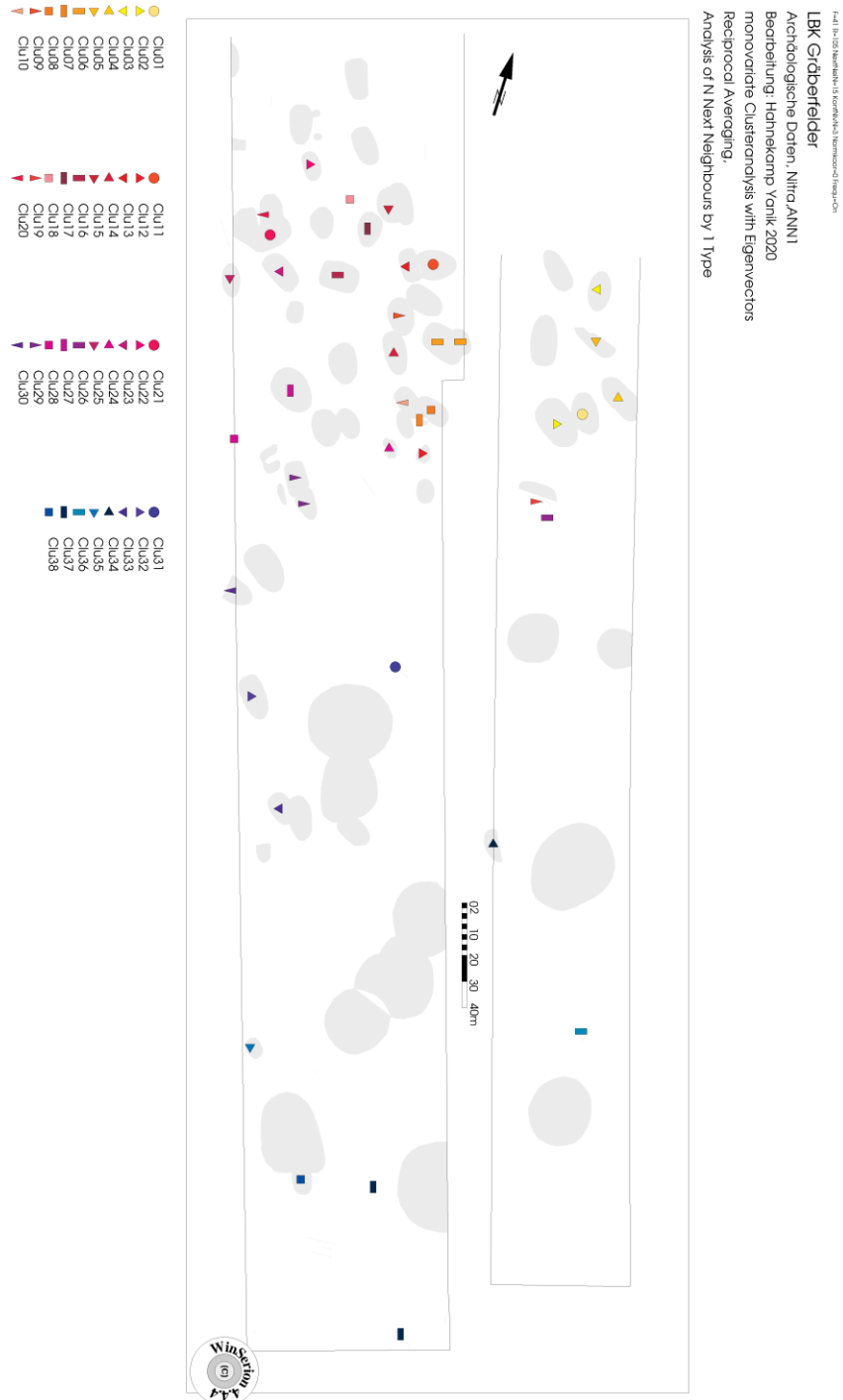
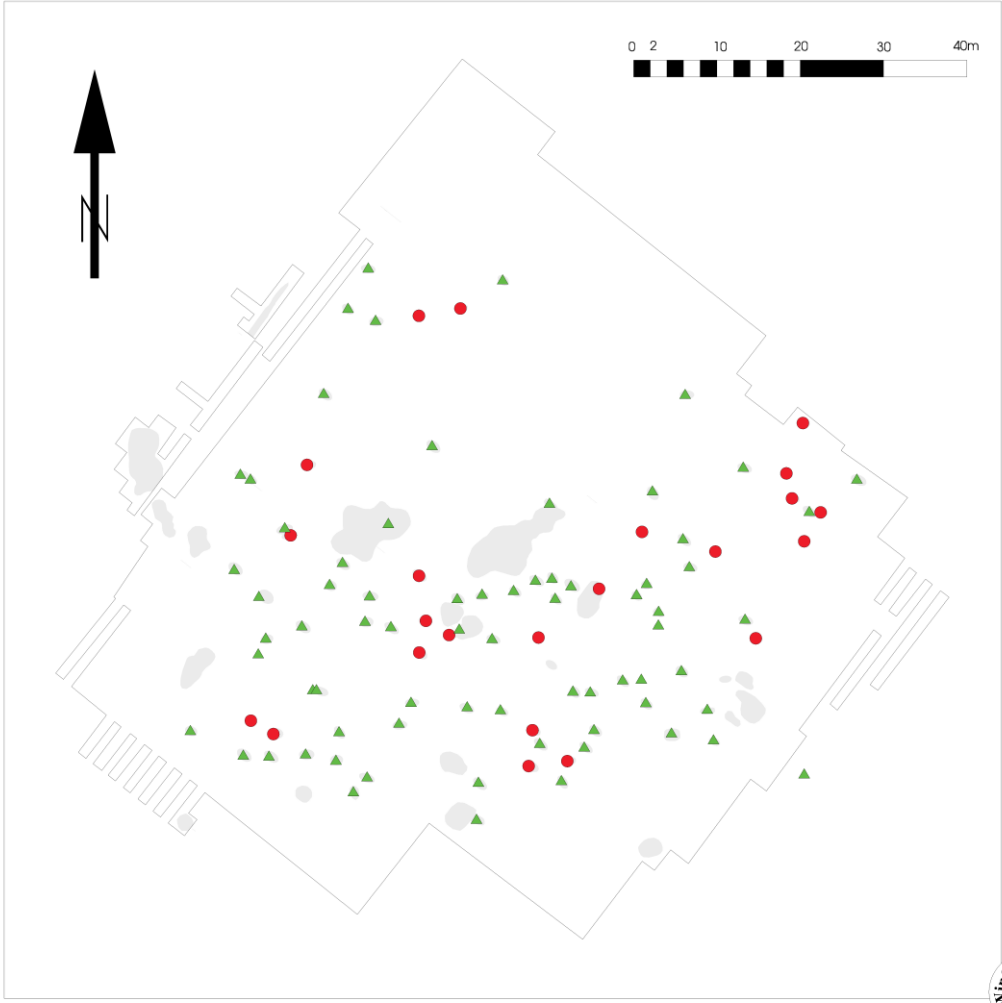


Figure Appendix 52: Analysis N Next Neighbours of grave goods and burial type at Nitra. The reciprocal averaging algorithm was only able to create 38 clusters while a few furnished burials (e. g. grave 1) were even excluded due to the generally small variation in traits at the site.

Burials in Bytes – A Quantitative Study of Linear Pottery cemeteries

F=08 B=118 NestNest=15 KontNiv=3 NormKoor=0 Frequ=On
 Map01, Grave good presence
 Hahnekamp Yanik
 Vedrovice Široká u lesa
 LBK Gräberfelder

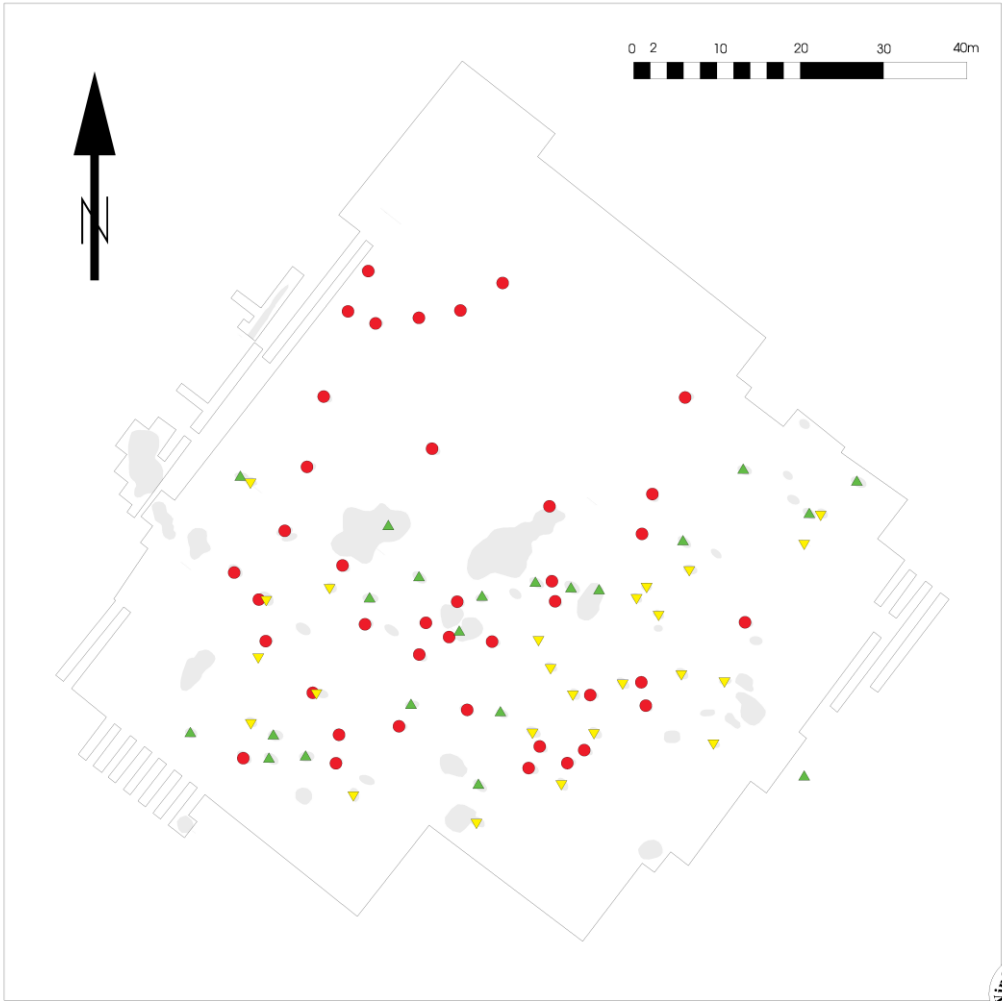


● Grave goods_No00010 : Grave good presence\No\##Grave goods_No
 ▲ Grave goods_Yes00010 : Grave good presence\Yes\##Grave goods_Yes

Figure Appendix 53: Distribution map 1 of Vedrovice.

Burials in Bytes – A Quantitative Study of Linear Pottery cemeteries

F=98 B=118 NestNel=15 KonNli=3 Normkoor=0 Frequ=On
 Map02, Biological sex
 Hahnekamp Yanik
 Vedrovice Stroká u lesa
 LBK Gräberfelder

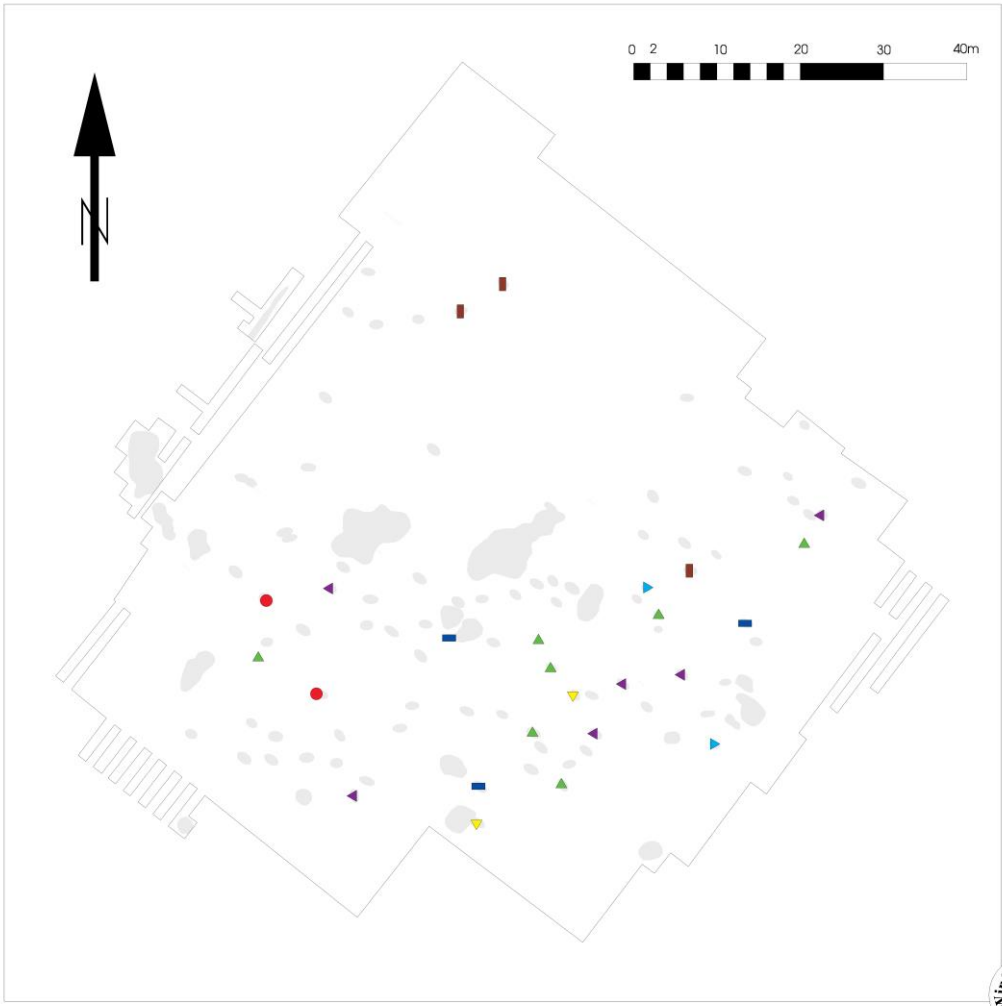


- Sex00010 : Anthropology\##Sex\Female
- ▲ Sex00020 : Anthropology\##Sex\Male
- ▼ Sex00030 : Anthropology\##Sex\Uncertain

Figure Appendix 54: Distribution map 2 of Vedrovice.

Burials in Bytes – A Quantitative Study of Linear Pottery cemeteries

F=08 B=118 NestNest=15 KontNiv=3 NormKoor=0 Fragu=On
 Map03, Age (subadult)
 Hahnekamp Yanik
 Vedrovice Široká u lesa
 LBK Gräberfelder

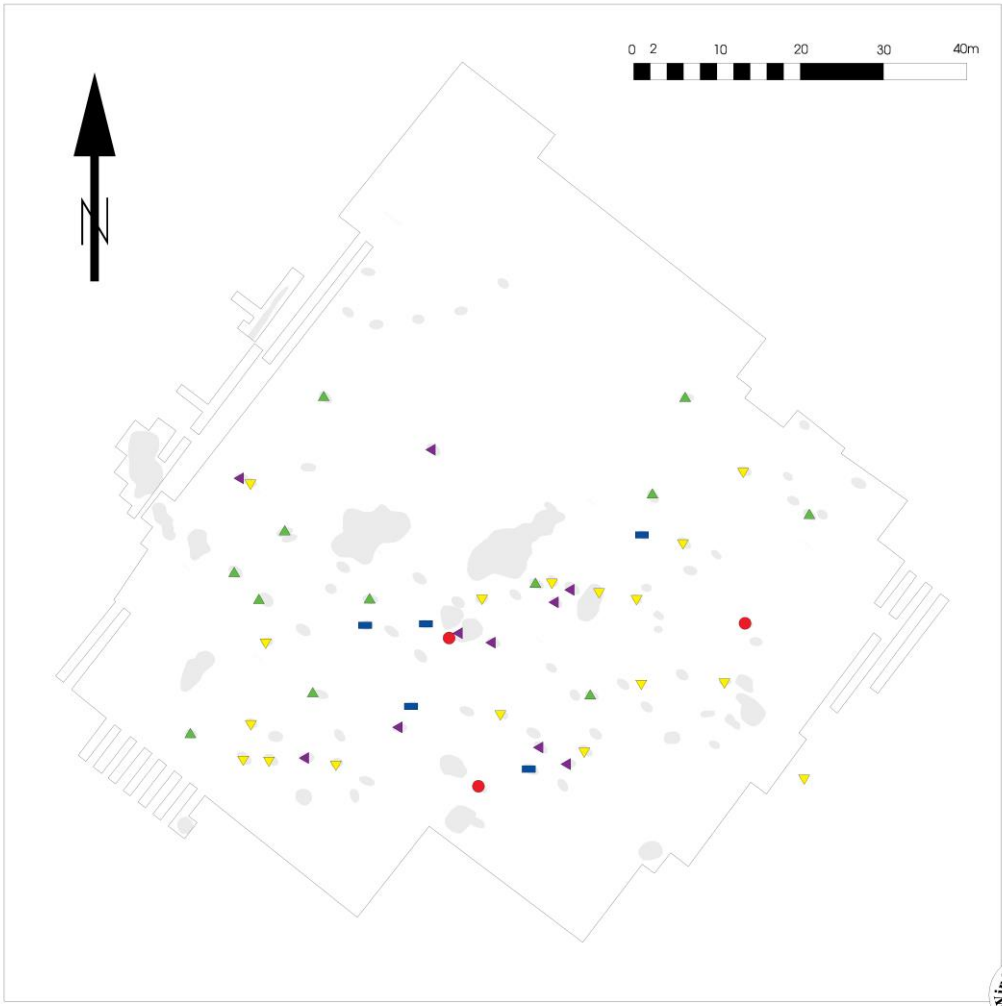


- Age00010 : Anthropology\##Age\01_Neonate
- ▲ Age00020 : Anthropology\##Age\02_Infans I
- ▼ Age00030 : Anthropology\##Age\03_Infans I/II
- ▲ Age00040 : Anthropology\##Age\04_Infans II
- ▲ Age00050 : Anthropology\##Age\05_Infans II/Juvenis
- Age00060 : Anthropology\##Age\06_Juvenis
- Age00070 : Anthropology\##Age\07_Juvenis/Adult I

Figure Appendix 55: Distribution map 3 of Vedrovice.

Burials in Bytes – A Quantitative Study of Linear Pottery cemeteries

F=08 B=108 NestNest=15 KontNiv=3 NormKoor=0 Fragu=On
 Map04, Age (adult)
 Hahnekamp Yanik
 Vedrovice Široká u lesa
 LBK Gräberfelder

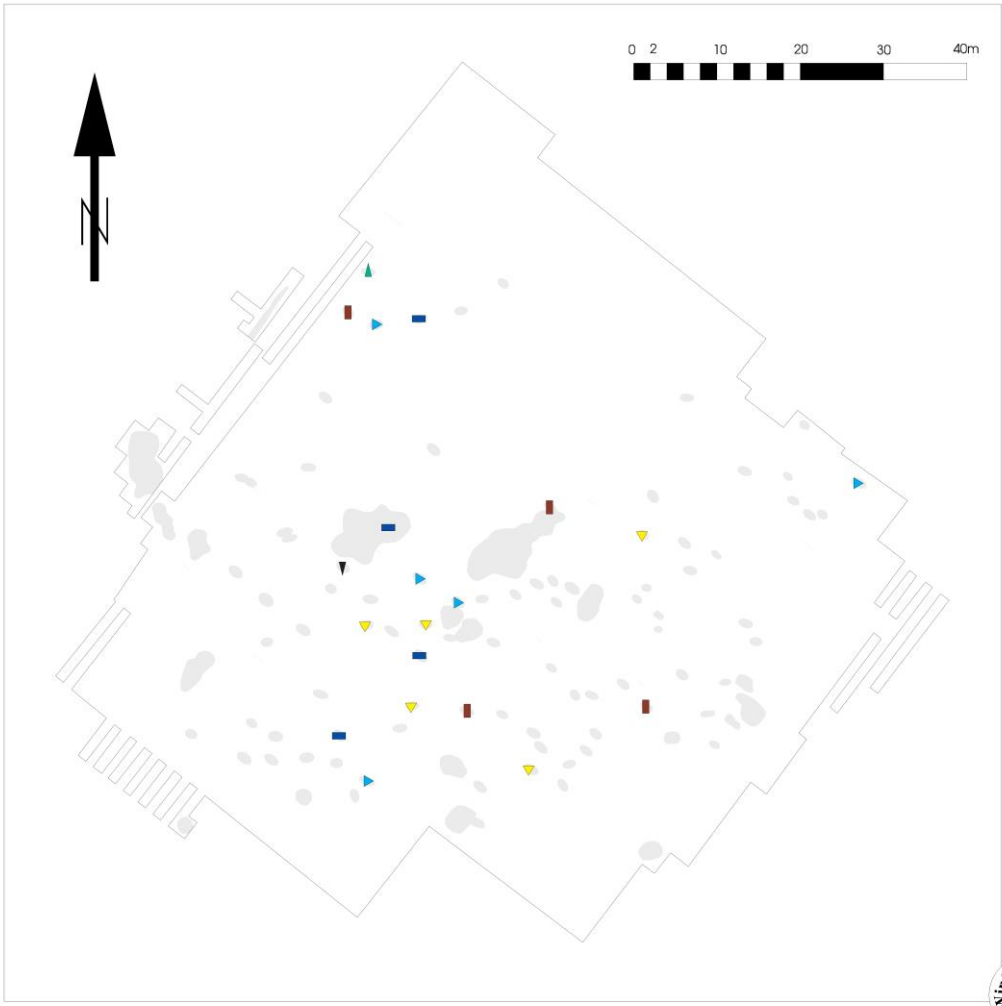


- Age00070 : Anthropology\##Age\07_Juvenis/Adult I
- ▲ Age00080 : Anthropology\##Age\08_Adult I
- ▼ Age00090 : Anthropology\##Age\09_Adult I/II
- ▲ Age00100 : Anthropology\##Age\10_Adult II
- Age00130 : Anthropology\##Age\13_Adult II/Matur I

Figure Appendix 56: Distribution map 4 of Vedrovice.

Burials in Bytes – A Quantitative Study of Linear Pottery cemeteries

F=08 B=118 NestNest=15 KontNiv=3 NormKoor=0 Freag=On
 Map05, Age (mature to senile)
 Hahnekamp Yanik
 Vedrovice Široká u lesa
 LBK Gräberfelder

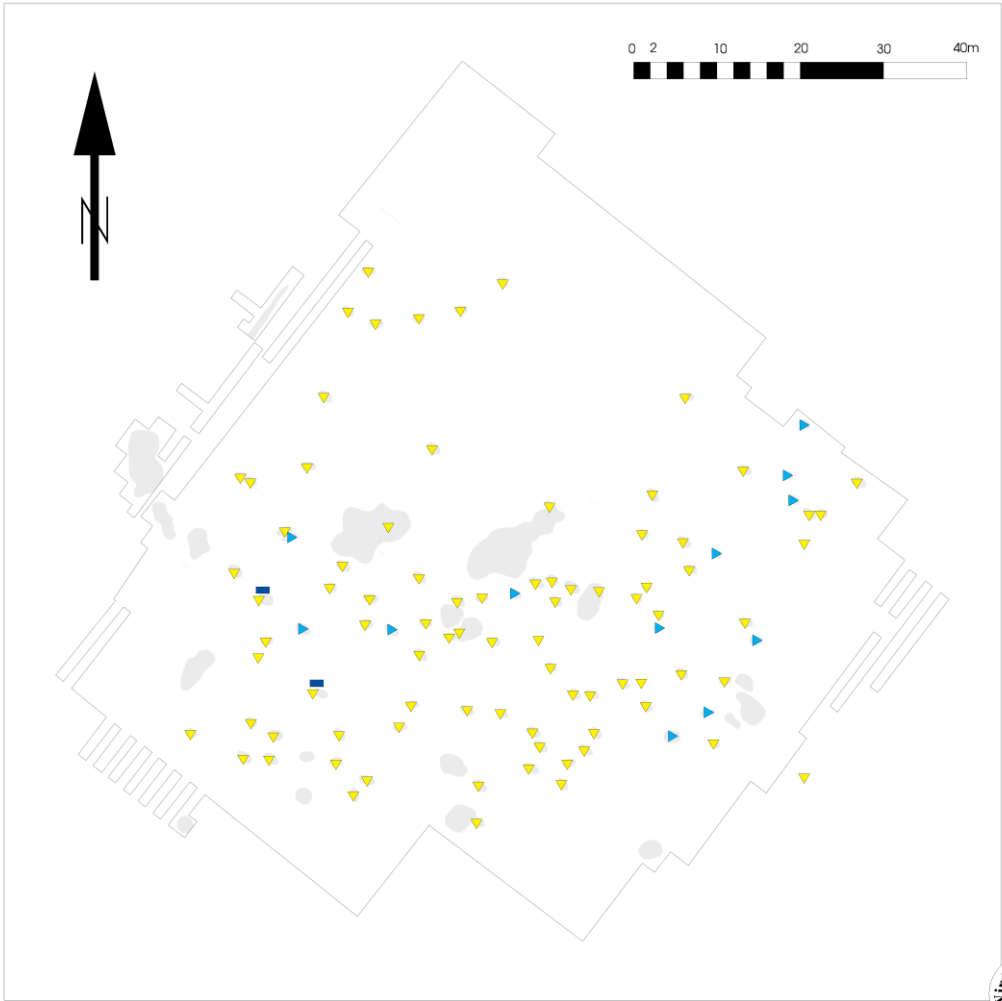


- ▼ Age00130 : Anthropology\##Age\13_Adult II/Matur I
- ▲ Age00150 : Anthropology\##Age\15_Matur I
- Age00160 : Anthropology\##Age\16_Matur I/II
- Age00170 : Anthropology\##Age\17_Matur II
- ▲ Age00190 : Anthropology\##Age\19_Matur II/Senile
- ▼ Age00200 : Anthropology\##Age\20_Senile

Figure Appendix 57: Distribution map 5 of Vedrovice.

Burials in Bytes – A Quantitative Study of Linear Pottery cemeteries

F=98 B=118 NessfNeN=15 KonfNi=N=3 Normkoo=0 Freq=On
 Map06, Burial type
 Hahnekamp Yanik
 Vedrovice Stroká u lesa
 LBK Gräberfelder

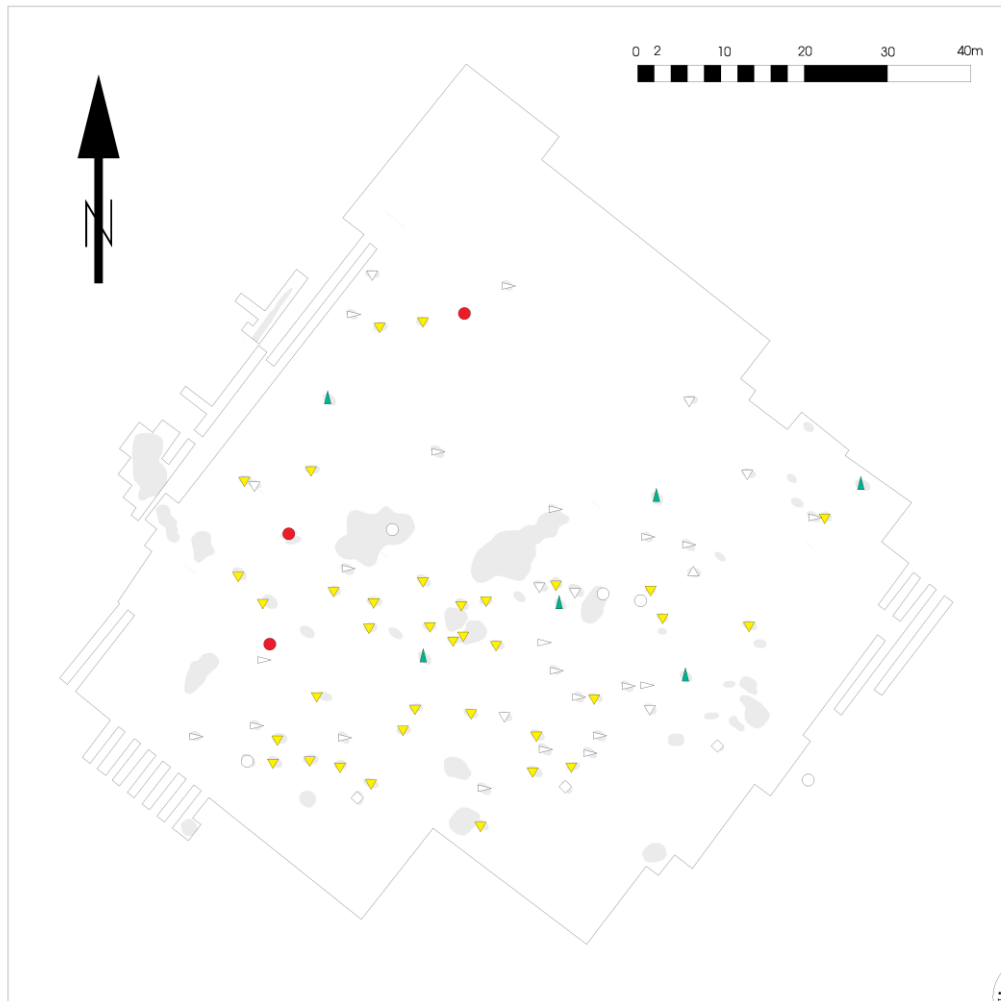


- ▼ Inhumation00010 : Type of finding\##Inhumation
- ▲ Empty pit_excavated in 19th century00010 : Type of finding\##Empty pit_excavated in 19th century
- Double inhumation00010 : Type of finding\##Double inhumation

Figure Appendix 58: Distribution map 6 of Vedrovice.

Burials in Bytes – A Quantitative Study of Linear Pottery cemeteries

F=08 B=118 NestNest=15 KontNiv=3 NormKoor=0 Freq=On
 Map07, Burial pit orientation
 Hahnekamp Yanik
 Vedrovice Široká u lesa
 LBK Gräberfelder

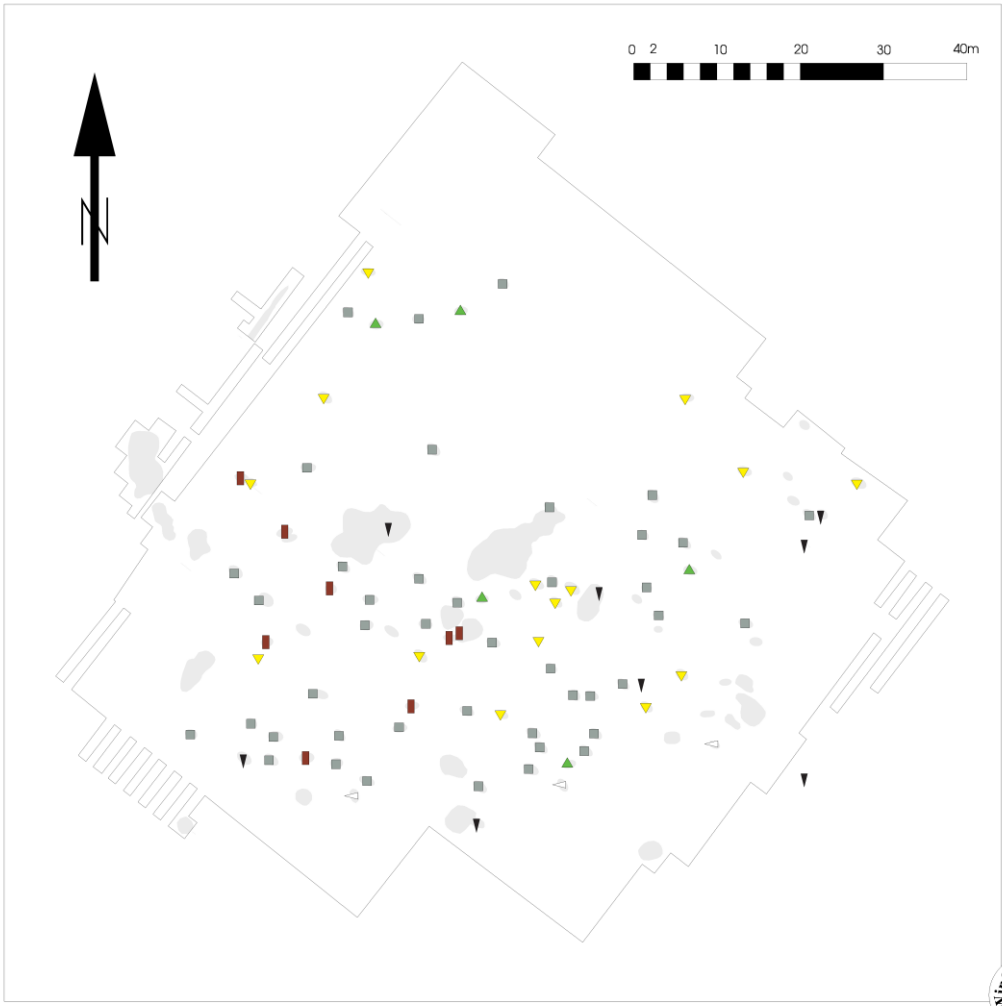


- Pit_Grave orientation00010 : Inhumation\##Pit_Grave orientation\E-W
- ▲ Pit_Grave orientation00030 : Inhumation\##Pit_Grave orientation\ESE-WNW
- ▲ Pit_Grave orientation00090 : Inhumation\##Pit_Grave orientation\NW-SE
- ◊ Pit_Grave orientation00120 : Inhumation\##Pit_Grave orientation\SE-NW
- ◊ Pit_Grave orientation00130 : Inhumation\##Pit_Grave orientation\SSE-NNW
- Pit_Grave orientation00160 : Inhumation\##Pit_Grave orientation\Uncertain
- ◊ Pit_Grave orientation00170 : Inhumation\##Pit_Grave orientation\W-E
- ◊ Pit_Grave orientation00180 : Inhumation\##Pit_Grave orientation\WNW-ESE

Figure Appendix 59: Distribution map 7 of Vedrovice.

Burials in Bytes – A Quantitative Study of Linear Pottery cemeteries

F=98 B=118 NestNest=15 KontNiv=3 NormKoor=0 Frequ=On
 Map08, Line of sight
 Hahnekamp Yanik
 Vedrovice Široká u lesa
 LBK Gräberfelder

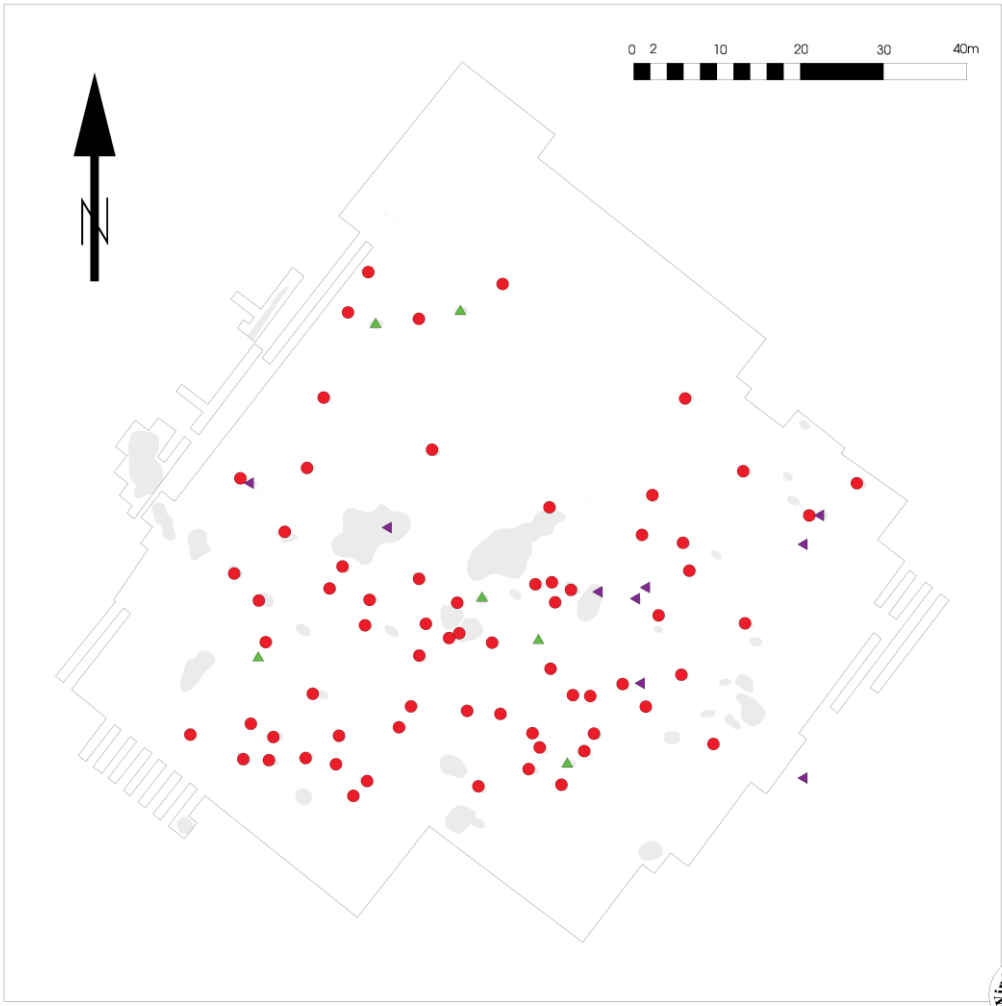


- ▲ Line of sight00020 : Inhumation\##Line of sight\N
- ▼ Line of sight00030 : Inhumation\##Line of sight\NE
- Line of sight00060 : Inhumation\##Line of sight\S
- Line of sight00080 : Inhumation\##Line of sight\SW
- ▼ Line of sight00100 : Inhumation\##Line of sight\Uncertain
- ◁ Line of sight00110 : Inhumation\##Line of sight\W

Figure Appendix 60; Distribution map 8 of Vedrovice.

Burials in Bytes – A Quantitative Study of Linear Pottery cemeteries

F=08 B=118 NestNest=15 KontNiv=3 NormKoor=0 Frege=On
 Map09, Body orientation
 Hahnekamp Yanik
 Vedrovice Široká u lesa
 LBK Gräberfelder

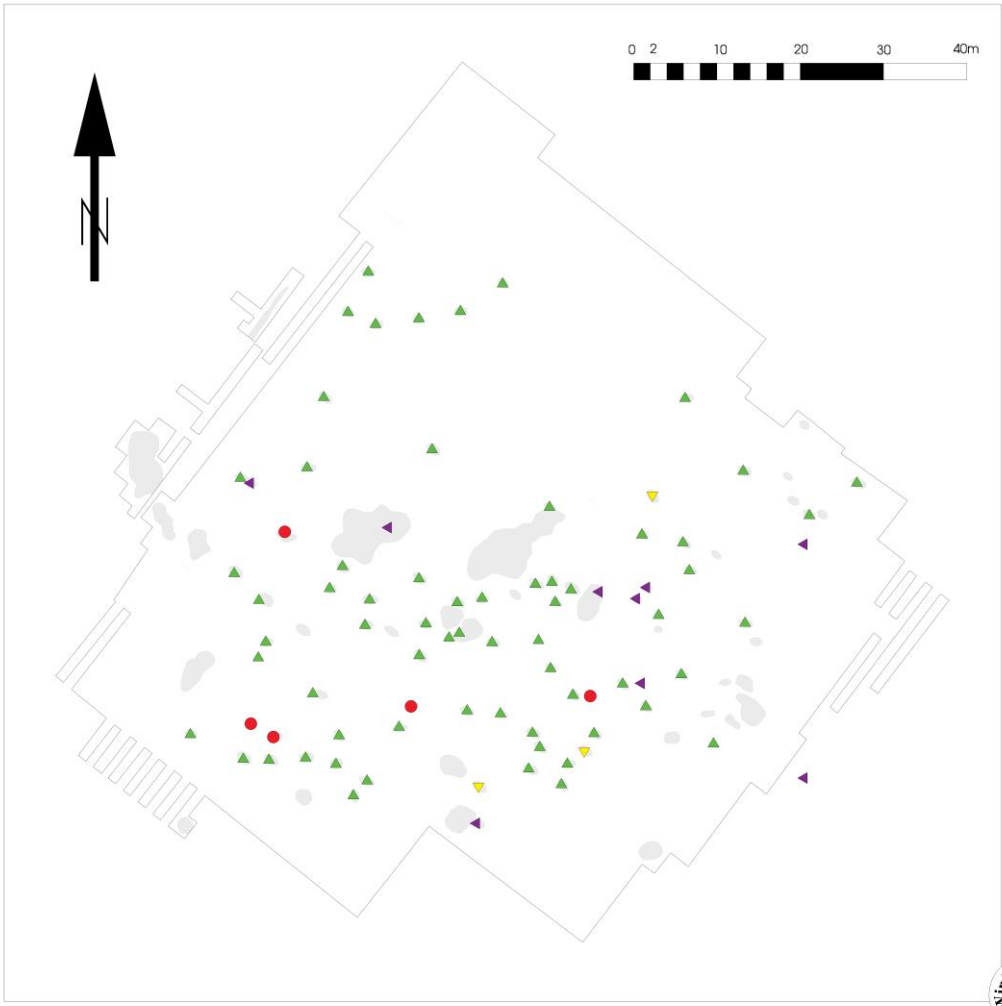


- Body orientation00010 : Inhumation\##Body orientation\Left
- ▲ Body orientation00020 : Inhumation\##Body orientation\Right
- ▼ Body orientation00040 : Inhumation\##Body orientation\Uncertain

Figure Appendix 61: Distribution map 9 of Vedrovice.

