Life and afterlife in the Nordic Bronze Age

Proceedings of the 15th Nordic Bronze Age Symposium held in Lund, Sweden, June 11-15, 2019

Tornberg, Anna; Svensson, Andreas; Apel, Jan

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Life and afterlife in the Nordic Bronze Age

Proceedings of the 15th Nordic Bronze Age Symposium held in Lund 11th to 15th June 2019

Anna Tornberg, Lund University
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Jan Apel, Stockholm University

This book contains some of the papers presented at the 15th Nordic Bronze Age Symposium, organized by Lund University on 11–15 June 2019. Over these five days approximately 100 researchers of the Bronze Age gathered to present papers and discuss traditional research questions as well as current topics that have been brought about by the breakthrough of the third science revolution of archaeology over the last 20 years.

The idea of hosting the 15th Nordic Bronze Age Symposium in Lund was suggested by the department's research group on craft and production and was regarded as an opportunity to celebrate the 100-year anniversary of the installation of the first chair in Prehistory and Medieval Archaeology at Lund University. Even before the subject of Archaeology attained its first chair in 1919, the rich Bronze Age had held a central position in Lund. Sven Nilsson, professor of Natural History at Lund University, contributed to Thomsen's establishment of the three-period system in the early part of the 19th century and published a bold theory that the Scandinavian Bronze Age was triggered by Phoenician colonizers (see e.g., Nicklasson, 2018, p. 153). The theory was quickly forgotten but has to some extent been revitalized, not in detail, but in its focus on large-scale systems and migrations (e.g., Kristansen, 2014).

Since its inception at Isegran in Östfold in 1977, the Symposium has served as a vital forum for archaeological research on Bronze Age topics. The size of the Symposia held over the last 20 years clearly demonstrates the strength of Bronze Age research within the Nordic countries. The 15th Symposium in Lund offered a rich and varied program with one keynote presentation and 65 papers split between nine sessions. The keynote speaker, Professor Helle Vandkilde from Aarhus University—who was awarded an honorary doctorate in Archaeology in June 2019 by the Joint Faculties of Humanities and Theology at Lund University—presented her recent publication on the Pile Hoard.

This book is divided into three themes containing two to five papers each. The first theme, (1) "Subsistence, regionality, and networks", comprises four papers with archaeological examples from Sweden, Denmark, and Norway that exemplify the diversity of the Nordic Bronze Age. In addition, one paper questions the Grand Bronze Age narratives that have been shown by recent regional contextual studies to be less and less tenable. The second theme, (2) "Burials and the buried", encompasses five papers within the field of burial archaeology. The theoretical and methodological approaches are influenced by both natural science approaches and social sciences. Lastly, the third theme, (3) "Expressions", consists of two papers that discuss Bronze Age expressions in ceramic craft and rock art respectively. Interpretations of both expressions as social phenomena and the practices of expression are evaluated and archaeologically contextualized. The themes and their respective papers are presented more thoroughly in the beginning of each section.

The Organizing Committee of the Nordic Bronze Age Symposium 2019 and the editors of this volume would like to express our

sincere gratitude to those who made the Symposium and this publication possible. Generous grants were received from Kungliga Humanistiska Vetenskaps-samfundet i Lund, and Fil dr. Uno Otterstedts fond för främjande av vetenskaplig undervisning och forskning.

Last, but not least, we thank the student volunteers from KNUT, the student association of the Department of Archaeology and Ancient History, who took responsibility for different tasks and provided a welcoming and productive atmosphere for all participants throughout the Symposium. Thank you!

The Editors:

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Andreas Svensson
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The Organizing Committee of NBAS 2019, Lund:

Jan Apel
Katarina Botwid
Fredrik Ekengren
Andreas Nilsson
Andreas Svensson
Anna Tornberg

References

Kristiansen, K. 2014. Towards a new paradigm. The third science revolution and its possible consequences in archaeology. *Current Swedish Archaeology* 22 (4): 11–71.

Nicklasson, P. 2018. *Från Stonehenge till Hagbards galge: om Sven Nilsson, bronsålder och fenicier*. Acta Archaeologica Lundensia, Series Prima In 4º. Lund: Lund University.

Subsistence, regionality, and networks

Andreas Svensson, Lund University
Anna Tornberg, Lund University

The research topics touching on subsistence, regionality, and networks can in many ways be viewed as the traditional backbone of research questions within the study of the Nordic Bronze Age. They form the core of our understanding of Bronze Age society and have been thoroughly discussed. Much focus has previously been given to the geographical area of southern Scandinavia. The articles presented within this section provide examples from both within and beyond this focus area. In that regard, they offer new perspectives and revitalize these essential aspects.

The articles were originally presented in three sessions: the history of archaeology session of "Traces of thoughts, traces of trowels", the session "Bronze Age hunting", and the session "Travel and exchange". Although with distinctly different frameworks, they all possessed the common theme of subsistence, regionality, and networks.

Martin Egelund Poulsen discusses the simultaneous tradition of the construction of the largest barrows and large and sturdy bole-walled longhouses in western, central and southern Jutland. He acknowledges that these timber-consuming houses were not built in forested areas; on the contrary, forested areas lack bole-walled houses. Egelund Poulsen discusses possible import of timber and a possible connection between the monumentality of the barrows and the large and sturdy contemporaneous houses in Jutland. This largely follows the argumentation by Holst *et al*. (2013). They argue that the construction of an estimated 50,000 barrows and 200,000 long houses on Jutland during the Early Bronze Age would have strong association with ritual and competitive motivations. The massive amount of resources needed for these monumental constructions would have been devastating for the regional ecology, and by extension, the economy.

Egelund Poulsen's article connects to classical Scandinavian Bronze Age geographical areas; however, it is evident that there is a substantial scholarly interest in broadening the geographical context of the Nordic Bronze Age. *Karin Ojala* provides a research historical review of the Mälardalen eastern contacts with Finland and Russia during the Nordic Bronze Age and how the interpretations of such contacts have changed from the late 19th century to the present day. Ojala describes how the Mälardalen area often has been addressed as peripheral in the broader Scandinavian context, a theme that is further accentuated in the article by *Magnus Ljunge* and *Joakim Wehlin*. Ljunge and Wehlin argue that, instead of relating the northern Scandinavian Bronze Age to the southern Scandinavian norm, it is relevant to discuss several contemporaneous Bronze Ages, based on the material culture of the northern area itself. Discussions of centre-periphery are nothing new in Nordic Bronze Age research, and there are several publications highlighting the heterogeneity in Nordic Bronze Age material culture and subsistence (e.g., Prescott, 1991; Skandfer & Wehlin, 2015).

Lastly, the article by *Dag Erik Færø Olsen* explores the role of Bronze Age hunting in south Norway. The area under study has been utilized for hunting throughout prehistory and Færø Olsen thus provides a review of hunting activity from the presence of typologically different projectile points in the broader chronological setting. He concludes

that bifacial arrowheads indicating Late Neolithic-Bronze Age hunting were in some areas a majority, but that, due to agricultural activity starting at approximately 2350 BCE, hunting was practiced in a reduced geographical area.

References

Holst, M. K., Rasmussen, M., Kristiansen, K. & Bech, J. H. 2013. Bronze Age 'herostrats': ritual, political, and domestic economies in Early Bronze Age Denmark. *Proceedings of the Prehistoric Society* 79: 265–296.

Prescott, C. 1991. Late Neolithic and Bronze Age developments on the periphery of southern Scandinavia. *Norwegian Archaeological Review* 24 (1): 35–48.

Skandfer, M. & Wehlin, J. 2015. The northern perspective 2000 BC–AD 1. In: *New perspectives on the Bronze Age: Proceedings of the 13th Nordic Bronze Age Symposium held in Gothenburg 9th to 13th June 2015*. (pp. 307–312). Bergerbrant, S. & Wessman, A. (Eds.). Oxford: Archaeopress Archaeology.

Outlining the study of Nordic Bronze Ages

Moving from singularity to diversity

Magnus O. Ljunge, Stockholm University
Joakim Wehlin, Uppsala University

Abstract

Research dealing with the Scandinavian Bronze Age period has often been related to the notion of a society organized around metal trade, both in terms of social organization and networks. The central area for this development has been located to the southernmost parts of Scandinavia. However, the rich southern material in the form of a combination of metals, monumental mounds and longhouses is not relatable to most other parts of the Nordic area. In this paper we outline a study of several co-existing Bronze Ages, with the purpose of understanding the distribution and chronology of the vast and varied archaeological record of the Nordic area without any reference to a central area in the south. We argue for the possibility of studying Bronze Age movements, contacts, networks, and social organization directly based on the archaeological material at hand, rather than in relation to the norm set by the southern Bronze Age paradigm. This enables possibilities of studying intersections of archaeological material that change in relation to both time and space.

Keywords: Bronze Ages, Chronology, Categorization, Movement, Contact

The concept of a homogenous Scandinavian Bronze Age society, characterized by a hierarchical social organization based on wealth related to bronze trade, has long served as a reference point for archaeological research on the subject. On the one hand, this Bronze Age singularity has been challenged from time to time by numerous studies dealing with variations in archaeological materials that do not seem to fit the frame (e.g., Anfinset & Wrigglesworth, 2012). On the other hand, the concept of one Bronze Age cultural sphere with continuity from the Early Bronze Age to the transition to the Iron Age is still actively articulated and maintained. To paraphrase: one Bronze Age to rule them all!

Essentially, the narrative of a homogenous Bronze Age (the Grand Bronze Age Narrative) relies on two foundations:

1) the notion of a cultural and social centre in southernmost Scandinavia and

2) a perspective of temporal development characterized by continuity rather than change.

The archaeological material of primarily Denmark, and to some degree south Sweden, has been defined as the centre of the Nordic Bronze Age. The vast number of monumental graves, bronze objects, longhouses as well as iconic finds such as the oak coffin graves or the Trundholm sun chariot stands out as something quite exceptional from a Nordic perspective. The archaeology of the south has defined the Bronze Age since the 19th century and the establishment of the three-period system. The categorization of a Bronze Age period relies heavily on the occurrence of metalwork, and specifically in relation to the southernmost part of Scandinavia where the number of finds is beyond compare with any other Nordic area. As a result of this, areas where bronze objects are absent (such as the northern inland areas of Sweden) are mostly

excluded from the discourse and categorized as an Arctic Bronze Age which is defined as areas inhabited by mobile hunter-gatherer groups with little or no connection to the southern sphere (see however Bolin, 1999; Prescott & Melheim, 2017; Oma, 2018; Ojala & Ojala, 2020).

The Grand Bronze Age Narrative upholds a normative function in the sense that the archaeology of the "centre" always works as a reference point for the level of Bronze Age-ness in whatever is studied. We are of course aware of the plurality of Nordic Bronze Age research and the many studies that have dealt with regional or thematic aspects of the period that do not necessarily relate to a homogenous Bronze Age narrative (cf. Victor, 2007; Wehlin, 2013; Ljunge, 2015; Ojala, 2016; Röst, 2016; Oma, 2018; Goldhahn, 2019). We can clearly detect a new movement in Bronze Age research in recent years, where researchers have presented studies that challenge the Grand Bronze Age Narrative to its foundations. Nevertheless, we would argue that the concept of a homogenous Bronze Age still has a profound effect on archaeological thinking of all aspects of Bronze Age society. One account of this is the consistent terminology used to describe archaeological materials that does not fit in, such as "variations" or "regionalizations". A telling example of this is how the vast concentrations of piles of fire-cracked stones in central Sweden are described as a regional ritual expression due to the absence of the phenomenon in southern Scandinavia (Victor, 2007). Another expression of the assumed Bronze Age (southern) homogeneity is the implicit assumption that bronze and metalwork are an essential ingredient when understanding both ritual, social and cultural traits of society.

In the following we will outline some basic starting points for a research approach to Nordic Bronze Age source materials beyond the concept of a single (southern) Bronze Age, and without any assumed relations between a centre and the periphery (cf. Skandfer & Wehlin, 2017). Our aim is mainly to explore directions away from notions of a Bronze Age singularity, in favour of an approach characterized by a more symmetrical perspective on relations between north and south, as well as between different archaeological source materials. We will give examples that show how the parameters of space and time change the conditions for understanding all aspects of Bronze Age societies, and we will argue in favour of a move from the concept of one Bronze Age to the study of how the Nordic area consisted of several co-existing Bronze Ages. Further, we do not wish to term Bronze Age differences as regionalizations, as this maintains the notion of a divergence from a general pattern. Neither is it our intention that a study of Bronze Ages should be limited to an understanding based on a spatial or chronological demarcation, for example in relation to a specific area. The study of Bronze Ages involves understandings of how contacts, exchanges and movement are an active part in creating both differences and similarities in northern Europe. This is certainly a development that changes over time.

First, we will briefly discuss some geographical features of the archaeological material in order to define patterns that could be understood in terms of Bronze Ages. We wish to acknowledge what is often termed as variation or regionalization as an essential starting point for the understanding of co-existing but diverse Bronze Age societies. We will then move on to the scale of time and discuss problems related to the three-period categorization, the Montelian division of the Bronze Age in six general periods, as well as the notion of a Bronze Age continuity. Finally, we aim to present how a move from a homogenous Bronze Age concept to that of several Bronze Ages could lead to new insights and understandings of large-scale north European networks and exchanges.

Nordic Bronze Ages

Traditionally, the study of the Nordic Bronze Age starts from the occurrence of bronze

objects and materials. Wherever these are found, the assumption is made of the existence of a society with a connection to a large-scale Bronze Age sphere. At a basic level, this is true. Bronze objects presuppose a connection, in a very general sense, to metal technologies, metal trade and a set of cultural and social values of bronze. Based on the vast archaeological material dated to the Bronze Age period, the connections between bronze and society seem to vary greatly. In some parts of the Nordic area, bronze objects are rare and few in number, while in other parts they occur more frequently.

Treating bronzes from a more non-hierarchical perspective makes them one ingredient among many others when compiling a picture of the archaeological record of different parts of the Nordic area. It then becomes apparent that archaeological materials dated to the Bronze Age period is composed differently dependent on both time and space, and that patterns are clustered both geographically and temporally. Similar observations have of course been made many times over the years by archaeologists dealing with the period (i.e., Arbman, 1938; Baudou, 1960; Bakka, 1976), but mainly with the purpose of identifying regional variations in connection with the idea of a Grand Bronze Age narrative.

In the following, we will present a short overview of the character of the archaeological record in different parts of the Nordic area. The purpose of this is to show how the essentialist Bronze Age narrative is an unsuitable starting point for understanding both the organization and chronological development of Bronze Age societies other than those found in the southernmost parts of Scandinavia. We will also point out that these identified clusters or Bronze Ages were part of wider contexts and networks that do not always follow the directions (from south to north) that are assumed within the Grand Bronze Age Narrative. It is however important to note that we do not wish to ascribe the Bronze Ages of the Nordic areas with distinct social identities, such as ethnicities. Rather this is an attempt to pinpoint how Bronze Age centres, networks, contacts and connections are visible in the archaeological material in different ways at different times and regions.

The Baltic

The Baltic proper region stretches from the Danish strait in the south-west to the sea around Åland in the north, excluding the Gulf of Finland and the Gulf of Riga. The idea of a Baltic Bronze Age was formulated early on in studies in relation to the similarities of the distribution and form of the archaeological material. In the first part of the 20th century, several researchers argued for connections between the Mälardalen area in central Sweden and the areas across the Baltic Sea thought to occur around 1100 BCE (Tallgren, 1916; Arbman, 1938; Nerman, 1954). During recent years, the eastern connection has been addressed again and researchers have argued that the central Scandinavian area should be studied as a clearly defined Bronze Age area not primary relatable to southernmost Scandinavia (cf. Thedéen, 2004; Victor, 2007; Lindström, 2011; Ojala, 2016). Furthermore, several researchers have directed attention towards the distinctive character of the archaeological Bronze Age material originating from areas around the Baltic Sea, especially in relation to the time period spanning 1000–200 BCE (e.g., Pydyn, 1999; Feldt, 2005; Sabatini, 2007; Eriksson, 2009; Wehlin, 2013; Runesson, 2014; Sperling, 2014).

Studies of ceramics found in both burial and domestic contexts show the occurrence of common traits in the western Baltic area during the Late Bronze Age period (Sabatini, 2007; Eriksson, 2009). Comparisons with the eastern material from primarily present-day Estonia confirms the notion of a commonly spread Baltic ceramic tradition (Sperling, 2014). In addition, studies of east Baltic bronze neck rings crafted in the workshops of hill-fort sites have revealed a similar pattern of distribution (Sperling & Luik, 2010; Sperling, 2014). Neck rings of Baltic type are quite common in the archaeological material

found on Gotland. Generally, Baltic metalwork has not been studied as part of an eastern network to any great extent during recent years. Earlier research has however pointed out several common Baltic traits of metal objects, for example represented in Bornholmian-type fibulae (Oldeberg, 1933) or socketed axes of Gotland type (Baudou, 1960) distributed on both sides of the Baltic Sea (Graudonis, 2001; Vasks & Vijups, 2004; Lang, 2007).

The large number of Bronze Age metal workshops located around Gulf of Riga and along the river systems of the eastern Baltic area deserve to be studied further in relation to the south-eastern and central parts of Sweden. The area most probably played a significant role in the trade and distribution of metalwork. It is also apparent that the social networks around the Baltic are maintained during the Early Iron Age, and that the occurrence of iron and iron technology in central Sweden is connected to the developments in the south-eastern Baltic area (Serning, 1979; Hjärthner-Holdar, 1993; Arnberg, 2007; Wehlin, 2013).

Anna Arnberg (2007) has shown that the earliest examples of Iron Age metal production on the island of Gotland are closely associated with ringforts. Several of the Gotlandic ringforts and enclosures were established before the beginning of the Iron Age, and this is a common trait all over the Baltic area (cf. Wehlin, 2013). Early Iron Age metal objects are distributed across the Baltic area in similar ways to bronze metalwork. An example is the so-called "swan-necked needles" that occur in burials on Gotland but are also found in the Lausitz area (Kwapiński & Kwapiński, 2007). These needles relate to monumental remains characteristic of the Baltic area, such as stone ship settings and boat-shaped stone cist graves. Joakim Wehlin (2013) argues that the stone ship settings should be understood in relation to the maritime networks that connect areas around the Baltic Proper region. In tandem with other widely spread features, such as mounds of fire-cracked stones and structures for farming activities, this points towards a certain consistency in the Baltic area. All these mediated, through shared and mutual interests and cultural values, a Baltic Bronze Age.

The island of Gotland is of special interest when trying to understand the development and characteristics of a Baltic Bronze Age. The work of Erik Nylén (1974, 1979) could be considered as an initial effort to address the importance of the Gotlandic material in relation to a wider Baltic context. Nylén's studies primarily focused on Early Iron Age materials, and actively sought to understand chronological development in relation to the Late Bronze Age period, especially in relation to grave materials where the chronological division between the Late Bronze Age and Early Iron Age seems almost impossible to distinguish in the remains. From a Baltic perspective, society seems to be characterized by continuity rather than change during what is generally described as a transition phase between periods. In an attempt to outline a research plan dealing with these issues, Nylén (1959) discusses the possibility of two co-existing Gotlandic Bronze Ages, one coastal-oriented and the other inland-based. Later research confirmed this pattern to some degree, but Wehlin (2013) argues that the Bronze Age material on Gotland should be understood in relation to a society deeply involved in maritime practices that maintained networks across the Baltic Sea. The nature of such networks and contacts, how they were shaped and how they changed over time needs further attention. To be able to do this, it is required that studies are directed at how regional variations are linked in an inter-regional framework.

An example of how to approach such an issue concerns the location of settlements on Gotland (cf. Nylén, 1959; Runesson, 2014). A recent attempt at understanding the Gotlandic Bronze Age settlement pattern is presented by Gunilla Runesson (2014). However, the study is an example of the problems that occur when comparing a distinctively characteristic archaeological material with an expectation based on the Grand Bronze Age Narrative. Runesson

concludes that the absence of longhouses on Gotland is explained by the fact that large scale rescue excavations do not take place on the island. Despite this conclusion, Runesson's study presents interesting results that clearly indicate settlement activity in the form of hearths, single postholes and possible hut remains (Runesson, 2014, pp. 39–58). The ambition to search for traces of Bronze Age activity associated with the norm of the Grand Bronze Age Narrative, such as longhouses, should be abandoned in favour of efforts more directed to the patterns and material at hand.

Compared with a southernmost contexts, the Gotlandic material could be regarded as fragmented traces of Bronze Age life-worlds. However, these traces could just as well express dwelling practices and movements through the landscape in patterns that should be understood on their own terms (cf. Björhem & Magnusson Staaf, 2006; Runesson, 2014, pp. 125–126). The regional character of the Gotlandic material is also apparent in the divided distribution of bronzes and stone monuments, such as ship settings and cairns, which are generally found in different parts of the landscape. This could indicate that the coastal areas of Gotland were of importance not only in relation to maritime practices, but also to notions of death and afterlife. It is possible that the society on Gotland had more of a mobile and seasonal character than the contemporary longhouse dwellers in southern Scandinavia (cf. Nylén, 1959, pp. 10–11).

Western Scandinavia

The Bronze Age of western Scandinavia is geographically defined in relation to the Norwegian coastline and the northern parts of the Swedish west coast. Areas located in the south- and central western parts of Scandinavia have to a large degree been incorporated in the Grand Bronze Age Narrative, based on the occurrence of vast concentrations of rock art found from Bohuslän in the south, and along the Norwegian coastline. Recently, rock art concentrations in Vestland and Møre og Romsdal in western Norway have been discussed as exchange points related to metal trade networks between Scandinavia and the Italian Alps (Melheim & Sand-Eriksen, 2020). As often is the case, the importance of bronze might be overestimated in this area considering that just over 800 bronzes dated to the period have been recovered from the entire area of present-day Norway, not even half the amount of the number of finds from southern Scania, Sweden (cf. Håkansson, 1985; Prescott, 2006).

The idea of rock art concentrations as areas characterized by movement and contact is however worth considering as a starting point for further understanding of the Bronze Ages of western Scandinavia. Rock art in large quantities is located either at the coastlines, or in inland areas alongside rivers or lakes. A large-scale pattern of the distribution of rock art from south-west Scandinavia and up along the Norwegian coastline indicates connections between the water-worlds of the open sea and inland rivers and lake areas (cf. Nimura *et al*., 2019). Archaeological remains within this area are characterized by a diversity greater than that of other Bronze Age regions During recent decades, this diversity has been highlighted by researchers working with the archaeology of present-day Norway (Skandfer 2012; Oma 2016, 2018). A number of changes related to movements, landscape use and social structure have been identified, starting somewhere around 1800 BCE, a time categorized as a transition period between the Late Neolithic and Early Bronze Age.

The Norwegian material indicates that traditionally categorized Early Bronze Age structures, such as monumental moumds, cairns and longhouse settlements, are clearly located near the southern and south-western coastline, but also in close relation to fjords, or rivers running down from the south-central highland areas (cf. Oma, 2016; Prøsch-Danielsen *et al*., 2020; Austvoll, 2021). During the later parts of the Bronze Age, the construction of monumental graves

generally ceases, just as it does in other Bronze Age areas, but the settlements close to the coastlines are continuously used up until the Late Iron Age (Oma, 2016, p. 14). There are also indications of intensified use of highland areas, most probably related to pastoral activities and hunting (Prescott & Melheim, 2017; Oma, 2018).

Studies of Norwegian Bronze Age materials could inspire us to think further on the relationships between different sets of Bronze Age landscapes and the relations formed by movement in-between them. A first step would be to abandon the notion of the coastal areas as centres of Bronze Age societies, and instead adopt a more symmetrical perspective on the importance of different landscapes. Clearly, the construction of monumental graves, the production of rock art and the settlement areas are part of a permanently lived spaces in the terms of Kristin Armstrong Oma (2016). However, these coastal areas are also located in a borderland between sea and land, as well as between the coastal plains and the forested and sub-alpine inland and highland areas. Based on the archaeological evidence, we cannot draw the conclusion that large-scale involvement in long-distance metal trade should be the basic premises for understanding the social structure of these societies over time.

We would instead point to the possibility of understanding the western Bronze Age as an area where social organization increasingly depends on the emergence of a distinctive pastoral farming society, a development traceable back to the Late Neolithic (Prescott & Melheim, 2017). A wide range of archaeological data, derived from both excavations and palaeobotanical sampling methods, shows an increasing "domestication" of upland areas in central southern Norway during the course of the Bronze Age. Apart from what has been interpreted as seasonal settlements, in the form of rock shelters or pit houses, an increased use of hunting pits could be noted from the early parts of the period (cf. Indrelid, 1994; Groseth, 1999). There are also indications that some lower parts of the highland areas were cleared of vegetation during the Late Bronze Age (Prøsch-Danielsen *et al*., 2020).

In light of recent developments in archaeological research dealing with the social organization of farming societies characterized by a high level of pastoral activities, it could be worth considering the great importance of inland landscapes in relation to the settlement concentrations located in coastal areas. Moving livestock to highland pasture would have been a practice that engaged many people and meant taking vast and varied landscapes into use. Studies in historical archaeology, and indeed ethnography, have shown that intense pastoral activities do not rule out formation of large-scale, territorially bound entities (cf. Prescott, 1995; Honeychurch, 2014). On the contrary, agro-pastoralist subsistence strategies which include the use of highland landscapes offer possibilities of keeping higher number of animals as well as taking advantage of other resources not accessible in agricultural landscapes (cf. Costello, 2020).

Addressing the western Scandinavian Bronze Age from more holistic perspective on the distribution of the archaeological materials over a larger area, spanning from the coast to inland highland areas, gives the opportunity to obtain a deeper understanding of the conditions for social organization, trade and movement. We believe that it would be fruitful to include the south-western areas of present-day Sweden in this framework. To date, efforts aimed at understanding the relation between the rock art concentrations in Bohuslän and the forested inlands and highlands to the north-east are practically non-existent.

To summarize, the west Scandinavian Bronze Age material challenge notions of centres and peripheries. The complex relationships created by movements between differently inhabited landscapes and lived spaces should be addressed without ordering sites and landscapes hierarchically. This does

not presume social equality or absence of elites. Rather it gives the opportunity to discuss the basis of both archaeological categorization and social organization in direct relation to the archaeological record.

Inland northern Scandinavia

The boreal inland area north of Dalälven is an under-studied region. During the mid-20th century, many rivers in the northern parts of Scandinavia were regulated by power plant dams. These construction projects were preceded by archaeological rescue excavations, the results of which challenged previous knowledge on northern prehistory. It became obvious that the traditional categorization of a culturally homogenous, and geographical demarcated Arctic Bronze Age did not apply to the variations apparent in the archaeological record (cf. Tallgren, 1937; Bakka, 1976). Objects dated to the period 2000 BCE to 1 CE, such as flint daggers, stone adzes, bronze spear-heads and axes, have clear connotations with southern parts of Scandinavia, but the differences in relation to the south are far more distinct. Studies of local and regional scope reveal great variations in the archaeological material (Prescott, 1993; Bolin, 1999; Holmblad, 2010; Amundsen, 2011; Sjöstrand, 2011; Bergsvik, 2012; Lavento, 2012; Skandfer, 2012; Wehlin & Lannerbro Norell, 2016), and concepts such as hybridization and creolization has been applied in order to capture interactions between hunter-gatherer groups and farming-herding societies (cf. Eriksson, 2009; Sjöstrand, 2011; Damm, 2012).

Some researchers have even questioned the relevance of the Bronze Age categorization in relation to parts of the northernmost material, due to the very small quantities of metal finds (e.g., Christiansson, 1963). Evert Baudou (1995) has suggested an alternative categorization of the northern region and has put forward the concept "Epineolithic" to describe the development in the northern inlands of a society with a Neolithic-like way of life even though the use of metals and metal working was known. Evert Baudou also uses the term "early metal age", which is commonly applied in relation to eastern areas such as present-day Finland and Russia (e.g., Jørgensen, 1986; Shumkin, 1990; Lavento, 2001).

It is obvious that the chronology established for the Nordic Bronze Age does not apply to the inlands of northern Scandinavia, and that any attempt to define a general chronological development of the vast northern area is not supported by the archaeological material. Per Ramqvist (2007) argues that the variations apparent in the northern material could be used to define five northern regions. Even though Ramqvist's division is used to define specific cultural spheres in a somewhat generalizing way, his work pinpoints the heterogenous character of the northern area (cf. Skandfer & Wehlin, 2017).

An interesting example of how to approach a northern material in relation to the Bronze Age time period could be illustrated in relation to the area just north of what is traditionally defined as the limit of the Nordic Bronze Age. This area consists of the central Scandinavian region north of Dalälven in Sweden and areas north of Lake Mjøsa in Hedmark, Norway (Amundsen, 2011). Only a small number of bronzes have been found in this area, but other remains are plentiful. Hunting pits are a common feature in the area, some of which are dated to the Late Bronze Age. Hearths and single postholes from the period are also distributed throughout the area. In terms of artefacts, large amounts of bifacial arrowheads in quartzite have been collected from all parts of the area.

Graves are also present in the form of small, round stone settings, dated to the 1st millennia BCE (Wehlin, 2017). Few of these stone settings have been excavated, and those that have been are often empty of artefacts or other kinds of archaeological material. It is not until the Early Iron Age that more extensive grave material is found in this area.

At this point a new category of grave fields emerge, so called lake- or hunting-ground

graves. The distribution of these grave fields is clearly connected to hunting-pit systems, and these features are most likely part of the development of a new social system, a social organization that most probably originated at the same time as the Bronze Ages in other parts of Scandinavia. Excavations of hunting-ground graves show a connection to hunting, and crafting of leather, horns, and bone materials, expressed by grave finds (Christensen, 1986; Zachrisson, 2014). However, finds traditionally related to farming, such as scissors and spindle whorls, are also a part of the grave assemblages. Osteological analysis shows similar results, with a mixture of deposited animal bones from both wild and domesticated animals (Wehlin, 2016).

The archaeological pattern that emerges during the Early Iron Age just north of what is traditionally characterized as a Nordic Bronze Age sphere is complemented by pollen analysis from the area. Such analyses have only been made in a limited amount, but they still show that around 2000 BCE changes occur in the use of landscapes, involving increased deforestation. Most likely, this development could be associated with efforts to clear woodlands to create pastures. Simultaneously, wooded highland areas seem to be exploited more intensively than earlier. Pollen samples show evidence of cultivation, and hunting pits along with finds of archaeological artefacts, show an increased presence in areas beyond the plain-lands. The cause of this development could have several explanations, but changes in hunting methods as well as an increased pastoralism were probably important factors (Wehlin & Lannerbro Norell, 2016; Wehlin, 2019).

Just as in other central Scandinavian areas, traces of settlements are hard to identify in this northern material. The area is rich in Stone Age settlement sites concentrated along major waterways. These sites are often categorized as Stone Age sites during surveys, mainly based on the occurrence of worked stone material. However, it is possible that many of these sites are of a much younger date even though absolute dates are few in number. The number of collected ^{14}C samples available decreases around 2000 BCE. This decrease could be related to the aim of trying to find the oldest possible dates on settlement sites with Stone Age character, thus the available samples makes it difficult to investigate any possible long-term use of sites. The definitions used when trying to identify settlements are often based on patterns in southern areas, with the aim of finding farming settlements. We argue for the importance of abandoning such comparisons, which are based on a strict division of farming societies and mobile hunter-gatherers. Instead, we encourage embracing the notion that societies just north of what is traditionally termed “the farming limit” operated within subsistence systems that involved both domestication and hunting. Seasonal settlements and movement could express both pastoral activities and hunting practices, just as studies of the Norwegian material have shown (Prescott, 1993; Mjaerum, 2012).

Applying a more nuanced perspective, rather than one based on strict categorizations of what constitutes a farmer or a hunter, allows an understanding of the hunting-pit systems as part of a domestication of the landscape (cf. Lindholm *et al*., 2013). Further, it becomes possible to re-evaluate the meaning of artefacts deposited in graves. Iron tools as part of grave assemblages haves traditionally been interpreted as representations of smith burials but could likewise be associated with horn or bone craftsmanship (cf. Hyenstrand, 1987). From such a viewpoint, it becomes possible to identify previously uninterpreted uses of objects, such as the function of the small iron edge tool often found in both graves and at settlements. The use of this type of tool has been discussed and recent suggestions categorize them as hide scrapers or plane irons (Zachrisson, 2014; Holm, 2016).

The above-presented example from an area traditionally categorized as a northern periphery of the Nordic Bronze Age world shows the possibility of formulating

questions based on later Iron Age material in relation to an earlier development, that has left a scarcer and more fragmented source material. By defining patterns based on the Early Iron Age material, it is possibly to move forward with efforts directed to this previously under-studied area.

Invisible areas

As we have shown so far, different Nordic regions are defined by variations in the archaeological material, variations that have the potential not only to define different Bronze Ages but also to challenge generalizations when placing oneself in the centre of the "variation". Up until this point, we have dealt with areas associated with a rich archaeological material that has been neglected in relation to the Grand Bronze Age Narrative, or alternatively defined as regionalizations. But what about the areas in-between, where archaeological evidence of Bronze Age activities is sparse or even lacking?

One interesting example of such an invisible area could be found between what we have defined as the Baltic and western Scandinavian Bronze Ages. The centre of this area would be the present-day Swedish county of Närke, an area with sparse occurrences of Bronze Age materials. During the early 20th century, when archaeological surveying was increasingly directed to the administrative borders of counties and parishes, the Närke area drew attention due to its seemingly strategic position between dense concentrations of Bronze Age materials to the east, west and south. Topographically, the area consists of plain-lands surrounded by forested highlands with the presence of a rich Neolithic Stone Age material, which presupposed notions of a continuity into the Bronze Age (Lindqvist, 1912).

The expectations of finding traces of Bronze Age populations in the Närke region were not fulfilled. Neither surveys nor excavations could reveal any Bronze Age material that, in terms of quantity, came close to neighbouring regions (Karlenby, 2003). A total of only just over 70 metal objects with Bronze Age origin have been found in the area, and 19 of these objects are part of one single deposit made in the Late Bronze Age time period in the north-eastern part of the county ("Hassleskatten") (Karlenby, 2003, p. 138). Other categories of remains traditionally used to identify a Bronze Age population, such as longhouses, rock art or cairns, are equally poor in numbers. No figurative rock art exists in the area, and only a few cairns and houses have been discovered. Recently a previously unknown mound of fire-cracked stones, accompanied by an animal grave, was identified and excavated (Balknäs, 2017), but this was indeed a rare occasion. When applying the features associated with the Grand Bronze Age Narrative, the Närke area seems to be a "blank space", in spite of the fact that remains that both predate and postdate the period occur in great quantities.

However, when turning to the data produced by rescue archaeology during the past 15 years, the notion of the invisible Bronze Age is challenged. Structures such as hearths, u-shaped grooves and cooking pits occur frequently, and often in clusters (cf. Knaby, 2003; Lagerstedt, 2008; Andersson, 2014; Klange, 2017). These results enrichen a Bronze Age material that requires new efforts to rethink archaeological categorizations of settlements and a social structure of sedentary households as the basis for pastoral farming. But it also pinpoints the profound impact of the Grand Bronze Age narrative on the interpretations and prioritization made by rescue archaeology. Structures, of the above character, are very seldom in focus and are therefore difficult to find in excavation rapports. Once again, the possibility of addressing the presence of other Bronze Ages is hampered by normative comparisons with the archaeology of southernmost Scandinavia.

Time

So far, we have pointed out how distinctive variations in archaeological materials enable

a study of the geography of several co-existing Bronze Ages. The observed distribution and character of the archaeological record throughout the central and northern parts of Scandinavia and the Baltic challenge the notion of the Grand Bronze Age Narrative. Comparisons with the source material of southernmost Scandinavian will not capture the organizations of these societies: they need to be studied based on their own conditions. But the development of Bronze Ages is not solely a geographical enterprise, it also needs to be related to temporal changes. Traditionally, the chronological definition of the Nordic Bronze Age spans 1700–500 BCE, a time period of just over one thousand years. Apart from the oldest periods of human prehistory, few other archaeological periods have been so unitarily communicated as the Nordic Bronze Age. Even though the time period is divided between an early and late phase, most clearly marked by substantial changes in burial customs, the core of social organization, ritual practices and cosmology, both subsistence and trade are defined in strong relation to Early Bronze Age materials. Rock art, as well as figurative images on bronzes, constitute an exception to the most important building blocks of the Grand Bronze Age Narrative. The visual culture, in terms of figurative images, seems to develop during the later parts of the period (cf. Ling, 2008; Ljunge, 2015). However, images in stone and bronze are often used to support ideas of widespread Bronze Age religious or cosmological notions and power structures. The idea of a Bronze Age is hence based on a selection of different materials that is far from representative for the developments that occur over time, and it needs to be challenged.

The great majority of researchers that have studied archaeological material originating from other parts of the Nordic area than present-day Denmark and south Sweden have proposed chronologies based on temporal changes independent of the general Bronze Age timescale. Observations of changes in material culture that do not fit the Bronze Age periodic time system is neither unusual nor are they surprising. The traditional Bronze Age chronology is still based on the typological work of Oscar Montelius (1885), undertaken almost 150 years ago. The six-period chronology is primarily based on the typology of bronze artefacts, a source material mainly representative of the southern parts of Scandinavia. North of present-day Scania, the quantities of bronze artefacts diminish rapidly (Oldeberg, 1974; Larsson, 1986). It is quite illustrating that 45% of all Early Bronze Age metalwork in present-day Sweden has been found in the southern parts of Scania (Larsson, 1986).

The problems associated with a general Bronze Age chronology based on metal artefacts are especially obvious in relation to the beginning and end of the period. When taking other archaeological material into account, it is almost impossible to make a clear distinction between the Late Neolithic and the Early Bronze Age, and between the Late Bronze Age and Early Iron Age. Chronologies can be defined in many various ways dependent on what material or phenomenon one chooses to focus on. Some aspects of society seem to be characterized by continuities beyond the Bronze Age categorization, while other features are changeable. Anders Högberg and Deborah Olausson (2005, pp. 97–98) have argued that not even the most southern materials show any traces of major change during the transition between the Late Neolithic and Early Bronze Age. Stone working and stone objects continued to be of importance throughout the Bronze Age. Features such as house types, animal husbandry, the crops used, ritual deposition practices and grave rituals are areas characterized by continuity rather than breaches at the points in time where we usually delineate the different time periods.

Studies of the Baltic area have produced similar results when addressing materials and features other than bronze objects, such as graves, pottery, landscape use and the introduction of iron technology. A change

seems to occur around 1000 BCE when most of the ship settings are built and cairns are replaced by fields of smaller stone settings. It is at this time the first examples of iron production occur and settlements seem to be relocated to areas where we later encounter Iron Age settlements. These changes are then followed by a continuity in the patterns and distribution of the archaeological material that lasts up until 200 BCE, which makes it difficult to separate the last Montelian period VI from the Early Iron Age (cf. Hansson, 1927; Nylén, 1972, 1979; Hjärthner-Holdar, 1993; Wehlin, 2013). To summarize: the chronological developments of the northern inland areas cannot be based on the Montelian categorization. Based on the patterns visible in the archaeological record, a change could be noted somewhere around 800 BCE, followed by a time of continuity that extends several centuries into the next millennium (cf. Baudou, 1995).

Movement and contact

So far, we have highlighted how the differences between archaeological Bronze Age materials are essentially related to the parameters of space and time. Our reason for making this point is related to the aim of abandoning the notion of a Nordic Bronze Age centre surrounded by peripheral areas, that to varying degrees meets the criteria for being part of the Grand Bronze Age Narrative. Instead of using such a model as a normative template for comparison, we argue that one should place oneself within the temporal and spatial contexts of various Bronze Ages as a starting point for discussing social relations (cf. Skandfer & Wehlin, 2017).

When placing oneself in a specific area at a specific time, the life-worlds of Bronze Age people become the starting point for defining areas of central importance. As shown above, it is obvious that different regions are characterized by substantial variations represented in the archaeological record. But there are also similarities. Visual culture in different media appears in most parts of the Nordic Bronze Age area, mortuary rites in the form of cremation and urn burials are a widespread phenomenon, as well as the Early Bronze Age practice of building monumental graves using earth or stone materials. Even though the quantities and concentrations of these remains vary, they occur frequently in many areas. The distribution of bronze is also evenly spread throughout large parts of the Nordic area, with the extraordinary exception of southernmost Scandinavia. The large quantities of bronze in this area should most probably be related to the Bronze Ages of present-day Germany, the Low Countries and central Europe, rather than be compared to the situation in the rest of the Nordic region (cf. Fokkens & Fontijn, 2013; Jockenhövel, 2013).

By making the point of different co-existing Nordic Bronze Ages we do not advocate a further study of demarcated regions. To reach understanding of the developments of different Nordic Bronze Ages, one must consider how and why such a development occurred within a larger geographical and temporal context. In relation to this, we consider the concept of regionalization as slightly problematic since it implies a variation in relation to a normative pattern. Neither should Bronze Age societies be studied in isolation. The occurrence of both differences and similarities in the Bronze Age material suggests contacts, movements, and widespread ideas over large parts of the Nordic Bronze Age world. A methodological starting point for addressing this could preferably be to identify thematic areas of investigation and the material culture that expresses surfaces of contact. Examples of such inquiries will be given later on in this paper.

Movement, and to some degree contact, have constituted an important area of study for Nordic Bronze Age researchers since the end of the 19th century (cf. Nilsson, 1875). The interest in movement has however with few exceptions been directed to metal trade, where the sources of copper in south-central Europe and the Mediterranean have led researchers to conclusions involving long-

distance travel and contacts between these areas and the Nordic Bronze Age. But as pointed out by Sørensen (2015), the focus on the origin and final deposition of metal objects has led to a neglect of the social relations, interactions, and movements of people in-between point A and point B. Instead, the interest in movement should be directed to the archaeological material at hand, and to the social interactions and contacts between the Bronze Ages of the Nordic area.

As we previously have pointed out, different Bronze Ages seem essentially characterized by movements on different scales. The archaeological material of the eastern and Baltic Bronze Age were formed through networks spanning the Baltic Sea, and the western Bronze Age must be understood through the movements between coastal and highland areas. However, widespread distribution of materials and similarities between structures such as houses and mounds also give evidence of intense contact between such areas.

Ships, hands, and inland water-worlds

Defining different Bronze Ages is a promising starting point for further studies of large-scale relations that are firmly grounded in the archaeological record and not necessarily related to either typological categorizations based on southernmost Bronze Age material, nor any general assumptions of chronological developments or social format. Our point is not to promote further studies of regionality, but rather to seek ways to understand the observed patterns and variations within a wider context. We wish to give some examples of thematic focus areas with the purpose of identifying and understanding the intersections between different Bronze Ages. A good example of addressing the relation between variations and widespread phenomena in order to identify such Bronze Age intersections could be the study of symbols and their use and transformations in relation to time, space and archaeological context. The ship is perhaps the most iconic symbol of the Bronze Age and has been discussed in terms of both real representations of actual boats and as a cosmological and religious concept. It is however clear that ship symbols are expressed in various forms and media in different Bronze Ages. Ships occur on rock art, as engravings on bronzes and in the form of stone monuments (e.g., Skoglund, 2009; Bradley *et al*., 2010; Wehlin, 2012, 2013). Traditionally the ship symbol has primarily been understood as a homogenous concept. By making spatial, temporal and material variations the starting point when addressing the meaning of ship symbolism, it becomes possible to discuss changes in use and meaning. Ships as rock art, on bronzes or as monuments may refer to a general aesthetics or format, but also represent great differences in relation to manufacturing and media, landscape distribution, and use.

Change in the format of ship symbols over time is interesting and has been acknowledged before, commonly as a means for relative dating (e.g., Ling, 2008). The changes and variation of ship symbols within specific regions could however be compared with each other. This could enable identification of the wider networks and contacts that frame the transition and negation of the meaning of ship symbolism. Ship settings in present-day Estonia and Latvia differ from the examples found on Åland and Bornholm, yet both types are present on Gotland. Ship symbolism on Gotland seems primarily to be expressed in monuments, but there are also a few examples of rock art ships and ships on bronzes. Interestingly, the rock art ships on Gotland have an expression, in terms of style, that is very similar to the rock art found in Uppland, a region where the relationship between images and monuments is reversed when compared with Gotland (Wehlin, 2013, p. 141).

It is also noticeable that when different types of ship symbols occur on the same site, they are clearly distinguished from one another. Rock art and ship settings are found in the

same area, but also distinctly separated from each other. Further, there are examples of contexts where ship symbolism is expressed in all three media, rock art, bronze objects and ship settings, within a very limited area, as at Hjortekrog located on the south-east coast of present-day Sweden (Hansson, 1936; Widholm, 1998). Even though the use of the ship as some kind of ritual or social format in a general sense occurs over a wide area, the use of this format also differs in relation to media, style and location. This could indicate different use and meanings of manifestations of ships.

Another example that could elucidate social relations, exchanges and contact between Bronze Ages through the varying use of symbols is the distribution of the so-called hand motifs. Bronze Age visual culture is often treated as an expression of common notions of the world, such as cosmologies or mythologies. Similarities in the choice of motifs and how they are combined have been highlighted at the expense of differences in the choice of media and the wider archaeological context. Taking both these conditions into consideration opens interesting possibilities for studying how the use of widespread symbols could differ between different Bronze Ages.

The hand motif in Bronze Age visual culture is one such example. Accentuated hands appearing on anthropomorphic figures occur on rock art mainly located in the western Bronze Age areas, such as Bohuslän, Østfold and up along the Norwegian coastline (Goldhahn, 2007). The hands on these rock art figures are often disproportionately large with outspread fingers, and there is a close relation between anthropomorphs showing their hands and boat images (Ljunge, in review). But the hand motif also occurs on stone slabs found in present-day Denmark, often in close relation to graves or cult houses (Goldhahn, 2005), and as engravings on the backs of bronze fibulae found in the Baltic area. In these contexts, the hand is depicted without any body but sometimes accompanied by horizontal lines over it. The hand symbol seems to have been in use during the later parts of the Bronze Age, regardless of context or media.

Here we find a Bronze Age phenomenon in the form of a symbol that is used in different manners in different areas, but still works with a strict pictorial format. Hands on bronzes and stone slabs are considerably fewer in number than rock art accentuated hand motifs, and they are also of a more concealed nature. Hands on rock art occur more frequently, are visually accessible and combined with another motifs. A possibility worth considering is that the hand motif is a symbol that is transmitted through contacts between southern, western, and eastern Bronze Ages and renegotiates within these areas in different ways. On rock art, the hands are clearly associated with specific anthropomorphic figures and often in compositions involving boat motifs. The Danish stone slabs and the bronze objects in eastern Sweden are more stylized and of a concealed and esoteric character. This could mean that the hand motif was a widespread symbol but also expressed different social practices in different areas, and hence expresses both large-scale contacts and specific meanings in relation to space and time (Ljunge, in review).

But the intersections between the varied Bronze Age materials goes beyond the use of symbols. Movement and contacts need to be related to the landscapes of the different Bronze Ages. Bronze Age research has often made clear distinctions between coastal and inland areas, especially during the recent maritime turn in parts of Bronze Age archaeology (e.g. Ling, 2008; Wehlin, 2013). The dualism between coast and inland could be challenged, and its relevance for understanding Bronze Age networks and social organization has already been questioned by the examples given from the western and Gotlandic Bronze Ages. It is obvious that the maritime perspective on these Bronze Age materials has been firmly focused on the relation between coastline and sea, and not so much in relation to the water-worlds of the inlands. If we however look at the inland material in Scandinavia, we find a

close relation to water in the form of lakes, rivers, and wetlands. A broader water-related perspective could be formulated in relation to these areas focusing on movement, settlement patterns and subsistence but also in relation to conceptualizations of landscape and life-worlds.

The oldest water-transport-related artefact found in Sweden is a c. 9000 years old paddle recovered close to Hedemora in southern Dalarna. But there are other, more extensive distribution patterns that could serve as a starting point for a discussion on maritime inland Bronze Ages. In Dalarna, the distribution of graves and cairns is clearly connected to water. Grave fields dated to the Early Iron Age, and possibly the Late Bronze Age, are generally categorized as lake grave fields and their close relation to water differs from later Iron Age graves that commonly are situated close to farms and fields (Wehlin & Lannerbro Norell, 2016; Wehlin, 2016, 2017). The same situation is apparent when looking at distributions of hunting-pit systems, that are both related to grave fields and follow waterways and wetlands. The combination of hunting pits and graves alongside waterways suggests that the close water connection has reasons other than purely practical ones. In other words, the divisions between subsistence, ritual practices, settlement patterns and world-view are of little use. The movement through these landscapes has left traces that suggest a close ontological relationship to water.

The importance of water in inland Bronze Age landscapes has been touched upon earlier with the examples from present-day Norway and the close connection between settlements, rock art and coast-located grave mounds. A similar pattern could be identified in the south-eastern parts of present-day Sweden and the Bronze Age archaeology in Östergötland county. The Bronze Age material recovered here is rich in number, with extensive traces of settlements, grave mound areas and large concentrations of rock art (cf. Nordén, 1926; Borna-Ahlkvist, 2002; Hauptman, 2002). However, the Bronze Age of Östergötland also differs from the Grand Bronze Age norm, especially in relation to the location of rock art. The rock art areas in Östergötland are situated far from the sea, but still clearly associated with water in the form of rivers, lakes, and wetlands.

The area is geographically structured by systems of lakes and rivers that are very suitable as travelling routes, which use is apparent in historical records from medieval times onwards. Interestingly, during the Late Bronze Age patterns of settlement already seem to be connected to waterways. An example is the enclosed settlement of Vistad, located in the vicinity of the waterways running out of the great lake of Vättern (Larsson, 1993; Larsson & Hulthén, 2004). The character of Vistad reminds us of the hill-forts used as metal workshops in the Baltic areas, discussed earlier, and contacts with southern Baltic areas have been suggested based on the character of the archaeological record recovered at the site. The landscape of Östergötland is yet another example of how a Bronze Age inland region could be understood from a maritime perspective in relation to different kinds of waters. The travelling routes, made up by the system of lakes and rivers, made contacts possible to the west, but also to the east. Wetlands were most probably a prominent feature of the areas in between the waterways and played a significant role as pasture as well as nourishment for symbolic notions and ritual practices. When considering the meaning of rock art in such a landscape, it is quite telling that the large rock art concentrations of Östergötland have been given very little attention in recent efforts to construct a Grand Bronze Age narrative. Their distribution and character simply do not fit into the picture, which is mainly based on the rock art of Bohuslän and to some degree Uppland. By instead incorporating the rock art panels into a wider archaeological picture of landscape use, social networks and settlement patterns, new light could be cast on the Bronze Age of south-eastern Sweden.

Moving from singularity to diversity

The Grand Bronze Age Narrative has served as a reference point for archaeological research on the subject ever since the three-period system was elaborated by Montelius into a six subperiod chronology divided into an early and late period. The Montelian chronology has proven its resilience over the years. It is far from an arbitrary construction of a prehistoric development; on the contrary, it captured tendencies of stylistic change in metal objects based on a much smaller empirical basis than is available today. Hence, it also laid the foundation for further studies of Bronze Age society.

The Montelian chronology did however also lay the foundation for studying many aspects of the time period based on the assumption that metal was of central importance. Hence, the southernmost parts of Scandinavia, where large quantities of bronze objects have been recovered (including unique finds such as the Trundholm sun wagon and the Balkåkra "drum"), was identified as a centre for Bronze Age society and culture. The Bronze Age of the southern part of Scandinavia has not been the issue of this paper. Our concern is the normative framework that still affects archaeological thinking in relation to other parts of the Nordic area, where the archaeological material is essentially different.

Applying a more symmetrical point of departure when valuing different kinds of source materials, makes it impossible to argue for the presence of a single Bronze Age, a singularity where social organization, trade, ritual life, cosmology, contacts, settlement patterns and so forth derive from the notion of a southern influence. By this, we do not mean to deny that metalwork, metal trade or the significance of bronze objects were of importance. But the importance of metal in relation to other parts of society varies greatly. Sometimes bronze seem to be of a marginal importance, at other times and places metal plays a more prominent part in several social practices.

A first key point when moving towards a diverse Bronze Age is to make the relation between archaeological patterns and the inhabited landscape the primary starting point. Again, we stress the importance of an initial non-hierarchical, symmetric approach to the archaeological record. A maritime perspective, as an example, does not necessarily need to be focused on coastal areas. The relation to water could be just as important in inland areas. The example given of the archaeology of central Scandinavian inland contexts clearly demonstrates that water systems made up by lakes and rivers were of essential importance. They are "entanglements between nature and culture", in the words of Matt Edgeworth (2011). They act as infrastructures, boundaries, reference points, and are also part of conceptualizations of the world. We have further pointed out that the maritime dimension of coastal regions could not be separated from inland areas. Our western Bronze Age example shows the importance of following the waters of rivers and fjords that connect inland and highland areas with coastal regions. Only then can the dynamics of landscape during the time period be understood.

Our second point is the need to challenge the basic categorizations set by the Grand Bronze Age Narrative of what upholds a Bronze Age society. Apart from the focus on metal, a very general definition of Bronze Age society in relation to the southern material consists of an agricultural subsistence, settlements primarily in longhouses, and a ritual life materialized and manifested in monumental graves and cult complexes. In addition to this one could add the strong focus on social networks directed south, and an ideology connected to notions of warfare and Indo-European cosmologies. These features have an unfortunate effect of defining areas further north as more or less peripheral and have the tendency to create notions of absences. The search for longhouses is an excellent example of how researchers, and archaeologists working with rescue excavation, are caught up in a categorization of settlement patterns solely based on reference to the southern material.

This also relates to an assumption of an agricultural society as permanently settled farmers, when there is in fact strong evidence from both archaeology and ethnography that agricultural subsistence could also involve a high degree of movement and seasonal settling. Another example is the explicit downplay of patterns as "regionalization". The vast numbers of mounds of burnt stone found in the eastern parts of central Sweden have many times been characterized as a regional expression of Bronze Age ritual life, instead of being treated as a central part of understanding the area as another kind of Bronze Age than that encountered in the south.

Finally, we wish to point out that the study of Bronze Ages naturally involves an understanding of network-based contacts, but not in any presumed direction. It is only by applying a more holistic approach to the archaeological material that movement, contacts and exchanges could be identified. Social interactions are also manifested on different levels, and changes over time. They occur within a landscape, for examples in the dialectic between coast and inland, but also between areas in different directions. By comparing patterns of distribution and the changes that occur over time it becomes possible to study the nature of such social interactions and identify areas of contact. This also highlights to the need to adopt a more flexible approach to chronological categorizations.

The purpose of this paper has been to challenge the notion of a homogenous Bronze Age society, unevenly spread out over the Nordic area with a distinct centre in the south. We have done this by highlighting the quite simple and obvious observation of the varying character of the archaeological patterns that are apparent in different parts of the Nordic area in relation to both time and space. The move from a single Bronze Age to a more diverse concept of Bronze Ages starts by abandoning the hierarchy of archaeological categorizations in reference to the southern material. By avoiding preconceived notions based on the frequency and nature of the southern Bronze Age material, the archaeological record could be understood on its own terms. This creates possibilities of thematic studies aimed at understanding the intersections between materials and people of different Bronze Ages.

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References

Amundsen, H. R. 2011. *Mot de store kulturtradisjonene: endringsprosesser fra tidligneolitikum til førromersk jernalder mellom Mjøsa og Femunden*. Ph.D. thesis, University of Oslo.

Andersson, F. 2014. *Förhistoriska fynd vid Runnaby. Arkeologisk utredning. Eker 14:161, 14:178, 14:179. 14:180, Örebro socken och kommun, Närke, Örebro län*. Uppsala: SAU.

Anfinset, N. & Wrigglesworth, M. (eds.). 2012. *Local societies in Bronze Age northern Europe*. Sheffield: Equinox.

Arbman, H. 1938. Mälardalen som kulturcentrum under yngsta bronsåldern. In: *Winther-festskrift* (pp. 83–108). Nordling-Christiansen, H. & Globe, P. V. (eds.). Copenhagen: Ejnar Munksgaard.

Arnberg, A. 2007. *Där människor, handling och tid möts: en studie av det förromerska landskapet på Gotland*. Stockholm: Stockholm University.

Austvoll, K. I. 2021. *Seaways to complexity: a study of sociopolitical organisation along the coast of northwestern Scandinavia in the Late Neolithic and Early Bronze Age*. Sheffield: Equinox.

Bakka, E. 1976. *Arktisk og nordisk i bronsealderen i Nordskandinavia. Nordic and Arctic in the Bronze Age of northern Scandinavia*. Miscellanea 25. Trondheim: Det Kongelige norske videnskabers selskab.

Balknäs, N. 2017. *Boplatslämningar i Ekeby. Ekeby Prästgård 1:7, Ekeby socken, Kumla kommun, Närke. Arkeologisk utredning etapp 1 och 2*. Örebro: Arkeologigruppen.

Baudou, E. 1960. *Die regionale und chronologische Einteilung der jüngeren Bronzezeit im Nordischen Kreis*. Stockholm: Stockholm University.

Baudou, E. 1995. *Norrlands forntid—ett historiskt perspektiv.* Kungl. Skytteanska samfundets handlingar 45. Bjästa: CEWE-förlaget.

Bergsvik, K. A. 2012. The last hunter-fishers of western Norway. In: *Becoming European. The transition of the third millennium northern and western Europe* (pp. 100–114). Prescott, C. & Glørstad, H. (eds.). Oxford and Oakville: Oxbow Books.

Björhem, N., & Magnusson Staaf, B. 2006. *Långhuslandskapet: en studie av bebyggelse och samhälle från stenålder till järnålder*. Malmö: Malmö kulturmiljö.

Bolin, H. 1999. *Kulturlandskapets korsvägar: mellersta Norrland under de två sista årtusendena f. Kr*. Stockholm: Stockholm University.

Borna-Ahlkvist, H. 2002. *Hällristarnas hem: gårdsbebyggelse och struktur i Pryssgården under bronsålder*. Lund: Lund University.

Bradley, R., Skoglund, P. & Wehlin, J. 2010. Imaginary vessels in the Late Bronze Age of Gotland and south Scandinavia: ship settings, rock carvings and decorated metalwork. *Current Swedish Archaeology* 18: 79–103.

Christensen, A. E. 1986. Reinjeger og kammaker, en forhistorisk yrkeskombinasjon? *Viking* 49: 113–133.

Christiansson, H. 1963. Norrland och Sydskandinavien: arkeologiska frågeställningar och problemlösningar under ett sekel. *Tor* (Uppsala) 1963 (9): 9–46.

Costello, E. 2020. *Transhumance and the making of Ireland's uplands (1550–1900).* Woodbridge, Suffolk: Boydell Press.

Damm, C. 2012. Approaching a complex past: entangled collective identities. In: *Local societies in Bronze Age northern Europe* (pp. 13–30). Anfinset, N. & Wrigglesworth, M. (eds.). Sheffield: Equinox.

Edgeworth, M. 2011. *Fluid pasts: archaeology of flow*. London: Bristol Classical.

Eriksson, T. 2009. *Kärl och social gestik: keramik i Mälardalen 1500 BC–400 AD*. Uppsala: Uppsala University.

Feldt, B. 2005. *Synliga och osynliga gränser: förändringar i gravritualen under yngre bronsålder—förromersk järnålder i Södermanland*. Stockholm: Stockholm University.

Fokkens, H. & Fontijn, D. 2013. The Bronze Age in the Low Countries. In: *The Oxford handbook of the European Bronze Age* (pp. 550–570). Harding, A. F. & Fokkens, H. (eds.). Oxford: Oxford University Press.

Goldhahn, J. 2005. *Från Sagaholm till Bredarör—hällbildsstudier 2000-2004.* Gothenburg: Gotarc Serie C, Arkeologiska skrifter 62.

Goldhahn, J. 2007. *Dödens hand: en essä om brons- och hällsmed*. Institutionen för arkeologi och antikens kultur, Gothenburg: Gothenburg University.

Goldhahn, J. 2019. *Birds in the Bronze Age. A north European perspective.* Cambridge: Cambridge University Press.

Graudonis, J. J. 2001. Agro Metālu periods. In: *Latvijas senākā vēsture, 9. g. t. pr. Kr.-1200. g.* (pp. 116–185). Mugurēvičs, Ē. & Vasks, A. (eds.). Riga: Latvijas vēstures institūta apgāds.

Groseth, L. 1999. *Å finne sted. Økonomiske og rituelle landskap i Telemark i senneolitikum og bronsealder*. Hovedfagsoppgave, IAKN, Det historisk-filosofiske fakultet, Universitetet i Oslo.

Håkansson, I. 1985. *Skånes gravfynd från äldre bronsålder som källa till studiet av social struktur.* Bonn: Habelt.

Hansson, H. 1927. *Gotlands Bronsålder*. Stockholm: Kungl. Vitt. Hist. Och Antikvitets Akademiens handl. 37:1.

Hansson, H. 1936. Några nya bronsåldersgravar. *Fornvännen* 31: 327–343.

Hauptman, K. 2002. *Bilder av betydelse: hällristningar och bronsålderslandskap i nordöstra Östergötland.* Stockholm: Stockholm University.

Hjärthner-Holdar, E. 1993. *Järnets och järnmetallurgins introduktion i Sverige*. Uppsala: Uppsala University.

Högberg, A. & Olausson, D. S. 2005. Flinta under yngre bronsåldern—några tankar om nu och då. In: *Mellan sten och järn. D. 1* (pp. 97–122). Goldhahn, J. (ed.). Gothenburg: Institutionen för arkeologi, Gothenburg University.

Holm, O. 2016. Hyveljärn eller samisk skinnskrapa? Ett gåtfullt eggverktyg från järnåldern. *Arkeologi i norr* 15: *63–89.*

Holmblad, P. 2010. *Coastal communities on the move. House and polity interaction in southern Ostrobothnia 1500 BC–AD 1*. Umeå: Umeå University.

Honeychurch, W. 2014. Alternative complexities: the archaeology of pastoral nomadic states. *Journal of Archaeological Research* 22: 277–326. DOI: 10.1007/s10814-014-9073-9

Hyenstrand, Å. 1987. Forntid i gränsland. In: *Lima och Transtrand. Ur två socknars historia. 2* (pp. 109–166). Björklund, S. (ed.). Malung.

Indrelid, S. 1994. *Fangstfolk og bønder i fjellet: bidrag til Hardangerviddas førhistorie 8500–2500 år før nåtid*. 2. uppl Oslo: Universitetets oldsaksamling.

Jockenhövel, A. 2013. Germany in the Bronze Age. In: *The Oxford handbook of the European Bronze Age* (pp. 723–745). Harding, A. F. & Fokkens, H. (eds.). Oxford: Oxford University Press.

Jørgensen, R. 1986. The Early Metal Age in Nordland and Troms. *Acta Borealia* 3 (2): 61–84.

Karlenby, L. 2003. Till frågan om Närkes bronsålder. Ett försök till definition. In: *Mittens rike. Arkeologiska berättelser från Närke* (pp. 133–156). Karlenby, L. (ed.). Stockholm: Riksantikvarieämbetets förlag.

Klange, J. 2017. *Lämningar från tidigneolitikum till 1800-tal i kvarteret Diakonen*. Arkeologisk förundersökning och undersökning inom fornlämningen Kumla 2006, Kumla socken och kommun, Örebro län, Närke. Rapporter från Arkeologikonsult 2017:2934. Upplands Väsby: Arkeologikonsult

Knaby, E. 2003. *Bönder vid Backalunda: Från stenålder till historisk tid. Del 1*. UV Bergslagen, arkeologisk förundersökning och särskild arkeologisk bearbetning. Örebro: Riksantikvarieämbetet, Avd för arkeologiska undersökningar.