Burials in Bytes – A Quantitative Study of Linear Pottery cemeteries

F=08 B=118 NestNest=15 KontNiv=3 NormKoor=0 Fragu=On
 Map10, Torso position
 Hahnekamp Yanik
 Vedrovice Široká u lesa
 LBK Gräberfelder

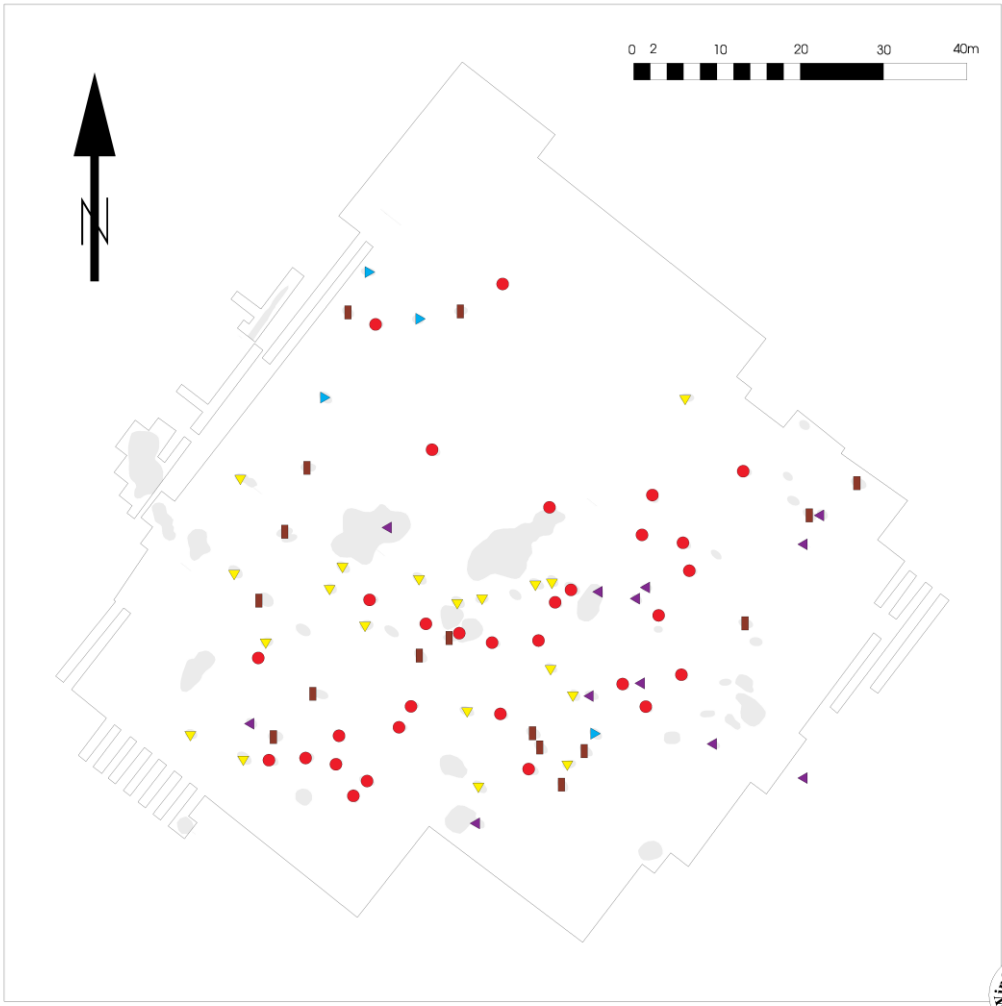


- Torso position00010 : Inhumation\##Torso position\Prone
- ▲ Torso position00020 : Inhumation\##Torso position\Side
- ▼ Torso position00030 : Inhumation\##Torso position\Supine
- ◀ Torso position00040 : Inhumation\##Torso position\Uncertain

Figure Appendix 62: Distribution map 10 of Vedrovice.

Burials in Bytes – A Quantitative Study of Linear Pottery cemeteries

F=98 B=118 NestNest=15 KontNiv=3 NormKoor=0 Frequ=On
 Map11, Angle backbone to upper thigh
 Hahnekamp Yanik
 Vedrovice Široká u lesa
 LBK Gräberfelder



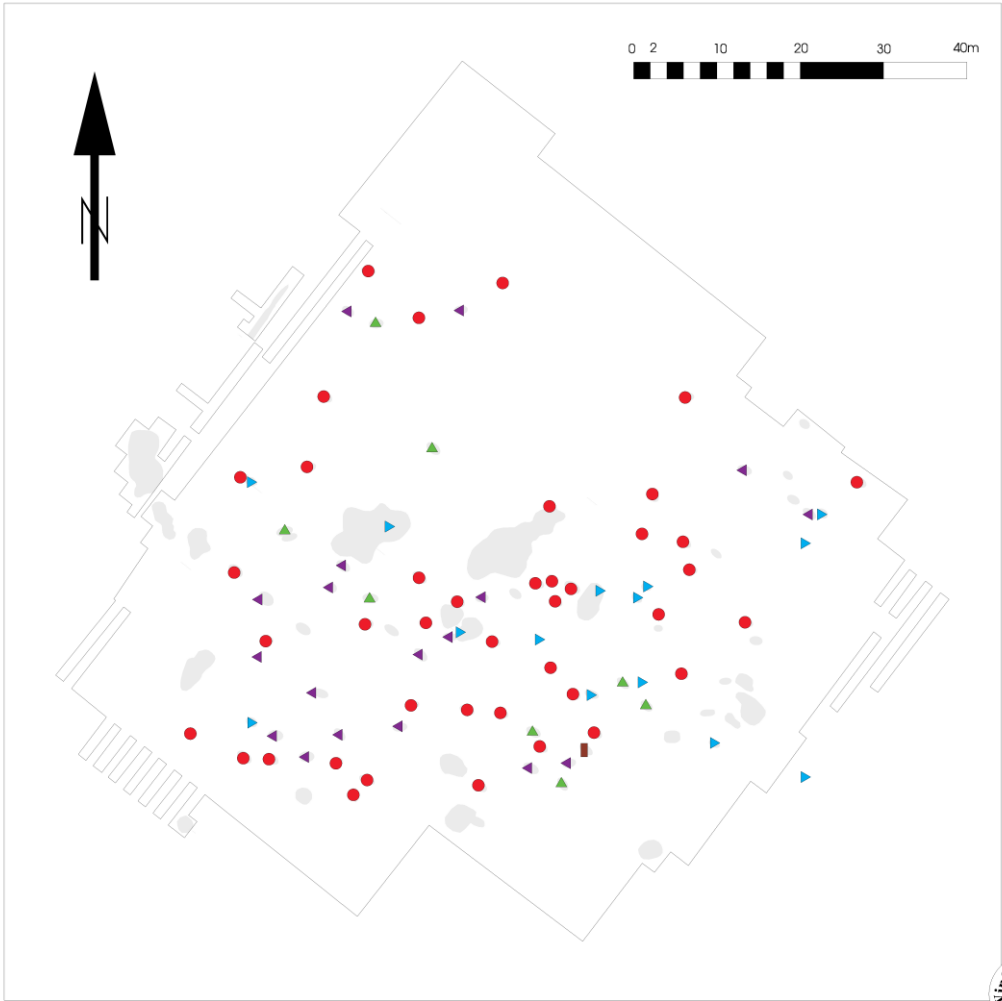
- Angle backbone to upper thigh00010 : Inhumation\##Angle backbone to upper thigh\Moderate
- ▲ Angle backbone to upper thigh00030 : Inhumation\##Angle backbone to upper thigh\Tight
- ▲ Angle backbone to upper thigh00040 : Inhumation\##Angle backbone to upper thigh\Uncertain
- ▲ Angle backbone to upper thigh00050 : Inhumation\##Angle backbone to upper thigh\Very tight
- Angle backbone to upper thigh00060 : Inhumation\##Angle backbone to upper thigh\Wide



Figure Appendix 63: Distribution map 11 of Vedrovice.

Burials in Bytes – A Quantitative Study of Linear Pottery cemeteries

F=98 B=118 NestNel=15 KonNli=3 Normkoor=0 Frequ=On
 Map12, Angle upper to lower thigh
 Hahnekamp Yanik
 Vedrovice Stroká u lesa
 LBK Gräberfelder



- Angle upper to lower thigh00010 : Inhumation\##Angle upper to lower thigh\Extreme
- ▲ Angle upper to lower thigh00020 : Inhumation\##Angle upper to lower thigh\Moderate
- ▼ Angle upper to lower thigh00040 : Inhumation\##Angle upper to lower thigh\Tight
- ▶ Angle upper to lower thigh00050 : Inhumation\##Angle upper to lower thigh\Uncertain
- Angle upper to lower thigh00060 : Inhumation\##Angle upper to lower thigh\Wide

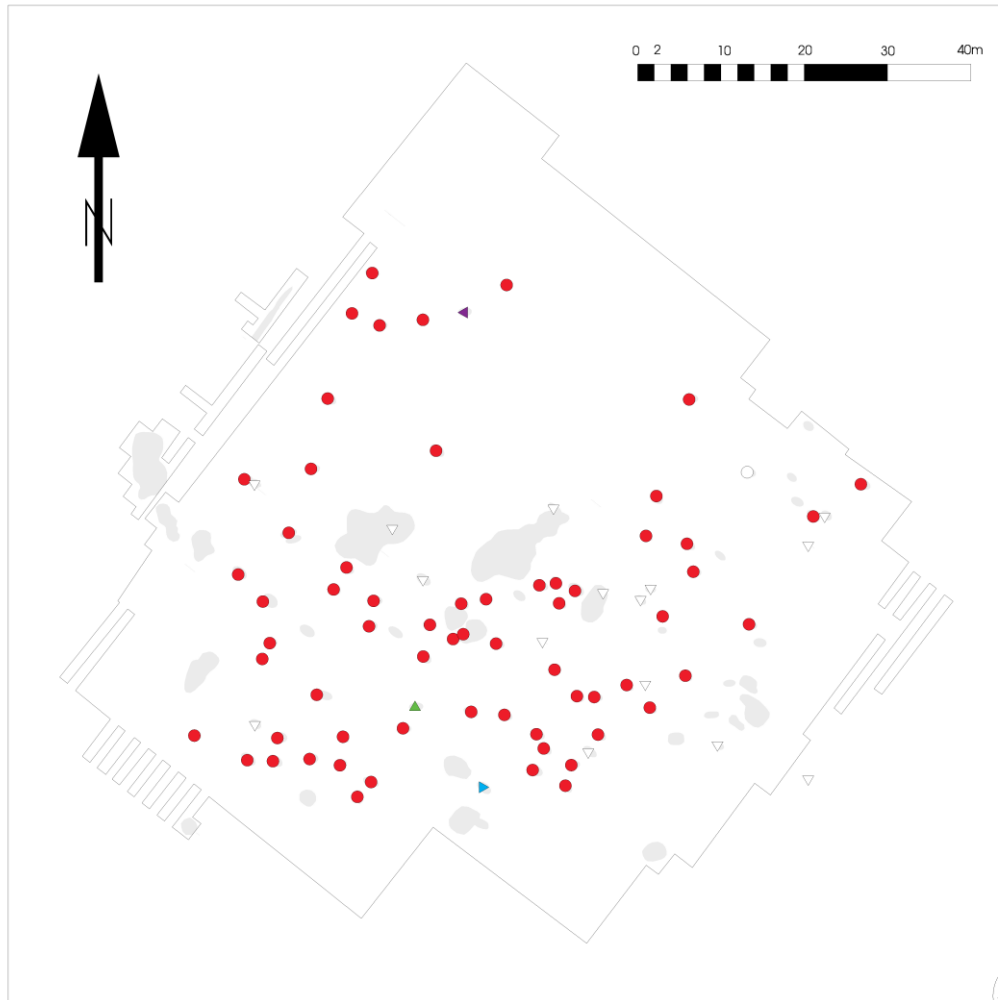
Figure Appendix 64: Distribution map 12 of Vedrovice.

Burials in Bytes – A Quantitative Study of Linear Pottery cemeteries

F=98 B=118 NestNel=15 KonNi=3 Normkoor=0 Frequ=On

Map13, Arm gesture

Hahnekamp Yanik
Vedrovice Stroká u lesa
LBK Gräberfelder

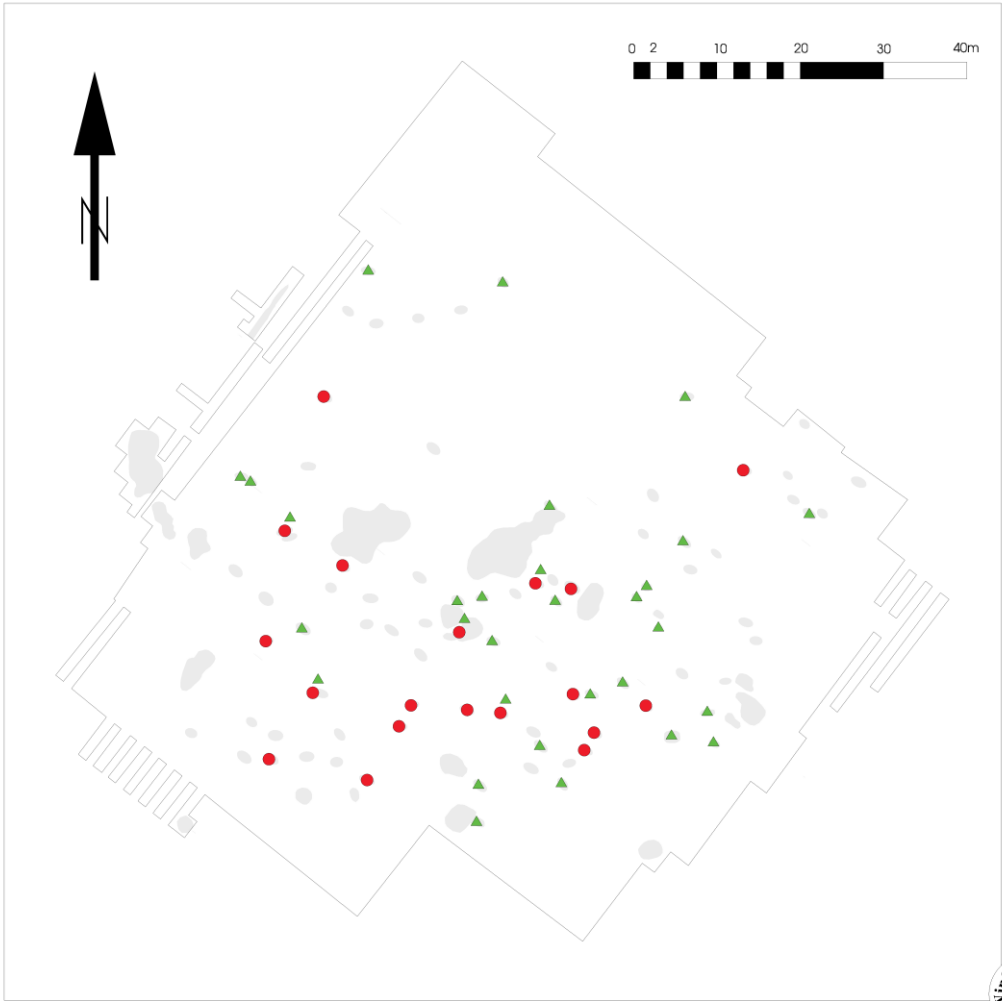


- Arms position00010 : Inhumation\##Arms position\01 Sleeping
- ▲ Arms position00020 : Inhumation\##Arms position\02 Diagonally crossed
- ▼ Arms position00040 : Inhumation\##Arms position\04 Right arm horizontally crossed, left arm on left shoulder
- ▶ Arms position00050 : Inhumation\##Arms position\05 On shoulder
- Arms position00160 : Inhumation\##Arms position\16 Arms pointing away from body
- ▽ Arms position00180 : Inhumation\##Arms position\18 Undetermined

Figure Appendix 65: Distribution map 13 of Vedrovice.

Burials in Bytes – A Quantitative Study of Linear Pottery cemeteries

F=98 B=118 NessfNeN=15 KonfNi=N=3 Normkoor=0 Frequ=On
 Map14, Vessel condition
 Hahnekamp Yanik
 Vedrovice Stroká u lesa
 LBK Gräberfelder

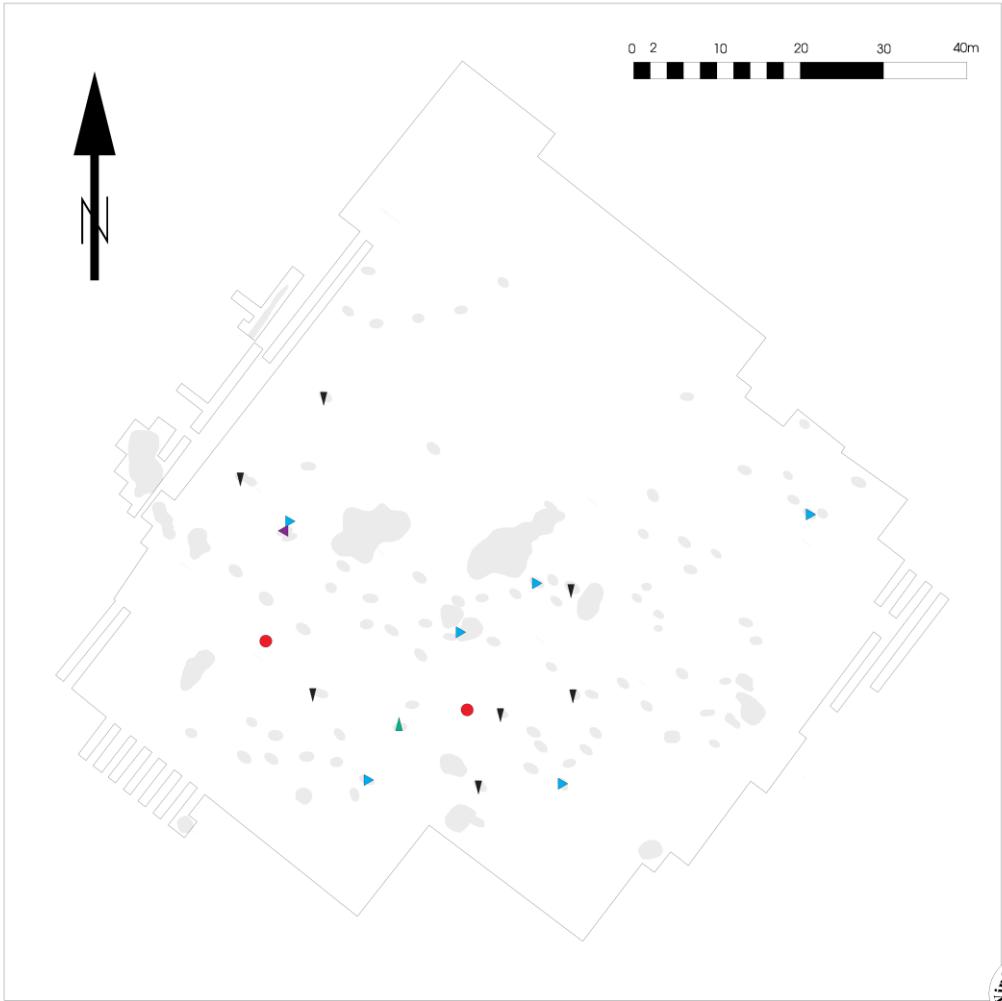


● Grave good00010 : Ceramic\##Grave good
 ▲ Vessel unit00010 : Ceramic\##Vessel unit

Figure Appendix 66: Distribution map 14 of Vedrovice.

Burials in Bytes – A Quantitative Study of Linear Pottery cemeteries

F=98 B=118 NessfNeN=15 KonfNi=N=3 Normkaor=0 Frequ=On
 Map15, Amphorae
 Hahnekamp Yanik
 Vedrovice Stroká u lesa
 LBK Gräberfelder

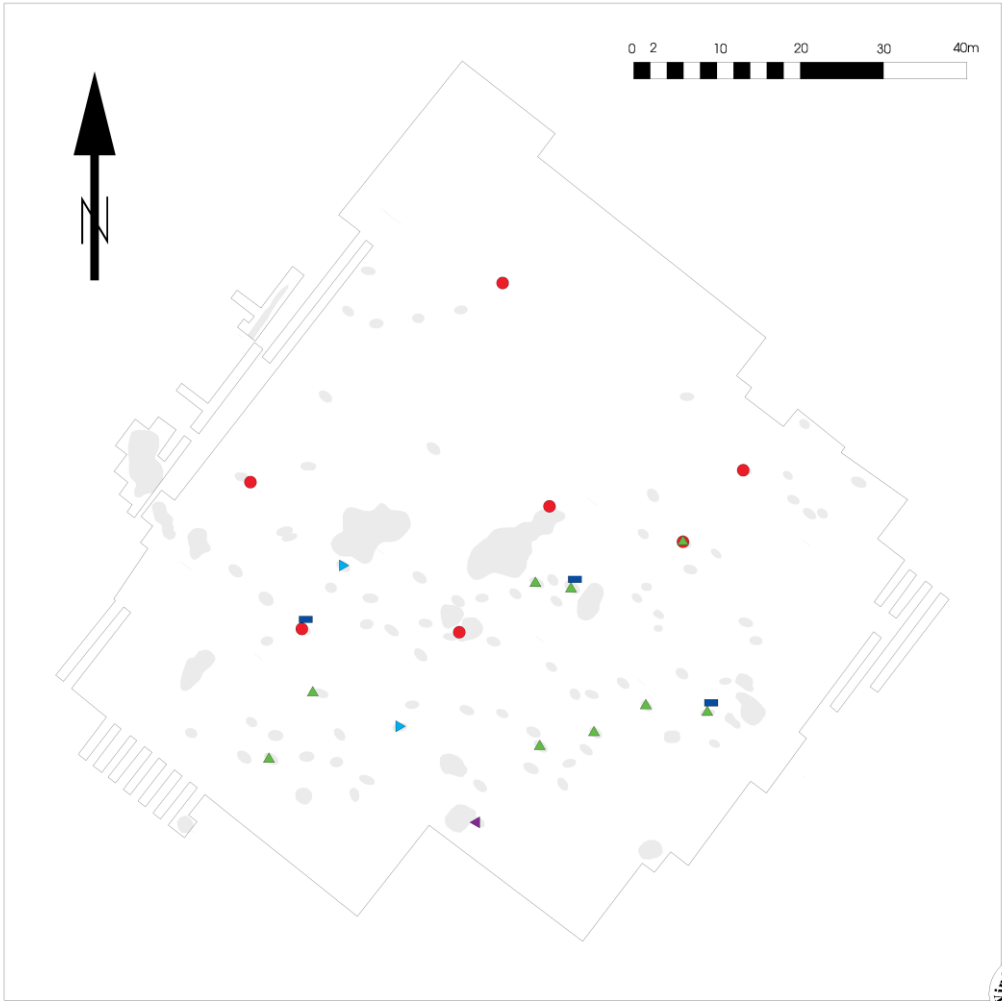


- Amphorae (1a)00010 : Ceramic\Pottery\1 Amphorae and Pots\##Amphorae (1a)
- ▲ Amphorae (1a)00010 : Ceramic\Pottery\1 Amphorae and Pots\##Amphorae (1a)
- ▲ Amphorae (1e)00010 : Ceramic\Pottery\1 Amphorae and Pots\##Amphorae (1e)
- ▲ Amphorae (1i)00010 : Ceramic\Pottery\1 Amphorae and Pots\##Amphorae (1i)
- ▼ Amphorae (Uncategorized)00010 : Ceramic\Pottery\1 Amphorae and Pots\##Amphorae (Uncategorized)

Figure Appendix 67: Distribution map 15 of Vedrovice.

Burials in Bytes – A Quantitative Study of Linear Pottery cemeteries

F=98 B=118 NessfNeN=15 KonfNi=N=3 Normkaor=0 Frequ=On
 Map16, Kämpfe
 Hahnekamp Yanik
 Vedrovice Stroká u lesa
 LBK Gräberfelder

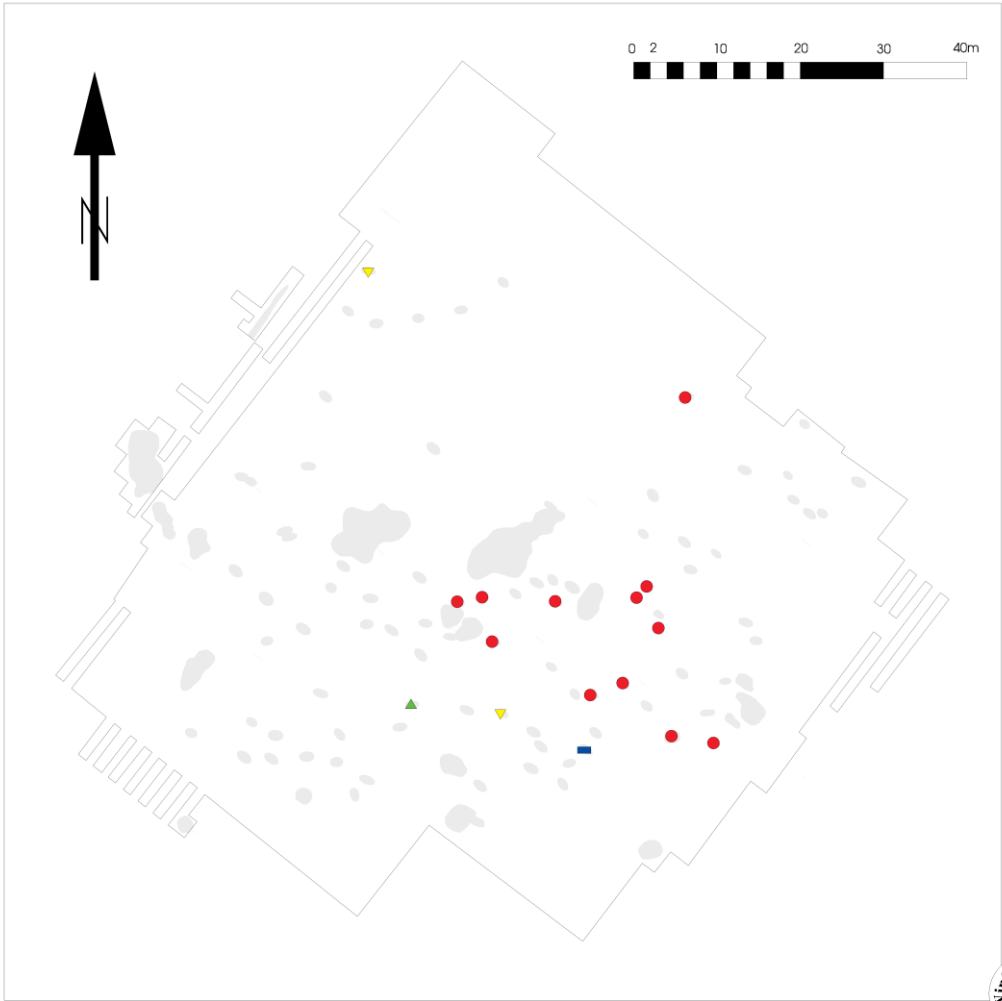


- Kumpf (2a)00010 : Ceramic\Pottery\2 Kämpfe\##Kumpf (2a)
- ▲ Kumpf (2b)00010 : Ceramic\Pottery\2 Kämpfe\##Kumpf (2b)
- ▲ Kumpf (2d)00010 : Ceramic\Pottery\2 Kämpfe\##Kumpf (2d)
- ▲ Kumpf (2e)00010 : Ceramic\Pottery\2 Kämpfe\##Kumpf (2e)
- Kumpf (Uncategorized)00010 : Ceramic\Pottery\2 Kämpfe\##Kumpf (Uncategorized)

Figure Appendix 68: Distribution map 16 of Vedrovice.

Burials in Bytes – A Quantitative Study of Linear Pottery cemeteries

F=98 B=118 NestNel=15 KonNiv=3 Normkon=0 Frequ=On
 Map17, Other vessel types
 Hahnekamp Yanik
 Vedrovice Stroká u lesa
 LBK Gräberfelder



- Uncategorized sherds00010 : Ceramic\Pottery\##Uncategorized sherds
- ▲ Low bowl (3a)00010 : Ceramic\Pottery\3 Bowls\##Low bowl (3a)
- ▼ High bowl (3b)00010 : Ceramic\Pottery\3 Bowls\##High bowl (3b)
- Vessel with pedestal (5a)00010 : Ceramic\Pottery\5 Special Vessels\##Vessel with pedestal (5a)



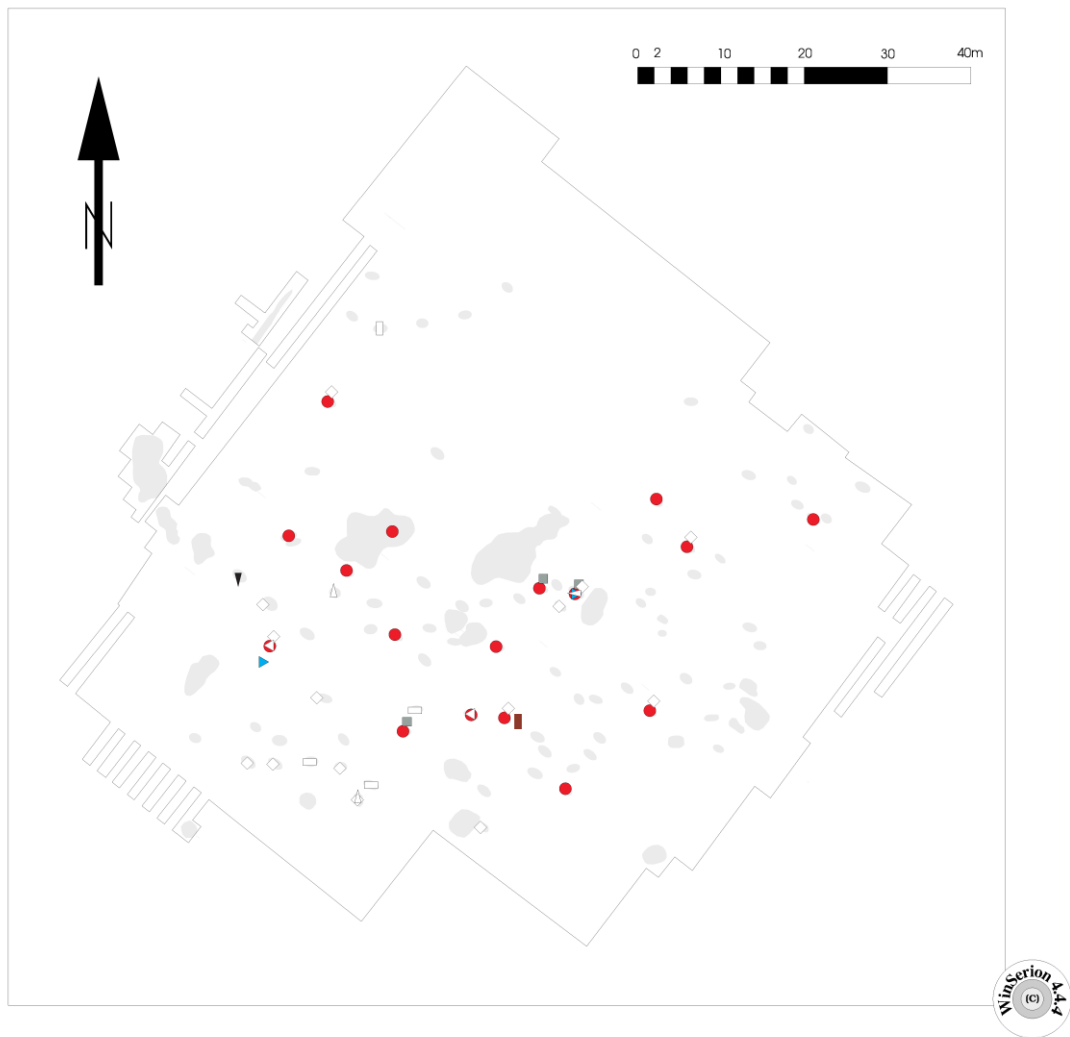
Figure Appendix 69: Distribution map 17 of Vedrovice.

Burials in Bytes – A Quantitative Study of Linear Pottery cemeteries

F=98 B=118 NestN=15 KontN=3 Normkoo=0 Freq=On

Map 18, Ornaments and unmodified shells

Hahnekamp Yanik
Vedrovice Stroká u lesa
LBK Gräberfelder

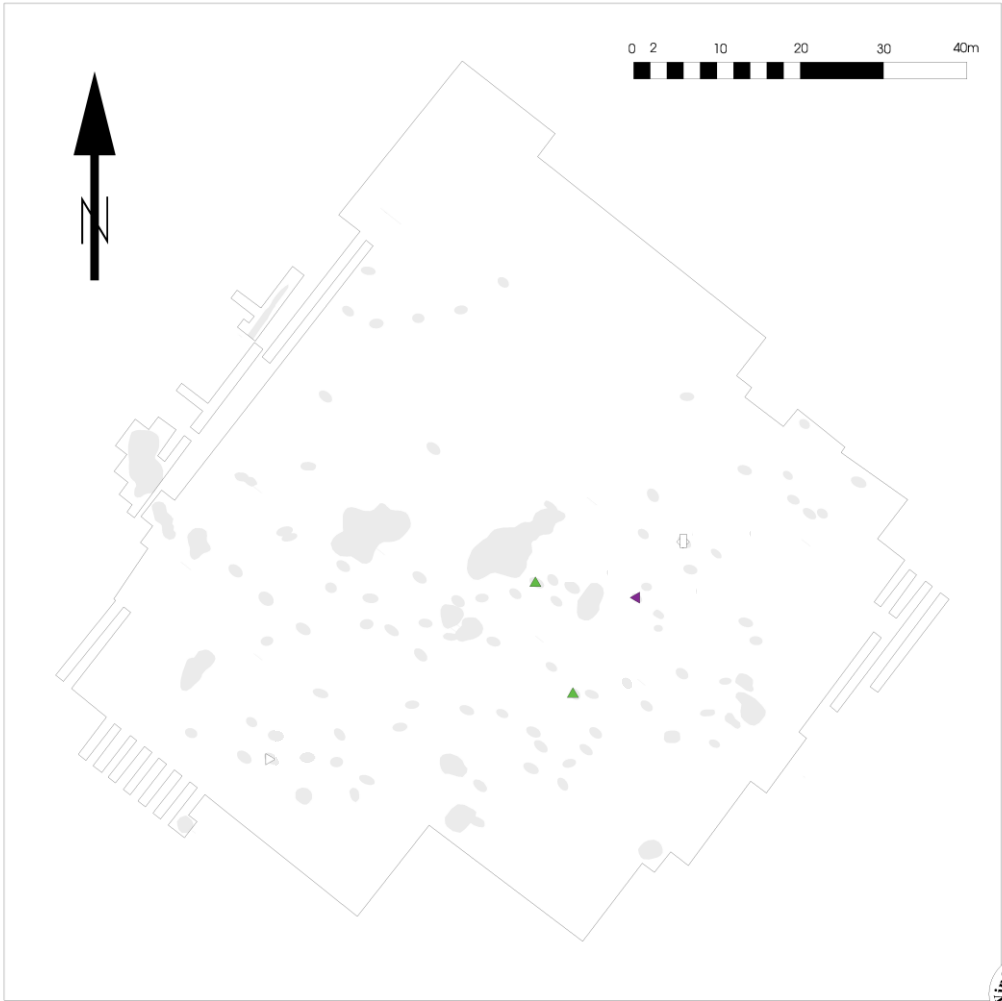


- Spondylus bead00010 : Clothing\Beads\##Spondylus bead
- ▲ Bone bead00010 : Clothing\Beads\##Bone bead
- Stone bead_Marble00010 : Clothing\Beads\Stone bead\##Stone bead_Marble
- ▼ Stone bead_Quartz00010 : Clothing\Beads\Stone bead\##Stone bead_Quartz
- ◇ Spondylus pendant00010 : Clothing\Pendants\##Spondylus pendant
- Bone pendant00010 : Clothing\Pendants\##Bone pendant
- Spondylus closure_Medallion00010 : Clothing\Belt buckle/closure\Spondylus closure\##Spondylus closure_Medallion
- Spondylus closure_Uncategorized00010 : Clothing\Belt buckle/closure\Spondylus closure\##Spondylus closure_Uncategorized
- Antler closure_Bow00010 : Clothing\Belt buckle/closure\Antler closure\##Antler closure_Bow
- Marble closure_Medallion00010 : Clothing\Belt buckle/closure\Marble closure\##Marble closure_Medallion
- ◇ Spondylus bracelet00010 : Clothing\Bracelet\##Spondylus bracelet
- ◇ Unspecified snail shell_Unmodified00010 : Clothing\Snail shells\Unmodified\##Unspecified snail shell_Unmodified

Figure Appendix 70: Distribution map 18 of Vedrovice.

Burials in Bytes – A Quantitative Study of Linear Pottery cemeteries

F=98 B=118 NestNel=15 KonNiv=3 Normkoor=0 Frequ=On
 Map19, Bone artefacts and remains
 Hahnekamp Yanik
 Vedrovice Stroká u lesa
 LBK Gräberfelder

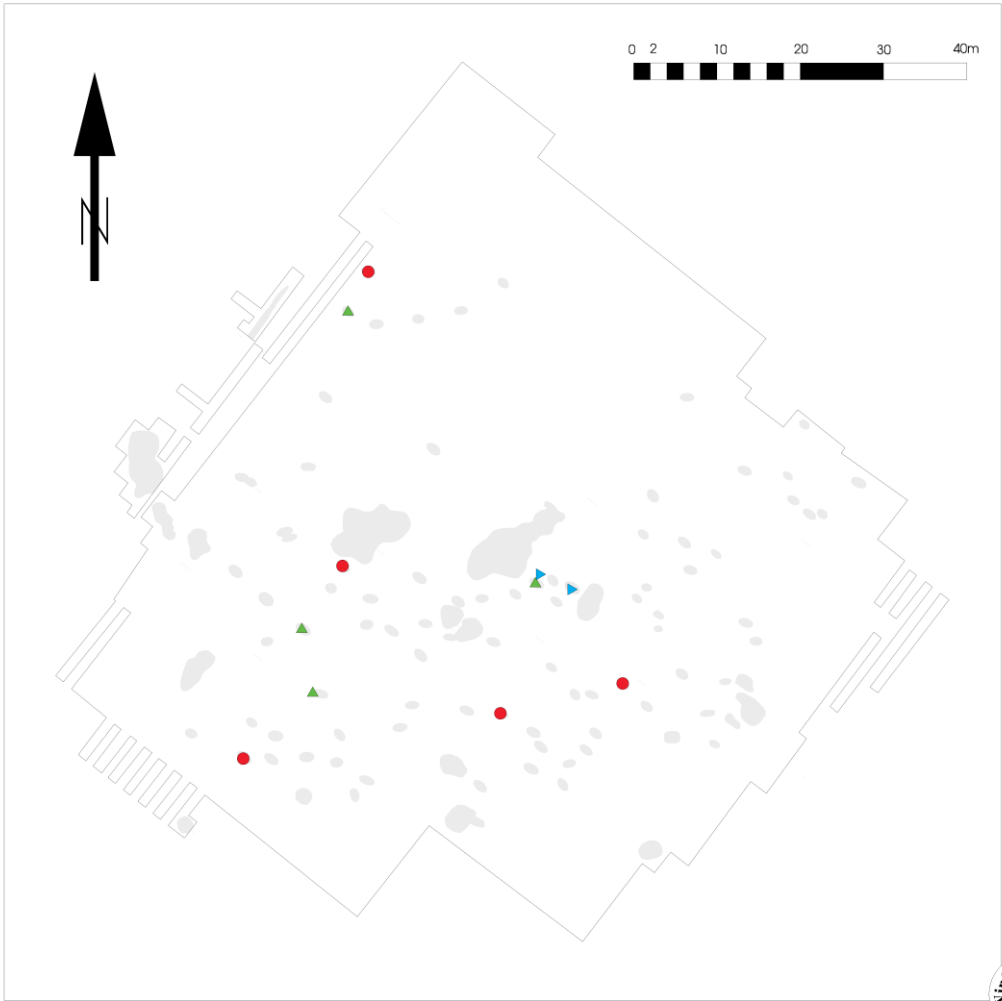


- ▲ Bone point_Metapodium00010 : Weapons and tools\Bone tools\Pointed bone tools\##Bone point_Metapodium
- ▼ Bone point_Uncategorized00010 : Weapons and tools\Bone tools\Pointed bone tools\##Bone point_Uncategorized
- ◇ Triangular bone point00010 : Weapons and tools\Bone tools\##Triangular bone point
- ◻ Wild boar remains00010 : Organic inventory\Animal bone remains\##Wild boar remains
- ◻ Unspecified animal remains00010 : Organic inventory\Animal bone remains\##Unspecified animal remains

Figure Appendix 71: Distribution map 19 of Vedrovice.