Kwapiński, M. & Kwapiński, A. 2007. *Korpus kanop pomorskich. Czeşc 2, Polska Środkowa i Poludniowo-Zachodnia.* Gdansk: Muzeum Archeologiczne w Gdansku.

Lagerstedt, A. (ed.). 2008. *På väg genom Närke: ett landskap genom historien*. Särskilda arkeologiska undersökningar Hidinge 105:1, Vintrosa 69:1, 85:1 och 92:1 och Vintrosa 96:1 och 63:1, Närke. Rapporter från Arkeologikonsult 2008:2025. Upplands Väsby: Arkeologikonsult.

Lang, V. (2007). *The Bronze and Early Iron Ages in Estonia.* Tartu: Tartu University Press.

Larsson, T. B. 1986. *The Bronze Age metalwork in southern Sweden: aspects of social and spatial organization 1800–500 B.C.* Umeå: Umeå University.

Larsson, T. B. 1993. *Vistad. Kring en befäst gård i Östergötland och östersjökontakter under yngre bronsålder.* Studia Archaeologica Universitatis Umensis 4. Umeå: Arkeologiska institutionen, Umeå University.

Larsson, T. B. & Hulthén, B. 2004. *Vistad '88 revisited: ceramological analyses and Lusatian connections.* Umeå: Umea University, Department of Archaeology and Sami Studies.

Lavento, M. 2001. *Textile ceramics in Finland and on the Karelian Isthmus: nine variations and fugue on a theme of C. F. Meinander.* Helsingfors: Helsingfors University.

Lavento, M. 2012. Cultural reproduction from Late Stone Age to Early Metal Age—a short discussion of the cultures in Finland, the northern part of Fennoscandia and Karelia, 3200 cal. BC to 1500 cal. BC. In: *Becoming European. The transition of the third millennium northern and western Europe* (pp. 144–155). Prescott, C. & Glørstad, H. (eds.). Oxford and Oakville: Oxbow Books.

Lindholm, K.-J., Sandström, E. & Ekman, A.-K. 2013. The archaeology of the commons. *Journal of Archaeology and Ancient History* 10: 2–49.

Lindqvist, S. 1912. *Från Nerikes sten- och bronsålder*. Örebro: Meddelanden från föreningen Örebro Läns museum.

Lindström, J. 2011. Norra Mälardalen under bronsåldern. En landskapsarkeologisk analys. In: *Nibble—en bronsåldersmiljö i Uppland* (pp. 511–552). Artursson, M., Karlenby, L. & Larsson, F. (eds.). UV Rapport 2011:111. Riksantikvarieämbetet: Riksantikvarieämbetets arkeologiska uppdragsverksamhet.

Ling, J. 2008. *Elevated rock art: towards a maritime understanding of Bronze Age rock art in northern Bohuslän, Sweden*. Gothenburg: Gothenburg University.

Ljunge, M. 2015. *Bortom avbilden. Sydskandinaviska hällbilders materialitet*. Stockholm: Stockholm University.

Ljunge, M. in review. Hand people. Rock art, contacts, and the Bronze Ages of south and central Scandinavia. *Norwegian Archaeological Review*.

Melheim, L. & A. Sand-Eriksen 2020. Rock art and trade networks: from Scandinavia to the Italian Alps. *Open Archaeology* 6 (1): 81–106. DOI: https://doi.org/10.1515/opar-2020-0101

Mjaerum, A. 2012. The bifacial arrowheads in southeast Norway: a chronological study. *Acta Archaeologica* 83 (1): 105–143.

Montelius, O. 1885. *Om tidsbestämning inom bronsåldern med särskildt afseende på Skandinavien.* Stockholm: Kongl. Vitterhets-, historie- och antiqvitetsakademien.

Nerman, B. 1954. Yngre bronsåldern—En första svensk vikingatid. *Fornvännen* 49: 257–285.

Nilsson, S. 1875. Spår efter Feniciska kolonier i Skandinavien. *Svenska fornminnesföreningens tidskrift* no 7: 1-47.

Nimura, C., Skoglund, P. & Bradley, R. 2019. Navigating inland: Bronze Age watercraft and the lakes of southern Sweden. *European Journal of Archaeology* 23: 186–206.

Nordén, A. 1926. *Östergötlands bronsålder: beskrivande förteckning med avbildningar av lösa fynd i offentliga och enskilda samlingar, kända gravar samt hällristningar*. Linköping: Carlssons bokhandel.

Nylén, E. 1959. Gotlands murade rösen och bronsålderns fjärrhandel. *Gotländskt Arkiv*, 9–34.

Nylén, E. 1972. *Mellan brons- och järnålder: ett rikt gravfynd och dess datering med konventionell metod och C14*. Stockholm: Almqvist & Wiksell.

Nylén, E. 1974. Bronze, Eisen und Gesellschaft. Eine soziale Umwälzung mit wirtchaftlichem Hintergrund zwischen Bronze- und Eisenzeit im nordischen Raum? *Die Kunde. Mitteilungen des Niedersächsischen Landesvereins für Urgeschichte* 25: 103–110.

Nylén, E. 1979. Goterna, Gotland och Gutasagan. In: *Arkeologi på Gotland* (pp. 181–186). Falck, W. (ed.). Visby: Gotlandica 14.

Ojala, K. 2016. *I bronsålderns gränsland: Uppland och frågan om östliga kontakter*. Ph.D. Thesis. Uppsala: Uppsala University.

Ojala, K. & Ojala, C.-G. 2020. Northern connections: interregional contacts in Bronze Age northern and middle Sweden. *Open Archaeology* 6 (1): 151–171. DOI: https://doi.org/10.1515/opar-2020-0104

Oldeberg, A. 1933. *Det nordiska bronsåldersspännets historia: med särskild hänsyn till dess gjuttekniska utformning i Sverige*. Uppsala: Uppsala University.

Oldeberg, A. 1974. *Die ältere Metallzeit in Schweden*. 1. Stockholm: Kungl. Vitterhets-, historie- och antikvitetsakad.

Oma, K. A. 2016. Long time—long house. In: *The agrarian life of the north 2000 BC–AD 1000. Studies in rural settlement and farming in Norway* (pp. 11–26). Iversen, F. & Peterson, H. (eds.). Kristianstad: Portal.

Oma, K. A. 2018. *The sheep people: the ontology of making lives, building homes and forging herds in Early Bronze Age Norway*. Sheffield: Equinox.

Prescott, C. 1993. *From Stone Age to Iron Age: a study from Sogn, western Norway*. Bergen: University of Bergen.

Prescott, C. 1995. Aspects of early pastoralism in Sogn, Norway. *Acta Archaeologica* 66: 163–190.

Prescott, C. 2006. Copper production in Bronze Age Norway? In: *Historien i forhistorien: festskrift til Einar Østmo på 60-års dagen* (pp. 183–190). Glørstad, H., Skar, B., Skre, D.-F. & Kaul, F. (eds.). Oslo: Kulturhistorisk Museum, Oslo University.

Prescott, C. & Melheim, L. 2017. Textiles from the peripheries? Upland evidence from Norway. In: *New perspectives on the Bronze Age. Proceedings of the 13th Nordic Bronze Age Symposium held in Gothenburg 9th to 13th June 2015* (pp. 313–325). Bergerbrant, S. & Wessman, A. (eds.). Oxford: Archaeopress.

Prøsch-Danielsen, L., Prescott, C. & Fredh, E. D. 2020. Land cover and exploitation of upland resources on the Høg-Jaeren plateau, southwestern Norway, over the last 6500 years. *Journal of Archaeological Science Reports* 32: 1–18. DOI: https://10.1016/j.jasrep.2020.102443

Pydyn, A. 1999. *Exchange and cultural interaction: a study of long-distance trade and cross-cultural contacts in the Late Bronze Age and Early Iron Age in central and eastern Europe*. Oxford: Archaeopress.

Ramqvist, P. 2007. Fem Norrland. Om norrländska regioner och deras interaktion. *Arkeologi i norr* 10: 153–180.

Röst, A. 2016. *Fragmenterade platser, ting och människor: stenkonstruktioner och depositioner på två gravfältslokaler i Södermanland ca 1000–300 f. Kr*. Stockholm: Stockholm University.

Runesson, G. 2014. *Bronsålderns bosättningsområden och boplatser på Gotland: många syns inte men finns ändå*. Stockholm: Stockholm University.

Sabatini, S. 2007. *House urns: study of a Late Bronze Age trans-cultural phenomenon*. Gothenburg: Gothenburg University.

Serning, I. 1979. Grop-schaktugnen från Hallfrede i Follingbo. In: *Arkeologi på Gotland* (pp. 173–178). Falck, W. (ed.). Visby: Gotlandica 14.

Shumkin, V. 1990. On the ethnogenesis of the Sami: an archaeological view. *Acta Borealia* 7 (2): 3–20.

Sjöstrand, Y. 2011. *Med älgen i huvudrollen: om fångstgropar, hällbilder och skärvstensvallar i mellersta Norrland*. Stockholm: Stockholm University.

Skandfer, M. 2012. Technology talks: material diversity and change in northern Norway 3000–1000 BC. In: *Becoming European. The transition of the third millennium northern and western Europe* (pp. 128–143). Prescott, C. & Glørstad, H. (eds.). Oxford and Oakville: Oxbow Books.

Skandfer, M. & Wehlin, J. 2017. The northern perspective 2000 BC–AD 1. In: *New perspectives on the Bronze Age. Proceedings of the 13th Nordic Bronze Age Symposium held in Gothenburg 9th to 13th June 2015* (pp. 307–312). Bergerbrant, S. & Wessman, A. (eds.). Oxford: Archaeopress.

Skoglund, P. 2009. Beyond chiefs and networks: corporate strategies in Bronze Age Scandinavia. *Journal of Social Archaeology* 9 (2): 200–219. DOI: https:// 0.1177/1469605309104136

Sørensen, T. F. 2015. Meaningless movements: a critique of the Bronze Age mobilities paradigm. In: *Forging identities: the mobility of culture in Bronze Age Europe: report from a Marie Curie project 2009–2012 with concluding conference at Aarhus University, Moesgaard 2012* (pp. 157–164). Suchowska-Ducke, P., Reiter, S. S. & Vandkilde, H. (eds.). Oxford: BAR International Series, 2771.

Sperling, U. 2014. Aspekte des Wandels in der Bronzezeit im Ostbaltikum. Die Siedlungen der Asva-Gruppe in Estland. *Estonian Journal of Archaeology* 18/2S, Supplement Series. Tallinn: Estonian Academy Publishers.

Sperling, U. & Luik, H. 2010. Arrowheads, palisades and an attack scenario. Ridala Bronze Age hill-fort revisited. In: *At the origins of the culture of the Balts: dedicated to the 60th birthday of Prof. Habil. Dr Algirdas Girininkas* (pp. 140–142). Bliujienė, A. (ed.). Klaipėda: Klaipėda University, Institute of Baltic Sea Region, History and Archaeology.

Tallgren, A. M. 1916. Sveriges förbindelser med Ryssland under bronsåldern. *Finsk Tidskrift* 80: 362–374.

Tallgren, A. M. 1937. The Arctic Bronze Age in Europe. *Eurasia Septentrionalis Antiqua* XI. Helsingfors.

Thedéen, S. 2004. *Gränser i livet—gränser i landskapet: generationsrelationer och rituella praktiker i södermanländska bronsålderslandskap*. Stockholm: Stockholm University.

Vasks, A. & Vijups, A. 2004. *Staldzenes bronzas laikmeta deposits* (Staldzene Bronze Age Hoard). Riga: Fobo Prints.

Victor, H. 2007. Skärvstensbruk och skärvstenskult: ett uttryck för regionalitet och kosmologi. In: *Att nå den andra sidan: om begravning och ritual i Uppland* (pp. 235–254). Notelid, M. (ed.). Uppsala: Riksantikvarieämbetet.

Wehlin, J. 2012. Vid stenskeppets akter En nyfunnen dubbelgrav från Gotland. In: *Forntid längs ostkusten 3—Blankaholmsseminariet år 2011* (pp. 175–199). Alexandersson, K., Dahlin, M., Palm, V. & Papmehl-Dufay, L. (eds.). Visby: Books on Demand.

Wehlin, J. 2013. *Östersjöns skeppssättningar*. *Monument och mötesplatser under yngre bronsålder*. GOTARC Serie B. Gothenburg Archaeological Theses 59. Ph.D. Thesis. Gothenburg: Gothenburg University.

Wehlin, J. 2016. Fångstmarkens folk. In: *Arkeologi i Dalarna* (pp. 218–249). Carlsson, E. (ed.). Falun: Dalarnas fornminnes- och hembygdsförbund i samarbete med Dalarnas museum.

Wehlin, J. 2017. Gravar och identitet i bronsålderns periferi. *Arkeologi i Norr* 16: 55–85.

Wehlin, J. 2019. Fäbodarnas förhistoria. In: *Fäbodlandskap och vallmusik. Dalarna 2019* (pp. 16–27). Tiderman-Österberg, J. & Thorell, E. (eds.) Falun: Dalarnas fornminnes- och hembygdsförbund i samarbete med Dalarnas museum.

Wehlin, J. & Lannerbro Norell, M. 2016. Gravrösen och den första metallen. In: *Arkeologi i Dalarna* (pp. 176–211). Carlsson, E. (ed.). Falun: Dalarnas fornminnes- och hembygdsförbund i samarbete med Dalarnas museum.

Widholm, D. 1998. *Rösen, ristningar och riter*. Lund: Lund University.

Zachrisson, I. 2014. Okänd och misskänd—skinnskrapan R. 416. Ombytta könsroller i Mellanskandinaviens yngre järnålder. *Arkeologi i norr* 14: 41–66.

Evidence of changing hunting practices in the south Norwegian highlands in the Late Neolithic/Early Bronze Age

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Abstract

This paper will explore hunting as an economic factor by comparing activity from the Late Neolithic/Early Bronze Age (LN/EBA) ca. 2350–1500 BC with the previous Early Neolithic/Middle Neolithic (EN/MN) periods, ca. 4000–2350 BC. Situated in south Norway, the mountain areas of Hardangervidda and the adjacent Nordfjella serve as the study area with evidence of reindeer hunting from the Early Mesolithic to present day. An important question is whether the utilization of the mountain areas fluctuated during the Neolithic and Early Bronze Age, and if so, why? Did the importance of hunting as an economic factor change after the transition to a more farm-based society in the LN/EBA? Was there an increase or decrease in the exploitation of mountainous resources? Through a diachronic analysis of settlement sites, these questions will be addressed to explore the role of hunting as part of the economy of agriculturally based societies in south Norway.

Keywords: Neolithic, Bronze Age, mountain, hunting, agriculture

The mountain areas of south Norway have a long history of human exploration with activity from the Early Mesolithic up to the present day (Indrelid, 1994; Loftsgarden, 2017; Olsen, D. E. F., 2020; 2022). This paper focuses on Hardangervidda, Europe's largest high mountain plateau, and the Nordfjella mountains to the north (Fig. 1). This area is part of a continuous mountain range called *Langfjella* ("the Long Mountains") which separates the western and eastern parts of Norway. Due to harsh climate conditions, there were never permanent year-round settlements in the high mountains. The geographical layout ensured that people from both regions visited these mountain areas for hunting reindeer and perhaps also for social interaction (Olsen, A. B., 1992; Bergsvik, 2006; Solheim, 2012; Nyland, 2016; Olsen, D. E. F., 2020; cf. also Loftsgarden, 2017 for discussions of activity in the Viking Age). Activity by various groups with different social traditions is reflected in the variation in the material culture found at the settlement sites.

Technological traditions in particular are suitable for identifying and distinguishing different regional groups, and therefore Hardangervidda and Nordfjella is an appropriate area for studying changing hunting traditions in a regional perspective.

The Mesolithic-Neolithic transition and the introduction of agriculture in south Norway seemingly took another form and process than that in southern Scandinavia, as in south Norway no longhouses or megaliths have yet been recorded, and there are few indicators of agricultural practice in general (e.g., Solheim, 2012; Reitan, 2016; Reitan *et al*., 2018; Prescott, 2020; Nielsen, 2021; Solheim, 2021). There is however a marked presence of technological and cultural traits that can be linked to different pan-regional

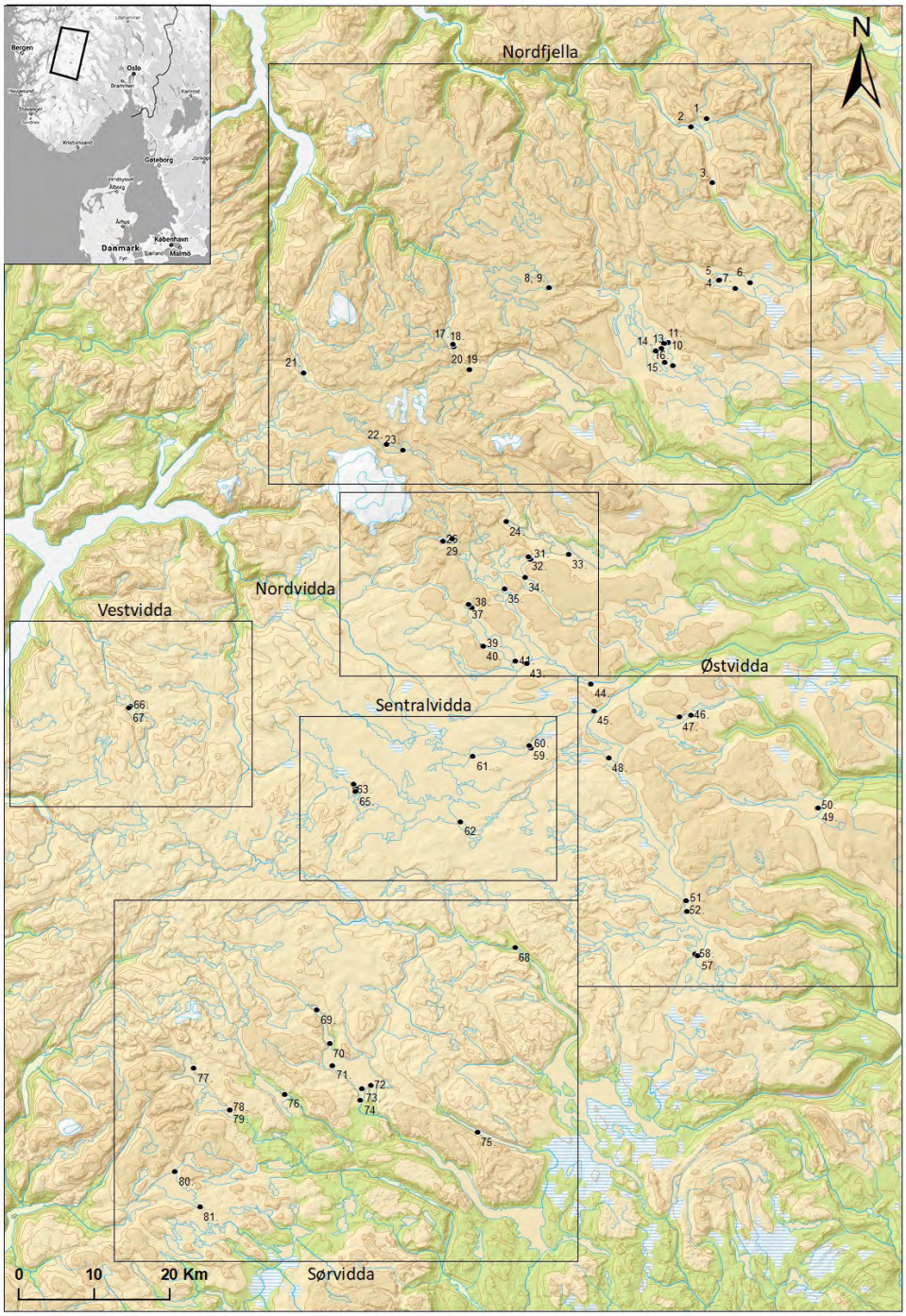

Figure 1. Map over the study area with sub regions and investigated sites.

networks in the Early and Middle Neolithic (EN/MN), such as the Funnel Beaker Culture (TRB), Pitted Ware Culture (PWC) and Battle Axe Culture (BAC). This points to active networks connecting, to varying degrees, different social groups in south Norway to south Scandinavia (Glørstad, 2010; Nielsen *et al.*, 2019; Bergsvik *et al.*, 2020). Agriculture did not become a transformative economic and social factor until the transition to the Late Neolithic (ca. 2350 BC) influenced by the Bell Beaker Culture (BBC) and its variants (e.g., Hjelle *et al.*, 2006; Olsen, A. B., 2009; Prescott & Glørstad, 2015, Solheim, 2021). During the Late Neolithic and Early Bronze Age a farm-based society was established, and an interesting question is to what degree did this societal change influence hunting as an economic factor?

This paper presents some results of a research project that had the utilization of mountain areas during the neolithization (ca. 4000–1500 BC.) as an overall theme (Olsen, D. E. F., 2020). Two main topics served as research focus: the importance of hunting, and regional variation in material culture. Data from 81 existing archaeological mountain sites were re-examined and comprised 61 excavated sites and 20 that were surveyed (e.g., Martens & Hagen, 1961; Johansen, 1969; Indrelid, 1978, 1994). These sites were originally identified and investigated as part of the development of hydroelectricity projects from the late 1950s to late 1970s. This material has now been re-evaluated using updated typological-chronological knowledge (e.g., Olsen, A. B., 1992; Naerøy, 1993; Glørstad, 2004; Bergsvik, 2006; Jaksland & Kraemer, 2012; Mjaerum, 2012) and discussed in light of new culture-historical insights and recent research into Holocene climate variations (e.g., Bjune *et al*., 2005; Lilleøren *et al*., 2012; Nesje *et al*., 2012).

The original excavations were based on extensive surveying based on surface finds and test-pitting as part of various projects between the late 1950s and the end of the 1970s. There are some source-critical aspects that affected how sites were chosen for investigation, and these will be briefly discussed. As test-pit surveying was time-consuming, areas without much vegetation were often chosen, and this resulted in a favouring of beach areas near lakes (e.g Martens & Hagen, 1961, pp. 9, 49). The current theoretical trend based on processual archaeology led to an adaptational perspective where one assumed the Stone-Age people brought together as many functions as possible at the same site. This implied that most sites would lie near contemporary bodies of water since these areas had stray-finds, and consequently most of the effort was concentrated in these landscape types (Johansen, 1978, p. 20; Indrelid, 1994, p. 19). The challenge is that sites outside the focus areas might be underrepresented and give a biased version of the activity in the study area. This is however thoroughly discussed in my research project, and it is concluded that the settlement pattern with main occupation sites situated along or near lakes and rivers gives a representative image, but that more short-term specialized sites might be missing to some degree in the material (Olsen, D. E. F., 2020, pp. 147–148, 362ff.). As a basis for analysing long-term presence and activity in the mountain areas, the sites and archaeological material are thus thought to be of good enough quality and representation.

The sites were selected from all over the study area based on the presence of lithic material indicating activity during the Neolithic–Bronze Age. Several of the sites were also multi-phased and thus provided the potential for analysing continuity or change in activity over time. The study included all the sites with identifiable bifacial technology, also including those from the Pre-Roman Iron Age (PRIA), to increase the comparative potential across the 2350 BC border. The map (Fig. 1) shows the study area divided into sub regions with all the sites. They represent the general level of activity over time; an exception is the western parts of the Hardangervidda where only two Stone Age sites are known.

Chronology and technology

The various arrowhead technologies present at the sites have the greatest information potential for discussing chronological aspects and will be the focus in this presentation. Some of the technologies have a distinct chronological and/or regional affinity and include the use of raw material that in some cases has a geographical as well as chronological aspect. Even though the main research question in this paper is changing hunting practices after 2350 BC, it is necessary to include specific technological traditions from the Early Neolithic and onwards.

Arrowheads

The introduction of cylindrical blade technology and tanged arrowheads is one of

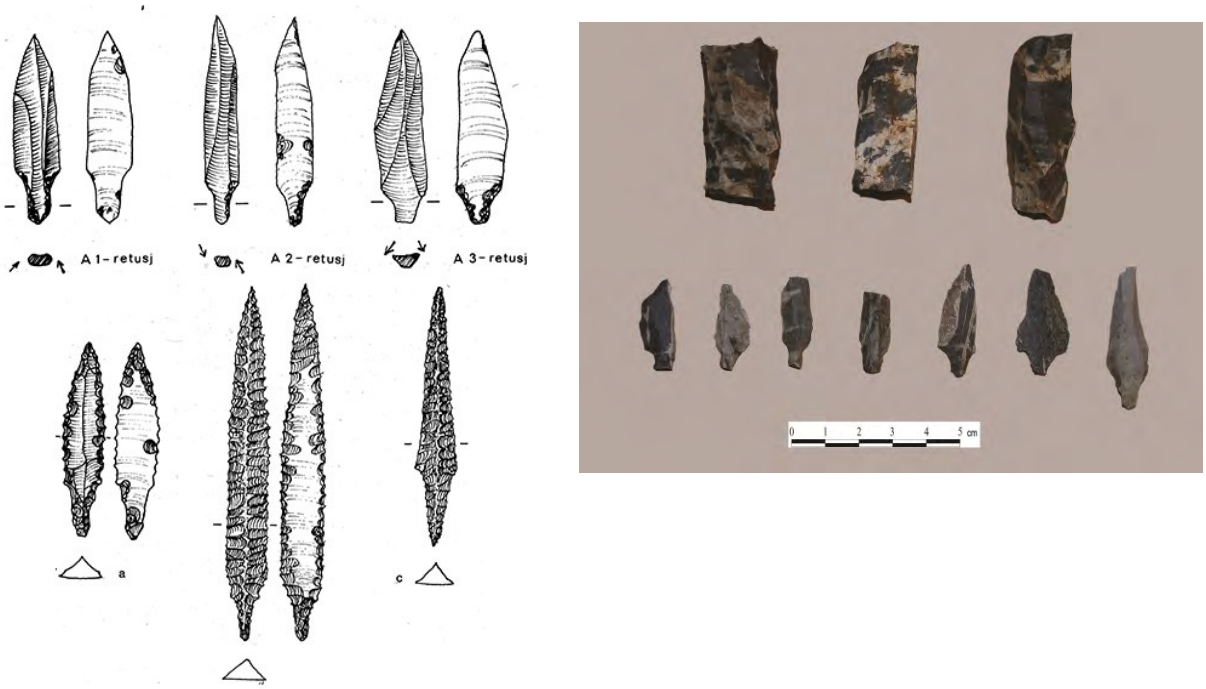

Figure 2. Left: Various types of tanged arrowheads mentioned in the text. After Olsen, D. E. F., 2020, based on Indrelid, 1994. Right: Cylindrical cores and tanged arrowheads type A of rhyolite. After Solheim, 2012.

the primary markers of the Mesolithic-Neolithic transition in western Norway ca. 4000 BC (Olsen, A. B., 1992; Naerøy, 1993; Bergsvik, 2006; Olsen, D. E. F., 2021).

Although various types of raw material were exploited, the technology is mostly connected to rhyolite, an igneous, magmatic rock that has only been quarried from Mount Siggjo on the island of Bømlo. This technology spread rapidly all along the western seaboard with a regional differentiation based on variation in raw material. Flint dominated in the south-west while rhyolite and various quartzites were more common further north. From 3500 BC, the technology was largely replaced by other technologies in western Norway such as bipolar and slate-based technologies. Using an indirect percussion technique alternating between two opposing platforms (Fig. 2, top right), regular blades could be produced for making tanged arrowheads of type A (Fig. 2, bottom right). The blade technology based on cylindrical dual-platform cores eventually spread to eastern Norway after 3500 BC at the end of the Early Neolithic. Here, flint was predominately used as raw material and can be identified at sites along the coast, inland and in the mountain areas. The early western Norwegian version of this technology is characterized by blades and arrowheads that are smaller relative to the later flint-made versions in eastern Norway (Olsen, D. E. F., 2021) and the difference can be used as a chronological marker. In the latter region, this type of blade-based tanged arrowhead gradually replaced various types of flake-based arrowheads, e.g., tanged, transverse and single-edged arrowheads which were predominately used during the Early Neolithic (Solheim, 2012) (Fig. 2, left).

Differences in lithic arrowhead technologies also distinguished western and eastern social groups in the Middle Neolithic A (3500/3300–2800 BC). Tanged arrowheads of type A remained important, based on flint along the coast and lowlands, but also with some use of quartz in the inland areas. Along

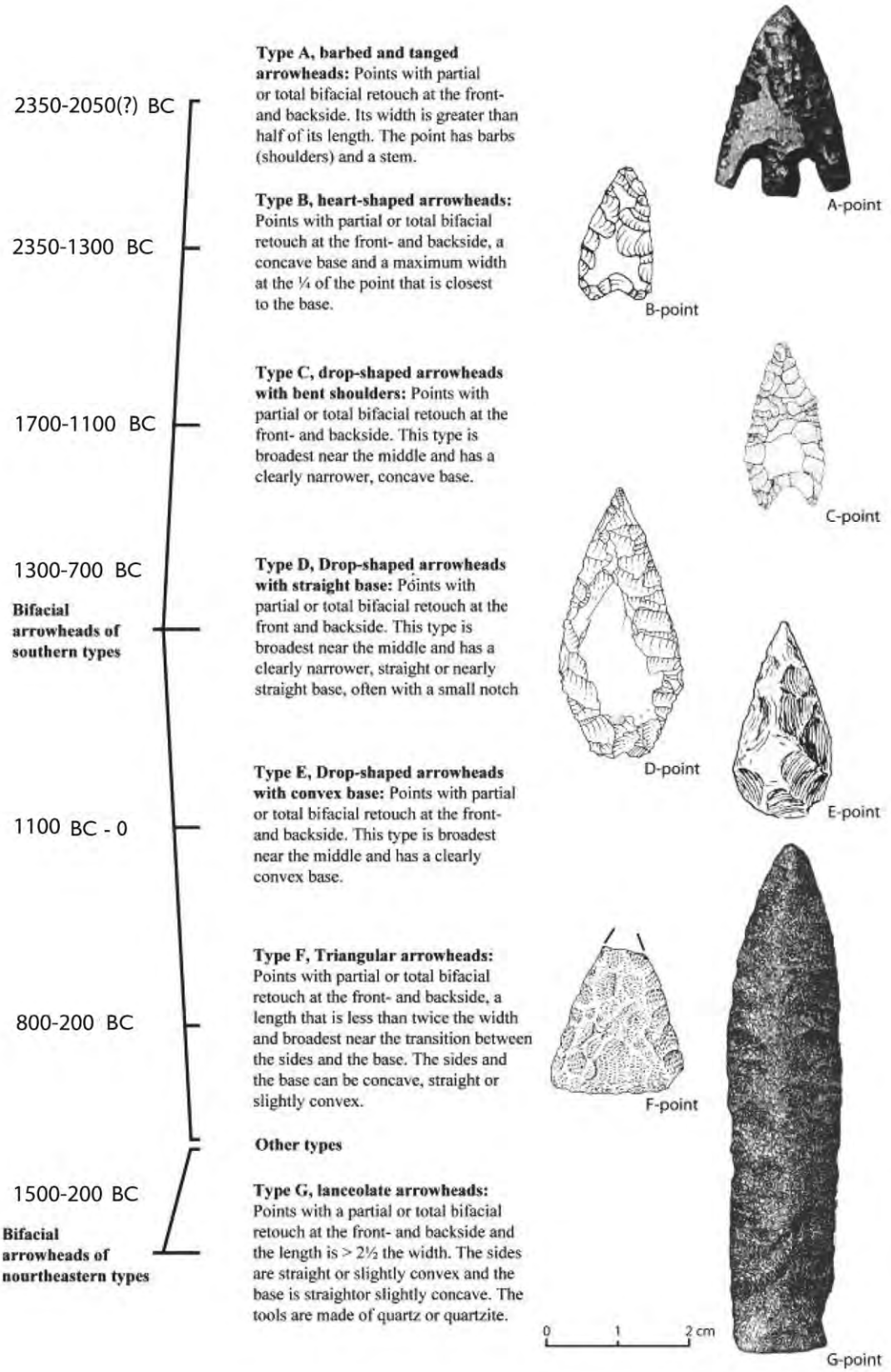

Figure 3. Chronological presentation of various typologically distinct bifacial arrowheads used as basis for analysing and dating activity at Hardangervidda and Nordfjella. After Mærum 2012.

the western parts of Norway slate technology became important, and this was a development shared with eastern parts. This resulted in a mix of locally unique and shared technologies that are also represented at mountain sites. Eastern Norway seemed more connected to southern Scandinavian networks as indicated by the presence of ceramics and various flint axe types. Western Norwegian groups were more semi-locally oriented and involved in other types of networks (Bergsvik, 2006). This seemingly changed during the Middle Neolithic B (ca. 2800–2350 BC) with the introduction of tanged arrowheads of types B–D in both eastern and western Norway (Fig. 2, bottom left). Slate technology continued to be used, and one interpretation is that central parts of west Norway became more integrated in southern Scandinavian networks (Olsen, A. B., 2012; Bergsvik *et al*., 2020), perhaps through increased activity in the mountain areas and more interaction with groups from eastern Norway (Olsen, D. E. F., 2020).

A change occurred during the Late Neolithic (2350–1700 BC), based on a more-commonly shared material culture with agriculture as a central economic factor. The shift to bifacial technology can be traced throughout south Norway and shows more homogenous and far-reaching networks (Apel, 2012; Mjaerum, 2012; Prescott, 2012) (Fig. 3). How did this affect the activity at the Hardangervidda and Nordfjella mountain areas?

LN-PRIA indicators—bifacial arrowheads

Bifacial arrowheads comprise approximately 15% of all arrowheads in the study and are comparable in numbers with the transverse type and type A tanged arrowhead. Figure 4 shows all the sites (26) with bifacial arrowheads in absolute numbers and as a percentage of all arrowheads at the sites. The variation of the sites is interesting regarding two important aspects: the extent of bifacial technology and if the sites are single- or multiphased. Sites with high relative numbers are represented in most of the study area (missing in western parts), but in the central parts of Hardangervidda bifacial arrowheads are in low relative and absolute numbers (site nos. 62–64). This area stands out from the rest and indicates less continuity in activity. The sites with medium absolute and relative numbers are interesting as examples of places with greater time depth and more continuity of activity related to hunting and fishing.

Also prominent are eleven sites where bifacial arrowheads make up 80–100% of all the arrowheads found. These sites are interesting as they represent mostly activity from the Late Neolithic and later periods. Six of them are defined as rock shelters; naturally occurring outcrops in cliffs or glacier-transported boulders under which shelters could be made. A hypothesis has been that rock shelters and caves became more frequently used from the Late Neolithic and thus represent a shift in settlement preferences linked to the introduction of transhumance (Indrelid, 1994, pp. 229, 269). A total of eleven rock shelters and caves were included in the study and 50% showed significant activity from the Late Mesolithic, and some even earlier. The data from this research project allowed the conclusion that the previous interpretation needs refining and that these types of settlements have always been valued (Olsen, D. E. F., 2022).

Bifacial arrowheads are divided into six subgroups (A–G) in addition to blanks, fragments and unknown/undefined (Fig. 3). The chronology and classification is primarily based on the work of Axel Mjaerum (2012), who studied most of the material in the collection of the Museum of Cultural History (University of Oslo). Types A–C can be dated to the Late Neolithic/Early Bronze Age and types D–G were mainly used in the Late Bronze Age/Pre-Roman Iron Age. Type A, also known as Bell Beaker point (*klokkebegerspiss*) is not represented in the study area, but occurs frequently in the coastal areas (Mjaerum, 2012). The B-type arrowhead, also called heart-shaped (*hjerteformet spiss*), was primarily used from

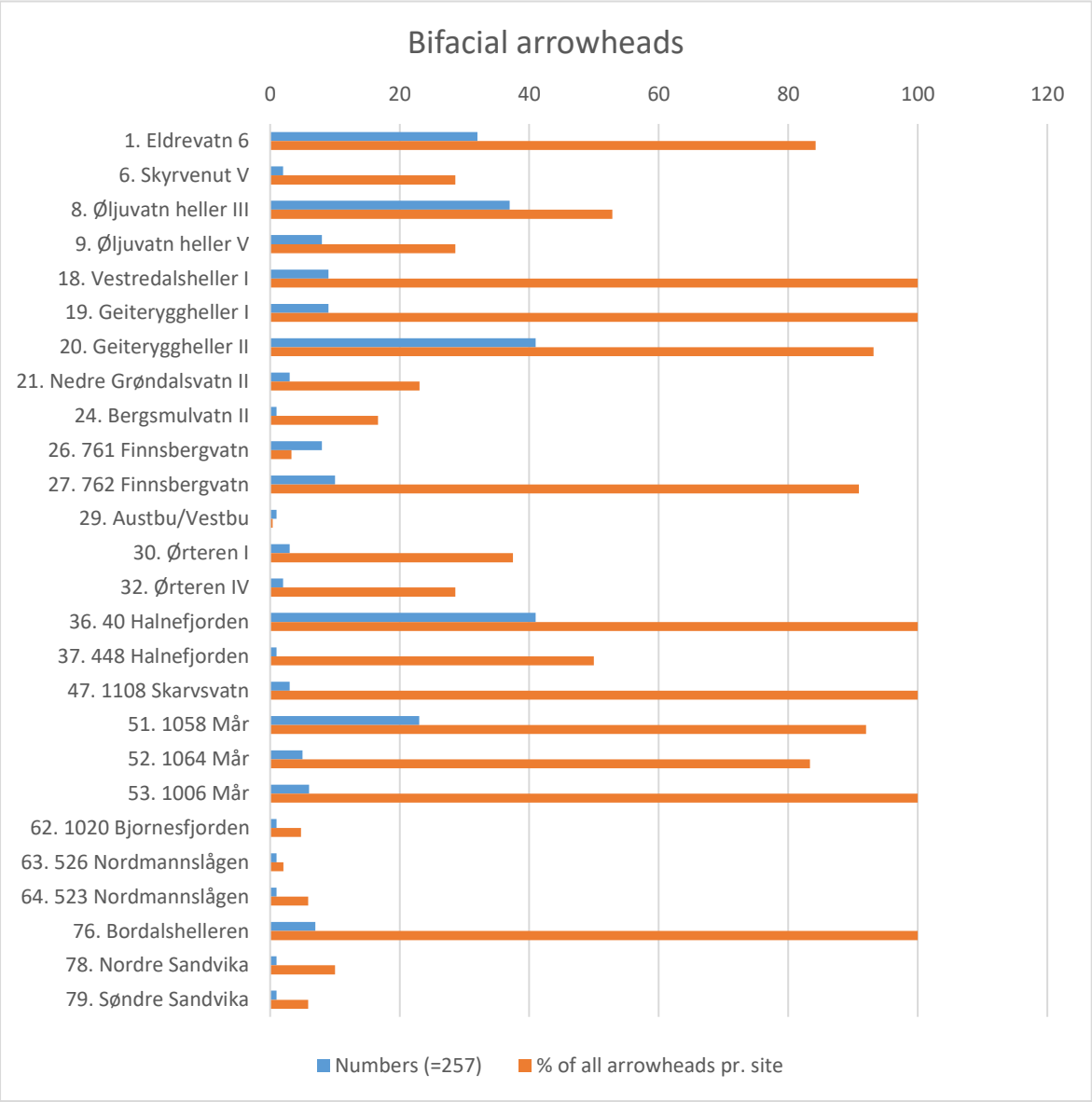

Figure 4. Distribution of bifacial arrowheads by sites. The diagram shows absolute numbers by site and relative numbers as percentage of the total numbers of arrowheads by site.

around 2100 BC (LN II) and into the beginning of the EBA (Mjaerum, 2012).

Quartzite is the predominant raw material and its use is a trend that increases over time (Fig. 5). Flint has also been used to some degree, unlike quartz which was rarely used in this technology. Easy access to high-quality quartzite in Nordfjella can at least partly explain the attraction to this raw material (Nyland, 2016), a tradition which was practised for almost 2,000 years.

Thirteen sites include arrowheads of the early types (B and C) with a majority in northern, central and eastern parts of the study area, but none in southern and western parts. A possible explanation for this trend is changing practices and traditions after 2350 BC by various groups, but arrowheads and ^{14}C dates indicate an increase in activity at least from the latter part of the Early Bronze Age (Olsen, D. E. F., 2020, 288). These trends can be further explored by comparing with earlier activity in the same mountain areas.

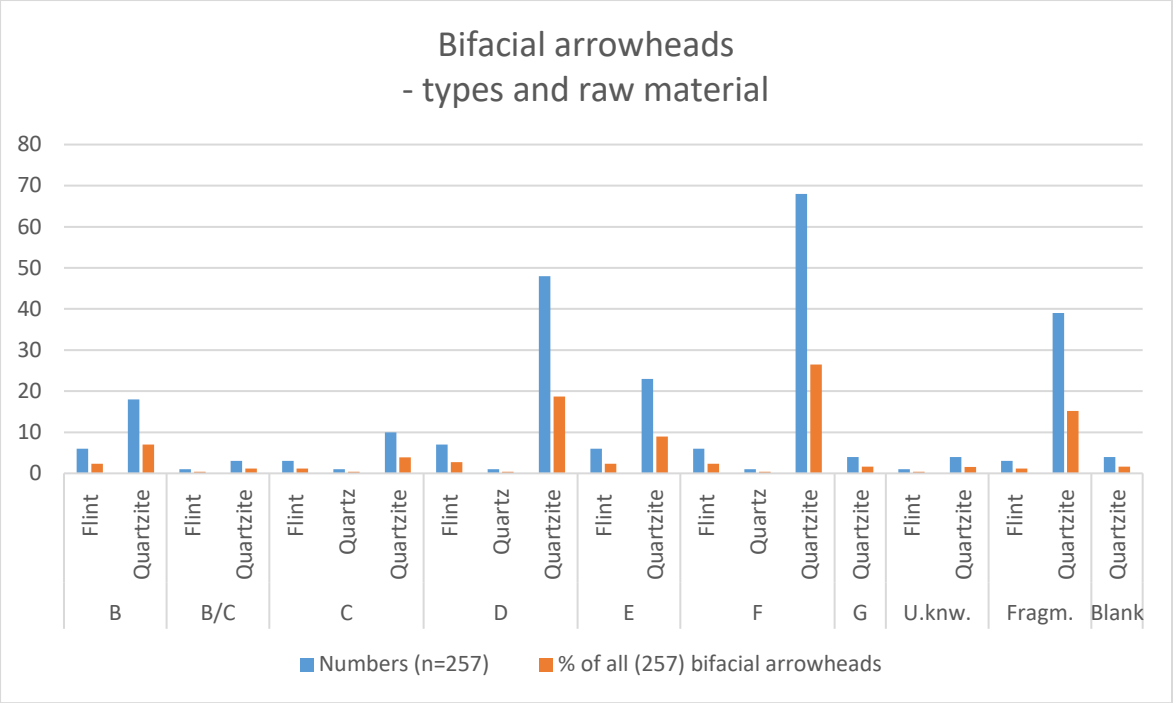

Figure 5. Distribution of bifacial arrowheads by type and raw material shown as absolute numbers and as percentage of all bifacial arrowheads.

Activity phases

The majority of the 61 excavated sites (47) can be defined as multiple-phased based on chronologically distinct technological material. About two-thirds of the sites include remnants of cultural layers and suggest revisitation of the same sites or local areas over hundreds or even thousands of years. In the following, artefacts will be used to establish different activity phases that can indicate variation over time. The focus will be on the 2350 BC transition by comparing the activity before and after this point.

Based on various types of technological traits, the activity was divided into a low-resolution timeline based on the classical chronological division of the Neolithic and the Bronze Age. As this chronology is mostly established based on south Scandinavian material culture, there is not always a clear correlation between technology and chronology. A pragmatic approach is necessary to quantify the activity over time and does not reflect variation in the degree of activity at sites between different phases. This low-resolution chronology is not suitable for identifying short-term changes, but can show larger transitional changes such as the proposed deneolithization in Middle Neolithic A (MN A) and the transition to agriculturally based societies at the end of the Neolithic. Each chronologically distinct activity, as represented by lithic material, is counted as a separate activity phase even if the actual numbers of arrowheads or other material varied. The focus in this paper will be the transition between Middle and Late Neolithic which includes a more distinct technological change.

A total of 154 distinct activity phases has been identified at 81 sites (including the surveyed sites). Figure 6 shows two timelines dividing the activity into four approximately 1000-year chronological phases. The topmost timeline includes all the activity phases while the lower divides the activity per 100 years within each chronological phase. They are comparable, indicating

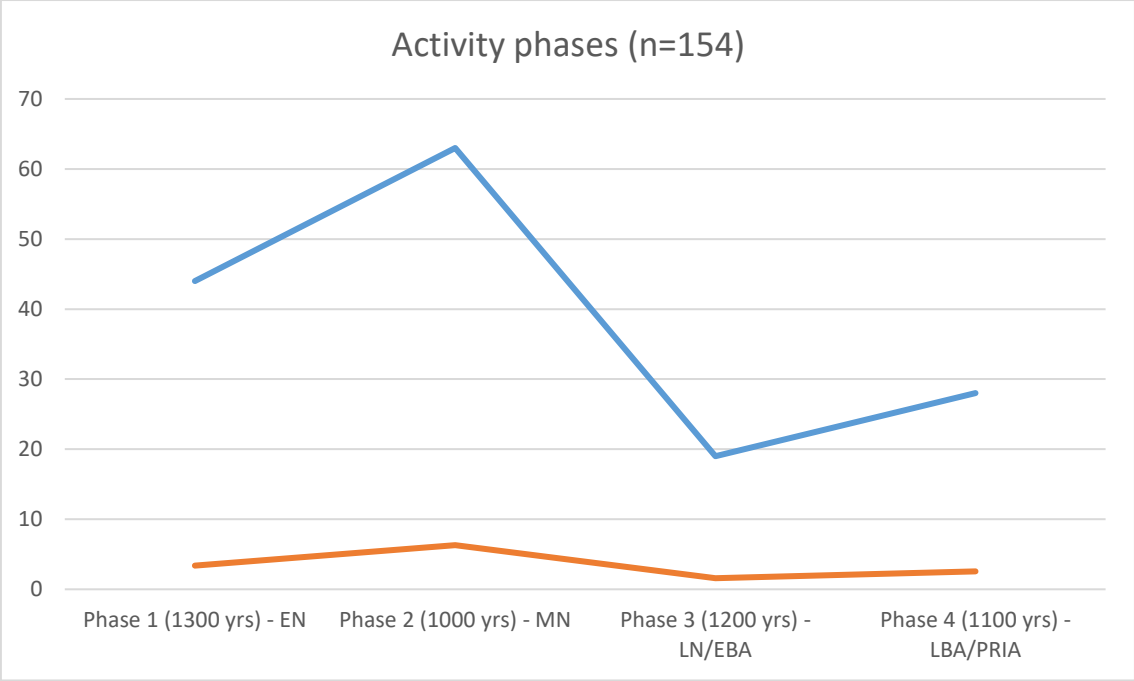

Figure 6. Activity phases. Top curve shows all activity phases by chronological phases. Bottom curve shows number of phases by 100 years.

similar trends with an increase in activity between the Early and Middle Neolithic and a decrease between the Middle and Late Neolithic/Early Bronze Age. We can also see a possible increase in activity in the Late Bronze Age/Pre-Roman Iron Age. This gives an indication of the relative activity at the mountain sites over 3000 years, but the trend does not apply in general for the mountain areas. This is reflected in Figure 7 where the same trend is divided by sub-regions (see also Fig. 1), showing clear variations in activity. The activity over time is not evenly distributed throughout the study area, where the trends are most prominent in the northern and eastern areas (Nordfjella, Nordvidda and Østvidda). The central and southern areas (Sentralvidda and Sørvidda) have few indicators of activity in phase 3 (LN/EBA), and this points to a differentiation in the use of these mountain areas in the last part of the Neolithic. The phases only give us a general and condensed picture of variation in activity and cannot indicate if the changes were over longer or shorter periods of time.

The apparent abrupt changes between phase 2 and 3 might have happened over a longer period, and if so would have appeared differently in the diagrams. Nor does the curve in Figure 6 indicate if the changes took place in the transition/early in the LN, or if it had already started towards the end of Middle Neolithic B (MN B). In order to explore this further, other factors such as demographic and climatic changes must be incorporated into the analysis to discuss these trends in order to illuminate hunting as an economic factor in the LN/EBA.

Discussion

Activity phases and demographic trends

Arguments have been made that changes in settlement pattern happened from the end of Middle Neolithic B, which prepared or instigated the transition to farm-based societies after 2350 BC (Hjelle *et al.*, 2006; Olsen, A. B., 2009; Bergsvik *et al.*, 2020). A challenge in exploring this narrow time period is that few artefacts present at mountain sites can be delimited to MN B alone. Most were also in use from MN A or

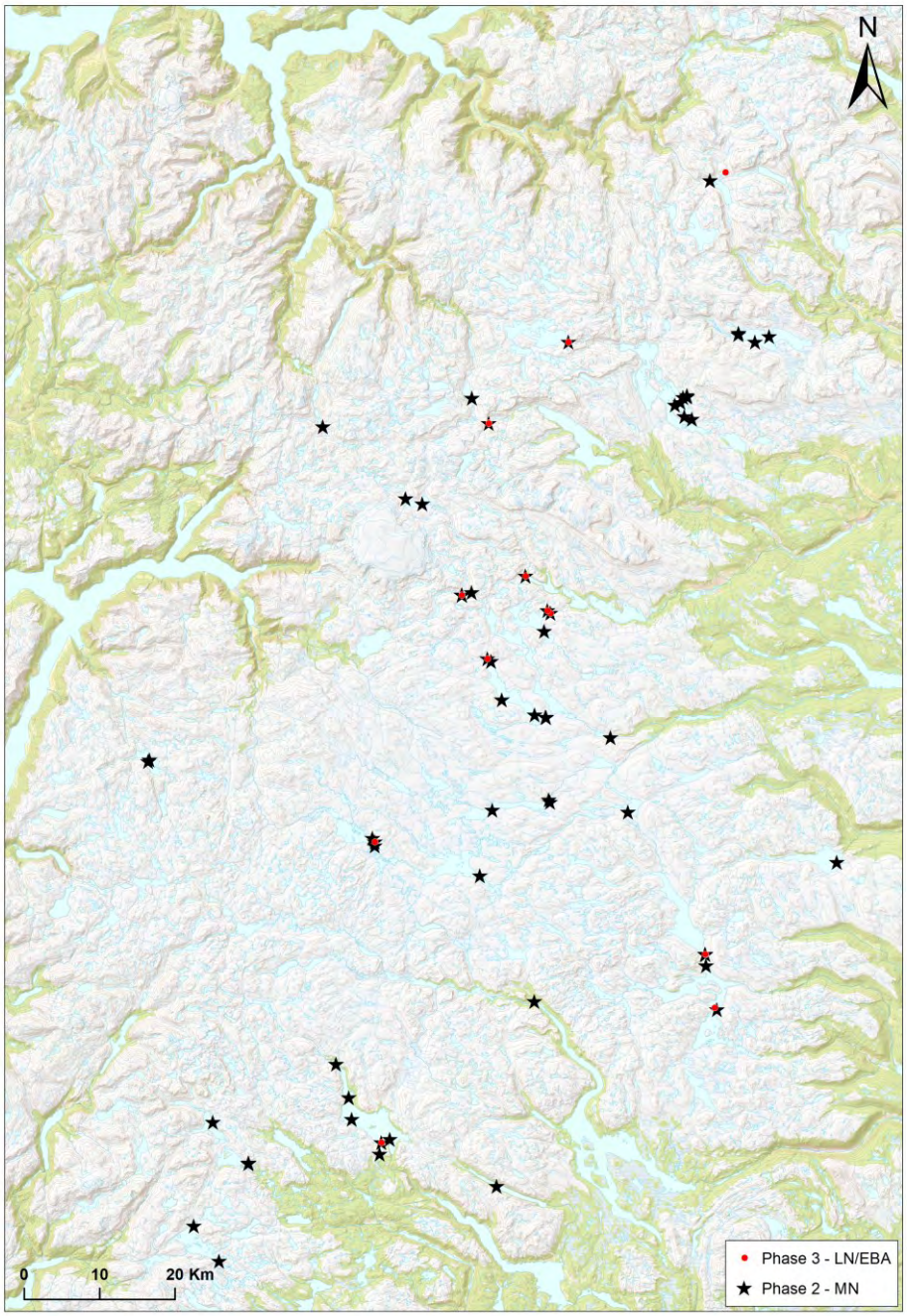

Figure 8. Distribution of all sites with activity from the Middle Neolithic and the Late Neolithic/Early Bronze Age. The current forest line is equivalent to the situation after the decline in temperature at the transition between the Middle Neolithic B and the Late Neolithic. Earlier in the Neolithic the forest line was higher.

even earlier, resulting in treating the whole of the Middle Neolithic as a separate chronological phase. The same is also relevant for the LN/EBA, where the two oldest types of bifacial arrowheads (with a concave base) present at mountain sites could be from the last half of the LN and the first half of the EBA (Fig. 3). If we look at the spatial distribution of the activity phases, the variation is obvious between the Middle Neolithic and the Late Neolithic/Early Bronze Age (Fig. 8).

We clearly see a spatial reduction in sites from the LN/EBA, concentrating the activity in fewer areas and most markedly the northernmost and eastern parts. This correlates with the trends from Figure 7 and

visualizes the variation in activity within the study area. How can this be interpreted? Was there a general decrease in activity in the LN/EBA or does it represent changes in landscape use not reflected in the discovered settlement sites? A comparable area is the Nyset-Steggje mountain area further north that was surveyed and excavated in the 1980s. This project focused on identifying activity from the LN and found that the settlement localization in this period differed from earlier in the Neolithic (Bjørgo *et al*., 1992; Prescott, 1995). The sites were found further away from contemporary bodies of water than at other mountain areas and these locations were interpreted as due to pasture being the primary factor for choosing settlements. However, there was also less activity in this area in the LN/EBA compared with the EN and LBA/PRIA. An explanation was that some mountain areas became less important during the early phases of farm-based societies and that this changed again later (Prescott, 1993, p. 215). Could this have been the case for Hardangervidda and Nordfjella?

Figure 9 combines several timelines for comparing the trends shown in the archaeological activity phases (to the left). The different curves in the diagram are not exactly correlated but give a representative and relative comparison. The coloured bars in orange and purple represent population increases and decreases respectively (cf. Nielsen *et al*., 2019) and those in grey mark chronological delimitations. The sum curve for ^{14}C dates is based on 70 dates from sites in the study area. The curve by Nielsen *et al.* shows the demographic development in south Norway during the Neolithic based on 643 ^{14}C dates from 204 coastal, inland and mountain sites (Nielsen *et al.*, 2019). The climate curve to the right reflects Holocene temperature variations based on Lilleøren *et al.*, 2012.

The ^{14}C sum curve for sites in the study area gives an indication of the activity that can be compared with activity as reflected through the lithic material. The ^{14}C dates stretch over a period from ca. 8000 cal. BC to the end of the PRIA (Olsen, D. E. F., 2020, p. 356, fig. 131) but in Figure 9 only dates from ca. 4000 BC are included. There is an increase in dates starting at the end of the Late Mesolithic, peaking around 3800 BC before dropping to a low point around 3500 BC. A new increase can be seen from ca. 3200 BC with a high point towards the end of the MNB around 2500 BC. After this the number of dates once more decreases until the transition between LN I-II ca. 2100 BC, with a subsequent rise until the transition to EBA I ca. 1700 BC. After this there is a marked drop in ^{14}C dates which lasts at least until the middle of the LBA (Olsen, D. E. F., 2020, p. 356). Although the number of dates is few, there is a clear correlation in the trends described by Nielsen *et al*. in Figure 9. They interpret the demographic trajectory in the Neolithic in terms of four population changes. The first increase was in the EN between 3900–3600 BC and the next in LN II between 2000–1750 BC. Two phases with a population decrease have been suggested, the first a being a short decline at the transition to MN A at approximately 3300 BC and then early in LN I between 2200–2100 BC (Nielsen *et al*., 2019, p. 85). The ^{14}C dates from the study area and the demographic trajectory overlap to a large degree, which is expected as most of the dates from the mountain areas are included in the data set of Nielsen *et al*. The latter includes more dates from comparable mountain areas and thus lends more credibility to the data from the mountain sites in comparison with the archaeological data, especially when seen together with the dates from other parts of south Norway. It is important to note that the people active in the mountain areas are the same that lived in coastal and/or inland areas the rest of the year. The activity in the different regions must then be analysed within the same interpretative frame as they reflect a diverse resource exploitation by groups moving laterally between coastal/lowlands and alpine areas. In the curve for the activity phases, there is a possible increase in activity from

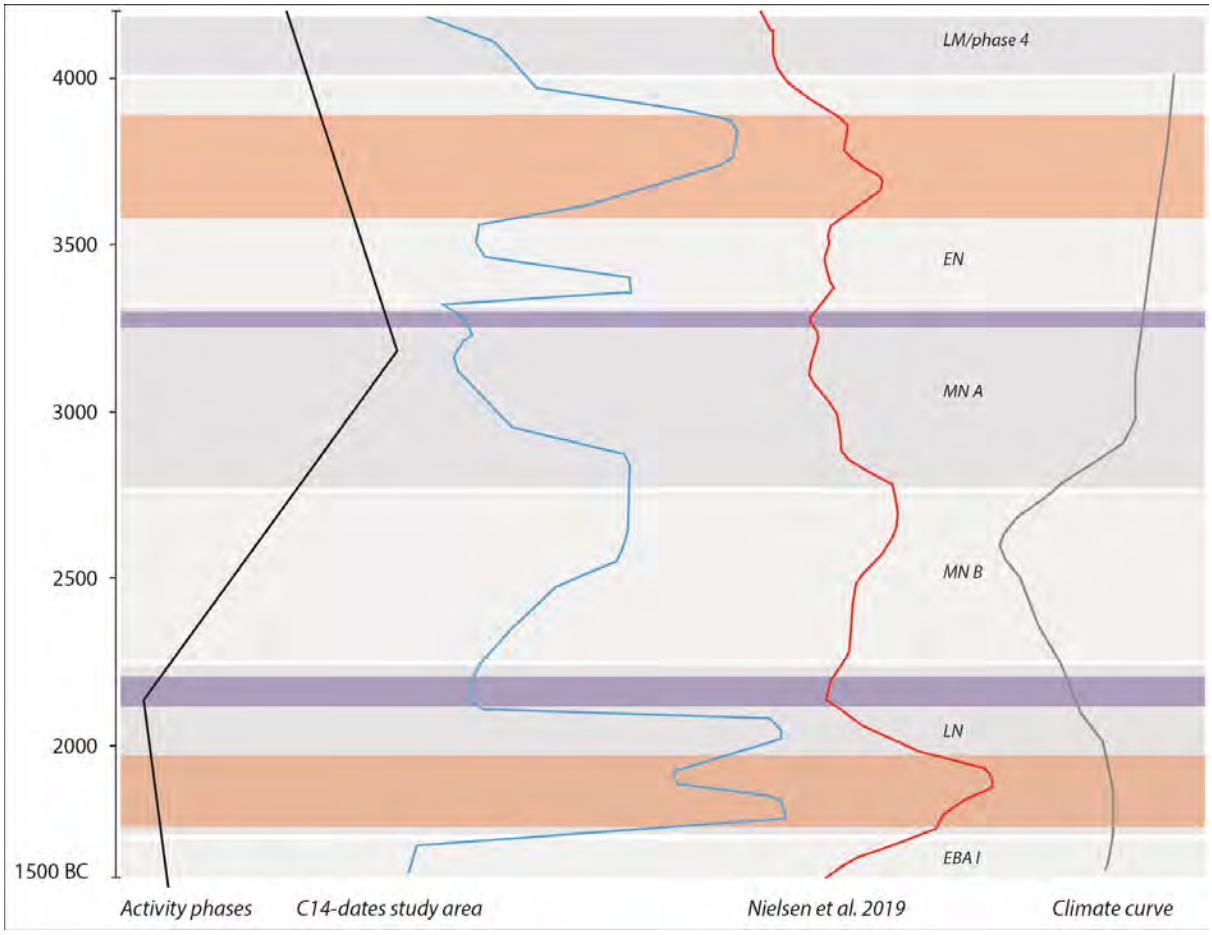

Figure 9. Diagram with activity phases, 14C-curve for the study area, demographic development and a temperature curve both for South Norway. The orange and purple bars reflects population increases and decreases respectively (based on Nielsen et al. 2019).

the LM/EN and the MN. The ^{14}C data from the study area indicate that this could have happened at the end of the EN, but is not reflected in Nielsen *et al*. Their proposed population increase in the EN can also be seen in the ^{14}C data but not in the activity phases. A possible explanation is that the apparent increase in archaeological activity actually took place in the LM/EN transition but this is difficult to pursue, as the resolution is too low. The intensification in activity in the Middle Neolithic as reflected in the archaeological material can possibly be more precise when compared with the other data. The short-termed decline in the demographic curve is hard to correlate to the activity phases, but is indicated in the ^{14}C data and by other researchers (e.g., Selsing, 2010, p. 240). There is however an increase in ^{14}C dates from the study area from just before 3000 BC with a peak between 2700–2500 BC. This is also discussed by Nielsen *et al.* but the deviations are not considered significant enough (cf. Nielsen *et al.*, 2019, fig. 2b). It is however, important to consider that trends from more general population studies for the entire area of south Norway does not necessarily reflect specific areas and that the situation described by the data from the study area could be more accurate in this particularly case. I would suggest that the increase in activity as seen in the archaeological material (activity phases) reflects the situation from the last part of MN A and the start of MN B (see also Selsing, 2010, p. 255). An interesting correlation is the temperature curve to the right in Figure 9, which shows a significant temperature drop within the same period, and could be a factor for explaining the fluctuation in activity at the mountain sites.

The last change in activity that will be discussed here is the relation between the

MN and the LN/EBA. The ^{14}C data and the demographic trends provide important insights that can be used to narrow down the activity phases. The population decrease in LN I has been argued to start at the end of MN B after 2500 BC (cf. Nielsen *et al.*, 2019 and can be seen in the ^{14}C sum curves. The next population increase in LN II is harder to correlate to the activity phases, but again it is possible that this specific demographic change did not occur in the study area. The activity decrease in the mountain areas in the LN/EBA has been proposed earlier (Indrelid, 1994, fig. 99; Selsing, 2010, pp. 252–253) and a hypothesis is that the activity in the study area from the LN/EBA was between 2000–1700 BC.

Climate changes—the 5.2 ka. event

A cold spell can be traced throughout Fennoscandia (Wanner *et al.*, 2008, p. 1795) and has been detected in glaciation growth in south Norway (Bakke *et al.*, 2008; Gjerde *et al.*, 2016). During a period of 500 years the mean temperature dropped by almost 1.5^{o} C from just over 1^{o} C warmer than today to almost 0.5^{o} C colder (Olsen, D. E. F., 2020, p. 79). This temperature curve is general for south Norway and the fluctuations were not necessarily homogenous. It is however clear that this had an impact on the forest line in the mountain areas as it was slowly lowered. At the start of the EN the forest line reached as high as 1200 m.a.s.l., meaning most of the settlement sites were in a forested landscape comprised mainly of birch and some pine in lower altitudes (Faarlund & Aas, 1991, p. 116, tabell 1; Eide *et al.*, 2006, pp. 77–78). This changed during the cold period beginning after 3200 BC, and gradually both the Hardangervidda and Nordfjella mountains gained an alpine vegetation without woodland. The most important effect of this change is hypothesized to be larger grazing areas for reindeer leading to larger herds than previously (Selsing, 2010, p. 241; Olsen, D. E. F., 2020, p. 369). This in turn would have meant an increase in hunting resources and consequently more activity in the mountain areas in general. This climate and environmental change fits with the archaeological and demographic data and is an important factor for explaining the activity during the MN. After 2700/2500 BC the temperature rose again and reached its maximum at ca. 1^{o} C warmer than today at around 2000 BC (Lilleøren *et al.*, 2012). After this, the temperature fell gradually towards the transition to the LBA (Olsen, D. E. F., 2020, p. 368). This could mean a higher forest line again at the transition to the LN and thus fewer or smaller reindeer herds.