Burials in Bytes – A Quantitative Study of Linear Pottery cemeteries

F=08 B=118 NestNest=15 KontNiv=3 NormKoor=0 Frequ=On
 Map20, Hammerstones, nodules and pebbles
 Hahnekamp Yanik
 Vedrovice Široká u lesa
 LBK Gräberfelder

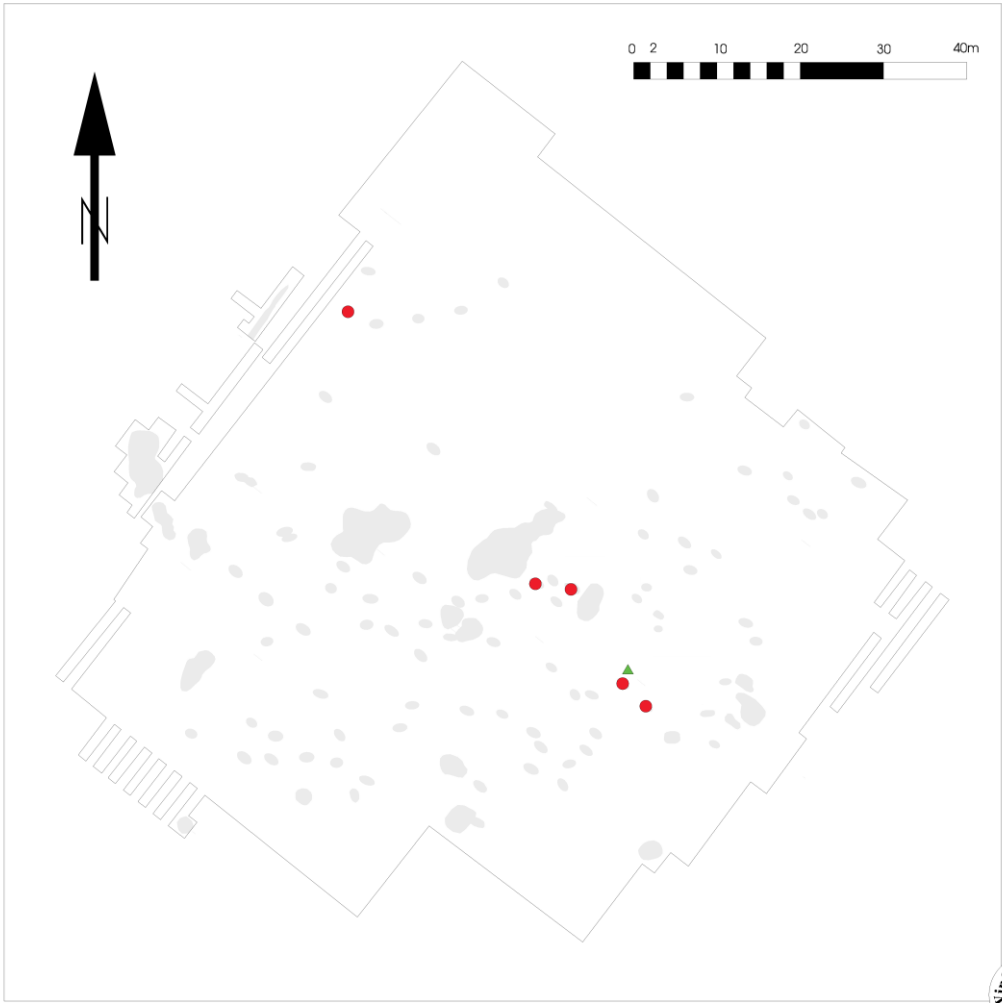


- Hammerstone00010 : Mineral resources\Hammer stones\##Hammerstone
- ▲ Pebble00010 : Mineral resources\Pebbles and nodules\##Pebble
- ▶ Stone with uncertain function00010 : Mineral resources\Pebbles and nodules\##Stone with uncertain function

Figure Appendix 72: Distribution map 20 of Vedrovice.

Burials in Bytes – A Quantitative Study of Linear Pottery cemeteries

F=98 B=118 Ness#Ne#15 Kon#Ni#3 Normkoor=0 Frequ=On
 Map21, Grinding tools
 Hahnekamp Yanik
 Vedrovice Stroká u lesa
 LBK Gräberfelder

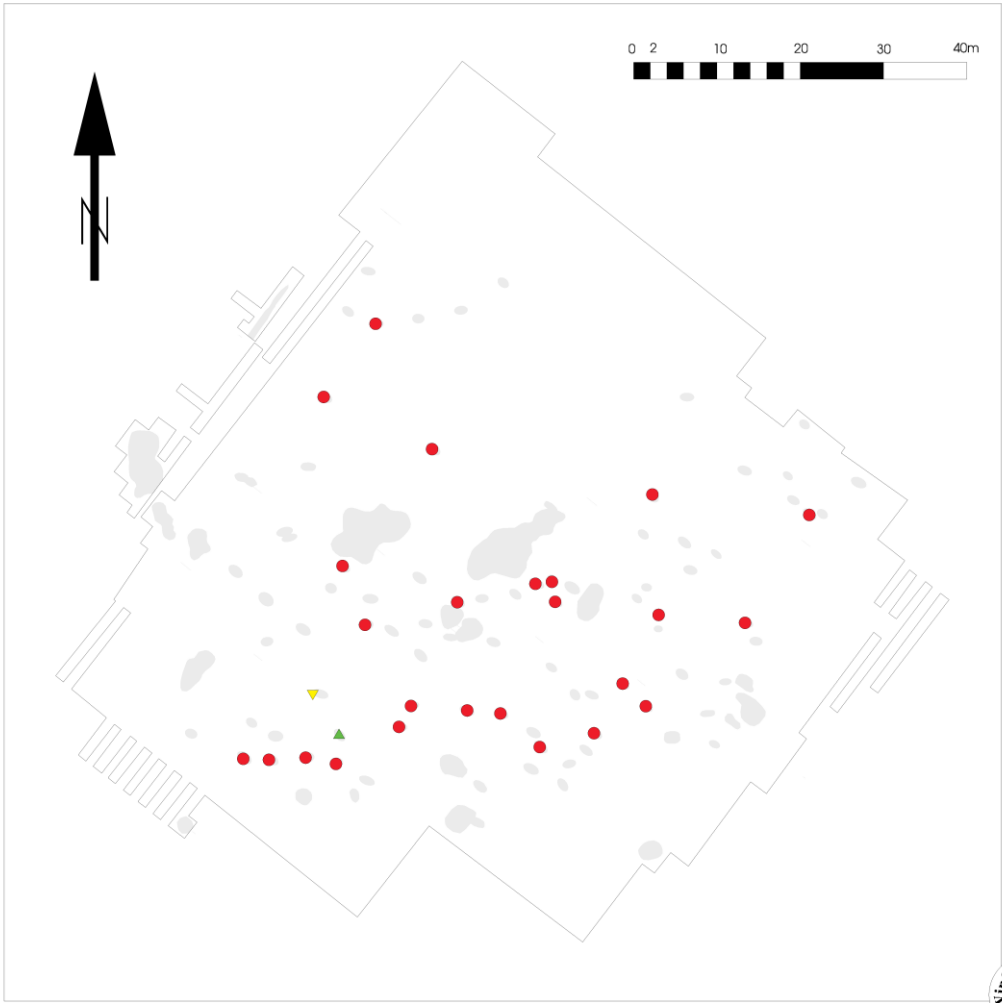


- Friction plate00010 : Weapons and tools\Grinding tools\###Friction plate
- ▲ Grinding stone00010 : Weapons and tools\Grinding tools\##Grinding stone

Figure Appendix 73: Distribution map 21 at Vedrovice.

Burials in Bytes – A Quantitative Study of Linear Pottery cemeteries

F=98 B=118 Ness#Nell#15 Kon#Ni#3 Norm#oon#0 Freq#On
 Map22, Colouring
 Hahnekamp Yanik
 Vedrovice Stroká u lesa
 LBK Gräberfelder

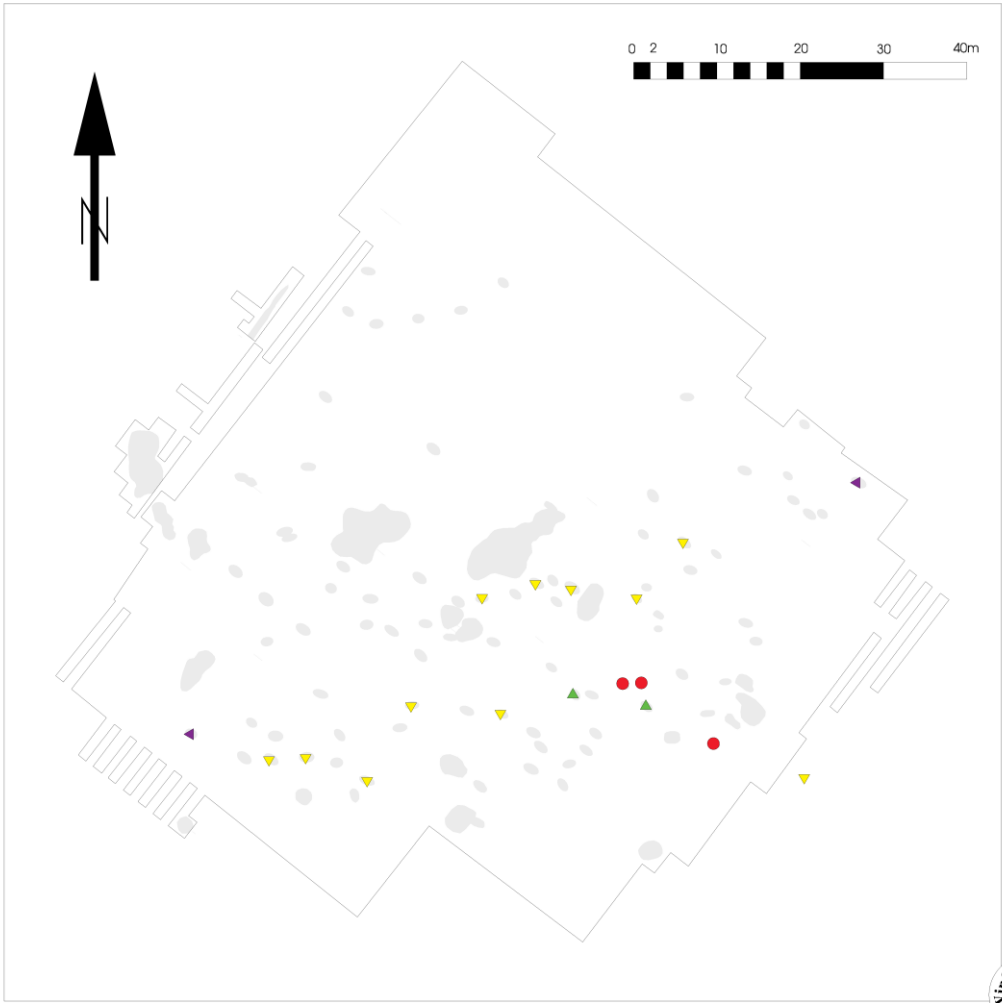


- Red chalk powder00010 : Mineral resources\Colouring\##Red chalk powder
- ▲ Red colour stone00010 : Mineral resources\Colouring\##Red colour stone
- ▼ Red colouration_undetermined00010 : Mineral resources\Colouring\##Red colouration_undetermined

Figure Appendix 74: Distribution map 22 of Vedrovice.

Burials in Bytes – A Quantitative Study of Linear Pottery cemeteries

F=98 B=118 Ness#Ne#N=15 Kon#Ni#N=3 Normkoor=0 Frequ=On
 Map23, Polished stone tools
 Hahnekamp Yanik
 Vedrovice Stroká u lesa
 LBK Gräberfelder

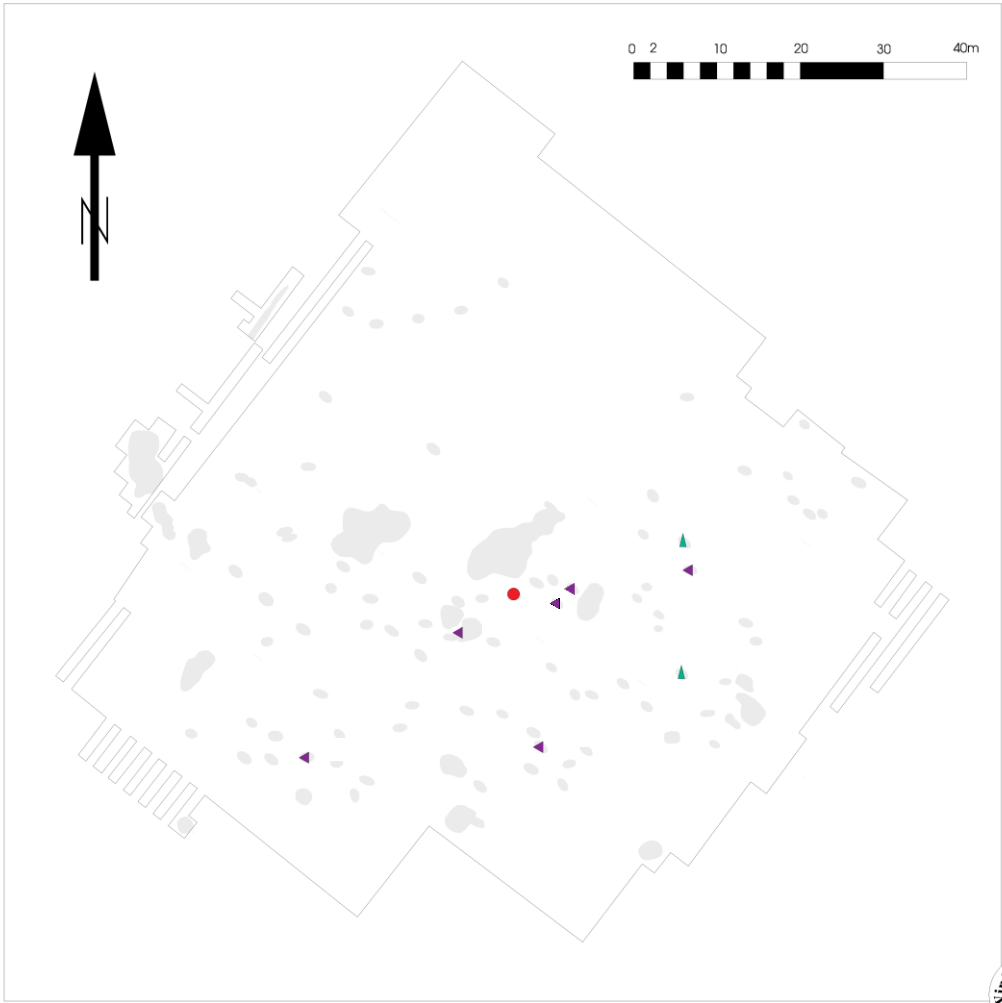


- Adze_Type 100010 : Weapons and tools\Polished stone tools\Non-perforated blades\##Adze_Type 1
- ▲ Adze_Type 200010 : Weapons and tools\Polished stone tools\Non-perforated blades\##Adze_Type 2
- ▼ Adze_Type 300010 : Weapons and tools\Polished stone tools\Non-perforated blades\##Adze_Type 3
- ◆ Adze_Type 400010 : Weapons and tools\Polished stone tools\Non-perforated blades\##Adze_Type 4

Figure Appendix 75: Distribution map 23 of Vedrovice.

Burials in Bytes – A Quantitative Study of Linear Pottery cemeteries

F=98 B=118 Ness#Nell#15 Kon#Ni#3 Normkoor#0 Frequ=On
 Map24, Macrolithic chert tools
 Hahnekamp Yanik
 Vedrovice Stroká u lesa
 LBK Gräberfelder



- Nucleus00010 : Weapons and tools\Chert artefacts\Macrolithic\##Nucleus
- ▲ Non-retouched blade00010 : Weapons and tools\Chert artefacts\Macrolithic\##Non-retouched blade
- ▲ Flake_Undetermined00010 : Weapons and tools\Chert artefacts\Macrolithic\##Flake_Undetermined

Figure Appendix 76: Distribution map 24 of Vedrovice.

Burials in Bytes – A Quantitative Study of Linear Pottery cemeteries

F=98 B=118 Ness/Nel=15 Kon/Ni=3 Norm/ko=0 Frequ=On
 Map25, Microlithic chert tools
 Hahnekamp Yanik
 Vedrovice Stroká u lesa
 LBK Gräberfelder

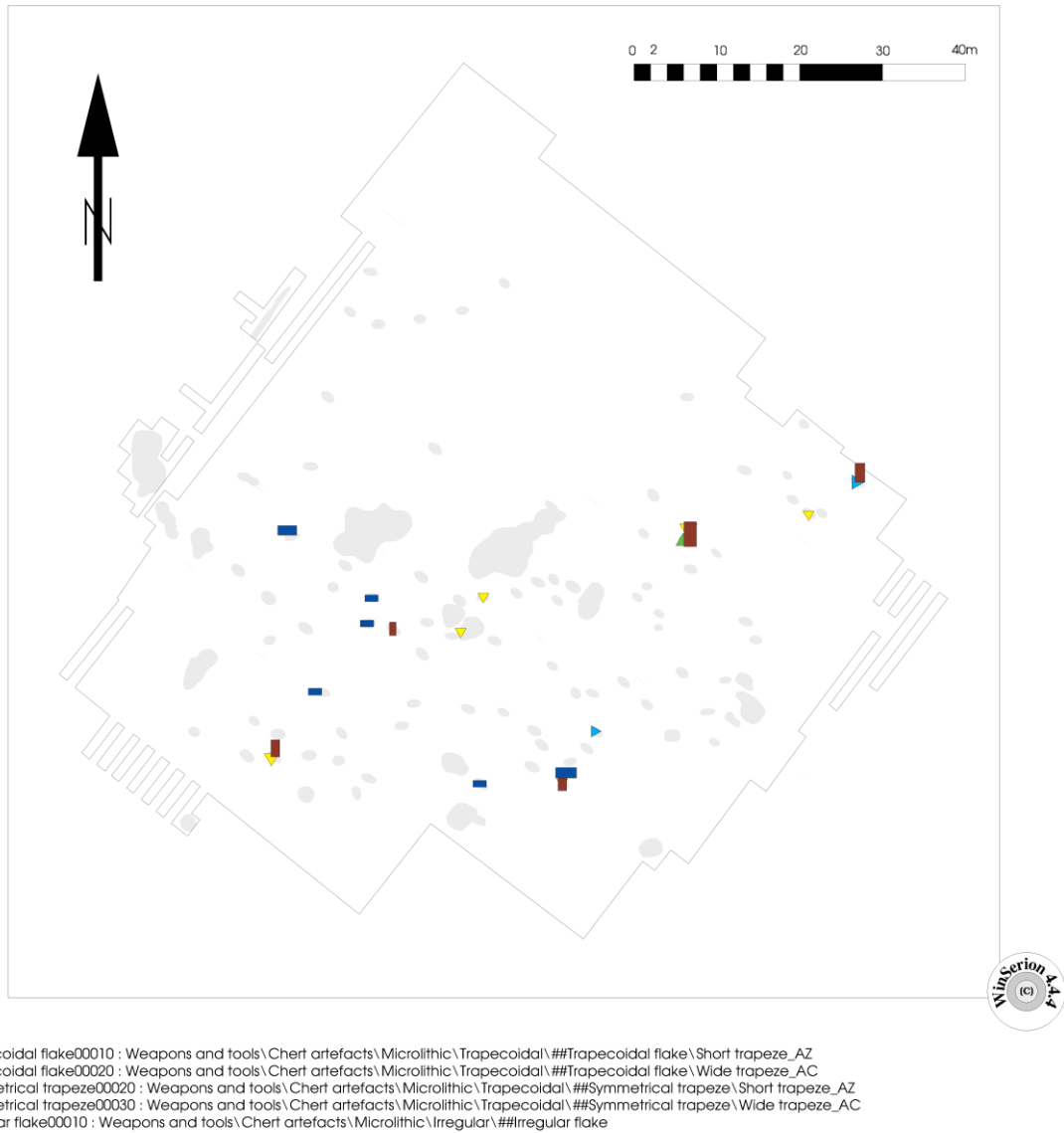


Figure Appendix 77: Distribution map 25 of Vedrovice.

Burials in Bytes – A Quantitative Study of Linear Pottery cemeteries

F=83 Eu=59 NextNeib=15 KonfN=V=3 Normkoon=0 Freque=On

LBK Gräberfelder

Archäologische Daten, Vedrovice Siroká u lesa, ANN1

Bearbeitung: Hahnekamp Yanik 2020

monovariate Clusteranalysis with Eigenvectors

Reciprocal Averaging,

Analysis of N Next Neighbours by 1 Type

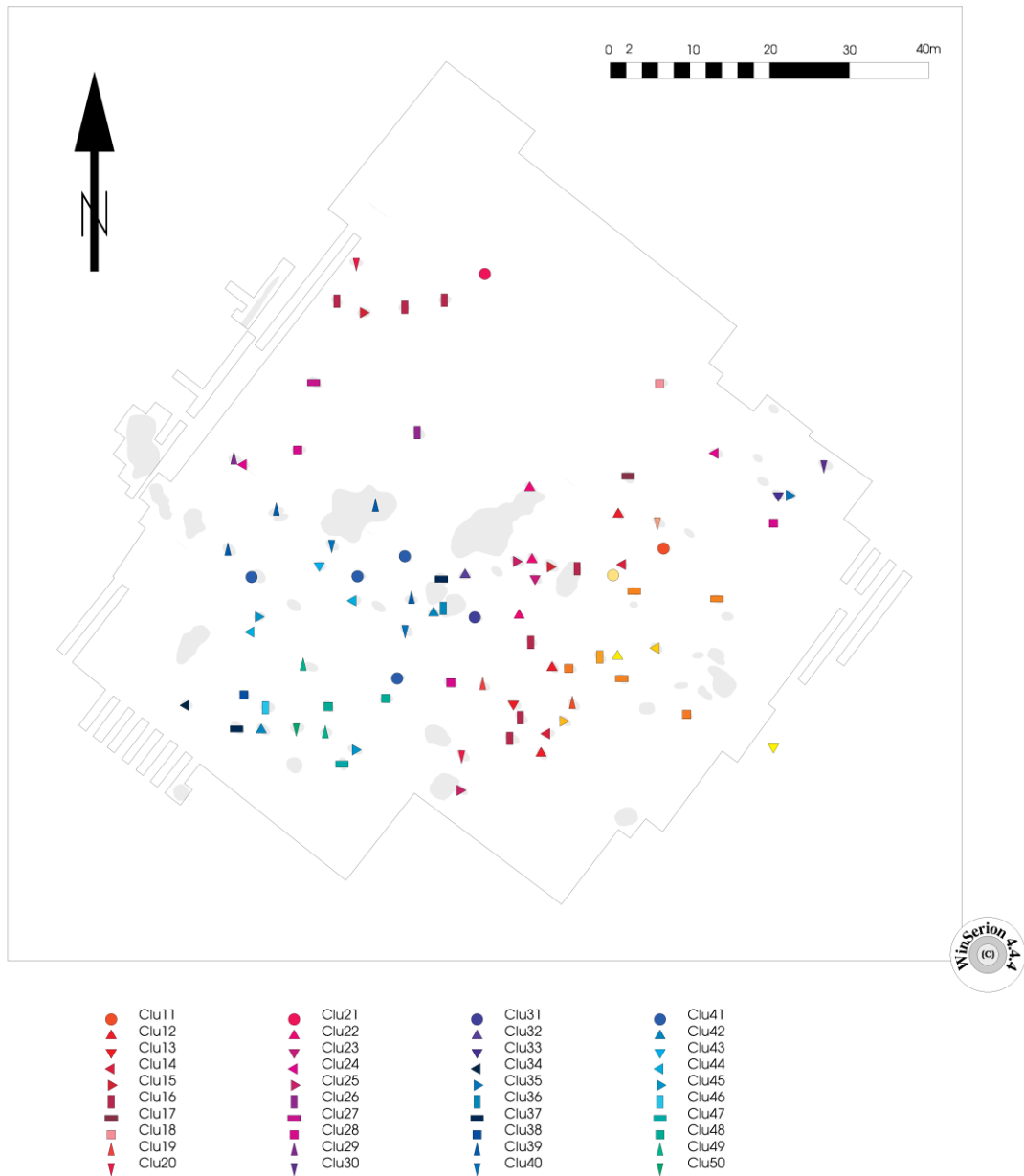
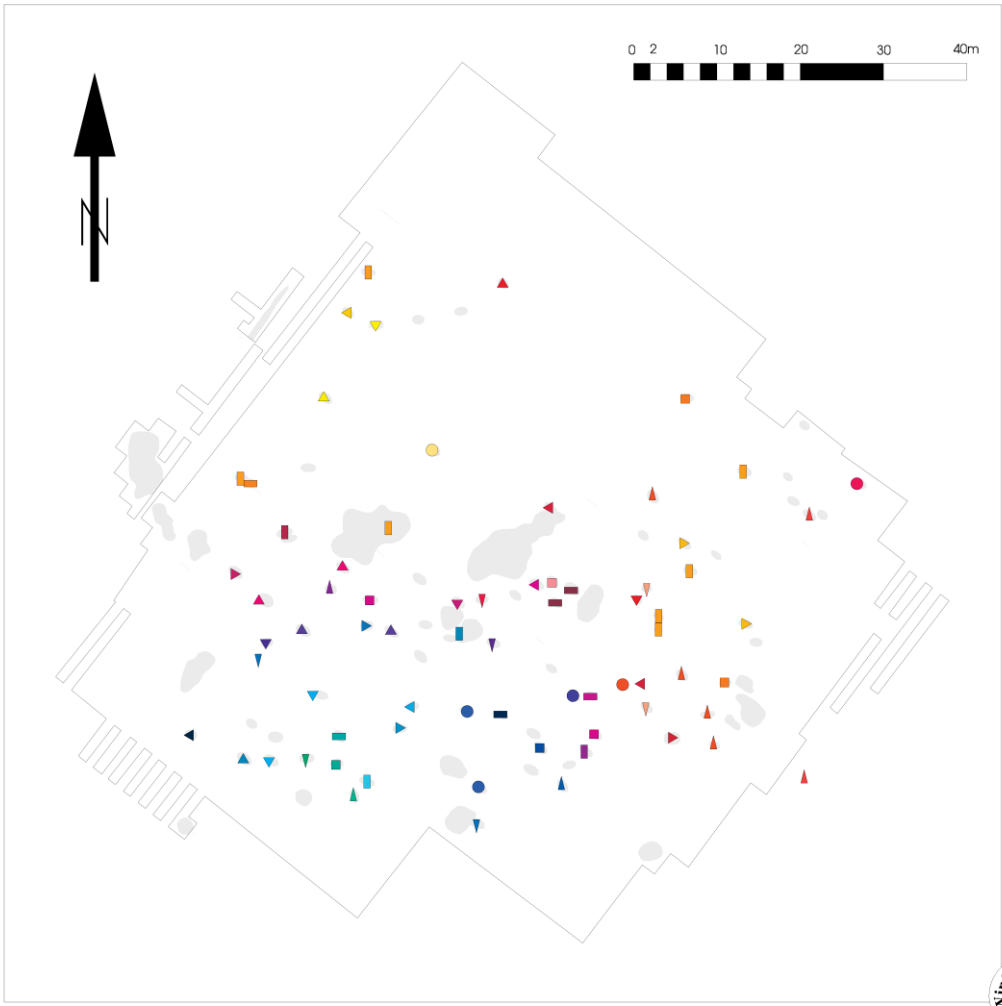


Figure Appendix 78: Analysis N Next Neighbours of pit orientation and burial position at Vedrovice “Siroká u lesa”.

Burials in Bytes – A Quantitative Study of Linear Pottery cemeteries

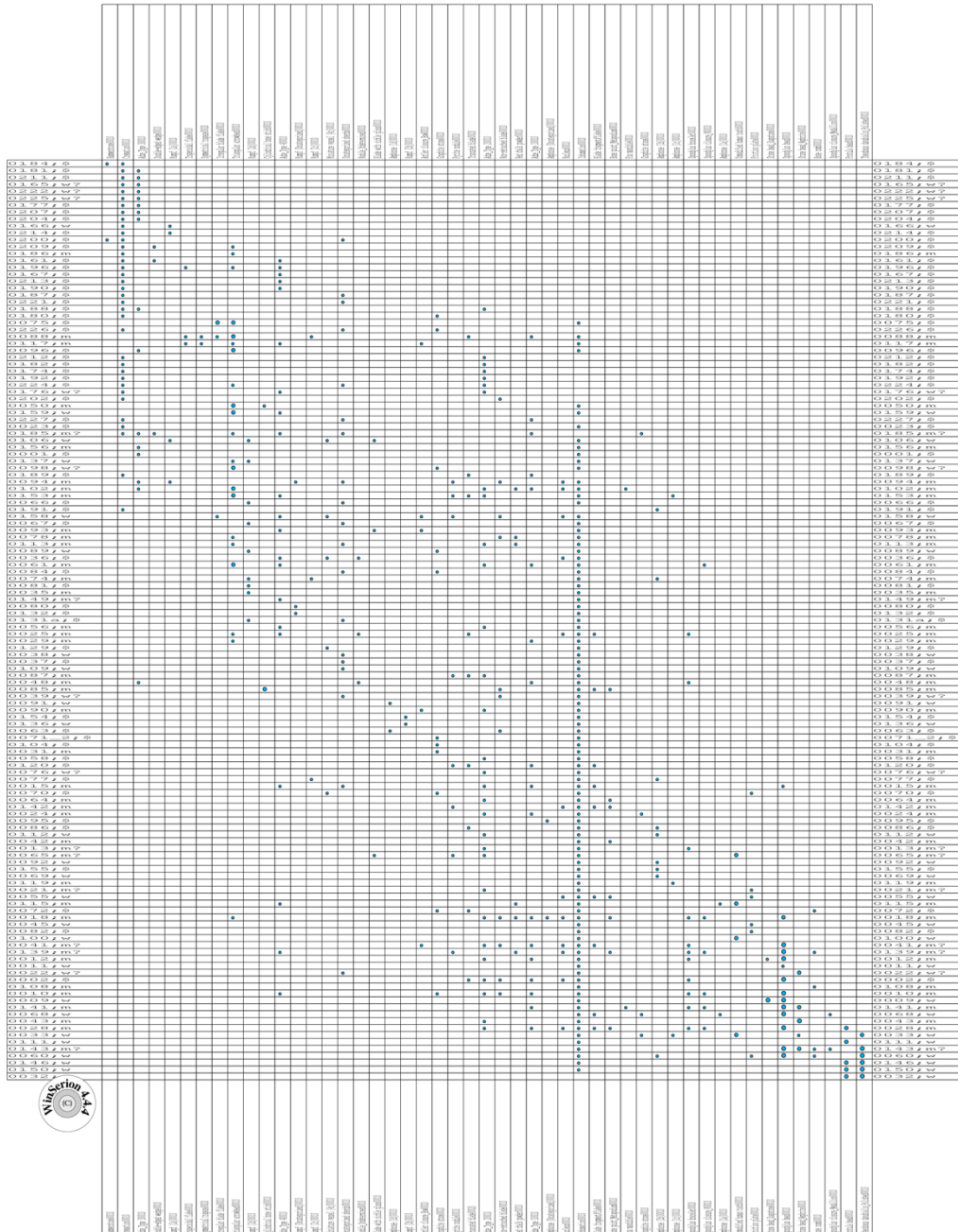
F=71 B=1209 NearestNe=15 Konf=0.93 Normkoeff=0 Freq=On
LBK Gräberfelder
 Archäologische Daten, Vedrovice Siroká u lesa,ANN1
 Bearbeitung: Hahnekamp Yanik 2020
 monovariate Clusteranalysis with Eigenvectors
 Reciprocal Averaging,
 Analysis of N Next Neighbours by 1 Type



- | | | | | |
|---------|---------|---------|---------|---------|
| ● Clu01 | ● Clu11 | ● Clu21 | ● Clu31 | ● Clu41 |
| ▲ Clu02 | ▲ Clu12 | ▲ Clu22 | ▲ Clu32 | ▲ Clu42 |
| ▲ Clu03 | ▲ Clu13 | ▲ Clu23 | ▲ Clu33 | ▲ Clu43 |
| ▲ Clu04 | ▲ Clu14 | ▲ Clu24 | ▲ Clu34 | ▲ Clu44 |
| ▲ Clu05 | ▲ Clu15 | ▲ Clu25 | ▲ Clu35 | ▲ Clu45 |
| ▲ Clu06 | ▲ Clu16 | ▲ Clu26 | ▲ Clu36 | ▲ Clu46 |
| ▲ Clu07 | ▲ Clu17 | ▲ Clu27 | ▲ Clu37 | ▲ Clu47 |
| ▲ Clu08 | ▲ Clu18 | ▲ Clu28 | ▲ Clu38 | ▲ Clu48 |
| ▲ Clu09 | ▲ Clu19 | ▲ Clu29 | ▲ Clu39 | ▲ Clu49 |
| ▲ Clu10 | ▲ Clu20 | ▲ Clu30 | ▲ Clu40 | ▲ Clu50 |

Figure Appendix 79: Analysis N Next Neighbours of grave goods and burial type at Vedrovice “Siroká u lesa”.

Burials in Bytes – A Quantitative Study of Linear Pottery cemeteries



**Reciprocal Averaging,
LBK Gräberfelder
Archäologische Daten, Aiterhofen Ödmühle, Seriation
Bearbeitung: Hahnekamp Yanik 2020**

F=133 T=49 I=474 I*=1200 OZ=1 AZ=30 LIS= 0.9514 COS= 0.9514 STR= 0.9514 J=1 M=24 ColorSet=CMYK

Figure Appendix 80: Seriation of the data set of grave goods combined with burial types of Aiterhofen-Ödmühle.

Burials in Bytes – A Quantitative Study of Linear Pottery cemeteries

F:\250 B\102 Nox\HeN=15 Kart\N\N=3 Normkoo=0 Frequ=On
 Map02, Biological sex
 Hahnekamp Yanik
 Aiterhofen Ödmühle
 LBK Gräberfelder

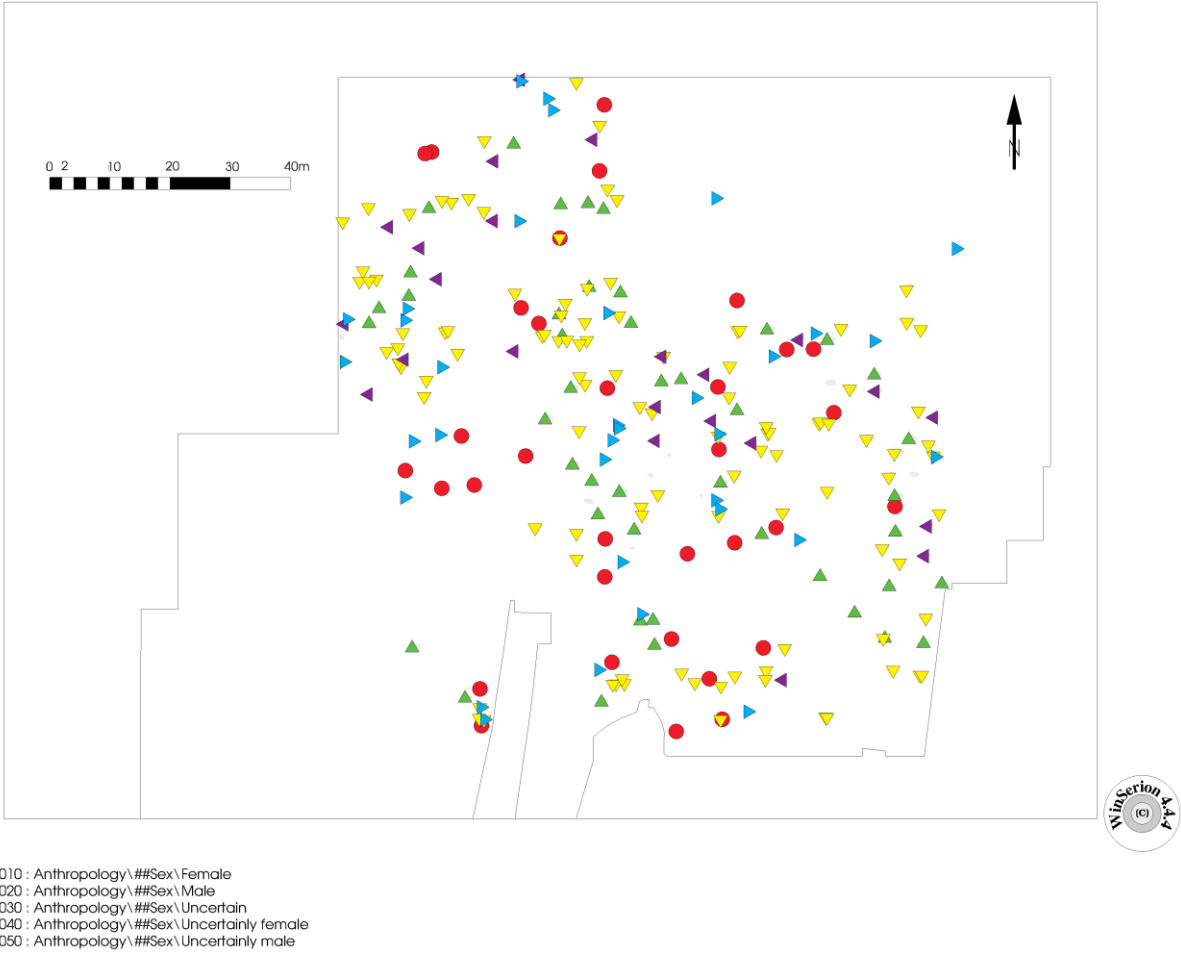


Figure Appendix 82: Distribution map 2 of Aiterhofen-Ödmühle.

Burials in Bytes – A Quantitative Study of Linear Pottery cemeteries

F=250.0=152 NextfileN=15 KorffN/A=3 Normican0 Frequ=On
 Map03, Age (adult)
 Hahnekamp Yanik
 Aiterhofen Ödmühle
 LBK Gräberfelder

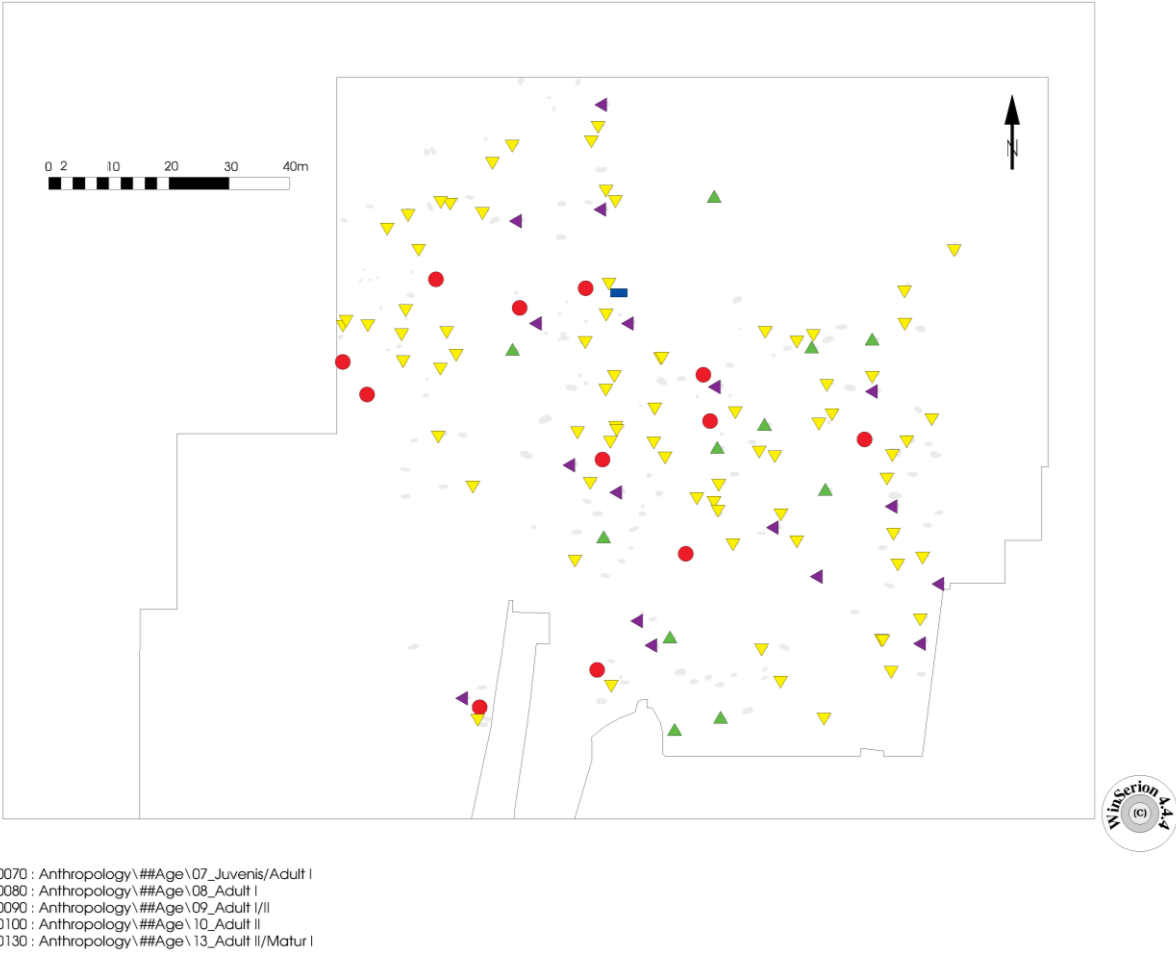


Figure Appendix 83: Distribution map 3 of Aiterhofen-Ödmühle.

Burials in Bytes – A Quantitative Study of Linear Pottery cemeteries

F:\250 B=142 Next\N=15 Kont\N=3 Norm\k=0 Freq=On
 Map04, Age (mature to senile)
 Hahnekamp Yanik
 Aiterhofen Ödmühle
 LBK Gräberfelder

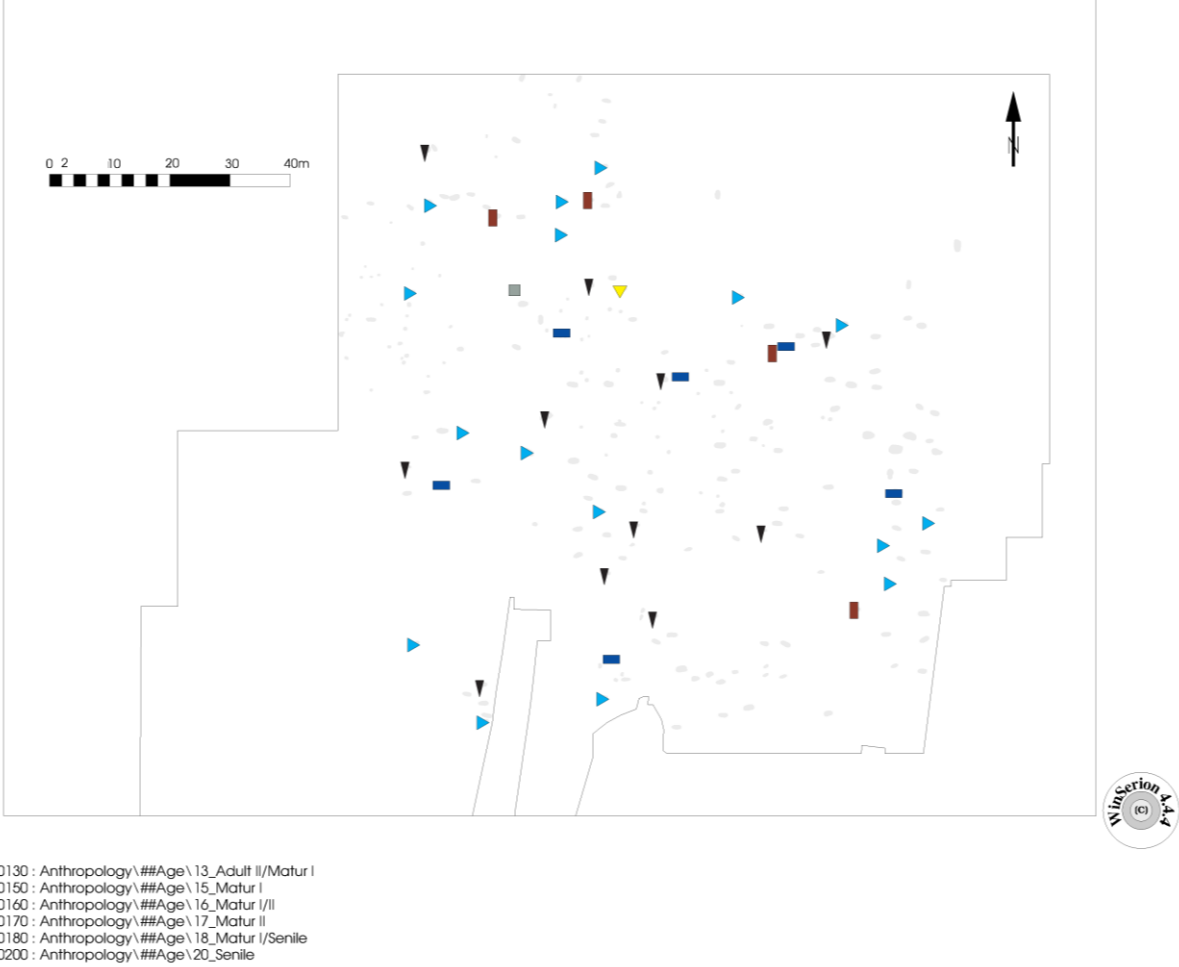
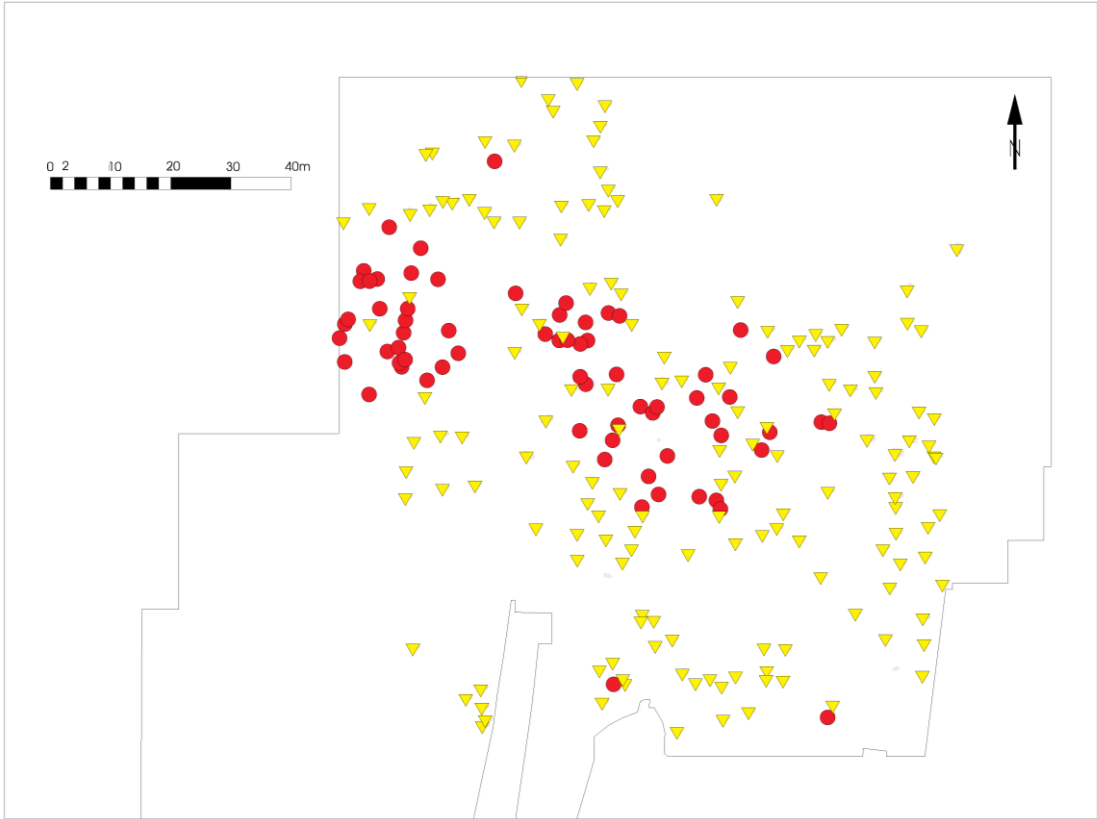


Figure Appendix 84: Distribution map 4 of Aiterhofen-Ödmühle

Burials in Bytes – A Quantitative Study of Linear Pottery cemeteries

F=255 B=102 NextNeib=15 KonfN/N=3 NormKor=0 Proj=Om
Map05, Burial type
Hahnekamp Yanik
Aiterhofen Ödmühle
LBK Gräberfelder



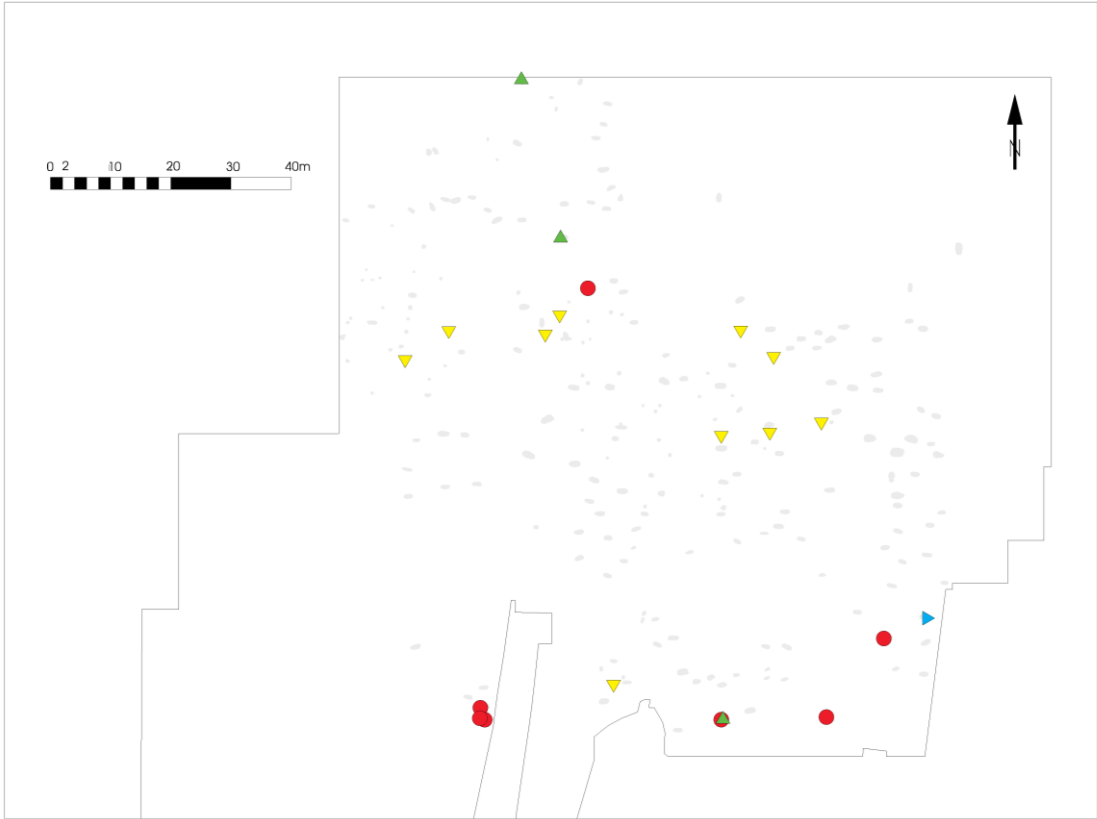
● Cremation00010 : Type of finding\##Cremation
▼ Inhumation00010 : Type of finding\##Inhumation



Figure Appendix 85: Distribution map 5 of Aiterhofen-Ödmühle.

Burials in Bytes – A Quantitative Study of Linear Pottery cemeteries

F=255 B=102 NextNeib=15 KonfN=3 NormKor=0 Proj=On
 Map06, Multiple burials
 Hahnekamp Yanik
 Aiterhofen Ödmühle
 LBK Gräberfelder



- Partial burial00010 : Type of finding\##Partial burial
- ▲ Double inhumation00010 : Type of finding\##Double inhumation
- ▼ Double cremation00010 : Type of finding\##Double cremation
- ▶ Uncertain double burial00010 : Type of finding\##Uncertain double burial



Figure Appendix 86: Distribution map 6 of Aiterhofen-Ödmühle.

Burials in Bytes – A Quantitative Study of Linear Pottery cemeteries

F:\250 B=162 New\Heb\N=15 Konth\W\N=3 Namikon\0 Requ=On

Map07, Burial pit orientation (1 of 2)

Hahnekamp Yanik
 Aiterhofen Ödmühle
 LBK Gräberfelder

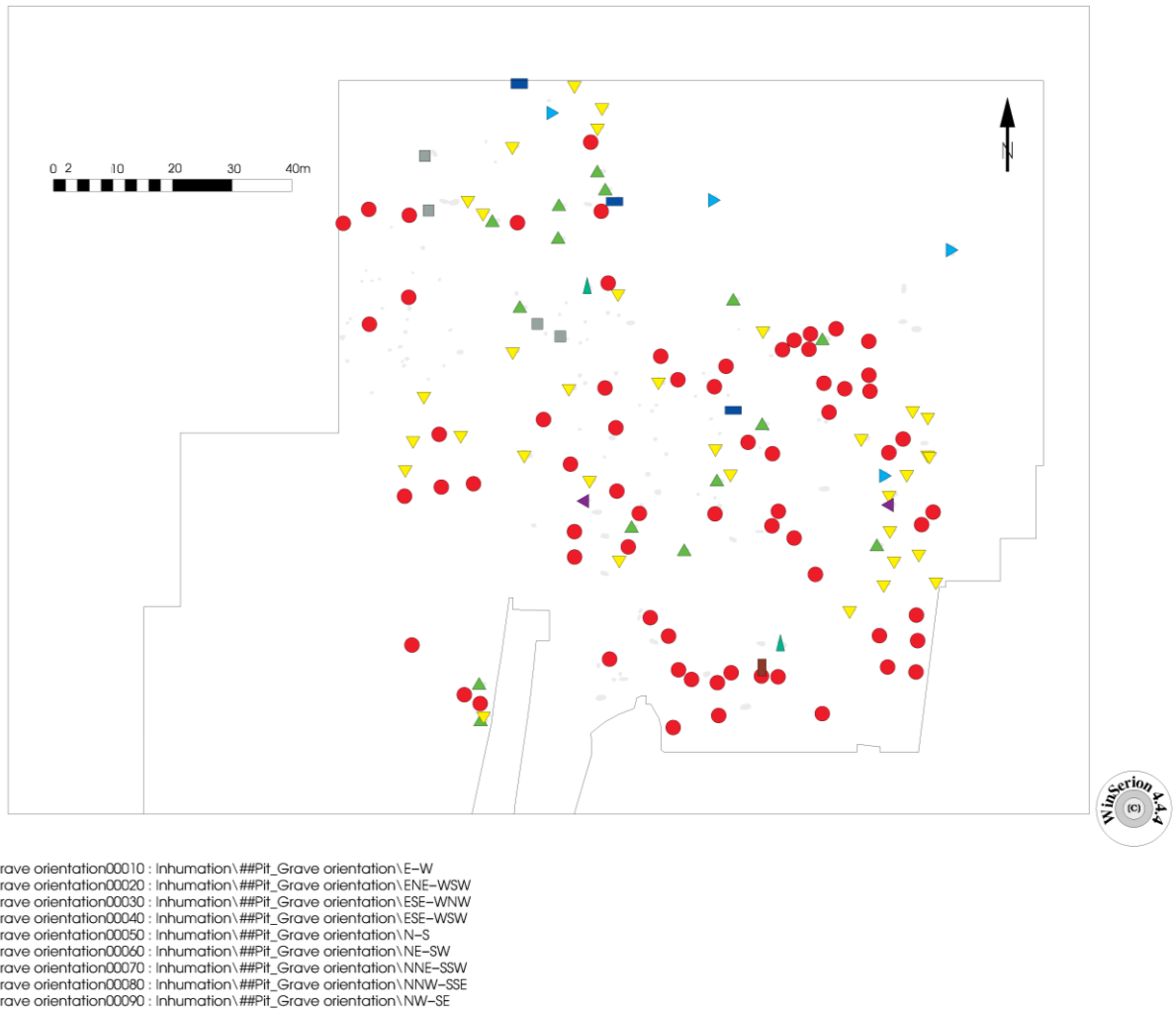
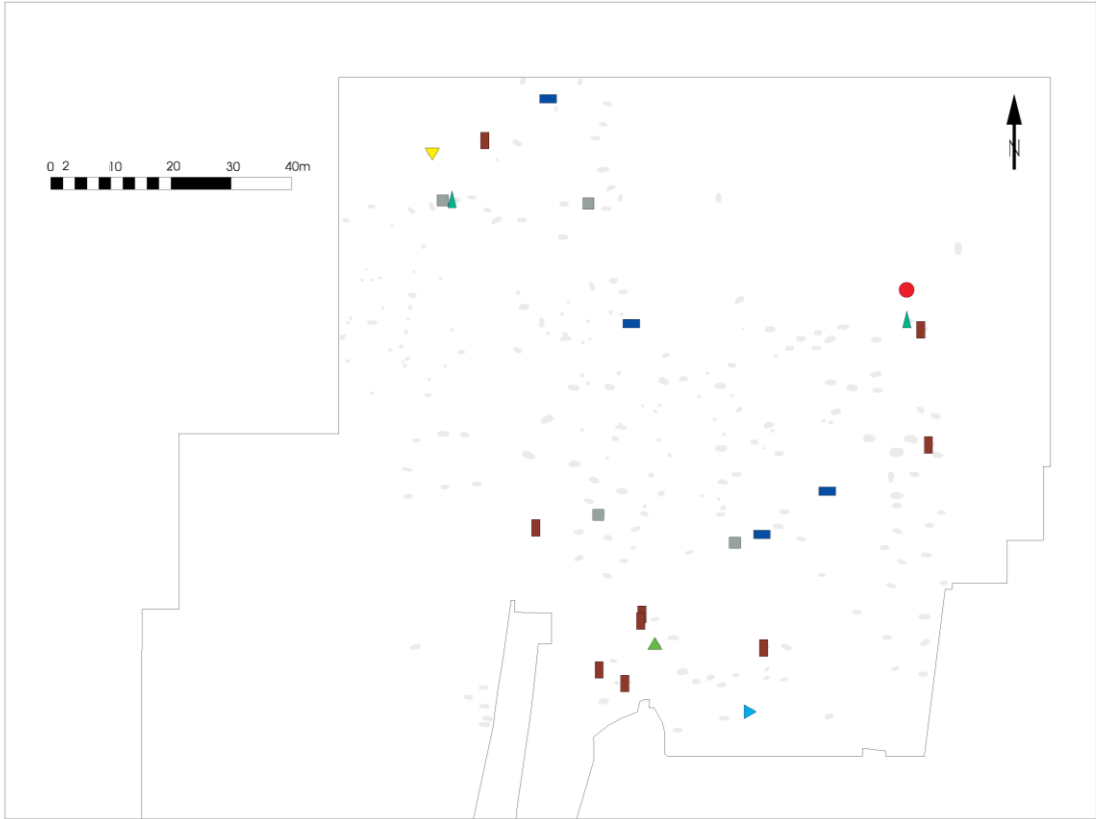


Figure Appendix 87: Distribution map 7 of Aiterhofen-Ödmühle.

Burials in Bytes – A Quantitative Study of Linear Pottery cemeteries

F:\200.04-162_Nordhelle\N=15_Kontroll\N=3_Nordhelle\0_Frequenz

Map08, Burial pit orientation (2 of 2)
 Hahnekamp Yanik
 Aiterhofen Ödmühle
 LBK Gräberfelder



- Pit_Grave orientation00110 : Inhumation\##Pit_Grave orientation\S-N
- ▲ Pit_Grave orientation00120 : Inhumation\##Pit_Grave orientation\SE-NW
- ▼ Pit_Grave orientation00130 : Inhumation\##Pit_Grave orientation\SSE-NNW
- ▶ Pit_Grave orientation00150 : Inhumation\##Pit_Grave orientation\SW-NE
- Pit_Grave orientation00160 : Inhumation\##Pit_Grave orientation\Uncertain
- Pit_Grave orientation00170 : Inhumation\##Pit_Grave orientation\W-E
- Pit_Grave orientation00180 : Inhumation\##Pit_Grave orientation\WNW-ESE
- ▲ Pit_Grave orientation00190 : Inhumation\##Pit_Grave orientation\WSW-ESE

Figure Appendix 88: Distribution map 8 of Aiterhofen-Ödmühle.

Burials in Bytes – A Quantitative Study of Linear Pottery cemeteries

F=250 B=150 NextHeN=15 KonfN=N=3 Normicon=0 Frequ=On
 Map09, Line of sight
 Hahnekamp Yanik
 Aiterhofen Ödmühle
 LBK Gräberfelder

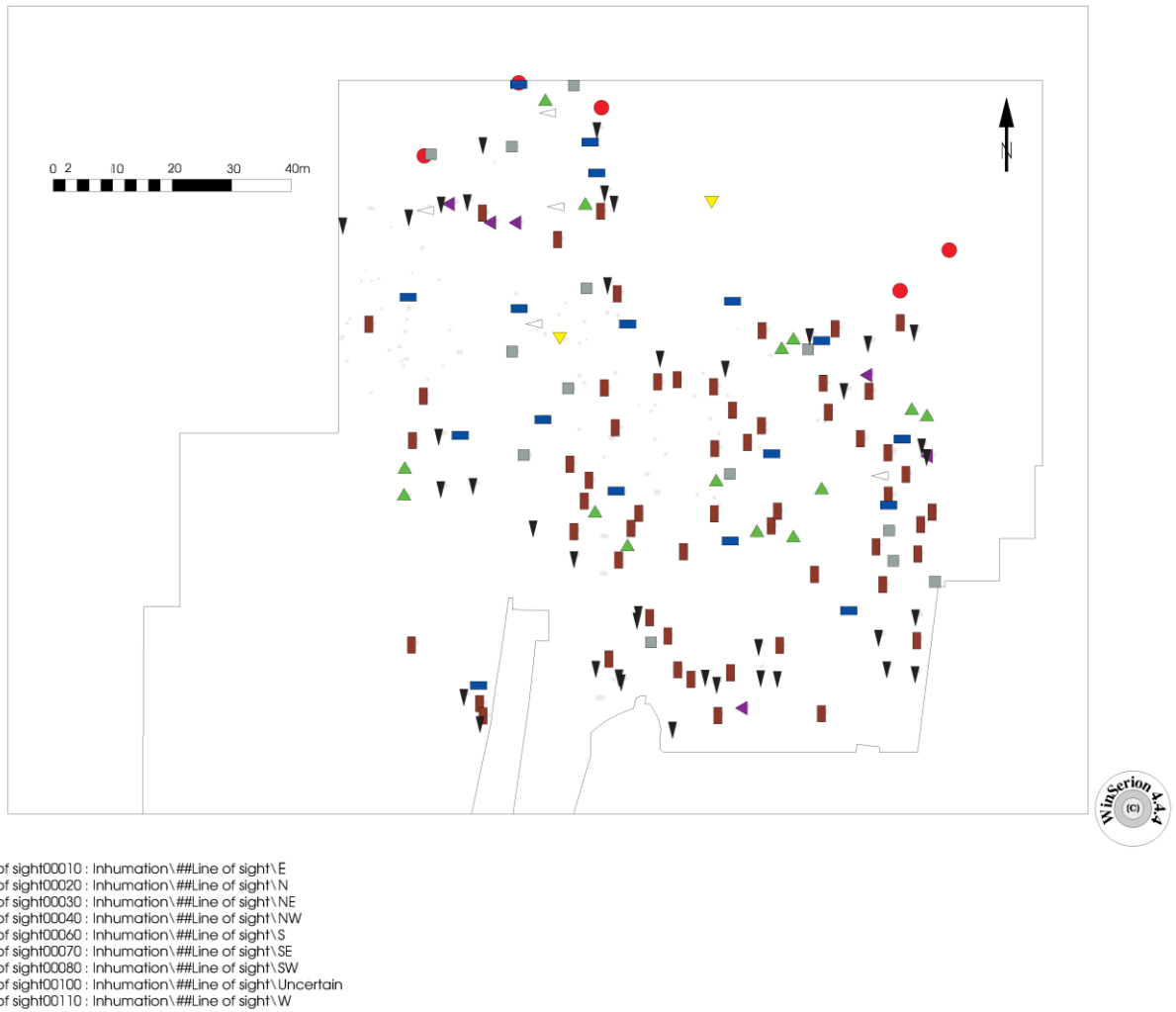
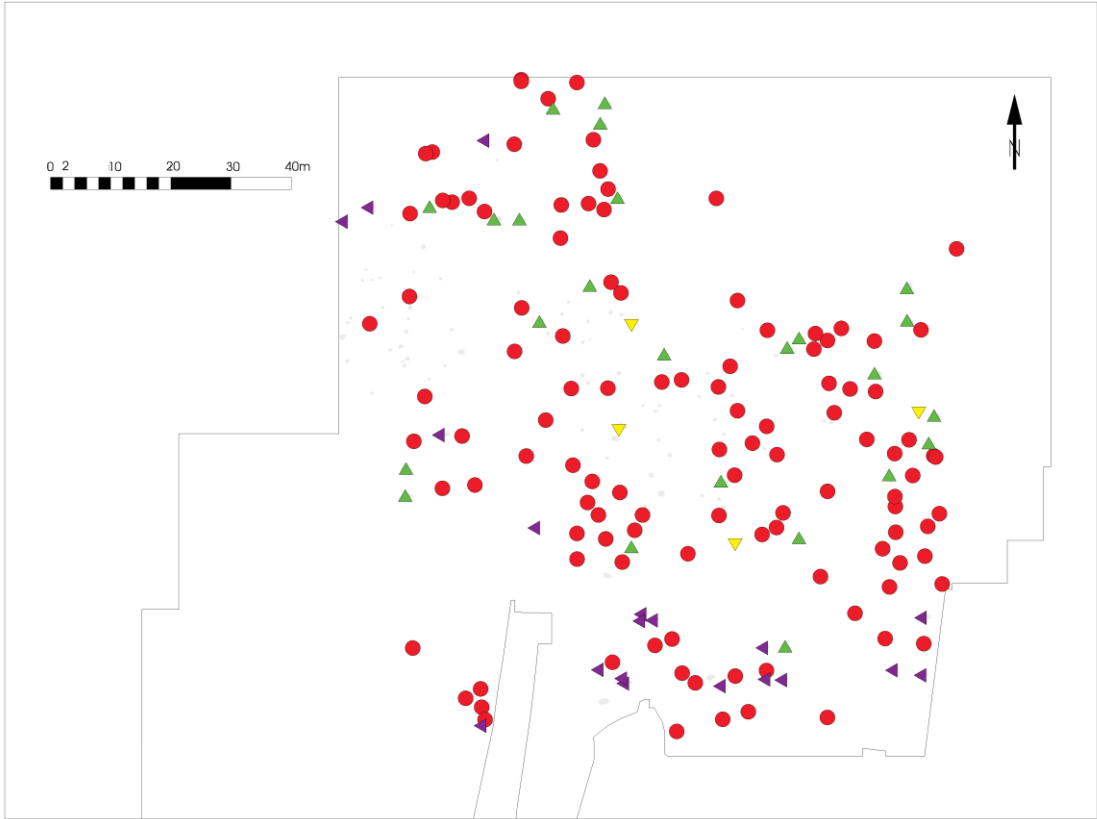


Figure Appendix 89: Distribution map 9 of Aiterhofen-Ödmühle.

Burials in Bytes – A Quantitative Study of Linear Pottery cemeteries

F=250 B=102 NextNull=15 KonfN=3 NormKor=0 Frag=On
 Map10, Body orientation
 Hahnekamp Yanik
 Aiterhofen Ödmühle
 LBK Gräberfelder



- Body orientation00010 : Inhumation\##Body orientation\Left
- ▲ Body orientation00020 : Inhumation\##Body orientation\Right
- ▼ Body orientation00030 : Inhumation\##Body orientation\Straight
- ◀ Body orientation00040 : Inhumation\##Body orientation\Uncertain

Figure Appendix 90: Distribution map 10 of Aiterhofen-Ödmühle.

Burials in Bytes – A Quantitative Study of Linear Pottery cemeteries

F:\250 B=142 Next\N=15 Kont\N=3 Norm\acc=0 Frequ=0m
 Map11, Torso position
 Hahnekamp Yanik
 Aiterhofen Ödmühle
 LBK Gräberfelder

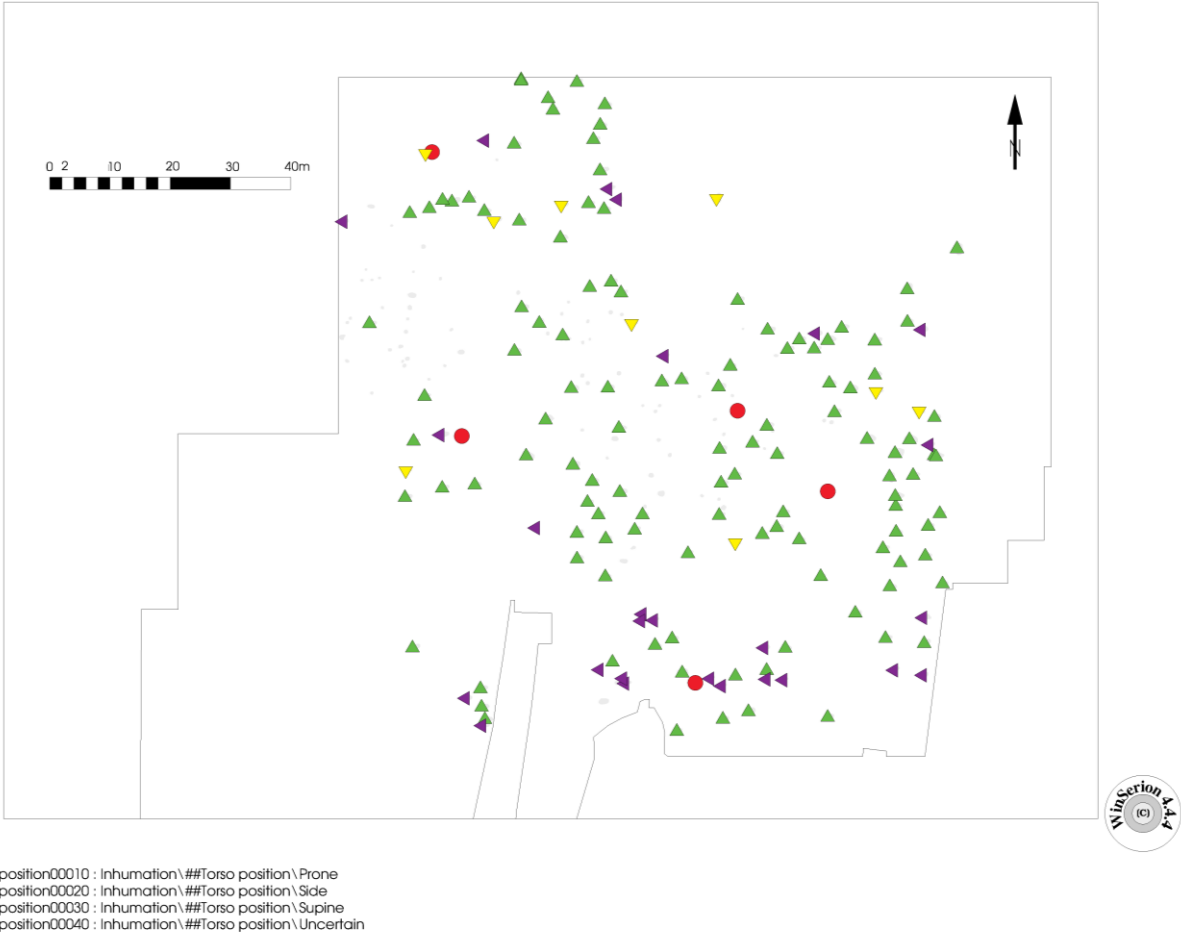


Figure Appendix 91: Distribution map 11 of Aiterhofen-Ödmühle.

Burials in Bytes – A Quantitative Study of Linear Pottery cemeteries

F=250 B=102 NaxtN=15 KartN=N=3 Normkoeff=0 Frequ=On

Map12, Angle backbone to upper thigh
 Hahnekamp Yanik
 Aiterhofen Ödmühle
 LBK Gräberfelder

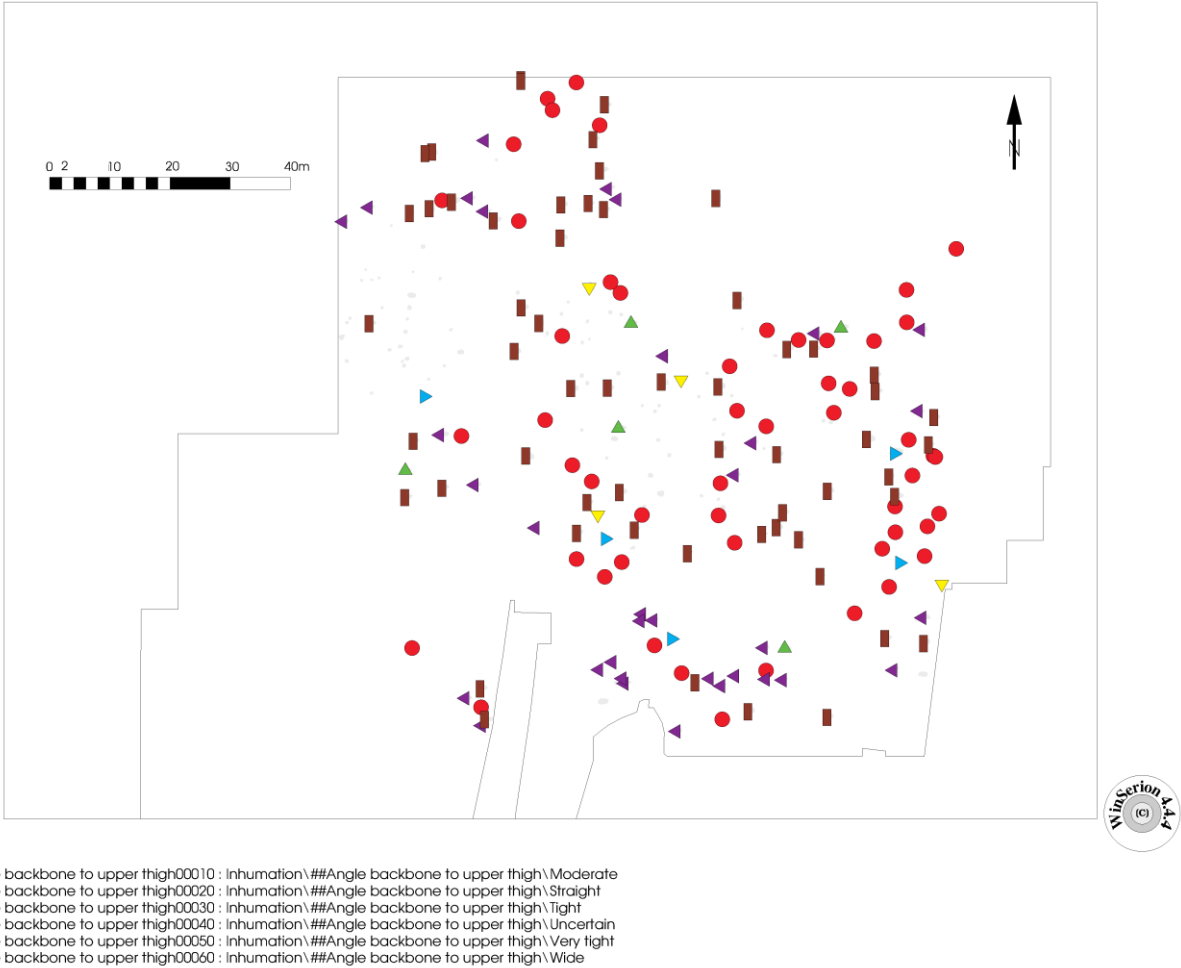
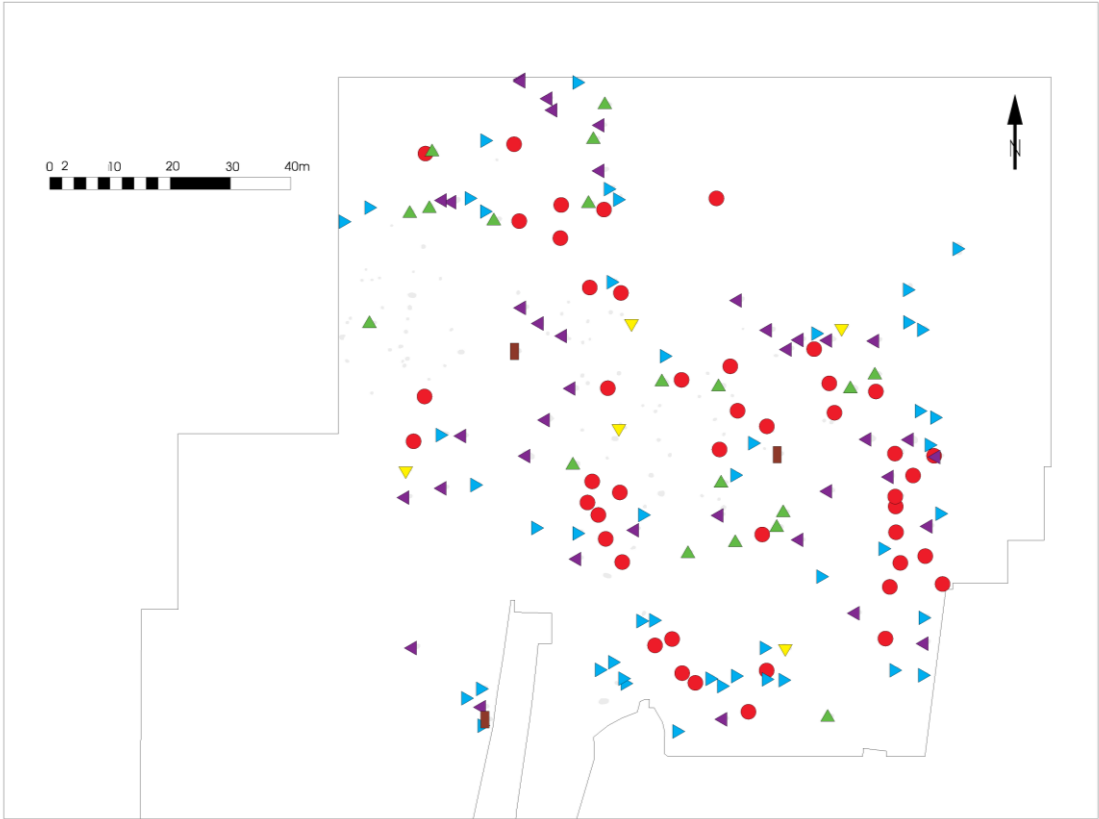


Figure Appendix 92: Distribution map 12 of Aiterhofen-Ödmühle.

Burials in Bytes – A Quantitative Study of Linear Pottery cemeteries

F=250 B=102 NextN=15 KonfN=3 NormKor=0 Frequ=0m

Map13, Angle upper to lower thigh
 Hahnekamp Yanik
 Aiterhofen Ödmühle
 LBK Gräberfelder



- Angle upper to lower thigh00010 : Inhumation\##Angle upper to lower thigh\Extreme
- ▲ Angle upper to lower thigh00020 : Inhumation\##Angle upper to lower thigh\Moderate
- ▼ Angle upper to lower thigh00030 : Inhumation\##Angle upper to lower thigh\Straight
- ▲ Angle upper to lower thigh00040 : Inhumation\##Angle upper to lower thigh\Tight
- ▲ Angle upper to lower thigh00050 : Inhumation\##Angle upper to lower thigh\Uncertain
- Angle upper to lower thigh00060 : Inhumation\##Angle upper to lower thigh\Wide



Figure Appendix 93: Distribution map 13 of Aiterhofen-Ödmühle.

Burials in Bytes – A Quantitative Study of Linear Pottery cemeteries

F:\250 B\102 Next\N=15 Kart\N=3 Norm\koc=0 Frequ=On

Map14, Arm gesture
 Hahnekamp Yanik
 Aiterhofen Ödmühle
 LBK Gräberfelder

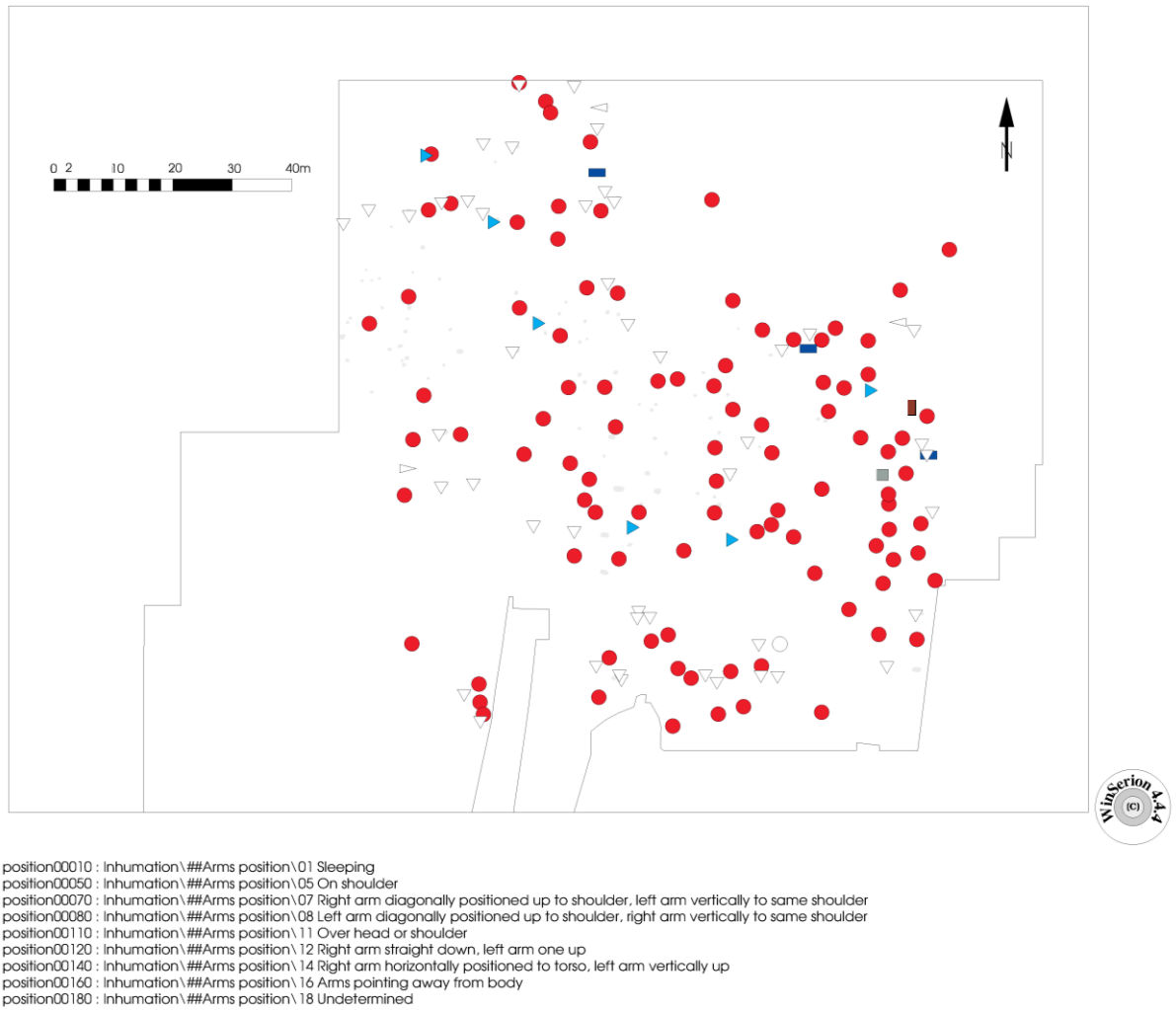
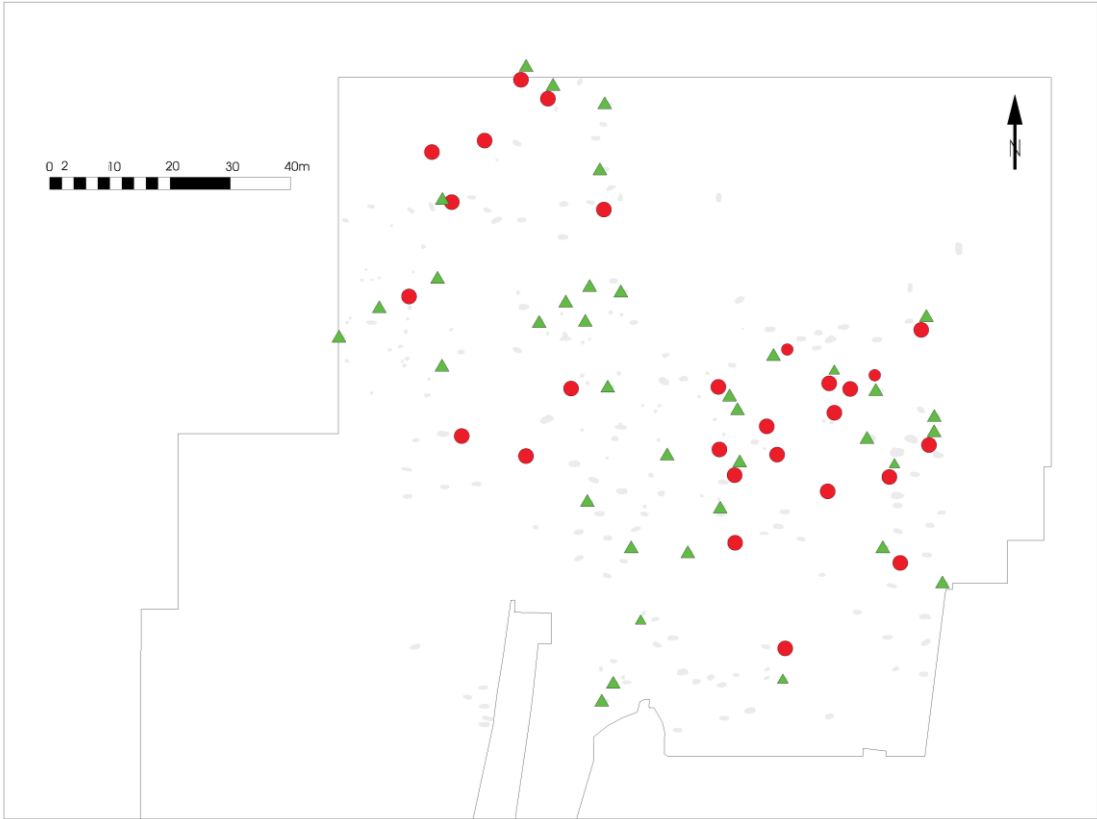


Figure Appendix 94: Distribution map 14 of Aiterhofen-Ödmühle.