Hunting in the Late Neolithic

The available data suggest changing trends in activity between the end of the Middle Neolithic and the Late Neolithic. The use of landscape as reflected by settlement sites seems to be more focused on fewer areas in the Late Neolithic/Early Bronze Age than before. There are some possible sources of error, one being the premise that transhumance/herding became important and led to changing settlement requirements. As argued earlier in this paper, there is little evidence that this was the case from 2350 BC and it certainly was not a homogenous development for the whole of south Norway. There is convincing evidence that there was a change and possible lowering of activity at the Hardangervidda and Nordfjella mountains in this period. The task has been to specify and to narrow the timeframe, and to propose some explanations as to why this happened.

It is clear that the activity never stopped, and that hunting and trapping in the mountain areas continued to be an economic factor throughout the Neolithic and Early Bronze Age. The results from this study also show that the activity fluctuated during this time, caused by various factors. To understand the changes in the Late Neolithic/Early Bronze age, both population changes and cultural upheaval must be considered. A general population decline is suggested starting after 2500 BC and with a low around 2100 BC (Nielsen *et al.*, 2019). This in itself might have affected the activity at Hardangervidda

and Nordfjella with fewer people migrating seasonally between the coast and mountains. The transition to a farm-based society might also have had consequences for activity in more "marginal" areas such as the high mountains. Establishing a new agricultural economy centred on permanent settlements with longhouses could have led to less focus on these types of subsistence activities, at least initially. One can also argue that permanent settlements led to land ownership and that farms closest to the Hardangervidda might have had a claim on these areas and resources. In addition, the climate fluctuations could have led to a rise of the forest limit again, resulting in fewer and/or smaller herds of reindeer and consequently less activity concentrated around key sites. There was however, an expansion again from the Late Bronze Age/Pre-Roman Iron Age with a broader utilization of the landscape, and hunting also continued to be an important economic factor in agrarian societies.

References

Apel, J. 2012. Tracing pressure-flaked arrowheads in Europe. In*: Becoming European. The transformation of third millennium northern and western Europe* (pp. 156–164). Prescott, C. & Glørstad, H. (eds.). Oxford: Oxbow Books.

Bakke, J., Lie, Ø., Dahl, S. O., Nesje, A. & Bjune, A. E. 2008. Strength and spatial patterns of the Holocene wintertime westerlies in the NE Atlantic region. *Global and Planetary Change* 60: 28–41.

Bergsvik, K. A. 2006. *Ethnic boundaries in Neolithic Norway.* BAR International Series, 1554. Oxford: Archaeopress.

Bergsvik, K. A., Hjelle, K. L., Halvorsen, L. S., Olsen, A. B. & Zinsli, C. 2020. Low-level agriculture in Neolithic western Norway. In: *Farmers at the frontier. A pan-European perspective on Neolithisation* (pp. 339–362). Gron, K., Sørensen, L. & Conwy, P. R. (eds.). Oxford: Oxbow Books.

Bjørgo, T., Kristoffersen, S. & Prescott, C. 1992. *Arkeologiske undersøkelser i Nyset-Steggjevassdragene 1981–87.* Historisk museum.

Bjune, A. E., Bakke, J., Nesje, A. & Birks, H. J. B. 2005. Holocene mean July temperature and winter precipitation in western Norway inferred from palynological and glaciological lake-sediment proxies. *The Holocene* 15: 177–189.

Eide, W., Birks, H. H., Bigelow, N. H., Peglar, S. M. & Birks, H. J. B. 2006. Holocene forest development along the Setesdal valley, southern Norway, reconstructed from macrofossil and pollen evidence. *Vegetation History and Archaeobotany* 15: 65–85.

Faarlund, T. & Aas, B. 1991. Sør-Norges fjellskoger gjennom etteristiden. *Viking* 54: 113–137.

Gjerde, M., 2016. Holocene glacier variability and Neoglacial hydroclimate at Ålfotbreen, western Norway. *Quaternary Science Reviews* 133: 28–47.

Glørstad, H. 2004. Kronologiske resultater fra Svinesundprosjektet. In*: Svinesundprosjektet. Bind 4.* Glørstad, H. (ed.). Oslo: Universitetets Kulturhistoriske Museer. Fornminneseksjonen.

Glørstad, H. 2010. *The structure and history of the Late Mesolithic societies in the Oslo Fjord area 6300–3800 BC.* Mölndal: Bricoleur Press.

Hjelle, K. L., Hufthammer, A. K. & Bergsvik, K. A. 2006. Hesitant hunters: a review of the introduction of agriculture in western Norway. *Environmental Archaeology* 11: 147–170.

Indrelid, S. 1978. Mesolithic economy and settlement patterns in Norway. In: *The early postglacial settlement of northern Europe. An ecological perspective.* Mellars, P. (ed.). London: Duckworth.

Indrelid, S. 1994. *Fangstfolk og bønder i fjellet: bidrag til Hardangerviddas førhistorie 8500–2500 år før nåtid.* Universitetets oldsaksamlings skrifter. Ny rekke nr. 17. Oslo: Universitetets Oldsaksamling.

Jaksland, L. & Kraemer, M. B. 2012. Nøklegård I—lokalitet fra senneolitikum. In: *E18 Brunlanesprosjektet bind III. Undersøkte lokaliteter fra tidligmesolitikum og senere* (pp. 199–228). Jaksland, L. (ed.). Oslo: Kulturhistorisk museum.

Johansen, A. B. 1969. *Høyfjellsfunn ved Lærdalsvassdraget*. Bergen: Universitetsforlaget.

Johansen, A. B. 1978. *Høyfjellsfunn ved Lærdalsvassdraget: 2: Naturbruk og tradisjonssammenhenger i et sør-norsk villreinområde i steinalder.* Bergen: Universitetsforlaget.

Lilleøren, K. S., Etzelmüller, B., Schuler, T. V., Gisnås, K. & Humlum, O. 2012. The relative age of mountain permafrost—estimation of Holocene permafrost limits in Norway. *Global and Planetary Change* 92–93**:** 209–223.

Loftsgarden, K. 2017. *Marknadsplassar omkring Hardangervidda: ein arkeologisk og historisk analyse av innlandets økonomi og nettverk i vikingtid og mellomalder.* Ph.D. thesis, University of Bergen.

Martens, I. & Hagen, A. 1961. *Arkeologiske undersøkelser langs elv og vann. Gyrinosvatn, Hallingdal og Tokke-Vinje-vassdraget, Telemark. Meddelelser om registreringer og utgravninger i forbindelse med vassdragsreguleringer 1959*. Norske Oldfunn X. Universitetes Oldsaksamling. Oslo.

Mjaerum, A. 2012. The bifacial arrowheads in southeast Norway: a chronological study. *Acta Archaeologica* 83: 105–143.

Naerøy, A. J. 1993. Chronological and technological changes in western Norway 6000–3800 BP. *Acta Archaeologica* 63: 77–95.

Nesje, A., Pilø, L. H., Finstad, E., Solli, B., Wangen, V., Ødegård, R. S., Isaksen, K., Støren, E. N., Bakke, D. I. & Andreassen, L. M. 2012. The climatic significance of artefacts related to prehistoric reindeer hunting exposed at melting ice patches in southern Norway. *The Holocene* 22: 485–496.

Nielsen, S. V. 2021. Early farming in Southeastern Norway: New evidence and interpretations. *Journal of Neolithic Archaeology* 23: 83-113.

Nielsen, S. V., Persson, P. & Solheim, S. 2019. De-Neolithisation in southern Norway inferred from statistical modelling of radiocarbon dates. *Journal of Anthropological Archaeology* 53: 82–91.

Nyland, A. J. 2016. *Humans in motion and places of essence: variations in rock procurement practices in the Stone, Bronze and Early Iron Ages, in southern Norway.* Ph.D. thesis, University of Oslo.

Olsen, A. B. 1992. *Kotedalen—en boplass gjennom 5000 år. Fangstbosetning og tidlig jordbruk i vestnorsk steinalder: nye funn og nye perspektiver.* Bind I. Bergen: Historisk museum, University of Bergen.

Olsen, A. B. 2009. Transition to farming in western Norway seen as a rapid replacement of landscapes. In: *Mesolithic horizons. Papers presented at the Seventh International Conference*

on the Mesolithic in Europe, Belfast 2005 (pp. 589–596). McCartan, S. B., Schulting, R., Warren, G. & Woodman, P. (eds.). Oxford: Oxbow Books.

Olsen, A. B. 2012. Neolittiseringen av Vestnorge. Møtet mellom to historiske tradisjoner i MNB. In: *Nordlige Verdener. Agrarsamfundenes ekspansion i nord. Symposium på Tanums Hällristningsmuseum, Underslös, Båhuslän 25–29 maj 2011* (pp. 125–141). Kaul, F. & Sørensen, L. (eds.). Copenhagen: Nationalmuseet.

Olsen, D. E. F. 2020. *Jakt og fangst på Hardangervidda og Nordfjella 400–1500 f.Kr. Regionalitet, kulturell variasjon og sosiale endringsprosesser i neolitikum og eldre bronsealder*. Ph.D. thesis, University of Bergen.

Olsen, D. E. F. 2021. The Mesolithic-Neolithic transition in south Norway. Cylindrical blade technology as an indicator of change. In: *Foraging Assemblages*. Volume 2. Boric, D., Antonovic, D. & Mihailovic, B. (eds.). (pp. 763-769). Belgrade: Serbian Archaeological Society.

Olsen, D. E. F. 2022. Stone Age rock shelters in the high mountains. In: *The Stone Age Conference in Bergen 2017* (pp. 169-182). Olsen, D. E. F. (ed.). Bergen: University of Bergen Archaeological Series 12.

Prescott, C. 1993. *From Stone Age to Iron Age: a study from Sogn, western Norway.* Ph.D. thesis, University of Bergen.

Prescott, C. 1995. *From Stone Age to Iron Age: a study from Sogn, western Norway.* BAR International Series, 603. Oxford: Tempus Reparatum.

Prescott, C. 2012. Veien til norske gårdssamfunn. Synspunkter på den kronologiske og kulturelle konteksten. In: *Neolitikum. Nye resultater fra forskning og forvaltning* (pp. 169–179). Solberg, S., Stålesen, J. A. & Prescott, C. (eds.). Oslo: Nicolay Arkeologisk Tidsskrift.

Prescott, C. 2020. One size does not fit all? Interpreting complex diachronic Neolithic-period data in Norway. In: *Farmers at the frontier. A pan-European perspective on Neolithisation* (pp. 381–400). Gron, K., Sørensen, L. & Conwy, P. R. (eds.). Oxford: Oxbow Books.

Prescott, C. & Glørstad, H. 2015. Expanding 3rd millennium transformations: Norway. In: *The Bell Beaker transition in Europe* (pp. 77–87). Martínez, M. P. P. & Salanova, L. (eds.). Oxford: Oxbow Books.

Reitan, G. 2016. Mesolittisk kronologi i Sørøst-Norge—et forslag til justering. *Viking* 79: 23–51.

Reitan, G., Sundström, L. & Stokke, J.-S. F. 2018. Grains of truth. Neolithic farming on Mesolithic sites. New insights into early agriculture in southeast Norway. In: *Kystens steinalder i Aust-Agder. Arkeologiske undersøkelser i forbindelse med ny E18 Tvedestrand-Arendal* (pp. 547–565). Reitan, G. & Sundström, L. (eds.). Oslo: Cappelen Damm Akademisk.

Selsing, L. 2010. *Mennesker og natur i fjellet i Sør-Norge etter siste istid med hovedvekt på mesolitikum*. AmS-Varia 51. Stavanger: Arkeologisk museum i Stavanger.

Solheim, S. 2012. *Lokal praksis og fremmed opphav: arbeidsdeling, sosiale relasjoner og differensiering i østnorsk tidligneolitikum.* Ph.D. thesis, University of Bergen.

Solheim, S. 2021. Timing the emergence and development of arable farming in southeastern Norway by using summed probability distribution of radiocarbon dates and a bayesian age model. *Radiocarbon* 63: 1503–1524.

Wanner, H., Beer, J., Bütikofer, J., Crowley, T. J. *et al.* 2008. Mid- to Late Holocene climate change: an overview. *Quaternary Science Reviews* 27: 1791–1828.

Interpreting Late Bronze Age Uppland

Regional identity and interregional contacts

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Abstract

Throughout the 20th century, many researchers have emphasized the regional character of Uppland and the northern parts of the Mälaren valley in central Sweden during the Late Bronze Age. The region has been seen as a periphery in a Scandinavian Bronze Age perspective as well as a centre in a regional perspective. In particular, contacts and interaction between Uppland and areas to the east—Finland, the Baltic countries and Russia—have been much discussed and have played an important role in the interpretation of the period in the region.

This paper examines, from a research historical perspective, how the Late Bronze Age in the the Mälaren valley region, more specifically Uppland, has been studied from the late 19th century up to the present day, and how views on eastern contacts have affected interpretations of Bronze Age Uppland.

Keywords: Uppland, Bronze Age, Mälar axe

In archaeological research, the province of Uppland in central Sweden has often been viewed as a geographical northern "periphery" of the Nordic Bronze Age area (e.g., Ekholm, 1911, p. 218, 1921, p. 72; Eriksson, 2005). However, the area has also been perceived as a centre, located in a border zone with contacts not only with areas in the south but also with areas in the east and, to some extent, in the north. Many researchers have underlined the regional character of Uppland and the northern Mälaren valley and emphasized the differences in the archaeological material between Uppland/the Mälaren valley and more southern parts of Scandinavia (e.g., Ekholm, 1921, pp. 69ff.; Arbman, 1938, p. 84; Jaanusson, 1981; Reisborg, 1989; Thedéen, 2004; Victor, 2007, p. 252; Eriksson, 2009; Ojala, 2016). These regional differences in the archaeological material have often been explained with the notion that during the Late Bronze Age the Mälaren valley had its "own" contact networks which included areas across the Baltic Sea, and according to some researchers even further to the east to the Volga-Kama area in Russia (e.g. Tallgren, 1916, pp. 362ff.; Ekholm, 1921, p. 72; Arbman, 1938, p. 105; Nerman, 1954; Jaanusson, 1981; Reisborg, 1989; Hjärthner-Holdar, 1993, 1998; Feldt, 2005, pp. 136ff.; Victor, 2007, p. 252; Eriksson, 2009).

This article examines, from a research historical perspective, how ideas of the Late Bronze Age in the eastern Mälaren valley region in central Sweden, more specifically Uppland, have been formed from the late 19th century up to the present day and how views on contacts and interaction, especially with areas in the east, have been an important part in the studies of the Late Bronze Age in the region.

Discovering Uppland's Bronze Age

As in many other places, the prehistoric remains from the Bronze Age in Uppland have for a long time attracted the attention of scholars. Written sources from the 17th century mention the large burial mound and the rectangular shape of a so-called cult/ritual house (at this time it was described as resembling the foundation of a church) at Håga at the outskirts of present-day Uppsala, as well as two sites with rock art in Uppland (Almgren, 1905, p. 3; Einerstam, 1976, p. 9; Kaliff & Oestigaard, 2018). However, it was not until the late 19th century that Uppland's Bronze Age would be studied more in depth. In the work *Bronsålder i norra och mellersta Sverige* ('Bronze Age in northern and central Sweden') from 1871–1873, the well-known archaeologist Oscar Montelius describes in detail the known Bronze Age objects from Uppland, but also other parts of central and northern Sweden. About 30 bronze objects, mainly different kinds of swords, spearheads and axes were at this time known from Uppland (Montelius, 1871–1873, tab B). Graves and settlements from the period were unknown in the area, so only the stone and bronze artefacts could give a picture of the Bronze Age in Uppland. However, compared to the southern parts of Sweden the bronze objects were few.

An interesting aspect of *Bronsålder i norra och mellersta Sverige* is that Montelius not only describes the various artefacts in detail, but also in which context and how they had been found. The objects were furthermore compared with similar bronze items found in other parts of Sweden and Europe. Montelius regarded *Bronsålder i norra och mellersta Sverige* as his first typological work (Gräslund, 1974, p. 168).

At the end of the 19th century, the first graves from the period were excavated at Jordslunda in Alunda parish. In one of the three excavated stone settings were cremated bones, a sherd of pottery and a pair of bronze tweezers (Salin, 1890–1892, p. 112). However, the knowledge of the Bronze Age in Uppland was still very limited, especially of the burial practices and settlements which were still largely unknown (Almgren, 1905; Ekholm, 1911, 1921). In addition, only five sites with rock art had been found (Ekholm, 1921, p. 80; Einerstam, 1976). However, this situation would change during the beginning of the 20th century.

Within a few years at the beginning of the 20th century three well-known Bronze Age sites in Uppland were excavated. The results of the archaeological investigations of the Håga mound (Bondkyrko parish, excavated in 1902–1903), the "Bronze Age hut" in Boda (Breds parish, excavated in 1906) and a cairn at Torslunda (Tierp parish, excavated in 1909) were over a large part of the 20th century very important for the interpretation of Uppland's Bronze Age (Almgren, 1905, 1912; Ekholm, 1921).

The most famous of these prehistoric sites is the so-called Hågahögen or Håga mound, also known as King Björn's mound, located in Håga in the outskirts of Uppsala (Fig. 1). In the Håga valley area there are also many other ancient monuments from the Bronze Age, including several heaps of fire-cracked stones, two "cult/ritual houses" and a "hillfort" (Almgren, 1905; Olausson, 1995; Victor, 2002; Kaliff & Oestigaard, 2018). In the early 20th century, however, only the central parts of the mound and parts of the large "cult house" were examined (Almgren, 1905). The results from the excavations were published in Swedish by Oscar Almgren in 1905 and later translated into English (Kaliff & Oestigaard, 2018).

Before the investigations in Håga began, the mound was believed to be from the Iron Age. A theory was that the large depression on the

Figure 1. The Håga mound, in the outskirts of present-day Uppsala, is probably the most well-known Bronze Age site in Uppland (photo by author).

top of the mound indicated a wooden chamber. It was also compared to the mounds in Old Uppsala, not far from Håga (Almgren, 1905, p. 11; Stenberger, 1964, p. 210). Due to lack of funding, the excavation at Håga focused on the centre of the mound (Almgren, 1905, pp. 11f.). The excavations revealed a very rich grave dating to the Bronze Age period IV. The earth mound was built over a large stone cairn. The cairn contained a wooden "chamber" with a coffin made of an oak tree. In the assumed oak coffin were cremated bones and several objects made of bronze and gold: a sword, a spectacles-shaped brooch, double buttons, razors and tweezers among other objects (Almgren, 1905). It was very unexpected to find such "magnificent" bronze objects as far north as Uppland (Almgren, 1905; Nerman, 1918). Not only were the many artefacts remarkable, but also the structure and construction of the mound. Bronze Age mounds had previously been excavated in Denmark as well as more southern parts of Sweden but were not known from the area. Based on primarily the bronze artefacts Oscar Almgren suggested that there had been strong influences from Denmark and even possible direct contacts between Uppland and Denmark during this period (Almgren, 1905, p. 46).

Although Håga mound is the most well-known prehistoric monument from the Bronze Age in Uppland, an interesting site with at least one early Bronze Age stone setting or cairn (dating to ca. 1500–1300 BC) was examined just a few years later in 1909 at Torslunda in Tierp parish. Unfortunately, Knut Stjerna (1874–1909), who led the investigations in Tierp, died later that year and the results from the excavations were never published (Ekholm, 1921, p. 12). As a result, there is no good documentation from the excavation and the site is very difficult to interpret.

In May 1909, a miniature dagger and a neck collar were found at Torslunda, and shortly thereafter the excavations began at the site (Ekholm, 1921). In a cairn or stone setting

(close to where the other objects were found) a double button, a tutulus and six pendants were found. Some years later, a tutulus was found south of the grave (Ekholm, 1921; Oldeberg 1974). Several researchers have assumed that all these objects are likely to originate from the cairn/stone setting (Oldeberg, 1974; Bergerbrant, 2007, p. 121). What makes this grave special is that, in addition to containing an unusually large amount of bronze objects, many of the objects are typical female objects that are usually found in areas further south. It has been suggested that a woman who originated from southern Scandinavia was buried in the grave (Bergerbrant, 2007, p. 121).

The excavations of the Håga mound and the cairn/stone setting in Torslunda were in many ways very special. Not only were the graves very "rich" and contained many "southern" objects, but they were also among the first graves from the Bronze Age excavated in Uppland. Thus, they provided an insight into the burial practices in the area. From what we know today these graves, and especially the Håga mound, are exceptional in the area. Instead, we usually find graves in cairns, stone settings, heaps of fire-cracked stones and in different stone constructions (e.g., Schönbäck, 1952, 1959; Victor, 2002, 2007; Thedéen, 2004; Eriksson, 2005; Ojala, 2016; Röst, 2016; Ojala & Röst, 2021).

Just a few years after the investigation of the Håga mound, a feature, which was at that time interpreted as Uppland's first known Bronze Age house, or rather hut, was excavated. In 1905, a bronze brooch with an unusual design was found in Boda in Bred parish in south-western Uppland. There were some similarities between the brooch and brooches found in Skåne and the island of Bornholm. The find of the brooch in Boda was therefore seen as a new proof of the close relationship that existed between bronze objects from period IV found in Uppland and in southern Scandinavia (due to the decoration Almgren dated the brooch from Boda as period IV and therefore later then the south Scandinavian equivalent; Almgren, 1912).

Excavations at Boda commenced in the summer of 1906 and an oval stone layer with an overlying layer with pieces of burnt clay was found. This "structure" was interpreted as a hut floor. For a long time the "Bronze Age hut" in Boda became a model for how it was thought the Bronze Age houses in Uppland would have looked (Almgren, 1912; Ekholm, 1921, p. 37; Arwidsson, 1939; Schönbäck, 1952; Stenberger, 1964, p. 294; cf. Victor, 2002, p. 54). The interpretation was later questioned, and it was considered unlikely that the "hut" was a trace of a dwelling house from the Bronze Age. It has been suggested that it was perhaps the remains of a cultic building or a heap of fire-cracked stones (Victor, 2002, p. 54; Thedéen, 2004, p. 42; Larsson, 2006, p. 122). Regardless of what was actually investigated in the summer of 1906, the interpretations of the site as a Bronze Age hut were of great importance for the picture of the Bronze Age in Uppland. It was not until the second part of the 20th century that it became clear that people had lived in longhouses during the period (e.g. Göthberg, 2000, p. 14; Victor, 2006; Östling *et al*., 2008).

The excavations of the mound in Håga, the cairn/stone setting in Torslunda, and the "hut" in Boda had a major impact on the perception of the Bronze Age in Uppland. One reason for this was that before these excavations there had been so few investigations of Bronze Age sites in Uppland that the archaeologists did not know what remains from the Bronze Age usually looked like. However, several well-known sites from the Bronze Age had been investigated in other places in Scandinavia, not least some of the large well-preserved Bronze Age mounds in southern Scandinavia. It was also to the southern Scandinavian material that the archaeologists mainly turned in order to find parallels or explanations of the archaeological material in Uppland.

At Håga, Torslunda and Boda were prehistoric structures as well as artefacts that pointed to southern Scandinavia. The sites would have great significance for

interpretations of the area's Bronze Age (at least until the mid-20th century when more sites from the period were excavated) and especially Uppland's connection and relationship with southern Sweden and southern Scandinavia (Håga has continued to be a very central site in the understanding of the area's Bronze Age). However, shortly after these excavations it was the Mälaren valley's and Uppland's connections to areas eastwards, and especially the Volga-Kama area in Russia, which would come in to focus. The reason for this was the discovery of the distribution of the so-called Mälardalsyxan or Mälar axe/Mälar celt (Fig. 2).

"Eastern expansion" and "the Mälaren valley as a region"

By the end of the 19th century only a few Mälar axes had been found in Sweden (Montelius, 1871–1873, 1917). The distribution of the known Mälar axes was concentrated in the Mälaren valley region and they were at this time seen as local products (Lindqvist, 1913). It was not until the work of the Finnish archaeologist A. M. Tallgren in the early 20th century that the axes in Sweden were associated with the distribution of similar axes in the Volga-Kama region in Russia (Tallgren, 1911a, 1911b, p. 29, 1916). Tallgren regarded the presence of "Mälar axes" in the Volga-Kama region as a result of Scandinavian influences, and theories about some form of Scandinavian colonization in the Volga-Kama region were put forward (Tallgren 1916). These theories were very influential and had a great impact on Swedish archaeology. Several Swedish researchers began to interpret similarities in the archaeological material in the Mälaren valley and the Volga-Kama region as being the result of interaction and contacts between people in the two regions. In the following years many well-known Swedish archaeologists such as Sune Lindqvist, Oscar Montelius, Birger Nerman and Gunnar Ekholm wrote about the distribution of the Mälar axes in the east (Lindqvist, 1913; Montelius, 1917, p. 48; Nerman, 1918; Ekholm, 1921).

> The more I considered the matter, the more I became convinced that the Uppland region during the Late Bronze Age was really in a very lively connection with the large bronze cultural area, the centre of which was near present-day Kazan, and no doubt that the connection mainly consisted of trade relations, which perhaps provided Uppland with its great position of power (the Håga grave, the Mälar axes) during the Late Bronze Age. (Tallgren, 1911b, p. 29; my translation)

Since the Mälaren valley was considered as a prosperous central region during the Late Bronze Age, a theory based on the Håga mound and some rich hoards, wide-ranging networks of contacts which stretched across the Baltic Sea and Scandinavian colonies in Russia, Finland and the Baltic countries fitted well into this image (Tallgren, 1916; Ekholm, 1921; Arbman, 1934, 1938; Nerman, 1954). This is perhaps one of the reasons why eastern contacts became such an important theory during this time period. The so-called Mälar axes were very central in this discussion. This can be illustrated by Holger Arbman who writes:

> Already during period 4, it is noticeable that the Mälaren valley is beginning to become an area with an independent development and of great importance within the Nordic cultural area. Indeed, the magnificent finds from the Håga mound were imported from Danish territory, but they testify to wealth and trade connections. On the other hand, the Mälar axes testify to independent creativity. (Arbman, 1934, p. 206; my translation)

Figure 2. A Mälar axe found in Håga by, Bondkyrka parish, Uppland (photo by author).

Part of the discourse at that time was to draw parallels between the Bronze Age and the Viking Age (e.g., Tallgren, 1916; Arbman, 1934; Nerman, 1918, 1954). These parallels emphasized the image of people from Sweden travelling eastwards, in the Bronze Age as well as the Viking Age. Tallgren's theory of Scandinavian colonies was long-lived in archaeological research in Sweden. Maps describing areas with possible "Scandinavian settlements" or "colonies" in the Volga-Kama region, as well as parts of Finland and the Baltic countries, can be found in articles as late as 1954 (Nerman, 1954; see discussion in Ojala, 2016).

By the mid-20th century, the situation for studying contacts between the Mälaren valley and the Volga-Kama region had changed considerably since the time of Tallgren's earlier works. When opportunities for contact between researchers in the East and the West were closed in the 1930s during the era of Stalin, the situation for archaeologists was also to change drastically (Tallgren, 1936; Klejn, 2012; Salminen, 2017). As a result, research in the Volga-Kama region continued in the Soviet Union but its findings remained little known in Sweden. Tallgren's views therefore lived on unchallenged in Sweden for a considerable time (see discussion in Ojala, 2016).

In the mid-1900s, the idea of Scandinavian colonies in the east was questioned in Swedish archaeology (see e.g., Meinander, 1954, p. 38; Baudou, 1960; Stenberger, 1964, p. 213). At this time the known Bronze Age sites in Uppland were still few, but some prehistoric remains such as heaps of fire-cracked stones (typical for eastern Sweden) had been excavated (Oldeberg, 1960; Bellander, 1938; Arwidsson, 1939). A reason that so few Bronze Age sites were known might be that the archaeologists partly were searching for something that did not exist. For example, Gunnar Ekholm assumed that the majority of graves from the period would

be found as secondary burials in cairns and mounds, "just like in other parts of Scandinavia". He also suggested that many of the urns with cremated bones that had been found in burial mounds could be from the Bronze Age (Ekholm, 1921, p. 73). However, human bones are found in many different contexts, such as cairns, heaps of fire-cracked stones, stone settings, in stone constructions or pits—but very rarely in urns (see Schönbäck, 1952, 1959; Eriksson, 2005, 2009, p. 206; Forsman & Victor, 2007; Ojala, 2020).

In the middle of the 20th century the knowledge of the Bronze Age in Uppland was still poor when in the 1950s a series of excavations on Bronze Age sites in Uppland commenced (Stenberger, 1960, pp. 63, 66). The first of the sites was located at Broby, in Börje parish, not far from Uppsala (Schönbäck, 1952, 1959; Stenberger, 1960, p. 64). The excavations at the large site focused on a few prehistoric features e.g., a cult house, heaps of fire-cracked stones and stone settings, but not the areas in-between the visible features. During the excavations, a large amount of pottery (some considered to be of an "eastern type"), but also casting moulds, crucibles and a few bronze and iron objects were found. However, the most interesting discovery was the very varied burial practice at the site (Schönbäck, 1952, 1959). In the late 1960s and early 1970, new excavations were carried out at Broby (Ojala, 2016).

The second site that was excavated was Darsgärde in Skederid parish (Ambrosiani, 1958, p. 16, 1959, 1964; Stenberger, 1960, p. 66; Reisborg, 1989). The remains from the Bronze Age at Darsgärde were located on a hill (underneath layers from an Iron Age hill-fort), which is uncommon for the area. At the site a large amount of decorated "eastern type of pottery" was found. The large amount of decorated pottery is very unusual in the Uppland area (see Ambrosiani, 1959; Jaanusson, 1981; Reisborg, 1989; Eriksson, 2009, p. 131). It is interesting that the only Mälar axe that is not a stray find was found in a cultural layer at Darsgärde (Ambrosiani, 1958, 1959, 1964). Darsgärde and the pottery from the site have been very central in the discussion about the Mälaren valley's relation to areas in the east, mainly Finland and the Baltic countries, during the Late Bronze Age.

In 1958, excavations started at a large burial site at Dragby in Skuttunge parish, north of Uppsala. The burial site at Dragby is mostly known for a large cairn with a stone cist from the Late Neolithic/Early Bronze Age. In the cairn, that was later enlarged, were also some 20 or so secondary burials from different periods of the Bronze Age. Surrounding the cairn is a large burial ground with graves from primarily the Late Bronze Age and the Early Iron Age (Stenberger, 1960, 1961; Rydh, 1962).

After these excavations, Mårten Stenberger suggested that the Bronze Age in eastern middle Sweden could be interpreted as two different "cultural-geographical structures". One was in the inner part of Uppland with a local expression that was mainly influenced by southern areas, but also to some extent from the east and the south-east, with sites such as Broby. The second was a more "peripheral area" with a strong eastern influence, best demonstrated in Darsgärde (Stenberger, 1960, p. 66).

A Baltic Sea region

As a result of the large-scale road and railway projects undertaken from the 1980s onwards, several large Bronze Age sites such as Apalle, Nibble, Sommaränge Skog and Ryssgärdet were excavated (Ullén, 2003; Forsman & Victor, 2007; Hjärthner-Holdar et al., 2008; Östling et al., 2008; Karlenby, 2011). In addition, throughout the 20th century a large number of sites with rock art have been discovered and documented in the southern parts of Uppland (e.g., Einerstam, 1976; Kjellén & Hyenstrand, 1977; Ling, 2013). As more large sites were excavated, the picture of the period in Uppland became more complex.

Several researchers, working with the Bronze Age in the Lake Mälaren region and Uppland, have emphasized how the area in some aspects, for example the variation in the burial practice, the large amount of heaps of fire-cracked stones, the pottery, some of the bronze artefacts and their manner of deposition, is different from other parts of the country (e.g., Baudou, 1956; Hjärthner-Holdar, 1998; Thedéen, 2004; Bolin, 2005; Victor, 2007, p. 252; Eriksson, 2009). One explanation that has been put forward for some of these differences is that the Lake Mälaren region had contacts and interaction with areas to the east (e.g., Jaanusson, 1981; Hjärthner-Holdar, 1998; Feldt, 2005; Eriksson, 2009). These more recent studies that mainly focus on interactions with areas located on the other side of the Baltic Sea deal with, among other things, Mälar axes, pottery, graves and bronze objects (see Jaanusson, 1981; Feldt, 2005; Eriksson, 2009; Wehlin, 2013).

The distribution of the Mälar axe is still debated, but in a different way than previously. This is partly due to the fact that the present-day known distribution of the axe is very different from that known in the early 20th century and Tallgren's work. Numerous "Mälar axes" (or axes similar to the Mälar axe, usually called Akozinsko-melarskie axes) were found during excavations of large-scale burial grounds in the western part of the Volga-Kama region, including the Akozino and Achmylovo burial grounds (Patrusjev, 1971, 1975, 1984; Patrusjev & Chalikov, 1982; Meinander, 1985; Kuzminych, 1993). The new finds led to a new understanding of the distribution of the axes, and nowadays a greater number of Akozinsko-melarskie axes is known in the Volga-Kama region than Mälar axes in Sweden (Kuzminych, 1993, 1996). Outside Sweden and Russia similar axes are also known from Denmark (Bornholm), Norway, Finland, Belarus and the Baltic countries (e.g., Baudou, 1953, 1960; Kuzminych, 1993; Yushkova, 2011; Melheim, 2015; Ojala, 2016; Lavento, 2019; Paavel et al., 2019; Podėnas & Čivilytė, 2019). There is a large variation within the Mälar axe/Akozinsko-melarskie axe types and only some of the axes in the Volga-Kama area are similar to the Mälar axes found in Sweden (Eriksson, 2009, pp. 248ff.; Ojala, 2016). The origin and the dating of the axes and the relationship between axes found in the different countries are still debated in Swedish archaeology (e.g., Hjärthner-Holdar, 1998; Eriksson, 2009; Ojala, 2016) as well as in many other countries (Yushkova, 2011; Melheim, 2015; Lavento, 2019; Paavel et al., 2019; Podėnas & Čivilytė, 2019)

The interpretation of Swedish colonies, an idea originating in the early 20th century, has long been abandoned. Instead of a "Swedish expansion", many researchers discuss interaction over the Baltic Sea and eastern influences in the Lake Mälar region (e.g., Jaanusson, 1981; Hjärthner-Holdar, 1998; Feldt, 2005; Eriksson, 2009; Wehlin, 2013; Sperling, 2016a, 2016b). Eva Hjärthner-Holdar has in several works discussed the relation between the Mälaren valley and the Volga-Kama area from the point of, for instance, the distribution of the Mälar axes, the striated and textile pottery and early iron objects in Sweden (Hjärthner-Holdar, 1993, 1998). Hjärthner-Holdar is focusing on ideas and technology and how these were transmitted. She argues for eastern influences in the Mälaren region and that this can be connected to the introduction of iron technology in Sweden (Hjärthner-Holdar, 1998). In more recent studies the pottery and especially the surface treatment of the pottery has been analysed (e.g., asbestos-tempered pottery, striated pottery, textile pottery and pottery with decoration; Ambrosiani, 1959; Jaanusson, 1981; Hjärthner-Holdar, 1993; Eriksson, 2009). Excavated sites, with a rich find material of pottery connected with ceramic traditions in areas east of the Baltic Sea, such as Darsgärde in particular, but also Hallunda (in the province of Södermanland) and to some extent Broby, have been very important in this discussion (Ambrosiani, 1958, 1959; Schönbäck, 1952, 1959; Jaanusson, 1981; Reisborg, 1989; Eriksson, 2009). During the Late Bronze Age there is a large variation in the burial practice in the

Lake Mälaren region. Although this has been known for a long time, this issue has been much debated during recent years. There has been an interest in the distribution of the so-called ship settings and tarand graves in the Baltic Sea region (e.g., Feldt, 2005; Lang, 2007; Wehlin, 2013). In the Mälaren region a few excavated stone settings that are constructed of different "cells" have been interpreted as a local version of so-called tarand graves (Modin, 1966, 1973; Bennett, 1975; Feldt, 2005; Lindblom & Spijkerman, 2009).

Concluding remarks

In the archaeological research Uppland has often been seen as a periphery in a south Scandinavian Bronze Age area. However, the region has also been perceived as a prosperous centre located in a border zone with contacts not only towards the south but also the east, and to some extent the north.

As shown in the article, Uppland's relation to other areas has been a recurring topic in Bronze Age research during the 20th century, and many of the questions about contacts and interaction discussed in the early 20th century are still debated within archaeology today. In particular, interaction with areas to the east (regardless of whether this means Finland and the Baltic countries or Russia) has been one way of explaining why the material in Uppland to some extent is different from that in southern Scandinavia. However, during the 20th century, the focus of research has shifted from contacts with the more distant Volga-Kama area in Russia to interaction across the Baltic Sea. These discussions also include other categories of bronze objects, as well as pottery and burial practice.

Even though Uppland's relation to southern Scandinavia always has been seen as very important, researchers who study Bronze Age Uppland also have to take into account the relationship between the Mälaren valley and areas in the east. However, according to Hans Bolin, eastern influences in the Mälaren valley have often been downplayed in favour of southern ones. In doing so, the differences between northern Sweden and the Lake Mälaren area have also been emphasized (Bolin, 2005; see Ojala & Ojala, 2020).

Eastern contacts and interaction have often been perceived in a very different way to southern contacts. During the early part of the 20th century contacts were often seen in a very unproblematic way, as a Swedish expansion or colonization of areas in the east, mostly focusing on the distribution of bronze artefacts and especially the Mälar axe. Very little was discussed about how eastern contacts functioned in practice and what influence they might have had on societies in Uppland, except as a way of explaining the wealth in the area. Even though contacts across the Baltic Sea have been part of this discussion, it is only recently that interaction across the Baltic Sea and eastern influences in the Mälaren region have been discussed in more depth, including a wide range of prehistoric remains. Although the interest in Uppland's relations with other areas has increased during the latter part of the 20th century, many questions remain unanswered and require more in-depth study. However, these studies also need to include contacts with areas further north of Uppland.

Although the present-day state boundaries did not exist in prehistoric times, these boundaries have in many ways influenced the ways in which the past has been studied. 20th-century political history has had an impact on the ways in which eastern contacts have been conceptualized and studied, and from which perspectives this issue has been approached. This is also the case with Bronze Age Uppland. Language differences and problems with gaining access to archaeological research results still sometimes make it difficult to study archaeology across national borders. The lack of knowledge about the archaeology practised in the Soviet Union may be one of the reasons why the interpretations of Scandinavian colonies in the east survived for so long within Swedish archaeology.

Nowadays the field of archaeology is very different from what it was in the beginning of

the 20th century when the distribution of the Mälar axes was interpreted in terms of expansion and colonies. Today there is much greater knowledge about other parts of the archaeological material such as burial practice and settlements, which provides a much more complex picture of the past, unknown to earlier researchers. However, in order to study the prehistory of Uppland and the northern parts of the Lake Mälaren region, it is fundamental to understand how and from which perspectives the Bronze Age in the region has previously been studied.

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References

Almgren, O. 1905. *Kung Björns hög och andra fornlämningar vid Håga*. Stockholm: Kungl. Vitterhets Historie och Antikvitets Akademien.

Almgren, O. 1912. En uppländsk bronsåldershydda. *Fornvännen* 7: 132–151.

Ambrosiani, B. 1958. Darsgärdekomplexet. En preliminär rapport. *Fornvänne*n 53: 161–176.

Ambrosiani, B. 1959. Keramikboplatsen på Hamnbrinken vid Darsgärde. *Tor* 5: 108–128.

Ambrosiani, B. 1964. *Fornlämningar och bebyggelse. Studier i Attundalands och Södertörns förhistoria*. Uppsala: Almqvist & Wiksell.

Arbman, H. 1934. Periferisk bronsålderskultur. *Fornvännen* 29: 203–212.

Arbman, H. 1938. Mälardalen som kulturcentrum under yngsta bronsåldern. In: *Winther-festskrift* (pp. 83–108). Nordling-Christiansen, H. & Globe, P.V. (eds.). Copenhagen: Ejnar Munksgaard.

Arwidsson, G. 1939. Bronsåldersfyndet från Domta vad i Österunda socken. *Upplands fornminnesförenings tidskrift* 46: 65–80.

Baudou, E. 1953. De svenska holkyxorna under bronsåldern. *Fornvännen* 48: 241–261.

Baudou, E. 1956. Regionala grupper i Norden under yngre bronsåldern. *Fornvännen* 51: 19–36.

Baudou, E. 1960. *Die regionale und chronologische Einteilung der jüngeren Bronzezeit im Nordischen Kreis*. Acta Universitatis Stockholmiensis. Studies in North European Archaeology 1. Stockholm: Almqvist & Wiksell.

Bellander, E. 1938. Bålrösen—offerrösen. In: *Kulturhistoriska studier tillägnade Nils Åberg 19 24/7 38.* (pp. 91–100). Stockholm: Generalstabens litografiska anstalts förlag.

Bennett, A. 1975. Nyupptäckta svenska tarandgravar. *Fornvännen* 70: 59–67.

Bergerbrant, S. 2007. *Bronze Age identities: costume, conflict and contact in northern Europe 1600–1300 BC.* Stockholm Studies in Archaeology 43. Stockholm: Stockholm University.

Bolin, H. 2005. Ockuperad förhistoria—om östligt inflytande i den nordiska bronsålderskretsen. In: *Mellan sten och järn del 1* (pp. 217–227). Goldhahn, J. (ed.). Gothenburg: Gothenburg University.

Einerstam, B. 1976. Den uppländska hällristningsforskningens äldre historia. In: *Upplands hällristningar: the rock carvings of Uppland, Sweden* (pp. 9–10). E. Kjellén (ed.). Stockholm: Kungl. Vitterhets Historie och Antikvitets Akademien.

Ekholm, G. 1911. Upplands bronsålder. *Upplands fornminnesförenings tidskrift* 27: 218–254.

Ekholm, G. 1921. *Studier i Upplands bebyggelsehistoria II.* Bronsåldern. Uppsala universitets årsskrift, 1921. Uppsala: Uppsala University.

Eriksson, T. 2005. Human bones in the Bronze Age of Uppland. In: *Dealing with the dead. Archaeological perspectives on prehistoric Scandinavian burial ritual* (pp. 237–260). Artelius, T. & Svanberg, F. (eds.). Stockholm: Riksantikvarieämbetet.

Eriksson, T. 2009. *Kärl och social gestik.* AUN 41. Uppsala: Uppsala University.

Feldt, B. 2005. *Synliga och osynliga gränser. Förändringar i gravritualen under yngre bronsåldern–förromersk järnålder i Södermanland*. Stockholm Studies in Archaeology 37. Stockholm: Stockholm University.

Forsman, C. & Victor, H. 2007. *Sommaränge skog. Begravningar, ritualer och bebyggelse från senneolitikum, bronsålder och folkvandringstid*. SAU Skrifter 18. Uppsala: Societas Archaeologica Upsaliensis.

Göthberg, H. 2000. Uppland från slutet av yngre bronsålder till tidig medeltid. OPIA 25. Uppsala: Uppsala University.

Gräslund, B. 1974. Relativ Datering. Om kronologisk metod i nordisk arkeologi. *Tor* 16.

Hjärthner-Holdar, E. 1993. *Järnets och järnmetallurgins introduktion i Sverige*. Aun 16. Uppsala: Uppsala University.

Hjärthner-Holdar, E. 1998. Samspel mellan olika regioner i Sverige och Rysland under yngre bronsåldern sett utifrån järnteknologins införande. In: *Bronsealder i Norden—Regioner og interaksjon. Foredrag ved det 7. Nordiske bronsealdersymposium i Rogaland 31 August–3 September 1995.* AmS-Varia 33 (pp. 35–43). Løken, T. (ed.). Stavanger: Arkeologisk museum i Stavanger.

Hjärthner-Holdar, E., Eriksson, T. & Östling, A. (eds.). 2008. *Mellan himmel och jord. Ryssgärdet, en guldskimrande bronsåldersmiljö i centrala Uppland*. Arkeologi E4 Uppland—Studier Volym 5. Uppsala: Riksantikvarieämbetet.

Jaanusson, H. 1981. *Hallunda. A study of pottery from a Late Bronze Age settlement in central Sweden.* The Museum of National Antiquities, Studies 1. Stockholm: Historiska museet.

Kaliff, A. & Oestigaard, T. 2018. *Bronze Age Håga and the Viking king Björn. A history of interpretation and documentation from AD 818 to 2018*. OPIA 66. Uppsala: Uppsala University.

Karlenby, L. 2011. *Stenbärarna. Kult och rituell praktik i skandinavisk bronsålder*. OPIA 55. Uppsala: Uppsala University.

Kjellén, E. & Hyenstrand, Å. 1977. *Hällristningar och bronsålderssamhälle i sydvästra Uppland*. Upplands fornminnesförenings tidskrift 49. Uppsala.

Klejn, L. S. 2012. *Soviet archaeology. Trends, schools, and history.* Oxford Studies in the History of Archaeology. Oxford: Oxford University Press.

Kuzminych, 1993 = Кузьминых, С. В., 1993. Меларские кельты Восточной Европы и Фенноскаидии: (к проблеме одной археологической загадки). // *Археологические памятникии среднего поочья. Сборник научных трудов* 3: 61–107.

Kuzminych, S. V. 1996. Osteuropäische und Fennoskandische Tüllenbeile des Mälartyps: ein Rätsel der Archäologie. *Fennoscandia Archaeologica* 13: 3–27.

Lang, V. 2007. *The Bronze and Early Iron Ages in Estonia.* Estonian Archaeology 3. Tartu: Tartu University Press.

Larsson, T. B. 2006. Bronsåldern i Fornvännen 1906–2005: axplock och analys. *Fornvännen* 101: 119–129.

Lavento, M. 2019. Early Metal Age bronze axes in Finland: an overview. Записки Института Истории Материальной Культуры РАН 20. Sankt Petersburg.

Lindblom, C. & Spijkerman, I. 2009. Herresta—*Gravar från yngre bronsålder till vikingatid och en gård från vikingatid till dess avhysning år 1681, RAÄ 114 och 239 Järfälla sn, Uppland: Särskild arkeologisk undersökning*. Arkeologikonsult 2008:2047. Upplands Väsby.

Lindqvist, S. 1913. De svenska holkyxorna från bronsåldern. In: *Opuscula archaeologica Oscar Montelio. Septuagenario dicata D. IX M. SEPT. A. MCMXII* (pp. 79–90). Stockholm: Ivar Hæggström.

Ling, J. 2013. *Rock art and seascapes in Uppland*. Oxford & Oakville: Oxbow Books.

Meinander, C. F. 1954. *Die Bronzezeit in Finland*. Finska fornminnesföreningens tidskrift 54. Helsinki.

Meinander, C. F. 1985. Akozino, Achmylovo och mälaryxorna. *Finskt Museum* 92: 15–34.

Melheim, L. 2015. Late Bronze Age traffic from Volga-Kama to Scandinavia? The riddle of the KAM axes revisited. In: *Archaeometallurgy in Europe III. Proceedings of the 3rd International Conference Deutsches Bergbau-Museum Bochum. June 29–July 1, 2011*. Der Anschnitt. Zeitschrift für kunst und kultur im Bergbau. Beiheft 26 (pp. 193–202). Hauptmann, A. & Modarressi-Tehrani, D. (eds.). Bochum.

Modin, M. 1966. Ett gravfynd från Täby i Uppland. *Fornvännen* 1966: 154–163.

Modin, M. 1973. Tarandgravar i Täby. *Fornvännen* 68: 65–70.

Montelius, O. 1871–1873. *Bronsålder i norra och mellersta Sverige*. Antiqvarisk tidskrift för Sverige. Utgifven af Kongl. Vitterhets historie och antiqvitets akademin 3: 173–433.

Montelius, O. 1917. *Minnen från vår forntid/ordnade och beskfrina af Oscar Montelius. Stenåldern och bronsåldern*. Stockholm.

Nerman, B. 1918. En svensk bosättning i östra Ryssland omkring år 1000 före Kristus. A. M. Tallgrens forskningar om förbindelserna mellan Sverige och Ryssland under yngre bronsåldern. *RIG* 1918: 193–198.

Nerman, B. 1954. Yngre bronsåldern—en första svensk vikingatid. *Fornvännen* 49: 257–285.

Ojala, K. 2016. *I bronsålderns gränsland. Uppland och frågan om östliga kontakter*. OPIA 61. Uppsala: Uppsala University.

Ojala, K. 2020. Inhumationsgravar under yngre bronsåldern och äldsta järnåldern i Uppland. *Fornvännen* 115: 145–155.

Ojala, K. & Ojala, C.-G. 2020. Northern connections: interregional contacts in Bronze Age northern and middle Sweden. *Open Archaeology* 6: 151–171.

Ojala, K. & Röst, A. 2021. Bronsålderns benbruk i östra Mellansverige—med exempel på variation i gravskicket vid Broby och Hallunda. *Fornvännen* 116: 1–16.

Olausson, M. 1995. *Det inneslutna rummet—om kultiska hägnader, fornborgar och befästa gårdar i Uppland från 1300 f Kr till Kristi födelse*. Arkeologiska undersökningar Skrifter 9. Stockholm: Riksantikvarieämbetet.

Oldeberg, A. 1933. *Det nordiska bronsåldersspännets historia: med särskild hänsyn till dess gjuttekniska utformning i Sverige*. Stockholm: Kungl. Vitterhets Historie och Antikvitets Akademien.

Oldeberg, A. 1960. Skälbyfyndet. En boplatslämning från den yngre bronsåldern. Antikvariskt arkiv. 15 (pp. 1–51). Stockholm: Kungl. Vitterhets Historie och Antikvitets Akademien

Oldeberg, A. 1974. *Die ältere Metallzeit in Schweden I & II.* Stockholm: Kungl. Vitterhets Historie och Antikvitets Akademien

Östling A., Eriksson T. & Hjärthner-Holdar, E. 2008. Allt mellan himmel och jord. En introduktion till Ryssgärdet. In: *Mellan himmel och jord. Ryssgärdet, en guldskimrande bronsåldersmiljö i centrala Uppland* (pp. 11–46). Hjärthner-Holdar, E., Eriksson, T. & Östling, A. (eds.). Arkeologi E4 Uppland—Studier Volym 5. Uppsala: Riksantikvarieämbetet.

Paavel, K., Kriiska, A., Lang V. & Kulkov, A. 2019. Three bronze axes with wooden haft remains from Estonia. *Estonian Journal of Archaeology*, 23 (1): 3–19.

Patrusjev, 1971 = Патрушев, В. С. 1971. Кельты старшего ахмыловского могильника и их функциональное назначение. *КСИА АИ СССР. Т.* 128: 37–43.

Patrusjev, 1975 = Патрушев, В. С. 1975. Акозинско-Меларские Кельты Марийского поволжья. *Советская Археология* 3: 28–43.

Patrusjev, 1984 = Патрушев. В. С. 1984. *Марийский край в VII–VI вв. до н.э. (Старший Ахмыловский могильник)*. Йошкар-Ола: Марийское книжное издателство.

Patrusjev & Chalikov, 1982 = Патрушев, В. С. & Халиков, А. Х. 1982. *Волжские Ананьинцы (старший Ахмыловский Могиьник).* Издательство Наука. Москва.

Podėnas, V. & Čivilytė, A. 2019. Bronze casting and communication in the southeastern Baltic Bronze Age. *Lietuvos Archeologija* 45: 169–199.

Reisborg, S. 1989. Die Keramik der Darsgärde-Siedlung, Skederid, Uppland. Eine Chronologische Analyse. In: *Die Bronzezeit im Ostseegebiet. Ein Rapport der Kgl. Schwedischen Akademi eder Literatur Geschichte und Altertumsforschung über das Julita-Symposium 1986*. Kungl. Vitterhets Historie och Antikvitets Akademien (pp. 83–105). Ambrosiani, B. (ed.). Stockholm: Almqvist & Wiksell.

Röst, A. 2016. *Fragmenterade platser, ting och människor. Stenkonstruktioner och depositioner på två gravfältslokaler i Södermanland ca 1000–300 f.Kr*. Stockholm Studies in Archaeology 71. Stockholm: Stockholm University.

Rydh, S. 1962. Dragbygravfältet kring röse 88, *Tor* 8: 45–95.

Salin, B. 1890–1892. Fornminnen i Uppland undersökta sommaren 1890. *Kongl. Vitterhets historie och antiqvitets akademiens månadsblad* 1890: 100–115.

Salminen, T. 2017. Aarne Michaël Tallgren and the international discussion on the Bronze Age of Russia. *Bulletin of the History of Archaeology* 27 (1).2: 1–17.

Schönbäck, B. 1952. Bronsåldershus i Uppland. *Tor* 2: 23–45.

Schönbäck, B. 1959. Bronsåldersbygd i Mälarområdet. *Tor* 5: 52–107.

Sperling, U. 2016a. Visitors to the other side: some reflections on the Baltic Sea as a frontier and contact zone in late prehistory. In: *The dynamics of cultural border*s (pp. 106–132). Kannike, A. & Tasa, M. (eds.). Tartu: University of Tartu Press.

Sperling, U. 2016b. Bronze Age connections across the Baltic Sea: discussing metalwork as source of maritime contacts in prehistory. In: *Marine ventures: archaeological perspectives on human-sea relations* (pp. 399–416). Bjerck, H. B., Breivik, H. M., Fretheim, S. E., Piana, E. L., Skar, B., Tivoli, A. M. & Zangrando, A. F. J. (eds.). Sheffield: Equinox.

Stenberger, M. 1960. Gravfältet vid sockenmötet. Dragby i Skuttunge, orientering och problem. *Tor* 6: 63–86.

Stenberger, M. 1961. Dragbyröset 88. *Tor* 7: 184–190.

Stenberger, M. 1964. *Det forntida Sverige*. Stockholm: Almqvist & Wiksell.

Tallgren, A. M. 1911a. *Die Kupfer- und Bronzezeit Nord- und Ostrussland*. Helsingfors: Helsingfors University.

Tallgren, A. M. 1911b. Bronsåldern i Finland. *Finskt museum* 18: 2–30.

Tallgren, A. M. 1916. Sveriges förbindelser med Ryssland under bronsåldern. *Finsk Tidskrift* 80: 362–374.

Tallgren, A. M. 1936. Archaeological studies in Soviet Russia. *Eurasia Septentrionalis Antiqua* 10: 129–170.

Thedéen, S. 2004. *Gränser i livet—gränser i landskapet. Generationsrelationer och rituella praktiker i södermanländska bronsålderslandskap.* Stockholm Studies in Archaeology 33. Stockholm: Stockholm University.

Ullén, I. (ed). 2003. *Arkeologi på väg—undersökningar för E18. Bronsåldersboplatsen vid Apalle i Uppland. UV Uppsala. Rapport 1997:64.* Hägersten: Riksantikvarieämbetet.

Victor, H. 2002. *Med graven som granne: om bronsålderns kulthus*. Aun 30. Uppsala: Uppsala University.

Victor, H. 2006. Bronsålderns kulthus—ett dateringsproblem i en komplex miljö. In: *Kulthus & Dödshus. De ritualiserade rummens teori och praktik* (pp. 113–122). Anglert, M., Artursson, M. & Svanberg, F. (eds.). Stockholm: Riksantikvarieämbetet.

Victor, H. 2007. Skärvstensbruk och skärvstenskult—ett utryck för regionalitet och kosmologi. In: *Att nå den andra sidan. Om begravningar och ritual i Uppland.* Arkeologi E4 Uppland—studier 2 (pp. 235–254). Notelid, M. (ed.). Uppsala: Riksantikvarieämbetet.

Wehlin, J. 2013. *Östersjöns skeppssättningar: monument och mötesplatser under yngre bronsålder*. Gothenburg: Gothenburg University.

Yushkova, 2011 = Юшкова, М. А. 2011. Новые находки металлических изделий эпохи бронзы на северо-западе России. *Тверской Археологический сборник* 8 (1): 273–288.

Robust longhouses in the west

Bole-walled houses from the Early Bronze Age Periods II–III and their western distribution

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Abstract

During the Nordic Early Bronze Age Period II and early Period III, 1500–1200 BC, south Scandinavia experienced an increase in the construction of barrows and longhouses. Their number, dimensions and the resources involved in their construction had a dramatic effect on the landscape. On the sandy plains of western, central and southern Jutland, longhouses were particularly large and robust structures. Their walls were constructed using the bole-wall technique that involved sturdy vertical posts with horizontal planks in-between—a building tradition that demanded a large quantity of oak timber. On the young moraine landscapes of eastern Jutland and the Danish Isles, houses were built using a more ephemeral wall construction tradition, that often leaves little or no archaeological trace. But what did this regional variation reflect? Why are the large timber-consuming longhouses common in the old glacial landscapes of western Denmark, while they are missing in the central and eastern parts of south Scandinavia? This can hardly be explained simply as a result of resource availability. Pollen analyses from barrows, bogs and lakes in the western parts of Jutland have clearly shown evidence for a more open grass and heath landscape, whereas the heavy moraine soils of eastern Jutland and the eastern Danish Islands seemed to have been much more forested. One could ask if house construction in the western parts of Denmark was actually dependent on timber resources from central and eastern south Scandinavia. The bole-walled longhouses are particularly characteristic to the southern part of Jutland during the Early Bronze Age and their distribution corresponds to that of the largest Early Bronze Age barrows with their iron pans and rich burials. There seems to be an intentional act of conspicuous consumption in the construction of both monumental longhouses and barrows in the south-western part of Denmark during the Early Bronze Age.

Keywords*:* Early Bronze Age, timber-consuming houses, regionality, monumentality, southern Jutland.

From the middle of the Late Neolithic to the earliest Bronze Age, ca. 2000–1500 BC, settlement in central and eastern South Scandinavia was characterized by sturdy and often large two-aisled longhouses. These timber-demanding buildings that were sometimes constructed with bole walls, were primarily distributed along the coastal zones (Nielsen, 1999; Artursson, 2005; Gidlöf *et al*., 2006; Johannsen, 2017; Madsen, 2019, p. 91). In contrast, settlement during this period in Jutland, situated in the western part of south Scandinavia, was characterized by smaller and more flimsy houses that often had sunken floors. Here, the large two-aisled longhouses were rarer, and the majority have been excavated on settlement sites along the fjords and coastal areas in eastern and northern Jutland (Boas, 1993; Geertz, 2007; Kristensen, 2019, p. 198).

This picture changes completely with the final introduction of the three-aisled building tradition in Early Bronze Age Period II. Now, the tradition of timber-consuming longhouses moved westwards into the inland regions of Jutland. In the centuries between 1500 and 1200 BC, settlements in southern, western and central Jutland were homogenic in character, often dominated by uniform three-aisled longhouses with rounded gables and sturdy wall posts placed at a considerable distance from each other. These houses were for the most part built using the bole-wall technique (Fig. 1) that was only represented in Jutland, which is remarkable considering that the distribution area of this house type (Fig. 2) was characterized by open landscapes with limited timber resources. On the other hand, a great part of the inland regions in central and eastern south Scandinavia were forested, but here the number of large houses was comparatively smaller and typically had lighter and less timber-demanding wall constructions (Fig. 2). This rather "irrational" distribution of house types in relation to timber resources will be examined below.

The Early Bronze Age bole-walled house—a short history of research

The Early Bronze Age bole-walled house type was archaeologically recognized and defined during the Højgård excavations near Gram in southern Jutland in the 1980s (Ethelberg, 1987, 1993). However, a few large and robust Bronze Age houses had been excavated in the 1960s and the early 1970s at the sites of Ristoft, Spjald and Bjerg in western Jutland (Becker, 1968, 1972). In his interpretation of the longhouse from Bjerg, measuring 33 x 8 m, which at the time was the largest Bronze Age house excavated in Scandinavia, C. J. Becker suggested that the walls were constructed with planks rather than wattle and daub (Becker, 1972, p. 16). His interpretation was based on the great distance between the wall postholes and the lack of burnt clay in the features. The first excavated Bronze Age "halls" in western Jutland were originally dated to the Late Bronze Age because of pottery found in outlying pits on the sites. During the 1980s and 1990s, an increasing number of three-aisled houses with similar characteristics were excavated, and often these examples were radiocarbon dated to the Early Bronze Age. For this reason, Per Ethelberg redated the houses from Becker´s excavations to the Early Bronze Age (Ethelberg, 1987, p. 164), and he classified the robust house type as a bole-walled construction. Furthermore, Ethelberg noticed some regional variations in southern Jutland and south Schleswig, despite the then-limited number of excavated houses. Here, the bole-walled house type seemed to be built on the sandy plains and hill islands of the old moraine landscape to the west, while houses with lighter constructions like stave walls, wattle and daub, etc. were raised on the hillier and clay-dominated young moraine to the east (Ethelberg, 2000, p. 186).

Today, the number of Early Bronze Age houses known in Denmark has increased dramatically. However, it still seems that

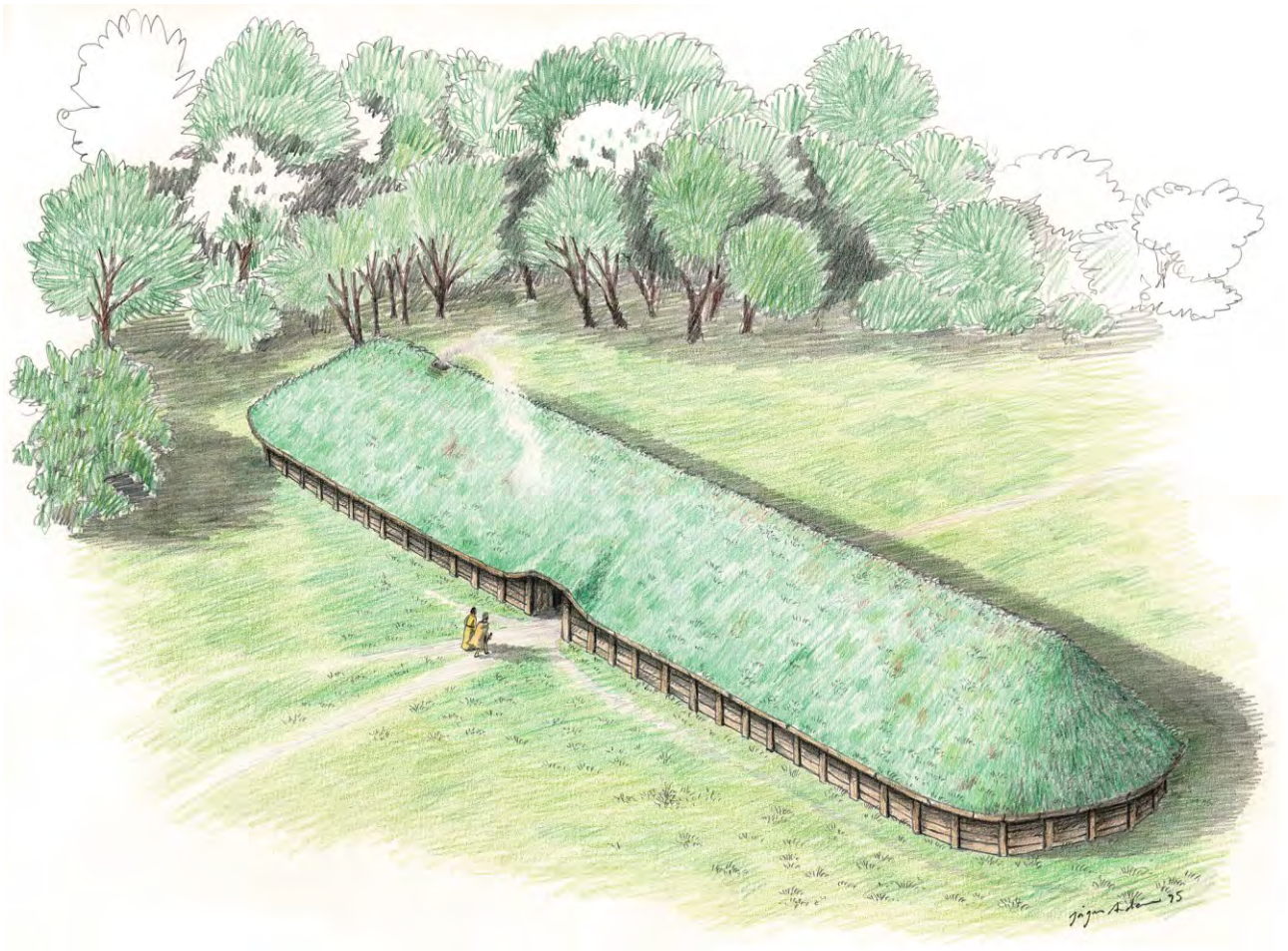

Figure 1. Reconstruction of an Early Bronze Age bole-walled longhouse. This building tradition with vertical posts and horizontal planks was very timber-consuming. Drawing: J. Andersen, after P. Ethelberg, Museum Sønderjylland—Arkæologi Haderslev.