Burials in Bytes – A Quantitative Study of Linear Pottery cemeteries

F:\250 B\102 Nov\Net\N=15 Kart\N\N=3 Norm\koc=0 Frequ=On
Map15, Vessel condition
Hahnekamp Yanik
Aiterhofen Ödmühle
LBK Gräberfelder

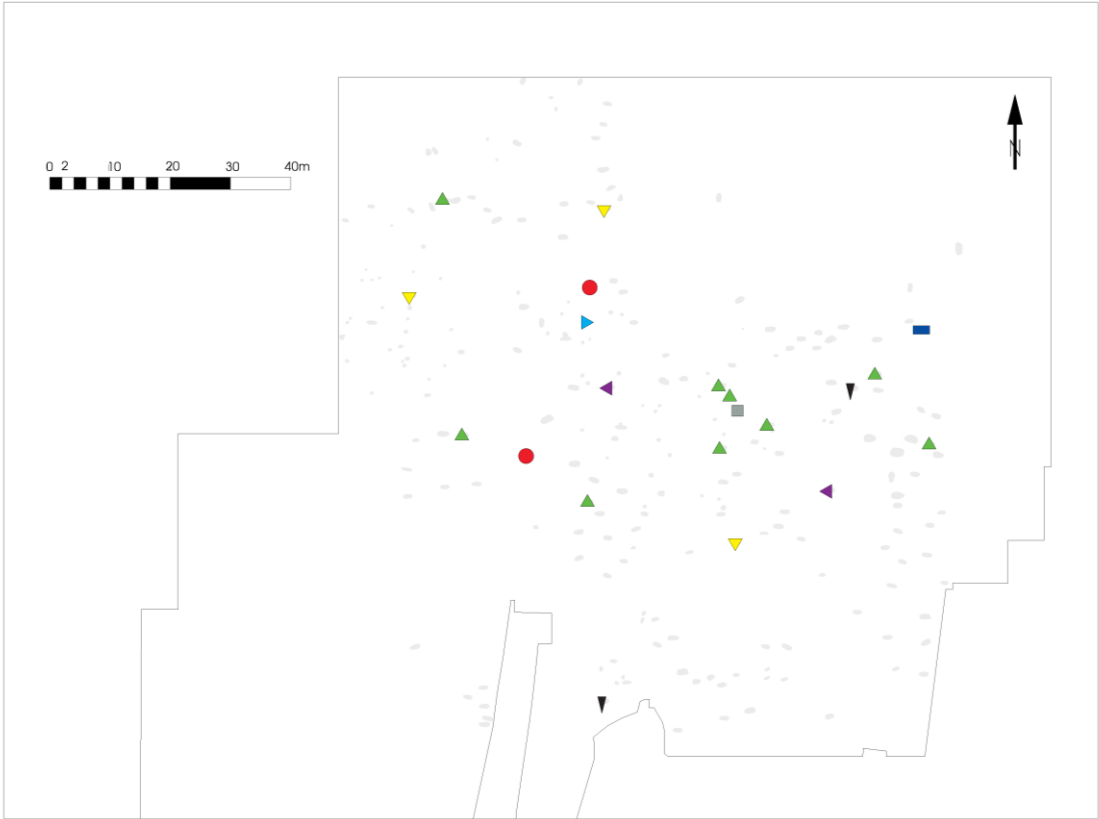


● Grave good00010 : Ceramic\##Grave good
▲ Vessel unit00010 : Ceramic\##Vessel unit

Figure Appendix 95: Distribution map 15 of Aiterhofen-Ödmühle.

Burials in Bytes – A Quantitative Study of Linear Pottery cemeteries

F=250 B=102 NextHeN=15 KonfN=N=3 NormKor=0 Frequ=On
 Map16, Amphorae
 Hahnekamp Yanik
 Aiterhofen Ödmühle
 LBK Gräberfelder



- Amphorae (1a)00010 : Ceramic\Pottery\1 Amphorae and Pots\##Amphorae (1a)
- ▲ Amphorae (1b)00010 : Ceramic\Pottery\1 Amphorae and Pots\##Amphorae (1b)
- ▼ Amphorae (1c)00010 : Ceramic\Pottery\1 Amphorae and Pots\##Amphorae (1c)
- ▲ Amphorae (1d)00010 : Ceramic\Pottery\1 Amphorae and Pots\##Amphorae (1d)
- ▲ Amphorae (1e)00010 : Ceramic\Pottery\1 Amphorae and Pots\##Amphorae (1e)
- Amphorae (1g)00010 : Ceramic\Pottery\1 Amphorae and Pots\##Amphorae (1g)
- ▲ Amphorae (1h)00010 : Ceramic\Pottery\1 Amphorae and Pots\##Amphorae (1h)
- ▼ Amphorae (Uncategorized)00010 : Ceramic\Pottery\1 Amphorae and Pots\##Amphorae (Uncategorized)

Figure Appendix 96: Distribution map 16 of Aiterhofen-Ödmühle.

Burials in Bytes – A Quantitative Study of Linear Pottery cemeteries

F:\250 B=102 Next\N=15 Kart\N=3 Norm\koo=0 Frequ=On
 Map17, Kämpfe
 Hahnekamp Yanik
 Aiterhofen Ödmühle
 LBK Gräberfelder

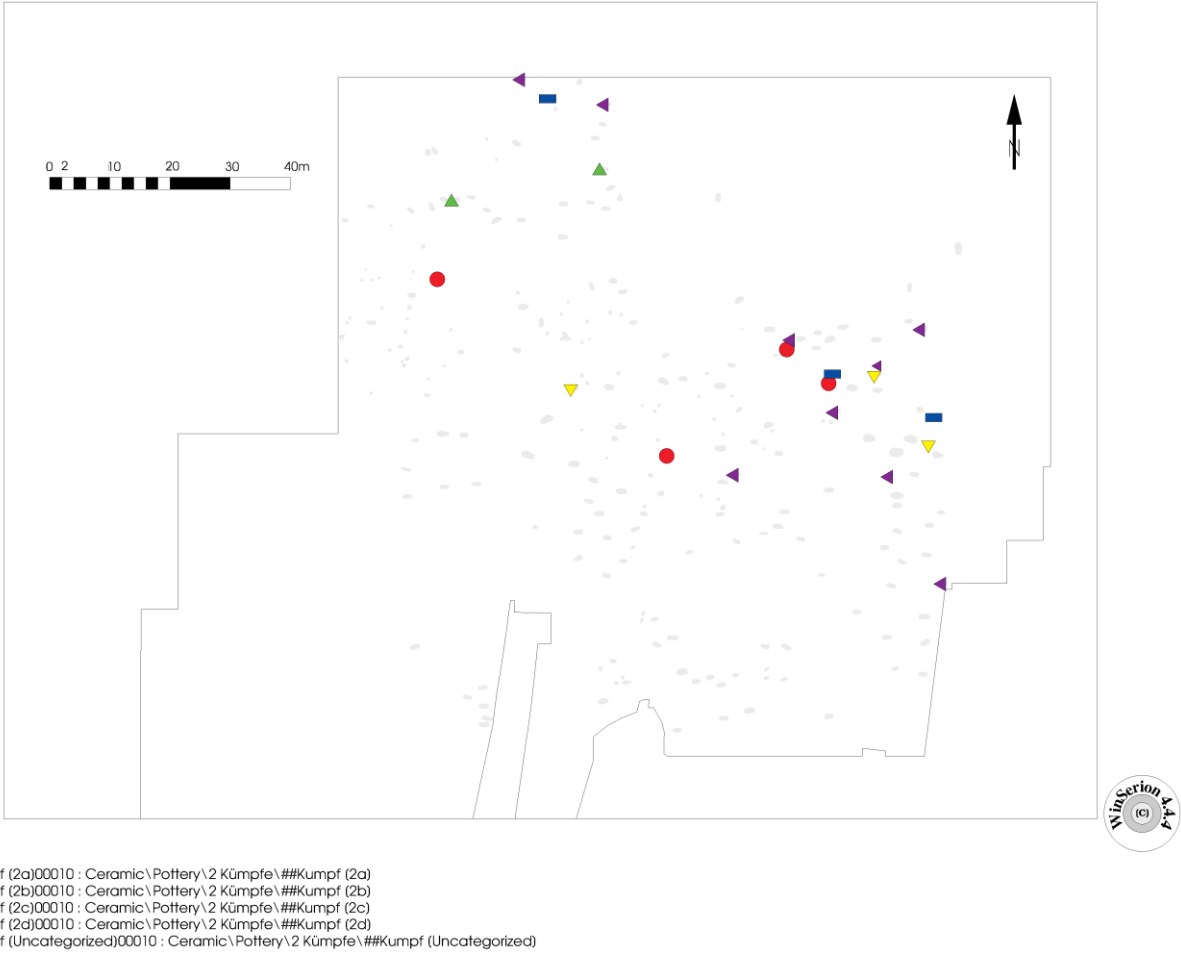


Figure Appendix 97: Distribution map 17 of Aiterhofen-Ödmühle.

Burials in Bytes – A Quantitative Study of Linear Pottery cemeteries

F=250 B=102 NextHeN=15 KonstN=N=3 NormKor=0 Frequ=On
 Map18. Other vessel types
 Hahnekamp Yanik
 Aiterhofen Ödmühle
 LBK Gräberfelder

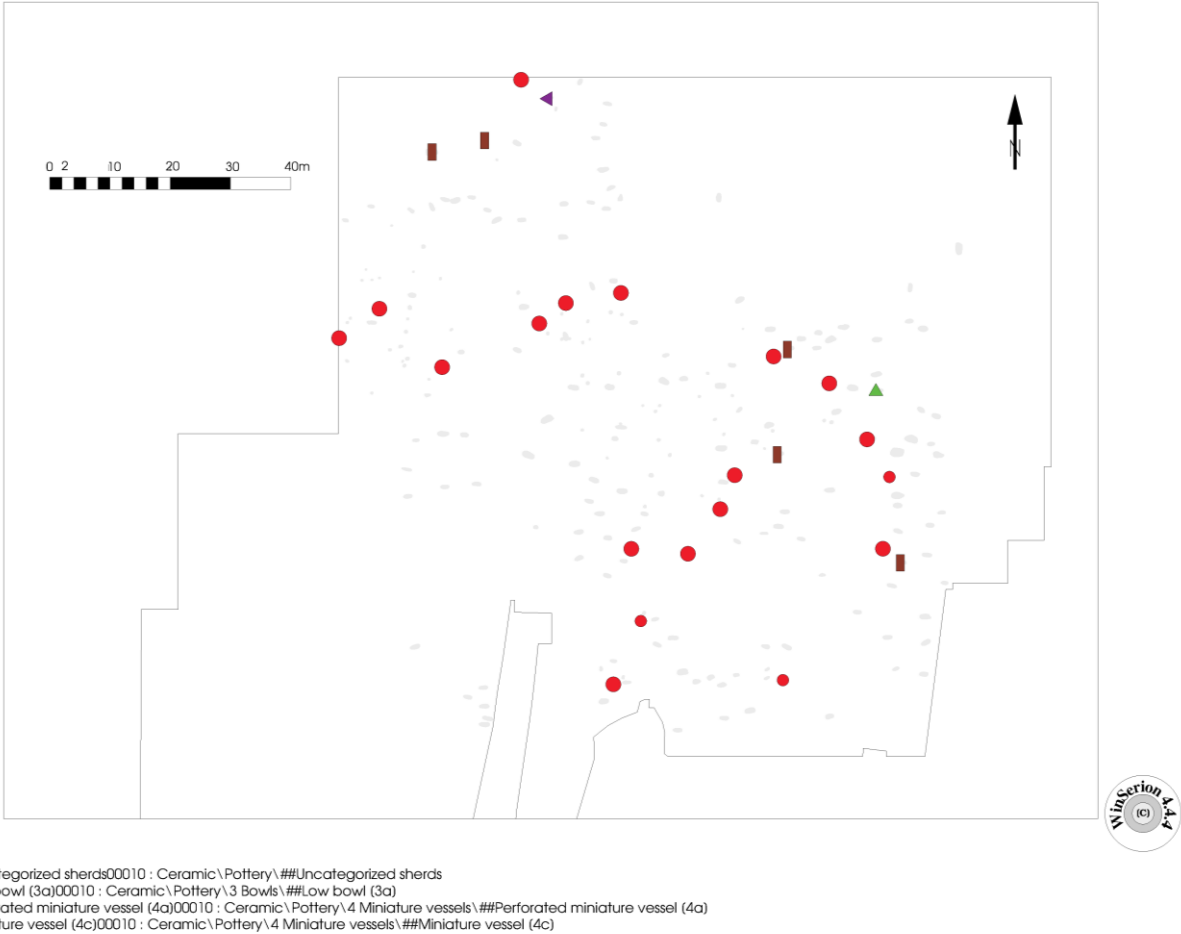
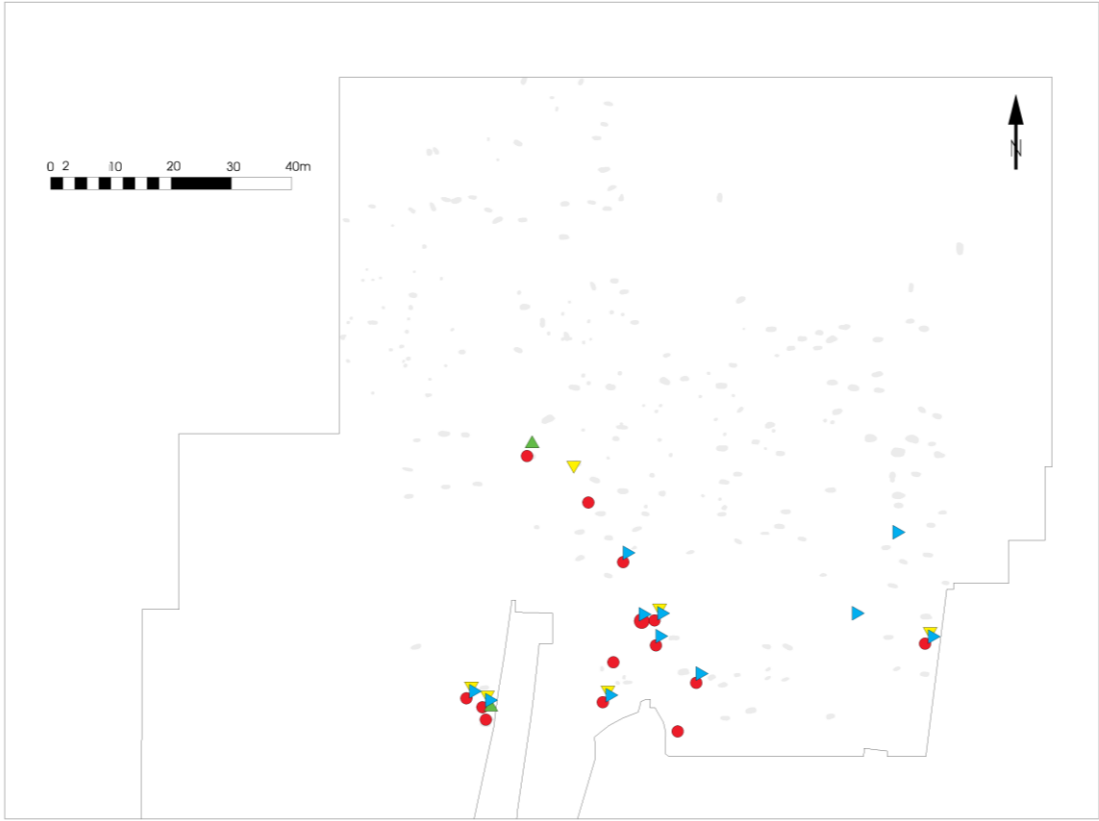


Figure Appendix 98: Distribution map 18 of Aiterhofen-Ödmühle.

Burials in Bytes – A Quantitative Study of Linear Pottery cemeteries

F=250 B=102 NextNeiN=15 KonfN=N=3 NormIcon=0 Proq=On
 Map19, Spondylus
 Hahnekamp Yanik
 Aiterhofen Ödmühle
 LBK Gräberfelder



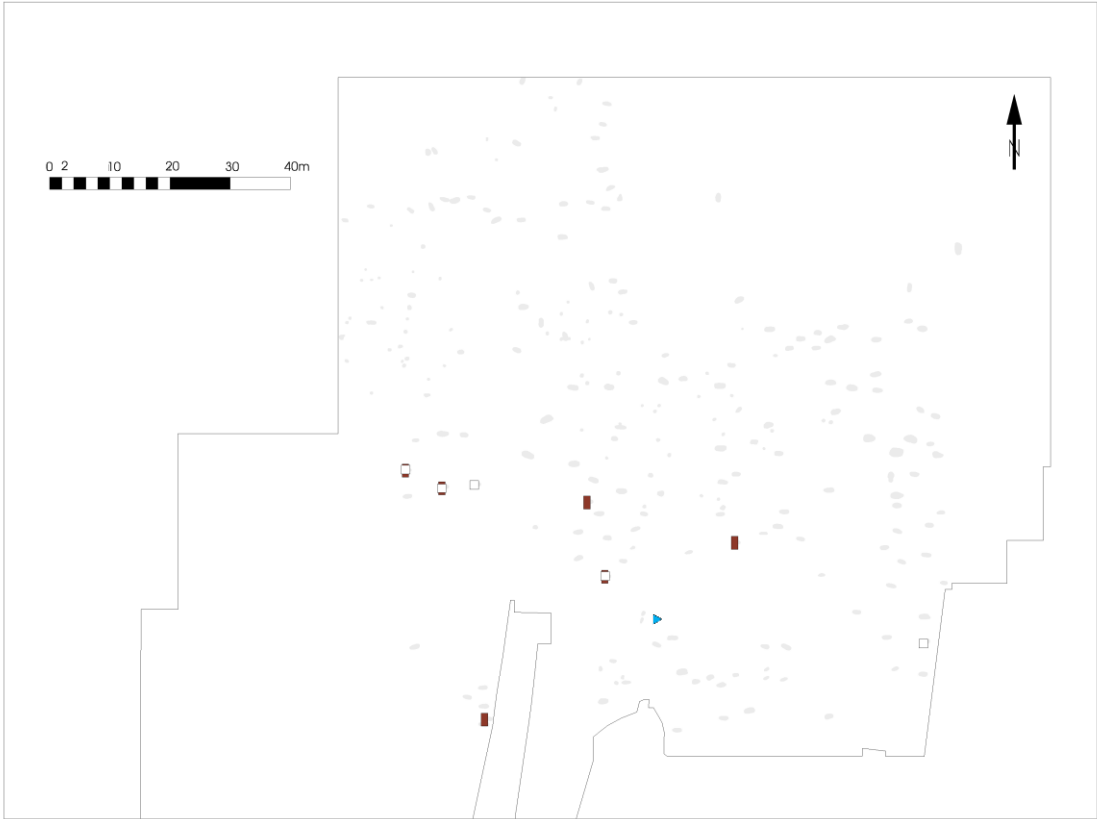
- Spondylus bead00010 : Clothing\Beads\##Spondylus bead
- ▲ Spondylus closure_Medallion00010 : Clothing\Belt buckle/closure\Spondylus closure\##Spondylus closure_Medallion
- ▼ Spondylus closure_V00010 : Clothing\Belt buckle/closure\Spondylus closure\##Spondylus closure_V
- ▶ Spondylus bracelet00010 : Clothing\Bracelet\##Spondylus bracelet

Figure Appendix 99: Distribution map 19 of Aiterhofen-Ödmühle.

Burials in Bytes – A Quantitative Study of Linear Pottery cemeteries

F:\250 B=142 Nav\N=15 Kart\N=3 Normkoo=0 Frequ=On

Map20, Shell ornaments and unmodified shells
 Hahnekamp Yanik
 Aiterhofen Ödmühle
 LBK Gräberfelder



- Theodoxus danubialis_Polished00010 : Clothing\Snail shells\Polished\##Theodoxus danubialis_Polished
- ▶ Unspecified freshwater mussel shell_Unmodified00010 : Clothing\Mussel shells\Unmodified\##Unspecified freshwater mussel shell_Unmodified
- Protula bead00010 : Clothing\Beads\##Protula bead

Figure Appendix 100: Distribution map 20 of Aiterhofen-Ödmühle.

Burials in Bytes – A Quantitative Study of Linear Pottery cemeteries

F:\250 B=142 Naxt\N=15 Korf\N=3 Normkoo=0 Frequ=0n
 Map21, Bone ornaments
 Hahnekamp Yanik
 Aiterhofen Ödmühle
 LBK Gräberfelder

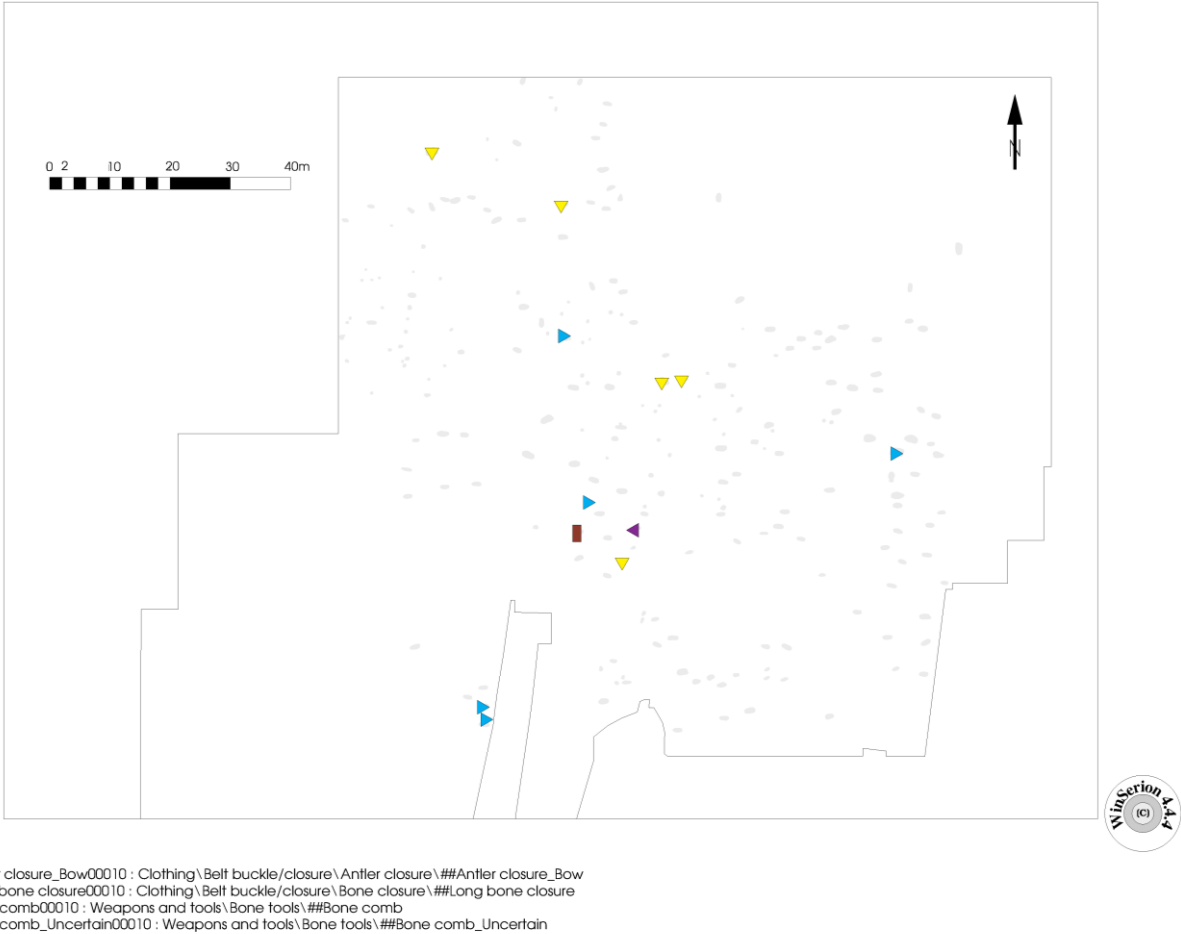
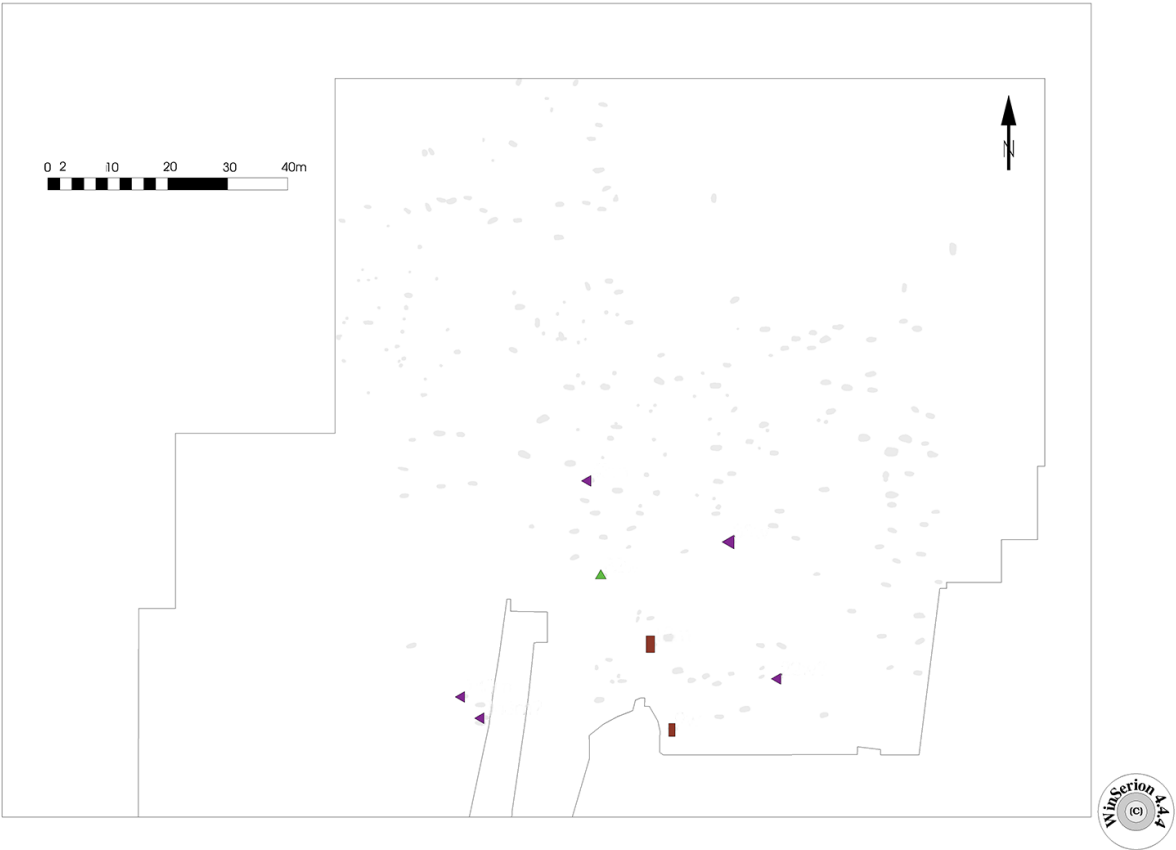


Figure Appendix 101: Distribution map 21 of Aiterhofen-Ödmühle.

Burials in Bytes – A Quantitative Study of Linear Pottery cemeteries

F:\250 B\102 Nord\N15\Kart\N15\3 Norm\com0 Proqum\On
 Map22, Stone ornaments
 Hahnekamp Yanik
 Aiterhofen Ödmühle
 LBK Gräberfelder



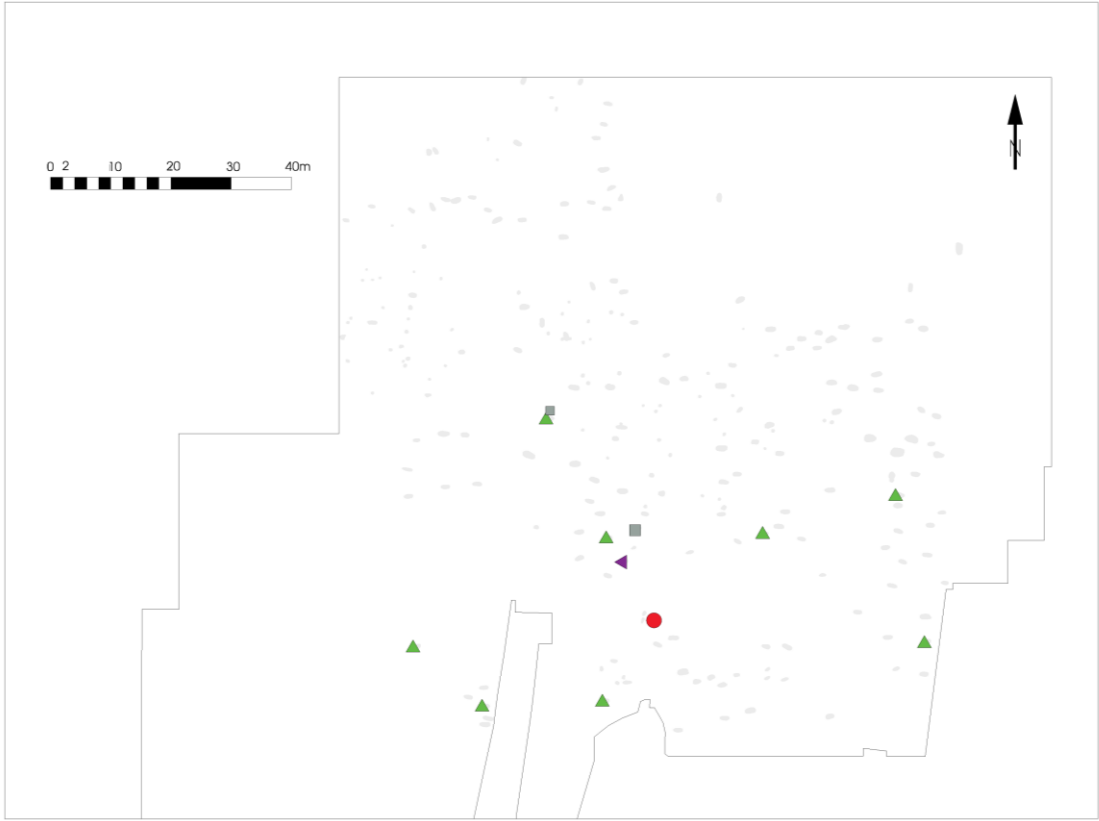
- ▲ Stone bead_Limestone00010 : Clothing\Beads\Stone bead\##Stone bead_Limestone
- ▼ Stone bead_Nephrite00010 : Clothing\Beads\Stone bead\##Stone bead_Nephrite
- Stone bead_Soapstone00010 : Clothing\Beads\Stone bead\##Stone bead_Soapstone



Figure Appendix 102: Distribution map 22 of Aiterhofen-Ödmühle.

Burials in Bytes – A Quantitative Study of Linear Pottery cemeteries

F:\250 B\102 Nord\N1\15 Kart\N\N=3 Norm\ca=0 Proj=On
 Map23, Bone points
 Hahnekamp Yanik
 Aiterhofen Ödmühle
 LBK Gräberfelder

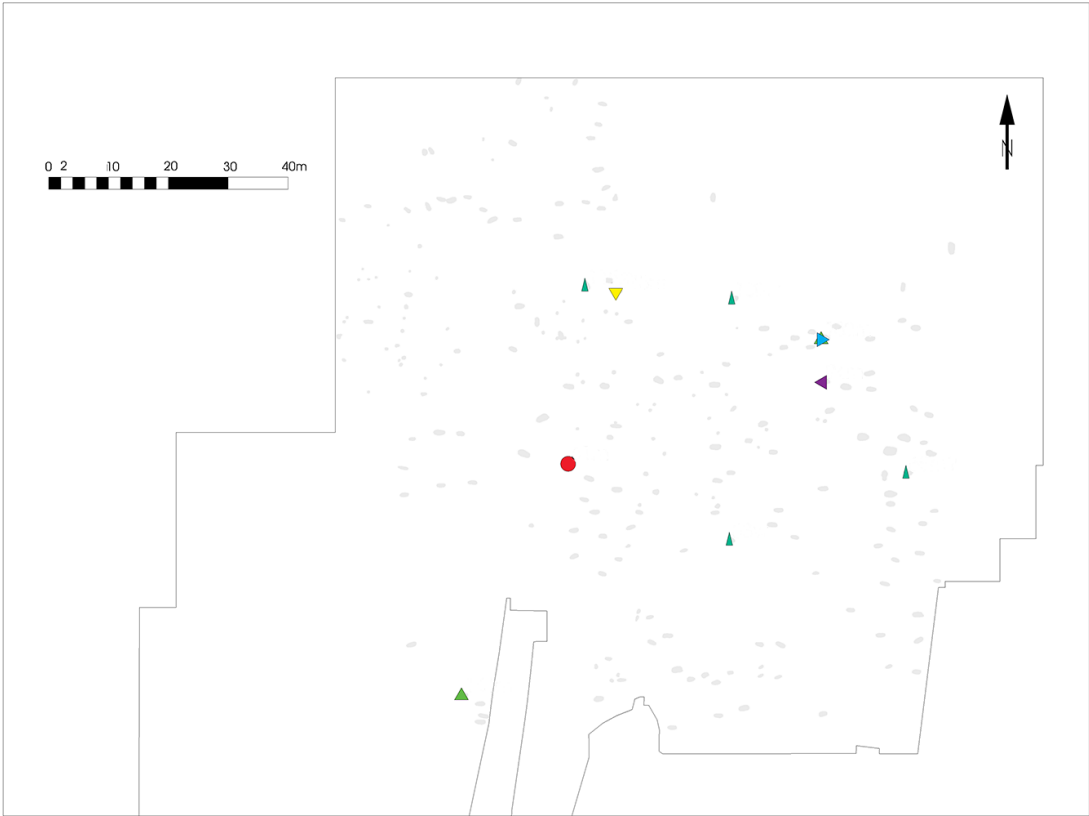


- Bone point_Long bone-long bone segment00010 : Weapons and tools\Bone tools\Pointed bone tools\##Bone point_Long bone-long bone segment
- ▲ Bone point_Metapodium00010 : Weapons and tools\Bone tools\Pointed bone tools\##Bone point_Metapodium
- ▼ Bone point_Uncategorized00010 : Weapons and tools\Bone tools\Pointed bone tools\##Bone point_Uncategorized
- Cylindrical bone stick00010 : Weapons and tools\Bone tools\##Cylindrical bone stick

Figure Appendix 103: Distribution map 23 of Aiterhofen-Ödmühle.

Burials in Bytes – A Quantitative Study of Linear Pottery cemeteries

F:\250 B\102 Nord\Nell\15 Kart\N\N\3 Norm\coord\0 Freque\On
 Map24, Bone remains
 Hahnkamp Yanik
 Aiterhofen Ödmühle
 LBK Gräberfelder



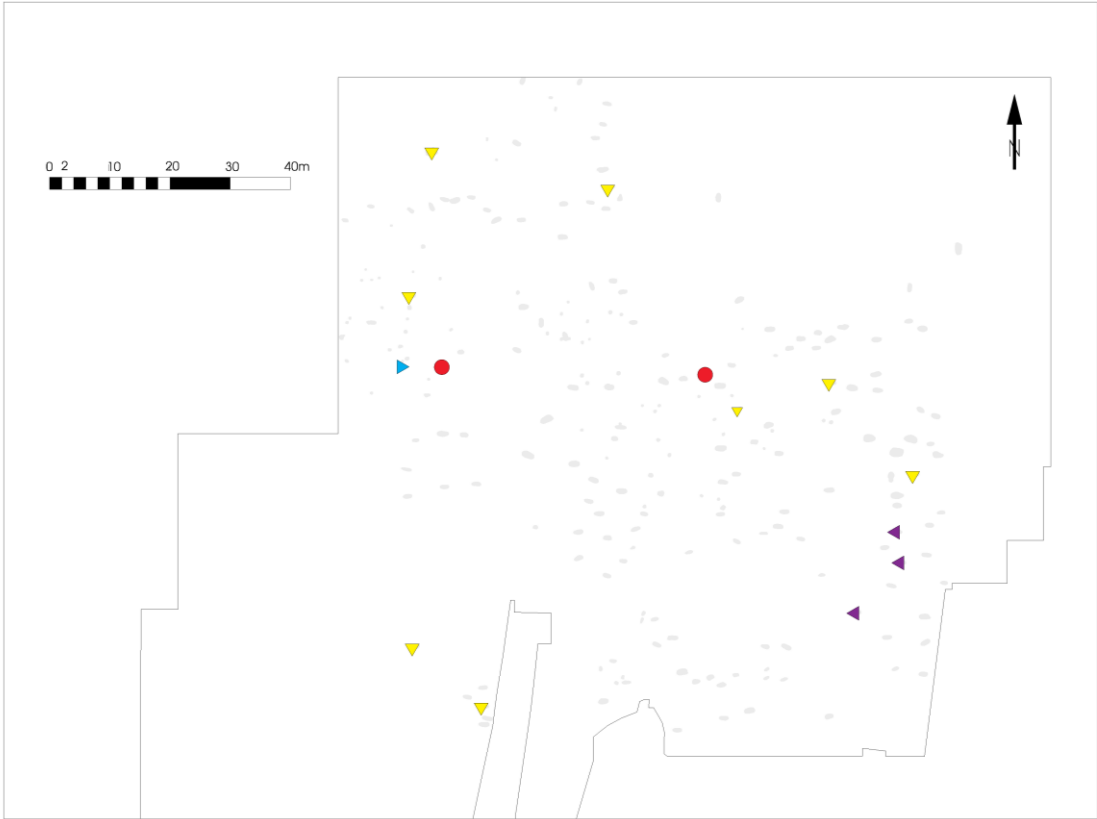
- Cow remains00010 : Organic inventory\Animal bone remains\##Cow remains
- ▲ Fox mandible00010 : Organic inventory\Animal bone remains\##Fox mandible
- ▼ Dog remains00010 : Organic inventory\Animal bone remains\##Dog remains
- ▲ Goat-Sheep remains00010 : Organic inventory\Animal bone remains\##Goat-Sheep remains
- ▲ Pig remains00010 : Organic inventory\Animal bone remains\##Pig remains
- ▲ Unmodified human tooth00010 : Organic inventory\##Human tooth

Figure Appendix 104: Distribution map 24 of Aiterhofen-Ödmühle.

Burials in Bytes – A Quantitative Study of Linear Pottery cemeteries

F:\250 B=142 Nax#N=15 Kart#N=3 Normkloc=0 Frequ=On

Map25, Hammerstones, nodules and pebbles
 Hahnekamp Yanik
 Aiterhofen Ödmühle
 LBK Gräberfelder

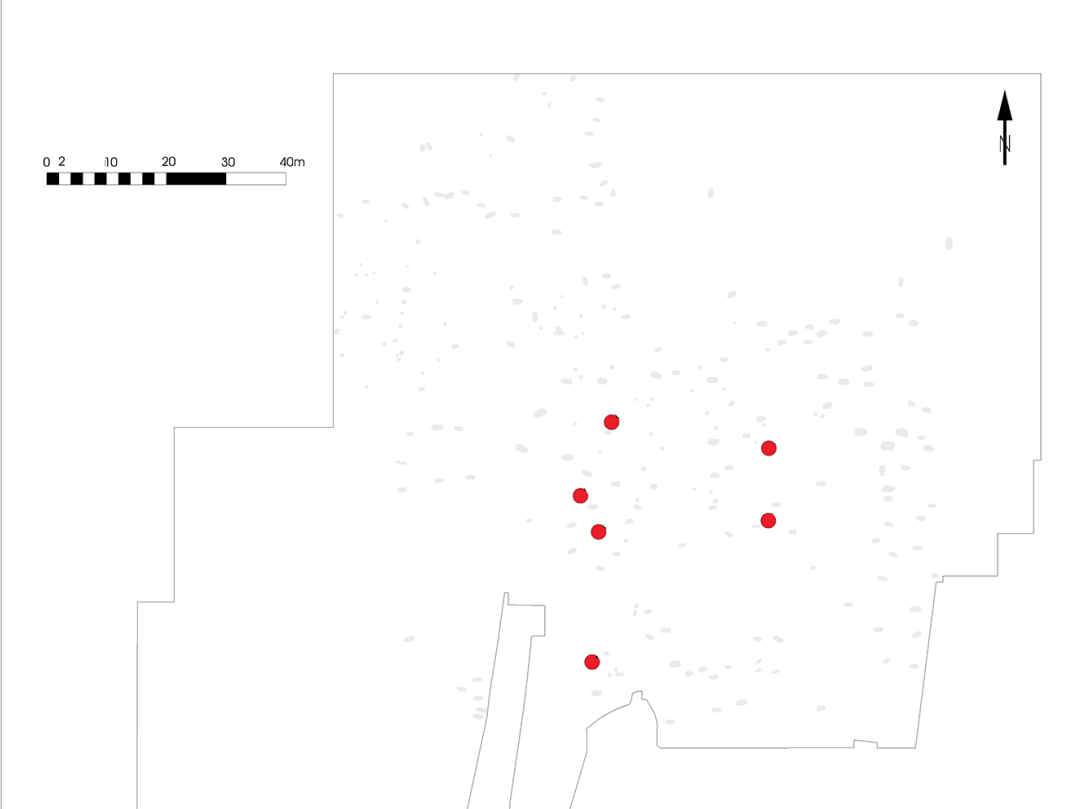


- Hammerstone00010 : Mineral resources\Hammer stones\##Hammerstone
- ▼ Pyrite nodule00010 : Mineral resources\Pebbles and nodules\##Pyrite nodule
- ▲ Nodule_Undetermined00010 : Mineral resources\Pebbles and nodules\##Nodule_Undetermined
- ▶ Stone with uncertain function00010 : Mineral resources\Pebbles and nodules\##Stone with uncertain function

Figure Appendix 105: Distribution map 25 of Aiterhofen-Ödmühle.