Ethelberg was right in his observations, and now the regionality of this house type can be studied in a broader scale, which will be demonstrated in the following article. But before I proceed, it is worth discussing the defining characteristics of bole-walled architecture.

Is the established interpretation still valid?

How do we know for certain whether our interpretations of prehistoric buildings as bole-walled houses are correct? Is it possible to document this type of architecture archaeologically, when only the postholes are preserved? In my opinion, there is strong archaeological evidence for this timber-demanding architecture as demonstrated by numerous recent excavations.

The distance between the wall postholes of 1.5–2.5 m in Early Bronze Age houses corresponds well with historically documented, and in several cases, still-standing structures with bole walls from the 16th to the 19th centuries AD (e.g., Sørensen, 2015). Furthermore, burned clay remains from wattle-and-daub walls have so far not been recorded in these robust longhouses from the Late Neolithic and Early Bronze Age. What has been found, on the other hand, are some clay strips with finger and plank impressions that have been interpreted as caulking or

insulation material that was likely pressed in-between the horizontal planks (Boas, 1991, p. 96, 1997, p. 22).

In recent years, new observations in well-preserved remains of Early Bronze Age houses in western and southern Jutland have revealed post impressions in wall postholes with central, narrow features that have the same orientation as the straight longwalls and rounded gables. In other words, these features represent the traces of horizontal planks with a thickness of 5–10 cm that were fixed on to the vertical posts (Frandsen & Jørgensen, 2012, p. 30; Poulsen, 2019a, p. 7, 2019b, p. 9). These recent observations clearly support the interpretation of the existence of bole-walled architecture in the Nordic Early Bronze Age.

Intense exploitation of resources

According to charcoal analyses from numerous Bronze Age settlement sites in Jutland, the three-aisled houses of the bole-wall type were constructed with oak timber. Preserved, unburnt building timbers from Early Bronze Age houses have so far only been recorded at the settlement of Bjerre Enge in Thy, north-western Jutland. Here, a couple of medium-sized houses with a light wall construction contained different types of wood that were collected from scrubland and as driftwood from the beach area in the deforested region of Thy (Bech, 1997, p. 8; Christensen, 1999, p. 8; Malmros, 2018).

In contrast, the bole-walled houses needed suitable oak timber of high quality. A large, but still an almost ordinary sized Early Bronze Age building like the Legård house III from Thy, measuring about 33 x 8 m, would need more than 150 oak trees of different ages (Holst *et al*., 2013, p. 16; Draiby, 2018). The construction process was indeed complex, labour- and time-consuming, from selecting and cutting the logs to the often-long transportation of the wood and finally the building activity at the settlement. This demanded a well-structured organization involving many people, not far from that of the contemporary barrow constructions, where vast areas of grass- and heathlands were used as building material. It has been estimated that ca. 240,000 houses were constructed in Denmark during Periods II–III (Holst *et al*., 2013, p. 21). This gives us a clear impression of the intense pressure on high forest in these centuries. However, it was not everywhere in the country that the most timber-consuming longhouses were constructed.

The three-aisled Early Bronze Age houses and their distribution in Denmark

The author of this article has collected 240 excavated house finds of the bole-wall type and 80 houses with lighter wall constructions from publications, reports and the Danish Sites & Monuments database. At least 25–30 more Early Bronze Age houses have been excavated in Denmark, but these unpublished examples are temporarily excluded because of very brief and inadequate descriptions in the mentioned database.

The distribution map (Fig. 2) shows clearly that the most timber-consuming houses were constructed in Jutland. Here, the bole-walled tradition favoured the old glacial landscapes of western, central and the northern part of southern Jutland with its sandy plains and hilltops. This area was completely dominated by these oak-built longhouses. In contrast, further south and not least in northern Jutland, a greater variation in house types was predominant (Fig. 2). Only a very few bole-walled houses have been excavated on the clay-dominated and hilly young moraine landscapes of eastern Jutland, and the Danish Isles further east are still missing the most timber-consuming house type. This picture is clarified by the fact that the bole-walled tradition in Early Bronze Age Periods II–III seems to be absent in Sweden as well. In other words, the distribution clearly demonstrates

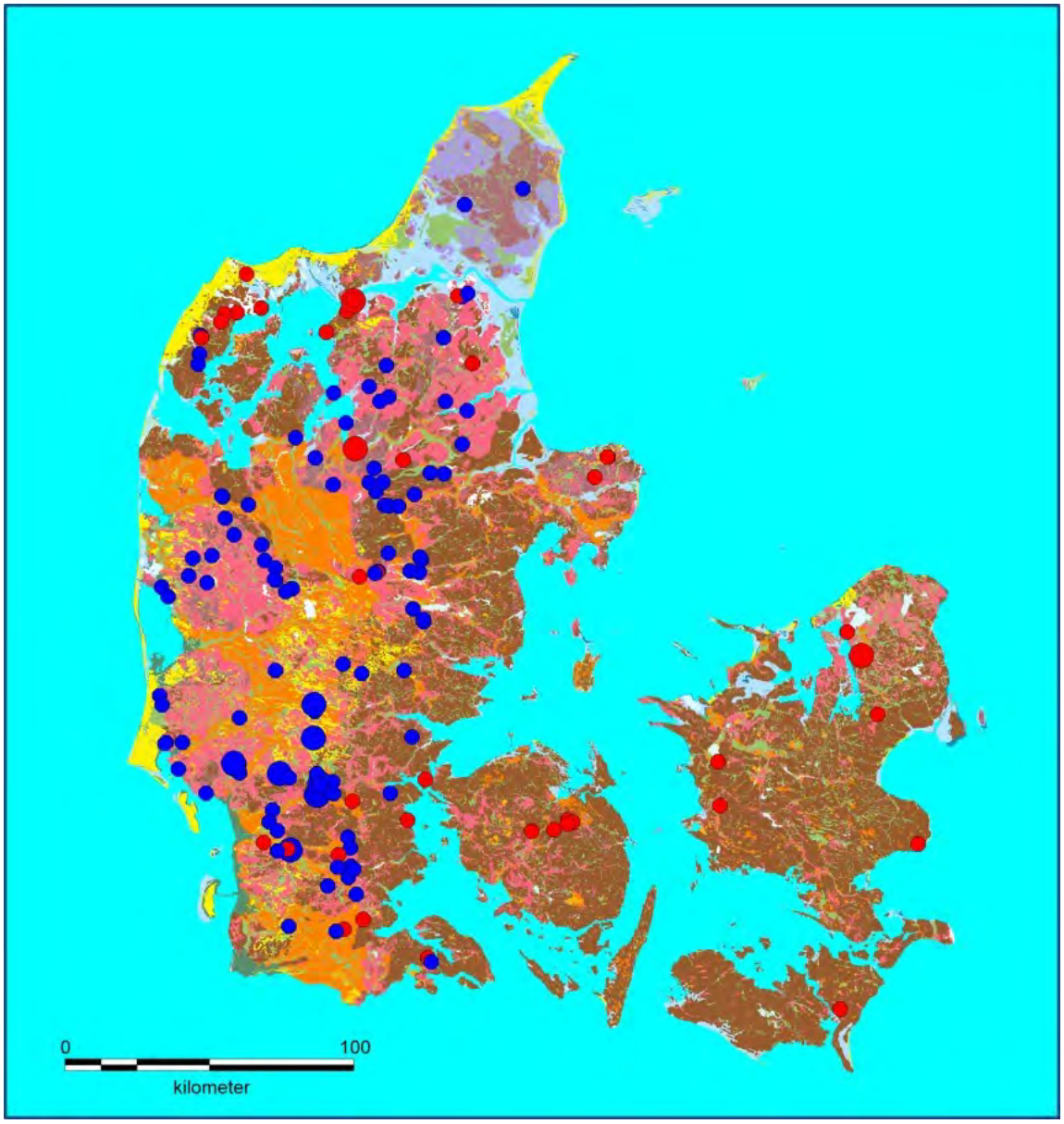

Figure 2. Geological map showing the distribution of three-aisled houses from the Early Bronze Age Periods II–III in Denmark. Bole-walled houses are marked with blue circles, while houses with lighter and less timber-consuming wall constructions are marked with red circles. The large ones indicate more than five houses. The brown areas represent the young moraine, while the orange area in the south-western part of the country is the old glacial landscape. Illustration: S. R. Dollar/M. E. Poulsen after The Geological Survey of Denmark and Greenland.

that the three-aisled house type with bole walls was a Jutlandic phenomenon in the Early Bronze Age. Here, the south-western part apparently represented the central area (Fig. 2).

The three-aisled Early Bronze Age houses with less timber-demanding wall constructions typically had wattle and daub or tiny staves complementing the vertical posts. This is archaeologically indicated by closely spaced postholes and narrow trenches respectively. Furthermore, burnt clay remains from wattle-and-daub constructions have been excavated in a few houses from eastern Denmark (e.g., Pedersen, 1987, p. 171). Additionally, 25% of the three-aisled houses from northern Jutland, the area of young moraine in eastern Jutland,

and the Danish Isles, lack traces of the walls and gables, which indirectly indicate flimsy and shallow wall constructions. In addition, when houses were protected under barrows, they can be poorly preserved as well (Pedersen, 1987).

Intense cultivation in modern times on the islands of Funen, Zealand and in the south Swedish region of Scania could theoretically explain the absence of bole-walled houses. However, ploughing can hardly be the reason why the most timber-consuming house type is not yet represented in central and eastern south Scandinavia, as the postholes in the longwalls and gables were often dug deep into the subsoil, sometimes even deeper than the inner roof-bearing posts (Ethelberg, 2000, p. 181; Bech & Haack Olsen, 2013, p. 12; Poulsen & Dollar, 2015, p. 9). Furthermore, some of the sturdy two-aisled longhouses from the Late Neolithic and earliest Bronze Age in eastern Jutland, Scania, and on Bornholm were most likely constructed with bole walls (Boas, 1991, p. 96; Nielsen, 1998, p. 22). However, this should be recognizable in the later three-aisled house structures in these regions as well. The house types with lighter wall constructions may still be underrepresented, as the lesser well-preserved examples are sometimes given a lower priority during research, and therefore they are not precisely dated. The bole-walled and generally more well-dated house type should be recognizable almost everywhere because of its robust character. Therefore, it is reasonable to interpret the distribution as a representative picture, even though it should still be seen as an interim result.

Timber-demanding architecture in deforested regions

In Per Ethelberg´s above-mentioned early attention to regional variations in southern Jutland, he explains the different types of wall construction as a result of available resources. In the western areas there would be forestlands with plenty of good building timber, and the eastern parts of southern Jutland contained clay material suitable for the wattle-and-daub constructions (Ethelberg, 2000, pp. 186–187). However, in the sandy areas west of the young moraine, timber was hardly available in sufficient quantities. Regional and local pollen analyses from lakes, bogs and barrows in the western parts of Jutland all show evidence for open grass and heath landscapes in the Early Bronze Age (Odgaard, 1985, 1991, 1994; Karg, 2008). Furthermore, the numerous barrows constructed with turves from grass- and heathlands indicate a domination of treeless landscapes (Holst, 2013, p. 32). A large barrow, measuring, for example, 30 m in diameter and with a height of 7 m, would need ca. 225,000 turves, corresponding to 2–3 hectares of open land (Holst & Rasmussen, 2015, p. 128). This resulted in a serious degredation of farmland, and the stripped areas needed decades to regenerate, which indeed gives a clear impression of open and barren landscapes. Additionally, some macrofossil-analysed cooking pits from Early Bronze Age houses in southern Jutland have shown that twigs and heather turves were used for fuel instead of timber (Poulsen, 2014, p. 33). Similar results have been documented in Thy (Holst *et al*., 2013, p. 18; Malmros, 2018).

The heavy moraine in the eastern parts of Jutland and the Danish Isles were much more forested (Holst 2013, p. 32; Holst *et al*., 2013, p. 7). The barrows and settlements were primarily distributed along the coastal areas and fjords of Funen and Zealand, while the inland areas were sparsely settled during the Bronze Age (Fig. 2). Even if some areas in the old glacial landscapes of Jutland theoretically had been forested to a lesser extent, the great number of bole-walled houses clearly shows that building timber was not available in sufficient quantities. The settlements in western Denmark therefore probably needed to import suitable timbers from the young moraine in the east. In the southern part of

Figure 3. Map of iron-pan encapsulated barrows from the Early Bronze Age with a distinction between those with well-defined iron-pan encapsulation and those with uncertain or weakly developed pans. Graphics: Lars Foged Thomsen. After Holst et al., 2015, p. 260.

Jutland and further north in the Viborg area numerous bole-walled houses were situated at a short distance from the Jutland Ridge, which represents the border between the old glacial landscape and the young moraine (Fig. 2). Here, the transportation of timber would be relatively easy and manageable.

In this context, I could mention the bog complex of Abkaer in southern Jutland, situated where the old and young moraine meet. Pollen diagrams have shown that this area was forested until the end of the Early Bronze Age (Aaby, 1990, p. 133). In the areas further west, the heavy building timbers were

most likely an object of long-distance exchange. In this article, the hypothetical export of timber goes from the hilly and clay-dominated eastern and central parts of Denmark to the sandy plains in the western regions. However, it has been suggested that Thy in north-western Jutland would import timber for boats and longhouses from Rogaland in south-west Norway (Ling *et al*., 2018, pp. 9ff.).

It seems rather irrational that people on the young moraine of Denmark or other forested regions in Scandinavia did not embrace the bole-walled architecture in the Early Bronze Age, as they seemed to do more often in the Late Neolithic. Large parts of eastern Jutland and the Danish Isles were characterized by high forest, where oak timber was available in sufficient quantities (Andersen, 1985, p. 99; Aaby, 1985, p. 71, 1994, p. 40; Meier, 2000, p. 35). Nevertheless, timber-saving construction types like stake or wattle and daub were preferred in these areas. The inhabitants of the high forest areas probably made economic profits by exporting oak timber to the rich settlements in the deforested parts of western Denmark. However, we still need to examine why people in regions dominated by grass- and heathlands preferred a timber-consuming house architecture.

The bole-walled house as a monument of prestige

The northern part of Jutland represents a geologically more varied region with young moraine, glacial sand and raised sea-beds. In contrast to the regions further south and east, northern Jutland had a greater variation in house types as well (Fig. 2). Here, the bole-walled constructions represented the largest longhouses (e.g., Nilsson, 1996; Earle et al., 1998, p. 19). These monuments were placed in prominent locations on the sites and could even accommodate high-status objects like bronze artefacts, hoards of bronze, and remains from bronze casting (Nilsson, 1996, pp. 150ff.; Kristensen, 2015, p. 115; Mikkelsen, 2019, p. 48). In contrast, so far only one case of an Early Bronze Age medium-sized longhouse with a light wall construction has contained objects of bronze (Haack Olsen & Earle, 2018, pp. 104–105).

Further south, where the bole-walled tradition was almost fully integrated, metal objects found in houses seems to be a rarer phenomenon. However, a bronze belt plate dated to Period II was recently excavated in a large bole-walled longhouse from southern Jutland (Riis, 2015, p. 111). Even though metal objects from Early Bronze Age houses are generally rare, these examples may emphasize the special significance of bole-walled architecture, as almost every bronze object is related to the timber-consuming house type.

In southern, western and central Jutland houses of varied dimensions were constructed with bole walls. However, the settlement sites with the largest longhouses were located at significant places in the landscape, which were elevated and/or strategic in relation to potential land-routes and waterways like the larger streams (Nielsen, 1998, p. 26; Riis, 2015, p. 111; Grundvad et al., 2015, p. 63; Poulsen, 2017, p. 18). In some of these communicative locations, clusters of bole-walled houses have been excavated, which may represent some kind of permanent farm in several phases (Ethelberg, 1993; Poulsen & Dollar, 2015; Bech, 2018, p. 90).

The same pattern can be seen in the burials from Periods II–III, where the largest barrows were also placed in the most prominent locations in the landscape. They were meant to be visible from a long distance and to the travellers along the roads and streams (e.g., Boye, 1896, p. 65; Prangsgaard et al., 1999; Holst et al., 2004). The geographical distribution of the richest and largest barrows in Denmark and northern Germany—the burial mounds with iron-pan encapsulations—clearly shows a concentration in southern Jutland (Holst et al., 2015, p. 260 fig. 3). In the same

region, the largest number of bole-walled houses could be found, as they form a clear concentration in this area (Fig. 2). Additionally, the largest Bronze Age longhouses ever found in Scandinavia were excavated in southern Jutland, where the dimensions of the bole-walled monuments reach 50 x 10 m (Jensen, 1997; Ethelberg, 2000, pp. 177ff.). The monumentalization of the landscape in Period II is remarkable everywhere in south Scandinavia, but in southern Jutland there seemed to be a special need to highlight and mark the terrain with large barrows and longhouses.

Southern Jutland as a region of special significance in Early Bronze Age Periods II–III

The above-mentioned similarities and coincidences are hardly accidental. Southern Jutland was clearly a region of special importance in the Early Bronze Age. This should probably be explained by the topography and from a geographical position. The Jutland Ridge (along which ran "the Ancient Road") had a more or less north-south orientation from the Viborg area in the north to the Jelling area in south-eastern Jutland, and the same direction of the prehistoric main road can be seen from the Åbenrå area in southern Jutland and further south to northern Germany. However, between these regular routeways, the landscape changes and the possible roads that were often flanked by barrows, run in all directions (Müller, 1904; Johansen *et al*., 2004; Knudsen, 2006, p. 12; Holst & Rasmussen, 2013). This area has therefore been described as the delta of the Ancient Road (Becker-Christensen, 1981, p. 81). Additionally, the routeways meet numerous streams, with the Kongeå river as the largest watercourse. There is therefore no doubt that this part of southern Jutland represented a communicative junction. Geographically, the region represented a physical threshold between Scandinavia and the Continent as well.

Therefore, it seems logical that southern Jutland played an important role when the European exchange network peaked in Early Bronze Age Period II (1500–1300 BC). Here, the elites that constructed the expensive bole-walled longhouses controlled and distributed the products of import and export. In the southernmost part of Jutland, close to the German border, the number of bole-walled houses is reduced (Fig. 2), and in south Schleswig the three-aisled houses with light wall constructions dominate (Bokelmann, 1977; Ethelberg, 2000, p. 186; Meier, 2013). Even the large barrows with iron pans become rarer (Fig. 3). This adjacent north German region represents a strategic area as well. Could the reduced number of monuments reflect that this area did not represent the same level of a communicative junction as the northern part of southern Jutland?

Conclusion

The adoption of three-aisled house architecture has often been explained as the result of the need for a larger byre for cattle-stalling within the longhouse (e.g., Ethelberg, 2000, p. 192; Kristiansen, 1998). However, similarities rather than differences have been documented in the internal arrangements of the late two-aisled and early three-aisled houses (Grundvad *et al*., 2015; Poulsen, 2017, p. 12). The argument that there was a direct link between indoor stalling and the introduction of three-aisled architecture is based on limited data, as the actual number of Danish Bronze Age houses with clear evidence for cattle stalls so far is 20, only seven of which date to the Early Bronze Age (Bech & Haack Olsen, 2013, pp. 19ff.). Furthermore, there was clear knowledge of the three-aisled roof construction technique before 1500 BC, which raises the question, why the development towards three-aisled domination did not take place centuries earlier. It is hard to find plausible explanations for the three-aisled "revolution" in the internal arrangements of the longhouses. The

additional space would rather be used for social gatherings than a general need for larger byres or storage areas, and the early three-aisled monuments should most likely be seen as communicative points in the landscape. Their interaction with the large barrows at visible and significant places in the landscape, which were elevated and/or strategic in relation to water- and land-routes, make it clear that the large three-aisled longhouses represented more than just ordinary farms. The bole-walled architecture was an expression of power and prestige, as the larger houses were visible monuments made of expensive and often imported materials.

This article is a preliminary synthesis of Early Bronze Age settlements in Denmark and what the remarkable regional variation in Periods II–III may reflect. The centuries between 1500 and 1200 BC represent a period when monumentality reached its peak. This is not only reflected in the large dimensions of longhouses and barrows, but also in significant role played by the locations in the landscapes. I will continue the collection and registration of three-aisled Early Bronze Age houses, and hopefully it will be possible to extend the geographical area. This will either support the preliminary distribution picture or make it considerably more complex.

References

Aaby, B. 1985. Norddjurslands landskabsudvikling gennem 7000 år. Belyst ved pollenanalyse og bestemmelse af støvindhold i højmosetørv. *Fortidsminder. Antikvariske studier* 7: 60–84.

Aaby, B. 1990. Pollen og jordstøv fortæller om fortidens landbrug. *Nationalmuseets Arbejdsmark* 1990: 130–140.

Aaby, B. 1994. Skovene i forhistorisk tid. *Bol og By* 1994 (1): 26–50.

Andersen, S. T. 1985. Natur- og kulturlandskaber i Næsbyholm Storskov siden istiden. *Fortidsminder. Antikvariske studier* 7: 85–107.

Artursson, M. 2005. Byggnadstradition. In: *Bronsåldersbygd 2300-500 f.Kr.* (pp. 20–83). Lagerås, P. & Strömberg, B. (eds.). Skånska spår—arkeologi längs Västkustbanan. Lund.

Bech, J.-H. 1997. Bronze Age settlements on raised sea-beds at Bjerre, Thy, NW-Jutland. In: *Forschungen zur bronzezeitlichen Besiedlung in Nord- und Mitteleuropa* (pp. 3–15). Assendorp, J. J. (ed.). Internationale Archäologie Band 38. Espelkamp.

Bech, J.-H. 2018. Fårtoft 6 og bronzebebyggelsen i Thy—Status og perspektiver efter endnu en udgravningskampagne i Thisted. In: *Status og samfundsstruktur i yngre bronzealders kulturlandskab* (pp. 77–100). Boddum, S. & Terkildsen, N. (eds.). Yngre bronzealders kulturlandskab 6. Tarm.

Bech, J.-H. & Haack Olsen, A.-L. 2013. Early Bronze Age houses from Thy, northwest Denmark. In: *Siedlungen der Bronzezeit. Beiträge zur Siedlungsarchäologie und Paläoökologie des zweiten vorchristlichen Jahrtausends in Südskandinavien, Nord-deutschland und den Niederlanden* (pp. 9–32). Willroth, K.-H. (ed.). Studien zur nordeuropäischen Bronzezeit Band 1. Neumünster.

Becker, C. J. 1968. Bronzealderhuse i Vestjylland. *Nationalmuseets Arbejdsmark* 1968: 79–88.

Becker, C. J. 1972. Hal og hus i yngre bronzealder. *Nationalmuseets Arbejdsmark* 1972: 5–16.

Becker-Christensen, H. 1981. *Hærvejen i Sønderjylland—et vejhistorisk studie. Fra Kongeåen til Danevirke*. Vojens.

Boas, N. A. 1991. Bronze Age houses at Hemmed Church, East Jutland. *Journal of Danish Archaeology* 8: 88–107.

Boas, N. A. 1993. Late Neolithic and Bronze Age settlements at Hemmed Church and Hemmed Plantation, East Jutland. *Journal of Danish Archaeology* 10: 119–135.

Boas, N. A. 1997. Settlements and fields covered by sand drift in the Bronze Age, Djursland, east Jutland. In: *Forschungen zur bronzezeitlichen Besiedlung in Nord- und Mitteleuropa* (pp. 16–28). Assendorp, J. J. (ed.). Internationale Archäologie Band 38. Espelkamp.

Bokelmann, K. 1977. Ein bronzezeitlicher Hausgrundriss bei Handewitt, Kreis Schleswig-Flensburg. *Offa* 34: 82–87.

Boye, V. 1896. *Fund af Egekister fra Bronzealderen i Danmark. Et monografisk Bidrag til Belysning af Bronzealderens Kultur*. Copenhagen.

Christensen, K. 1999. *Artsbestemmelse m.v. af bygningstømmer fra bronzealderbopladsen Bjerre plads 6 i Thy*. Nationalmuseets Naturvidenskabelige Undersøgelser, NNU Rapport 13. Copenhagen.

Draiby, B. 2018. Legaard house III. In: *Bronze Age settlement and land-use in Thy, northwest Denmark 2* (pp. 531–533). Bech, J.-H., Eriksen, B. V. & Kristiansen, K. (eds.). Jutland Archaeological Society Publications 102. Gylling.

Earle, T., Bech, J.-H., Kristiansen, K., Aperlo, P., Kelertas, K. & Steinberg, J. 1998. The political economy of Late Neolithic and Early Bronze Age society: the Thy Archaeological Project. *Norwegian Archaeological Review* 31 (1): 1–27.

Ethelberg, P. 1987. Early Bronze Age houses at Højgård, southern Jutland. *Journal of Danish Archaeology* 5: 152–167.

Ethelberg, P. 1993. Two more house groups with three-aisled long-houses from the Early Bronze Age at Højgård, south Jutland. *Journal of Danish Archaeology* 10: 136–155.

Ethelberg, P. 2000. Bronzealderen. In: *Det Sønderjyske Landbrugs Historie. Sten- og Bronzealder* (pp. 135–280). Madsen, L. S. & Madsen, O. (eds.). Skrifter fra Historisk Samfund for Sønderjylland 81. Haderslev.

Frandsen, L. B. & Jørgensen, P. K. 2012. Årets arkæologi. *Opdatering—Årbog for Museet for Varde By og Omegn & Ringkøbing-Skjern Museum*: 21–44.

Geertz, N. 2007. Nr. Uttrup—et langhus fra senneolitikum. *Nordjyllands Historiske Museum Årsberetning*: 32–34.

Gidlöf, K., Dehman, K. H. & Johansson, T. 2006. *Almhov—delområde 1. Rapport över arkeologisk slutundersökning*. Citytunnelprojektet Rapport 39. Malmö.

Grundvad, L., Poulsen, M. E. & Andreasen, M. H. 2015. Et monumentalt midtsulehus ved Nørre Holsted i Sydjylland. Analyse af et langhus fra ældre bronzealder periode I. *Kuml* 2015: 49–75.

Haack Olsen, A.-L. & Earle, T. 2018. Bjerre 6. In: *Bronze Age settlement and land-use in Thy, northwest Denmark 2* (pp. 89–109). Bech, J.-H., Eriksen, B. V. & Kristiansen, K. (eds.). Jutland Archaeological Society Publications 102. Gylling.

Holst, M. K. 2013. South Scandinavian Early Bronze Age barrows—a survey. In: *Skelhøj and the Bronze Age barrows of southern Scandinavia 1. The Bronze Age barrow tradition and the excavation of Skelhøj* (pp. 27–128). Holst, M. K. & Rasmussen, M. (eds.). Jutland Archaeological Society Publications 78. Højbjerg.

Holst, M. K. & Rasmussen, M. 2013. Herder communities: longhouses, cattle and landscape organization in the Nordic Early and Middle Bronze Age. In: *Counterpoint: essays in archaeology*

and heritage studies in honour of Kristian Kristiansen (pp. 99–110). Bergerbrant, S. & Sabatini, S. (eds.). BAR International Series 2508. Oxford.

Holst, M. K. & Rasmussen, M. 2015. The barrow gathering. In: *Skelhøj and the Bronze Age barrows of southern Scandinavia 2. Barrow building and barrow assemblies* (pp. 127–136). Holst, M. K. & Rasmussen, M. (eds.). Jutland Archaeological Society Publications 89. Højbjerg.

Holst, M. K., Rasmussen, M. & Breuning-Madsen, H. 2004. Skelhøj. Et bygningsværk fra den ældre bronzealder. *Nationalmuseets Arbejdsmark* 2004: 11–23.

Holst, M. K., Rasmussen, M., Kristiansen, K. & Bech, J.-H. 2013. Bronze Age "herostrats": ritual, political and domestic economies in Early Bronze Age Denmark. *Proceedings of the Prehistoric Society* 79: 1–32.

Holst, M. K., Breuning-Madsen, H. & Rasmussen, M. 2015. The iron pans and the barrow construction. In: *Skelhøj and the Bronze Age barrows of southern Scandinavia 2. Barrow building and barrow assemblies* (pp. 249–285). Holst, M. K. & Rasmussen, M. (eds.). Jutland Archaeological Society Publications 89. Højbjerg.

Jensen, S. 1997. Bronzealder set fra luften—et usædvanligt hus fra ældre bronzealder. *By, marsk og geest* 9: 5–8.

Johannsen, J. W. 2017. Mansion on the hill—a monumental Late Neolithic house at Vinge, Zealand, Denmark. *Journal of Neolithic Archaeology* 19: 1–28.

Johansen, K. L., Laursen, S. T. & Holst, M. K. 2004. Spatial patterns of social organization in the Early Bronze Age of south Scandinavia. *Journal of Anthropological Archaeology* 23 (1): 33–55.

Karg, S. 2008. Direct evidence of heathland management in the Early Bronze Age (14th century BC) from the gravemound at Skelhøj in western Denmark. *Vegetation History and Archaeobotany* 17 (1): 41–49.

Knudsen, S. A. 2006. Landskabet. In: *Folding Sogn i fortid og nutid* (pp. 8–32). Christensen, P., Jensen, P.M. & Bolvig, T. (eds.). Jelling: Historisk Arkiv for Brørup og Omegn.

Kristensen, I. K. 2015. Spor efter bronzehåndværk i Salling og Fjends. In: *Bronzestøbning i yngre bronzealders lokale kulturlandskab* (pp. 107–119). Boddum, S., Mikkelsen, M. & Terkildsen, N. (eds.). YBK 5. Tarm: Viborg & Holstebro Museum.

Kristensen, I. K. 2019. Two-aisled house sites without sunken floors from Salling, Fur and Fjends. In: *Houses for the living. Two-aisled houses from the Neolithic and Early Bronze Age in Denmark. Volume 1—text* (pp. 189–202). Sparrevohn, L. R., Kastholm, O. T. & Nielsen, P. O. (eds.). Nordiske Fortidsminder 31.1. Copenhagen.

Kristiansen, K. 1998. The construction of a Bronze Age landscape. Cosmology, economy and social organisation in Thy, northwestern Jutland. In: *Mensch und Umwelt in der Bronzezeit Europas* (pp. 281–291). Hänsel, B. (ed.). Kiel.

Ling, J., Earle, T. & Kristiansen, K. 2018. Maritime mode of production. Raiding and trading in seafaring chiefdoms. *Current Anthropology* 59 (5): 1–37.

Madsen, M. 2019. The typology of house remnants. Two-aisled houses on south-east Zealand and Møn. In: *Houses for the living. Two-aisled houses from the Neolithic and Early Bronze Age in Denmark. Volume 1—text* (pp. 81–94). Sparrevohn, L. R., Kastholm, O. T. & Nielsen, P. O. (eds.). Nordiske Fortidsminder 31.1. Copenhagen.

Malmros, C. 2018. Resource problems in a treeless cultural landscape. Investigations of building timbers and charcoal from the Bronze Age settlements at Bjerre Enge, Thy. In: *Bronze Age settlement and land-use in Thy, northwest Denmark 1* (pp. 231–250). Bech, J.-H., Eriksen, B. V. & Kristiansen, K. (eds.). Jutland Archaeological Society Publications 102. Gylling.

Meier, D. 2000. Sønderjylland fra natur- til kulturlandskab. In: *Det Sønderjyske Landbrugs Historie. Sten- og Bronzealder* (pp. 11–62). Madsen, L. S. & Madsen, O. (eds.). Skrifter fra Historisk Samfund for Sønderjylland 81. Haderslev.

Meier, D. 2013. Eine Siedlung der älteren Bronzezeit in Schleswig-Holstein. In: *Siedlungen der Bronzezeit. Beiträge zur Siedlungsarchäologie und Paläoökologie des zweiten vorchristlichen Jahrtausends in Südskandinavien, Nord-deutschland und den Niederlanden* (pp. 91–118). Willroth, K.-H. (ed.). Studien zur nordeuropäischen Bronzezeit Band 1. Neumünster.

Mikkelsen, M. 2019. Bronzestøbning. In: *Arkæologiske strategier for udgravninger i Danmark. Strategi for bronzealderens arkæologiske undersøgelser* (pp. 46–51). Lindegaard, M. R. (ed.). Slots- og Kulturstyrelsen. Nykøbing Falster.

Müller, S. 1904. Vei og Bygd i Sten- og Bronzealderen. *Aarbøger for Nordisk Oldkyndighed og Historie* 1904: 1–64.

Nielsen, P. O. 1998. De ældste langhuse. Fra toskibede til treskibede huse i Norden. *Bebyggelsehistorisk tidskrift* 33: 9–29.

Nielsen, P. O. 1999. Limensgård and Grødbygård. Settlements with house remains from the Early, Middle and Late Neolithic on Bornholm. In: *Settlement and landscape*. *Proceedings of a conference in Århus, Denmark, May 4–7 1998* (pp. 149–165). Fabech, C. & Ringtved, J. (eds.). Gylling.

Nilsson, T. 1996. Store Tyrrestrup. En vendsysselsk storgård med bronzedepot fra ældre bronzealder. *Kuml* 1993–1994: 147–154.

Odgaard, B. 1985. Kulturlandskabets historie i Vestjylland. Foreløbige resultater af nye pollenanalytiske undersøgelser. *Fortidsminder. Antikvariske studier* 7: 48–59.

Odgaard, B. 1991. Cultural landscape development through 5500 years at Lake Skånsø, northwestern Jutland as reflected in a regional pollen diagram. *Journal of Danish Archaeology* 8: 200–210.

Odgaard, B. 1994. The Holocene vegetation history of northern west Jutland, Denmark. *Opera Botanica* 123: 1–171.Pedersen, J.-A. 1987. A new Early Bronze Age house site under a barrow at Hyllerup, western Zealand. *Journal of Danish Archaeology* 5: 168–176.

Poulsen, M. E. 2014. *Beretning for arkæologisk systematisk undersøgelse af HBV j.nr. 1456 Kongehøj III, Askov by, matr.nr. 9iy, Malt sogn, Malt herred, Vejen kommune, Region Syddanmark. (Stednr. 190307-212. Kulturstyrelsens j.nr. 2011-7.24.02/HBV-0007).* Museet på Sønderskov.

Poulsen, M. E. 2017. Bebyggelse og landbrug i overgangsperioden mellem yngre stenalder og ældre bronzealder—betragtninger fra et sydjysk indlandsområde. *By, marsk og geest* 29: 5–29.

Poulsen, M. E. 2019a. *Beretning for arkæologisk forundersøgelse af HBV j.nr. 1782 Kongehøj VII, Askov by, matr.nr. 9m, Vejen sogn, Malt herred, Vejen kommune, Region Syddanmark. (Stednr. 190307-239. Slots- og Kulturstyrelsens j.nr. 18/09595)*. Museet på Sønderskov.

Poulsen, M. E. 2019b. *Beretning for arkæologisk undersøgelse af HBV j.nr. 1490 Kongeengen, Askov by, matr.nr. 14al & 12i, Vejen sogn, Malt herred, Vejen kommune, Region Syddanmark. (FF systemnr. 213327, Stednr. 190307-225. Slots- og Kulturstyrelsens j.nr. 19/01377)*. Museet på Sønderskov.

Poulsen, M. E. & Dollar, S. R. 2015. Bronzealderbønder i det sydjyske indland. Treskibede langhuse fra ældre bronzealder på Kongehøj II. *By, marsk og geest* 27: 5–19.

Prangsgaard, K., Andersen, S. T., Breuning-Madsen, H., Holst, M., Malmros, C. & Robinson, D. 1999. Gravhøje ved Lejrskov. Undersøgelse af fem høje. *Kuml* 1999: 53–97.

Riis, K. M. 2015. Bæltepladen fra Bråtterup—Et unikt fund fra bronzealderens periode II. *Arkæologi i Slesvig/Archäologie in Schleswig* 15: 105–115.

Sørensen, F. 2015. Bulhuse på Løjt. In: *Værd at bevare. Gårde og huse i Løjt Sogn* (pp. 35–45). Furdal, K. & Sørensen, F. (eds.). Museum Sønderjylland.

Burials and the buried

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Burials have, in one way or another, been one of the main themes of archaeology throughout the history of the discipline, but new theoretical approaches and methodological advances in the recent decades have revolutionized the intrinsic potential for burials and the buried as source material. Although these new methodological advances primarily apply to the buried, the burial itself still strongly contributes to new knowledge of identity, norms and past societies, often accompanied with bioarchaeological data of the buried. This section of the conference volume comprises five papers from different branches of burial archaeology. The papers were originally presented in two different, but often related, sessions: *Burials, individuals and society* and *Science and Bronze Age archaeology*.

Although with distinctly different aims, in common for all of the papers in this section is the inclusion of bioarchaeological methods for understanding the past. *Malou Blank* discusses the presence, production and chronology of Late Neolithic flint daggers through a combination of typology, radiocarbon dates and osteological analyses of skeletons in megalithic burials in south-western Sweden. Both *Serena Sabatini* and *Malene R. Beck* explore norms, identity and traditions through multi-methodological analyses of the grave fields of Simris, south-eastern Sweden, and Kalvehavegård, on the island of Funen, respectively. In both of their cases it is evident that the combination of chemical analyses, osteology and archaeology could provide explanations otherwise undetectable. Lastly, both the papers by *Anna Tornberg* and by *Matthew J. Walsh, Samantha S. Reiter, Catherine J. Frieman, Flemming Kaul* and *Karin M. Frei* highlight violence, warriors and warfare. Although warrior identity has been a common Bronze Age archaeology theme, Bronze Age warfare was more or less unexplored prior to Keeley's seminal work (Keeley, 1995; Vandkilde, 2003).

It is clear that burial archaeology is indeed influenced by changes in archaeological paradigms. Originally rooted within Processual Archaeology (Chapman, 2013), the theoretical and methodological approaches to burials and the buried have developed, first, through critique of Processual Archaeology within Postprocessual Archaeology as offering too simplistic (and often incorrect) explanations (Hodder, 1982; Chapman, 2013), and, maybe second, within the current paradigm of Scientific archaeology, as argued by Kristiansen (2014).

The five papers in this chapter are well situated within current archaeological theories and methods of death and burials. Not only are new methodological approaches of the third Scientific Revolution (e.g., multiple radiocarbon dates and isotope analyses) applied, testing earlier assumptions of chronology, diet and mobility, but the studies are also well-founded in theoretical models, especially from social theory, which provides substance to the interpretation. These new combinations set the sails for the future of the archaeology of burials and the buried.

References

Chapman, R. 2013. Death, burial, and social representation. In: *The Oxford handbook of the archaeology of death and burial* (pp. 47–57). Tarlow, S. & Nilsson Stutz, L. (eds.). Oxford: Oxford University Press.

Hodder, I. 1982. *Symbols in action: ethnoarchaeological studies of material cultur*e. Cambridge: Cambridge University Press.

Keeley, L. H. 1995. *War before civilization*. New York: Oxford University Press.

Kristiansen, K. 2014. Towards a new paradigm. The third science revolution and its possible consequences in archaeology. *Current Swedish Archaeology* 22 (4): 11–71.

Vandkilde, H. 2003. Commemorative tales: archaeological responses to modern myth, politics, and war. *World Archaeology* 35 (1): 126–144.

Flint daggers and related artefacts in megalithic tombs of south-western Sweden.

Chronology, distribution, and production

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Abstract

In this article, the prevailing chronology of the flint dagger typology is re-evaluated based on previous research, a re-examination of flint daggers, and new radiocarbon dates of human remains from megalithic graves in inland south-western Sweden. Distribution, networks and local production of flint daggers and arrowheads are also discussed. Additionally, combinations of daggers with other artefacts are examined. The study includes 103 megalithic graves from Falbygden and surrounding sites. In 15 of these graves both daggers and radiocarbon-dated human bones occur. The result demonstrates that the conventional typology in most cases can be used to roughly date contexts in south-western Sweden, although the Lomborg type III seems to be later than previously proposed. Furthermore, graves dated to the early part of the Late Neolithic contain few or no daggers. The daggers are most probably imported from Denmark and Scania, although some local production is also suggested. Some areas seem to have had access to flint daggers earlier than others, and distribution nodes consisting of sites with numerous daggers within the exchange networks are suggested.

Keywords: Flint daggers, chronology, radiocarbon-dates, megalithic graves, inland south-western Sweden, Late Neolithic

Flint daggers have been and still are considered useful for dating Scandinavian Late Neolithic (LN, 2200–1700 cal BC) and Early Bronze Age (EBA, 1700–1100 cal BC) contexts (Blank *et al*., 2020). Some of the south-western Swedish daggers have been important in the construction of a dagger typo-chronology (Forssander, 1936). However, the typology has been revised (Lomborg, 1973) and the chronological aspects have been questioned (e.g., Ebbesen, 1975; Madsen, 1978; Vandkilde, 1996; Apel, 2001). Furthermore, in the more marginal regions, like Västergötland, the inland of south-western Sweden, arguments of long-term circulation have been brought forward, and dagger types have been suggested to be related more to differences in social status than to chronology (Segerberg, 1978, Weiler, 1994).

Previous research has focused on typology, chronology, distribution networks, the elaborated craftsmanship and production chains, as well as the use and origin of the daggers (e.g., Müller, 1902; Vandkilde, 1996; Apel, 2001; Varberg, 2005; Frieman & Eriksen, 2015; Olausson, 2017). In the inland of south-western Sweden, where flint is not available, daggers are regarded as imports from Denmark and possibly southern Scania, although small-scale local production from imported flint has also been proposed (Olausson, 2000, p. 132; Apel, 2001, p. 330).

The aim of this study is to get a better understanding of the chronology of the conventional typology and origins of the inland south-western Swedish daggers. Building on previous research, a re-examination of flint daggers, and new 14C dates of human skeletons from megalithic

graves, the prevailing chronology of the dagger typology (Vandkilde, 1996; Apel, 2001) is re-evaluated. Additionally, some of the associated artefacts, which are not given enough attention in current research, and aspects linked to production and distribution networks of daggers are investigated.

Background

The south Scandinavian LN is often viewed as a time of increased social complexity, growing population density, cultural blending, and stronger reliance on agriculture (Vandkilde, 1996; Apel, 2001; Lekberg, 2002; Kristiansen & Larsson, 2005; Artursson, 2009; Iversen, 2015). It is characterized by complex bifacial flint-working techniques, the continued development of longhouse construction, an intensified import of gold and copper artefacts, and increased long-distance trading networks (Vandkilde, 1996; Apel, 2001; Kristiansen & Larsson, 2005; Artursson, 2009; Ling *et al*., 2014; Simonsen, 2017). The flint dagger, which appeared at the beginning of the LN, is regarded as the ultimate expression of a highly developed flint knapping technique. According to Apel (2001), flint daggers were mainly produced by specialists, which required a hierarchical social organization, possibly hereditary.

Flint daggers are frequently interpreted as important prestige items, and along with artefacts such as bifacial spearheads and arrowheads that appear in the onset of LN I, they are considered to reflect a specialized male warrior ideal, adopted from the Bell Beaker complex (Vandkilde, 2000, 2001; Apel, 2001, pp. 336ff.; Varberg, 2005; Iversen, 2015, p. 69). However, functions for the flint daggers such as multi-tools, weapons for war and hunting, and ritual or household utensils have also been brought forward (e.g., Stensköld, 2004; Frieman & Eriksen, 2015; Olausson, 2017). In this study, I am focusing on the chronology of dagger types and some associated artefacts, potential exchange networks, and local production.

The area of investigation is located in the inland of south-western Sweden, Västergötland, and mainly concentrated on the two largest sedimentary areas (Falbygden and Kinnekulle, Fig. 1) where favourable bone preservation has enabled the acquisition of good-quality radiocarbon dates of human remains. In this province, the flint sources are scarce and only minor outcrops in the form of Cambrian flint at Kinnekulle exist (Fig. 1). The nearest source of south Scandinavian flint is found at the west coast in form of secondary rolled beach deposits, often small nodules of rather poor quality (Högberg & Olausson, 2007). For dagger production, flint of good quality and adequate size is necessary. Natural flint sources in Scandinavia are confined to the southern regions. Primary flint is abundant in the chalk layers found in south-western Scania, Jutland, and eastern isles of Denmark, but also appears in eastern Scania in the Kristianstad area (Högberg *et al*., 2001; Högberg & Olausson, 2007). Flint mines dated to the Neolithic are known in Denmark and south-western Scania (Holst, 1906; Schnittger, 1910; Becker, 1951, 1980a, 1980b, 1980c; Högberg *et al*., 2001), but flint is available in eroding chalk cliffs, till deposits and at beach ridges as well. Earlier depositions of imported polished flint axes could also have been used for dagger production in regions such as Västergötland.

Forssander (1936) published a dagger typo-chronology based on the daggers found in a gallery grave (Skogsbo/Norra Säm 10) in Västergötland. His chronology was criticized and modified by several archaeologists (e.g., Kaelas, 1964; Lomborg, 1973, 1975; Ebbesen, 1975; Segerberg, 1978). Forssander was criticized for not considering that many of the daggers were resharpened and found far from their flint source, and for using an unclear stratigraphy of a disturbed gallery grave which had been used for successive burials (Kaelas, 1964; Lomborg, 1975). Segerberg (1978) made a new study of the Skogsbo daggers based on Lomborg's (1973) typology and Sverker Janson's (1950) stratigraphic report of

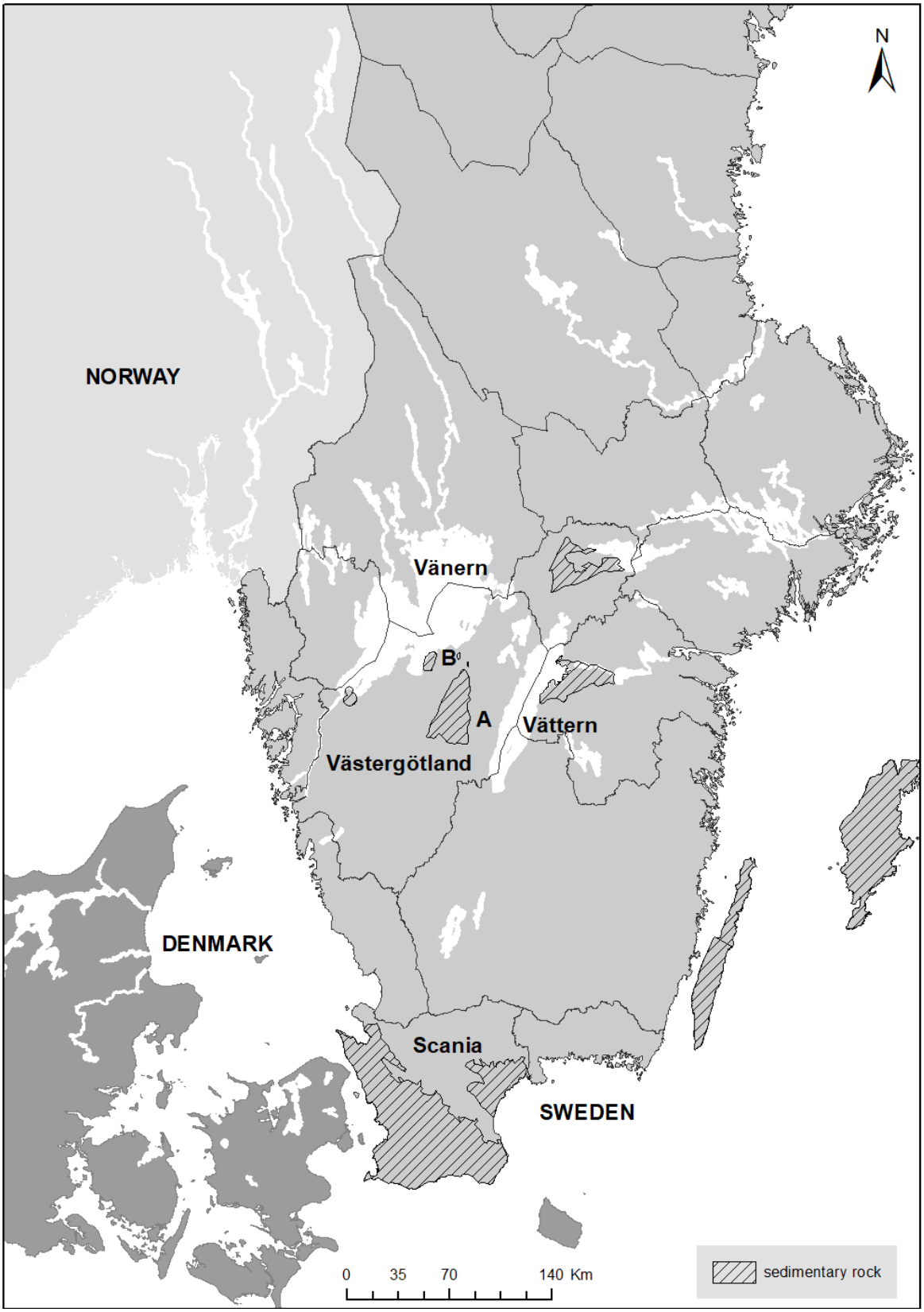


Figure 1. Overview of the investigated area. A: sedimentary area of Falbygden and Billingen mountain, B: sedimentary area of Kinnekulle.

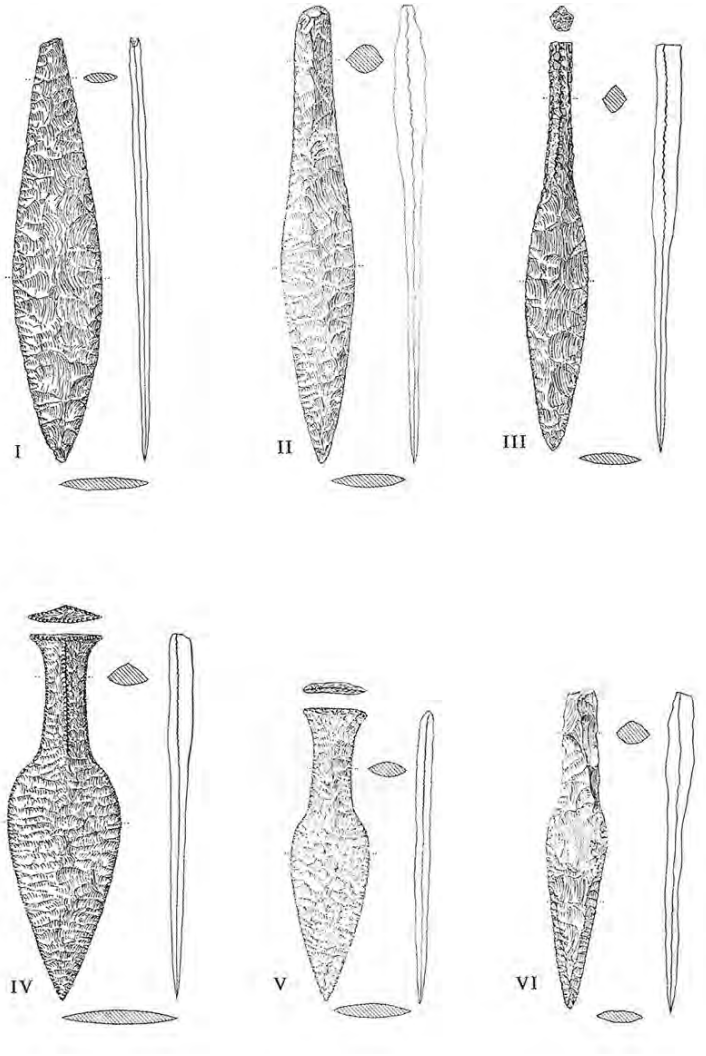


Figure 2. Dagger typology from Apel (2001, p. 242), based on Lomborg (1973, p. 53).

Sune Lindqvist's drawing of the Skogsbo finds (ATA- the image archive), in which she disproved Forssander's results.

Lomborg's dagger typology published in 1973 with six main types (Fig. 2) is the prevailing model used in Scandinavian archaeology. Lomborg (1973) divided the Late Neolithic into three phases: A, B, and C (LN I covers LN A and B, and LN II covers LN C). He argued that type I defined LN A, type II and III LN B and type IV and V LN C (Lomborg, 1973, p. 158). However, the chronological significance is less emphasized in more recent research, although chronological aspects are still considered important as well as regional differences (Ebbesen, 1975; Wincentz Rasmussen, 1990; Vandkilde, 1996; Apel, 2001). According to Vandkilde (1996) and Apel (2001) Lomborg's types I–III belong to the LN I (2350–1950 cal BC), while IV and V are considered to be LN II (1950–1700 cal BC) and the last type VI is dated to the EBA (1700–1100 cal BC). Furthermore, type I (with the exception of ID) was suggested to originate from Limfjorden in northern Jutland, Denmark while types ID–VI mainly derived from the eastern isles of Denmark and south-western Sweden (Vandkilde, 1996; Apel, 2001).

Weiler (1994) argued that the daggers might have been in circulation for several generations and that the various types, in a Västergötland context, instead represented social hierarchies

Table 1. Number of included megalithic graves and daggers.

	Included (N)	With daggers (N)	With daggers and 14C dates (N)	Total no. of daggers
Dolmens	3	0	0	0
Passage graves	46	9	2	25
Gallery graves	47	30	13	117
Dolmens/Gallery graves	3	1	0	1
Megalithic graves	4	1	0	1
Total	103	41	15	144

in the Late Neolithic population. The later flint daggers, especially Lomborg type IV, which demanded a lot of technical skill to produce, would be the most prestigious (Lindman, 1986; Weiler, 1994).

Material and method

This study is based on Lomborg's (1973) typology and Vandkilde's (1996) and Apel's (2001) basic chronology. The dagger types have been determined mainly by examinations of the base and the shape of handles (Appendix). Daggers and some of the associated artefacts were examined at SHM (Statens historiska museum), VGM (Västergötlands museum) and FM (Falköpings museum). Comparative analyses of artefacts and 14C dates were conducted.

Undertaking the comparison of dagger types with 14C dates of skeletal remains in megalithic graves is rather complicated and some obvious problems cannot be avoided. In most cases, it is impossible to relate the daggers to a specific individual, as the megalithic graves contain commingled skeletons and artefacts from successive burials. Some of the graves included in the study were only partially excavated, and many of the graves had already been disturbed by reuse, robbery or agriculture. Furthermore, only some of the buried individuals have been dated and the proportion varies between graves. Not all the individuals were buried with daggers, and the deposition of daggers probably changed over time and varied between localities.

In order to achieve as accurate a result as possible, several strategies were implemented. Patterns were studied by comparing the earliest and the latest radiocarbon dates with the earliest dagger type and the total number of daggers of various types as well as comparisons of sum plots and number of dagger types (see result and discussion).

The included material derives from the investigated/excavated gallery graves and passage graves from the sedimentary areas of Falbygden and Billingen mountain and Kinnekulle, with some additional examples from gallery graves in the Precambrian areas of Västergötland (Table 1, Fig. 3). The comparative analyses of daggers and 14C dates were based on 15 megalithic graves where daggers occur along with available radiocarbon dates of human remains (Table 1).

Results and discussion

General characteristics of the daggers

The scarce flint sources and the intensive reuse of flint artefacts in the region demonstrate that flint was an exclusive and valuable raw material.

The flint daggers found in Västergötland's megalithic graves, as well as daggers from other contexts in this region, are made of south Scandinavian flint of varying quality, mostly

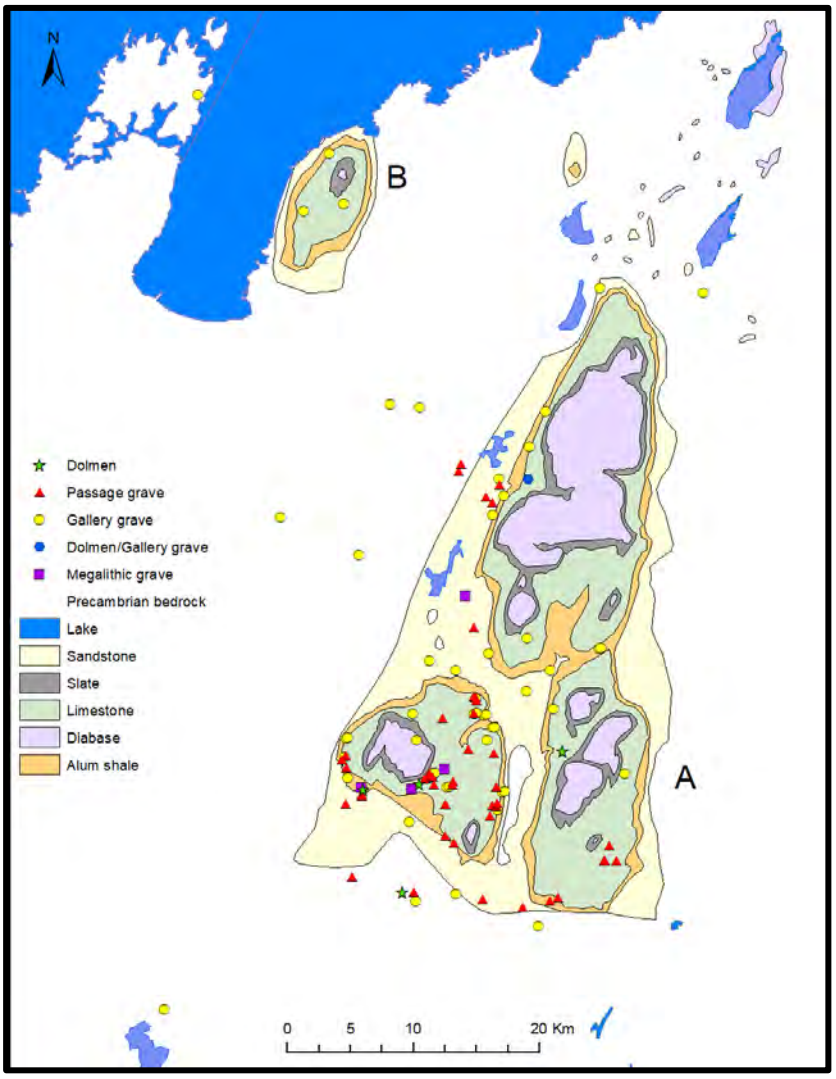


Figure 3. Map of included megalithic graves. A: sedimentary area of Falbygden and Billingen mountain, B: Sedimentary area of Kinnekulle.

Senonian and Danien, but Kristianstad flint is also present. The flint daggers are relatively small, measuring between 9 and 31 cm with an average length of about 16 cm. Some daggers, especially in areas with many daggers (see below), display a high degree of technical skill, such as parallel flaking, pressure-flaked seams, etc. (Fig. 4).

The daggers are often reworked by various techniques and reshaped in different ways. Mostly blades but also handles were reworked by knapping or polishing. Many of the daggers have been reworked into other tools, such as for example chisels. A chalky cortex is very common on the base of the handles but also at other parts of the handles, showing that the entire raw material was utilized, and maybe also to show the skills of the knapper, and/or that the used flint originated from a mine. Several of the daggers were extensively re-sharpened and polished on large parts (Fig. 5). The polish is always in the longitudinal direction on the daggers.

Small daggers with no sign of reshaping and/or with chalky cortex along the handles and on the base of handles demonstrate that these daggers were made small-sized from the start (Herrljunga 9, SHM 5661, Norra Säm 10 SHM 15003, Medelplana 54 SHM 15660, Fig. 6). The production of small daggers might be a

Figure 4. Two daggers from the Utbogården (Karleby 71) gallery grave (SHM 5386a). Photograph by Malou Blank, CC BY (SHM).

Figure 5. Two daggers from the Lilla Balltorp (Torbjörntorp 18) gallery grave (VGM 88966). Photograph by Malou Blank.

Figure 6. Top: a dagger from the Norra Säm 10 gallery grave (SHM 15003). Bottom: a dagger from the Herrljunga 9 gallery grave (SHM 5661). Photograph by Malou Blank, CC BY (SHM).

result of small flint nodules/pieces or/and that daggers were intended for children.

The characteristics of the included daggers correlate to the general description presented in a previous study (Apel, 2001) based on 609 mainly stray finds of flint daggers from Västergötland.

Distribution of flint daggers in megalithic graves

Early/Middle Neolithic dolmens and passage graves are mainly restricted to the coastal areas and the inland area of Falbygden, while the LN gallery graves are more dispersed in the landscape. Large gallery graves are concentrated at the inland of south-western Sweden and are not present at the coast where concentrations of the earlier megalithic graves occur (Fig. 7).

Concentrations of daggers and gallery graves seem to correlate rather well. Clusters of daggers and gallery graves are found in central Västergötland, Falbygden, Dalsland, and on the west coast (Figs. 7, 8).

Of the gallery graves included in this study, 61 or 67% (30/49 or 30/45) contained flint daggers, depending on if the partially excavated graves were counted or not (Appendix; Table 1). This result correlates rather well with Weiler's study (1994, p. 72) where she concludes that 68% of the completely excavated gallery graves at that time contained daggers.

In most of the gallery graves, only a few daggers were recovered, and of the 30 graves 18 contained one or two, five had between three and four, four had five or six, and only three had between 14 and 19 daggers (Appendix).

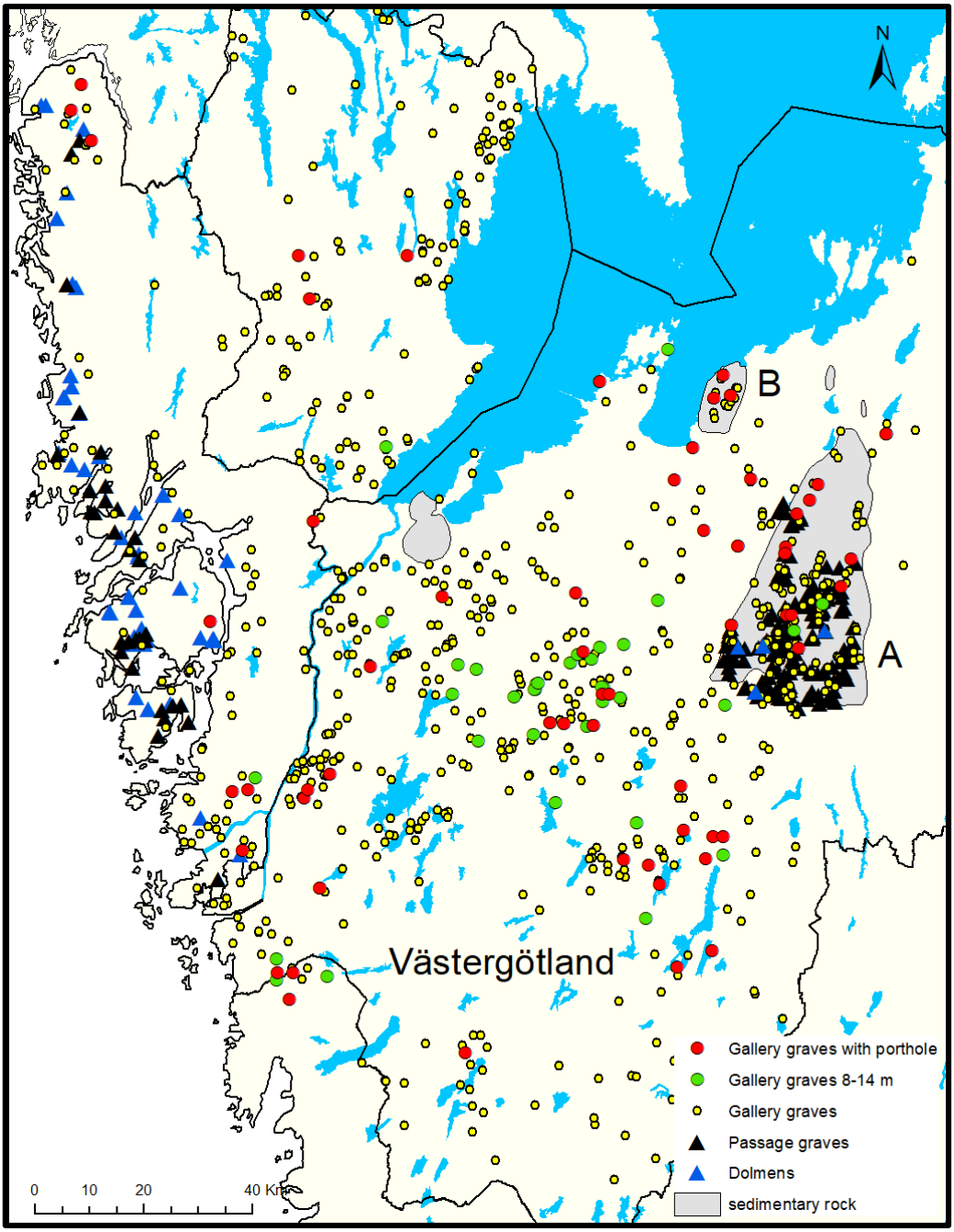
The frequency of daggers in other megalithic graves was for obvious reasons not as high, and most of these daggers were found in passage graves (Table 1). Of these 56 megalithic graves eleven (20%) contained daggers; only three graves had more than three daggers, Falköping 19, Luttra 16, Kinneved 19 (Appendix; Table 1).

If all the gallery graves in south-western Sweden are taken into account, a concentration of gallery graves with more than ten daggers can be observed west of Falbygden in central Västergötland. In Fänneslunda in this region seven graves contained as many as 26 daggers. The distribution of these graves partly correlates with the distribution of graves with metal artefacts from the LN/EBA (Fig. 9). Weiler earlier demonstrated a similar pattern (1994, p. 87).

These areas might have been important nodes in a long-distance network with access to good-quality daggers and metal objects. The sites might have functioned as distribution centres.

The number of daggers in the graves is partly dependent on the number of burials, but not consistently so (Appendix). However, this could only be investigated in the fully excavated graves with preserved bone material. According to Ebbesen (2007, p. 23), the number of daggers can be related to the number of buried individuals, and only 18% of the buried were accompanied by a dagger in Danish gallery graves. The average, according to the estimated number of burials compared with number of daggers in Falbygden, is around 20% (Appendix).

Supposing that only males were accompanied by daggers, which is a common view (e.g., Weiler, 1994; Vandkilde, 1996; Apel, 2001), the Falköping 5 grave with only one dagger and 30 burials (3%) would contain fewer males than Torbjörntorp 18 where just under 24% (19/80) were buried with a dagger. On the contrary, 60% of the buried individuals were males in Falköping 5, according to osteological examinations (Weiler, 1977). Tornberg (Blank *et al*., 2018) determined the proportion of males in Falköping 5 to be even higher. In Torbjörntorp 18, a uniform distribution of biological sex was suggested based on osteological studies (Lennblad, 2015) and considering the individuals that were genetically determined to sex (N:14), 79% were female (Blank *et al*., 2021). Thus, reasons other than the sex must have been decisive in



Figur 7. Distriubution of megalithic graves in Västergötland, Bohuslän and Dalsland. A: Falbygden and B: Kinnekulle.

whether a dagger accompanied the dead or not. This does not necessarily refute the idea that daggers were a male attribute, but other factors such as daggers becoming more common in grave contexts in the later part of the LN might explain the differences noted above.

The dagger in Falköping 5 is a type II dagger while the daggers in Torbjörntorp 18 are of later types (Appendix). Type I and II daggers mostly appear one or two per grave, while type III daggers occur one to 13 per grave (Appendix). No clear correlation can be observed between grave type/shape and the occurrence of

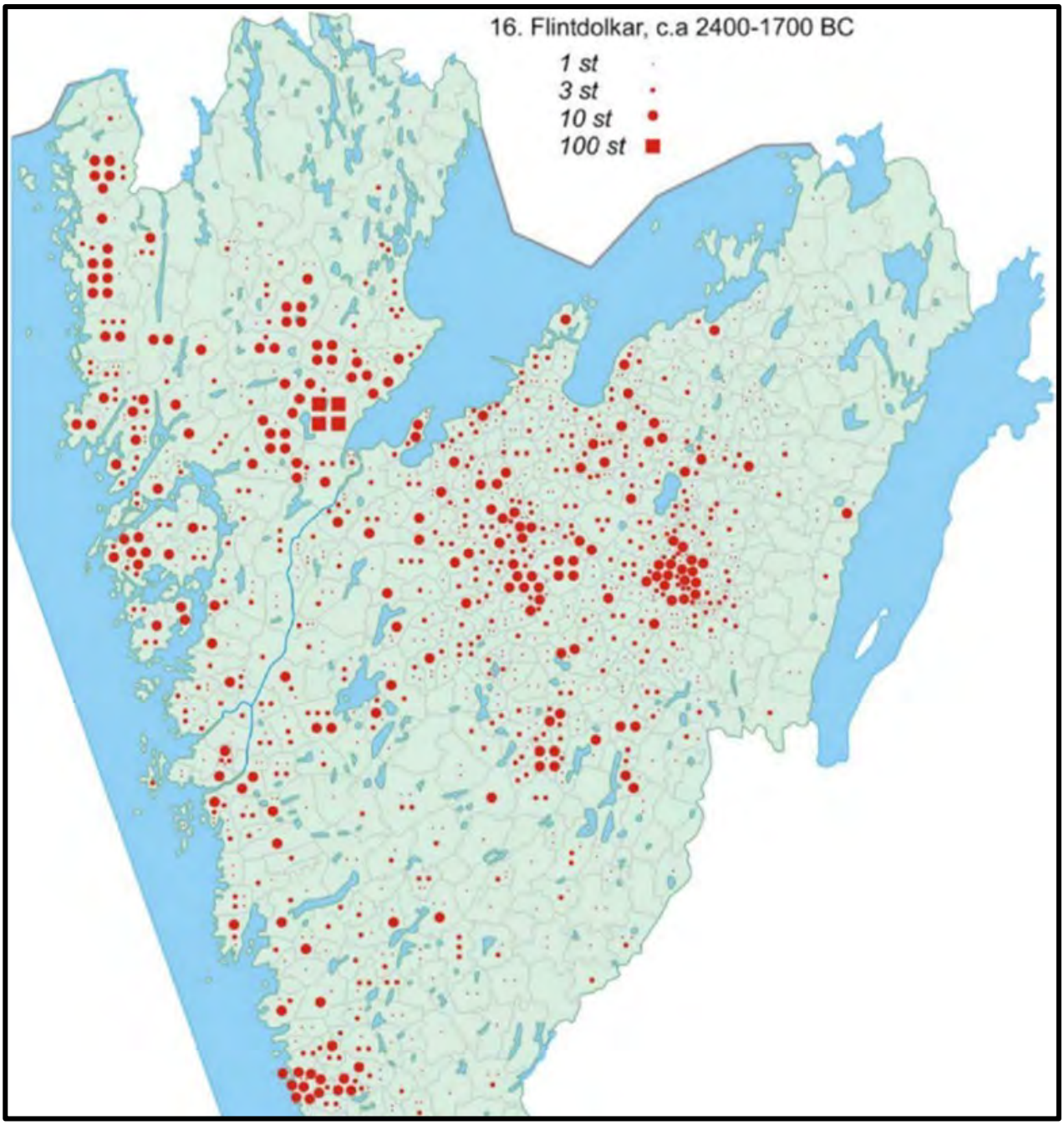


Figure 8. Distribution of flint daggers, from Blomqvist/Bägerfeldt, 1990.

different dagger types. Type I and II daggers occur in graves from localities in Falbygden where large concentrations of both passage and gallery graves were found, and these daggers might indicate that these places were already important in the early LN. At Kinnekulle on the other hand, only IV and V types occur, which might suggest that this area was not part of distribution networks before the transition between the LN and EBA.

I suggest that the number of daggers in megalithic graves is dependent on several factors: the number of burials, the dating of the burials with an increasing practice of placing daggers in megalithic graves in the later phase

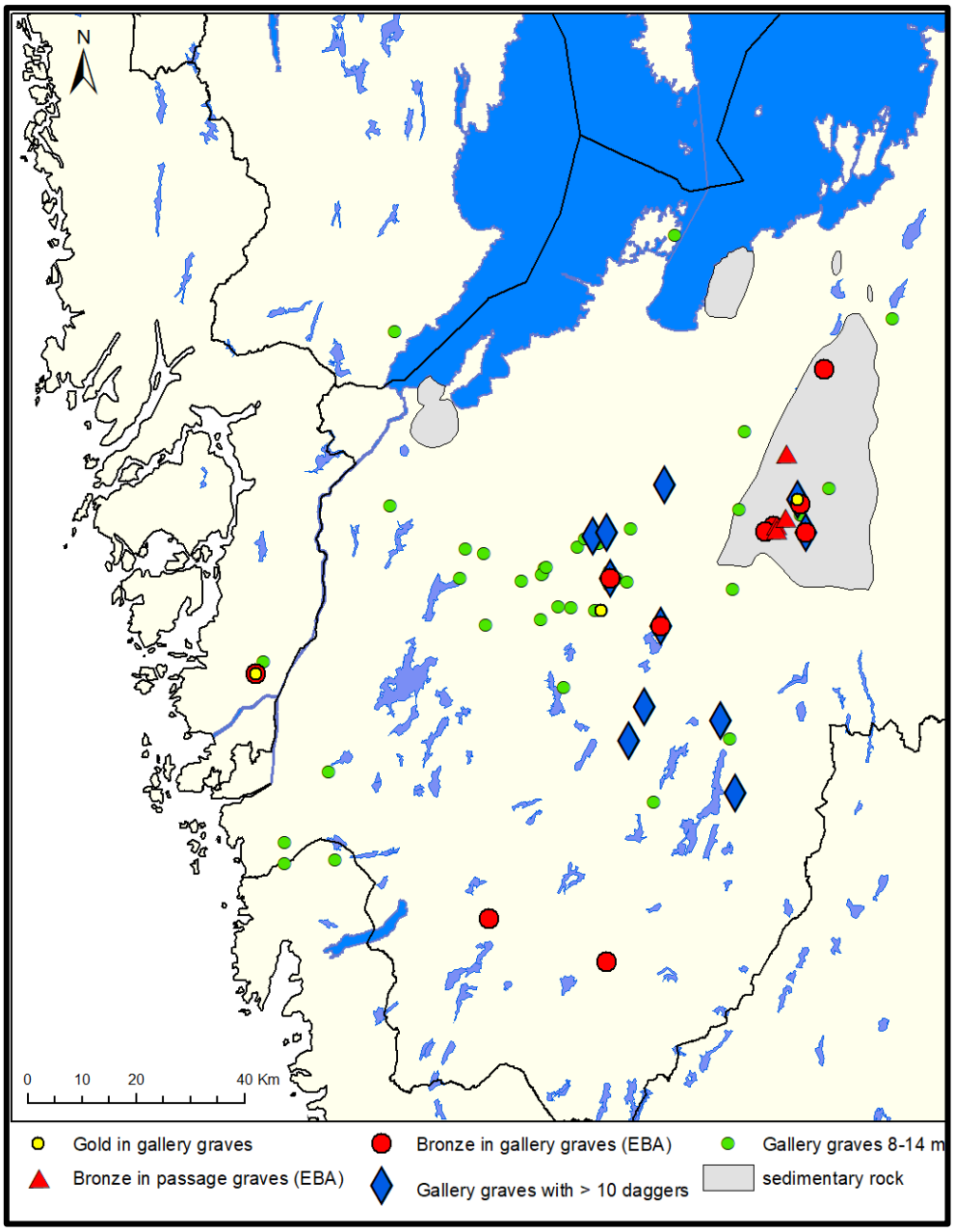


Figure 9. Distribution map of megalithic graves with more than ten flint daggers and LN/EBA metal.

of the LN, the availability of daggers in different geographical areas, and the social status of the groups using the specific grave.

Dagger types in megalithic graves

If the 14C dates of human remains in megalithic graves in south-western Sweden are considered, the time of use appears in two discrete time intervals: 3400–2500 and 2200–1600 cal BC (Blank *et al.*, 2020; Fig. 10). In the LN most of the dates are placed in the transition between LN I and II, and in LN II, while there are few LN I and EBA dates (Blank *et al.*, 2020). No daggers in megalithic graves can be dated earlier than 2200 cal BC (95.4%, Appendix). In the same area, type III daggers are by far the most frequent while I, II and VI are less common (Appendix; Fig. 11).

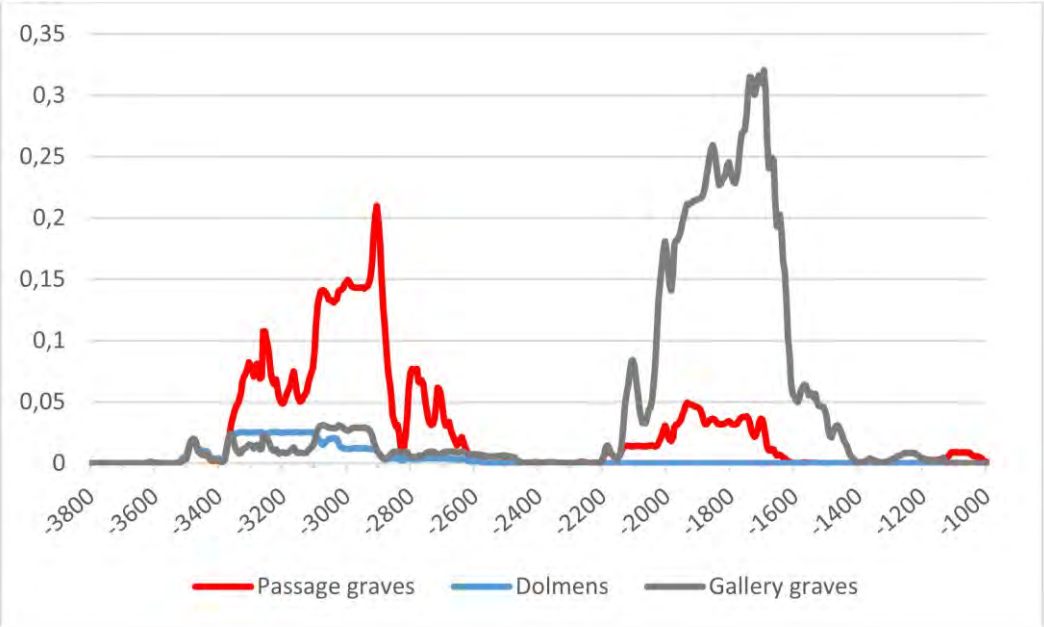


Figure 10. Sum plot of radiocarbon dates of human remains in megalithic graves in Västergötland, based on Blank et al., 2020.

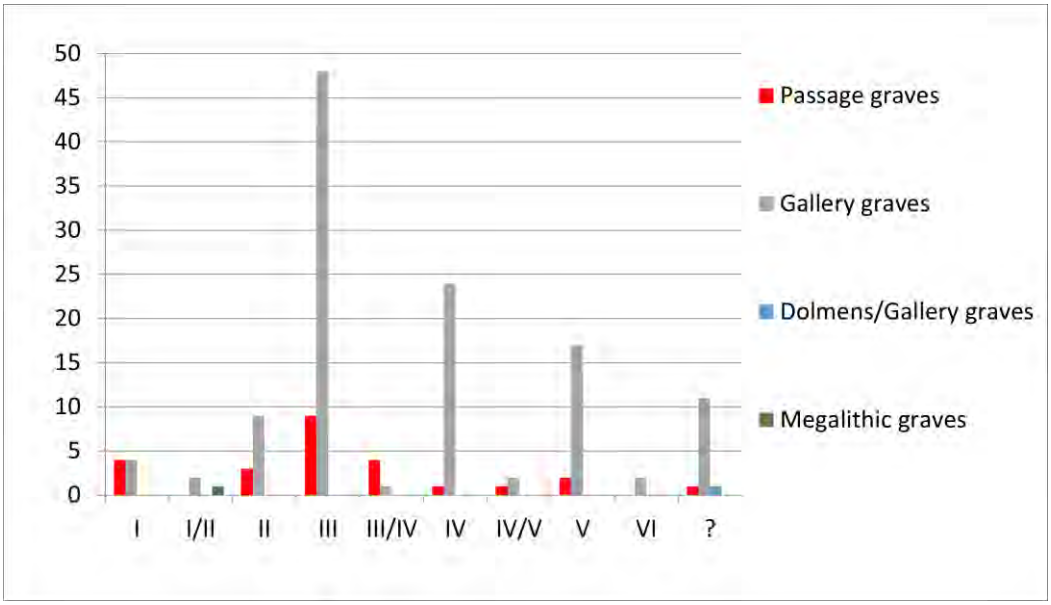


Figure 11. Number of Lomborg's dagger types in various megalithic graves in Västergötland.

According to Figs. 10 and 11, dagger types correspond to burial frequency, if type III can be dated to the transition between LN I and II, and to the first part of LN II. Similar patterns have been observed in the few Norwegian gallery graves concentrated near the present-day Swedish border, where the majority of the daggers were of type III and the 14C dates point to an intensive use in the end of LN I and beginning of LN II (Østmo, 2011).

If we compare the daggers recovered in gallery graves (N:69) with the daggers found as stray finds (N:65) in Falbygden, a clear difference is observed (Fig. 12). The early dagger types (I and II) dominate in the stray finds while the

later dagger types III and IV are less frequent than in the gallery graves (Fig. 12). The same pattern is present in Västergötland as a whole.

Can the frequency of different types of daggers be related to context? Is it possible that the type III daggers were preferred in burial settings while types I and VI primarily are connected to settlement or ritual depositions? During the LN, daggers are common in hoards and wetland deposition in southern Scandinavia (Karsten, 1994; Vandkilde, 1996). In Denmark most daggers found in these contexts are types I to III (Vandkilde, 1996, pp. 296f). In my opinion, it is more likely that the stray finds in Falbygden mostly derive from destroyed flat graves, and that the difference demonstrated in Fig. 12 may be related to different types of graves. There is only one known LN flat grave in Västergötland (Djurfeldt, 1967), although some stray finds of shaft-hole axes have been suggested to originate from destroyed graves (Lekberg, 2002). Furthermore, flat graves without any stone constructions would be difficult to identify in agricultural areas such as Falbygden, where large-scale excavations are infrequent.

In the scenario of stray finds mostly representing flat graves, these would be dated earlier than the gallery graves according to the distribution of dagger types. This correlates with the suggestion that the flat graves in Scania are mainly dated to LN I, while the gallery graves belong to LN II (Tornberg, 2017). However, a distinct chronological division between the two burial types cannot be observed in Scania according to results in Bergerbrant *et al*. (2017). Thus, a clear-cut distinction between the use of these two grave types is not likely in Falbygden either, although a tendency of earlier flat graves can be expected.

Dagger chronology and 14C dates of human remains

In this section, the earliest and latest dates are compared with the number of daggers of various types. Figures 13–15 demonstrate several interesting tendencies. Graves with the earliest burial dated to LN I only contain type I and II daggers. Type I and II daggers only appear in graves with the earliest burial dated to LN I or the LN I/LN II transition. Type III daggers occur in graves with the earliest burial dated to the LN I/LN II transition and LN II. Graves with the earliest burial dated to the transition between the LN II and EBA only contain type IV and V daggers. Type V daggers only occur in graves with LN II/EBA transition or EBA dates.

Figures 13–15 demonstrate a clear chronological pattern of the Lomborg types, with types I and II clustering in the LN I, types III and IV in the LN I/LN II transition and LN II, and type V in the LN II/EBA transition. This result roughly correlates with the overall frequency of daggers and the frequency of radiocarbon-dated burials in megalithic graves discussed above.

In one single case, a flint dagger could be linked to a specific individual. In the Torsagården grave, at Gökhem parish in Falbygden, an adult male was recovered with a dagger of type IB placed on the hip (Fig. 16). The male was 14C-dated to LN II (Appendix), which does not agree with the early dagger type. Underneath the feet of the male a skeleton from a juvenile/child was found, which was dated to the LN I/LN II transition (Appendix).

Two scenarios are likely: the dagger was first placed in the grave with the juvenile and could be dated to the transition between the LN I and LN II, or the dagger was placed in the grave with the male in LN II and had been in circulation for a long time. This example demonstrates that even though the type I and II daggers mostly occur in LN I contexts, later dates cannot be ruled out.

Long use and circulation of daggers, revealed by extensive re-sharpening and reuse (Weiler, 1994; Apel, 2001; this study), must be considered in the inland of south-western Sweden. The distance from the dagger production core areas might also result in a later date of the depositions of various dagger

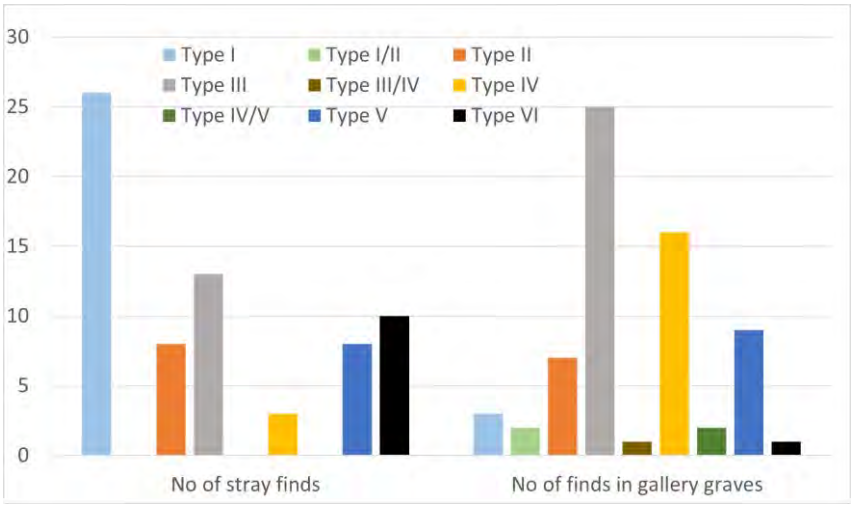


Figure 12. Number of Lomborg's dagger types in stray finds compared to gallery grave contexts in Falbygden. The stray finds are based on Apel (2001) and gallery grave contexts are based on Appendix.

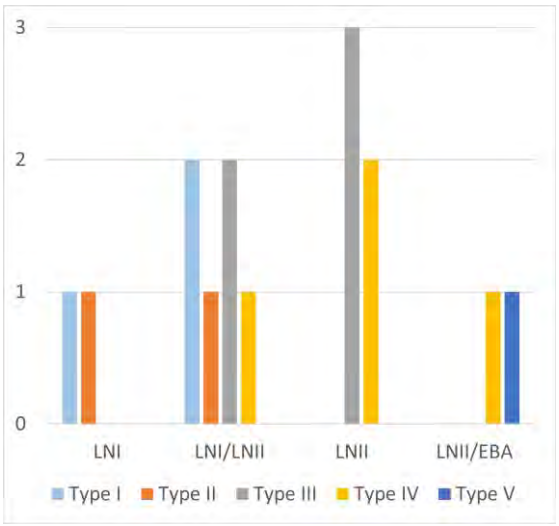


Figure 13. Earliest dagger type in grave compared to the earliest radiocarbon date of the grave.

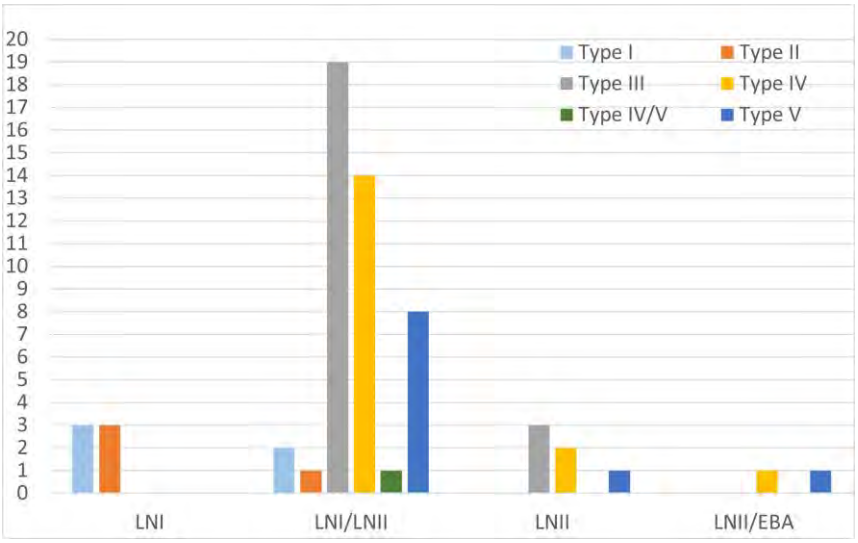


Figure 14. Number of daggers of various types compared with the earliest radiocarbon date of megalithic graves.

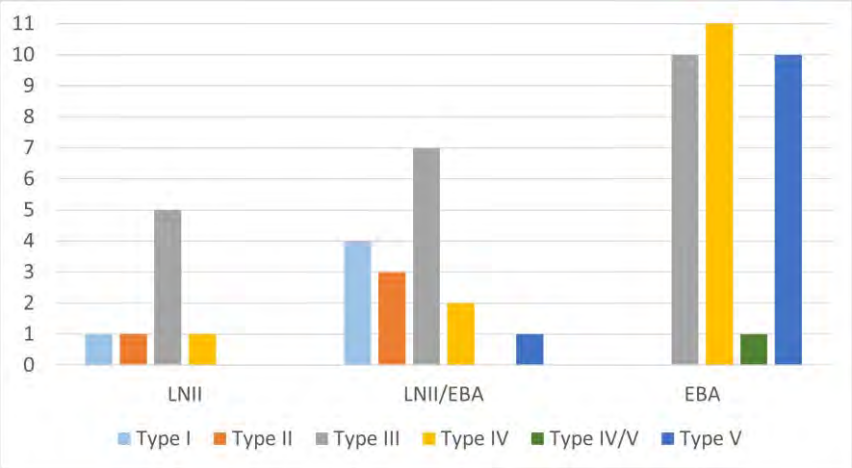


Figure 15. Number of daggers of various types compared with the latest radiocarbon date of megalithic graves.

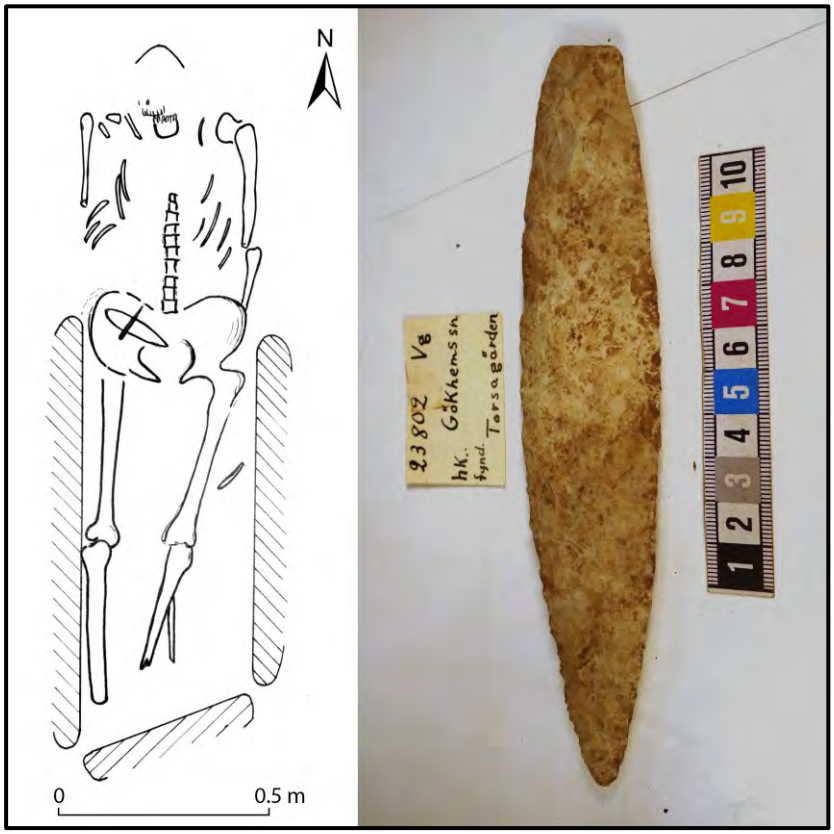


Figure 16. Drawing and photograph of a flint dagger from the Torsagården gallery grave, Gökhem. Drawing by Sahlström (1947) and photograph by Malou Blank, CC BY (SHM).

types in Västergötland (e.g., Weiler, 1994). However, as argued by Lomborg (1975, p. 116) this is probably not a significant factor, as rather well-established long-distance exchange networks can be discerned during this time involving flint, metal and other artefacts, as well as shared practices. Even though chronological differences are visible between the Lomborg dagger types in Västergötland, dating based solely on dagger types must be considered uncertain.

Flint daggers and some associated artefacts

Bifacial arrowheads are common artefacts in gallery graves and LN contexts (Appendix). In 13 of the studied gallery graves (27.7%) and in seven passage graves (15.2%) bifacial arrowheads were recovered. The number of arrowheads in gallery graves was one to three in seven graves, four to ten in five graves and in Norra Säm 10, 27 arrowheads were found. The number of arrowheads in passage graves was between one and four.

Like the daggers, the arrowheads in the investigated graves were mainly made out of south Scandinavian flint, although a few examples of Cambrian flint occur (SHM 15660, SHM 8058). Most of the arrowheads were barbed with concave bases belonging to Kühn's types 7a–10 (Kühn, 1979). Some of the bifacial retouched arrowheads were carefully pressure-flaked on both sides (both types of flint, south Scandinavian and Cambrian, were used for this), while others lacked pressure flaking. Many of the arrowheads were polished on one side and retouched on the other (Fig. 17). The polish is probably an indicator of the reuse of polished artefacts such as axes, pieces of which are common in the gallery graves of Västergötland, to form the arrowheads.

Of the 30 gallery graves with daggers, 13 contained bifacial arrowheads. In twelve of 13 gallery graves with arrowheads, flint daggers occur. Furthermore, arrowheads do not occur in graves with only type I and II daggers.

Another category of artefact, which commonly occurs with both arrowheads and daggers, is slate pendants. Eight out of 13 gallery graves with arrowheads also contained slate pendants. The connection between the presence of daggers and slate pendants in western Swedish gallery graves has previously been noted (Hector, 1993, p. 35). In nine of ten graves with slate pendants, daggers appear, but slate pendants never occur in graves with only type I and II daggers (Fig. 18).

Bifacial spearheads are always accompanied by daggers in gallery graves and other types of megalithic graves and occur with all dagger types. Shaft-hole axes only occur in gallery graves with daggers (with both early and late dagger types), although they are found in other megalithic types without daggers (Appendix). Most of the bone needles were found in graves with daggers, while amber beads/pendants on the other hand are more common in graves without daggers (Fig. 18). Flint sickles are not as common and only occur in five of the investigated gallery graves and in two of the other types of megalithic graves. Amber beads/pendants and bone needles appear in graves with all dagger types, while sickles only occur with later dagger types (Appendix).

Dagger production and networks

Some daggers, especially in areas with many daggers, display a high degree of technical skill, such as parallel flaking, pressure-flaked seams etc. The daggers were in most cases resharpened and reworked with plain technique, indicating that the know-how of dagger production was lacking. Furthermore, most arrowheads were manufactured by simple bifacial knapping technique and many gallery graves contain polished flint pieces and polished axe fragments. Hence, the daggers were most probably imported, while arrowheads were locally produced from, for example, reused flint artefacts.

Apel (2001) argues that to produce these skilfully knapped daggers, an institutionalized apprenticeship system with know-how passed from generation to generation in areas with an abundance of available raw material was required. Therefore, the main production areas were suggested to be the main areas of primary flint sources where mines occur in northern Jutland, the Danish eastern isles, and south-western Scania (Apel, 2001). In south-western Scania, large numbers of axe and dagger preforms made of flint probably sourced from outcrops in the beach ridges have been found (Högberg, 2002). Hence, these areas are the most likely origins of these specific daggers, although the occurrence of Kristianstad flint also indicates exchange networks with eastern Scania.

Figure 17. Arrowheads from the Norra Säm 10 gallery grave, SHM 15003. Photograph by Malou Blank, CC BY (SHM).

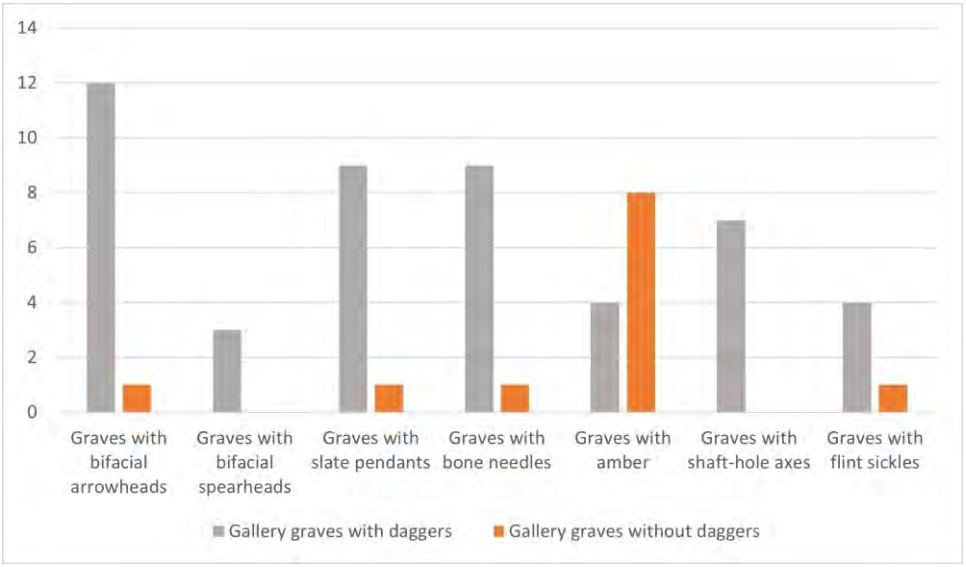


Figure 18. Diagram of number of gallery graves with different artefacts grouped by the occurrence or absence of daggers.

Figure 19. Flint dagger and flint flakes from the Falköping stad 5 gallery grave. Photograph by Malou Blank, CC BY (SHM).

The distribution of daggers into areas where flint was scarce required local and regional redistribution centres (Apel, 2001). Gallery graves west of Falbygden in central Västergötland containing large numbers of daggers might represent such kind of locations (see above).

According to Apel's (2001, p. 306) investigation of frequencies of dagger types in Västergötland, most of the daggers originated from the eastern Danish isles or south-western Scania in Sweden, although imports from northern Jutland also occurred. Considering the distribution of type I daggers and other dagger types in both megalithic graves and stray finds in this study, Apel's assumption seems credible.

There is evidence in the archaeological material that suggests some degree of know-how of pressure-flaking technique and/or mobile specialists outside the core production areas, which in my opinion deserves more attention. A few skilfully pressure-flaked arrowheads made in local flint (Öglunda 23, SHM 8058, Medelplana 54, SHM 15660), and one spearhead of slate (Södra härene 73, Alingsås Museum 5956) occur. There are some examples of possibly locally produced daggers, and in one of the graves the daggers appear to have been made by the same person (Härlunda 7, SHM 11727). Apel (2001) has also noted the existence of these less-elaborately executed daggers.

No production sites are known in Falbygden, although flint flakes originating from the same piece as the dagger were found in one of the gallery graves (Falköping stad 5), from the same kind of flint and with the same kind of polishing (Fig. 19). The flakes might derive from the polished dagger preform, or an axe used to produce the dagger. The flakes might have been produced locally or brought with the dagger and might have been intended for arrowhead production.

The abundance of flint daggers in Västergötland with large, polished parts might be a result of using polished axes for dagger production, which also could explain the many small-sized daggers. Schnittger (1920) proposed that a polished axe was used as raw material for one of the daggers in Medelpana 54 gallery grave (SHM 15660). However, polishing was an established method to facilitate pressure flaking and perhaps polishing was a technique with long tradition that was mastered to a greater extent than pressure flaking in Västergötland.

Conclusion

The results from comparative analyses of dagger types and 14C dates in the megalithic graves of Västergötland demonstrate that types can be used to roughly date contexts, but not always. I suggest that types I and II can be dated to LN I and in a few cases into first part of LN II, type III daggers to the LN I/LN II transition and the first half of LN II, type IV to LN II and LN II/EBA transition and type V to the LN II/EBA transition and the EBA. More examples of daggers connected to specific individuals would be desirable to resolve these questions.

Furthermore, gallery graves with LN I burials contain few or no daggers (always of types I and II), but never slate pendants or flint sickles. Gallery graves dominated by LN II burials usually contain daggers mostly of types III and IV, arrowheads, slate pendants and sometimes spearheads. Gallery graves with human remains mainly dated to the LN II/EBA transition and the EBA often contain daggers of types IV, V and VI, slate pendants, and sometimes sickles and metals.

The daggers were imported probably from northern Jutland, the Danish eastern isles, and south-western Scania, but small-scale local production is also proposed.

The number of daggers could correspond to a long use-time of the graves, but the correlation between number of daggers and skilful knapping techniques might also indicate localities with access to good-quality daggers, which were important nodes in a distribution network during the Scandinavian LN and EBA. Early daggers in graves in the central

part of Falbygden might suggest nodes in distribution network already existing in LN I, while at Kinnekulle these do not appear until the transition between LN II and the EBA.

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References

Apel, J. 2001. Daggers, knowledge & power. Ph.D. thesis, Uppsala University.

Artursson, M. 2009. Bebyggelse och samhällsstruktur. Södra och mellersta Skandinavien under senneolitikum och bronsålder 2300-500 f. Kr. Ph.D. thesis, Gothenburg University.

Becker, C. J. 1951. Late Neolithic flint mines at Aalborg. Acta Archaeologica 22: 135–152.

Becker, C. J. 1980a. Hov, Gem. Sennels, Amt Thisted, Jütland. In: 5000 Jahre Feuersteinbergbau (pp. 457–464). Weisgerber, G. (ed.). Deutsches Bergbau Museum, Bochum.

Becker, C. J. 1980b. Hillerslev, Amt Thisted, Jütland. In: *5000 Jahre Feuersteinbergbau* (p. 470). Weisgerber, G. (ed.). Deutsches Bergbau Museum, Bochum.

Becker, C. J. 1980c. Aalborg, Skovbakken (oder Hasseris), Amt Aalborg, Jütland. In: *5000 Jahre Feuersteinbergbau* (p. 469). Weisgerber, G. (ed.). Deutsches Bergbau Museum, Bochum.

Bergerbrant, S., Kristiansen, K., Allentoft, M. E., Frei, K. M., Price, T. D., Sjögren K.-G. & Tornberg, A. 2017. Identifying commoners in the Early Bronze Age: burials outside barrows.In: New perspectives on the Bronze Age: proceedings from the 13th Nordic Bronze AgeSymposium held in Gothenburg 9th June 2015 (pp. 37–64). Bergerbrant, S. & Wessman, A.(eds.). Oxford: Archaeopress.

Blank, M., Tornberg, A. & Knipper, C. 2018. New perspectives on the Late Neolithic of southwestern Sweden. An interdisciplinary investigation of the gallery grave Falköping stad 5. Open Archaeology 4: 1–35.

Blank, M., Sjögren, K.-G. & Storå, J. 2020. Old bones or early graves? Megalithic burial sequences in southern Sweden based on 14C datings. *Archaeological and Anthropological Sciences* 12: 89. https://doi.org/10.1007/s12520-020-01039-9

Blank, M., Sjögren, K.-G., Knipper, C., Frei, K. M., Malmström, H., Fraser, M., Svensson, E., Günther, T., Yngve, H., Jakobsson, M., Götherström, A. & Storå, J. 2021. Mobility patterns in inland southwestern Sweden during the Neolithic and Early Bronze Age. *Archaeological and Anthropological Sciences* 13: 64. https://doi.org/10.1007/s12520-021-01294-4

Blomqvist/Bägerfeldt, L. 1990. *Neolitisk Atlas över västra Götaland*. Falköping: Norders Bokhandel.

Djurfeldt, M. 1967. Rapport över undersökning av boplatsområdet söknummer 32, Stora Önnered, Göteborgs stad. Unpublished report in Göteborgs stadsmuseums archives (no. 32: Västra Frölunda 337).

Ebbesen, K. 1975. Comments on the flint daggers of Denmark. *Norwegian Archaeological Review* 8 (2): 107–111.

Ebbesen, K. 2007. Danske hellekister fra stenalderen. *Aarbøger for nordisk Oldkyndighed og Historie* 2004: pp. 7–62.

Forssander, J. E. 1936. *Der Ostskandinavische Norden Während der Ältesten Matallzeit Europas*. Acta Regiae Societatis humaniorum litterarum Lundensis, Lund.

Frieman, C. & Eriksen, B.V. (eds.) 2015. *Flint daggers in prehistoric Europe*. Oxford: Oxbow Books.

Hector, L. 1993. Senneolitiska skifferhängen i Västergötlands hällkistor. En materialanalys. Unpublished BA thesis, Stockholm University.

Högberg, A. 2002. Production sites on the beach ridge of Järavallen. Aspects on tool pre-forms, action, technology, ritual and the continuity of place. *Current Swedish Archaeology* 10: 137–162.

Högberg, A. & Olausson, D. 2007. Scandinavian flint—an archaeological perspective. Aarhus: Aarhus University Press.

Högberg, A., Apel, J., Knutsson, K., Olausson, D. & Rudebeck, E. 2001. The spread of flint axes and daggers in Neolithic Scandinavia. *Památky Archeologické* 92 (2): 193–221.

Holst, N. O. 1906. Flintgrufvor och flintgräfvare i Tullstorpstrakten. *Ymer* 26 (2): 147–148.

Iversen, R. 2015. *The transformation of Neolithic societies. An eastern Danish perspective on the 3rd millennium BC*. Aarhus: Aarhus University Press.

Janson, S. 1950. Gravfynd från stenåldern. Skogsbo hällkista, Norra Säm sn, VG. Dnr/SHM 15003/1950, ATA, Stockholm. Report.

Kaelas, L. 1964. Senneolitikum i Norden. *Tor* 10: 135–148.

Karsten, P. 1994. Att kasta yxan i sjön: en studie över rituell tradition och förändring utifrån skånska neolitiska offerfynd. PhD thesis, Lund Univeristy. Stockholm: Almqvist & Wiksell International.

Kristiansen, K. & Larsson, T. B. 2005. *The rise of Bronze Age society: travels, transmissions and transformations*. Cambridge: Cambridge University Press.

Kühn, H. J. 1979. *Das Spätneolithikum in Schleswig-Holstein*. Offa-Bücher, 40. Neumünster: Wachholtz Verlag.

Lekberg, P. 2002. Yxors liv, människors landskap: en studie av kulturlandskap och samhälle i Mellansveriges senneolitikum. Ph.D. thesis, Uppsala University.

Lennblad, A. 2015. Döden i hällkistan. En material och litteraturstudie kring senneolitikums hällkistegravar. M.Phil. thesis, University of Gothenburg.

Lindman, G. 1986. Aggressionsforskning i arkeologi: metoder och resultat i ett västsvenskt exempel. University of Gothenburg.

Ling, J., Stos-Gale, Z., Hjärthner-Holdar, E., Grandin, L., Billström, K. & Persson, P. 2014. Moving metals II: provenancing Scandinavian Bronze Age artefacts by lead isotope and elemental analyses. *Journal of Archaeological Science* 41: 106–132.

Lomborg, E. 1973. *Die Flintdolche Dänemarks. Studien über Chronologie und Kulturbeziehungen des südskandinavischen Spätneolithikums*. Nordiske Fortidsminder, Serie B, 1. Det Konglige Nordiske Oldskriftselskab, Copenhagen.

Lomborg, E. 1975. The flint daggers of Denmark. Studies in chronology and cultural relations of the south Scandinavian Late Neolithic & reply to comments. *Norwegian Archaeological Review* 8 (2): 98–101, 115–124.

Madsen, T. 1978. Perioder og periodovergange i neolitikum: om forskellige fundtypers egenhed til kronologisk opdelninger. *Hikuin* 4: 51–60.

Müller, S. 1902. *Flintdolkene I den nordiske Stenalder*. Nordiske Fortidsminder I. Cophenhagen.

Olausson, D. 2000. Talking axes, Social daggers. In: *Form, function and context. Material culture studies in Scandinavian archaeology* (pp. 121–134). Olausson, D. & Vandkilde, H. (eds.). Lund: Almqvist and Wiksell International.

Olausson, D. 2017. Knapping skill and craft specialization in Late Neolithic flint daggers.

Lithic Technology 42 (4): 127–139.

Østmo, E. 2011. *Krigergraver. En dokumentarisk studie av hellekister i Norge*. Oslo: Oslo University, Kulturhistorisk museum.

Sahlström, K. E. 1947. Torsagården, Gökhem sn, VG. Dnr: 3022/47, ATA, Stockholm. Excavation report.

Schnittger, B. 1910. Förhistoriska flintgrufvor och kulturlager vid Kvarnby och S. Sallerup i Skåne. *Antikvarisk Tidskrift för Sverige* 19 (1): 1–101.

Schnittger, B. 1920. Hälles och Kisas gravar på Kinnekulle. *Västergötlands fornminnesförenings tidskrift* 4 (1): 26–38.

Segerberg, A. 1978. Den enkla skafthålsyxan av sten. Fyndförhållanden och datering. *Tor* 17: 159–218.

Simonsen, J. 2017. *Daily life at the turn of the Neolithic. A comparative study of longhouses with sunken floors at Resengaard and nine other settlements in the Limfjord region, south Scandinavia*. Aarhus.

Stensköld, E. 2004. Att berätta en senneolitisk historia: sten och metall i södra Sverige 2350–1700 f. Kr. Ph.D. thesis, Stockholm University.

Tornberg, A. 2017. Diet, toothache and burial diversity. Tracing social status through bioarchaeological methods in Late Neolithic-Early Bronze Age Scania. *Lund Archaeological Review* 22: 21–36.

Vandkilde, H. 1996. *From stone to bronze. The metalwork of the Late Neolithic and earliest Bronze Age in Denmark*. Jutland Archaeological Society Publications 32, Aarhus.

Vandkilde, H. 2000. Material culture and Scandinavian archaeology: a review of the concepts of form, function, and context. In: *Form, function & context. Material culture studies in Scandinavian archaeology* (pp. 3–50). Olausson, D. & Vandkilde, H. (eds.). Lund: Lund University.

Vandkilde, H. 2001. Beaker representations in the Danish Late Neolithic. In: *Bell Beaker today. Pottery, people, culture and symbols in prehistoric Europe. Proceedings of the International Colloquium, Riva del Garda, Trento, Italy. May 1998* (pp. 333–360). Nicolis, F. (ed.). Trento: Ufficio Beni Archeologici.

Varberg, J. 2005. Oprindelsen til en ny tidsalder. Mellem stenalder og bronzealder i Sydskandinavien 2350–1700 B.C. *Fornvännen* 100 (2): 81–95.

Weiler, E. 1977. Fornlämning 5, hällkista. Raä och SHM Rapport UV 1977:18. Riksantikvarieämbetet, Stockholm.

Weiler, E. 1994. Innovationsmiljöer i bronsålderns samhälle och idévärld: kring ny teknologi och begravningsritual i Västergötland. Ph.D. thesis, Umeå University.

Wincentz Rasmussen, L. 1990. Dolkproduktion og distribution i senneolitikum. *Hikuin* 16: 31–42.

Appendix

Name-Raä no.	Grave type	Inventory no.	LN artefacts	LN/EBA daggers	Earliest LN burial, cal BC, 95.4%*	Latest LN/BA burial, cal BC, 95.4%*	No. of buried ind	No. of 14C dated ind.*
Håkanstorp 66	GG	SHM 4840	1 bifacial flint arrowhead	1 type III			N.D.	
Vartofta-Åsaka, Möleberget	GG	SHM 20333		1 type III			N.D.	
Dimbo 18:2	GG	FM 852, 1327 (ATA dnr 0784/1933)	1 slate pendant, 3 bone needles, 1 bifacial flint arrowhead	3: 1 type II,1 type III, 1 IV			N.D.	
Falköping stad 5	GG	SHM 32384	2 bone needles, amberbeads etc.	1 type IIB	2202-1980 (LNI)	1902-1697 (LNII)	30	22
Borgunda 106	GG	SHM 6846, 7591:100	1 shaft-hole axe	2: 1 type I, 1 type III	2027-1771 (LNI/LNII)	1877-1639 (LNII/EBA)	>3	3
Gudhem 112	GG	SHM 4840:50-53	ceramic sherds	2: 1 type VA, 1 type IVE			N.D.	
Gudhem 159:2	GG	FM 1300:3		2: 1 type I, 1 type II?			N.D.	
Gökhem, Torsagården	GG	SHM 23802	1 bone awl	1 type IB	2031-1772 (LNI/LNII)	1922-1746 (LNII)	2	2
Högstena 45	GG	FM1075	2 bone needles, 1 bone awl	2: 1 type II, 1 type II?			N.D.	
Karleby 71	GG	SHM 5386A	4 bifacial flint arrowheads, 4 slate pendants, 3 flint spearheads, bone needles, amberbeads, part of a flint sickle, pottery etc	14: 8 type IV, 5 type V, 1 type IV/V	2018-1766 (LNI/II)	1611-1413 (EBA)	60	10
Kinneved 73#	GG	SHM 22 987, FM:2028	1 slate pendant, ceramic sherds etc.	1 type III	1911-1700 (LNII)	1877-1646 (LNII/EBA)	3?	2
Norra lundby 103:4	GG	SHM 8059:1	1 flint spearhead	1 type III			N.D.	
Norra lundby 110	GG	SHM 6163	1 part of a flint sickle, piece of slate, flint scraper	2: 1 type IV, 1 type VI?			N.D.	
Torbjörntorp 16#	GG	SHM 21675	1 flint spearhead, bone needles, 1 bone awl, 1 slate button etc.	5: 4 type III, 1 type IV	2121-1891 (LNI/II)	1943-1695 (LNII)	15?	6
Torbjörntorp 18	GG	SM 88966	10 bifacial flint arrowheads, 9 slate pendants, 2 slate buttons, 3 shaft-hole axes, bone needles, amberbeads, ceramic vessels etc.	19: 10 type III, 5 type IV, 3 type V, 1 type ?	2113-1779 (LNI/LNII)	1384-1126 (EBA)	80	23
Torbjörntorp 31	GG	SHM 18522, 18832	8 bifacial arrowheads, 1 slate pendant, 1 shaft-hole axe, bone needles, ceramic vessels etc.	5: 1 recut type II, 4 type III	2119-1891 (LNI/LNII)	1867-1612 (LNII/EBA)	30	16
Torbjörntorp 37	GG	FM 29	1 flint scraper, 1 bifacial flint arrowhead	1 recut type III/IV			N.D.	
Varnhem 116	GG	SHM 5386:F , 17709	1 bone needle, ceramic sherds	1 recut III	1881-1692 (LNII)	1876-1641 (LNII/EBA)	>9	3
Östra Thunhem 26	GG	SHM 20362, FM 960	1 shaft-hole axe, polished axe fragment	2 type I/II			N.D.	
Brunhem 48	GG	SHM 19202					N.D.	
Falköping stad 15:1	GG	SHM 4840:29-32	1 bone fish hook	0			N.D.	
Falköping stad 20:2	GG	SHM 4840: 13-22	ambearbeads	0			N.D.	
Falköping stad 22	GG	SHM 6593	1 axe shaped amberbead	0			N.D.	
Falköping stad 26	GG	SM/VGM 1M16-104782	1 axe shaped amberbead	0			N.D.	
Falköping stad, Blinningsberg#	GG	SHM 20317	10 amberbeads	0			N.D.	
Falköping stad, Kapellgatan	GG	SHM 19409	amberbeads	0			N.D.	
Gudhem 159:1	GG	FM 1300:3, SM		0			N.D.	
Gökhem Ledsgården	GG	SHM 21426	amberbeads, 1 bone awl	0			N.D.	
Valtorp 2:2	GG	SHM 27911	1 slate pendant	0			N.D.	
Vilske-Kleva 26:1#	GG	SHM 22681		0			N.D.	
Vårkumla 25	GG	SHM 18170	amberbeads	0			N.D.	
Östra Thunhem 22#	GG	SHM 24211	ceramic sherds	0			N.D.	
Södra kyrktorp 62	GG	SHM 1687		3 type ?			N.D.	
Karleby 195	GG	SHM 4840	1 flint sickle, 1 flint scraper	0			N.D.	
Öglunda 23	GG	SHM 8058	2 bifacial arrowheads, bone needles, bone fish hook, amberbeads etc	0			N.D.	
Segersstad 176, Valtorp 36#	GG	SHM 32672		0			N.D.	
Österplana 27	GG	SHM 7881, 15944, 16679	1 flint sickle, bone needles etc.-shaft-hole axe-not sickle	2: 1 type IV, 1 type ?	1884-1664 (LNII/EBA)	1879-1665 (LNII/EBA)	50	3
Medelplana 54	GG	SHM 15660	6 bifacial arrowheads, 4 slate pendants, recut flint sickle, ceramic etc.	6: 2 type IV, 2 type V, 2 type ?	1889-1698 (LNII)	1611-1422 (EBA)	20/60?	14

Name-Raä no.	Grave type	Inventory no.	LN artefacts	LN/EBA daggers	Earliest LN burial, cal BC, 95.4%*	Latest LN/BA burial, cal BC, 95.4%*	No. of buried ind	No. of 14C dated ind.*
Medelplana 18	GG	SHM 3482	1 slate pendant	1 type V	1927-1664 (LNII/EBA)	1927-1664 (LNII/EBA)	N.D.	1
Skånings åsaka 7	GG	SM/VGM 85605	1 bifacial flint arrowhead, 6 slate pendants etc.	1 type IV	1885-1693 (LNII)	1744-1564 (LNII/EBA)	10	2
Skånings åsaka 13	GG	SM/VGM 4893					N.D.	
Vinköl 61	GG	SM/VGM 86866	1 bifacial flint arrowhead, 2 slate pendants, 1 shaft-hole axe etc.	3: 2 type III, 1 type II?			N.D.	
Härlunda 7	GG	SHM11727	3 bifacial arrowheads etc.	6 type III			N.D.	
Timmersdala 5	GG	SHM5974	9 bifacial flint arrowheads, 1 bone needle, 2 pieces of flint daggers etc	4: 2 type VA, 1 type VIB?, 1 type III			N.D.	
Otterstad 14	GG	SM/VGM 86888	1 shaft-hole axe	4: 1 type IIIE, 1 type IV, 2 type ?			N.D.	
Horn 10	GG	SHM 12816	1 shaft-hole axe	2 type V			N.D.	
Norra Säm 10:1	GG	SHM 15003	27 bifacial flint arrowheads, 1 flint spearhead, 3 slate pendants, 1 amber button, 1 amber hourglass pendant, 1 amberbead, ceramic etc.	19: 13 type III, 1 type I, 1 type II, 1 type IV, 1 type V, 2 type ?			N.D.	
Falköping stad 3	PG	SHM 4032	1 bifacial flint arrowhead					
Falköping stad 4	PG	SHM 4033						
Falköping stad 7	PG	SHM 4840	1 bone needle					
Falköping stad 9	PG	SHM 24692						
Falköping stad 11	PG	SHM 4034:a, 4840	1 bone needle					
Falköping stad 18	PG	SHM 4840, FM 1347, 2101	1 flint sickle	1 recut flint dagger type V				
Falköping stad 19	PG	SHM 4840, 4034b	1 spearhead, 4 bifacial arrowheads, 2 slate pendants, 1 amberbead, 1 shaft-hole axe, 3 bone needles, 3 bone awls, 2 ceramic sherds	8:1 type Ia, 2 type III, 3 type IV/III, 1 type IVa/Va, 1 type ?				
Falköping stad 28	PG	SHM 18833, FM 2112						
Falköping östra 1	PG	SM/VGM?	14C-hb, 1 bifacial flint arrowhead					
Friggesåker 1	PG	SHM 19160						
Gudhem 7	PG	SHM 6261						
Gökhem 17	PG	SHM 32201						
Gökhem 24	PG	SHM 21426						
Gökhem 31#	PG	SM/VGM 1M16-104358						
Gökhem 71#	PG	SM/VGM 1M16-107017	14C-hb					
Gökhem 72	PG	FM 129, SHM 24626	bifacial flint	1 recut type III				
Gökhem 78#	PG	GU	1 flint sickle					
Gökhem 94:1	PG	SHM 18119	14C-hb					
Hornborga 31	PG	SHM 23594						
Hångsdala 2	PG	SHM 3095	2 bone needles					
Hångsdala 14	PG	SHM 3097						
Hångsdala 15	PG	SHM 3096	1 bone needle	2: 1 type III, 1 type IV?				
Karleby 55	PG	SHM 9736:b		1 recut type II				
Karleby 57	PG	SHM 5157	1 bifacial flint arrowhead, ceramic					
Karleby 59	PG	SHM 5386:b	14C-hb, 1 bone needle					
Karleby 82#	PG	SHM 18050, SM?		1 recut type III				
Karleby 105#	PG	SM/VGM?	1 bifacial flint arrowhead					
Kinneved 19	PG	SHM 3878	2 spearhead	5: 1 type IV/III, 3 type III, 1 type V				

Name-Raä no.	Grave type	Inventory no.	LN artefacts	LN/EBA daggers	Earliest LN burial, cal BC, 95.4%*	Latest LN/BA burial, cal BC, 95.4%*	No. of buried ind	No. of 14C dated ind.*
Luttra 16	PG	SHM 3165	14C-hb, 1 flint spearheads, 1 bifacial flint arrowhead, 1 bone hourglass pendant, bone needles etc.	5: 3 type I, 2 type II	2196-1974 (LNI)	1876-1627 (LNII/EBA)	>9	9
Norra Lundby 38	PG	SHM 21425						
Norra Lundby 41	PG	SHM 7494:B						
Norra Lundby 66	PG	SHM 7494C	1 bifacial flint arrowhead, 1 bone needle					
Näs 6	PG	SHM 21476						
Näs 7	PG	SHM 32196						
Skärv 8	PG	SHM 439	1 shaft-hole axe					
Skärv 82	PG	GU/SM						
Slöta 24	PG	SHM 3166, 16959	1 slate pendant					
Torbjörntorp 12#	PG	GU/SM						
Valstad 8	PG	GU/SM	ceramic?					
Valtorp 1	PG	GU/SM	1 shaft-hole axe					
Valtorp 2:1	PG	SHM 27911	14C-hb, 1 bone needle	1 recut type III	1974-1700 (LNII)	1974-1700 (LNII)	130	24
Valtorp 42	PG	GU/SM	ceramic					
Vartofta- Åsaka 8	PG	SHM 5386:c-e						
Vårkumla 45	PG	FM 2302	1 shaft-hole axe					
Kinneved 21	D	SHM 14217						
Falköping västra 7	D	SHM 24625, FM 2326	1 bone needle					
Gökhem 164	D	SHM 20817						
Göteve 41	PG	SHM 12644						
Karleby 37	PG	SHM 9736:a						
Falköpings västra 2	MG	SHM 7571:212, FM 1592	2 bone needles					
Falköping västra 24	MG	SHM 4840:149		1 type I/II				
Hornborga 108	MG	FM 1261	1 shaft-hole axe					
Gökhem 94:2	MG	SHM 18119						
Falköpings västra 1	D/GG	SHM 20899	1 bone needle					
Falköping stad 15:3	D/GG	SHM 4840:23-27	1 bone hourglass pendant					
Varnhem 80	D/GG	SM/VGM		1 recut type ?				

A prehistory of violence

Evidence of violence-related skull trauma in southern Sweden, 2300–1100 BCE

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Abstract

Warriors and warfare have become common themes within Bronze Age archaeology over the past 10–20 years. Recent reporting of Neolithic and Bronze Age massacres and battlefields in Germany supports the presence of endemic violence in these regions. But what about in southern Scandinavia? This paper explores the evidence of violence-related skull trauma from a pooled sample of 257 individuals from 40 different localities in southern Sweden. The results show that there is a relatively large difference in the frequency of skull trauma depending on burial type. Due to the common practice of Early Bronze Age reburials in Late Neolithic gallery graves, the high frequency of trauma in gallery graves and barrows is probably linked to increased violence rates in the Early Bronze Age. The majority of cases are caused by blunt force, and up to 13% of the individuals were affected. Most of the traumata were healed, especially among males. It is probable that the high levels of blunt-force skull trauma in southern Sweden mirrors a society with endemic warfare during the Early Bronze Age.

Keywords: Trauma, Violence, Late Neolithic, Early Bronze Age, Bioarchaeology

As we continuously encounter acts of violence through the news, both as domestic violence, homicide, gang-related violence, and warfare, it is easy to feel that we are living in a more violent epoch than ever before. When Steven Pinker, in his best-selling book, *The better angels of our nature: why violence has declined*, proclaims that we instead live in the most peaceful of all times (Pinker, 2012), we are likely to raise our eyebrows and deem this untrue. In his book, Pinker collects data of violence-related deaths from prehistoric times up to the present. He builds his narrative of how violence gradually has declined upon a large variety of data, combining archaeological and historical statistics, ethnographical observations, and biological, psychological and evolutionary theory. Although the book has proved strongly influential, it has also received some criticism. The critique has touched upon Pinker's heavy reliance on evolutionary psychology with disregard of other relevant theories that explain human violence (Bhatt, 2013), but also that the data, on which Pinker draws his conclusions about high levels of lethal violence among hunter-gatherers (Lee, 2014), in medieval England (Butler, 2018), and in modern societies (Mann, 2018), are misinterpreted. This critique, of course, influences the reliability of Pinker's claim. However, new evidence of prehistoric violence is continuously being reported, and additional analyses are necessary.

This paper explores the presence of violence and possible warfare through evidence of skull trauma in the south Scandinavian Late Neolithic (LN) and Early Bronze Age (EBA). The results are discussed within a framework of archaeological, anthropological, and evolutionary theories of violence, warriors, and warfare.

Table 1. Compilation of number of hits of search on Google Scholar for papers on prehistoric violence.