Burials in Bytes – A Quantitative Study of Linear Pottery cemeteries

F:\250 B=102 Naxt\N=15 Konf\N=3 Norm\kon=0 Frequ=On
Map26. Grinding tools
Hahnekamp Yanik
Aiterhofen Ödmühle
LBK Gräberfelder



● Friction plate00010 : Weapons and tools\Grinding tools\##Friction plate

Figure Appendix 106: Distribution map 26 of Aiterhofen-Ödmühle.

Burials in Bytes – A Quantitative Study of Linear Pottery cemeteries

F:\250 B=142 Nav\N=15 Kart\N=3 Normkoo=0 Frequ=On
 Map27. Colouring
 Hahnekamp Yanik
 Aiterhofen Ödmühle
 LBK Gräberfelder

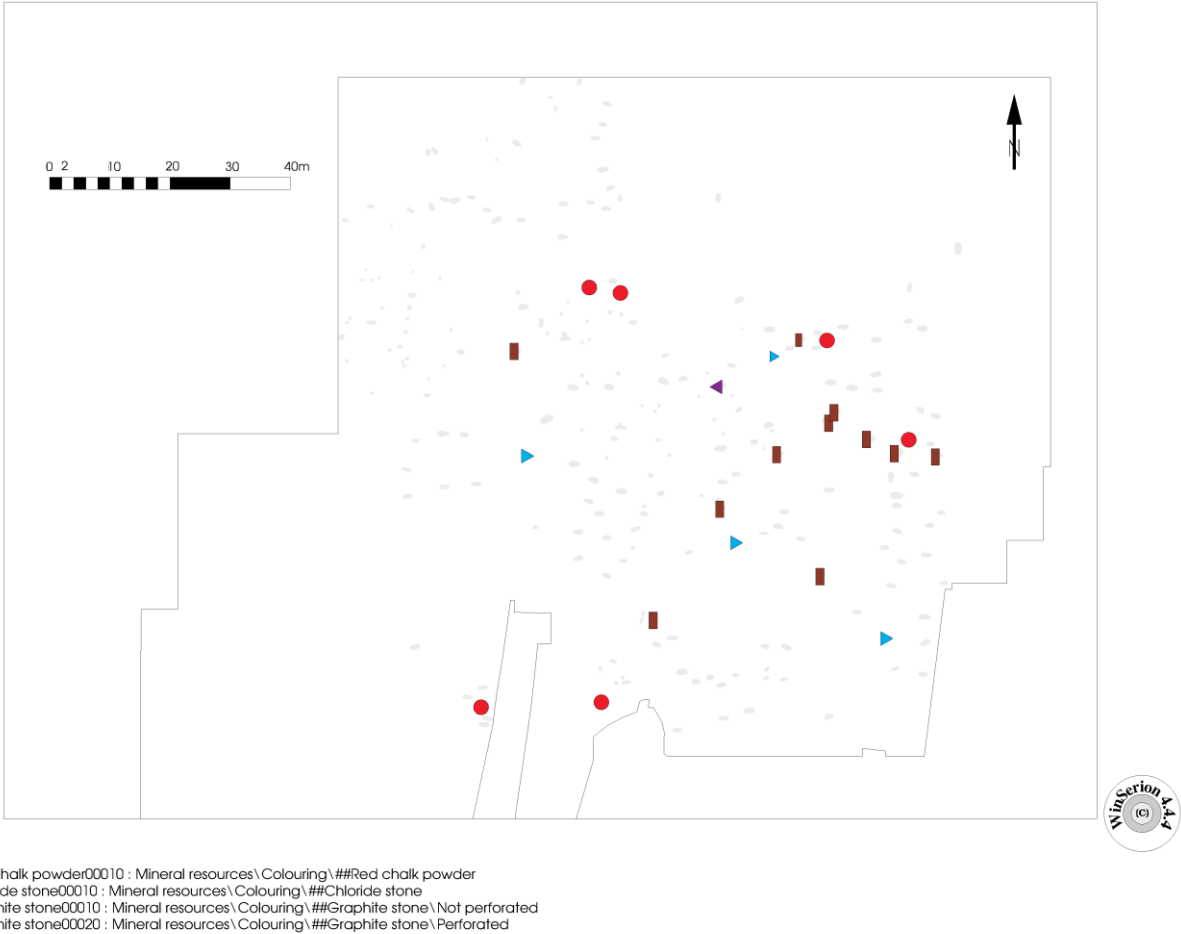
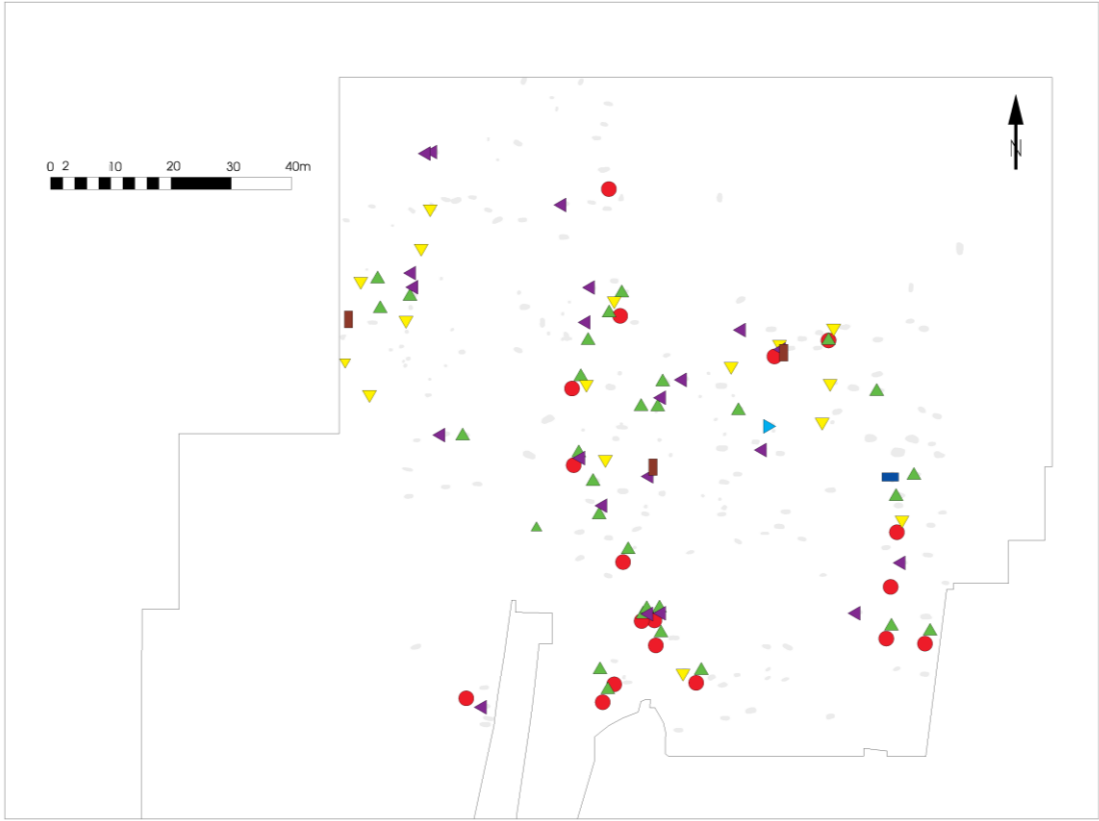


Figure Appendix 107: Distribution map 27 of Aiterhofen-Ödmühle.

Burials in Bytes – A Quantitative Study of Linear Pottery cemeteries

F:\250 B\102 Nord\N10\15 Kart\N10\3 Norm\coord=0 Proj=Utm
 Map28, Polished stone tools
 Hahnkamp Yanik
 Aiterhofen Ödmühle
 LBK Gräberfelder



- Adze_Type 100010 : Weapons and tools\Polished stone tools\Non-perforated blades\##Adze_Type 1
- ▲ Adze_Type 200010 : Weapons and tools\Polished stone tools\Non-perforated blades\##Adze_Type 2
- ▼ Adze_Type 300010 : Weapons and tools\Polished stone tools\Non-perforated blades\##Adze_Type 3
- ▲ Adze_Type 400010 : Weapons and tools\Polished stone tools\Non-perforated blades\##Adze_Type 4
- ▲ Adze_Undetermined00010 : Weapons and tools\Polished stone tools\Non-perforated blades\##Adze_Undetermined
- Double-edged wedge00010 : Weapons and tools\Polished stone tools\Perforated blades\##Double-edged wedge
- Disc mace00010 : Weapons and tools\Polished stone tools\Perforated blades\##Disc mace

Figure Appendix 108: Distribution map 28 of Aiterhofen-Ödmühle.

Burials in Bytes – A Quantitative Study of Linear Pottery cemeteries

F=250 B=142 Next#N=15 Kont#N=3 Normkorr=0 Frequ=On

Map29, Macrolithic chert tools
 Hahnekamp Yanik
 Aiterhofen Ödmühle
 LBK Gräberfelder

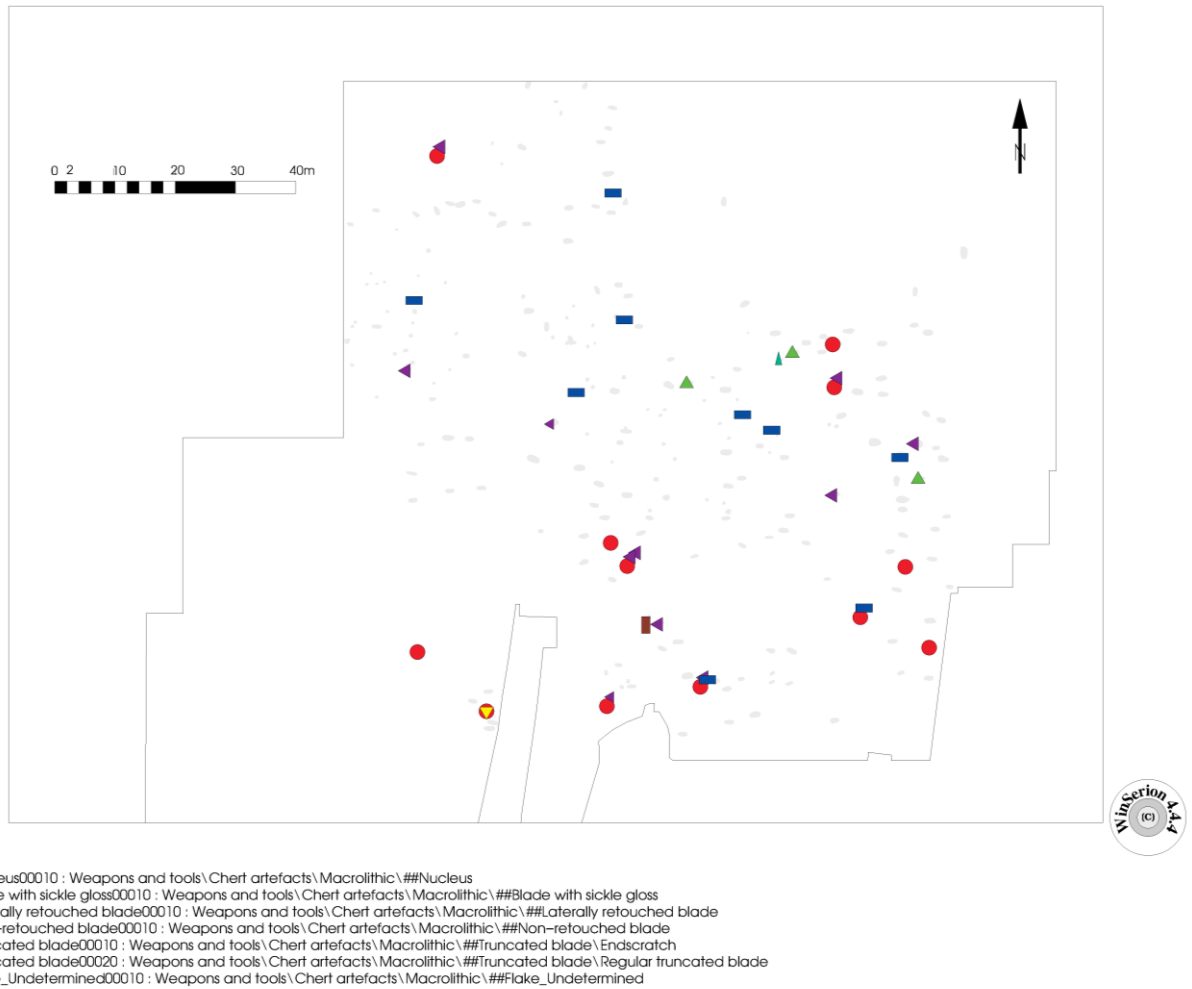


Figure Appendix 109: Distribution map 29 of Aiterhofen-Ödmühle.

Burials in Bytes – A Quantitative Study of Linear Pottery cemeteries

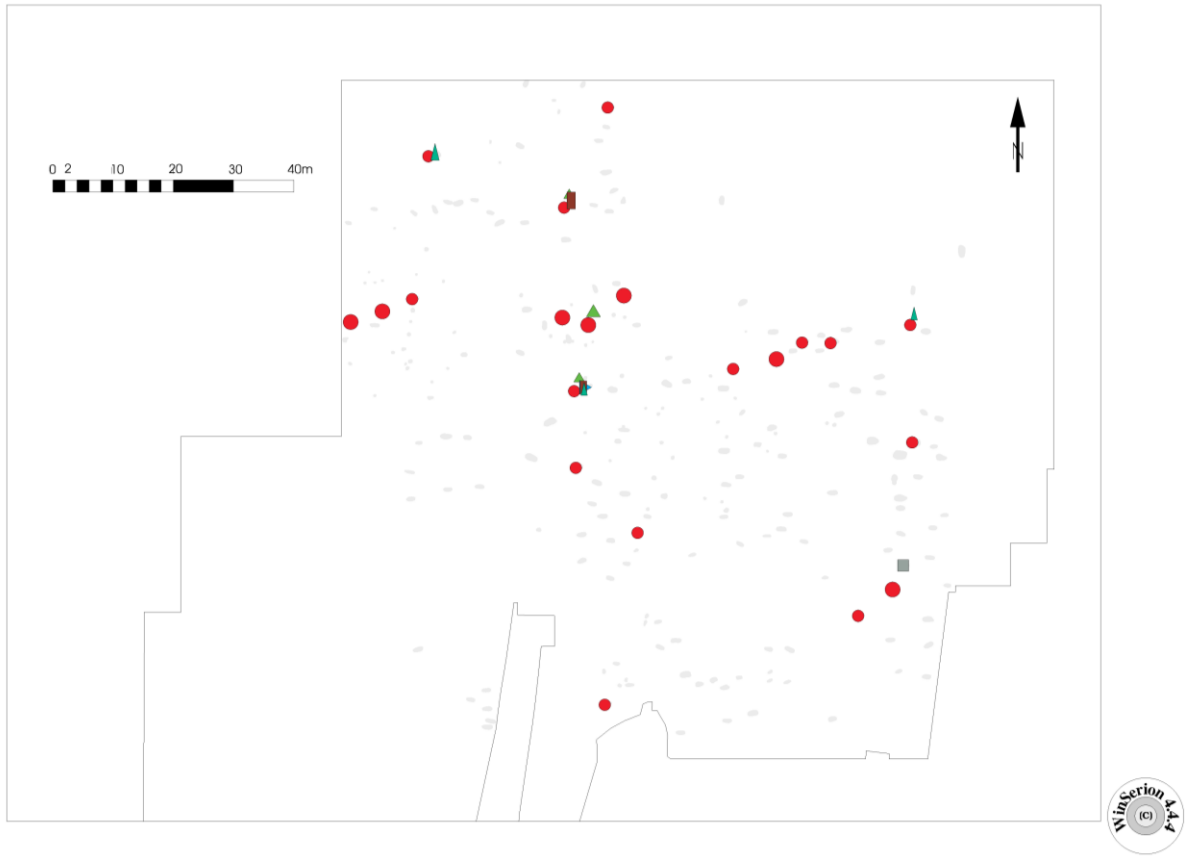
F=250 B=102 NaxfNell=15 KorfN\N=3 Normicoor=0 Frequ=On

Map30, Microlithic chert tools

Hahnkamp Yanik

Aiterhofen Ödmühle

LBK Gräberfelder



- Triangular arrowhead00010 : Weapons and tools\Chert artefacts\Microlithic\Triangular\##Triangular arrowhead
- ▲ Trapeoidal flake00010 : Weapons and tools\Chert artefacts\Microlithic\Trapeoidal\##Trapeoidal flake\Short trapeze_AZ
- ▶ Symmetrical trapeze00010 : Weapons and tools\Chert artefacts\Microlithic\Trapeoidal\##Symmetrical trapeze\Long trapeze_AA
- Symmetrical trapeze00020 : Weapons and tools\Chert artefacts\Microlithic\Trapeoidal\##Symmetrical trapeze\Short trapeze_AZ
- Irregular flake00010 : Weapons and tools\Chert artefacts\Microlithic\Irregular\##Irregular flake
- ▲ Irregular blade flake00010 : Weapons and tools\Chert artefacts\Microlithic\Irregular\##Irregular blade flake

Figure Appendix 110: Distribution map 30 of Aiterhofen-Ödmühle.

Burials in Bytes – A Quantitative Study of Linear Pottery cemeteries

F=162 S=1070 NextNei=15 Korf@N=3 Norm@acc=0 Frequ=On

LBK Gräberfelder
 Archäologische Daten, Aiterhofen Ödmühle,ANN1
 Bearbeitung: Hahnekamp Yanik 2020
 monovariate Clusteranalysis with Eigenvectors
 Reciprocal Averaging,
 Analysis of N Next Neighbours by 1 Type

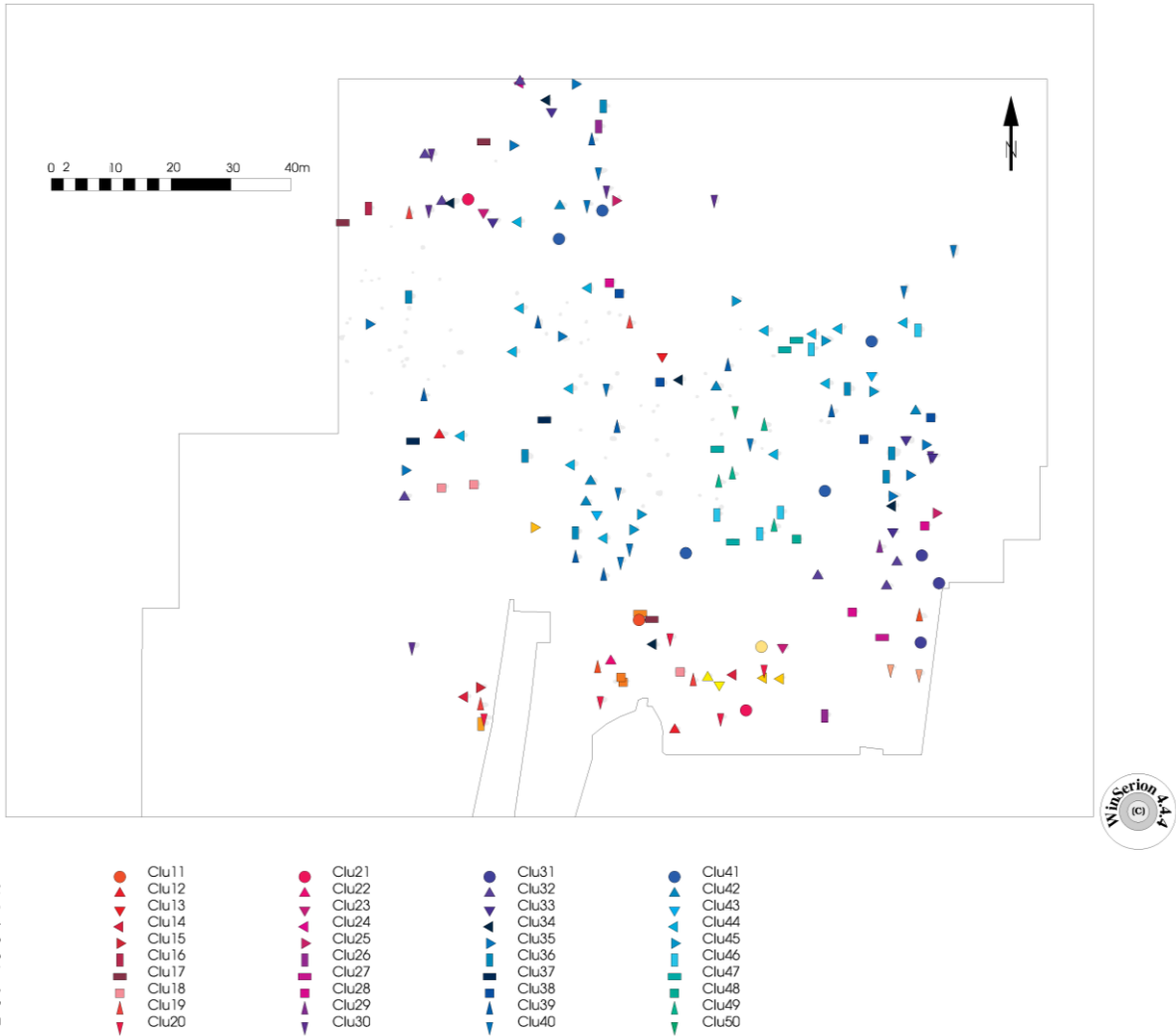


Figure Appendix 111: Analysis N Next Neighbours of pit orientation and burial position at Aiterhofen-Ödmühle.

Burials in Bytes – A Quantitative Study of Linear Pottery cemeteries

F=140 R=417 Iterations=15 Korrelationskoeffizient=0,3 Normalkoeffizient=0 Frequenz=0

LBK Gräberfelder
 Archäologische Daten, Aiterhofen Ödmühle, ANN1
 Bearbeitung: Hahnekamp Yanik 2020
 monovariate Clusteranalysis with Eigenvectors
 Reciprocal Averaging,
 Analysis of N Next Neighbours by 1 Type

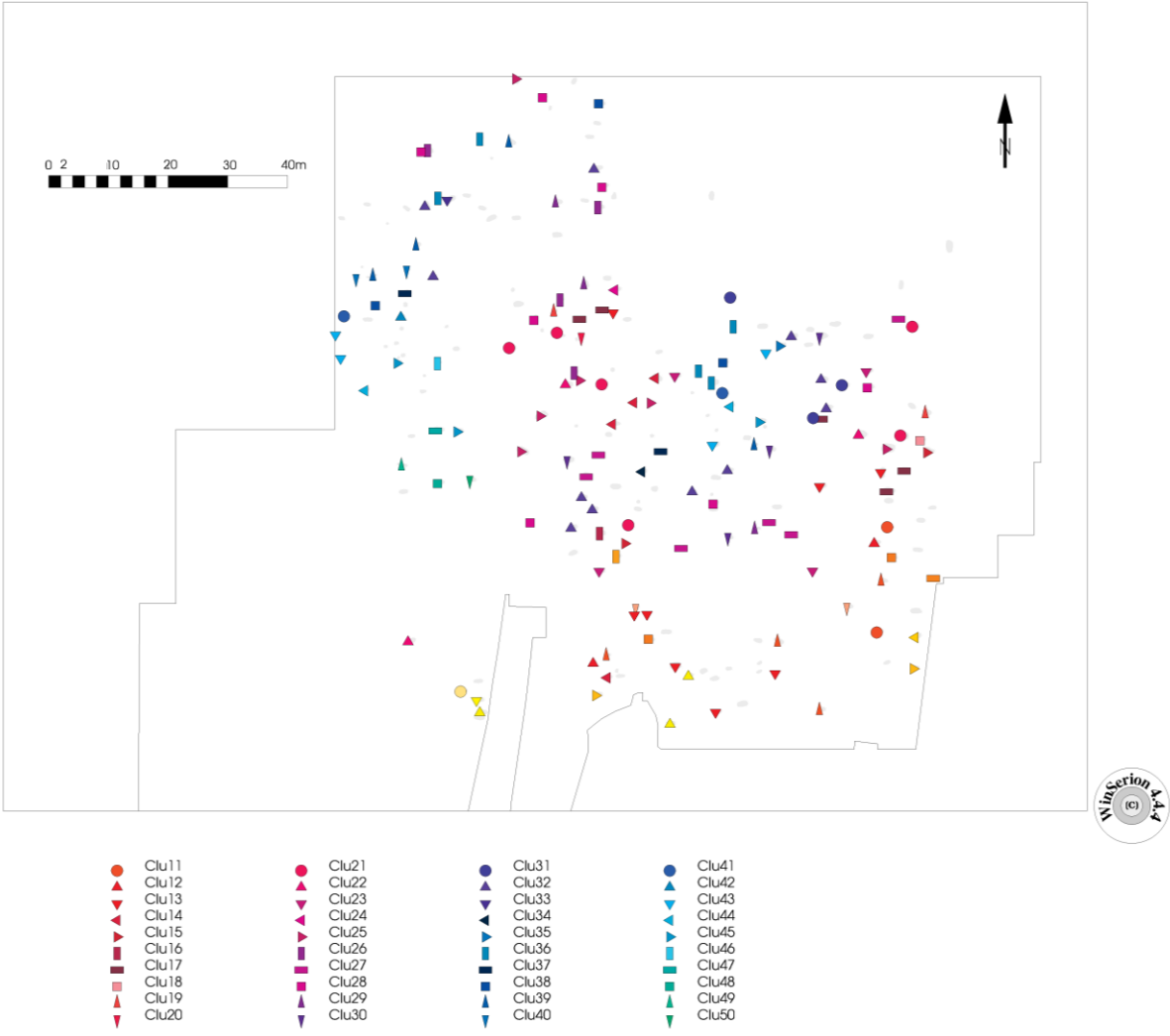


Figure Appendix 112: Analysis N Next Neighbours of grave goods and burial type at Aiterhofen-Ödmühle.

Burials in Bytes – A Quantitative Study of Linear Pottery cemeteries

F:\229 8+153 \axthai\15 \konf\lv\3 \norm\koor=0 \freq=On
Map01, Grave good presence
Hahnekamp Yanik
Schwetzingen Schälzig
LBK Gräberfelder



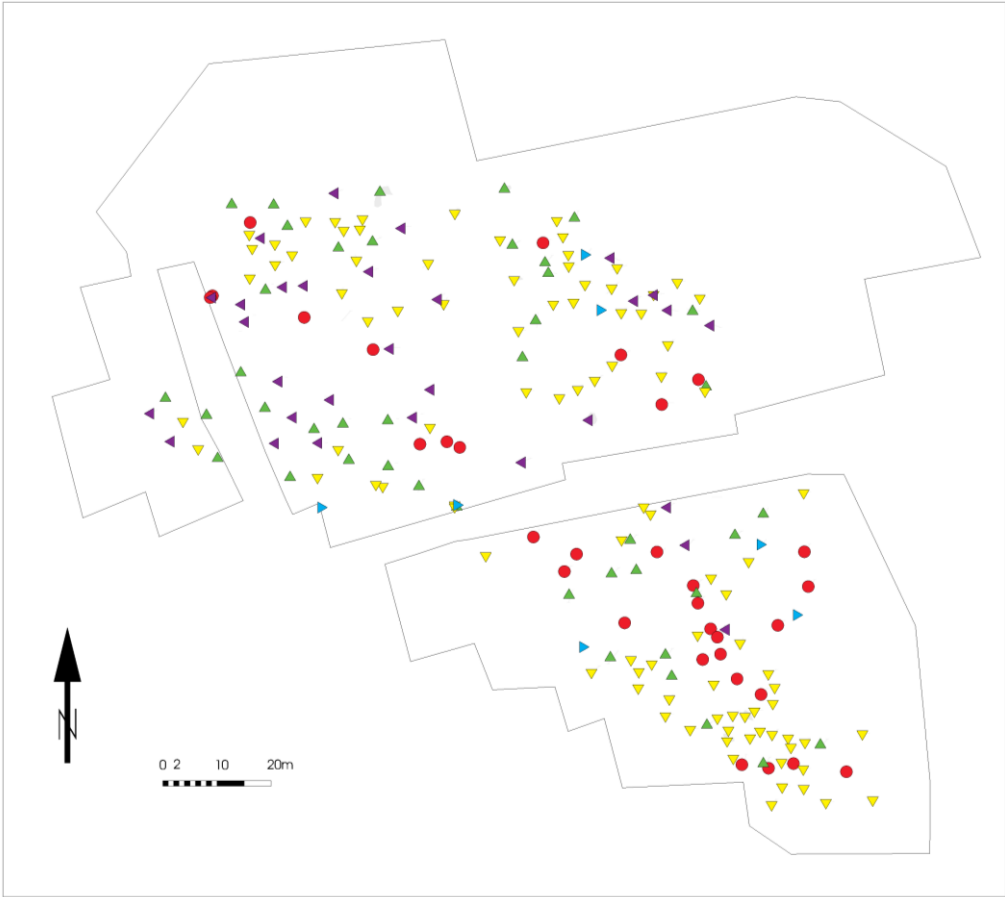
● Grave goods_No00010 : Grave good presence\No\##Grave goods_No
▲ Grave goods_Yes00010 : Grave good presence\Yes\##Grave goods_Yes



Figure Appendix 113: Distribution map 1 of Schwetzingen.

Burials in Bytes – A Quantitative Study of Linear Pottery cemeteries

F=229 B=153 NextVal=15 KonthVal=3 Normskoon=0 Freaqu=On
 Map02, Biological sex
 Hahnekamp Yanik
 Schwetzingen Schälzig
 LBK Gräberfelder



- Sex00010 : Anthropology\##Sex\Female
- ▲ Sex00020 : Anthropology\##Sex\Male
- ▼ Sex00030 : Anthropology\##Sex\Uncertain
- ◀ Sex00040 : Anthropology\##Sex\Uncertainly female
- ▶ Sex00050 : Anthropology\##Sex\Uncertainly male

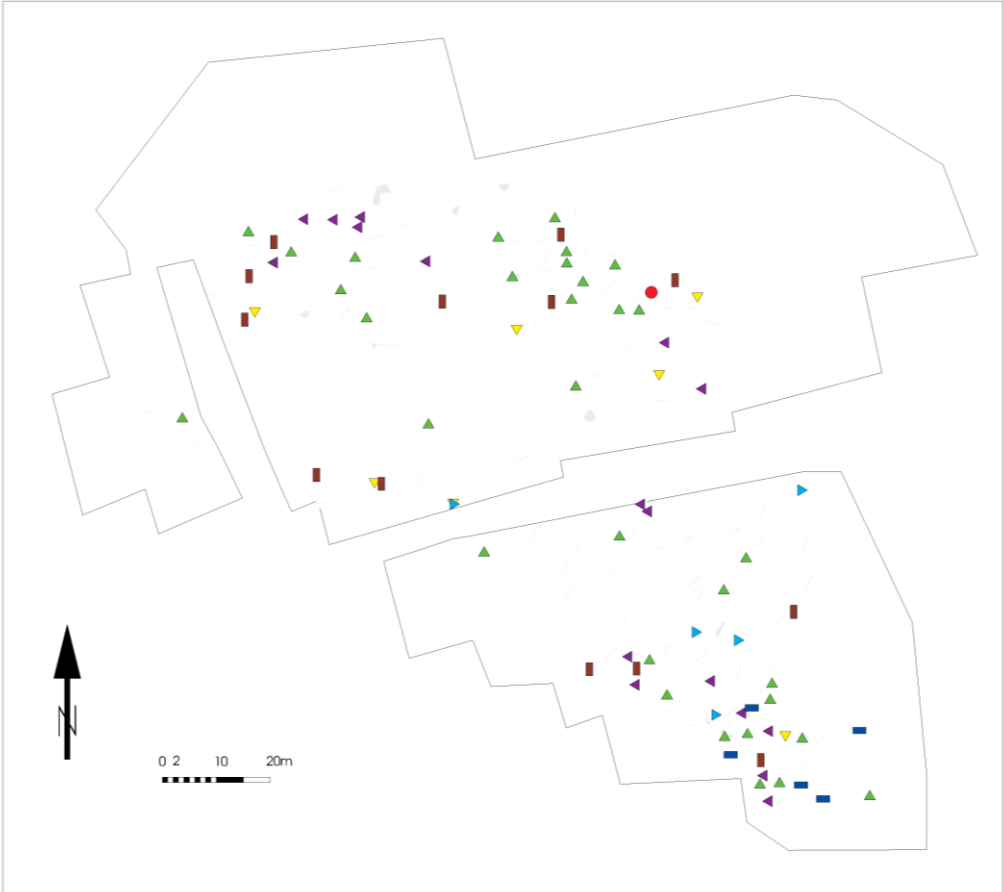


Figure Appendix 114: Distribution map 2 of Schwetzingen.

Burials in Bytes – A Quantitative Study of Linear Pottery cemeteries

F=229.8=153 Nostriell=15 KonfN=3 Normko=0 Frequ=On

Map03, Age (subadult)
 Hahnekamp Yanik
 Schwetzingen Schälzig
 LBK Gräberfelder



- Age00010 : Anthropology\##Age\01_Neonate
- ▲ Age00020 : Anthropology\##Age\02_Infans I
- ▼ Age00030 : Anthropology\##Age\03_Infans I/II
- ▶ Age00040 : Anthropology\##Age\04_Infans II
- ▲ Age00050 : Anthropology\##Age\05_Infans II/Juvenis
- Age00060 : Anthropology\##Age\06_Juvenis
- Age00070 : Anthropology\##Age\07_Juvenis/Adult I

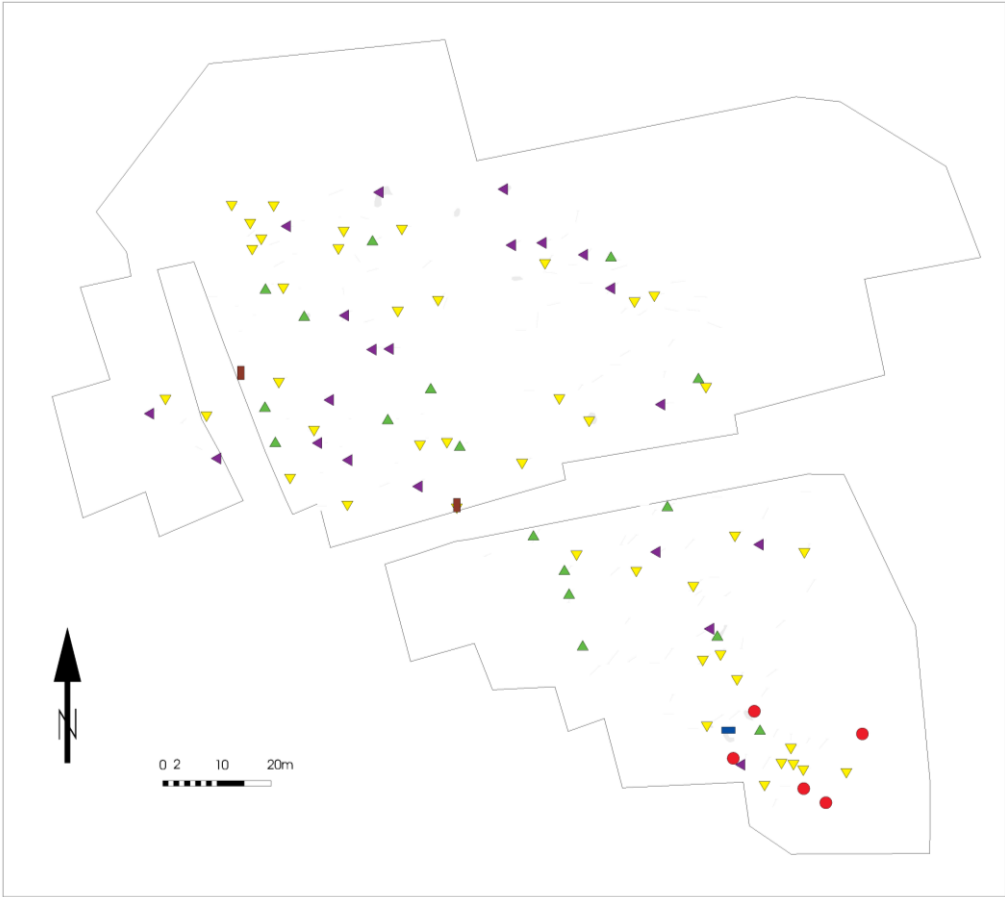


Figure Appendix 115: Distribution map 3 of Schwetzingen.

Burials in Bytes – A Quantitative Study of Linear Pottery cemeteries

F=229 B=153 Northlat=15 Northlon=-3 Normskoon=0 Freque=On

Map04, Age (adult)
 Hahnekamp Yanik
 Schwetzingen Schälzig
 LBK Gräberfelder



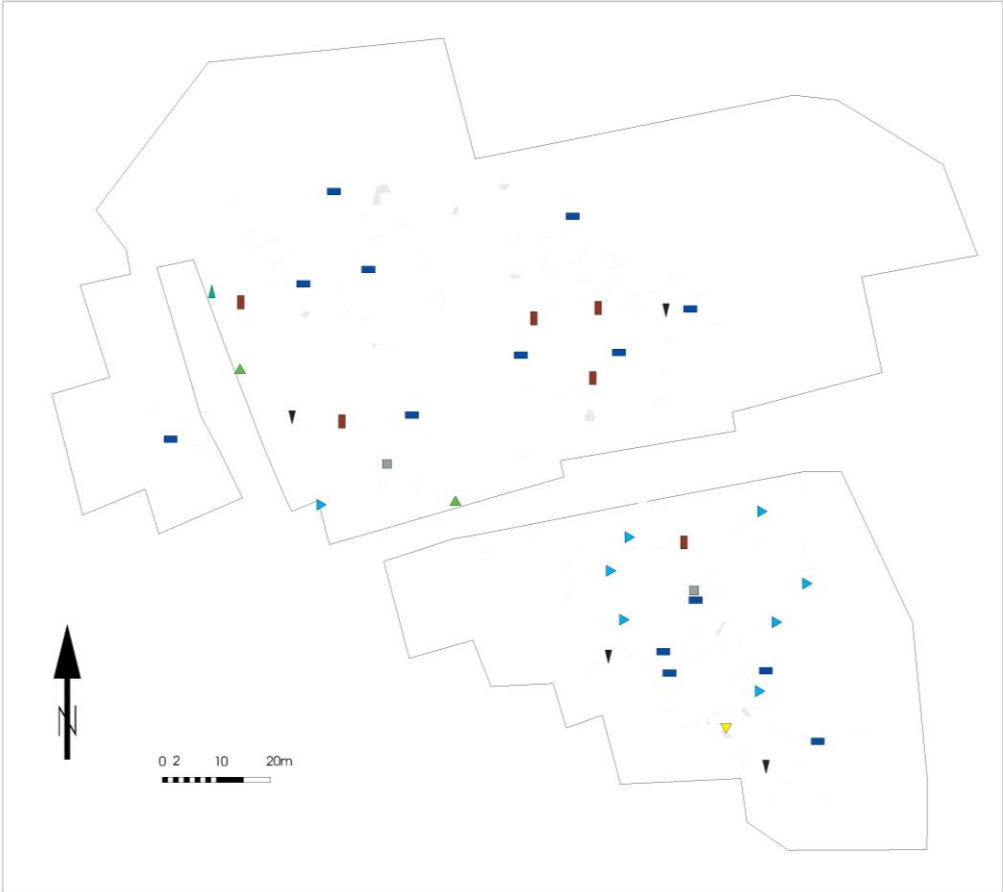
- Age00070 : Anthropology\##Age\07_Juvenis/Adult I
- ▲ Age00080 : Anthropology\##Age\08_Adult I
- ▼ Age00090 : Anthropology\##Age\09_Adult I/II
- ◀ Age00100 : Anthropology\##Age\10_Adult II
- Age00120 : Anthropology\##Age\12_Adult I/Matur II
- Age00130 : Anthropology\##Age\13_Adult II/Matur I



Figure Appendix 116: Distribution map 4 of Schwetzingen.