Search results of the keywords "prehistoric violence" on Google Scholar.		
Years	**No. of hits**	**Mean no. of hits per annuum**
1900–1950	3 210	64.2
1951–1970	1 450	72.5
1971–1990	4 980	249
1990–2020	45 900	1 530

Violence and archaeological evidence—from non-existent to warfare

When discussing the presence of prehistoric warfare, it is critical to address several variables provided in the archaeological record. It is however also of importance to review the scholarly tradition of the study of violence and warfare. Ferguson (2013a, 2013b) argues for an inclusive approach to the archaeological record, but that suggests that the archaeological record is without biases that affect the scholarship on prehistoric warfare. It is evident that the research interest, as well as the interpretations, of violence and warfare within the field of archaeology has fluctuated through time, which could influence the presence of data.

The interest of prehistoric violence within archaeology has increased significantly in the last decades. From being more or less discarded as non-existent, and thus, not worthy of study, it has become a frequently occurring subject in academic papers in high-profile journals. A search on the keywords "prehistoric violence" on Google Scholar show the tendencies of this development. Publications on prehistoric violence seem to have increased continuously from the first half of the 20th century up to the present day (Table 1). Of course, the example is superficial, but it outlines the general trend in archaeological research interest.

This general trend is not the result of chance, but rather it clearly follows the overarching theoretical attributes of different archaeological paradigms and revolutionary findings. Vandkilde (2003, 2013, 2015) put forward that warfare was not considered in academic archaeological texts until after Keeley's influential book on war before the state (1995), and then only with some caution in the years that followed. Although weapons, and in some cases, also warriors, were natural parts of archaeological themes, warfare, as the link between these themes, was ignored. Why? Vandkilde seeks the answer in contemporary society. After years of vicious warfare and genocide within living memory, warfare, as a part of prehistory, was reluctantly considered. The viciousness of warfare, that so many of those living had experienced personally, was difficult to attribute to the "primitive other" in prehistory (Vandkilde, 2003, 2013). In the years that followed the WWII, prehistoric peoples of the Neolithic and Bronze Age were portrayed as peaceful peasants and traders, not as warriors (Vandkilde, 2003, 2013). As warriors, and in some instances warfare, again gained attention over the last couple of decades, it was during a time when warfare and genocide increased in frequency in the contemporary western world. Still, the warrior was portrayed as part of an elite (almost glorified), even though new findings and

methodological developments provided evidence of warfare and violence, thereby illuminating the horrors of warfare in prehistory (Vandkilde, 2003, 2013). As Vandkilde (2003) points out, the amount of war-related archaeological data, e.g., weaponry, petroglyphs depicting battles, and skeletal trauma, is substantial enough to confirm prehistoric violence and warfare, but has been overlooked as a result of past research traditions.

Kristiansen (2014) argues for an ongoing scientific revolution in archaeology. The scientific revolution of big data, quantitative modelling and biochemical analyses (e.g., aDNA and strontium isotope analysis) is helping to develop the knowledge and understanding of prehistoric warfare. The increasing interest in, and developing scientific respect for, bioarchaeological research (i.e., osteological, isotope, and palaeogenetic analyses), sets a new repertoire of available data of prehistoric violence. This means that in the recent decade we have continuously gained not only new evidence of the presence of skeletal trauma, but also insight in the interrelatedness of individuals suffering from trauma. Without being detached from solid theoretical frameworks, I believe that, following Kristiansen's terminology, the scientific revolution in archaeology can expand our knowledge of prehistoric warfare in ways previously impossible, and this has only just begun.

Warfare, warriorhood and violence—the Nordic Neolithic and Bronze Age

Weapon hoards, weapons as burial equipment, and petroglyphs of weapons and fighting scenes give us glimpses of the importance of weaponry and warfare in the Nordic Bronze Age (NBA), plausibly with warrior chiefs as clan leaders (e.g., Harding, 1999; Kristiansen, 1999; Fyllingen, 2003; Horn, 2015). Even though warriorhood traditionally has been discussed as a significant feature of BA societies, there is a growing understanding that the roots of warriorhood should rather be sought among the different branches of the Corded Ware Culture (CWC) (Neubert *et al*., 2014; Vandkilde, 2016; Ling *et al*., 2018). Horn (2021) however suggests that battle weapons in the form of flint halberds might have already been present among Funnelbeaker groups, thus pushing evidence of possible warriorhood even further back in time. Considering this, warriorhood as a class was already well-established in the NBA and was also likely to have been present throughout the LN.

The petroglyphs of Bohuslän, south-western Sweden, depict a huge amount of fighting scenes. The interpretations of these fighting scenes have comprised religious themes as well as actual representations of warfare. However, it should be stressed that these petroglyphs date to the last parts of the NBA (Ling & Cornell, 2010), thus post-dating the periods under study in this paper. Ling.*et al*, (2018) argue for a "maritime mode of production" with a division between a land-based agricultural aristocracy in Jutland and a sea-based fisher-farmer aristocracy in western Sweden (Tanum). They argue for a linkage between agricultural surplus in Denmark, access to boat timber and maritime experts in western Sweden and Norway, and access and demand for products, such as slaves, in continental Europe. In this linkage, warriors are the protectors and expanders of the chiefdom, as well as capturers of slaves. The warriors were connected to the chieftain and would gain personal prestige from this relationship. Ling *et al*. (2018) point to slaves as important commodities associated with warriors and seafarers, and give examples of the phenomenon as represented in petroglyphs.

A number of wear analyses prove that several deposited weapons had in fact been used and did not solely figure as ritual items (Kristiansen, 2002; Horn, 2013; Melheim & Horn, 2014; Horn & von Holstein, 2017). The

study of skeletal remains provides direct evidence of violence through the presence of skeletal trauma. It is certain that not all violent events leave detectable damage on the skeletons, but bioarchaeology has significantly contributed to the study of violence and warfare in prehistory in the recent decades. The example of Eulau, Germany, provided evidence of murdered families of Corded Ware groups (Haak *et al*., 2008; Meyer *et al*., 2009; Meyer, 2019), and the Early Neolithic mass burial of Talheim showed that, not only did most of the individuals suffer from violent deaths, but they had also been deliberately mutilated and tortured (Meyer *et al*., 2015). Both sites provide important evidence of warfare in the Neolithic, and this evidence challenges earlier interpretations that real warfare (in contrast to ritual warfare) is a much later phenomenon. The assumption, which is dependent on the fact that the Neolithic lacks centralized power and thus the social structure for warfare, is however unrealistic. If ritual warfare exists, so does real warfare (Otto *et al*., 2006, p. 15).

Although scholars have been in general agreement that warfare, ritual or real, was a significant trait of the Bronze Age, few would ever dream of finding an actual example of a battlefield of that time. When human bones in large quantities began appearing around the Tollense river, many had to reconsider. At the site of Tollense a minimum number of 124 individuals, mostly males, were buried at one single time, and as the excavations are still ongoing, many more may yet be recovered. Many of the bones show evidence of trauma (Jantzen *et al*., 2011; Brinker *et al*., 2016). The site has been radiocarbon-dated to 1300 BC, corresponding to the Nordic Bronze Age period III (Brinker *et al*., 2013). Two of the most remarkable finds were that of a perimortem blunt-force trauma (BFT) to a frontal bone, and that of a perimortem trauma caused by a flint arrowhead in a humerus, where the arrowhead was found still embedded in the bone. Not only do the trauma types provide incontrovertible evidence of conflict, but the number of dead individuals, as well as the demographic composition, do not reflect that of a natural population (Jantzen *et al*., 2011; Flohr *et al*., 2015). After Bennike's (2003) re-evaluation of her own interpretations of prehistoric trepanations as in fact being cranial trauma, it was evident that prehistoric Denmark was not spared from violence either. The majority of skull traumata that were previously interpreted as trepanations were reinterpreted as blunt-force trauma, not unlike the kind reported from Tollense.

Academic papers continued to provide bioarchaeological evidence of high frequencies of violence-related trauma in northern Europe. Fyllingen (2003) argues for structural and endemic violence in NBA Norway, given the evidence of a high frequency of repeated trauma and physiological stress found in a mass burial in Sund, Inderøy, Nord-Trøndelag, Norway, and Fibiger *et al*. (2013) provided data to support frequencies of violence-related skull traumas of between 9.4 and 16.9% in Neolithic Sweden and Denmark, respectively. Since such a large part of the population was affected, and since the majority of the injuries showed signs of healing, they argue for violence and warfare also being endemic in Neolithic Scandinavia. The mass burials of central Europe have, presently, no direct affinity in Scandinavian burials, but the evidence of repeated violence also in Scandinavian prehistory is stacking up.

It is evident that warfare and warriorhood are significant parts of Bronze Age societies. However, in what ways does this warriorhood influence people in general? There are several different types of violence. The World Health Organization's ecological model of violence (WHO, 2002) consists of four overlapping layers—individual, relationship, community and societal—which all interplay in a complex matter. The societal stage includes cultural norms of violent behaviour on a state level, in this context warriorhood, but these norms also play a role in the other stages. Thus, violent behaviour is entangled as a web, and violence

between the different stages, i.e., interpersonal, group, and societal, is interconnected (Turpin & Kurtz, 1997). That is, in societies where violence is encouraged on a state level, e.g., through strong military control, violent behaviour is also more common between individuals and between different groups. Thus, it is necessary to consider all types of violent behaviour to gain insight into the social complexity of conflict.

Violence is a significant part of warfare; however, warfare is more than violent acts and all violence does not necessarily equate to warfare. The distinction between violence associated to warfare and other types of violence, e.g., homicide or ritual violence, can be hard to discern in archaeological remains, although they are generally interconnected. Therefore, a wider definition of warfare might be adequate. Warfare could thus be defined as a co-ordinated action within a group aiming to harm another group through the means of violence. A categorization of "war-related violence" might be a good compromise (Vandkilde, 2015). Considering the interconnection of different levels of violence, an inclusive approach to violent behaviour in prehistoric contexts seems adequate.

Weaponry and combat techniques

The distinction between what is to be considered a weapon and what is to be considered a tool is sometimes problematic. Weapons can often be used both as hunting equipment and in violent acts between humans. Usually, a definition of weapons (e.g., arrowheads and swords) and tool-weapons/weapon-tools (e.g., axes and daggers) is made, the latter including their properties of dual possible use (Vandkilde 2006, p. 366). It is probable that both regular weapons and weapon-tools have been used in battles, exemplified by petroglyphs depicting both battles with axes and with swords. However, both spears and arrows can be used also in hunting. The sword, on the other hand, is only suitable in human-against-human battles.

Molloy (2010) argues that both sword casting and sword fighting require expert training and that military needs would have pushed bronze casting substantially forward. In contrast to daggers, sword casting and fighting with swords called for specialization. Thus, it is likely that sword-fighting was only practised by a specialized part of the population, i.e., warriors, and did not merely replace the use of daggers in battles, but was socially and politically sanctioned. This means that there must have been a large amount of weapons that were used in violence by non-specialists, many of which are probably missing in the archaeological data due to taphonomic processes.

Weapons inflict damage to the body in different ways, and the target part of the body to strike would differ depending on the weapon. While blunt weapons are suitable for crushing hard tissue, bladed weapons are suitable for cutting soft tissue. Bladed bronze weapons were used to cause extensive bleeding or injure the internal organs, only accidentally causing damage to the bones, considering the risk of the blade then getting stuck. It is probable that the attacks from bladed weapons were directed towards the limbs, neck and abdomen (Hermann *et al*., 2020). According to Molloy (2010), the metallurgic characteristics of BA swords would be associated with a high risk of the blade breaking if attempting to cleave a target with high force. Rather, a controlled cutting with the blade is suggested (Molloy, 2010; Hermann *et al*., 2020). BA swords would as such rarely be associated with skull trauma, an assumption strengthened by bioarchaeological investigations (Aranda-Jiménez *et al*., 2009).

Dyer & Fibiger (2017) tested the impact on skull bones of a blow from a replica of the Neolithic wooden Thames Beater, through experimental analyses on an artificial human skull. They found that the blunt-force trauma

associated with the experimental blow had highly similar features to archaeological blunt-force trauma. They argue that wooden clubs were probable weapons of choice in Neolithic Europe, but that other blunt object, such as sling-stones, could possibly also be associated with prehistoric blunt-force trauma. Dyer & Fibiger's results demonstrate that a large quantity of prehistoric violence-related skull trauma can be associated with weapons often undetectable in the archaeological material. Wooden clubs were also found at the battlefield of Tollense (Jantzen *et al*., 2011). As such, reconstructions of combat techniques need to be addressed both through the properties of the archaeologically detectable weapons, and through the skeletal lesions of the combatants themselves.

The osteological material

The study in question is based on a minimum number of 257 individuals from the provinces of Scania and Västergötland in southern Sweden. The sample is pooled, originating from 40 different localities, dating to the LN and EBA (Figs. 1 & 2). All the remains were retrieved from inhumation graves during the 20th century, and underwent osteological analyses between 2012 and 2016, as part of the author's doctoral research project. Most of the remains had previously never been osteologically examined. The preservation of the remains varied greatly, from excellent preservation to heavily fragmented, which challenged the analyses. The burial customs of the LN and the EBA in southern Scandinavia include single inhumation in flat burials, single inhumations in barrows and cairns, and multiple inhumations in gallery graves. This study includes inhumations from all these burial traditions, with a division of n=43 flat burials, n=14 barrows, and n=11 gallery graves. In many cases several flat burials from the same gave field were examined.

Methods

While sorting out individuals from flat burials and barrows is relatively easy, the same procedure is nearly impossible when it comes to gallery graves. Because of this, the inhumations from these kinds of multiple burials had to be treated as a bulk material and addressed on the level of skeletal element frequencies. For comparability, this analysis is thus based on elemental frequency of skull trauma. Only elements that were preserved to a degree of 50% or more were included in the analysis. Smaller skull fragments were considered too small to be able to assess the element correctly to location and side, as well as the possibility of counting one skull trauma more than once was more likely. Elements were separated into left and right side when paired.

There is always a possibility for skull trauma to be caused by accidents. In modern cases, most severe skull traumata are caused by motor vehicle accidents (Hyder *et al*., 2007). However, there are general morphological differences between accidental and intentionally caused skull trauma. While accidental skull trauma commonly results in linear fractures, violent acts correlate well to depressed fractures (Walker, 1989; Lovell, 1997; Symes *et al*., 2012; Li *et al*., 2021). Further, traumata above the hat brim line (HBL), i.e., the upper part of the cranial vault, are more likely to be caused by intentional force than accidents (Ehrlich & Maxeiner, 2002; Kremer *et al*., 2008). Both characteristics have been acknowledged in this investigation. Skull trauma has been divided between healed, antemortem injuries, and unhealed perimortem trauma after Ortner (2003). Botham (2019) emphasizes an over-diagnosing of healed blunt-force trauma in skeletal remains and argues that the criteria often used to diagnose such are not pathognomonic.

Figure 1. Map of the distribution of five gallery graves from Västergötland, south-western Sweden. 1 = Torbjörntorp 31, 2 = Medelplana 54, 3 = Österplana 27, 4 = Timmersdala, 5 = Falköping stad 5. Map created using ArcGIS 10.5 by Esri. Reproduced from Tornberg (2018).

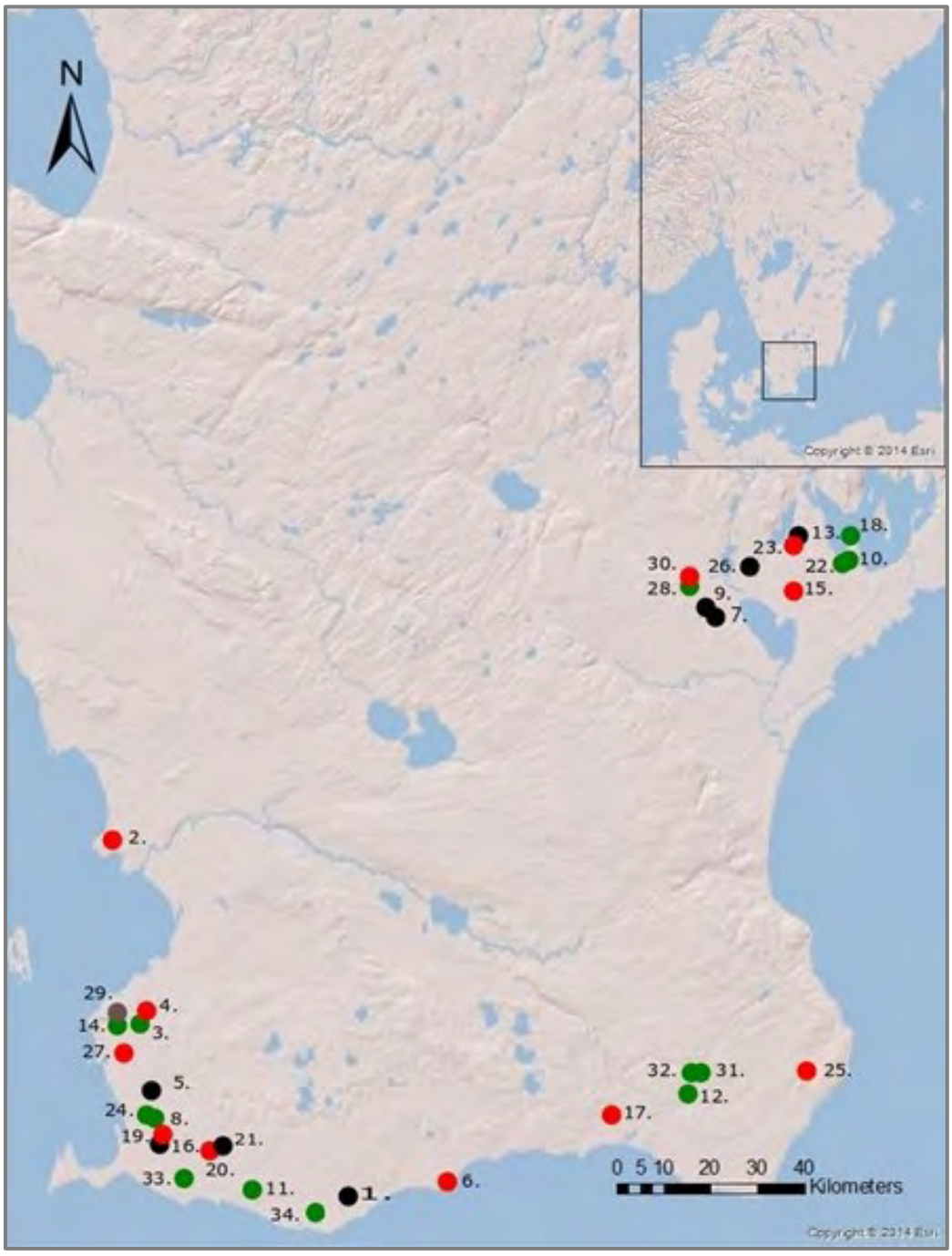

Figure 2. Distribution of the Scanian localities. 1 = Äspö, 2 = Rörbäck 10, 3 = Tannhäuser, 4 = Höjagården, 5 = Vattenöverföringsledningen, 6 = Abbekås (barrows I & II), 7 = Ängamöllan, 8 = Kyhlbjersbacken, 9 = Öllsjö 7, 10 = Kiaby 80, 11 = V. Virestad 19, 12 = Bollerup 4, 13 = Österslöv 57, 14 = Järavallen, 15 = Riksvägen, 16 = Håslöv 5, 17 = Hemmanet, 18 = Bäckaskogs kungsgård, 19 = Åkes hög, 20 = Hammarlöv 6, 21 = Bonhög, 22 = Kiaby mosse, 23 = Österslöv 24, 24 = Vellinge 27, 25 = Viarp, 26 = Möllebacken, 27 = Solnäs, 28 = Skepparslöv, 29 = Knuts backe, 30 = Skepparslöv 20, 31 = Hammenhög 26, 32 = Hammenhög 35, 33 = Ahlbäcksbacken, 34 = Snorthög. Red = barrows, green = flat burials, black = gallery graves. Map created using ArcGIS 10.5 by Esri. Modified from Tornberg (2018).

He discusses both treponematosis and cysts that leave similar marks on the cranial vault. This is of course true, but considering that treponematosis is unknown from prehistoric Scandinavia, and bone-modelling cysts are to be considered rare, most depressions of the skull, however, need to be addressed as trauma.

Sex and age were estimated using standard osteological protocol, when possible. It was rarely possible to attribute the commingled remains of megalithic gallery graves to specific individuals. In these cases, secondary characteristics of the crania were used to assess sex. Characteristics of the cranium are less reliable in assessing specific sex since these characteristics are defined as differences in robustness. It is well acknowledged that robustness differs between time and populations and is dependent on cultural habits such as diets. However, within each population, these characteristics are relatively reliable in referring different degrees of robustness to different sexes. In this study, these characteristics were defined in reference to the population.

Skeletal evidence of violence in southern Sweden

From the total of 257 individuals, at least 82 were males, 65 were females, and 65 were juveniles. Additionally, 45 individuals were adults of either sex. None of the juveniles exhibited any skeletal pathology of the crania that could be associated with trauma. It should however be noted that skulls from juveniles suffered from higher degrees of fragmentation and were thus excluded from the analysis in higher frequencies. The majority of the inhumed individuals derive from gallery graves, followed by barrows and flat burials. The flat burials in Scania are mostly dated to the LN I, while gallery graves from both Scania and Västergötland include burials from the LN II–EBA. In Scania, most of the inhumations are dated to the EBA (Bergerbrant *et al*., 2017, Tornberg 2017, 2018). There are small differences in the frequency of skull trauma between the different burial types, with flat burials exhibiting the lowest frequency with only one individual (Table 2). It is possible that this difference is due to the earlier date, but other explanations could not be excluded. There does not seem to be a tendency towards a difference in proportion of males versus females in the different burial types; the inhumations in flat burials are divided as 16 juveniles, 16 males and 12 females in barrows, 13 juveniles, 13 males and 10 females, and in gallery graves, 35 juveniles, 45 males and 42 females. The span in frequency in gallery graves is due to the commingled state of the skeletal remains. It is possible, however not probable, that one individual has been counted more than once due to poor preservation, hence the minimum and maximum number of individuals suffering from skull trauma has been presented. This span indicates that between 6.7 and 10.4 of the individuals buried in gallery graves were suffering from skull trauma. These are equal numbers to BA barrows.

However, if we consider that none of the juveniles show evidence of skull trauma, it might be reasonable to calculate the percentage of the adult population. When this is done, there is a frequency of 8.5–13.2% (n=129) in gallery graves, 11.1% (n=36) in barrows and 3.6% (n=28) in flat burials.

Only 14 of the traumata could be associated with definite sex; nine were males and five were females. The proportion of affected males would thus be at least 10.8%, and for females 7.7%. There is as such a small predominance of violence-related trauma among males, but the difference is not statistically significant ($p = 0.3568$). However, the suffering individuals that could not be associated with specific sex could fall within either of the categories, altering the results. Of the affected males, only one exhibited a perimortem lesion, while as many as three of the females did not show any evidence of healing. It seems as if females

Table 2. Frequency of skeletal trauma, divided by burial type.

Burial type	MNI	Trauma MNI min.	Trauma MNI max.	Healed	Unhealed	% total
Gallery grave	164	11	17	10	8	6.7–10.4
Barrow	49	4	4	4	0	8.2
Flat burial	44	1	1	0	1	2.3

Table 3. Affected skull bones divided by side and healed vs. unhealed trauma (l = left, r = right).

	Frontal (l)	Frontal (r)	Parietal (l)	Parietal (r)	Temporal (l)	Temporal (r)	Occipital
Total no.	119	121	105	95	116	105	99
Total unhealed	3	1	2	1	1	0	0
Total healed	6	3	2	6	0	0	0
% trauma	7.6	3.3	3.8	7.4	0.9	0	0

might in general be less susceptible to trauma, but if so, in higher degrees died from their injuries. These results are supported by other European Neolithic–BA skeletal assemblages (Dyer & Fibiger, 2017). It is probable that this pattern indicates the reoccurrence of violent encounters among males, while females were more often victims rather than aggressors. All traumata are located on the front or upper part of the cranial vault (Table 3). Usually, violence-related trauma is discussed as mostly present on the left hemisphere due to face-to-face combat with a right-handed aggressor. When it comes to the south Swedish sample it is evident that trauma of the parietal bones occurs more frequently on the right hemisphere. However, when it comes to the frontal part of the skull, the majority of cases are situated on the left side.This fact might be a result of that frontal injuries are mostly due to face-to-face combat, while parietal trauma could in large extent be caused by blows from the side or from behind. Forensic studies show that depressed fractures on the right side of the posterior part of the crania is most common head injury type in violent assaults (Kranioti, 2015). The pattern from southern Sweden could thus indicate that the injuries were caused, not only by face-to-face combat between two aggressors, but by battles between more than two combatants, perhaps in warfare. It is evident that almost all skull trauma in LN–EBA southern Sweden is consistent with blunt-force trauma. Only two injuries of the skull might be consistent with projectiles, while sharp-force trauma to the head is completely missing. The most common fracture type is depressed fractures, or pond fractures (shallow depressions), without visible involvement of the inner table (Fig. 3). These types of fractures are often consistent with slow loading on a small part of the skull (Kranioti, 2015). However, there is a possible bias of intracranial involvement where skulls were intact, and thus it was not possible to examine them visually. Radiating fractures associated with blunt-force trauma originate on the inside of the skull, because of inward bending due to the applied force, and consequently these are not necessarily visible on the outer table. All traumata are located above the hat brim line and as such, indicate a

Figure 3. Examples of blunt-force trauma in individuals from LN–EBA southern Sweden. Healed pond fracture on the left frontal in an elderly female (left), and blunt-force trauma with bone remodelling on right parietal in an adult individual (right). Note the sloping parietals i.e., biparietal thinning, on the left skull, indicating an age of over 70 years. Photographs: Anna Tornberg.

violent origin. The lack of sharp-force trauma in the south Swedish skeletal assemblage is interesting, however not unique. If one compares the types of cranial injuries to the skeletons of Tollense, it is evident that most violence-related skull injuries in the NBA are due to blunt-force trauma. This is probably a result of combat technique. While blunt weapons are used to cause severe damage to hard tissue like bones, sharp weapons are used to cause damage of soft tissue, and therefore only occasionally affect bones. In reference to this, we do not expect a vast quantity of sharp-force trauma to the skull in the NBA.

Trauma or trepanations—or both?

There are always problems in discriminating trauma from trepanations in skeletal remains. There are numerous examples of reported cases of prehistoric trepanations, but as Bennike (2003) states in her re-evaluation of Danish examples, many of these cases are probably not trepanations, but severe skull trauma due to blunt- and sharp-force trauma. Although the first historical document of trepanation, from ancient Egypt, dates as old as possibly 5,000 years (Walsh, 1987, pp. 1–4; Wilson *et al*., 2017), the same document also provides evidence that the surgical intervention in most cases was as treatment of war-wounds. The same conclusion is put forward by Andrushko & Verano (2008) and Jolly & Kurin (2017), who provide supporting evidence that most trepanations are found in relation to skull trauma, thus functioning as treatment of war-wounds.

In the south Swedish sample two individuals show evidence of head injuries that could be possible trepanations. Neither of these individuals was included in the trauma analysis since a traumatic origin cannot be concluded. The first individual is dated to the EBA period II and was buried in a mound at the site of Abbekås, Skivarp parish, in Scania. The individual suffered from a ca. 50 x 63 mm hole through the complete skull on the left parietal (Fig. 4). The individual is a male approximately 40–50 years old at death. The wound shows clear signs of healing and a loss of diploëic structure. The examination of the skull is complicated due to attempted

Figure 4. Possible Bronze Age trepanation from barrow I in Abbekås, Skivarp parish. Photograph: Anna Tornberg.

Figure 5. Possible LN–EBA trepanation from a gallery grave of Ängamöllan, Vä parish. Photograph: Anna Tornberg.

reconstructions of the skull in the 20th century. Thus, it is difficult to assess possible evidence of radiating fracture lines linked to heavy blunt-force trauma. The other case is a young individual inhumed in a gallery grave at the site of Ängamöllan in Vä parish, Scania. The possible trepanation hole is situated on the left parietal. The skull shows some, but not excessive, signs of healing (Fig. 5). Neither of the cases show evident signs of trepanations, such as scrape or cut marks. Although the evidence of trepanations is inconclusive, the location of the injury on the left parietal is consistent with other examples of prehistoric blunt-force trauma. As such, both cases might be regarded as having suffered from violence-related trauma and might subsequently be included as evidence of violence in the LN–EBA.

Discussion and concluding remarks

In this article, evidence of violence-related skull trauma in the south Swedish LN and EBA has been analysed in relation to burial type, location on the cranial vault, and sex.

It is evident that the majority of the skull traumata were caused by blunt force. None of the individuals showed evidence of sharp-force trauma that could be assigned a blow from an axe or a sword. All the affected individuals were adults, with a slight dominance of males. However, females exhibited higher frequencies of unhealed versus healed trauma. The analysis suggests that none of the juveniles were afflicted with skull injuries. It is possible that children were not exposed to violence, but the results could be biased since the immature remains suffered from higher degrees of fragmentation, and thus were excluded from the analysis to a greater extent than the adults. The trauma patterns among juveniles are inconclusive when it comes to prehistoric violence. Meyer *et al*. (2015) provide evidence of perimortem skull injuries in juveniles from the massacre of Talheim, and Fibiger (2013) found evidence of violence in children in Neolithic Germany. The remains from Tollense include children, but none of them exhibited evidence of trauma (Jantzen *et al*., 2011). At the same time, Aranda-Jiménez *et al*. (2009) only found evidence of violence in the adult population of Bronze Age Iberia. It seems likely that children and adolescents occasionally encountered violence, but that skull trauma among immature remains is more likely to occur in contexts of massacres than among traditional burials. Most bioarchaeological investigations provide support for higher levels of skull trauma among males than females (Aranda-Jiménez *et al*., 2009; Ahlström & Molnar, 2012; Schulting, 2012; Fibiger *et al*., 2013; Meyer *et al*., 2015), but Dyer & Fibiger (2017) also state that the difference in perimortem fractures are relatively equal between the sexes. It is likely a result of males being more regularly involved in conflicts both as aggressors and victims, while females encounter conflicts as victims in battles and abuse. Although it is possible that females took part in conflicts as aggressors, the pattern of antemortem and perimortem skull trauma speaks against it as frequently occurring in LN–EBA southern Sweden.

Although left-side skull trauma is generally considered evidence of face-to-face combat with a right-handed aggressor, skull trauma in southern Sweden has an equal distribution of location on the left frontal and right parietal bones. It is true that face-to-face combat probably more frequently resulted in damage to the left side of the skull, but that would mostly include blows to the frontal part of the head. Evidence from forensic sciences shows that, when it comes to assault, the right side of the parietal is most affected (Kranioti, 2015). The patterns of the south Swedish LN–EBA thus suggest a combination of face-to-face battle and assaults from the back or the side. It is possible that this pattern is related to the injuries being caused by blunt force. It is perhaps more likely that face-to-face combats are engaged when the combatants are fighting with swords, but that strikes from blunt objects

are more commonly inflicted from behind or from the side. There is of course a possibility that right-sided blunt-force trauma is connected to violent assaults such as raids, but in connection to Vandkilde's (2015) broader definition of war-related trauma, it would still be associated to a war-oriented social structure. As Molloy (2010) and Hermann *et al*. (2020) point out, to target the skull with a Bronze Age sword would be ineffective since the risk of the sword breaking would outweigh the possibility of harming the opponent. In this respect we would not expect to find sharp-force trauma of the skull region. It is plausible that face-to-face sword-battling was undertaken, but from a technological point of view it would be more efficient to target the soft tissue of the opponent. Hermann *et al*. (2020) argue that targeting both the chest area and the head area would increase the risk of the blade getting stuck in bone, thus making the aggressor vulnerable. The lack of sharp-force trauma in Bronze Age skeletal remains should thus not be considered as a sign that swords were not used in combat, but rather that skilled swordsmen would try to avoid hitting bones. Unfortunately, bioarchaeologists seldom have the opportunity to study soft tissue, which is why data from a variety of sources are necessary to understand patterns of violence-related trauma and conflict in prehistory.

The frequency of violence-related trauma ranges between 2.2 and 10.4% depending on the burial type. If only the adult population is considered the numbers increase to 8.5–13.2% (n=129) in gallery graves, 11.1% (n=36) in barrows and 3.6% (n=28) in flat burials. The frequencies found in gallery graves and barrows are consistent with earlier analyses of skull trauma from Neolithic Sweden and Denmark (Fibiger *et al*., 2013). Individuals buried in flat burials are affected by violence to a much lesser extent than those inhumed in gallery graves or barrows. It is possible that the burials reflect differences in social status and that individuals acquiring inhumations in flat burials due to their social status are to a lesser extent engaged in conflicts. Håkansson (1985) suggest that individuals inhumed in flat burials are of mid-range social status. If so, this suggests that both the upper class buried in barrows, and a lower class, inhumed in gallery graves, were more commonly involved in violence. Would this then reflect a distinction between warrior-specialist prominent burials in barrows, and peasant-fighter burials in gallery graves? Maybe, but it is perhaps rather a reflection of chronological differences. Although gallery graves are generally considered to be of LN date, recent radiocarbon dates of skeletal remains provide evidence of major reuse of Scanian gallery graves in the Early Bronze Age (Bergerbrant *et al*. 2017; Tornberg, 2017). In fact, a majority (15/22) of the skeletal remains in Scanian gallery graves are Early Bronze Age. At the same time, 11/20 flat burials are dated to LN I, and only three have a Bronze Age date (Tornberg, 2017). It is highly likely that the difference in skull trauma frequencies between burial types is in fact a reflection of increased societal conflict between the LN and EBA in southern Sweden. The reason for this is uncertain, however, it is possible that the reburials in LN gallery graves reflect a population increase and increased hierarchization in the EBA (Bergerbrant *et al*., 2017; Tornberg, 2017), both well-known triggers for violence. As an effect of long-distance mobility (Frei *et al*., 2015) and a general increase in conflict in central Europe as seen, for example, in the battlefield of Tollense, it is possible that a more violent and warfare-oriented society also developed in southern Sweden.

So, were the south Swedish LN and EBA periods violent? Yes, at least in the later part. There is a clear difference between burials, where frequencies in the later part of the LN and in the EBA exhibit far more skull trauma than earlier LN burials. Do the skeletal remains support warfare? Perhaps. If up to 13% of the adult population suffered from violence-related skull trauma, the data, at the very least, support endemic violence. That males to a greater extent than females were both inflicted

by skull trauma, but also show higher degrees of healed trauma, might also be linked to repeated conflict. Looking into the web of violence (Turpin & Kurtz, 1997; WHO, 2002), it is fair to discuss endemic violence as a part of societal acceptance, and maybe promotion, of violent behaviour. If violence is encouraged by the political power, acts of violence are likely to be present in all parts of the society, both on an individual level and between groups. As the NBA clearly represents warrior aristocrats, warriorhood and enacted warfare is a natural part of such societies. Although the frequency and nature of skull injuries in the NBA does not differ significantly from those described in studies of the Neolithic, there is a considerable difference; there are no swords in the Scandinavian Neolithic. The weapons of the Neolithic are all blunt or semi-blunt weapons. The battle technique associated with these kinds of weapons would predominantly target hard tissue, and the head would be the most efficient body part of your opponent to damage. Thus, one could expect that most lethal injuries would be associated with blows to the head, and that most violent encounters with the aim of severely injuring or killing the opponent would be found in the head region. When it comes to the Bronze Age, the situation is quite the opposite. Although blunt weapons were still in use, and obviously very much so, the warrior weapon was the sword, which would have been much more lethal than a wooden club. As sword cuts would affect the soft tissue, and only occasionally the bones, it is much more likely that evidence of violence in the NBA is left undetectable in the skeletal remains, and that evidence of skull trauma only reflects a small subset of actual violent acts. In the battlefield of Tollense, only 14% of the perimortem injuries were attributed to the head, and only 7% of the individuals showed evidence of ante- or perimortem skull injuries (Brinker *et al.*, 2016; Horn, 2021). Hence, this paper provides evidence of skull trauma frequencies of similar, or even exceeding numbers, to that of Tollense for the south Swedish LN–EBA. Palaeodemographic analysis might aid in the interpretation of possible warfare in the NBA and a high age non-specific mortality of LN–EBA southern Sweden is possibly linked to high frequencies of violence (Blank *et al.*, 2018; Tornberg 2018).

In a society where violence is endemic, the evolutionarily sensible thing to do is to continue fighting (North *et al.*, 2009; Pinker, 2012, pp. 32, 611ff.). If violence is frequent enough to decrease the risk of surviving into fertile age, more aggressive behaviour might be favoured, both culturally and evolutionarily. It is difficult to conclude if this is the case in the NBA, but violence does seem to be affecting the palaeodemography of southern Sweden, with generally high mortality in mid-life (Blank *et al.*, 2018, Tornberg, 2018). Related to this is the presence of care. Caregiving, such as trepanations, must have been crucial for the sustainability of a violent society. Perhaps both the high survival rates of blunt-force trauma and the two possible trepanations are examples of this. Although I generally agree with Bennike (2003) of the overinterpretation of prehistoric trepanations, I dare to conclude that care has been present, which I suggest in a previous paper on skull trauma in Neolithic Sweden (Tornberg & Jacobsson, 2018). It is probable that the overinterpretation of ancient trepanation should be seen through the lens of a past interpreted as pacified, as suggested by Vandkilde (2003, 2013, 2015). However, in the same way that it might be evolutionarily sensible to keep on fighting, the same goes for caring for the injured. Spikins *et al*. (2019) wisely argue that care provision should be viewed not as an example of complex cultural behaviour, but as a "risk-pooling" strategy among others. In this respect, caregiving should be considered a natural part of a society where violent acts are common, and evidence of trepanations should rather be interpreted as further signs of violent acts rather than a separate feature in prehistoric societies.

To conclude, violence, and probable warfare, was endemic in the south Swedish LN–EBA. With evidence of skull trauma in comparable numbers to that of a known contemporary battlefield, it is evident that we also have a prehistory of violence in southern Scandinavia. Maybe Pinker was right—maybe violence, in fact, has declined. To fully understand the social patterns of violence and warfare, further analyses are necessary. The scientific revolution in archaeology is likely to provide data and tools to support this aim. A combination of big data, ancient DNA, and high-resolution isotope analysis could help us to obtain a broader knowledge of kinship, migration, and mobility as possible triggers of and explanations for prehistoric warfare.

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References

Ahlström, T. & Molnar, P. 2012. The placement of the feathers: violence among sub-boreal foragers from Gotland, central Baltic Sea. In: *Sticks, stones, and broken bones: Neolithic violence in a European perspective* (pp. 17–33). Schulting, R. J. & Fibiger, L. (eds.). Oxford: Oxford University Press.

Andrushko, V. A. & Verano, J. W. 2008. Prehistoric trepanation in the Cuzco region of Peru: a view into an ancient Andean practice. *American Journal of Physical Anthropology* 137 (1): 4–13.

Aranda-Jiménez, G., Montón-Subías, S. & Jiménez-Brobeil, S. 2009. Conflicting evidence? Weapons and skeletons in the Bronze Age of south-east Iberia. *Antiquity* 83 (322): 1038–1051.

Bennike, P. 2003. Ancient trepanations and differential diagnoses: a re-evaluation of skeletal remains from Denmark. In: *Trepanation: history, discovery, theory* (pp. 95–116). Arnott, R., Finger, S. & Smith, C. U. M. (eds.). Lisse: Swets & Zeitlinger.

Bergerbrant, S., Kristiansen, K., Allentoft, M. E., Frei, K. M., Price, T. D., Sjögren, K. G. & Tornberg, A. 2017. Identifying commoners in the Early Bronze Age: burials outside barrows. In: *New perspectives on the Bronze Age: Proceedings of the 13th Nordic Bronze Age Symposium held in Gothenburg 9th to 13th June 2015* (pp. 37–64). Bergerbrant, S. & Wessman, A. (eds.). Oxford: Archaeopress.

Bhatt, C. 2013. Book Review Symposium: Steven Pinker, *The better angels of our nature*: a history of violence and humanity. *Sociology* 47 (6): 1229–1232. doi:10.1177/0038038513513853

Blank, M., Tornberg, A. & Knipper, C. 2018. New perspectives on the Late Neolithic of south-western Sweden. An interdisciplinary investigation of the gallery grave Falköping stad 5. *Open Archaeology* 4 (1): 1–35.

Botham, A. D. 2019. Unthinking empiricism and the overdiagnosis of nonlethal cranial injuries: an interdisciplinary review of diagnostic criteria for healing, depressed cranial fractures. *Journal of Archaeological Science, Reports* 27, 101939.

Brinker, U., Flohr, S., Piek, J. & Orschiedt, J. 2013. Human remains from a Bronze Age site in the Tollense valley: victims of a battle? In: *The Routledge handbook of the bioarchaeology of human conflict* (pp. 192–206). Knüsel, C. & Smith, M. (eds.) Abington, Oxon: Routledge.

Brinker, U., Schramm, A., Flohr, S., Jantzen, D., Piek, J., Hauenstein, K. & Orschiedt, J. 2016. The Bronze Age battlefield in the Tollense valley, Mecklenburg-Western Pomerania, northeast

Germany—combat marks on human bones as evidence of early warrior societies in northern Middle Europe. *Later Prehistory to the Bronze Age* 1: 39–56.

Butler, S. M. 2018. Getting medieval on Steven Pinker: violence and medieval England. *Historical Reflections/Réflexions Historiques* 44 (1): 29–40.

Dyer, M. & Fibiger, L. 2017. Understanding blunt force trauma and violence in Neolithic Europe: the first experiments using a skin-skull-brain model and the Thames Beater. *Antiquity* 91 (360): 1515–1528.

Ehrlich, E. & Maxeiner, H. 2002. External injury marks (wound) on the head in different types of blunt trauma in an autopsy series. *Medicine and Law* 21 (4): 773–782.

Ferguson, B. R. 2013a. Pinker's list: exaggerating prehistoric war mortality. In: *War, peace, and human nature: the convergence of evolutionary and cultural views* (pp. 112–131). Fry, D. P. (ed.). New York: Oxford University Press. DOI:10.1093/acprof:oso/9780199858996.003.0007

Ferguson, B. R. 2013b. The prehistory of war and peace in Europe and the Near East. In: *War, peace, and human nature: the convergence of evolutionary and cultural views*. (pp. 191–240). Fry, D. P. (ed.). New York: Oxford University Press. DOI:10.1093/acprof:oso/9780199858996.003.0011

Fibiger, L. 2013. Misplaced childhood? Interpersonal violence and children in Neolithic Europe. In: *The Routledge handbook of the bioarchaeology of human conflict*. (pp. 173–191). Knüsel, C. R. & Smith, M. (eds.). Abington, Oxon: Routledge.

Fibiger, L., Ahlström, T., Bennike, P. & Schulting, R. J. 2013. Patterns of violence-related skull trauma in Neolithic southern Scandinavia. *American Journal of Physical Anthropology* 150 (2): 190–202.

Flohr, S., Brinker, U., Schramm, A., Kierdorf, U., Staude, A., Piek, J., Jantzen, D., Hauenstein, K. & Orschiedt, J. 2015. Flint arrowhead embedded in a human humerus from the Bronze Age site in the Tollense valley, Germany—a high-resolution micro-CT study to distinguish antemortem from perimortem projectile trauma to bone. *International Journal of Paleopathology* 9: 76–81.

Frei, K. M., Mannering, U., Kristiansen, K., Allentoft, M. E., Wilson, A. S., Skals, I., Tridico, S., Nosch, M. L., Willerslev, E., Clarke, L. & Frei, R. 2015. Tracing the dynamic life story of a Bronze Age female. *Scientific Reports* 5 (1): 1–7.

Fyllingen, H. 2003. Society and violence in the Early Bronze Age: an analysis of human skeletons from Nord-Trøndelag, Norway. *Norwegian Archaeological Review* 36 (1): 27–43.

Haak, W., Brandt, G., de Jong, H. N., Meyer, C., Ganslmeier, R., Heyd, V., Hawkesworth, C., Pike, A. W. G., Meller, H. & Alt, K. W. 2008. Ancient DNA, strontium isotopes, and osteological analyses shed light on social and kinship organization of the Later Stone Age. *Proceedings of the National Academy of Sciences* 105 (47), 18226–18231.

Håkansson, I. 1985. *Skånes gravfynd från äldre bronsålder som källa till studiet av social struktur*. Ph.D. thesis, Lund University.

Harding, A. 1999. Warfare: a defining characteristic of Bronze Age Europe? In: *Ancient warfare: archaeological perspectives* (pp. 157–173). Carman, J. & Harding, A. F. (eds.). Stroud: Sutton.

Hermann, R., Dolfini, A., Crellin, R. J., Wang, Q. & Uckelmann, M. 2020. Bronze age swordsmanship: new insights from experiments and wear analysis. *Journal of Archaeological Method and Theory* 27 (4): 1040–1083.

Horn, C. 2013. Weapons, fighters and combat: spears and swords in Early Bronze Age Scandinavia. *Danish Journal of Archaeology* 2**:** 20–44.

Horn, C. 2015. Combat and change: remarks on Early Bronze Age spears from Sweden. In*: Forging identities: the mobility of culture in Bronze Age Europe: report from a Marie Curie project 2009-2012 with concluding conference at Aarhus University, Moesgaard 2012* (pp. 201–212). Suchowska-Ducke, P., Reiter, S. S. & Vandkilde, H. (eds.). Oxford: British Archaeological Reports International Series 2772.

Horn, C. 2021. Trouble in paradise? Violent conflict in Funnel-Beaker societies. *Oxford Journal of Archaeology*, 40 (1): 43–64.

Horn, C. & von Holstein, I. C. 2017. Dents in our confidence: the interaction of damage and material properties in interpreting use-wear on copper-alloy weaponry. *Journal of Archaeological Science* 81**:** 90–100.

Hyder, A. A., Wunderlich, C. A., Puvanachandra, P., Gururaj, G. & Kobusingye, O. C. 2007. The impact of traumatic brain injuries: a global perspective. *NeuroRehabilitation* 22 (5): 341–353.

Jantzen, D., Brinker, U., Orschiedt, J., Heinemeier, J., Piek, J., Hauenstein, K., Krüger, J., Lidke, G., Lübke, H., Lampe, R., Lorenz, S., Schult, M. & Terberger, T. 2011. A Bronze Age battlefield? Weapons and trauma in the Tollense valley, north-eastern Germany. *Antiquity* 85 (328), 417–433.

Jolly, S. & Kurin, D. 2017. Surviving trepanation: approaching the relationship of violence and the care of "war wounds" through a case study from prehistoric Peru. In: *New developments in the bioarchaeology of care: further case studies and expanded theory* (pp. 175-195). Tilley, L. & Schrenk, A. A. (eds.). Switzerland: Springer.

Keeley, L. H. 1995. *War before civilization*. New York: Oxford University Press.

Kranioti, E. F. 2015. Forensic investigation of cranial injuries due to blunt force trauma: current best practice. *Research and Reports in Forensic Medical Science* 5: 25–37.

Kremer, C., Racette, S., Dionne, C. A. & Sauvageau, A. 2008. Discrimination of falls and blows in blunt head trauma: systematic study of the hat brim line rule in relation to skull fractures. *Journal of Forensic Sciences* 53 (3): 716–719. https://doi.org/10.1111/j.1556-4029.2008.00725.x

Kristiansen, K. 1999. The emergence of warrior aristocracies in later European prehistory and their long-term history. In: *Ancient warfare: archaeological perspectives* (pp. 175-189). Carman, J. & Harding, A. F. (eds.). Stroud: Sutton.

Kristiansen, K. 2002. The tale of the sword: swords and swordfighters in Bronze Age Europe. *Oxford Journal of Archaeology* 21**:** 319–332.

Kristiansen, K. 2014. Towards a new paradigm. The third science revolution and its possible consequences in archaeology. *Current Swedish Archaeology* 22 (4): 11–71.

Lee, B. R. 2014. Hunter-gatherers on the best-seller list: Steven Pinker and the "Bellicose School's" treatment of forager violence. *Journal of Aggression, Conflict and Peace Research* 6 (4): 216–228. https://doi.org/10.1108/JACPR-04-2014-0116

Li, H., He, L., Gibbon, V. E., Xiao, X. & Wang, B. 2021. Individual centred social-care approach: using computer tomography to assess a traumatic brain injury in an Iron Age individual from China. *International Journal of Osteoarchaeology* 31: 99–107. https://doi.org/10.1002/oa.2928

Ling, J. & Cornell, P. 2010. Rock art as secondary agent? Society and agency in Bronze Age Bohuslän. *Norwegian Archaeological Review* 43 (1): 26–43.

Ling, J., Earle, T. K. & Kristiansen, K. 2018. Maritime mode of production: raiding and trading in seafaring chiefdoms. *Current Anthropology* 59 (5): 488–524.

Lovell, N. C. 1997. Trauma analysis in paleopathology. *Yearbook of Physical Anthropology* 40 (S25): 139–170.

Mann, M. 2018. Have wars and violence declined? *Theory and Society* 47 (1): 37–60.

Melheim, L. & Horn, C. 2014. Tales of hoards and swordfighters in Early Bronze Age Scandinavia: the brand new and the broken. *Norwegian Archaeological Review* 47 (1): 18–41.

Meyer, C. 2019. *Collective violence in the Neolithic of central Europe. The analysis of human skeletal remains from complex burial features*. Ph.D. thesis, Johannes Gutenberg-Universität, Mainz.

Meyer, C., Brandt, G., Haak, W., Ganslmeier, R. A., Meller, H. & Alt, K. W. 2009. The Eulau eulogy: bioarchaeological interpretation of lethal violence in Corded Ware multiple burials from Saxony-Anhalt, Germany. *Journal of Anthropological Archaeology* 28 (4): 412–423.

Meyer, C., Lohr, C., Gronenborn, D. & Alt, K. W. 2015. The massacre mass grave of Schöneck-Kilianstädten reveals new insights into collective violence in Early Neolithic central Europe. *Proceedings of the National Academy of Sciences* 112 (36): 11217–11222.

Molloy, B. 2010. Swords and swordsmanship in the Aegean Bronze Age. *American Journal of Archaeology* 114 (3): 403–428.

Neubert, A., Wicke, J. & Bruchhaus, H. 2014. Mit der Axt—durch die Axt. Der Zusammenhang von Schädeldefekt und Waffenbeigabe in Bestattungen des schnurkeramischen Kulturkreises. In: *Gewalt und Gesellschaft. Dimensionen der Gewalt in ur- und frühgeschichtlicher Zeit. Internationale Tagung vom 14.–16. März 2013 an der Julius-Maximilians-Universität Würzburg* (pp. 217–224). Link, T. & Peter-Röcher, H. (eds.). Universitätsforschungen zur Prähistorischen Archäologie 259: Bonn.

North, D. C., Wallis, J. J. & Weingast, B. R. 2009. *Violence and social orders: a conceptual framework for interpreting recorded human history*. Leiden: Cambridge University Press.

Ortner, D. J. 2003. *Identification of pathological conditions in human skeletal remains*. Cambridge, MA: Academic Press.

Otto, T., Thrane, H. & Vandkilde, H. (eds.). 2006. *Warfare and society: archaeological and social anthropological perspectives*. Aarhus: Aarhus University Press.

Pinker, S. 2012. *The better angels of our nature: why violence has declined*. New York: Penguin. 1st ed. 2011.

Schulting, R. J. 2012. Skeletal evidence for interpersonal violence: beyond mortuary monuments in southern Britain. In: *Sticks, stones, and broken bones: Neolithic violence in a European perspective* (pp. 223–248). Schulting, R. J. & Fibiger, L. (eds.). Oxford: Oxford University Press.

Spikins, P., Needham, A., Wright, B., Dytham, C., Gatta, M. & Hitchens, G. 2019. Living to fight another day: the ecological and evolutionary significance of Neanderthal healthcare. *Quaternary Science Reviews* 217: 98–118.

Symes, S., L'Abbé, E. N., Chapman, E. N., Wolff, I. & Dirkmaat, D. C. 2012. Interpreting traumatic injury to bone in medicolegal investigations. In: *A companion to forensic anthropology* (pp. 340-389). D. C. Dirkmaat (ed.). Chichester: John Wiley & Sons, Ltd.

Tornberg, A. 2017. Diet, toothache and burial diversity. *Lund Archaeological Review* 22: 21–37.

Tornberg, A. 2018. *Health, cattle and ploughs: bioarchaeological consequences of the Secondary Products Revolution in southern Sweden, 2300–1100 BCE*. Ph.D. thesis, Lund University.

Tornberg, A. & Jacobsson, L. 2018. Care and consequences of traumatic brain injury in Neolithic Sweden: a case study of ante mortem skull trauma and brain injury addressed through the bioarchaeology of care. *International Journal of Osteoarchaeology* 28 (2): 188–198.

Turpin, J. E. & Kurtz, L. R. (eds.). 1997. *The web of violence: from interpersonal to global*. Urbana: University of Illinois Press.

Vandkilde, H. 2003. Commemorative tales: archaeological responses to modern myth, politics, and war. *World Archaeology* 35 (1): 126–144.

Vandkilde, H. 2006. Warriors and warrior institutions in Copper Age Europe. In: *Warfare and society: archaeological and social anthropological perspectives (pp.* 393–431). Otto, T., Thrane, H. & Vandkilde, H. (eds.). Aarhus: Aarhus University Press.

Vandkilde, H. 2013. Warfare in northern European Bronze Age societies. Twentieth-century presentations and recent archaeological research inquiries. In: *The archaeology of violence: interdisciplinary approaches* (pp. 37–62). Ralph, S. (ed.). Albany, New York: State University of New York Press.

Vandkilde, V. 2015. Conflict and war, archaeology of: weapons and artifacts. In: *The international encyclopedia of social and behavioral sciences*, 2nd ed. (pp. 607–613). Wright, J. D. (ed.). Oxford: Elsevier Ltd.

Vandkilde, H. 2016. Violent beauty in the Bronze Age. In: *Bronze Age hillforts between the Taunus and Carpathian Mountains. Proceedings of the First International LOEWE Conference* (pp. 7–9). Hansen, S. & Krause, R. (eds.). Bonn: Habelt.

Walker, P. L. 1989. Cranial injuries as evidence of violence in prehistoric southern California. *American Journal of Physical Anthropology* 80 (3): 313–323.

Walsh, K. 1987. *Neuropsychology: a clinical approach*. 2nd ed. Edinburgh: Churchill Livingstone.

WHO, 2002 = World Health Organization 2002. *World report on violence and health: a summary*. Geneva: World Health Organization.

Wilson, B. A., Winegardner, J., van Heugten, C. M. & Ownsworth, T. 2017. *Neuropsychological rehabilitation. The international handbook*. London, New York: Routledge, Taylor & Francis Group.

Burials, individuals, and society

The case of the Late Bronze Age cemetery at Simris II in south-eastern Sweden

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Abstract

The study of burials is central to archaeology in many ways. Each burial is likely to have been an event that individuals and/or groups of various sizes attended, following norms, rituals, and customs; possibly from time to time such norms were altered or new ones were introduced. One may consider that during the funerary rituals, the deceased becomes tightly enmeshed with his or her burial. In this process, the complex plurality of each burial with all its components ends up conveying messages to the world of the living. Burial contexts can be considered for instance as communicating adherence or contrast to dominating values and norms; they could also signal forms of social, cultural, political or economic status characterizing the deceased him-/herself or perhaps his or her kin.

This contribution aims to discuss and problematize the complexity at display in Late Bronze Age burials from southern Scandinavia using the cemetery at Simris II, in south-eastern Sweden, as a case study. The dominant burial practice during the period in question is cremation, which almost completely obliterates the body of the deceased and its identity markers (e.g., gender, age, individual features, and material culture such as clothing and adornments). A review of the archaeological record—combined with data from recent multidisciplinary studies of the ceramic and osteological material from the site—suggests that not only the carefully selected urns, but also the characteristics and the positions of the graves embodied manifold meanings. Taken together, they likely signalled significant aspects of the identity of the deceased or of the family/group to which they belonged.

Keywords: Urns, cremation, age, gender, ceramics, identity, distinction, mobility, spatial organization, monumentalizing.

The area defined as Simris II (Simris 34:1 in the Swedish National Heritage Board register) lies on a gentle hilltop north-west of the town of Simris, in Simrishamn municipality, overlooking the eastern bank of the Tommarp river (Fig. 1). The area, as is the case for the rest of south-eastern Scania, was densely inhabited during the Bronze Age (e.g., Stjernquist 1961; Strömberg 1982; Olausson 1987; Jennbert 1992; Skoglund 2016) and multifarious remains in the form of monumental graves and rock art are still visible landmarks in the local landscape. Various finds were recovered in the area of the Simris cemetery during the 19th and early 20th century until systematic excavations took place in 1949–1951 under the direction of Berta Stjernquist, Lund University. The Iron Age and Bronze Age finds from the excavations have been thoroughly published in two subsequent volumes (Stjernquist 1955, 1961). During the 1949–1951 excavations traces of an Early Neolithic settlement were also found at the site. A forthcoming publication was announced (Stjernquist, 1961, p. 9), but apparently was never followed through. More finds dated to the Early Neolithic were excavated later on during public works in the area (RAÄ document L1990:3607 [Simris 34:1] and L1990:3627 [Simris 34:2]). It is

Figure 1. Map of southern Sweden with modern regional borders and the cemetery at Simris in south-eastern Scania (graphics: author).

unlikely that any visible trace of Early Neolithic constructions would still be apparent in the Bronze Age; however what Stjernquist (1961, pl. 1) defines as "a Dolmen period structure" once rested by the stone paving in what seems to be the middle of the Bronze Age cemetery (see below). One is indeed tempted to think that the location of the cemetery might have been somehow determined by the existence of such early evidence. However, considering the lack of any documentation concerning the proposed "Dolmen period structure", this should remain a suggestion.

The cemetery at Simris II was in use over a long time, and features burials dated to both the Bronze Age and the Iron Age. Different burial practices distinguish each period. It seems that cremation burials, with or without burial urns, generally characterize the Late Bronze Age horizon. Inhumation seems the customary practice during the Roman Iron Age, while cremation pits, often unfurnished but with cremated remains, might have been burials from both the Late Bronze Age and the Pre-Roman Iron Age (Stjernquist, 1961, pp. 105–110, 122–127) or possibly remains of

cremation places (e.g., Arcini, 2007; Arcini *et al*., 2007; Skoglund, 2016, p. 119; see also below). Despite clear transformations in the burial ritual, it is difficult to trace any horizontal stratigraphy (Stjernquist, 1961, p. 125 and pl. 1) as all the excavated contexts lie close to each other, marking a particular sense of continuity through time.

Although substantial and systematic, the 1949–1951 excavations did not uncover the entire cemetery. A number of graves emerged in test trenches outside the main excavation area; in addition, an unclear number of contexts had been opened and/or damaged during earlier agricultural work and tree-felling carried out in the area (Stjernquist, 1961, p. 126). The evidence suggests that the burial ground was in all probability larger than what we can see today; it is therefore difficult to estimate the size of the site and of the community using it. Nonetheless, the well-defined concentration of graves unearthed by Berta Stjernquist and her team, the presence of monumental structures (see below) in the middle of the excavation area, and its relatively elevated position in the local landscape (Stjernquist, 1961, p. 177) suggest that perhaps a significant portion of the cemetery, including its central part, was fully investigated. The lack of any distinct horizontal stratigraphy (cf. Stjernquist, 1961, p. 125) might endorse this hypothesis. If graves from different periods are concentrated in the relatively limited surface investigated in 1949–1951, it seems feasible to consider that this particular area was specifically allocated to the reception of burials.

The lack of a clear horizontal stratigraphy provides yet another type of information. It shows that markers of the Late Bronze Age cemetery were probably still visible in the Iron Age. Despite difficulties in the dating of some of the contexts, almost none of the later graves seem to disturb the Bronze Age burials. The Roman Iron Age inhumations generally occupy spaces apparently left without graves during earlier periods. Whether or not the cremation hearths or cremation pits belong to the Pre-Roman Iron Age or are contemporary to the Late Bronze Age burials, their placement suggests that the spatial organization of the Late Bronze Age cemetery was well defined.

The present work is part of a series of investigations (cf. Sabatini *et al*., 2020; Ladegaard-Pedersen *et al*., 2021) aimed at shedding new light on the Late Bronze Age burial practices at Simris II. The site has been accurately documented at the time of the excavation (cf. Stjernquist 1961), and it is also one of the few Scanian sites, which includes house and face urn burials[1]. Such burials suggests that the communities burying their dead at those sites might have been not only actively involved in long-distance exchange networks of various sizes and characteristics, but also that they were keen to display those links with the rest of the continent in the burial arena (e.g., Sabatini 2007, 2014; Kneisel, 2012). The aim of the following study is to propose a critical review of old and new data and to discuss and problematize the complexity at display in Late Bronze Age burials from southern Scandinavia and at the Simris II cemetery in particular.

Materials and methods

The study of the grave goods deposited in the various graves at Simris II suggested to the excavator that the earliest Bronze Age contexts were to be assigned to Period IV or to the transition from Period IV to Period V (Stjernquist 1961, p. 122), while the majority of the Bronze Age graves likely belonged to Period V (ca. 900–700 BCE). Period VI contexts appeared more difficult to isolate and were possibly poorly represented in the

[1] Beside Simris II, there are two other well-documented Bronze Age cemeteries with house urn burials in the region at Ingelstorp (Strömberg 1982) and Piledal (Olausson 1987). The remaining three house urns known from Scania come from the sites of Ruuthsbo and Stora Hammar (Sabatini 2007, pp. 241–243)

excavated area. However, a significant number of graves could be either Period V or VI since their grave goods are not particularly representative for either of the two periods. One context (grave 49) has been dated to Period VI due to the characteristic of the burial and of the shape of the ceramics (Stjernquist, 1961, p. 122).

A number of so-called cremation pits were excavated at the site. They generally contained charcoal, small bone fragments, and no or very few finds. In recent years, similar contexts have been interpreted as the material remains of cremation places rather than proper graves (e.g., Arcini, 2007; Arcini et al., 2007; Skoglund, 2016, p. 119). The available documentation from Simris leaves the issue open; however, some of these features can be dated to the Late Bronze Age (Stjernquist 1961, pp. 89–90, tab. 1). A calibration attempt with the OxCal 4.4.2 programme (Fig. 2) of the uncalibrated radiocarbon dates carried out by Ingrid Olsson (1961) on samples consisting of resin and charcoal (Table 1) revealed that at least one of the graves (grave 68) seems to be of Period IV–V date.

Despite being close to grave 68, another cremation pit (grave 69) belongs instead to an advanced phase of the pre-Roman Iron Age or to the first part of the Roman Iron Age. The sample from grave 75 gave such a wide range that it is difficult to say anything about it, while the charcoal from grave 57 could be dated between Period IV and the very beginning of the Pre-Roman Iron Age, suggesting a likely Late Bronze Age date.

All in all, the excavated area is clearly in use during late Period IV, Period V and then again during the Roman Iron Age. A number of contexts that could be dated to Period VI or to the Pre-Roman Iron Age demonstrate that the cemetery may have never ceased to be used. The limited number of contexts dated to these phases might depend on a number of factors, which are not possible to investigate in any detail in this work; however, a feasible hypothesis is that the site perhaps assumes a different configuration at this time and that most burials took places in zones that have not been investigated.

From a methodological point of view, this work is based on a critical review of existing archaeological, chronological, demographic and ultimately geochemical data acquired through the years by different investigations (Gejvall, 1961; Olsson, 1961; Stjernquist, 1961; Sabatini et al., 2020; Ladegaard-Pedersen et al., 2021). In a recent study of the geochemical composition of the raw material used to manufacture the burial urns at Simris (Sabatini et al., 2020), it has been argued that urns were likely used to reproduce and maintain in the burial arena social distinctions between individuals and/or groups of people. Differently shaped urns seemingly acted as markers of social identity. The work proposes to adopt the Bourdieuan term “distinction” (cf. Bourdieu, 1984) as a frame of reference to discuss and closely grasp the significance of “taste” and of the possibility to exercise choices (in the case of Late Bronze Age southern Scandinavian communities, between different types of urns) as a way of distinguishing people into different social groups. In the present paper, such an approach will be further explored and extended to include and discuss the complex interplay between the cremated individuals, the burial urns, and the contexts in which they were deposited.

Table 1. Radiocarbon dates of nine graves from Simris II published in Olsson, 1961 (calibration data obtained with the OxCal 4.4.2 programme, © Bronk Ramsey, using atmospheric data from Reimer et al., 2020).

Sample	Lab. no.	R_Date	±	CALIBRATION Unmodelled (BC/AD)		
				From	To	%
Grave 68 (Cremation pit) The sample consists of charcoal found in the pit at ca. 0.5 m below surface (Olsson, 1960, p. 125).	U-137	2730	70	**-1049**	**-789**	95.4
Grave 75. (Cremation pit) The sample consists of charcoal found in the pit between 0.2–0.4 m below surface (Olsson, 1960, p. 125).	U-138	2290	160	**-791**	**11**	95.4
Grave 71. (Urn burial in stone cist) The sample consists of resin used to seal the door or the urn (Olsson, 1960, p. 125).	U-144	2690	80	**-1054**	**-750**	92.5
Grave 79A. (Urn burial) The sample consists of resin used to seal the lid of the urn (Olsson, 1960, p. 125).	U-145	2560	90	**-896**	**-411**	95.4
Grave 48. (Urn burial) The sample consists of resin used to seal the lid of the urn (Olsson, 1960, p. 125).	U-146	2510	80	**-798**	**-416**	95.4
Grave 57. (Cremation pit) The sample consists of charcoal found in the pit at ca. 0.6 m below surface (Olsson, 1960, p. 125).	U-147	2640	110	**-1047** **-1020**	**-417** **-456**	95.4 93.2
Grave 69. (Cremation pit) The sample consists of charcoal found in the pit at ca. 0.3 m below surface (Olsson, 1960, p. 125).	U-167	2015	80	**-341**	**210**	95.4
Grave 43. (Stone circle with multiple burials) The sample consists of charcoal found by the stone of the circle at 0.5 m below surface (Olsson, 1959, p. 98).	U-49	2650	80	**-1009** **-1009**	**-544** **-726**	95.4 80.8
Grave 94. Urn burial. The sample consists of resin used to seal the lid of the urn (Olsson, 1960, p. 125).	U-84	2690	90	**-1111** **-1111**	**-551** **-746**	95.4 89.4

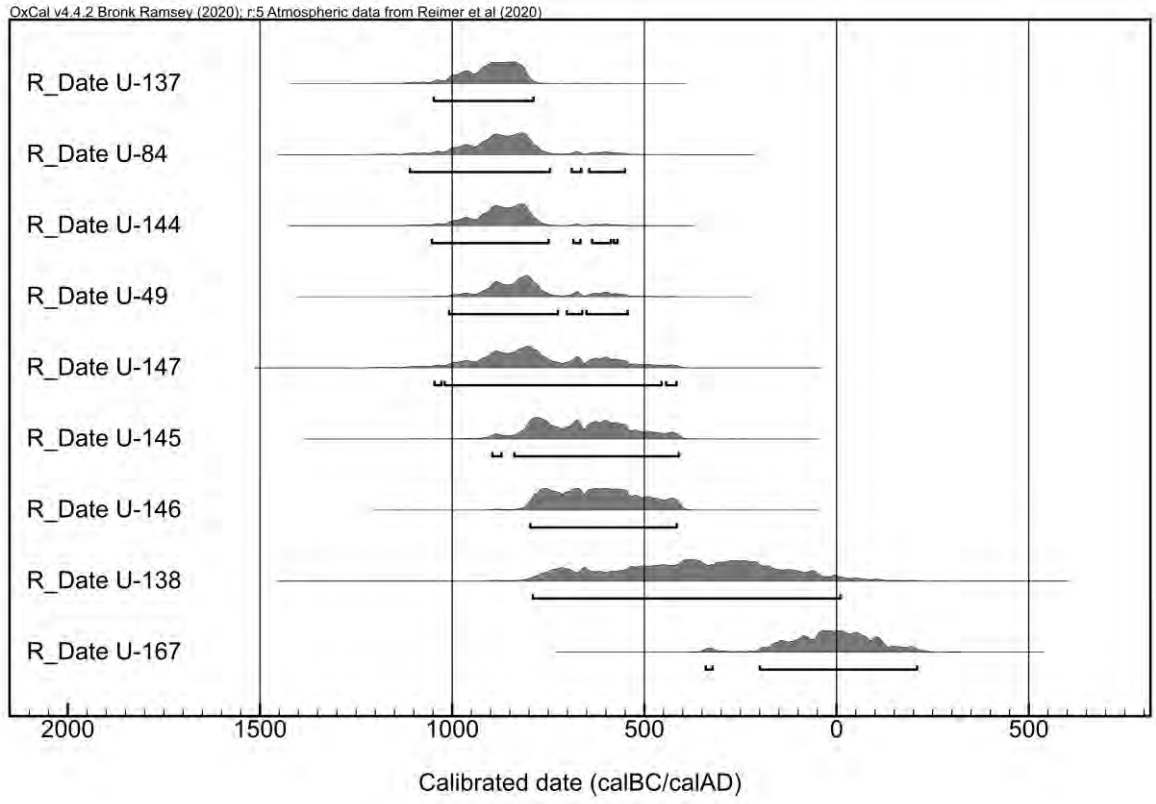

Figure 2. The sequence of radiocarbon datings from Simris II. Calibrations and modelling were performed by OxCal 4.4.2 (© Bronk Ramsey) using atmospheric data from Reimer et al., 2020.

Results

Spatial organization of the burial ground during the Late Bronze Age

The earliest graves dated by means of their grave goods (Stjernquist, 1961, p. 122) appear to be graves 6, 13, 31, 98 and 102 (Fig. 3). They are all adult male burials with the exception of grave 102 containing the bones of a juvenile individual (between 10 and 18 years, cf. Gejvall, 1961). The strong gender bias of these early contexts is somewhat problematic, and difficult to understand, while their distribution suggests that the spatial organization of the cemetery in its earlier phase might have been different to that of Period V. It is not possible to envision how it was organized, but judging from the position of those contexts, one could propose that it initially had a less dense structure, or that the graves may have followed a south-west/north-east axis (Fig. 3), maybe along a local road/path connecting the site to the Tommarp river or the nearby coast?

In the northern half of the investigated area, the excavators unearthed an extensive surface paved with small stones (cf. Fig. 3). There is relatively little information about the stone paving, but it embraces the three stone circles of the cemetery (Stjernquist, 1961, pp. 99–100). Judging from the published illustrations (Stjernquist, 1961, pls. IV–V), one is tempted to consider that the Period V stone circles cut or rather superimposed the paving, which would therefore have pre-existed them. Hypothetically, an early chronology for the paving could fit well the position of the late Period IV contexts (in particular graves 6, 13 and 31), which could have been placed around the margin of this area (maybe respecting its boundaries?).

On the basis of the available documentation, it is not possible to establish a definite chronology for the construction of the stone pavement. Nor it is possible to establish its function. Was it a monument (?) used for some form of ritual/cultic activity later adapted to accommodate the stone settings? Or was it conceived at the same time as the stone circles in order perhaps to increase the monumentality of the area? A somewhat similar structure was investigated in 2007 in the Tanum region, west Sweden (Svensson-Hennius, 2015). The excavations at the Tanum 539 site uncovered a stone paving, which was probably built through successive stages around pre-existing stone settings in a densely used area. If we suppose a similar life story for the stone pavement at Simris II, we could presume it was built roughly at the same time as the three stone settings, serving to isolate (and monumentalize?) them from the other graves. The presence of one grave (66) being covered by the paving (Stjernquist, 1961, p. 20) might support the latter hypothesis.

Altogether, it seems clear that approximately at the end of the Period IV or early during Period V, the cemetery underwent a significant transformation due to the construction of the three stone circles containing multiple graves and being surrounded by an extensive stone pavement. It is assumed that by this time, the area acquired a rather monumental appearance and a distinct funerary use. The Late Bronze Age contexts at the cemetery are to some extent clustered in groups separated by evident "empty" spaces. No traces of burnt layers or of structures of any sort have been reported in these spaces. In line with the results of recent studies (Arcini *et al.*, 2007; Skoglund, 2016, pp. 118–119) suggesting the selective use of grave field spaces, it is possible that those empty areas might have been used to mark distance between different clusters of graves and/or were paths crossing the burial ground (Fig. 4). The occurrence of paths delimiting burial zones or plots within Bronze Age cemeteries has been recently demonstrated by the study of the Middle Bronze Age (ca. 1500–1350 BCE) Casinalbo necropolis in the Po plain (Modena province) in Italy. The cemetery at Casinalbo has been sophisticatedly

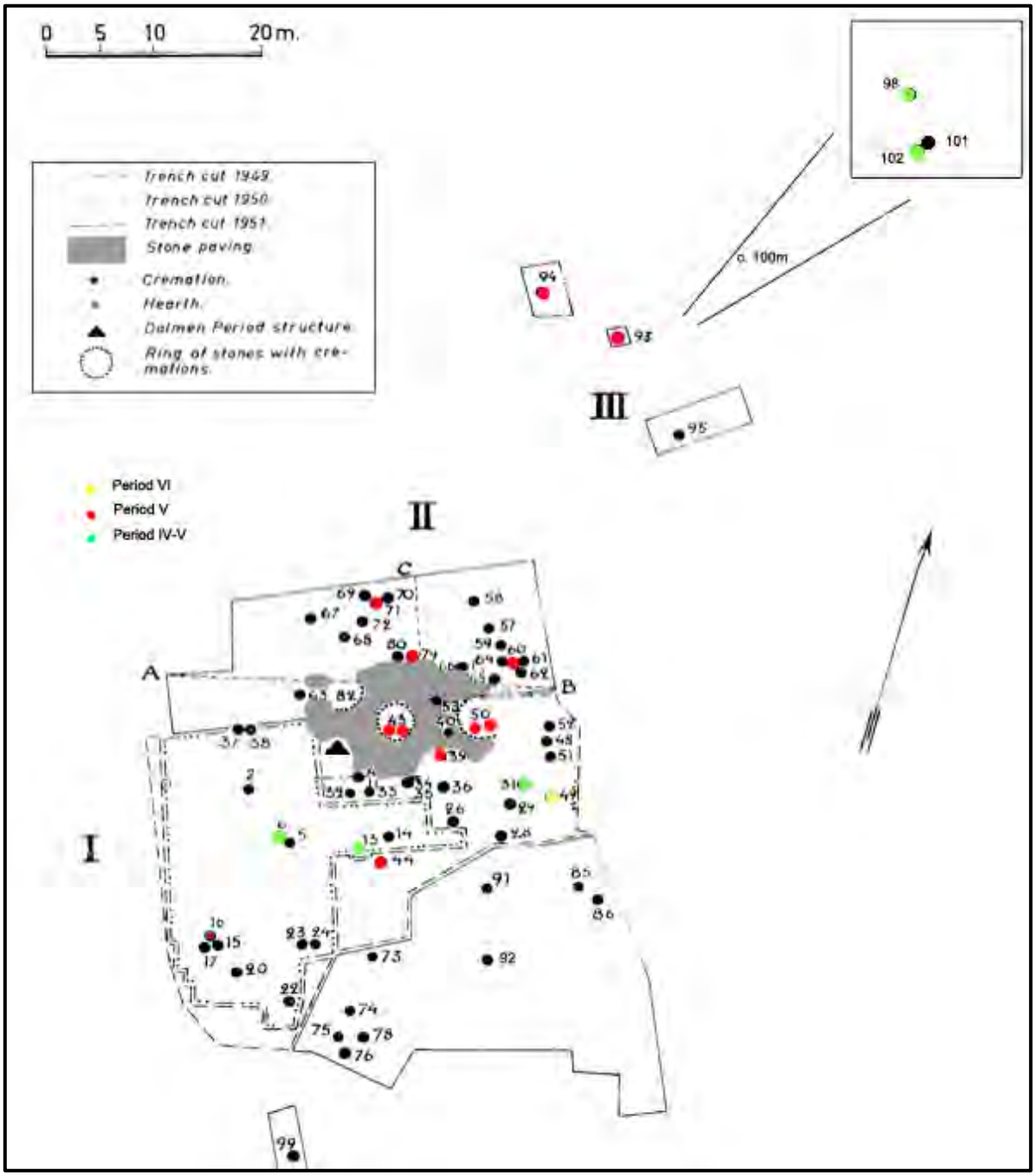

Figure 3. Map of the cemetery at Simris II with dated contexts (revised after Stjernquist, 1961, pl. 1)

excavated (Cardarelli, 2014). The archaeologists were able to find the original "floor" of the necropolis and excavate it horizontally, and thus could bring to light the internal web of paths and of differently used areas at the site. The investigations at Casinalbo represent an outstanding source of inspiration in this field of study, and invite the consideration of Bronze Age cemeteries not just as "urn-fields", but as locations where a variety of activities may have taken place. The present work does not wish to draw any connection between the two sites; the sole purpose here is to propose that Late Bronze Age cemeteries might have had a carefully planned organization with specifically allocated areas

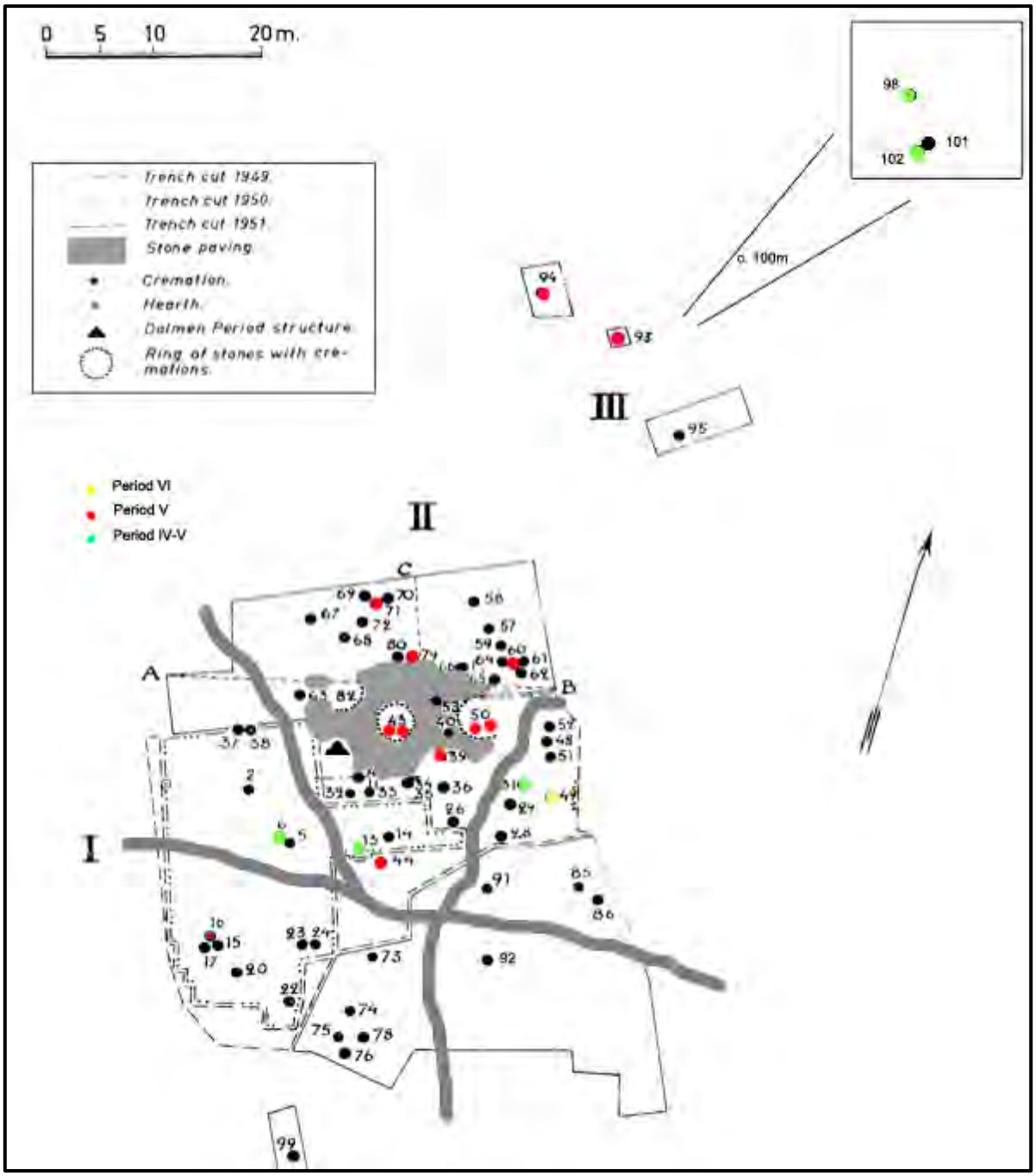

Figure 4. Map of the cemetery at Simris II with the projection of hypothetical paths crossing the site during the Late Bronze Age (revised after Stjernquist, 1961, pl. 1)

for burials, for ritual practices, and for the circulation of visitors. The position of the likely Period VI grave (49) and that of the later contexts, including the Iron Age inhumations, suggest that after the monumentalizing of the central area during Period V, the cemetery did not undergo other significant transformations, at least not in the zones excavated by the 1949–1951 excavations.

The function of the Period V empty spaces, or possible paths crossing the site, visibly changes. New graves are being placed there carefully avoiding the earlier contexts, which were probably still marked in some way.

During the Iron Age, the whole field must have gradually assumed a different aspect, becoming densely occupied by different types of burials (Stjernquist, 1961, pl. 1).

To sum up, a close attention to the structure of the cemetery, as we know it today, reveals a development which seems to culminate, probably at the beginning of Period V, in a monumentalized area with three roughly circular stone settings containing graves of adult individuals (see below). Kinds of "burial plots" appear distributed all around the stone paved area, separated by strips of land without burials, which could be possibly interpreted as paths crossing the cemetery.

Children, adults, and elderly burials at Simris II

The bone material from the 1949–1951 excavations underwent osteological analyses by Nils-Gustaf Gejvall (1961). Their degree of precision—by modern standards—is perhaps slightly limited; nevertheless, they provide abundant data about both the deceased and the animal bones deposited with them. 75 individuals were investigated: 60 adults above 18 years,[2] and 15 children or juveniles (Table 2). The sex of almost one third of the adults could not be identified, while a number of the other sex determinations are uncertain; however, the remaining cases suggest that both male and female individuals were probably equally represented (cf. also Stjernquist, 1961, p. 125). On the other hand, the number of children and juveniles seems far too low to be representative of a prehistoric community. Rituals and eschatological beliefs, or social and cultural constraints, might have significantly contributed to this evident age bias in the osteological material. In this respect, one should also keep in mind that probably only part of the original burial ground is known, and that age might have been a discriminating factor regarding the location of the burials, as some indications would suggest (see below).

One new-born (grave 68), two small children (graves 97 and 101), [3] one 3–6-year-old child (grave 22) and two approximately 6-year-old children (graves 73 and 78) have been given an individual grave; thus, at least some of the very young members of the community received their own burial in the investigated area. Two more children's graves, containing a 5–6-year-old (grave 38) and a small child (grave 101), might have also had an individual burial; however their graves are so close to the neighbouring burial (graves 37 and 102, respectively) that it is difficult to clearly distinguish the respective limits of the two contexts. In both cases the neighbouring cremation is that of a young individual, of ca. 18 years in grave 37, and under 18 years, but older than 10, in grave 102.

One newborn (grave 85), one 2-year-old (grave 51) and two children of 6–8 and 1–1½ years old (grave 49) were buried together with an adult. In the first two cases (graves 85 and 51) the bones of the child and those of the adult were mixed together in a single deposition. The anthropological assessment of the material from grave 85 is not clear, and one suspects that it could have contained a pregnant woman rather than two individuals (cf. Gejvall, 1961, p. 171). Grave 49 seems a sort of collective grave where three urns of different size containing the remains of one adult and two children have been buried very close to each other in one pit. Their position gives a sense of proximity both as to the possible fate of those individuals and/or as to possible kin relations. A similar situation was uncovered at the Late Bronze Age cemetery of Gualöv, in north-eastern Scania, where a grave with three urns

[2] The 18 years threshold is not chosen by the author; rather it is a recurrent age limit in Gejvall's (1961) interpretations.

[3] There is unfortunately no hint as to what Gejvall (1961) intended by the term "small child". Considering that age is provided for some very young individuals of 1 or 2 years, possibly a "small child" is an infant of a few months.

containing four individuals (one adult women, two juveniles and one child) were buried close together. The analyses of the context and of the ceramic material suggested that those individuals were buried at the same time and that the urns were likely made by the same hand specifically for their burial event (Arcini, 2007, pp. 177–179; Brorsson & Húlten, 2007, 282). It is probable, although not possible to demonstrate definitively on the base of the available documentation, that a similar situation occurred for those buried in grave 49 at Simris. It is intriguing—although possibly fortuitously—that these three contexts (graves 49, 51 and 85) with multiple burials and including both one adult and one or two children lie close to each other forming a north/south alignment right at the eastern margin of the excavated area (cf. Fig. 3).

A small group of children's graves (22, 73 and 78) are relatively close to each other (cf. Fig. 3), suggesting that perhaps some areas of the cemetery might have been more suitable than others for the deposition of young members of the community. In this respect, it is remarkable that there are both men and women, but not children or juveniles, in the three stone circles by the stone paved area in what probably was the central part of the Period V cemetery. Such evidence seems to corroborate the idea that children were the subject of a specific consideration, which hampers their visibility today. Four of the children's graves (51, 68, 97 and 101) were, for instance, not furnished with an urn. Although considerations of chronological character might influence this choice, it is also possible that children were buried more often than adults according to practices (e.g., deposited in containers of organic material or wrapped in textiles) that could make them difficult to detect in the archaeological record at the cemetery.

Five graves (29, 37, 62, 71 and 102) contained the remains of individuals younger than 18 and older than 10 years old. This is a fascinating group, not least for all the implications connected to the passage from childhood to adulthood, which most likely happened within this period of life; there is no room here to discuss the social roles of children and only considerations about the location and the characteristics of those contexts will be discussed. It was apparently not possible to establish with precision the age of most of these young individuals. One of them was between 10 and 11 years (grave 29), the others seem more in their teens, while the individual in grave 71 was apparently 15 years old (Gejvall, 1961, p. 169). The five graves are to be found in different clusters, thus, they were not buried in any separated age-related setting as might have happened to some of the smaller children. As mentioned, two of the graves (graves 37 and 102) were each located very close to the grave of a small child (graves 38 and 101 respectively) suggesting that a link between these specific individuals might have existed.

In contrast to the younger children, the cremated remains of all five juveniles were collected in an urn, and two of them were accompanied by bronze grave goods. As discussed below, much suggests that those juvenile individuals were, at least archaeologically, treated as adults, and to a certain extent as prominent such. The age determinations of the adult individuals do not allow further considerations about the distribution of their graves, while a discriminating pattern can be determined for those deceased in old age. It is remarkable that the graves of elderly individuals (6 and 57) and of adults above middle age[4] (33, 35, 50A, 50B, 50C, 52, 57, 60, 61 and 80) appear generally close to the stone-paved area (if not within, as for 50A, 50B and 50C).

[4] Gejvall (1961) does not provide information as to which ages are represented by the recurrently used term "middle age". Considering that young adults are often defined under "middle age", and adults (properly) as "middle-aged", "above middle age" surely distinguishes older members of the community.

Table 2. Synoptic table of the Late Bronze Age graves from the Simris II cemetery (from Gejvall, 1961; Stjernquist, 1961)

Grave	Sex	Age	Type of burial/Shape of the urn/ Observations	Grave goods/Animal bones
6	M+?	young + elderly indiv.	cremation pit/urn in organic material?/mixed bones of 2 individ.	bronze razor, tinder flint, iron piece, fragmentary potsherds, resin caulking from wooden box/-
13	M	adult, under middle age	stone cist/no urn/-	bronze awl, bronze double button/lamb
14	?	adult?	cremation pit/no urn/-	-/-
15	?	adult	urn burial/fragmentary barrel-shaped urn/-	-/lamb
16	M?	young adult	urn burial surrounded by a small stone packing/biconical urn/-	bronze toggle button, resin caulking/lamb
17	?	young adult	urn burial standing on stone slabs/fragmentary urn only base preserved/-	-/-
20	F?	adult, middle age	cremation pit/no urn/-	-/-
22	?	3–6 y.	no info available about the context	?/-
23	F	adult, middle age	stone slab above and on one side of the urn/face door urn/-	bronze rod/-
24	F?	ca. 20 y.	urn burial with a covering stone + 2 small stones on the side/biconical urn/-	-/-
29	?	10–11 y.	urn burial/roughly biconical urn/-	-/-
31	M	adult	stone cist/no urn/-	bronze razor, potsherds/-
32	?	adult?	cremation pit/no urn/pit filled with soot, charcoal and fire-cracked stones	1 daub piece, 3 potsherds/-
33	F?	adult, over middle age?	cremation pit/no urn/-	2 potsherds/-
34	?	adult	cremation pit/no urn/disturbs grave 35	fragments of iron and fire-cracked flint/-
35	F	adult over middle age	urn burial/barrel-shaped urn/context disturbed by grave 34	-/-
36	M?	adult, under middle age	urn burial covered with a stone slab/barrel-shaped urn/-	bronze fragment/-
37	?	young, <18 y.	urn burial deposited on a stone slab and a slab on the side/crushed urn/potsherds and bones partly mixed with those from grave 38	potsherds perhaps from the crushed urn/-
38	?	5–6 y.	urn burial/biconical urn/potsherds and bones partly mixed with those from grave 37	bronze double button/-
39	F?	18–-20 y.	urn burial/biconical urn/-	bronze double button, bronze fragment, fragmentary bronze razor or blade/lamb
40	F?	adult, middle age?	urn burial standing on a stone slab/ cylindrical urn with convex profile + lid/-	bronze wire/-

43B	F?	ca. 20 y.	urn burial covered by a stone slab in a circular stone setting/biconical urn + lid/-	bronze awl, accessory vessel (43A) initially believed to be a fifth burial in the stone setting/lamb + elk
43C	F?	adult, under middle age	urn burial with 3 stone slabs (under, above and on the side) in a circular stone setting/biconical urn/-	bronze awl, bronze double button/sheep
43D	M	adult, middle age?	urn burial under a stone slab in a circular stone setting/fragmentary biconical urn + lid/-	bronze razor/lamb
43E	M?	adult, young?	urn burial under a stone slab in a circular stone setting/fragmentary biconical urn/-	bronze double button, potsherds/-
44	M?	adult, under middle age	urn burial covered by two stone slabs/pear-shaped urn decorated with finger impressions/-	bronze awl/lamb
48	M?	adult, under middle age	urn burial protected by a small-sized stone packing/biconical urn/-	bronze awl, resin caulking/lamb
49A	?	6–8 y.	collective urn burial under a stone slab/roughly biconical urn + lid/bones mixed with charcoal	1 bronze ring/lamb
49B	F?	adult, under middle age	collective urn burial under a stone slab/slightly cylindrical urn with inward-sloping upper part and small handles + lid/clean bones	2 bronze rings/sheep
49C	?	1–1½ y.	collective urn burial under a stone slab/roughly barrel-shaped urn/bones mixed with charcoal	-/-
50A	F	adult, under middle age	burial surrounded by stone slabs in a circular stone setting/barrel-shaped urn with finger strokes/-	1 bronze ring, bronze awl, bronze button/sheep or goat
50B	M?	adult, over middle age	burial under a stone slab in a circular stone setting/biconical? urn with finger strokes + lid/-	bronze awl, bronze knife, bronze razor/lamb + pig
50C	?	adult, over middle age?	cremation pit within a circular stone setting/no urn?/-	potsherds from 2 different pots, flint blade/-
51	F?+?	adult (middle age) + ca. 2 y.	cremation pit/no urn/mixed cremated bones of 2 individ.	2 pieces of flint/-
52	M?	adult, over middle age	cremation pit with an urn burial with a stone on the side/roughly biconical urn/-	1 decorated pot, bronze ring/lamb
53	?	18–25 y.	urn burial covered by a stone slab/barrel-shaped urn + lid/-	1 bronze ring, resin caulking/-
57	F?	adult, elderly?	cremation pit/no urn/-	1 fragment of iron, potsherds/-
58	?	adult	cremation pit/no urn/-	-/lamb
60	M	adult, over middle age	urn burial/biconical urn + lid/resin caulking on the lid	2 vessels, bronze razor, bronze awl/lamb + pig
61	F	adult, middle age	urn burial/biconical(?) urn/-	bronze awl/-
62	?	<18 y., probably teenager	urn burial/crushed urn/-	5 potsherds from the urn?/temporal bone from an adult individ.
63	F	adult, young	urn burial/slightly biconical urn/-	-/lamb
64	?	adult	cremation pit/no urn/one fire-cracked stone on the surface	potsherds/-
65	-	-	cremation pit/no urn/very small bone fragments, impossible to determine	-/-
66	F	adult, under middle age	urn burial covered by a stone under the central stone paving/barrel-shaped with convex profile/-	bronze awl/-

67	?	adult, middle age?	urn burial with a cover stone/crushed urn/-	potsherds probably from the crushed urn/lamb
68	?	new-born child	cremation pit/no urn/-	potsherds/-
69	?	adult	cremation pit with fire-cracked stones on the surface/no urn/-	-/-
70	?	adult	urn burial standing on a flat stone/damaged urn only bottom survives/-	-/-
71	?	ca. 15 y.	stone cist without cover stone/door urn/-	bronze awl, bronze toggle button in the urn and a whetstone above the burial/lamb
73	?	ca. 6 y.	urn burial covered by a stone slab/cylindrical urn with convex profile/-	1 bronze ring/-
74	-	-	cremation pit/no urn/very small bone fragments, impossible to determine	2 potsherds/-
75	?	adult	cremation pit/no urn/bones of different colours: 2 individ.?	15 potsherds from 2 vessels, several pieces of fired clay (moulds?), several small stones/-
76	?	adult	urn burial/crushed urn/-	potsherds from the crushed urn?/-
78	?	ca. 6 y.	urn burial/crushed urn/-	potsherds from the crushed urn?/-
79A	M	adult, middle age?	urn burial beside a stone cist/biconical urn + lid/-	bronze awl, razor, bronze point/sheep or goat
79B	M?	adult	urn in a stone cist without cover stone/urn with roughly globular profile + lid/-	bronze razor/lamb
80	F	adult, over middle age	urn in a stone cist/urn with roughly globular profile + lid/-	resin caulking, bronze point, bronze double button/lamb
82A	?	adult	cremation pit within a stone setting/no urn/-	flint scraper/-
82B	M?	adult, under middle age	urn burial within a stone setting/crushed urn/-	potsherds from the crushed urn?/-
85	F+?	adult + small child	cremation pit/no urn/mixed bones of 2 individ., maybe a pregnant woman?	5 potsherds from a decorated beaker/lamb
86	?	adult	cremation pit/no urn/-	-/-
91	F?	adult, middle age?	cremation pit/no urn/-	-/-
92A	F?	adult, under middle age?	cremation pit/no urn/the pit is adjacent grave 92B	-/-
92B	M	adult, middle age?	urn burial/barrel-shaped urn/adjacent pit 92A	-/-
93	M+M	adult + adult	burial in small stone packing/ cylindrical urn + bowl lid/mixed bones of 2 individ.	bronze razor/lamb + pig
94	M?	adult, middle age?	urn in a stone cist in a stone setting/biconical urn + lid/-	bronze razor, resin caulking from the lid/cremated lamb + unburnt sheep molar
95	F	adult, middle age	urn burial/crushed urn + lid/-	200 potsherds from the crushed urn and lid + a second lid or bowl, resin caulking/-

97	?	small child	cremation pit with 2 large stones/no urn/-	6 daub fragments, 3 potsherds, flint flake/-
98	M?	adult, middle age?	cremation pit/no urn/the context was damaged	bronze double button, bronze hook, flint scraper/-
99	M?	adult, middle age?	heavily damaged context	-/-
101	?	small child	heavily damaged context probably within a stone setting/Iron Age finds were found outside the stone setting	-/-
102	?	<18 y.–>10 y.	urn burial/biconical(?) urn/?	bronze double button/horse

To sum up, biological sex does not seem to be a discriminating factor in the location of the grave, while age apparently does play a role. The graves of elderly people appear for instance preferentially located close to the central stone pavement. More evidently, age seems to discriminate the location of the young children, who are buried together with adults or in specific areas. Young individuals in their teens were instead apparently buried in a similar fashion to that of adults. The limited number of graves with young and very young individuals suggests, however, that part of the local community must have been buried according to practices that are not evident at

Simris II, or were buried in locations which have not yet been subjected to archaeological excavations. The presence of closely related contexts (such as graves 37 and 38, and 101 and 102) and of the graves containing multiple depositions of both adults and children (49, 51 and 85) suggests that common fate or strict kin relationship between individuals might have been important features to express in the burial arena.

Discussion

The Late Bronze Age urns from Simris II

As in the rest of southern Scandinavia and beyond (cf. Jennbert, 1992; Holst, 2013; Skoglund, 2016, pp. 118–121), at Late Bronze Age Simris, cremation was the most common practice for treating the dead. When using cremation, there is ample opportunity to display individual markers of identity before the funerary pyre is lit. Once the deceased has been cremated, the individual body is near-completely destroyed (cf. Stig Sørensen & Rebay-Salisbury 2008). Scholars have suggested that with the introduction of cremation, the container in which the cremated remains were collected acquired an important role to the point that it could substitute the materiality of the cremated deceased (e.g., Svanberg, 2005, 2007; Rebay-Salisbury, 2010; von Eles, 2012; De Angelis *et al*., 2016). The archaeological evidence for containers of perishable material is limited, but burial clay urns are common and allow a number of considerations.

Late Bronze Age pottery from southern Scandinavia was apparently manufactured with a considerable attention to the finishing of the surface (Eriksson 2009, pp. 148–149, 279). In other words, ceramics were likely to appeal both visually and in a tactile sense, suggesting a distinct way of relating to this material culture. A recent ICP-MS (Inductively Coupled Plasma-Mass Spectrometry) investigation of eleven different pottery sherds from eight of the Simris graves (23, 53, 60, 66, 71, 79, 85 and 93) demonstrated that the analysed vessels were in all likelihood made with local raw materials from south-eastern Scania, but not from exactly the same sources (Sabatini *et al*., 2020). In other words, clay and temper were collected at different locations

and used to produce a wide range of pottery types. The various ceramics would then be used selectively in the burial arena, suggesting that the shape and the decoration of the urns, rather than technological and manufacture-related factors, had a significant value, possibly embodying apparent signs of distinction, hence acting as likely markers of identity.

Petrographic analyses of the burial urns from the Late Bronze Age cemetery at Gualöv in north-eastern Scania provided a comparable situation. The study of the thin sections from the local urns could distinguish between two main categories of pottery: fine ceramics and functional/coarser pottery (Brorsson & Hulthén, 2007). Functional pottery was originally intended to serve practical functions (such as resisting fire and cooking processes), while fine ceramics were apparently manufactured with aesthetics in mind (in the sense of aiming at particular shapes and profiles) and often specifically for the burial event (Brorsson & Hulthén, 2007, p. 282). Although rarely discussed, the possibility of a ceramic production aimed exclusively at satisfying funerary practices is strongly supported by the existence of long-known phenomena such as the so-called North European house urns (Sabatini, 2007) and the face urns (Kneisel, 2012). The investigations at Gualöv confirms the extensiveness of this practice with implications for future studies on the topic, which are still to be fully explored. Additionally, the study of the cemetery at Gualöv also revealed that the different categories of ceramics had different distribution patterns and distinctive patterns of associations with bronze grave goods (Brorsson & Hulthén, 2007, pp. 289–291). It could be therefore concluded that the outline and the functional characteristics of the vessels, rather than artisanship, played a prominent role in the choice of the burial urns (Brorsson & Hulthén, 2007; cf. also Sabatini *et al*., 2020).

Technology and spatial distribution of the urns

The results of the ICP-MS analyses carried out on the Simris material demonstrated that some of the sampled urns were made with the same clay and temper, although their outlines could be very different. How can we interpret this information? Might the use of similar raw materials and/or technology underline some sort of link between the graves or the deceased buried in them? Was there a selective access to raw materials? Or should we imagine the existence of different workshops—each with its own supply? Might instead the difference in raw materials mirrors subtle chronological variations? Many questions will remain unanswered, but further considerations about the analysed material can still be made. The ICP-MS analyses revealed that the door urn in grave 71 was manufactured with the same raw materials as the bowl that functioned as an urn lid in grave 93. At the same time, the urns in graves 23 and 60 were also made with the same raw materials as one of the accessory vessels in grave 60 and as one of the sherds recovered in grave 85 (Sabatini *et al*., 2020).

Grave 71 contained the cremated remains of a 15-year-old individual deposited in a door urn and furnished with a bronze toggle pin (cf. Table 2). The burial was placed in a stone cist situated in what seems a rather well-defined cluster of graves north of the stone paved area (cf. Fig. 3); it is not possible to say whether the deceased in those graves were kin-related or what the cluster possibly aimed to define. The group is heterogeneous in terms of sex and age of the deceased (cf. Table 2) and includes three (graves 71, 79B and 80) out of the only six stones cists known from the whole cemetery. The other contexts are two of the earliest graves (13 and 31) to the south of the stone paved area, and grave 94, which stood in a stone setting close to grave 93 and located ca. 20 m to the north-east of the main excavated area (cf. Fig. 3). Grave 93 contained the bowl made with the same raw materials as the door urn from grave 71. Might raw materials

underscore some form of connection between those two groups of graves? A hypothetical link between them could exist when looking at mobility and involvement in long-distance networks.

The door urn from grave 71 is an expression of the above-mentioned North European house urn phenomenon (Sabatini, 2007). It has been assumed that house urns acted as manifold indices of agency, marking the distinctiveness of the people buried in them and/or of the group accessing the practice. Their use likely communicated access and/or acquaintance with long-distance exchange systems (Sabatini, 2014, 2017). Two graves (23 and 71) at Simris were given a house-urn burial. The urn in grave 23 is a unique piece, which conveys in one item two different burial traditions, i.e., it includes the face-urn phenomenon as well as the house-urn one, since it has face-features on the opposite side of the door opening (cf. Kneisel, 2012, pp. 639–640; Sabatini, 2013). The ICP-MS analyses revealed however that the two house urns were not made with similar raw materials. The analyses demonstrated that urn from grave 23 was instead made with the same raw materials as the urn from grave 60. It is interesting to note that they also have a very similar biconical outline. Were they maybe made at the same time? Or by the same hand? Do raw materials underline some form of link between the individuals deposited in these two contexts? Grave 60 also appears linked—by means of raw materials—to grave 85, which was placed at quite some distance from both graves 60 and 23. Both graves 23 and 85 belong to adult women and are relatively isolated south-west and south-east, respectively, of the stone paved area (cf. Fig. 3). Grave 60 is that of an adult, probably elderly, man deposited close to a dense group of graves immediately to the north-east of the stone paved area. Might these three individuals have been related somehow?

Recent strontium isotope analyses carried out on a limited samples of human bones and teeth from Simris have shown that the majority of the investigated individuals (including those in graves 71 and 60, discussed here) had strontium values compatible with those of the local baselines, and so it is likely that all but one spent their childhood in the Simris region.[5] The only individual showing strontium isotope ratios indicating an origin from a different geological area than Simris is one of the two adults buried in grave 93 (Ladegaard-Pedersen *et al*., 2021). The lid of the urn in grave 93 was made with the same raw material as the door urn from grave 71. Is this a coincidence or could the ICP-MS analyses reveal an otherwise invisible link between the individuals buried in these graves? In general, the contexts close to both graves 71 and 93 seem to date to Period V. The door urn from grave 71 and the strontium isotope ratios of the bones from grave 93 suggest association with various forms of mobility, and in the case of grave 71, with long-distance networks. Additionally, the clusters around those two contexts are characterized by a high concentration of stone cists (see above) and of bronze grave goods (Fig. 5). There is no room to discuss in further detail the characteristics of the single contexts, but grave goods are generally not abundant in Late Bronze Age burials (e.g., Holst, 2013), which also suggests that—when present—they were probably intended to add to the identity display and mark specific roles(?) for the person buried with them (cf. Sabatini, 2017; Sabatini *et al*., 2020). The concentration of contexts with bronze grave goods around the stone paved area (cf. Fig. 5) suggests that they were probably granted to or used by a select part of the population. The presence of bronze grave goods in both graves 93 and 94, which are also characterized by the presence of a

[5] Strontium isotope analyses present significant problems when it comes to investigating mobility during adulthood. If one can be certain that the person buried in grave 93 did not grow up in south-eastern Scania, this does not exclude that the other individuals did not experience mobility after childhood (Ladegaard-Pedersen *et al*., 2021).

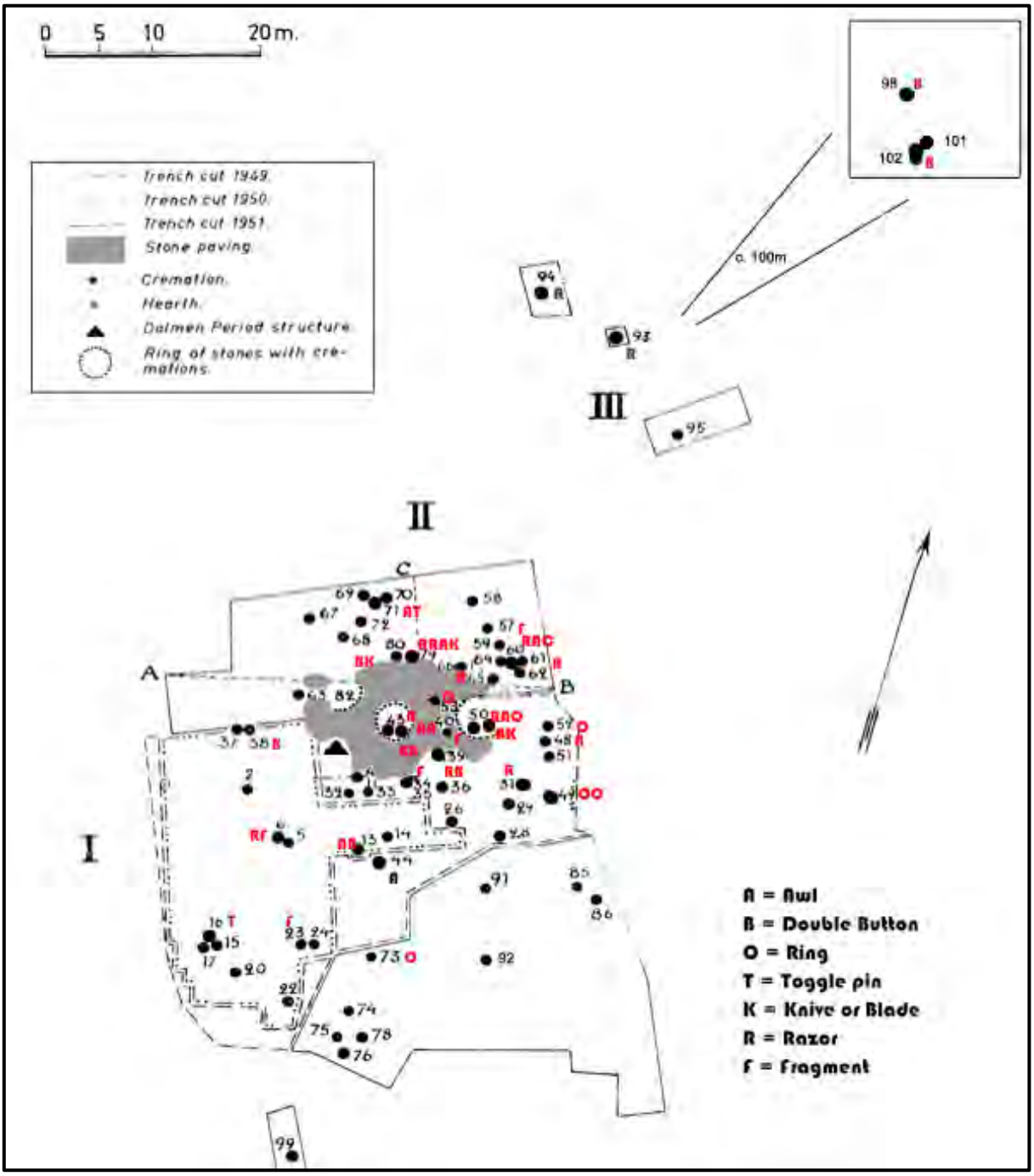

Figure 5. Map of the cemetery at Simris II: the bronze grave goods (revised after Stjernquist, 1961, pl. 1)

stone setting and a stone cist respectively and by evidence of mobility, as revealed by strontium isotope analyses, suggests a correlation between all those factors.

To conclude, not only did uniquely shaped urns such as house or face urns possibly exercise an agentive power expressing forms of distinction; it seems that burial urns in general were carefully selected and that in a significant number of cases urns were explicitly produced to be used as such. In the broader southern Scandinavian Late Bronze Age world, a combination of factors including the shape of the urns, the display of grave goods, the character of the context, and

ultimately the position of the graves likely contributed to communicate the identity of the deceased or of the family/group to which he/she belonged.

Conclusions

This contribution discussed and problematized the complexity on display in Late Bronze Age burials, focusing on the site of Simris II, in south-eastern Sweden. The Late Bronze Age phase at the cemetery is dominated by cremation burials deposited in a number of differently organized and furnished graves.

The review of the material proposed in this work suggests that after an initial stage with a possibly less dense organization, the cemetery underwent a phase (possibly at the beginning of Period V) of transformation and monumentalizing. From then on, a large stone paved area and three circular stone settings seem to dominate the probable central part of the burial ground. Observations about (1) the position of the graves, (2) the distribution of variously aged and sexed individuals, (3) the distribution of distinctively shaped urns, (4) the results of multidisciplinary investigations (such as ICP-MS analyses of pottery sherds and strontium isotope analyses of human bones and teeth), all suggest that the spatial organization of the cemetery was probably accurately planned. The number of contexts, and in particular the limited number of children and young individuals suggest that the cemetery might have been originally larger and more articulated than what we can understand today. Secondly and fundamentally, the observations also suggest that there was a complex interplay between the chosen urns, and the characteristics and the position of the graves. In all likelihood, such interplay allowed the expression of distinctiveness and signalled significant aspects of the identity of the deceased or of the family/group to which they belonged. Finally, it is also proposed that the production of ceramic vessels to be exclusively used in burial practices was probably widespread and contributed to distinguishing and characterizing the deceased after cremation took place. In various, and from time to time, subtle ways, urns seem to have also embodied (possibly personal, social or cultural) links between the deceased buried at the site.

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References

Arcini, C. 2007. Elden utplånar inte allt: Brandgravar och bålplatser i Gualöv. In: *Vägar till Vætland. En bronsåldersbygd i nordöstra Skåne 2300-500* (pp. 169–186). Artursson, M. (ed.). Stockholm: Riksantikvarieämbetet.

Arcini, C., Höst, E. & Svanberg, F. 2007. Gravar, bålplatser och två bronsåldersfamiljer i Gualöv. In: *Vägar till Vætland. En bronsåldersbygd i nordöstra Skåne 2300-500* (pp. 107–168). Artursson, M. (ed.). Stockholm: Riksantikvarieämbetet.

Bourdieu, P. 1984. *Distinction: a social critique of the judgement of taste.* Cambridge: Harvard University Press.

Brorsson, T. & Hulthén, B. 2007. Leran och elden. En studie av keramiken från Vætland. In: *Vägar till Vætland. En bronsåldersbygd i nordöstra Skåne 2300-500* (pp. 265–294). Artursson, M. (ed.). Stockholm: Riksantikvarieämbetet.

Cardarelli, A. 2014. *La necropoli della terramara di Casinalbo*, Grandi contesti e problemi della Protostoria Italiana 15. Florence: All'Insegna del Giglio.

De Angelis, D., Barbaro, B. & Trucco, F. 2016. Ornarsi oltre la vita: l'antropomorfizzazione dell'urna a Villa Bruschi Falgari (Tarquinia). In: *Ornarsi per comunicare con gli uomini e con gli Dei. Preistoria e Protostoria in Etruria, Atti del XII incontro di studi* (pp. 429–440). Negroni-Catacchio, N. (ed.). Milan: Centro di Studi di Preistoria e Archeologia.

Eriksson, T. 2009. *Kärl och social gestik. Keramik i Mälardalen 1500 BC–400 AD.* Uppsala/Stockholm: Uppsala Universitet/Riksantikvarieämbetet.

Gejvall, N.-G. 1961. Appendix II: Anthropological and osteological analyses of the skeletal material and cremated bones from Simris 2, Simris Parish. In: *Simris II. Bronze Age problems in the light of the Simris excavation*, Acta Archaeologica Lundensia 4.5 (pp. 157–173). Stjernquist, B. (ed.). Bonn/Lund: Habelt/Gleerup.

Holst, M. K. 2013. Burials. In: *The Oxford handbook of the European Bronze Age* (pp. 102–120). Fokkens, H. & Harding, A. (eds.). Oxford: Oxford University Press.

Jennbert, K. 1992. Changing customs: reflections on grave gifts, burial practices and burial ritual during Period III of the Bronze Age in southeast Scania. *Meddelanden från Lunds universitets historiska museum 1991–1992*: 91–103.

Kneisel, J. 2012. *Anthropomorphe Gefässe in Nord- und Mitteleuropa während der Bronze- und Eisenzeit. Studien zu den Gesichtsurnen: Kontaktzonen, Chronologie und sozialer Kontext.* Bonn: Habelt.

Ladegaard-Pedersen, P., Sabatini, S., Frei, R., Kristiansen, K. & Frei, K. M. 2021. Testing Late Bronze Age mobility in southern Sweden in the light of a new multi-proxy strontium isotope baseline of Scania. *PLoS ONE* 16(4): e0250279. https://doi.

org/10.1371/journal.pone.0250279

Olausson, D.S. 1987. Piledal and Svarte. A comparison between two Late Bronze Age cemeteries in Scania. *Acta Archaeological* 57: 121–152.

Olsson, I. 1959. Uppsala natural radiocarbon measurements I. *American Journal of Science Radiocarbon Supplement* 1: 87–102.

Olsson, I. 1960 Uppsala natural radiocarbon measurements II. *American Journal of Science Radiocarbon Supplement* 2: 112–128.

Olsson, I. 1961. Appendix I: The C14 determinations. In: *Simris II. Bronze Age problems in the light of the Simris excavation*, Acta Archaeologica Lundensia 4.5 (pp. 154–156). Stjernquist, B. (ed.). Bonn/Lund: Habelt/Gleerup.

RAÄ document L1990:3607 (Simris 34:1), retrieved 23 April 2020 at https://app.raa.se/open/fornsok/api/lamning/dokument/fil/aWlwYXg6Ly9vYmplY3RiYXNlLmRvY3VtZW50L2RvY3BhcnRpdGlvbiM2MDQzOTM3/L1990-3607-FMIS_H%C3%84NDELSER.pdf

RAÄ document L1990:3627 (Simris 34:2), retrieved 12 January 2021 at https://app.raa.se/open/fornsok/api/lamning/dokument/fil/aWlwYXg6Ly9vYmplY3RiYXNlLmRvY3VtZW50L2RvY3BhcnRpdGlvbiM1OTc2NDY5/L1990-3627-FMIS_H%C3%84NDELSER.pdf

Rebay-Salisbury, K. 2010. Cremations: fragmented bodies in the Bronze and Iron Ages. In: *Body parts and bodies whole: changing relations and meanings* (pp. 64–71). Rebay-Salisbury, K., Stig Sørensen, M. L. & Hughes, J. (eds). Oxford: Oxbow Books.

Reimer, P., Austin, W., Bard, E., Bayliss, A., Blackwell, P., Bronk Ramsey, C., Butzin, M., Cheng, H., Edwards, R., Friedrich, M., Grootes, P., Guilderson, T., Hajdas, I., Heaton, T., Hogg, A., Hughen, K., Kromer, B., Manning, S., Muscheler, R., Palmer, J., Pearson, C., van der Plicht, J., Reimer, R., Richards, D., Scott, E., Southon, J., Turney, C., Wacker, L., Adolphi, F., Büntgen, U., Capano, M., Fahrni, S., Fogtmann-Schulz, A., Friedrich, R., Köhler, P., Kudsk, S., Miyake, F., Olsen, J., Reinig, F., Sakamoto, M., Sookdeo, A. & Talamo, S. 2020. The IntCal20 northern hemisphere radiocarbon age calibration curve (0–55 cal kBP). *Radiocarbon* 62.4: 725-757. DOI: 10.1017/RDC.2020.41

Sabatini, S. 2007. *House urns. A European Late Bronze Age trans-cultural phenomenon.* Gothenburg: University of Gothenburg.

Sabatini, S. 2013. Local and transcultural burial practices in northern Europe in the Late Bronze Age: face, house and face/door urns. In *Exchange networks and local transformations* (pp. 134–145). Alberti, M. E. & Sabatini, S. (eds.). Oxford: Oxbow Books.

Sabatini, S. 2014. Burial practices as imagined community spaces: the example of the Late Bronze Age house urns. In: *Med hjärta och hjärna: En vänbok till professor Elisabeth Arwill-Nordbladh* (pp. 537–549). Alexandersson, H., Andreeff, A. & Bünz, A. (eds.). Gothenburg: University of Gothenburg.

Sabatini, S. 2017. Intentionally made: objects as composite indexes of agency and the case of the Late Bronze Age house urns. In: *New perspectives on the Bronze Age. Proceedings of the 13th Nordic Bronze Age Symposium held in Gothenburg 9th to 13th June 2015* (pp. 435–446). Bergerbrant, S. & Wessman, A. (eds.). Oxford: Archaeopress.

Sabatini, S., Brorsson, T. & Skoglund, P. 2020. Clay, burial urns, and social distinction in Late Bronze Age southern Scandinavia. In *Contrasts of the Nordic Bronze Age. Essays in honour of Christopher Prescott* (pp. 233–245). Austvoll, K. I., Hem Eriksen, M., Ditlef Fredriksen, P., Melheim, A. L., Prøsch-Danielsen, L. & Skogstrand, L. (eds.). Turnhout: Brepols.

Skoglund, P. 2016. *Rock art through time. Scanian rock carvings in the Bronze Age and Earliest Iron Age*. Oxford: Oxford Books.

Stig Sørensen, M. L. & Rebay-Salisbury, K. 2008. From substantial bodies to the substance of bodies: analysis of the transition from inhumation to cremation during the Middle Bronze Age in central Europe. In: *Past bodies: body-centred research in archaeology* (pp. 59–68). Robb, J. & Borić, D. (eds.). Oxford: Oxbow Books.

Stjernquist, B. 1955. *Simris. On cultural connections of Scania in the Roman Iron Age*, Acta Archaeologica Lundensia 4.2. Bonn/Lund: Habelt/Gleerup.

Stjernquist, B. 1961. *Simris II. Bronze Age problems in the light of the Simris excavation*, Acta Archaeologica Lundensia 4.5. Bonn/Lund: Habelt/Gleerup.

Strömberg, M. 1982. *Ingelstorp*, Acta Archaeologica Lundensia 14. Lund: Gleerup.

Svanberg, F. 2005. House symbolism in aristocratic death rituals of the Bronze Age. In: *Dealing with the dead: archaeological perspectives on prehistoric Scandinavian burial ritual* (pp. 73–98). Svanberg, F. & Artelius, T. (eds.). Stockholm: Riksantikvarieämbetet.

Svanberg, F. 2007. Aristokratiska Husgravar Under Bronsåldern. In: *Vägar till Vætland. En bronsåldersbygd i nordöstra Skåne 2300–500* (pp. 187–221). Artursson, M. (ed.). Stockholm: Riksantikvarieämbetet.

Svensson-Hennius, J. 2015. All those stones. Concerning stone constructions at Tanum 539. In: *Domestic life in the Tanum rock carving area* (pp. 189–213). Petersson, H. & Toreld, C. (eds.). Uddevalla: Bohusläns Museums Förlag.

von Eles, P. 2012. The Princess of Verucchio. In: *Princesses of the Mediterranean in the dawn of history* (pp. 235–257). Stampolidis, N. C. & Giannopoulou, M. (eds.). Athens: Museum of Cycladic Art.

Old traditions meeting new ideas

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Abstract

In 2016 and 2017, Museums of Eastern Funen excavated a ploughed-down Bronze Age round barrow at Kalvehavegård, near the southern shore of Kerteminde Fjord on Funen, Denmark. The site sheds new light on the transition from LN/NBA I to NBA II and concurrent changes in burial customs. The NBA II barrow covered a central grave containing the cremated bones of a man and a woman in an oak-log coffin, accompanied by an extraordinary set of grave goods. With a date of around 1400 BC, this is one of the earliest examples of a cremation grave in Denmark. A flat-field cemetery, originally containing at least eleven inhumation graves, was discovered on the northern periphery of the barrow. ^{14}C dates reveal that most of these graves are from NBA I, but at least one is from LN I. The flat-field graves appear to have numerous maritime associations, with contents including various mollusc shells and perhaps seaweed. The dead were buried in a fashion indistinguishable from the LN tradition. The NBA II barrow and the central grave appear to represent a break or change in tradition and ideas. The use of an existing burial ground indicates the continuation of a family tradition, but the incorporation of new funerary rites could be interpreted as showing the need of a newcomer to tap into local customs to establish an affiliation with the local community.

This article gives a preliminary presentation of the site with special reference to the link between the NBA IB flat-field graves and the NBA II barrow.

Keywords: Bronze Age, flat-field graves, cremation grave, burial traditions.

In September 2016, Museums of Eastern Funen were contacted by a metal detectorist who had found female ornaments, in the form of a belt plate, an arm ring and a neck ring, as well as a dagger. Collectively, the finds could be dated to the Nordic Bronze Age period II (NBA II). The detectorist had also located a sword in situ and thereby discovered a previously unrecorded barrow at Kalvehavegård near Kerteminde Fjord. These artefacts add to the statistics revealing a steadily increasing number of metal-detector finds from the Bronze Age. This is unfortunately a consequence of the fact that the bottom has quite literally been reached in many of Denmark's ploughed-down barrows and that the final remnants of a unique archaeological resource are currently in the process of disappearing forever.

The metal-detector discoveries led to the excavation of the round barrow in 2016 and 2017[6] (Beck, 2018a, 2018b). These investigations revealed an unusual double grave from NBA II. A man and a woman had been cremated and placed in an oak-log coffin together with grave goods indicating that they were members of an elite that had extensive external contacts, craft-related knowledge and

[6] The site has archive number ØFM 855 Kalvehavegård and is recorded in the Danish Agency for Culture and Palaces' Sites and Monuments database (FF) under the number 080106-160. The artefacts have been declared as treasure trove and are now part of the Danish National Museum's collections under the numbers B19128-19136. The anthropological (human bone) material is kept at the Unit of Anthropology at the Department of Forensic Medicine, University of Southern Denmark in Odense (ADBOU). The other finds from the excavation and the excavation records are kept at the Museums of Eastern Funen. The excavation was made possible by a grant from the Danish Agency for Culture and Palaces's funds allocated to cultivation-threatened sites and structures

skills and special societal functions. North of the barrow was a flat-field cemetery containing eleven inhumation graves, which extended in date from the Late Neolithic period I (LN I) to NBA IB. The rich barrow burial therefore forms part of the local burial tradition while, at the same time, expressing and exemplifying the significant changes in social structure that in several respects are testified to within the same time span (e.g., Vandkilde, 1996, 2017; Kristiansen & Larsson, 2005; Holst *et al*., 2013). This article gives a preliminary presentation of the excavation and the burial complex at Kalvehavegård.

Landscape and topography

The barrow is situated by the farm Kalvehavegård, close to the southern shore of Kerteminde Fjord on the island of Funen. The terrain to the south of the fjord comprises a slightly undulating moraine surface, in sharp contrast to the landscape to the north of the fjord, which is characterized by impressive lateral moraine hills. The barrow is located on a low moraine hillock about 40 m from the shore, and the site offers a good view across the entire outer part of Kerteminde Fjord. Today, the town of Kerteminde obscures the view to the Great Belt and the open sea about 2.3 km to the north-east. When the barrow was constructed, the mouth of the fjord was wider, and the Great Belt was visible from the site. A small watercourse flows out into the fjord just east of the barrow, creating a natural delimitation of the terrain, so the monument appears almost placed on a small promontory. The subsoil at the site is primarily moraine clay, but a pocket of bryozoan-rich sand has ensured unusually good conditions for the preservation of bone. The barrow at Kalvehavegård is one of a larger group of barrows which follows the shore and still characterizes the landscape around Kerteminde Fjord to this day. Settlement traces from the Early Bronze Age are extremely poorly elucidated in the area.

The barrow at Kalvehavegård

The barrow had an original maximum diameter of 22 m. The barrow material was preserved to a height of only 34 cm, but the monument's position on a small natural elevation caused the turf-built mound to appear significantly larger. A stone spread was preserved along the south-western periphery of the barrow. A charred vegetation layer under the barrow suggests that the vegetation had been burnt off prior to commencement of construction, although it is unclear whether this was for ritual or practical reasons (Thrane, 1991). Also found under the barrow were pits containing mollusc shells and flint, which are suggestive of settlement activity, presumably during the Late Neolithic.

The central grave

It was the barrow's central grave that the metal detectorist located in 2016. It is an unusual grave in terms of both its construction and its contents. An oak-log coffin had been placed on an up to 17-cm-thick layer of pure, yellow sand, which had been laid out as a foundation over the burnt vegetation layer. This is not beach/marine sand, and similar sand was not encountered within the confines of the excavation. It must therefore have been specifically dug and transported to the site; it is unclear from where or from how far away, but a small gravel pit, a couple of hundred metres to the north-west of the barrow, could be its origin. Parallels to the sand layer exist in the form of coffins lying on beach/marine sand (Appel & Pantmann, 2013, p. 107), and there are several examples of oak-log coffins placed on layers of beach stones which, in some cases, must have been transported quite a distance (Holst et al., 2015, p. 298; Beck & Frederiksen, 2018, p. 9). The choice of material can be seen as a parallel to the building material used for the barrow, in the form of turves taken from various landscape types in the vicinity (Holst & Rasmussen, 2015, p. 123) and thereby a tangible and symbolic incorporation of the

landscape's resources into the burial monument (Kristiansen, 2018, p. 127). The large oak-log coffin, which had internal dimensions of ca. 0.6 x 3 m, was supported by and presumably also originally covered by a stone packing that had only survived on the south side of the coffin.