Burials in Bytes – A Quantitative Study of Linear Pottery cemeteries

F=229.8=153 Nostriell=15 KonfN=3 Normkoor=0 Frequ=On
 Map05, Age (mature to senile)
 Hahnekamp Yanik
 Schwetzingen Schälzig
 LBK Gräberfelder



- ▲ Age00120 : Anthropology\##Age\12_Adult I/Matur II
- ▲ Age00130 : Anthropology\##Age\13_Adult II/Matur I
- ▲ Age00150 : Anthropology\##Age\15_Matur I
- Age00160 : Anthropology\##Age\16_Matur I/II
- Age00170 : Anthropology\##Age\17_Matur II
- ▲ Age00180 : Anthropology\##Age\18_Matur I/Senile
- ▲ Age00190 : Anthropology\##Age\19_Matur II/Senile
- ▼ Age00200 : Anthropology\##Age\20_Senile

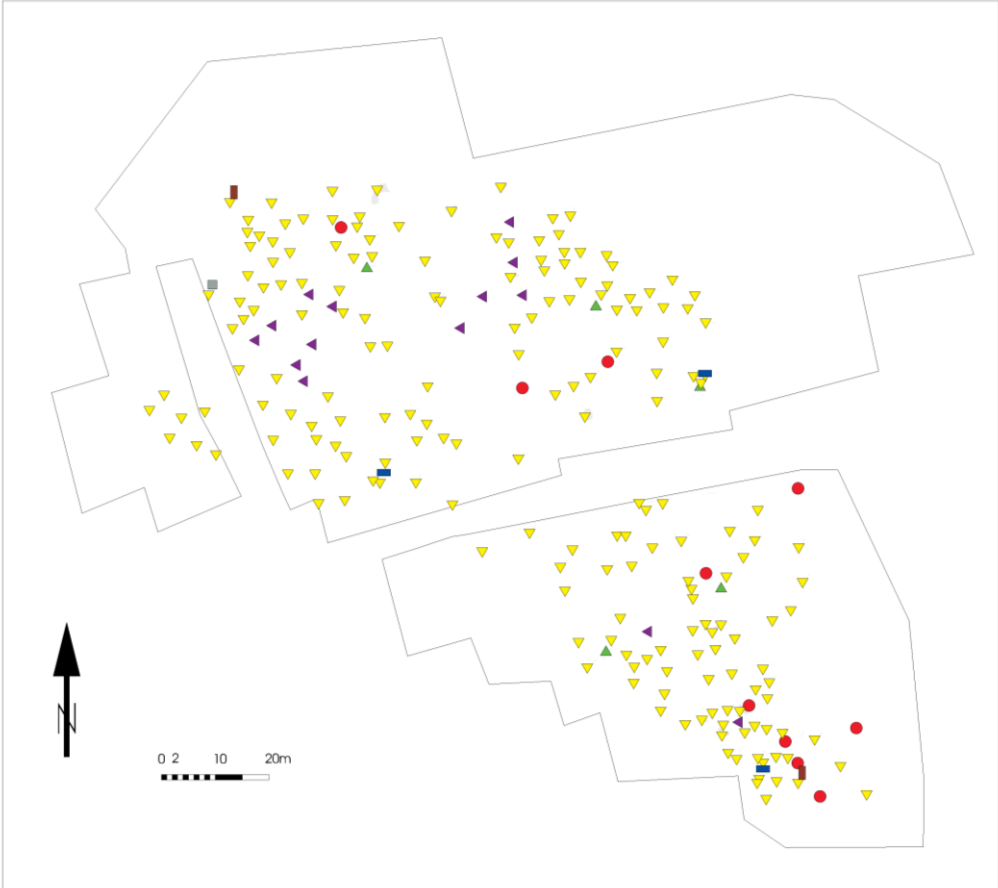


Figure Appendix 117: Distribution map 5 of Schwetzingen.

Burials in Bytes – A Quantitative Study of Linear Pottery cemeteries

F:\229 8-153 Nest\Nest\15 Konf\N\3 Norm\koan0 Frequ-On

Map06, Burial type
 Hahnekamp Yanik
 Schwetzingen Schälzig
 LBK Gräberfelder



- Cremation00010 : Type of finding\##Cremation
- ▲ Cremated human remains00010 : Type of finding\##Cremated human remains
- ▼ Inhumation00010 : Type of finding\##Inhumation
- ▲ Empty pit00010 : Type of finding\##Empty pit
- Empty pit_disturbed or previously excavated00010 : Type of finding\##Empty pit_disturbed or previously excavated
- Double inhumation00010 : Type of finding\##Double inhumation
- Triple burial00010 : Type of finding\##Triple burial

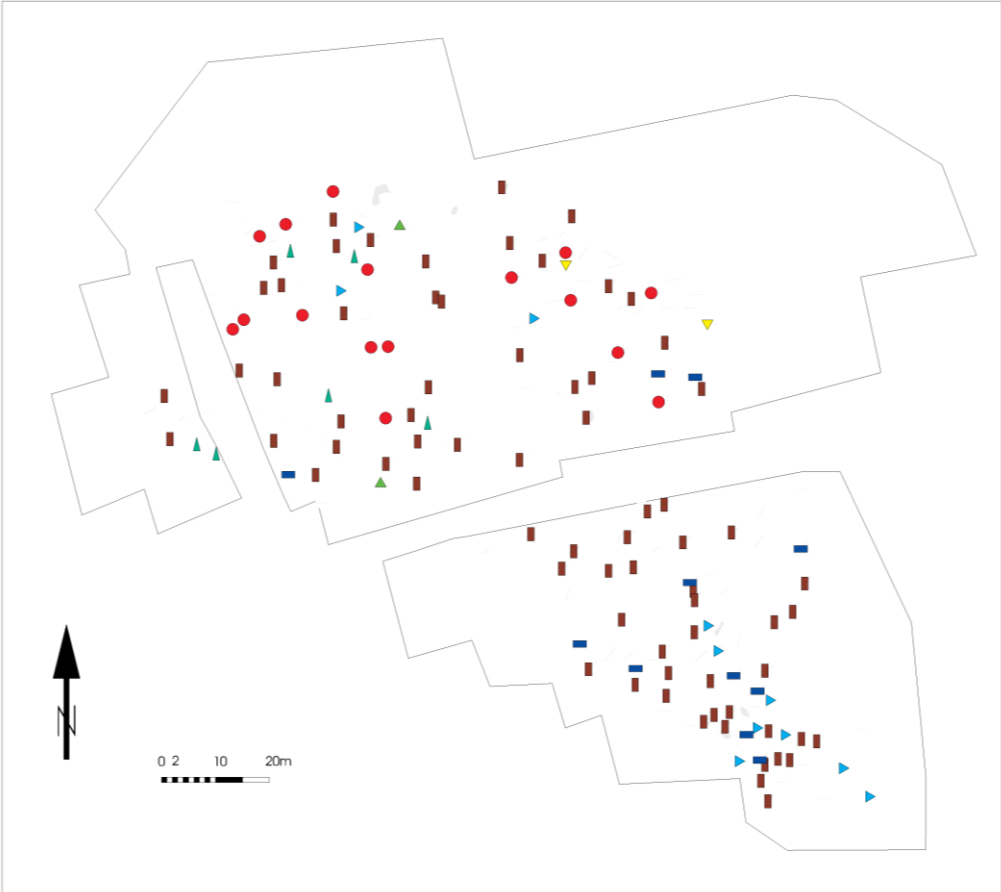


Figure Appendix 118: Distribution map 6 of Schwetzingen.

Burials in Bytes – A Quantitative Study of Linear Pottery cemeteries

F:\229 8=153 \xastha\N=15 Kont\N=3 \normkoor=0 frequ=On

Map07, Burial pit orientation (1 of 2)
 Hahnekamp Yanik
 Schwetzingen Schälzig
 LBK Gräberfelder



- Pit_Grave orientation00010 : Inhumation\##Pit_Grave orientation\E-W
- ▲ Pit_Grave orientation00020 : Inhumation\##Pit_Grave orientation\ENE-WSW
- ▼ Pit_Grave orientation00030 : Inhumation\##Pit_Grave orientation\ESE-WNW
- ▶ Pit_Grave orientation00050 : Inhumation\##Pit_Grave orientation\N-S
- Pit_Grave orientation00060 : Inhumation\##Pit_Grave orientation\NE-SW
- Pit_Grave orientation00070 : Inhumation\##Pit_Grave orientation\NNE-SSW
- ▲ Pit_Grave orientation00090 : Inhumation\##Pit_Grave orientation\NW-SE

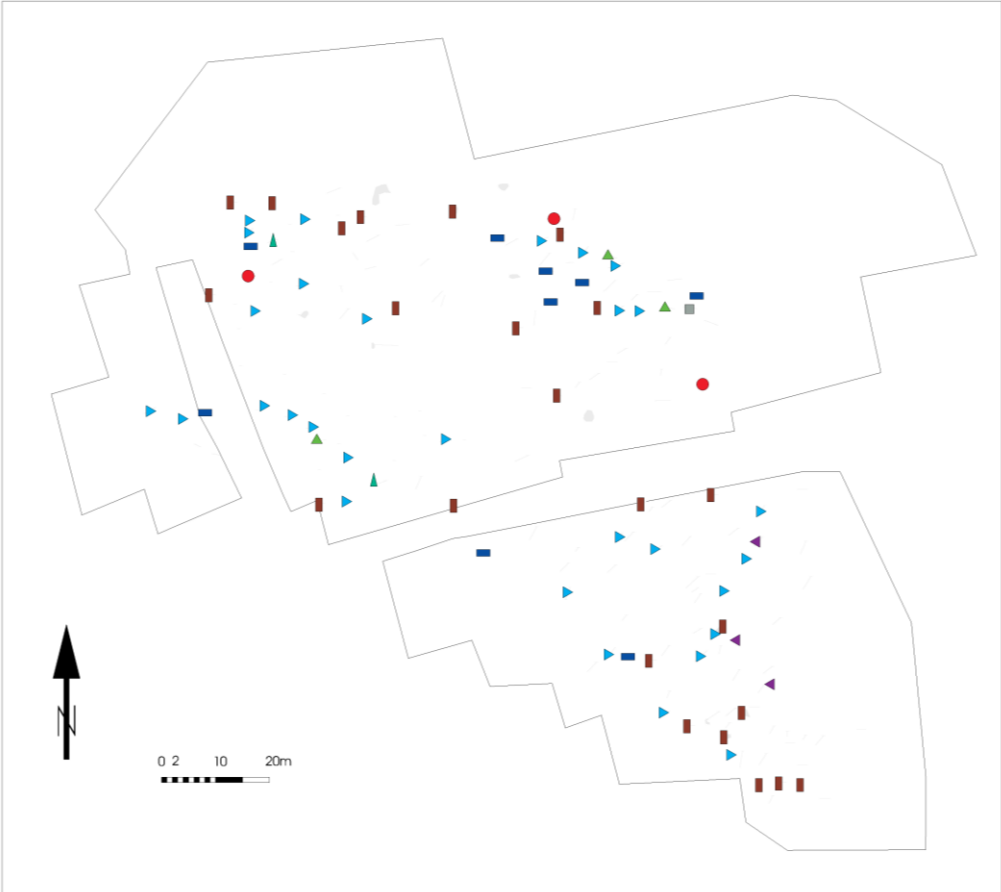


Figure Appendix 119: Distribution map 7 of Schwetzingen.

Burials in Bytes – A Quantitative Study of Linear Pottery cemeteries

F=229 B=153 N=15 K=15 H=3 N=3 H=0 F=0

Map08, Burial pit orientation (2 of 2)
 Hahnekamp Yanik
 Schwetzingen Schälzig
 LBK Gräberfelder



- Pit_Grave orientation00110 : Inhumation\##Pit_Grave orientation\S-N
- ▲ Pit_Grave orientation00120 : Inhumation\##Pit_Grave orientation\SE-NW
- ◀ Pit_Grave orientation00140 : Inhumation\##Pit_Grave orientation\SSW-NNE
- ▶ Pit_Grave orientation00150 : Inhumation\##Pit_Grave orientation\SW-NE
- Pit_Grave orientation00160 : Inhumation\##Pit_Grave orientation\Uncertain
- Pit_Grave orientation00170 : Inhumation\##Pit_Grave orientation\W-E
- Pit_Grave orientation00180 : Inhumation\##Pit_Grave orientation\WNW-ESE
- ▲ Pit_Grave orientation00190 : Inhumation\##Pit_Grave orientation\WSW-ENE

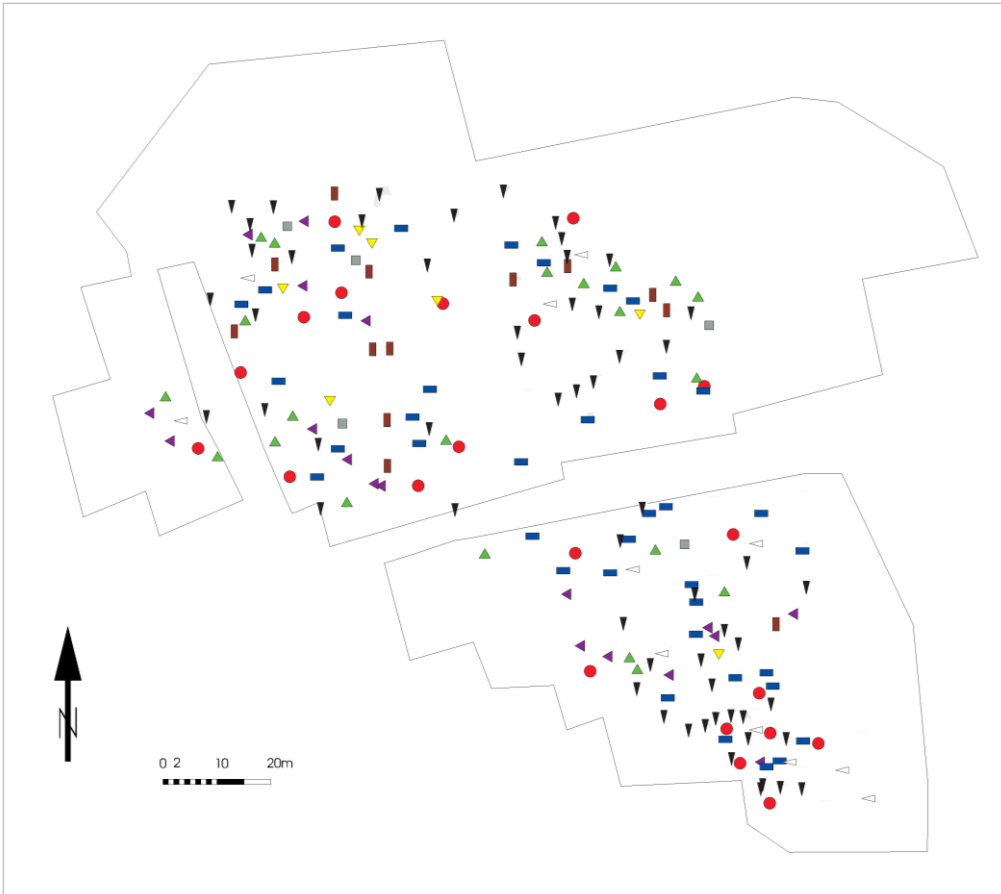


Figure Appendix 120: Distribution map 8 of Schwetzingen.

Burials in Bytes – A Quantitative Study of Linear Pottery cemeteries

F=229 B=153 N=asth=15 K=onh=3 N=ormko=0 F=recu=On

Map09, Line of sight
 Hahnekamp Yanik
 Schwetzingen Schölzig
 LBK Gräberfelder



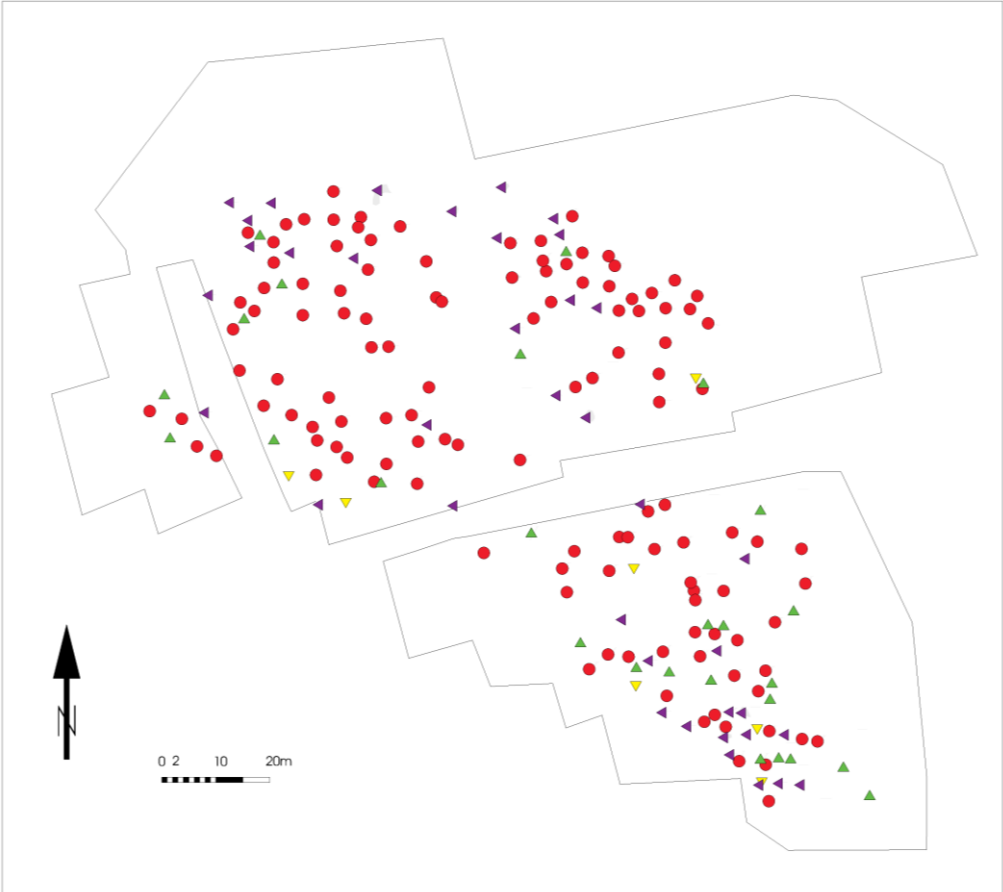
- Line of sight00010 : Inhumation\##Line of sight\E
- ▲ Line of sight00020 : Inhumation\##Line of sight\N
- ▼ Line of sight00030 : Inhumation\##Line of sight\NE
- ▲ Line of sight00040 : Inhumation\##Line of sight\NW
- Line of sight00060 : Inhumation\##Line of sight\S
- Line of sight00070 : Inhumation\##Line of sight\SE
- ▲ Line of sight00080 : Inhumation\##Line of sight\SW
- ▲ Line of sight00100 : Inhumation\##Line of sight\Uncertain
- ▲ Line of sight00110 : Inhumation\##Line of sight\W



Figure Appendix 121: Distribution map 9 of Schwetzingen.

Burials in Bytes – A Quantitative Study of Linear Pottery cemeteries

F=229 B=153 Naxthali=15 Konthivi=3 Normkoor=0 Frequ=On
 Map10, Body orientation
 Hahnekamp Yanik
 Schwetzingen Schälzig
 LBK Gräberfelder



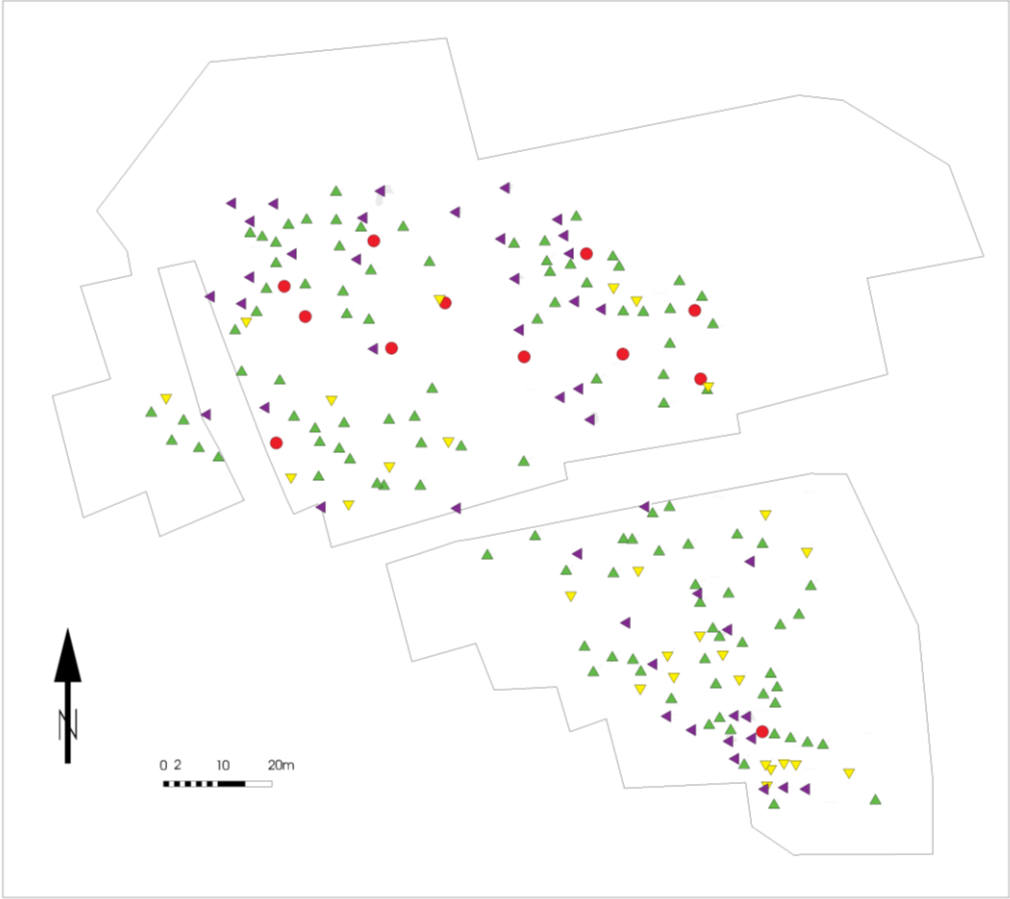
- Body orientation00010 : Inhumation\##Body orientation\Left
- ▲ Body orientation00020 : Inhumation\##Body orientation\Right
- ▼ Body orientation00030 : Inhumation\##Body orientation\Straight
- ◆ Body orientation00040 : Inhumation\##Body orientation\Uncertain



Figure Appendix 122: Distribution map 10 of Schwetzingen.

Burials in Bytes – A Quantitative Study of Linear Pottery cemeteries

T=229 B=153 Nestflueh=15 Konthflueh=3 Normskoon=0 Freque=On
 Map11, Torso position
 Hahnekamp Yanik
 Schwetzingen Schälzig
 LBK Gräberfelder



- Torso position00010 : Inhumation\##Torso position\Prone
- ▲ Torso position00020 : Inhumation\##Torso position\Side
- ▼ Torso position00030 : Inhumation\##Torso position\Supine
- ◀ Torso position00040 : Inhumation\##Torso position\Uncertain

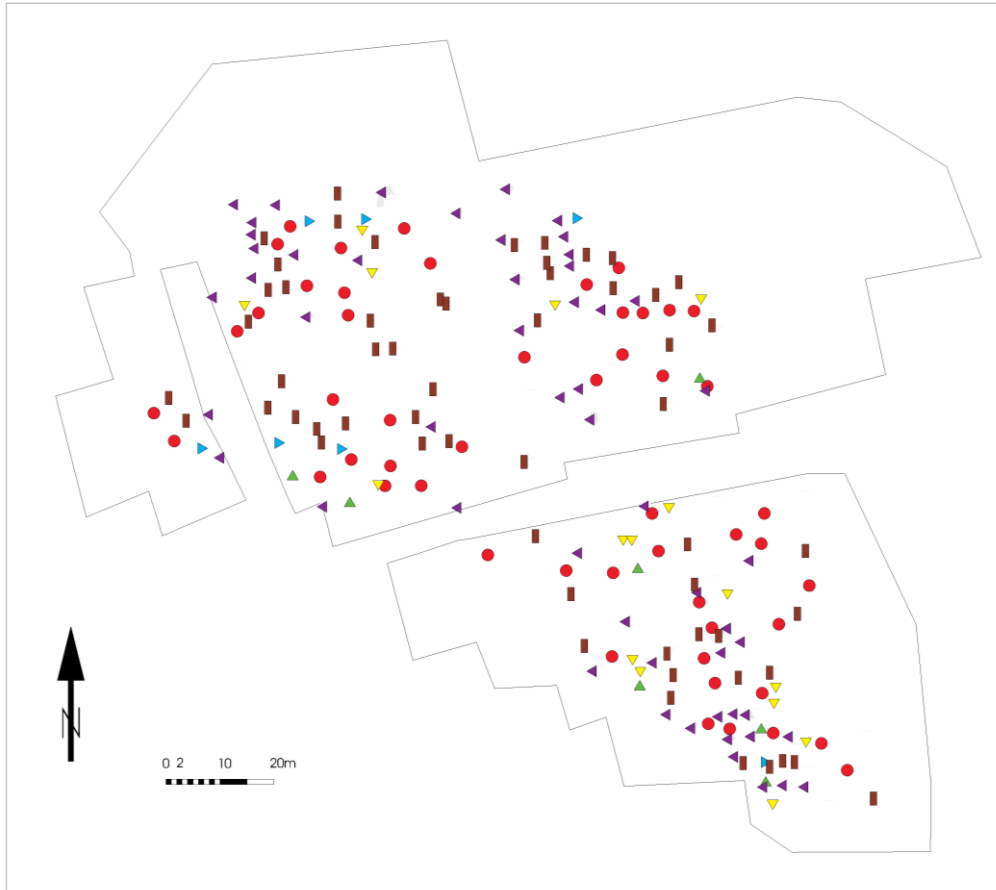


Figure Appendix 123: Distribution map 11 of Schwetzingen.

Burials in Bytes – A Quantitative Study of Linear Pottery cemeteries

F=229 B=153 N=218 I=15 K=3 N=3 Norm=0 Freq=On

Map12, Angle backbone to upper thigh
 Hahnekamp Yanik
 Schwetzingen Schözig
 LBK Gräberfelder



- Angle backbone to upper thigh00010 : Inhumation\##Angle backbone to upper thigh\Moderate
- ▲ Angle backbone to upper thigh00020 : Inhumation\##Angle backbone to upper thigh\Straight
- ▼ Angle backbone to upper thigh00030 : Inhumation\##Angle backbone to upper thigh\Tight
- ◀ Angle backbone to upper thigh00040 : Inhumation\##Angle backbone to upper thigh\Uncertain
- ▶ Angle backbone to upper thigh00050 : Inhumation\##Angle backbone to upper thigh\Very tight
- Angle backbone to upper thigh00060 : Inhumation\##Angle backbone to upper thigh\Wide

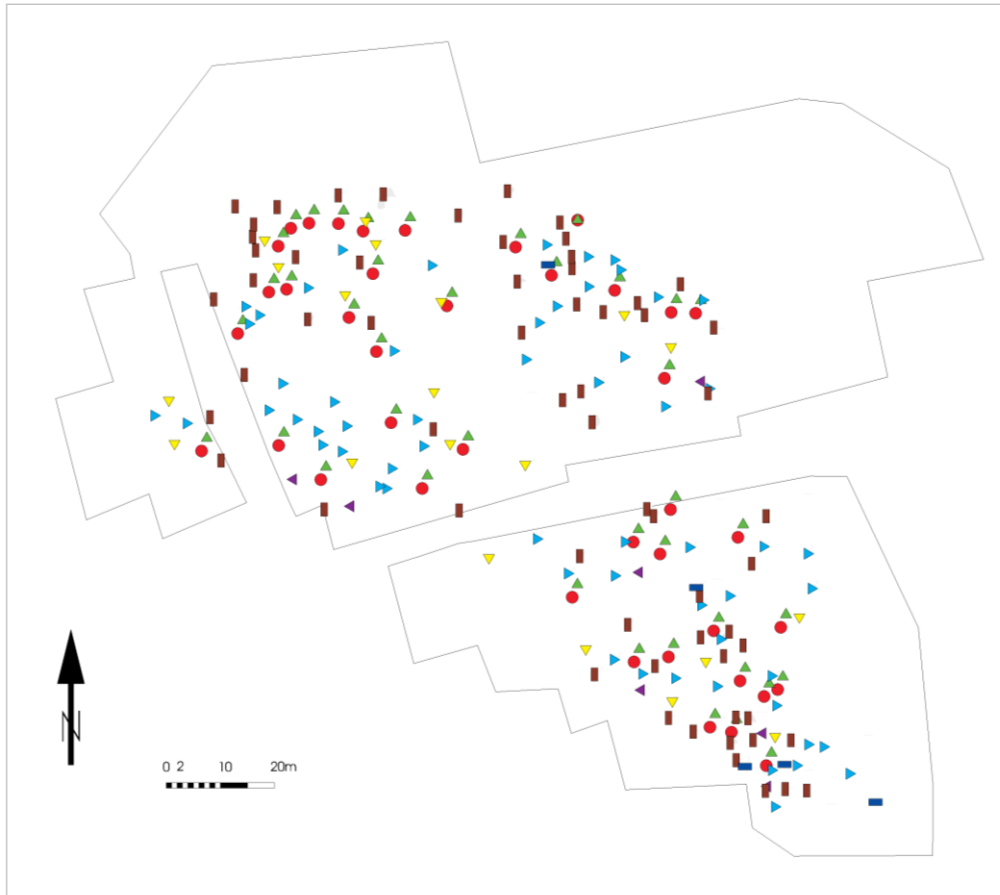


Figure Appendix 124: Distribution map 12 of Schwetzingen.

Burials in Bytes – A Quantitative Study of Linear Pottery cemeteries

F=229 B=153 N=2746 H=15 K=383 U=3 N=3000000 F=000-00

Map 13, Angle upper to lower thigh
 Hahnekamp Yanik
 Schwetzingen Schälzig
 LBK Gräberfelder



- Angle upper to lower thigh00010 : Inhumation\##Angle upper to lower thigh\Extreme
- ▲ Angle upper to lower thigh00010 : Inhumation\##Angle upper to lower thigh\Extreme
- ▼ Angle upper to lower thigh00020 : Inhumation\##Angle upper to lower thigh\Moderate
- ◀ Angle upper to lower thigh00030 : Inhumation\##Angle upper to lower thigh\Straight
- ▶ Angle upper to lower thigh00040 : Inhumation\##Angle upper to lower thigh\Tight
- Angle upper to lower thigh00050 : Inhumation\##Angle upper to lower thigh\Uncertain
- Angle upper to lower thigh00060 : Inhumation\##Angle upper to lower thigh\Wide



Figure Appendix 125: Distribution map 13 of Schwetzingen.

Burials in Bytes – A Quantitative Study of Linear Pottery cemeteries

F=229 B=153 Nord/Süd/N=15 Konth/N=3 Normskoon=0 Freaqu=On

Map14, Arm gesture
 Hahnekamp Yanik
 Schwetzingen Schälzig
 LBK Gräberfelder



- Arms position00010 : Inhumation\##Arms position\01 Sleeping
- ▲ Arms position00020 : Inhumation\##Arms position\02 Diagonally crossed
- ▼ Arms position00030 : Inhumation\##Arms position\03 Horizontally crossed
- Arms position00050 : Inhumation\##Arms position\05 On shoulder
- Arms position00060 : Inhumation\##Arms position\06 Arms straight down
- Arms position00070 : Inhumation\##Arms position\07 Right arm diagonally positioned up to shoulder, left arm vertically to same shoulder
- Arms position00080 : Inhumation\##Arms position\08 Left arm diagonally positioned up to shoulder, right arm vertically to same shoulder
- ▲ Arms position00100 : Inhumation\##Arms position\10 Differently crossed
- ▲ Arms position00130 : Inhumation\##Arms position\13 Left arm straight down, right arm up
- ▲ Arms position00140 : Inhumation\##Arms position\14 Right arm horizontally positioned to torso, left arm vertically up
- ▲ Arms position00160 : Inhumation\##Arms position\16 Arms pointing away from body
- ▲ Arms position00180 : Inhumation\##Arms position\18 Undetermined

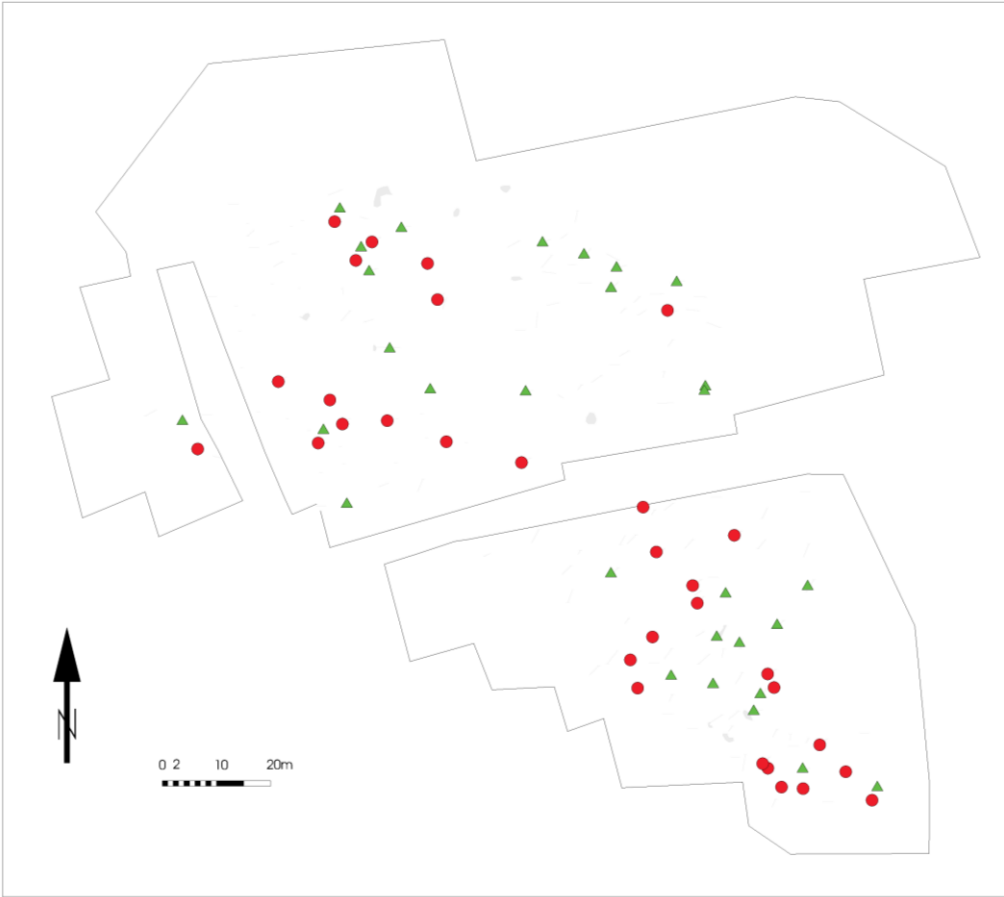


Figure Appendix 126: Distribution map 14 of Schwetzingen.

Burials in Bytes – A Quantitative Study of Linear Pottery cemeteries

F:\229 B\153 \ueath\ue=15 Konth\ue=3 \uormkoor=0 Freau=On

Map 15, Vessel condition
Hahnekamp Yanik
Schwetzingen Schälzig
LBK Gräberfelder



- Grave good00010 : Ceramic\##Grave good
- ▲ Vessel unit00010 : Ceramic\##Vessel unit



Figure Appendix 127: Distribution map 15 of Schwetzingen.

Burials in Bytes – A Quantitative Study of Linear Pottery cemeteries

F:\229 B\153\ueath\15 Konth\1\3\Normkoor-0\Freau-On

Map 16, Amphorae
 Hahnekamp Yanik
 Schwetzingen Schälzig
 LBK Gräberfelder



- Amphorae (1a)00010 : Ceramic\Pottery\1 Amphorae and Pots\##Amphorae (1a)
- Amphorae (1g)00010 : Ceramic\Pottery\1 Amphorae and Pots\##Amphorae (1g)
- Amphorae (1h)00010 : Ceramic\Pottery\1 Amphorae and Pots\##Amphorae (1h)

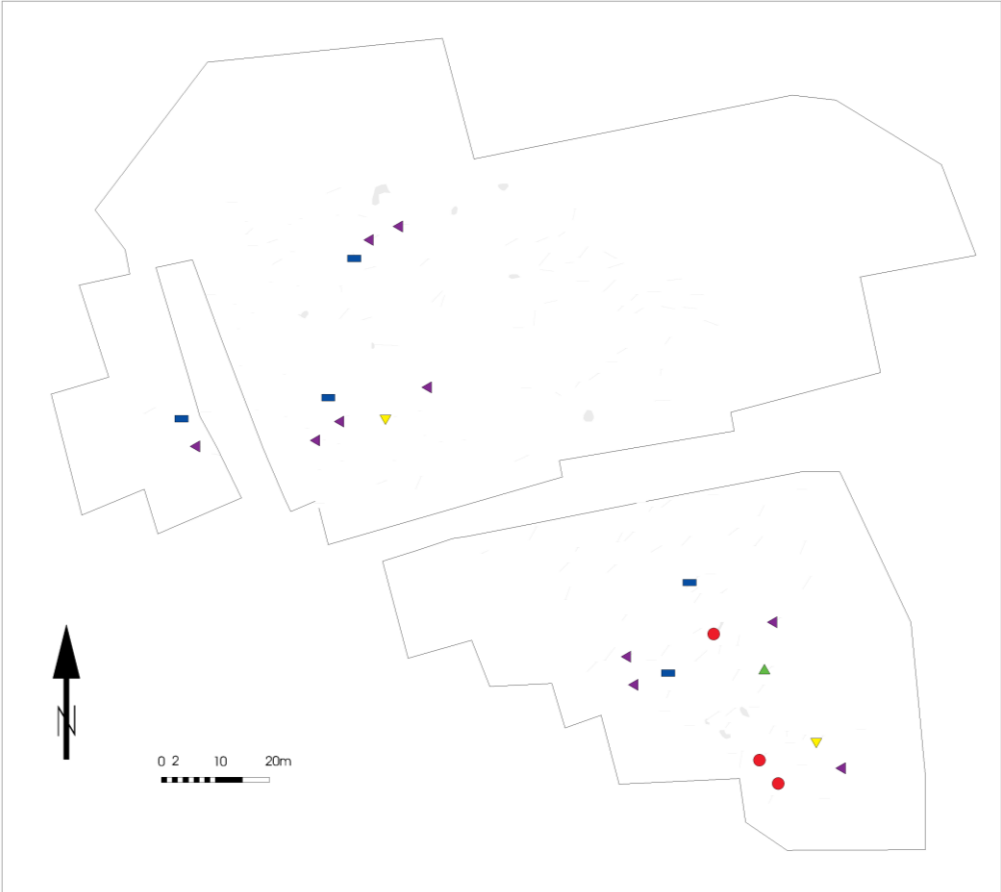


Figure Appendix 128: Distribution map 16 of Schwetzingen.

Burials in Bytes – A Quantitative Study of Linear Pottery cemeteries

F:\229 8=153 \axthai\=15 Konth\h\=3 Normkoor=0 Freau=On

Map17, Kämpfe
 Hahnekamp Yanik
 Schwetzingen Schälzig
 LBK Gräberfelder



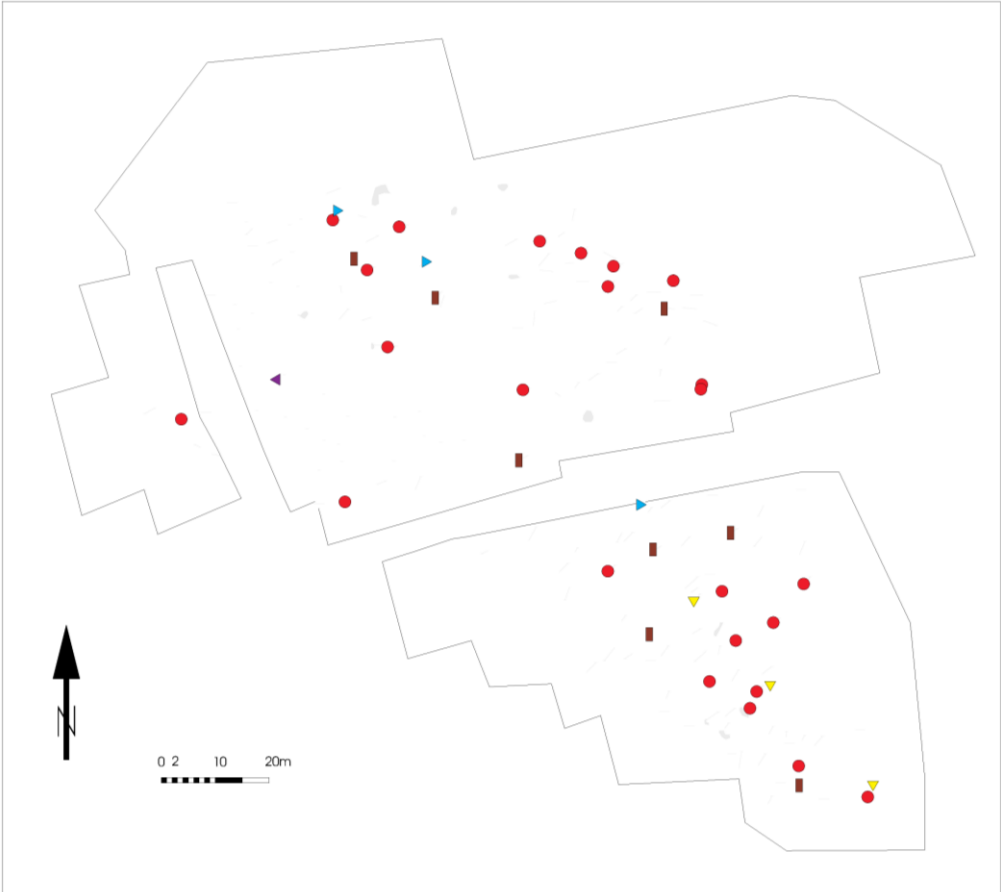
- Kumpf (2a)00010 : Ceramic\Pottery\2 Kämpfe\##Kumpf (2a)
- ▲ Kumpf (2b)00010 : Ceramic\Pottery\2 Kämpfe\##Kumpf (2b)
- ▼ Kumpf (2c)00010 : Ceramic\Pottery\2 Kämpfe\##Kumpf (2c)
- ▲ Kumpf (2d)00010 : Ceramic\Pottery\2 Kämpfe\##Kumpf (2d)
- Kumpf (Uncategorized)00010 : Ceramic\Pottery\2 Kämpfe\##Kumpf (Uncategorized)



Figure Appendix 129: Distribution map 17 of Schwetzingen.

Burials in Bytes – A Quantitative Study of Linear Pottery cemeteries

F=229 B=153 N=totalN=15 KonfliktN=3 Normkoor=0 frequ=On
 Map18, Other vessel types
 Hahnekamp Yanik
 Schwetzingen Schälzig
 LBK Gräberfelder



- Uncategorized sherds00010 : Ceramic\Pottery\##Uncategorized sherds
- ▼ High bowl (3b)00010 : Ceramic\Pottery\3 Bowls\##High bowl (3b)
- ▲ Perforated miniature vessel (4a)00010 : Ceramic\Pottery\4 Miniature vessels\##Perforated miniature vessel (4a)
- ▲ Miniature amphorae (4b)00010 : Ceramic\Pottery\4 Miniature vessels\##Miniature amphorae (4b)
- Miniature vessel (4c)00010 : Ceramic\Pottery\4 Miniature vessels\##Miniature vessel (4c)



Figure Appendix 130: Distribution map 18 of Schwetzingen.

Burials in Bytes – A Quantitative Study of Linear Pottery cemeteries

F=229 B=153 N=extlatN=15 KonthN=3 Normkoor=0 Freaum=On

Map19, Ornaments
 Hahnekamp Yanik
 Schwetzingen Schälzig
 LBK Gräberfelder



- Spondylus bead00010 : Clothing\Beads\##Spondylus bead
- △ Spondylus closure_Medallion00010 : Clothing\Belt buckle/closure\Spondylus closure\##Spondylus closure_Medallion
- △ Antler closure_Bow00010 : Clothing\Belt buckle/closure\Antler closure\##Antler closure_Bow
- △ Spondylus bracelet00010 : Clothing\Bracelet\##Spondylus bracelet
- △ Nucella lapillus_Perforated00010 : Clothing\Snail shells\Polished and perforated\##Nucella lapillus_Perforated

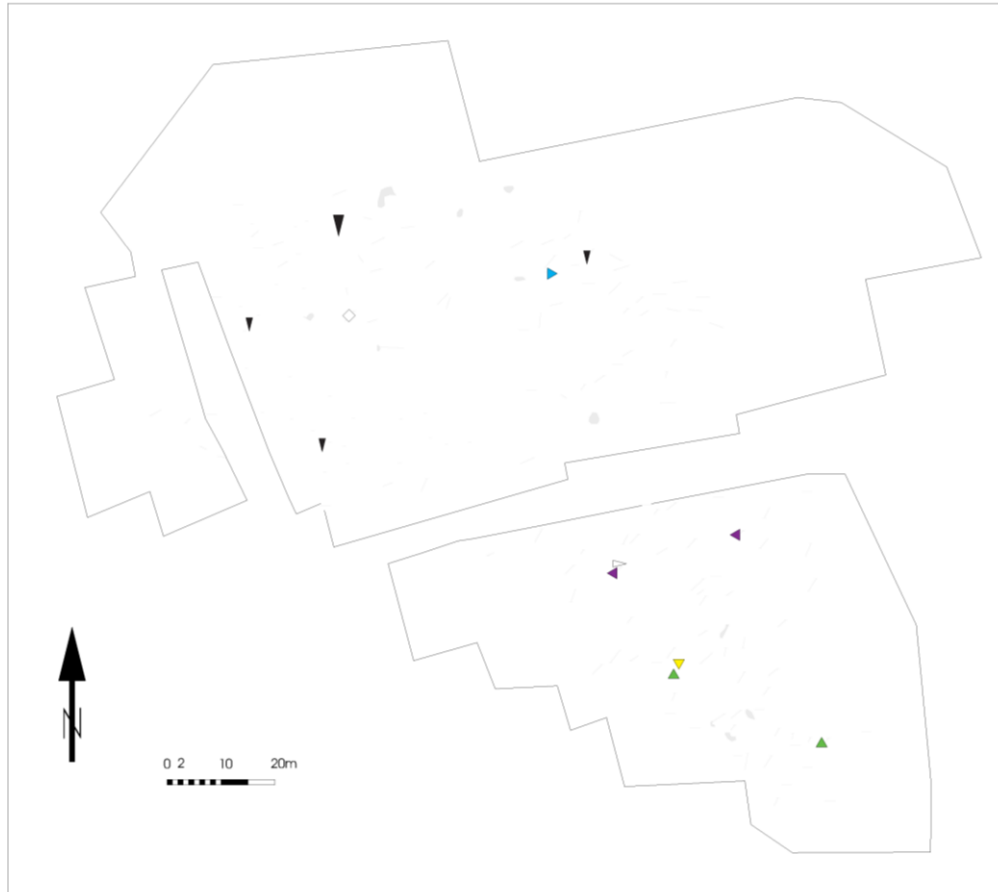


Figure Appendix 131: Distribution map 19 of Schwetzingen.

Burials in Bytes – A Quantitative Study of Linear Pottery cemeteries

F:\229 B-153\hahnekamp\15 konf\hahnekamp\3 norm\koo=0\freq=0n

Map20, Unmodified shells
 Hahnekamp Yanik
 Schwetzingen Schälzig
 LBK Gräberfelder



- ▲ Pseudunio auricularius_Unmodified00010 : Clothing\Mussel shells\Unmodified\##Pseudunio auricularius_Unmodified
- ▼ Unio crassus_Unmodified00010 : Clothing\Mussel shells\Unmodified\##Unio crassus_Unmodified
- ▲ Unio pictorum_Unmodified00010 : Clothing\Mussel shells\Unmodified\##Unio pictorum_Unmodified
- ▲ Unspecified freshwater mussel shell_Unmodified00010 : Clothing\Mussel shells\Unmodified\##Unspecified freshwater mussel shell_Unmodified
- ▼ Zebraia detrita_Unmodified00010 : Clothing\Snail shells\Unmodified\##Zebraia detrita_Unmodified
- ▲ Anodonta cygnea_Fragmented00010 : Clothing\Mussel shells\Modification uncertain\##Anodonta cygnea_Fragmented
- ◇ Glycymeris_Fragmented00010 : Clothing\Mussel shells\Modification uncertain\##Glycymeris_Fragmented

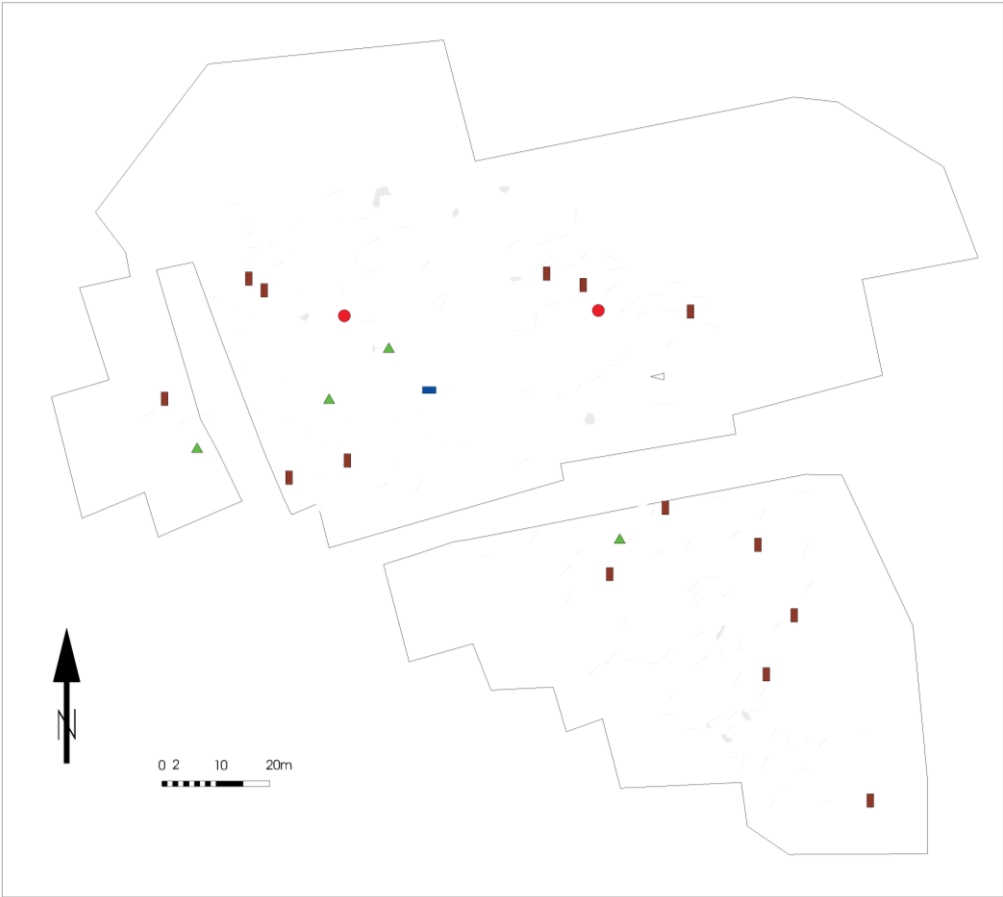


Figure Appendix 132: Distribution map 20 of Schwetzingen.

Burials in Bytes – A Quantitative Study of Linear Pottery cemeteries

F:\229 8-153 \axthai\15 Konth\3\Normkoor-0 Frequ-On

Map21, Bone tools and weapons
 Hahnekamp Yanik
 Schwetzingen Schälzig
 LBK Gräberfelder



- Bone point_Long bone–long bone segment00010 : Weapons and tools\Bone tools\Pointed bone tools\##Bone point_Long bone–long bone segment
- ▲ Bone point_Metapodium00010 : Weapons and tools\Bone tools\Pointed bone tools\##Bone point_Metapodium
- ▲ Triangular bone point00010 : Weapons and tools\Bone tools\##Triangular bone point
- Bone disc_Uncertain00010 : Weapons and tools\Bone tools\##Bone disc_Uncertain
- △ Perforated bone adze00010 : Weapons and tools\Bone tools\##Perforated bone adze



Figure Appendix 133: Distribution map 21 of Schwetzingen.

Burials in Bytes – A Quantitative Study of Linear Pottery cemeteries

F:\229 8=153 \next\el\=15 Konth\N=3 Norm\koor\0 Freau=On

Map22, Hammerstones, nodules and pebbles
Hahnekamp Yanik
Schwetzingen Schälzig
LBK Gräberfelder

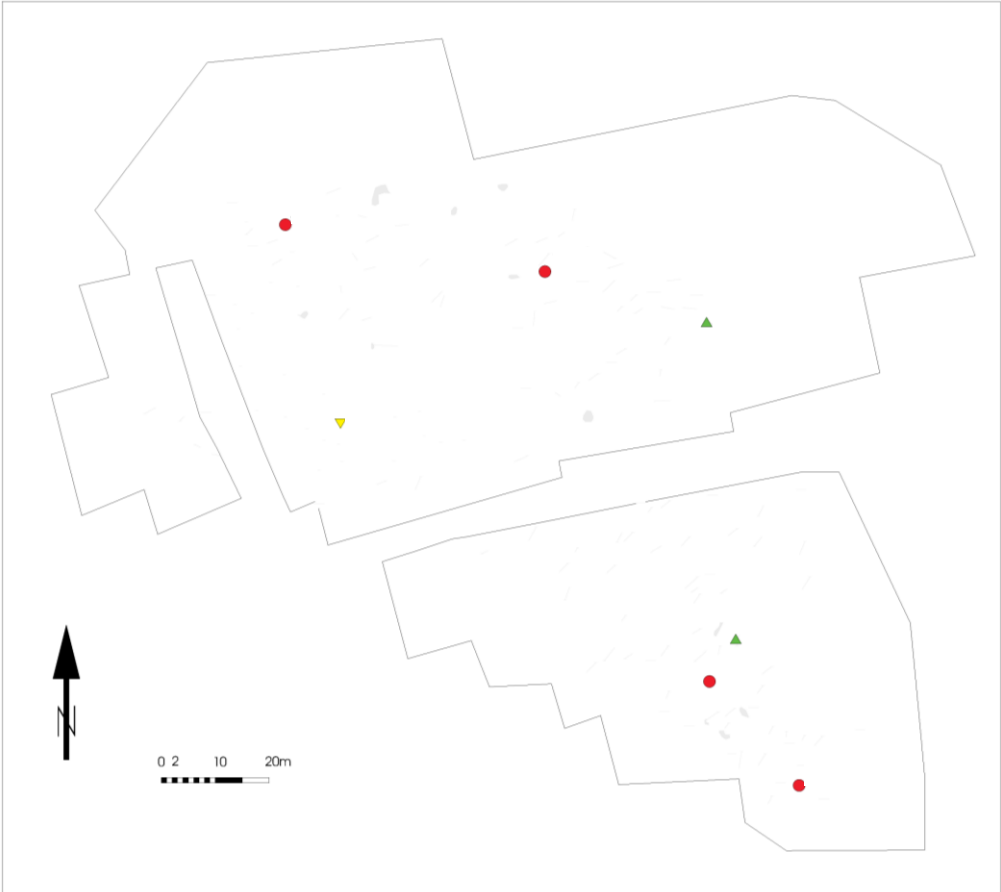


- ▲ Pebble00010 : Mineral resources\Pebbles and nodules\##Pebble
- ▼ Nodule_undetermined00010 : Mineral resources\Pebbles and nodules\##Nodule_undetermined

Figure Appendix 134: Distribution map 22 of Schwetzingen.

Burials in Bytes – A Quantitative Study of Linear Pottery cemeteries

F=229 B=153 N=15 K=15 H=3 N=3 H=0 F=0
 Map23, Grinding tools
 Hahnekamp Yanik
 Schwetzingen Schälzig
 LBK Gräberfelder



- Friction plate00010 : Weapons and tools\Grinding tools\##Friction plate
- ▲ Grinding stone00010 : Weapons and tools\Grinding tools\##Grinding stone
- ▼ Grinding tool fragment_Not specified00010 : Weapons and tools\Grinding tools\##Grinding tool fragment_Not specified

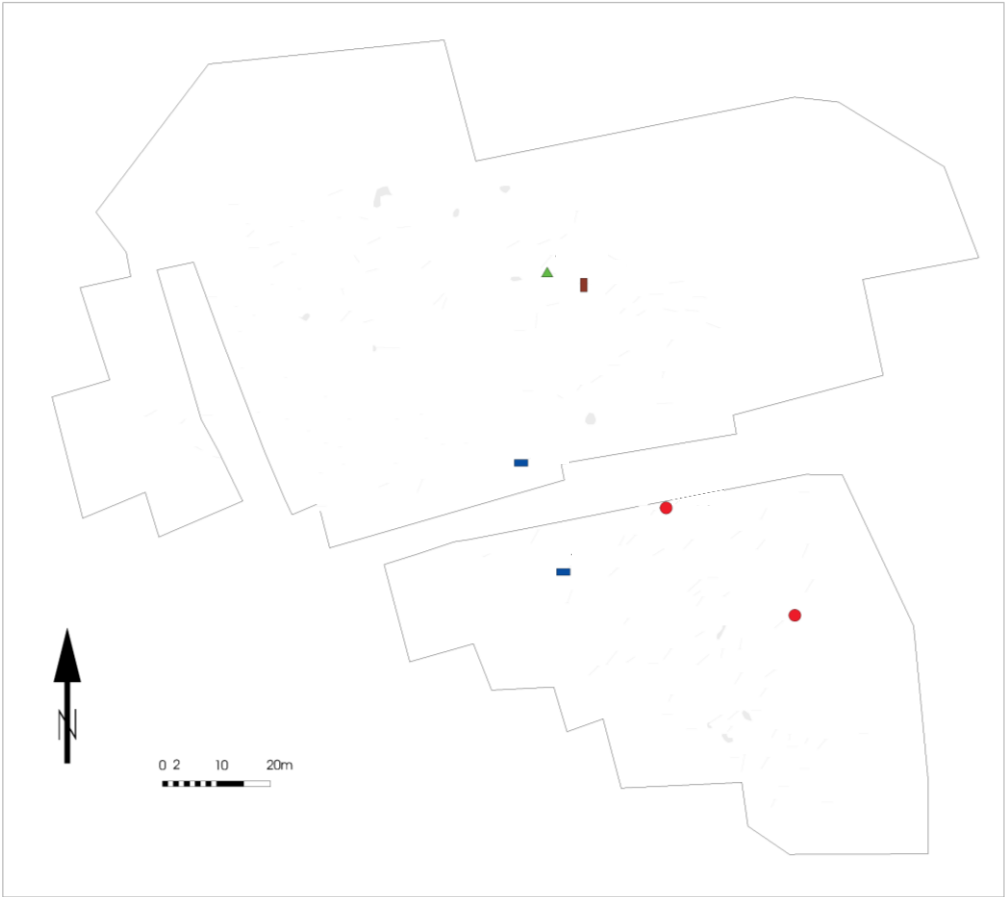


Figure Appendix 135: Distribution map 23 of Schwetzingen.

Burials in Bytes – A Quantitative Study of Linear Pottery cemeteries

F:\229 B-153\haxthell\15 konf\h\3\3\hormkoor-0\Freq\On

Map24, Colouring
 Hahnekamp Yanik
 Schwetzingen Schälzig
 LBK Gräberfelder



- Red chalk powder00010 : Mineral resources\Colouring\##Red chalk powder
- ▲ Red colour stone00010 : Mineral resources\Colouring\##Red colour stone
- Graphite stone00020 : Mineral resources\Colouring\##Graphite stone\Perforated
- Manganese stone00010 : Mineral resources\Colouring\##Manganese stone

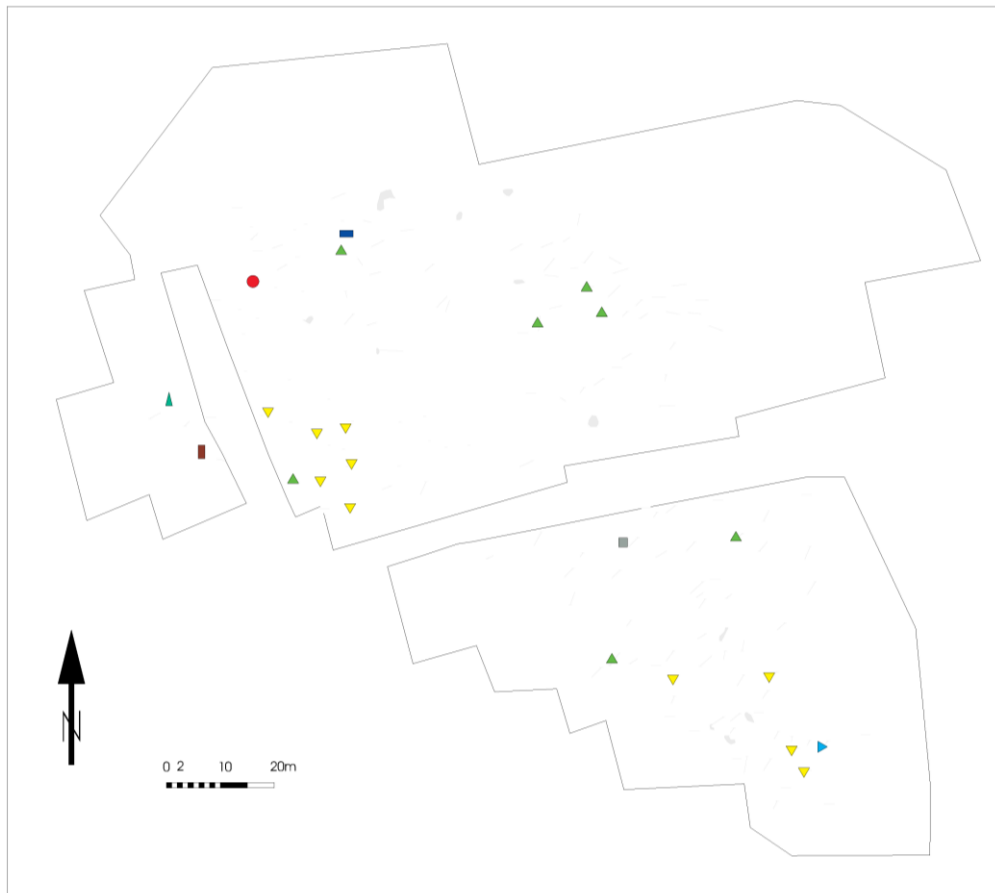


Figure Appendix 136: Distribution map 24 of Schwetzingen.

Burials in Bytes – A Quantitative Study of Linear Pottery cemeteries

F=229 B=153 NextVal=N=15 KonthV=N=3 NormKoord=0 Freaum=On

Map25, Polished stone tools
 Hahnekamp Yanik
 Schwetzingen Schälzig
 LBK Gräberfelder



- Adze_Type 100010 : Weapons and tools\Polished stone tools\Non-perforated blades\##Adze_Type 1
- ▲ Adze_Type 200010 : Weapons and tools\Polished stone tools\Non-perforated blades\##Adze_Type 2
- ▼ Adze_Type 300010 : Weapons and tools\Polished stone tools\Non-perforated blades\##Adze_Type 3
- ▲ Adze_Undetermined00010 : Weapons and tools\Polished stone tools\Non-perforated blades\##Adze_Undetermined
- Double-edged wedge00010 : Weapons and tools\Polished stone tools\Perforated blades\##Double-edged wedge
- Disc mace00010 : Weapons and tools\Polished stone tools\Perforated blades\##Disc mace
- Disc mace_Uncertain00010 : Weapons and tools\Polished stone tools\Perforated blades\##Disc mace_Uncertain
- ▲ Perforated shoe-last adze00010 : Weapons and tools\Polished stone tools\Perforated blades\##Perforated shoe-last adze

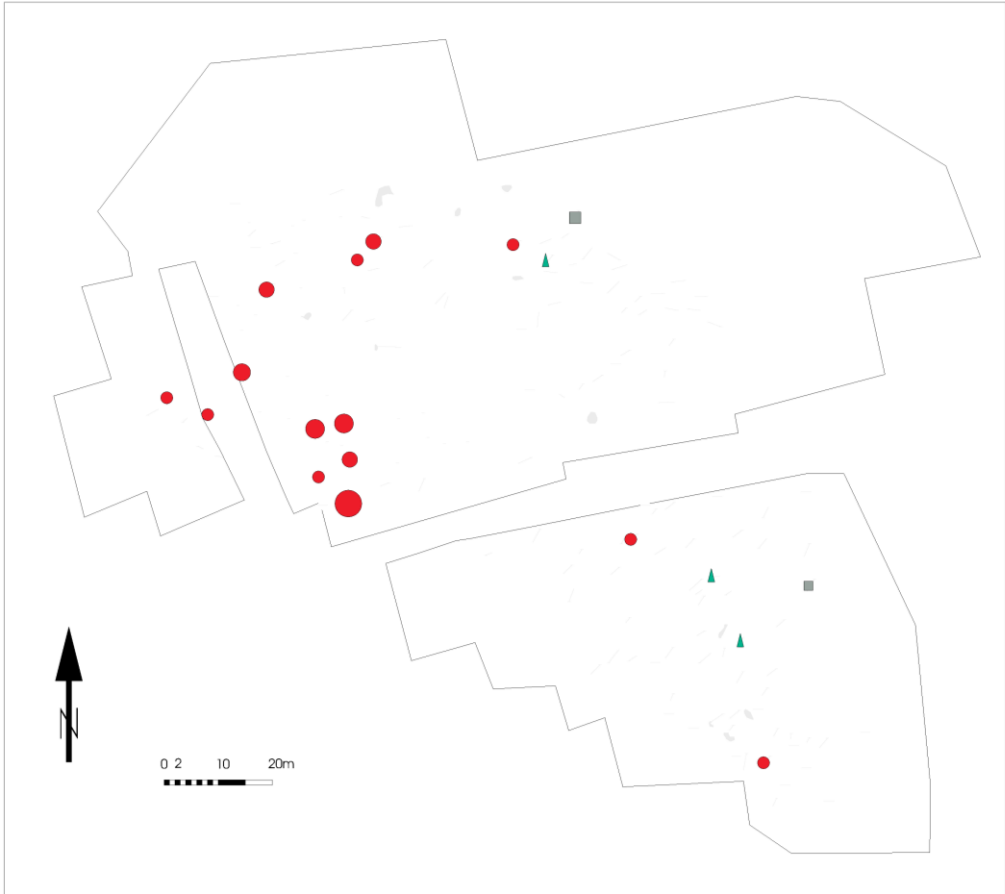


Figure Appendix 137: Distribution map 25 of Schwetzingen.

Burials in Bytes – A Quantitative Study of Linear Pottery cemeteries

F:\229 8-153 \xath\h=15 \konth\h=3 \norm\koor=0 \frequ=On

Map27, Microlithic chert tools
 Hahnekamp Yanik
 Schwetzingen Schälzig
 LBK Gräberfelder



- Triangular arrowhead00010 : Weapons and tools\Chert artefacts\Microlithic\Triangular\##Triangular arrowhead
- Trapezoidal flake00020 : Weapons and tools\Chert artefacts\Microlithic\Trapezoidal\##Trapezoidal flake\Wide trapeze_AC
- ▲ Irregular flake00010 : Weapons and tools\Chert artefacts\Microlithic\Irregular\##Irregular flake

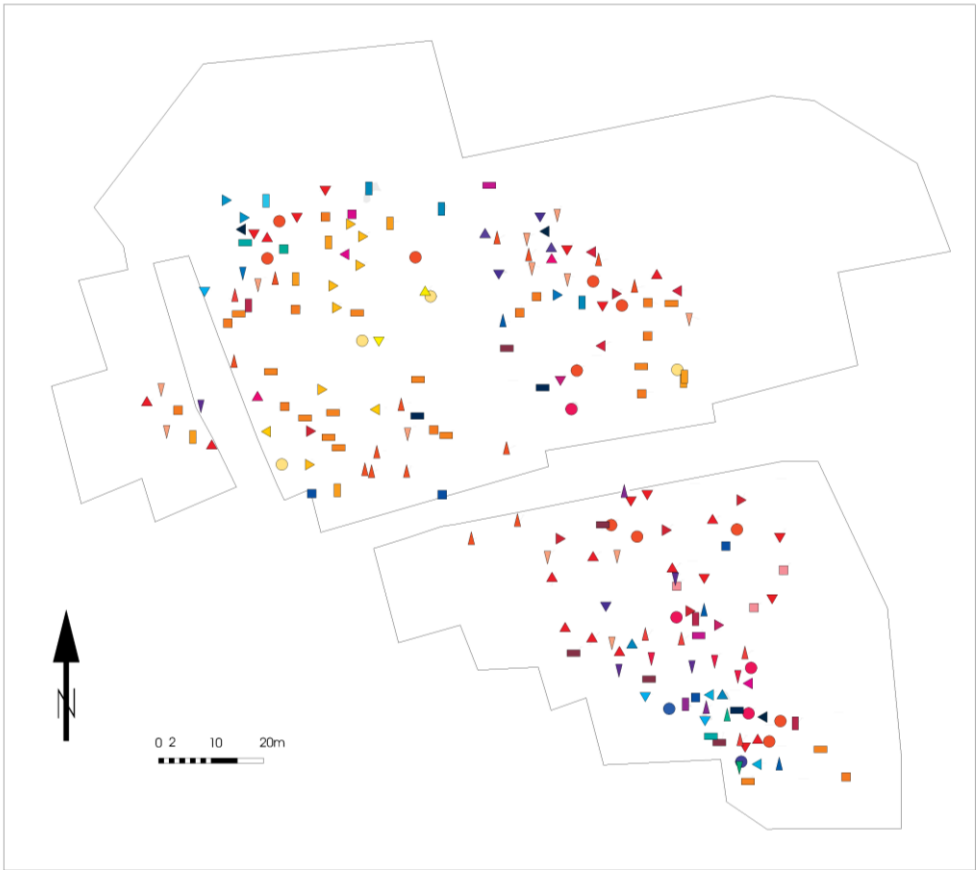


Figure Appendix 139: Distribution map 27 of Schwetzingen.

Burials in Bytes – A Quantitative Study of Linear Pottery cemeteries

F=195 R=1370 Neighbour=15 KonfA/N=3 Normskool=0 Frequ=On

LBK Gräberfelder
 Archäologische Daten, Schwetzingen Schälzig,ANN1
 Bearbeitung: Hahnekamp Yanik 2020
 monovariate Clusteranalysis with Eigenvectors
 Reciprocal Averaging,
 Analysis of N Next Neighbours by 1 Type



- | | | | | |
|---------|---------|---------|---------|---------|
| ● Clu01 | ● Clu11 | ● Clu21 | ● Clu31 | ● Clu41 |
| ▲ Clu02 | ▲ Clu12 | ▲ Clu22 | ▲ Clu32 | ▲ Clu42 |
| ▲ Clu03 | ▲ Clu13 | ▲ Clu23 | ▲ Clu33 | ▲ Clu43 |
| ▲ Clu04 | ▲ Clu14 | ▲ Clu24 | ▲ Clu34 | ▲ Clu44 |
| ▲ Clu05 | ▲ Clu15 | ▲ Clu25 | ▲ Clu35 | ▲ Clu45 |
| ▲ Clu06 | ▲ Clu16 | ▲ Clu26 | ▲ Clu36 | ▲ Clu46 |
| ▲ Clu07 | ▲ Clu17 | ▲ Clu27 | ▲ Clu37 | ▲ Clu47 |
| ▲ Clu08 | ▲ Clu18 | ▲ Clu28 | ▲ Clu38 | ▲ Clu48 |
| ▲ Clu09 | ▲ Clu19 | ▲ Clu29 | ▲ Clu39 | ▲ Clu49 |
| ▲ Clu10 | ▲ Clu20 | ▲ Clu30 | ▲ Clu40 | ▲ Clu50 |

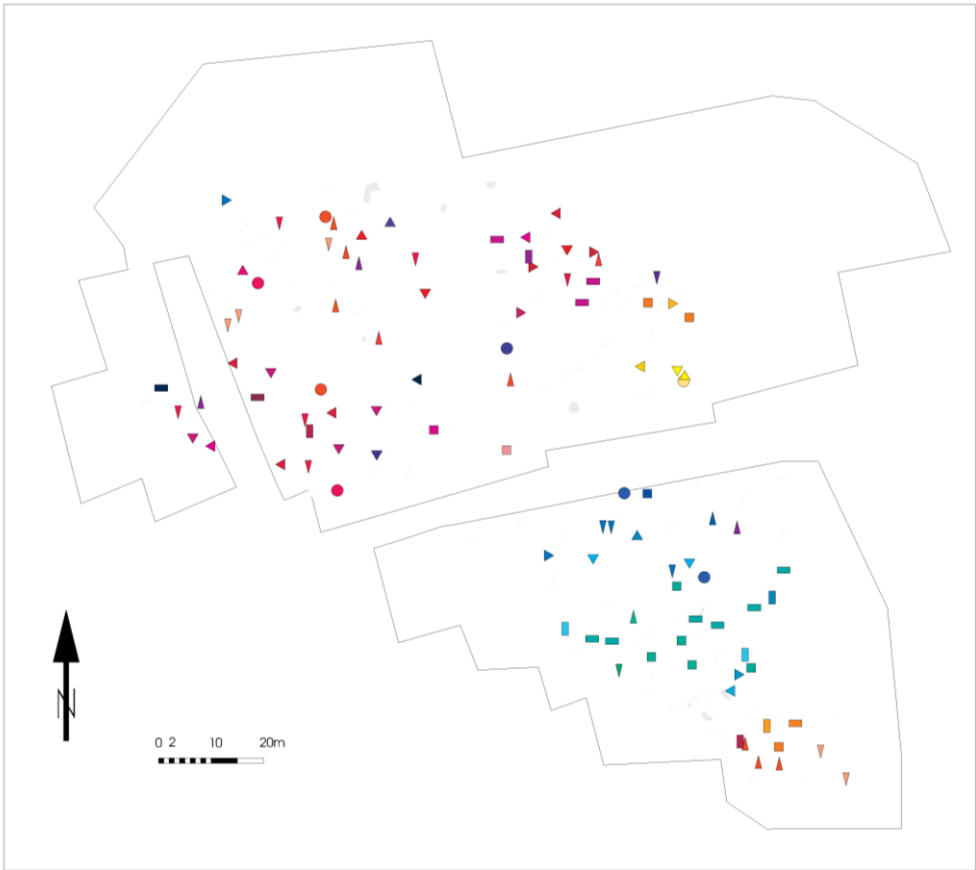


Figure Appendix 140: Analysis N Next Neighbours of pit orientation and burial position at Schwetzingen.

Burials in Bytes – A Quantitative Study of Linear Pottery cemeteries

f=99 k=256 nearestN=15 kofhshu=3 normkool=0 frequ=On

LBK Gräberfelder
 Archäologische Daten, Schwetzingen Schälzig,ANN1
 Bearbeitung: Hahnekamp Yanik 2020
 monovariate Clusteranalysis with Eigenvectors
 Reciprocal Averaging,
 Analysis of N Next Neighbours by 1 Type



- | | | | | |
|---------|---------|---------|---------|---------|
| ● Clu01 | ● Clu11 | ● Clu21 | ● Clu31 | ● Clu41 |
| ▲ Clu02 | ▲ Clu12 | ▲ Clu22 | ▲ Clu32 | ▲ Clu42 |
| ▲ Clu03 | ▲ Clu13 | ▲ Clu23 | ▲ Clu33 | ▲ Clu43 |
| ▲ Clu04 | ▲ Clu14 | ▲ Clu24 | ▲ Clu34 | ▲ Clu44 |
| ▲ Clu05 | ▲ Clu15 | ▲ Clu25 | ▲ Clu35 | ▲ Clu45 |
| ▲ Clu06 | ▲ Clu16 | ▲ Clu26 | ▲ Clu36 | ▲ Clu46 |
| ▲ Clu07 | ▲ Clu17 | ▲ Clu27 | ▲ Clu37 | ▲ Clu47 |
| ▲ Clu08 | ▲ Clu18 | ▲ Clu28 | ▲ Clu38 | ▲ Clu48 |
| ▲ Clu09 | ▲ Clu19 | ▲ Clu29 | ▲ Clu39 | ▲ Clu49 |
| ▲ Clu10 | ▲ Clu20 | ▲ Clu30 | ▲ Clu40 | ▲ Clu50 |



Figure Appendix 141: Analysis N Next Neighbours of grave goods and burial types at Schwetzingen.

LBK Gräberfelder
Archäologische Daten, LBK Gräberfelder, GoogleMap, CA

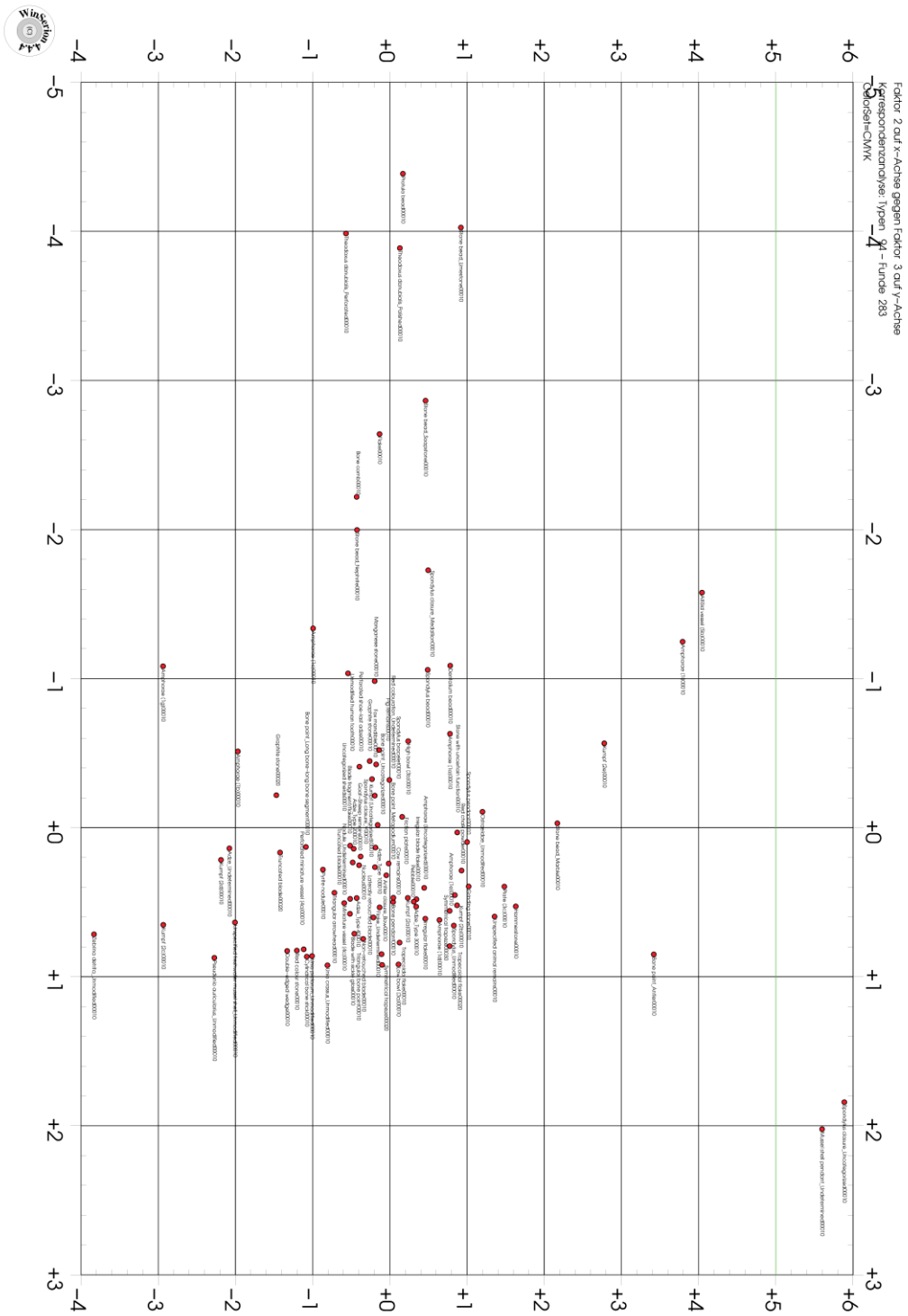
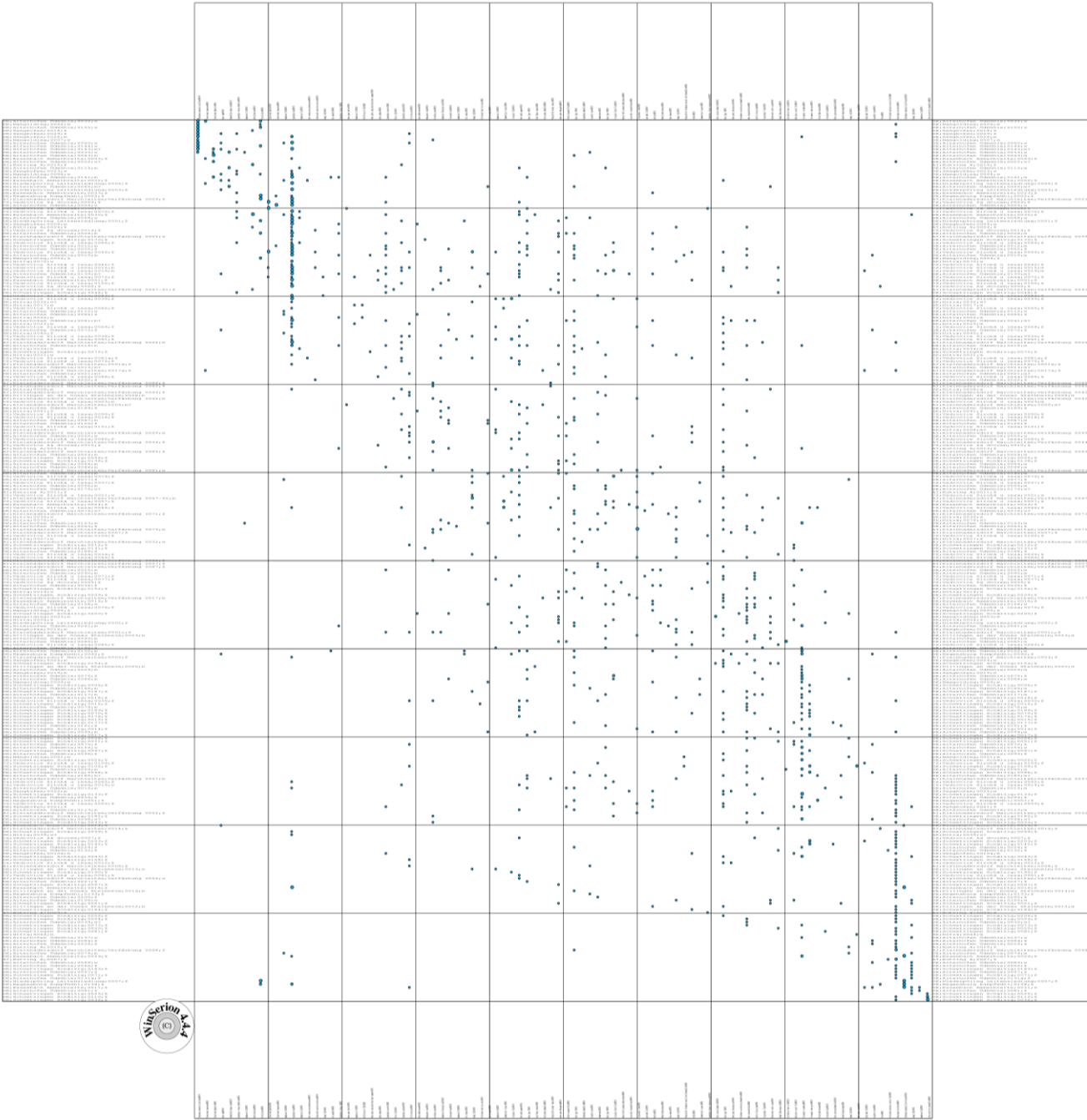


Figure Appendix 142: Correspondence Analysis of the complete data set of grave goods.



**Reciprocal Averaging,
LBK Gräberfelder
Archäologische Daten, LBK Gräberfelder.GoogleMap,Seriation
Bearbeitung: Hahnekamp Yanik 2020**
F=283 T=94 I=997 I'=3622 OZ=1 AZ=30 LIS= 0.9701 COS= 0.9701 STR= 0.9701 J=1 M=260 ColorSet=CMYK

Figure Appendix 143: Seriation of the complete data set of grave goods.