Cremation grave in oak-log coffin

In the eastern half of the oak-log coffin lay about 2 kg of white-calcined human bone, which had presumably been wrapped in a cow hide or cloth, with the unburnt grave goods placed on top; a situation seen in other early cremation graves in coffins (Ille, 1991, p. 114). There were bones from two adult individuals in the grave: an adult man, whose age could not be determined, and a slightly built woman of between 30 and 45 years of age.[7] The grave goods correspond to these two individuals, but whereas the bones had been mixed and packed together as a single entity, the grave goods were clearly separated and arranged in different places within the coffin. On top of the package containing the bones lay a flange-hilted sword, a fibula, a gold ingot and a folding stool: artefacts that probably belonged to the male burial. During the excavation, it could be demonstrated that female ornaments and the large dagger had lain just to the east of the heap of bones. Unfortunately, the metal detectorist's digging up of the finds had disturbed the grave in this area. As a result, it cannot be definitely ascertained whether the set of ornaments and the dagger had lain in the coffin or been placed on top of it. But it could be demonstrated stratigraphically that a pottery vessel had stood on top of the coffin. This vessel can, like the rest of the grave furnishings, be dated to NBA II (Rasmussen, 1993). Bones from the central grave have been ^{14}C dated to 1449–1260 BC and a fragment of charcoal from a twig, found mixed with the burnt bones, gave a date of 1505–1396 BC.[8] It is not the intention here to give a detailed account of the grave furnishings, but some of the artefacts deserve to be highlighted as they are unusual and thereby contribute to the overall picture of an extraordinary grave. The flange-hilted sword of Sprockhoff's type 1a (Sprockhoff, 1931, pp. 1ff., taf. A, 1) lay oriented with its hilt to the west. The flange was filled with lead. Lead is found in a pure form in Scandinavian artefacts from NBA II (Johannsen, 2016). In 1909, S. Müller described how traces of lead could be observed on several of the flange-hilted swords in the Danish National Museum's collection, and he suggested that the swords were of foreign origin (Müller, 1909, pp. 45ff.). At least 30 swords with traces of lead on the hilt are known from Scandinavia and northern Germany; the majority dated to NBA II. Most of the swords are types of north European origin, although it is possible that some were imported from central Europe (Johannsen, 2016, p. 154). Even though lead has been recorded on Early Bronze Age swords from all of Denmark, and has consequently been imported to some degree, it must be perceived as an exotic material, and a material that apparently was only used for one specific artefact group. On the hilt were remains of an organic material, possibly wood.[9] In addition to four functional rivets and several decorative examples, the hilt was decorated with two rows

[7] Dr Svenja Weise, Unit of Anthropology at the Department of Forensic Medicine, University of Southern Denmark, has undertaken the analyses of the human bone material from Kalvehavegård. The report (Weise, 2018) is available at: https://www.kulturarv.dk/publicffdata/documentation/file/doc/201236/public

[8] All dates are cited with 2 standard deviations. Lab. numbers Poz-104676 and Poz-104677. All dates associated with the investigation are available at: https://www.kulturarv.dk/fundogfortidsminder/Lokalitet/224755/

[9] The sword, fibula and gold ingot were taken up in situ in a block sample, which was examined by conservator Eva Salomonsen, National Museum of Denmark. The two rivets from the folding stool were excavated from a block sample by conservator Ida Hovmand, Bevaringscenter Fyn.

Figure 1. Arm ring, belt plate, fragments of a neck ring and a dagger blade found by metal detectorist in 2016. Photo: Eva Salomonsen, National Museum of Denmark.

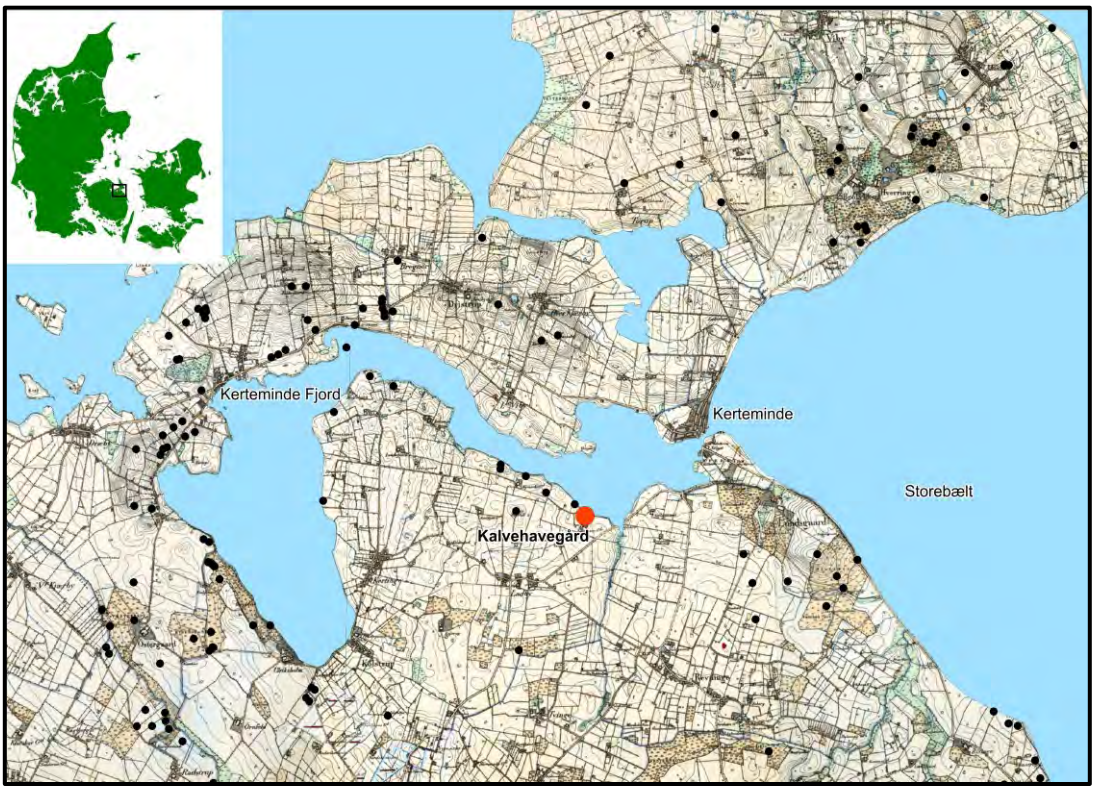

Figure 2. The barrow at Kalvehavegård lies close to Kerteminde Fjord and with a close connection to the Great Belt. On the map, all recorded round barrows are marked with a black circle. Based on the first edition ordnance maps (Høje Målebordsblade) with coastline from the first cadastral (Original 1) maps. Graphics: Malene R. Beck.

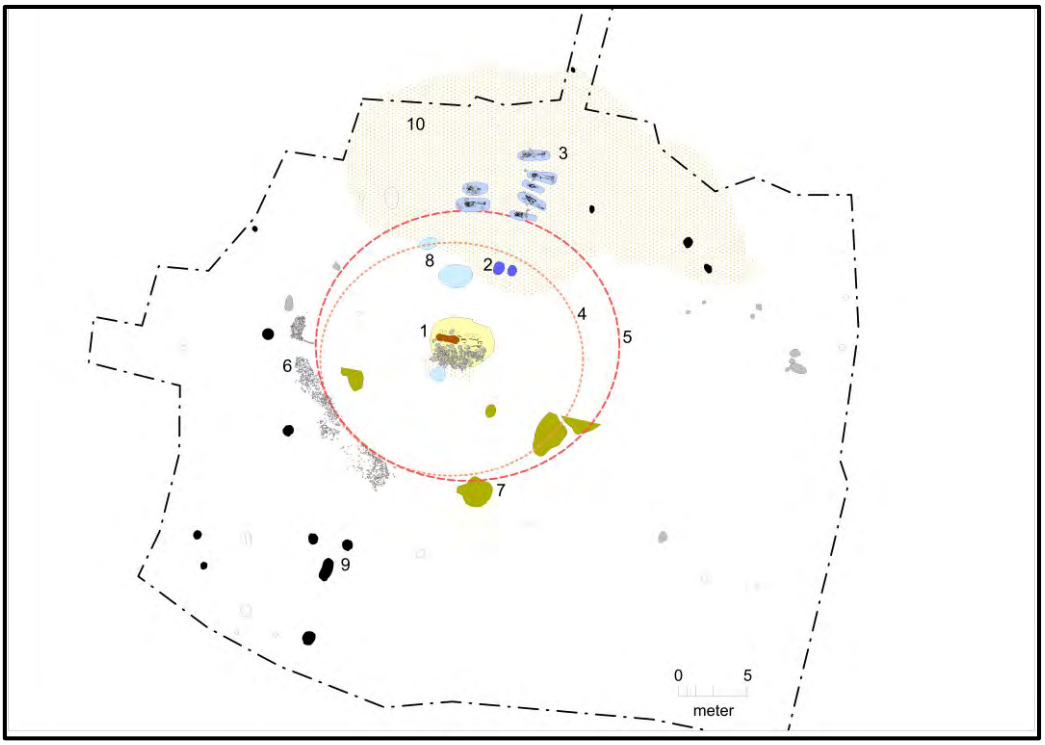

Figure 3. Overview of all features and structures excavated at Kalvehavegård. 1: Central grave. 2: Two stone-set posts in a disturbed inhumation grave. 3: Burial ground with inhumation graves. 4: Preserved barrow fill. 5: Estimated original extent of the barrow. 6: Stone pavement bordering the barrow periphery. 7: Patches of burnt vegetation layer. 8: Pits containing marine mollusc shells and flint. 9: Cooking pits. 10: Bryozoan-rich sand. Graphics: Malene R. Beck.

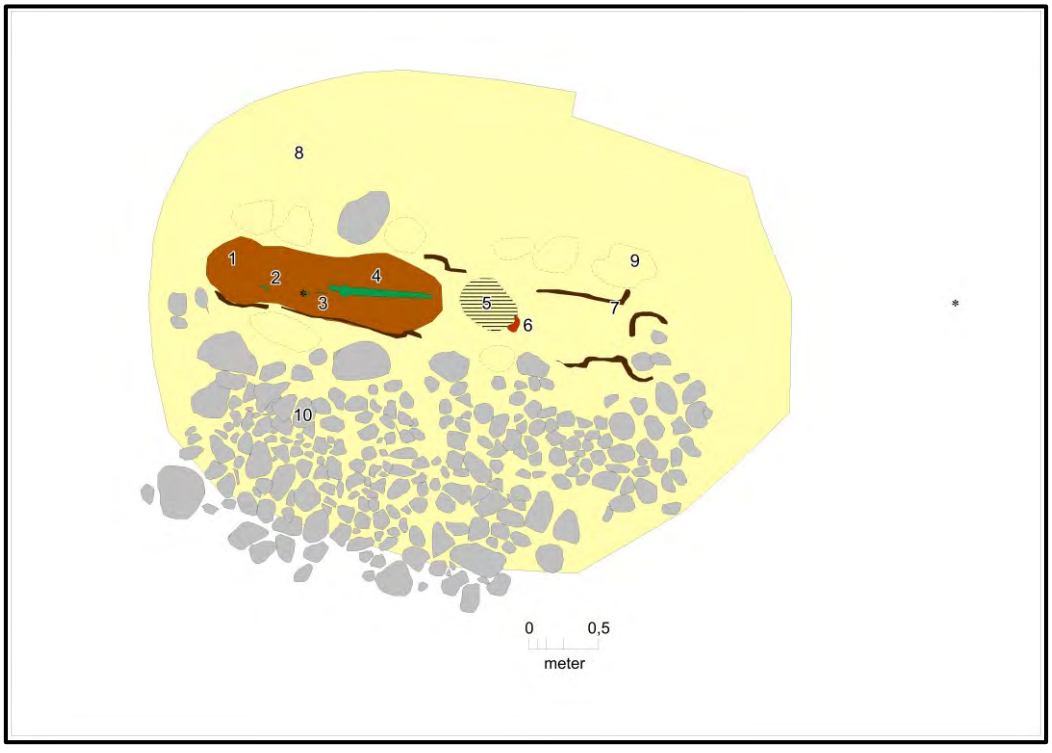

Figure 4. Detailed plan of the central grave. 1: Burnt bones wrapped in leather or cloth. 2: Rivets from folding stool. 3: Fibula. 4: Sword and gold ingot. 5: Disturbance caused by metal detectorist, find site for female ornaments and dagger. 6: Pottery vessel. 7: Coffin traces. 8: Sand layer. 9: Stone trace. 10: Stone Packing. Graphics: Malene R. Beck.

of closely spaced bronze pins. The hilt must originally have had a polychrome appearance, with a pattern of small golden-bronze rivets against a background of organic material. This was probably similar to the polychrome expression evident on full-hilted swords, and exemplified by the flange-hilted sword from the Muldbjerg burial (Bunnefeld, 2016, pp. 86ff., 2018, p. 202). Together with the sword lay a fibula. The fibula pin was of bronze, while the bow was of coiled gold thread. The grave's perhaps most unusual artefact, in the form of a gold ingot, was found close to the sword blade. Traces of dark, decayed material suggest that the gold had been wrapped or had perhaps lain in a leather pouch. The ingot has marks from hammering, and one end had been broken off with intent in the past. There are clear indications that it had been worked by an untrained metalworker, someone who lacked a comprehensive understanding of the metal's qualities. The metal shows evidence of being overworked in such a way that cracks have appeared in it. It is likely that gold from the ingot was used to make the fibula, as similar microscopic cracks can be observed in the latter.[10] There is only one other recorded find of a gold ingot from Denmark that can be securely dated to the Bronze Age: this was discovered in a hoard dating from NBA IV found near Ramløse in northern Zealand (Jørgensen & Petersen, 1998, p. 43).

The final artefact that will be mentioned here is a folding stool of Guldhøj type, represented by two 6-cm-long bronze rivets, lying 29 cm apart in the western end of the grave. The grave thereby joins a small exclusive group of 21 finds of folding stools in graves from Scandinavia and northern Germany (Werner, 1987; Fabian, 2009). The folding stool can be perceived as a status symbol and badge of office employed by the Bronze Age elite (Kristiansen & Larsson, 2005, pp. 305f.).

The central grave at Kalvehavegård stands out both in the choice of cremation as the burial form and in its content of rich and exclusive grave goods. It belongs to a small group of early cremation graves from NBA II in Denmark, many of which contain special grave goods and probably also special or important individuals, who in several cases were clearly not local (Haack Olsen, 1990; Feveile & Bennike, 2002; Bech & Rasmussen, 2018, pp. 72ff.). Consequently, the earliest cremation graves are not simply an expression of a transitional period from one burial custom to another, but a clearly conscious choice and an indication of special individuals who were the main actors in altering religious practice (Bech & Rasmussen, 2018, p. 73). The grave constitutes, on several levels, an illustration of how new ideas, contacts and crafts make a breakthrough in the 16th–15th centuries BC. The two interred individuals must be perceived as members of the elite in the Bronze Age society or in some other way first movers within a new craft and altered world view. The burial customs and grave goods highlight the individuals' special skills or knowledge in metalworking (the gold ingot, the fibula, lead and bronze pins in the sword hilt), their special societal functions or positions (the folding stool, the sword, the large dagger) and possibly their special origin or contacts. Whether it was the individuals themselves who were foreigners, or whether they were returned travellers in possession of new contacts and a new network (the cremation burial practice, the gold and the lead) is unclear. But while the grave reflects a series of social and societal changes and new networks, it is also clearly rooted in a local tradition, as the grave and barrow were placed next to an earlier cemetery.

[10] Thanks to Dr Heide Wrobel Nørgaard for information on and explanation of the working traces on the gold ingot and the fibula.

Figure 5a. The flange-hilted sword of Sprockhoffs type Ia with lead fill in hilt. Photo: Roberto Fortuna, National Museum of Denmark.

Figure 5b. Gold ingot with visible traces of hammering. Length: 60 mm, width: 9 mm, thickness: 6 mm, weight: 19.2 g. Photo: Roberto Fortuna, National Museum of Denmark.

The inhumation burial ground

It is common for later graves to be found in and around Early Bronze Age barrows, and the prevailing perception is that these graves are found particularly by the southern and eastern perimeters of the monuments. When a trial trench was dug in 2016 with the aim of establishing the barrow's state of preservation, it was consequently placed to the north, to cause as little damage as possible to any potential later graves, features and structures in the barrow. This resulted in the surprising discovery of two very well-preserved inhumation graves from a cemetery that was then fully investigated in 2017 together with the remaining part of the barrow and the area surrounding it. Seven inhumation graves were excavated to the north of the barrow and traces of an eighth grave were found beneath the barrow. In addition, remains of a further three individuals were encountered as stray finds during the excavation. A minimum of eleven individuals were therefore interred in the area. Several of the graves lay just below the plough-soil and were consequently exposed to destruction resulting from cultivation practices, and it seems likely that the cemetery was originally larger. All age groups, from new-born to adult, are represented in the cemetery, which therefore appears to represent a broad section of the population.

The graves were placed in two rows, which were oriented N–S. The eastern row comprised five graves north of the barrow and a disturbed grave found beneath it. In addition, stray finds of bones from a new-born infant and two children can also be linked to this row. The western row comprised two graves. Children and adults lay buried among each other. The dead were laid out in supine position, with their arms and hands along their sides or over their pelvic area and with their head at the western end of the grave.

The inhumation graves were evident in plan as very light-coloured, elliptical features, which were oriented E–W and ESE–WNW. Stones were observed in several of the graves, placed by the deceased individual's shoulders, hips and feet. In only one grave (A78) were there so many closely placed stones that it is possible to speak of some kind of stone coffin. In the same grave, a large stone had toppled over the skeleton, possibly a grave marker. None of the stones in the other graves would have been visible above the ground surface. But given that the graves lie separately, and that the later barrow respects the two rows of burials, it must be assumed that the graves were visible, either as low depressions or changes in the vegetation or due to some form of marker. There were no traces of coffins in the graves, but in several cases the limbs lay so close together that the corpses must have been wrapped up or bound prior to interment. Darker traces, presumably from decayed organic material, were observed around the skeleton and on the bones in only a few of the graves.

The grave contents

Only a few of the inhumation graves contained grave goods. In grave A32, a ca. 14-year-old individual was buried with an ornament consisting of small mother-of-pearl beads and two beads made of bone. The beads were found by the deceased individual's shoulder/neck. The positions of several of the small shell beads close together in rows suggests that they formed a necklace. The two bone beads comprise a flat, round, almost button-like example and a rectangular bead with a form that is temptingly reminiscent of ox-hide ingots (Ling & Stos-Gale, 2015). There is, however, nothing in the graves to indicate foreign contacts or for that matter the use of metal, so the bead perhaps simply reflects the form of an ox hide. In grave A77, a dog's-tooth bead lay by the deceased individual's temple. The ornament inventory, in the form of shell and tooth beads, corresponds to that found in Late Neolithic graves, as well as graves of both the Early and Late Bronze Age (Ebbesen, 1995, 233; Runge, 2010, p. 44f.), although

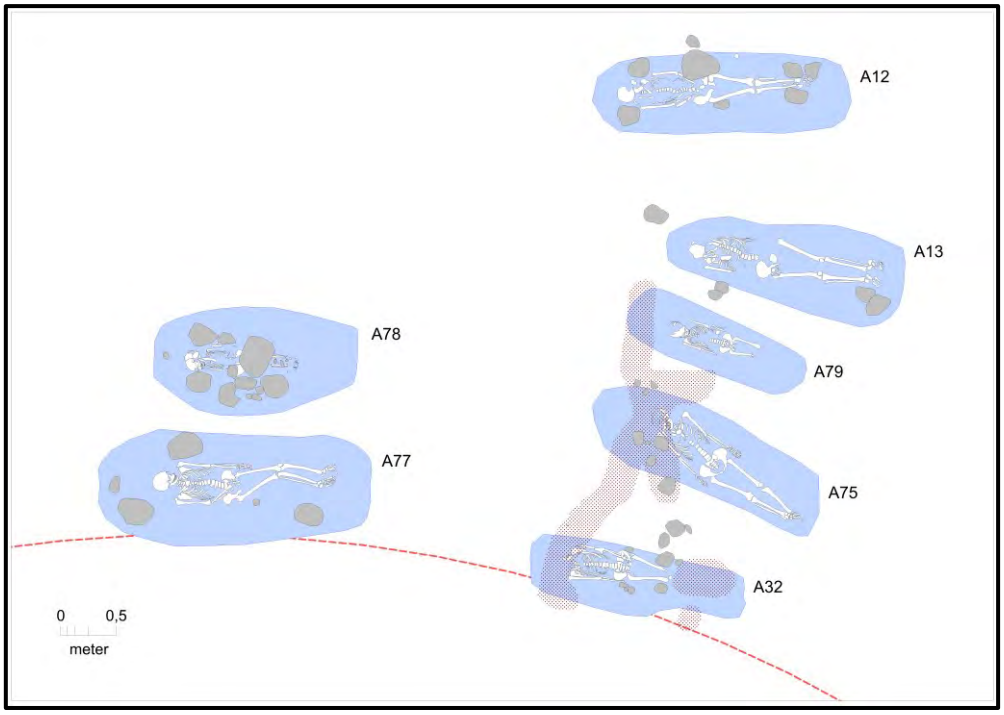

Figure 6. The inhumation graves were arranged in two rows. Some of the graves in the eastern row had been disturbed by a fox's burrow, marked by hatching. The lower legs of the skeleton in grave A32 were removed around 1950 when trees in a fruit orchard were dug up. Graphics: Malene R. Beck.

Figure 7. Close-up of grave A32 where some of the many shell beads can be seen scattered between the shoulder area and the cranium. The shell beads have a diameter of 4-5 mm. The area had been disturbed by a fox's burrow. Upper right is a bone bead which is c. 20 mm long. Photo: Eastern Funen Museum.

Table 1. Inhumation graves: Overview of contents and dating.

A-nr and x-nr	Sex	Age	Grave goods	Stones	14C
A12, x12	Male	Adult 23-30	None	Yes	1611 BC – 1439 BC Poz-103940
A13, x13	Female	Adult 27-35	None	Yes	1643 BC – 1504 BC Poz-103941
A79, x52	?	Child 6-8	Sherd of ceramic; Three pieces of flint (flakes); Small colourful stone; Periwinkle shells; Mussel shells	No	1644 BC – 1496 BC Poz-103942
A75, x54	Female	Adult 22-32	Periwinkle shells; Cockle shells (few fragments); Mussel shells (few fragments)	Yes	1631 BC - 1494 BC Poz-103944
A32, x53	?	Juvenile 13-16	Potsherd;100+ mother of pearl beads; Two bone beads; Four pieces of flint (flakes); Small colourful stone; Mussel shells	Yes	1660 BC - 1499 BC Poz-103943
A32 top, x33	?	Child 6-9	Disturbed grave	?	
Near A32, x36	?	Foetus/very small newborn, 3rd trimester	Disturbed grave	?	
Between A32 and A75, x205	?	Child 4-9	Disturbed grave	?	
A78, x56	?	Child 3-5	Three pieces of flint (flakes); Cockle shells; Mussel shells; Periwinkle shells; Oyster shells (fragments); Conch shells (very small); Colourful stones (black, red and green)	Yes	2206 BC - 2017 BC Poz-103946
A77, x55	Male	Adult 21-25	Dog-tooth bead; Three pieces of flint (flakes); Cockle shells; Periwinkle shells; Mussel shells; Conch shell; Flint stone	Yes	1683 BC - 1509 BC Poz-103945
A87, x207 and x211	?	Adult 18+	Disturbed grave covered by the burial mound	?	

shell beads are not a common occurrence. A single shell bead is recorded from a NBA II oak-coffin burial at Ordrup in Odsherred on Zealand (Aner & Kersten, 1976, no. 793F).

Two of the graves (A32 and A79) contained pottery in the form of a single potsherd. In child grave A79, the sherd lay by the right side of the cranium, while in grave A32 it was found during cleaning of the west end of the grave around the head, in an area that had been disturbed by a fox's earth. No other sherds were found mixed up in the grave fill, and it is therefore assumed that the sherds, as a pars pro toto, represent an intentional deposition in the grave.

Four of the graves (A32, A77, A78 and A79) contained flint flakes. Given that flint flakes were not otherwise found in the area, these are also assumed to be part of the grave furnishings; an interpretation that is supported by their positions in the graves. Several of the flakes have cortex, appear newly struck and seem therefore to have been specially produced for the occasion. The flakes were placed by the deceased individual's head/shoulder, in the hip/pelvic region and by the feet. Their position are consequently reminiscent of the way in which the larger stones in the graves were arranged, as described in the previous section.

In the same four graves (A32, A77, A78 and A79), small stones were found associated with the right side of the cranium, shoulder and arm. Given that there are no stones of similar size in the subsoil, and given that these stones were found in very uniform positions in the graves, they are interpreted as an expression of a conscious action, either as actual grave goods or as parts of the grave furnishing. In child grave A79, a small red-, white- and yellow-flecked piece of granite lay by the right side of the cranium. In A32, the grave of a teenager, a similar stone lay under the right upper arm. In A77, a flint stone had been placed by the right jaw and a flat, red stone by the right thigh. The child in grave A78 had a smooth, black piece of slate under its head. A piece of a red tabular stone lay under its right forearm and an elongated, verdigris-green stone was placed on top of the right lower leg. Small stones or fossils, which must be perceived as part of the grave inventory, are a well-known phenomenon in both the Bronze Age and Iron Age (Haack Olsen, 1990; Carlie 2004, pp. 155f.; Runge. 2010. p. 47). In a Bronze Age context, the Hvidegård burial is perhaps the best-known example, although the pebbles in this grave lay together with other selected and particularly significant artefacts in a pouch (Kaul, 1998, p. 16f.; Goldhahn, 2012, p. 58f.).

Five of the well-preserved graves (A32, A75, A77, A78 and A79) were found to contain varying quantities of marine mollusc shells: most frequently fragments of mussels, cockles and periwinkles. Gastropod shells in the form of tiny specimens, were found in three of the graves; in all cases in association with the deceased individual's chest/abdomen. Oyster shells were found in one grave. In only a few cases were the mollusc shells intact. They were found spread over the entire grave, above and at the level of the deceased individual, and in one case definitely below the corpse, too. This suggests that the shells may have entered the grave together with the eelgrass or seaweed that had been used as a bed for the grave and/or a covering. Eelgrass and mollusc shells have been found in several graves in northern Zealand from both the Early and Late Bronze Age; the eelgrass functioned as packing around the coffins and urns (Appel & Pantmann, 2013). This marine packing material can be interpreted as indicating a close relationship with, or dependency on, the sea. This is also an obvious conclusion relative to the Kalvehavegård site, in light of its close physical proximity to open water. Given the ^{13}C values measured in their bones there is, however, nothing to suggest that these people obtained their food from marine resources to any major extent. The use of these marine materials in the graves could perhaps therefore also be ascribed a religious or mythological foundation or be seen as marking the role of the sea as a connection and point of access to the wider world.

Use of the cemetery

In general, there are no differences in appearance between the adult and child graves. There is, though, a tendency for the graves of especially children/adolescents and younger adults to contain grave goods, whereas no actual grave goods were found in the graves of the three oldest individuals (graves A12, A13 and A75).

Seven graves have been radiocarbon dated. Six of these gave ages within the dating range of

Figure 8. Grave A77 containing the skeleton of a 21-25-year-old man. A few mollusc shells can be seen scattered across the grave, and flat reddish stone lies by the man's right thigh bone. Note the light-coloured grave fill. Photo: Eastern Funen Museums.

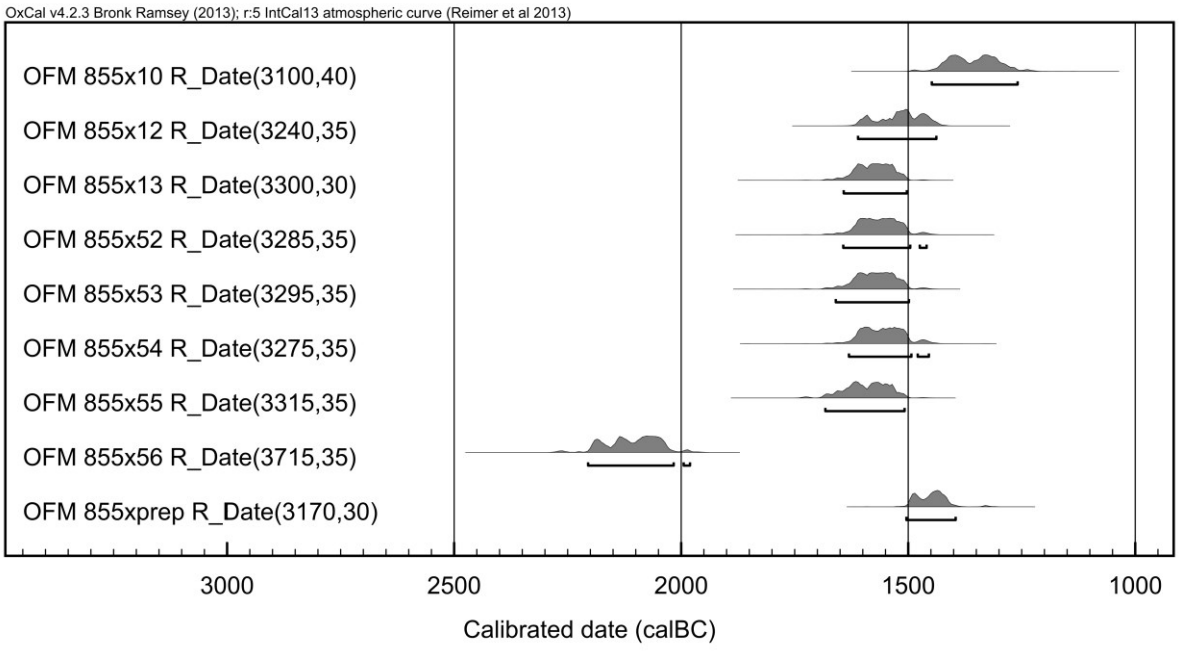

Figure 9. 14C dates for the inhumation graves and the central grave at Kalvehavegård. Poznan Laboratory Poz-103940-103946 and Poz-104676-104677.

1683–1494 BC, corresponding to NBA Ib. The dates are so uniform that the burials must have taken place within a short period or even as a single act. The northernmost grave in the eastern row (A12), with its date of 1611–1439 BC (period Ib-period II), comes closer to the date for the central grave and the construction of the barrow. The northernmost grave in the western row (A78) has been dated to 2206–2017 BC and is therefore a Late Neolithic burial (LN I), several centuries earlier than the other graves. This grave clearly resembles the other graves in the cemetery with respect to its orientation, structure and contents, but there are some differences. First and foremost, there is the use of more stones in its construction and the shape of the grave, which is reminiscent of a boat. That it does actually represent a boat could not be confirmed during the excavation, but boat graves have been recorded at other Late Neolithic burial grounds (Bican, 2012). The presence of oyster shells in grave A78 suggests that the period that elapsed between the flat-field cemetery burials, i.e., around 500 years, also saw changes in the local marine fauna, as oyster shells were not found in any of the other graves.

It was unfortunately not possible to date the disturbed grave that lay under the barrow. This grave, located midway between the cemetery with inhumation graves and the central grave, had definitely been covered by the barrow. At some point after the construction of the barrow, two large stone-set posts were erected precisely on top of this earlier burial. Given that there are no other posts or construction traces in the barrow, this suggests that the posts were placed either as markers of this earlier grave or, alternatively, as its intentional destruction. Regardless of which of these two explanations is true, this is yet another indication that the barrow builders were fully aware of the existence of the earlier cemetery in conjunction with the planning and construction of the round barrow.

Discussion—tradition versus innovation

The flat-field cemetery containing inhumation graves at Kalvehavegård was in use through several centuries, from the middle of the Late Neolithic to Early Bronze Age period Ib and probably early period II, without it being possible to see any appreciable development or changes in burial practice or grave form. This suggests that the burial ground was used by a local population that followed the local customs and traditions when a deceased member of the family was to be buried. The relatively simple grave form is reminiscent of other flat-field graves of the Late Neolithic or Early Bronze Age (Ebbesen, 2005; Bican, 2012). The sparse grave furnishings are consistent with the general picture of the period. Apart from the presence of a few personal ornaments, none of the graves stand out or are suggestive of an essential difference in the social hierarchy. The cemetery has a clear layout, with graves in rows and adult and child graves mixed together among one another. The family relationships of the individuals have not been established, but the presence of both adults and children as young as new-born infants indicates that this was a family burial ground.

The dead were probably wrapped in, or covered with, eelgrass. Was this just an easily accessible and usable wrapping material, or did it have a deeper symbolic significance? Eelgrass and other maritime connotations are evident in graves throughout the entire Nordic Bronze Age (Appel & Pantmann, 2013). The sea was a lifeline in relation to obtaining food and, not least, metals (Berntsson, 2005; Vandkilde, 2017, p. 162; Bech & Rasmussen, 2018, p. 86), and the significance of the sea in Bronze Age mythology, already established at the earliest bronze-using period, is well described (Kaul, 1998, 2004; Kveiborg *et al*., 2020). Trans-maritime networks and sea voyages increase dramatically around

1600–1500 BC, but even before this time, the sea was a lifeline on several levels. Late Neolithic boat graves (Bican, 2012) underline the fact that the boat or the ship, as a metaphor for travel or links to other worlds, existed prior to the Bronze Age. At Kalvehavegård, the dead were buried facing the sea and the rising sun, while being wrapped in eelgrass from the sea. It is difficult not to see this as an expression of a close connection with the water and the innumerable meanings that may lie within this.

The cemetery's long period of use is interesting and presumably not especially uncommon. As an increasing number of skeletons have been ^{14}C dated, it has become clear that there is a much closer connection between Late Neolithic burial grounds and the graves and barrows of the Bronze Age than was previously acknowledged (Bergerbrant, 2014, p. 259; Frei *et al*., 2019, p. 14). The situation at the Kalvehavegård site simply underlines clearly this close connection.

Inhumation burials outside barrows have been interpreted as the graves of "commoners", in contrast to the graves of the elite in the barrows (Bergerbrant *et al*., 2017; Kristiansen, 2018, p. 110). At Kalvehavegård, the flat-field cemetery with inhumation graves came first and the barrow construction clearly took account of the existing burial ground. This must be seen as showing that the humble inhumation graves were respected and ascribed a certain significance and value. They probably constituted a completely different social level to the central grave, but this difference must be explained with chronological displacement and social change rather than differences in a hierarchical societal structure.

Even though there are major social changes and societal new departures at the transition between the LN and the NBA, in the direction of a more hierarchical society with a warrior/trader elite at its centre (Vandkilde, 1996; Kristiansen & Larsson, 2005; Holst *et al*. 2013; Frei *et al*., 2019), the Kalvehavegård site indicates that the two individuals given an elite burial with such great care in the barrow linked their imposing burial monument to the existing burial ground. This choice can be interpreted as clearly marking of a sense of belonging and an affiliation with the place. Most likely, because they were descendants of the same lineage and thereby represented a younger, more-travelled and knowledgeable generation at the burial ground. Another possible interpretation is that the rich barrow burial was placed here because it was important for these individuals to be perceived as members of the local family or population, while being in reality newcomers. Regardless of the explanation for the location of the barrow, the extensive efforts involved in constructing the grave and barrow, as well as, not least, the choice of cremation and the grave's content of an unusual and rich collection of grave goods, clearly underline the foreign elements and emphasize the contrasts between the existing and the new. The elite that arose during the course of only a few generations, against the background of a far-reaching network of exchange and alliances, combined with new knowledge of metalworking and inspiration from new religious ideas, very clearly enters the stage at Kalvehavegård and, with its selection of grave goods and burial customs, marks its connections with, and perhaps even its origins in, a foreign country.

Conclusion

The burial complex at Kalvehavegård extends over a long period of use spanning several centuries, and provides an excellent starting point for a study of the changes in burial practices and social and societal structures at the transition from the Late Neolithic to the Early Bronze Age. There are still several aspects relating to the site that have yet to be illuminated or analysed. These include, to name but a few, investigations of the deceased individuals' possible respective family

relations and origin[11], and stylistic and metallurgical investigations of the grave furnishings in the central grave. Consequently, the Kalvehavegård site may, in the coming years, hopefully contribute significant new information about the social, societal and religious changes that took place around 1600 BC.

References

Aner, E. & Kersten, K. 1976. *Die Funde der älteren Bronzezeit des nordischen Kreises in Dänemark, Schleswig-Holstein und Niedersachsen*, vol. 2. Copenhagen/Neumünster: Holbæk, Sorø und Præstø Amter.

Appel. L. & Pantmann, P. 2013. Udnyttelsen af havets ressourcer i bronzealderen—nordsjællandske gravfund i nyt lys. In: *Dødekulten i yngre bronzealders lokale kulturlandskab. Seminarrapport fra seminariet "Dødekulten i yngre bronzealders lokale kulturlandskab" afholdt i Viborg, 2. marts 2012. Yngre bronzealders kulturlandskab vol. 3, 2013* (pp. 103-116). Boddum, S., Mikkelsen, M. & Terkildsen, N. (eds.). Viborg Museum & Holstebro Museum.

Bech, J. H. & Rasmussen, M. 2018. Thy and the outside world in the Bronze Age. Regional variations in a North Sea perspective. In: *Bronze Age settlement and land-use in Thy, northwest Denmark*, vol. I (pp. 25-90). Bech, J.-H., Eriksen, B. V. & Kristiansen, K. (eds.). Aarhus: Museum Thy/Jutland Archaeological Society.

Beck, M. R. 2018a. Bronzealderens firstmovers—gravhøjen ved Kalvehavegård. *Cartha* 2017/18: 27–41.

Beck, M. R. 2018b. Bronzealderhøjen ved Kalvehavegård—hvordan et detektorfund kan føre mere med sig. *Fund og Fortid, Arkæologi for Alle* 2018 (1): 4–9.

Beck, M. R. & Frederiksen, P. D. 2018. Når havet æder af nationalarven. *SKALK* 2018 (1): 3–10.

Bergerbrant, S. 2014. Children in the Bronze Age: Three case studies. In: *Med hjärta och hjärna: En vänbok till professor Elisabeth Arwill-Nordbladh.* GOTARC Series A, Gothenburg Archaeological Studies, vol. 5 (pp 523-536). Alexandersson, H., Andreeff, A. & Bünz, A. (eds.). Gothenburg: Gothenburg University.

Bergerbrant, S., Kristiansen, K. Allentoft, M. E., Frei, K., Price, T. D., Sjögren, K-G., Tornberg, A. 2017. Identifying commoners in the Early Bronze Age: burials outside barrows. In: *New perspectives on the Bronze Age. Proceedings of the 13th Nordic Bronze Age Symposium held in Gothenburg 9th to 13th June 2015* (pp. 37–64). Bergerbrant, S. & Wessman, A. (eds.). Oxford: Archaeopress.

Berntsson, A. 2005. *Två män i en båt—om människans relation til havet i bronsåldern*. Lund: University of Lund, Institute of Archaeology, Report Series 93.

Bican, J. F. 2012. Bulkister og bådgrav ved Bulbrogård—en senneolitisk gravplads ved vestbredden af Tissø. *Aarbøger for nordisk Oldkyndighed og Historie* 2010: 7–42.

[11] Strontium (Sr) isotope analyses are currently being carried out by research professor Dr Karin M. Frei, Environmental Archaeology and Materials Science, National Museum of Denmark, while DNA analyses are being undertaken at the GeoGenetics Centre, University of Copenhagen, by laboratory manager Jesper Stenderup and associate professor Morten Allentoft. Chemical analyses of a series of trace elements were undertaken by associate professor Dr Jesper Boldsen, Unit of Anthropology at the Department of Forensic Medicine, University of Southern Denmark.

The report is available at: https://www.kulturarv.dk/publicffdata/documentation/file/doc/201236/public

Bunnefeld, J.-H. 2016. *Älterbronzezeitliche Vollgriffschwerter in Dänemark und Schleswig-Holstein. Studien zu Form, Verzierung, Technik und Funktion. Studien zur nordeuropäischen Bronzezeit*, vol 3. Karl-Heinz Willroth. Seminar für Ur- und Frühgeschichte der Georg-August-Universität Göttingen. Teil I: Text und Katalog. Teil II: Listen, Karten und Tafeln.

Bunnefeld, J.-H. 2018. The chief and his sword? Some thoughts on the swordbearer's rank in the early Nordic Bronze Age. In: *Warfare in Bronze Age Society* (pp. 198–212). Horn, C. & Kristiansen, K. (eds.). Cambridge: Cambridge University Press.

Carlie, A. 2004. *Forntida byggnads kult. Tradition och regionalitet i södra Skandinavien.* Riksantikvarieämbetet. Arkeologiska undersökningar. Skrifter 57. Stockholm.

Ebbesen, K. 1995. Spätneolitische Schmuckmode. *Acta Archaeologica* 66: 219–279.

Ebbesen, K. 2005. En gravplads fra ældre bronzealder ved Sebber Skole. Gravfund med flintdolke af type VI. *Aarbøger for nordisk Oldkyndighed og Historie* 2002: 7–38.

Fabian, O. 2009. Noch einmal zu den Klappschemeln der älteren nordischen Bronzezeit. In: *Analele Banatului, SN., Acheologie-Istorie* 17: 109–128.

Feveile, C. & Bennike, P. 2002. Lustrupholm. Et brandgravfelt fra ældre bronzealder under flad mark. *KUML 2002. Årbog for Jysk Arkæologisk Selskab*: 109–139.

Frei, K. M., Bergerbrant, S, Sjögren, K.-G., Jørkov, M. L., Lynnerup, N., Harvig, L., Allentoft, M. E., Sikora, M., Price, T. D., Frei, R., Kristiansen, K. 2019. *Mapping human mobility during the third and second millennia BC in present-day Denmark.* PLoS ONE 14 (8): e0219850. https://doi.org/10.1371/journal.pone.0219850

Goldhahn, J. 2012. On war and memory and the memory of war—the Middle Bronze Age burial from Hvidegården on Zealand in Denmark revisited. In: *N-TAG TEN. Proceedings of the 10th Nordic TAG conference at Stiklestad, Norway 2009* (pp. 237–250). Berge, R., Jasinski, M. E. & Sognnes, K. (eds.). BAR International Series 2399. Oxford: Archaeopress. Haack Olsen, A.-L. 1990. Egshvile—A Bronze Age barrow with early urn graves from Thy. *Journal of Danish Archaeology* 9: 133–152.

Holst, M. & Rasmussen, M. 2015. *Skelhøj and the Bronze Age barrows of southern Scandinavia. Vol. 2. Barrow building and barrow assemblies.* Jutland Archaeological Society Publications 89.

Holst, M. K., Rasmussen, M., Kristiansen, K. & Bech, J. H. 2013. Bronze Age "Herostrats": ritual, political, and domestic economies in Early Bronze Age Denmark. *Proceedings of the Prehistoric Society* 79: 1–32.

Holst, M. K., Rasmussen, M. & Breuning-Madsen, H. 2015. Intended preservation? In: *Skelhøj and the Bronze Age barrows of southern Scandinavia. Vol. 2. Barrow building and barrow assemblies* (pp. 293-306). Holst, M. K. & Rasmussen, M. (eds.). Jutland Archaeological Society Publications 89.

Ille, P. 1991. *Totenbrauchtum in der älteren Bronzezeit auf der dänischen Inseln*. Internationale Archäologie 2. Dobiat, C., Fless, F. & Stauch, E. (eds.). Rahden: Verlag Marie Leidorf. Johannsen, J. W. 2016. Heavy metal: lead in Bronze Age Scandinavia. *Fornvännen* 111 (3): 153–161.

Jørgensen, L. & Petersen, P. V. 1998. *Guld, Magt og Tro. Danske skattefund fra oldtid og middelalder*. Copenhagen: National Museum of Denmark.

Kaul, F. 1998. *Ships on bronzes: a study in Bronze Age religion and iconography*. PNM Studies in Archaeology and History 3. Copenhagen: National Museum of Denmark.

Kaul, F. 2004. *Bronzealderens religion: Studier af den nordiske bronzealders ikonografi*. Copenhagen: Det Kongelige Nordiske Oldskriftselskab.

Kristiansen, K. 2018. The rise and fall of Bronze Age societies in Thy, northwest Jutland. In: *Bronze Age settlement and land-use in Thy, northwest Denmark*, vol. I (pp. 107-132). Bech, J.-H., Eriksen, B. V. & Kristiansen, K. (eds.). Aarhus: Museum Thy/Jutland Archaeological Society.

Kristiansen, K. & Larsson, T. B. 2005. *The rise of Bronze Age society: travels, transmissions and transformations.* Cambridge & New York: Cambridge University Press.

Kveiborg, J., Ahlqvist, L. & Vandkilde, H. 2020. Horses, fish and humans. Interspecies relationships in the Nordic Bronze Age. *Current Swedish Archaeology* 28: 75–98.

Ling, J. & Stos-Gale, Z. 2015. Representations of oxhide ingots in Scandinavian rock art: the sketchbook of a Bronze Age traveller? *Antiquity* 89: 191–209.

Müller, S. 1909. Bronzealderens Begyndelse og ældre Udvikling i Danmark. *Aarbøger for Nordisk Oldkyndighed og Historie.* Copenhagen: Det Kongelige Nordiske Oldskriftselskab.

Rasmussen, M. 1993. *Bopladskeramik i Ældre Bronzealder*. Jysk Arkæologisk Selskabs Skrifter 29. Aarhus: Jutland Archaeological Society.

Runge, M. 2010. *Kildehuse II. Gravpladser fra yngre bronzealder og vikingetid i Odense Sydøst.* Fynske Studier 23. Odense: Odense Bys Museer.

Sprockhoff, E. 1931. *Die Germanischen Griffzungenschwerter*. Berlin & Leipzig: Verlag von Walter de Gruyter & Co.

Thrane, H. 1991. Danish plough-marks from the Neolithic and Bronze Age. *Journal of Danish Archaeology* 8: 79–90.

Vandkilde, H. 1996. *From stone to bronze. The metalwork of the Late Neolithic and Earliest Bronze Age in Denmark.* Aarhus: Jutland Archaeological Society.

Vandkilde, H. 2017. *The metal hoard form Pile in Scania, Sweden. Place, things, time, metals, and worlds around 2000 BCE*. The Swedish History Museum, Studies 29 & Aarhus University Press.

Weise, S. 2018. *Anthropological report. ØFM 855, Kalvehavegård.*
https://www.kulturarv.dk/publicffdata/documentation/file/doc/201236/public

Werner, W. M. 1987. Klappschemel der Bronzezeit. *Germania* 65: 29–65.

In the company of men: Potential alternative masculinities in the Nordic Bronze Age.

Re-interpreting a same-sex double grave from Karlstrup, Denmark

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Abstract

Diverse non-binary gender categories have been identified in numerous cultural contexts around the world.[12] Here, we offer the possibility that the hierarchical warrior class—the so-called "warrior elite"—of Early Bronze Age society in southern Scandinavia may have embodied, in some cases, a distinctive and as-yet unrecognized gender category of its own. We evaluate possible evidence that, in part, the professional warrior class of the Nordic Bronze Age may have accommodated intensely intimate, possibly homoerotic same-sex relationships between men. We posit that *if* such a warrior-gender existed, Bronze Age societies would have recognized these relationships as one possible and socially acceptable facet of masculine identities. For example, such institutionalized relations among men in fraternal contexts may have been an understood and putative feature of the warrior identity and its ideology. We examine a double grave (Grave Q) from Karlstrup, Denmark that may suggest that such an intimate connection between two men could have been recognized within a rare mortuary tradition, i.e., an integrated double male grave. To explore this hypothesis, we contrast two types of Nordic Bronze Age (NBA) double burials. We offer an interpretation of the differences from a queer/gender studies perspective, taking into account numerous examples from Classical literature and ethnology, to shed light on the conceivable vicissitudes of warrior-related identities and their expression(s) in late prehistory in Northern Europe.

Keywords: Early Nordic Bronze Age, double graves, warrior identities, gender, sexuality.

As social constructs of "unstable categories", gender identities vary greatly around the world and presumably have done so since their ontogenesis (Ortner & Whitehead, 1981, e.g., Cucchiari, 1981; Gilchrist, 1999, p. 54;). Contemporary archaeology is increasingly recognizing the pervasiveness of non-dichotomous gender and sex categories throughout human history (e.g., Gilchrist, 1999; Sweely, 1999; and works therein; Gellar, 2019;). While gender has long been a hot topic in Scandinavian Bronze Age circles (e.g., Sørensen, 1992), non-dichotomous gender categories have yet to be more widely considered as potential facets of Bronze Age society (however, see e.g., Frieman *et al*., 2019). Vocation-associated gender categories and their non-binary flexibility are known

[12] For example, the "two-spirit" concept as recognized in many North American indigenous societies (Williams, 1986, 1992; Roscoe, 1987; Jacobs *et al*., 1997; Medicine, 2002; Nanda, 2014) provides an excellent example of a widespread non-dichotomous gender category.

from the ethnographic record from many parts of the world (see below). In these instances, individuals are socially recognized as being somewhat more versatile or fluid in their gender identification and sexual proclivities than is assumed for the general population. Often, this is because of their particular role within society (i.e., vocation). Such individuals may represent alternative gender categories. Examples can be found throughout traditional societies, e.g., among high-latitude shamanic practitioners in Far East Siberia (Bogoras, 1904–1909, pp. 448, 455; Jochelson, 1904–1907, p. 52, 1926, p. 194; Schmidt, 2000) and elsewhere (e.g., Solli, 1999; Bacagalupo, 2004; Ho, 2009), or in the varied so-called 'two-spirit' traditions of Indigenous North America (e.g., Whitehead, 1981; Callender & Kochems, 1983; Hollimon, 2000; Prine, 2000;) and many other places around the world (see Nanda [2014] for a global cross-cultural perspective).

Alterity of sexuality as represented in the archaeological record has been a subject of inquiry only relatively recently. In an early and insightful foray into the subject of historical homoeroticism from an anthropological perspective, Jan Bremmer (1980, p. 279) outlined the apparent circumstances of the phenomenon of institutionalized same-sex sexual practice (i.e., in the form of *paederastaia*) among the warrior class of the ancient Greeks, noting that such proclivities were "seen as a consequence of the militaristic way of Greek life." To the Greeks, intimate same-sex male relationships were a splendid expression of masculinity and formed a key feature of male sexual identities, particularly important among fraternal warrior institutions. If this line of reasoning is followed, parallels can be drawn to the lifestyles theorized for warriors in the Nordic Bronze Age (NBA) in southern Scandinavia (e.g., Kristiansen, 1984, 1999a, 1999b, 2002; Sherratt, 1987; Treherne, 1995; Kristiansen & Larsson, 2005; Vandkilde, 2012; Skogstrand, 2016; Frieman *et al*., 2017; Horn & Kristiansen, 2018; Felding et al., 2020). Possible homoerotic proclivities, specifically practised by members of the elite warrior class, may be considered as representing a unique gender category associated with that profession (i.e., warfare), not unlike those realized for example among more contemporary militant seafaring societies (cf. Burg, 1995; Cheng, 2017). To date, for the Nordic Bronze Age, male interrelationships have been presented as unambiguously heteronormative. Our aim is therefore to expand the theoretical norm to include a broader array of potential expressions of masculinity beyond homosocial relations, including the vicissitudes of fraternal relationships (e.g., Treherne, 1995; Vandkilde 2012), inclusive of the possibilities for same-sex desire and loyalty, and including conjugal relationships and complex sexual identities in the past.

Here, we investigate the possibility of alternative performed sexualities or masculine genders among the ENBA warrior class. Earle *et al*. (2015, p. 646) propose that the warrior lifestyle was highly mobile, with individuals likely spending a significant amount of time on regular trading and raiding campaigns, often presumably in the exclusive company of other men (see also Kristiansen & Suchowska-Ducke, 2015). Recent isotope investigations conducted on the human remains from male individuals from the Bronze Age battlefield site of Tollense in northern Germany seem to confirm this view (Price *et al*., 2019), as do studies of individuals interpreted as warrior burials from the Nordic Bronze Age (Felding *et al*., 2020, Kristiansen *et al*., 2020). We know that some Bronze Age women also travelled long distances during their lives, in some cases repeatedly (Frei *et al*., 2015, 2017; Knipper *et al*., 2017; Cavazutti, 2019; Frieman *et al*., 2019). Bronze Age individuals' mobility has become increasingly recognized (Kaul, 2013, 2018); the warrior class would have been one of the more mobile strata of NBA societies. Mobility during life on campaign (whether raiding, trading or through mercenary travels) was likely taken for granted by these warriors,

as suggested by the widespread imagery of ships and ship travel in Nordic Bronze Age iconography (Kristiansen, 1999a; Kaul, 1998; Earle *et al*., 2015).

Following the current paradigm, many archaeologists assume that, as NBA society became increasingly stratified, political and economic alliances between elites would have constrained and shaped inheritance and marriage patterns (e.g., Kristiansen & Larsson 2005, pp. 28, 237). Junior male siblings (*sensu* Ortner, 1981) may have for example opted for a mobile warrior lifestyle in order to secure their own wealth and/or to establish their own place within society. Extensive travel in the company of an all- (or primarily) male hierarchical martial fraternity or sodality would have engendered warrior lifestyles in dynamic and distinctive ways, and catalysed what Treherne (1995, p. 106) described as "a new understanding of personhood—specifically male self-identity." As Sherratt (e.g., 1994) outlines, and as Treherne (1995), Ling *et al*. (2018), and Vandkilde (1996, 2006a, 2007, 2012), among others have explored, the warrior ideology was expressed in shared lifestyle traits, such as "consumption patterns, common conventions, specific beliefs, and particular economic and ideal monopolies… involving heavy male symbolism and a generalized male ethos" (Treherne, 1995, p. 108). It also likely involved a conception of masculinity and sexuality specifically associated with members of elite male society (Horn, 2013), particularly among the mobile sodalities of the fighting class (see e.g., Burg, 1995; Cheng, 2017). Living by the sword, young men drawn to this lifestyle may have espoused a 'live-fast-die-young' warrior ideology (van Wees, 1992; Connell, 1995), based on individual valour and martial prowess, that would have demarcated them significantly from the rest of society,[13] as would the customs of a lifestyle lived largely in the company of men. Evidence suggests that these sodalities of young men may have travelled widely in such pursuits (e.g., Ling *et al*., 2018; Price *et al*., 2019).

Most recently, at Dermsdorf, Thüringen, Germany, close to the "princely burial" at Leubingen, ca. 2000 BC, a notable Early Bronze Age long house has been excavated. It measured 44 m long and 11 m wide. At the entrance to the house was found a deposition of 98 bronze (battle) axes and two halberds. It has been suggested that this particular house, close to the burial mound of an Early Bronze Age prince, was the barracks of the nobleman's 'lifeguard' or elite military troop (Meller, 2018, pp. 271–272, 2019, pp. 62–64). The house may have served as a men's house of some sort (i.e., a *Männerhaus)*, for upwards of 100 warriors, suggesting that fraternal institutions were already established early on in the period.

As Dover 1989 (1978), p. 201) observes of ancient Greece, "the warrior-community provided one favourable condition for the evolution" of institutional homoerotic behaviours among the male warrior class. As a result of either or both of the above prospects, intimate male relationships may have evolved as a recognized tradition associated with masculine identities, particularly those tied to the male fraternal society hypothesized to have been ubiquitous in the NBA. It is our intent to explore whether such intimate relationships between men could be one possible explanation for the presence of some variants of same-sex double burials during this period. We feel this approach has the potential to reveal complex and underrepresented social dynamics of warriorhood in relation to gender and identity in late prehistory (e.g., Vandkilde,

[13] A growing literature exists on PTSD, moral injury and other effects of combat experience on those exposed to warfare and organized violence. The shared experiences of combat are known to promote cohort bonding among military personnel while at the same time serving to alienate those same individuals from their natal communities and those outside martial society (e.g., Galovski & Lyons, 2004; Corvalan & Klein, 2011; Zerach *et al*., 2013; see also Crouthamel, 2008 for World War I soldiers' experiences as a case study directly addressing combat trauma, PTSD, and cohort bonding).

2007, p. 80, 2012; see also various chapters in Otto *et al*., 2006). We explore possible alternative expressions of gender and sexuality in the contexts of warrior identities beyond the presumed heteronormative and binary gender dichotomies normally attributed to the male warrior class in the NBA by reinterpreting the double-male burial from Karlstrup, (Zealand, Denmark). Ultimately, we offer an alternative perspective from which to examine existing archaeological evidence from a gender studies/queer theory approach (*sensu* Conkey & Spector, 1984; Voss, 2000; Cobbs, 2005; Blackmore, 2011).

Background

Double burials are rare in the NBA. They comprise male-female, male-male, and possibly female-female[14] burials (Sperber, 1999). In Denmark, it is rare that skeletal remains from double burials are sufficiently well-preserved to enable the determination of the biological sex of both deceased individuals. Consequently, grave goods are often used as a proxy for probable biological sex determination, which is presumed to indicate the deceased individual's socially constructed gender. In cases where no grave goods remain, it is often impossible to determine sex (Geller, 2017); and, in cases where grave goods are preserved without any identifiable human remains, any sex or gender interpretation remains a speculative exercise. P. V. Glob (1945, p. 181) suggests that the existence of male-female double graves intimated at least some gender equality between men and women, since women's graves were often afforded comparable positioning and outfitting within burial mounds (tumuli), and were the primary graves in some mounds (e.g., Frei *et al*., 2017). Furthermore, he posited that monogamy may have been recognized, since it is assumed that the individuals buried with each other were socially recognized as life partners. Glob (1967, p. 81) also suggests that the presence of double graves comprising two males within the barrows of the Late Neolithic Single Grave Culture (Danish *'enkeltgravskultur*') are indicative of a 'blood-brother' relationship (see also Vanggaard, 1972, p. 119). While double graves have been described elsewhere (e.g., Bergmann, 1962) as a sub-set of mortuary practice during the NBA, they have rarely been the subject of extensive analytical scrutiny. Nonetheless, wherever they occur, such graves are ubiquitously interpreted as denoting close personal relationships between paired individuals.

The case study site

The double grave Q (NM report No. XVI) from burial mound SB no. 4 at Karlstrup (Randsborg, 1968; Aner & Kersten, 1973 p. 181 (Ke518); København Amt, Tune Herred, Karlstrup Sogn) lies about 30 km south-west of Copenhagen alongside Køge Bay, and is a prime example through which to examine the potential for varied interpretations of prehistoric same-sex double graves. Here, two individuals (both tall males) were buried together in a single, large oak coffin.

In the following, we compare and contrast this grave with a selection of other double graves from the same period and region to explore the hypothetical implications of this grave's significance to our understanding of potential gender identities experienced and enacted by

[14] In our literature review we could find no concrete evidence for double graves containing paired adult females from the ENBA or immediately adjacent time periods. However, the Bronze Age literature is vast, and we acknowledge that we could have missed something. Later examples do exist, such as the "Queen's" ship burial at Oseberg, Norway (ca. early 9th century AD), in which two women were inhumed side by side. Thus, we suggest that this possibility remains open for the region at earlier periods but has not yet been certainly observed. For example, the Bronze Age double grave from Uglerup Huse could as conceivably contain two women as any other combination. Additionally, women's inhumation burials sometimes contain the remains of children (e.g., Haseloff, 1938, pp. 61–62), as at Egtved, but this appears to be a different phenomenon from the type of double graves described here.

male warriors during the NBA, as well as the recognition of those identities in NBA society.

The men in Grave Q

Both individuals in this double grave were osteologically sexed as males (Bennike, 1985) and both were accompanied by masculine-associated grave goods. Of the two, individual A is equipped with more and higher-value grave goods, and the inclusion of fishing paraphernalia may link some aspect of this individual's identity to a maritime lifestyle. Individual A's interment fits the profile of a high-status warrior in late Period II, comprising a highly fashionable toilet set (Childe, 1930, p. 101; see discussion in Treherne, 1995) that included a horse-headed razor and decorated tweezers, as well as a sword, knife, and flint strike-a-light, pairs of buttons and fibulae, and a larger double button inlaid with amber. He was also accompanied by a fragment of thick, spiral-decorated gold sheeting. Other, idiosyncratic items, believed to have been the contents of a belt pouch, included two fishhooks with twine, and some small wooden sticks of unknown significance (Randsborg, 1968, p. 4).

Individual B had a similar toilet set, presumably held in a pouch at his waist. This included a stylized horse-headed razor, as well as a flint strike-a-light and a lump of pyrite. Pieces of a bronze awl and a possible knife blade were accompanied by fragments of bronze of indeterminable nature (Randsborg, 1968). In addition to these preserved items, an assortment of small fragments of leather and wood were also found in the same location.

The human remains revealed that both men were relatively robust. Both appear to have been healthy, and they stood between 1.85–1.90 and 1.75–1.80 m tall, respectively, placing both men well within the upper ranges of adult male height for the period, and potentially strikingly so (Bennike, 1985, p. 51). A recent aDNA analysis confirmed individual B to be that of a male, with a mtDNA haplogroup N1a1a1a2 (Allentoft *et al*., 2015). Individual A is estimated to have been between 25–40 years old at the time of his death, while individual B was 20–25 years old (Frei *et al*., 2019). This last study also conducted strontium isotope (Sr) analyses of tooth enamel of both individuals which indicate that both men were non-local to the area in which they were buried (Frei *et al*., 2019). Furthermore, these two individuals present the highest Sr isotope values within Frei *et al*.'s (2019) entire dataset, which includes a total of 88 individuals dating to the 3rd and 2nd millennia BC (individual A, RISE 20, $^{87}Sr/^{86}Sr = 0.7178$, and individual B, RISE 21, $^{87}Sr/^{86}Sr = 0.7165$).

The two men were buried together with their heads at opposite ends of a 4.5-m-long coffin hewn from the trunk of an oak tree. From the position of their overlapping legs, individual B was likely placed in the coffin first. He was laid to rest with his left arm bent at the elbow so that his hand rested on his chest. His right arm was positioned parallel to the body. Individual A was set in the coffin with both arms at his sides, his left arm resting lengthwise on the leather scabbard of his wood-hilted sword. His left leg appears to have lain over the right shin/foot of his companion.

This placement suggests that an exceptionally close affiliation existed between these two men. Whatever the nature of that relationship, it was likely to have defined the identities of both men in some way. Importantly, is that such a link—reflected in the combined burial—suggests that their relationship (whatever that might have been) was both socially recognized *and* acceptable within the community. Since both men were adults, possible familial relationships (such as the one suggested by P. V. Glob of 'blood-brother') include father and adult son, uncle and adult nephew, grandfather and adult grandson, brothers, or cousins, etc. Possible non-genealogical fraternal relationships include friends or companions of relatively equal status within a sodality, such as brothers-in-

arms or a warrior and retainer. Other possibilities include one individual being the other's subordinate (presumably B to A), potentially also to the extent of having been a slave and/or an attendant human sacrifice. Given the burial contexts, the latter seems unlikely; at other contemporary sites, inhumations interpreted as attendant sacrifices are not afforded grave goods and were generally treated quite differently from the primary individual with whom they were interred (e.g., Maringer, 1942, p. 10). An alternate scenario is that they could each have fallen victim to the other in some form of duel or blood-feud for which custom dictated connection in the afterlife.

The fact that only individual A was buried with a sword, yet both were buried with typical 'male' grooming kits, is important. It implies that, of the two, only individual A may have been explicitly a member of the warrior class, however individual B was also clearly perceived to be a member of the male elite by those who buried him. This suggests that individual B could also have been a non-combatant member of the warrior-aristocracy, or was at least of high status in civilian society (*sensu* Treherne, 1995, p. 109). Another possibility is that these men were intimate companions of a homoerotic nature (e.g., Greek '*erastēs*' or lovers), who were recognized as such in the eyes of the community that arranged for their funeral. In the following, we attempt to unpack some of these possibilities and provide insights into this possibility from Classical and ethnographic sources.

Exploring the possibilities

To properly comprehend the possibilities relative to the pair in Karlstrup Q, we must attempt to understand a number features of the burial. First, we note that the bodies were buried together at or nearly the same time. Thus, we may presume that individuals A and B likely met their ends at (or very near to) the same time *or* that the first to die was enshrined in a death-house until the passing of his compatriot (e.g., Kersten, 1936). Second, the differences in positioning of the two individuals were intentional and may have symbolically differentiated and identified the men relative to each other. Third, the deceased individuals were placed in the coffin in direct physical contact with one another: the leg of individual A was placed so as to overlap that of individual B. Fourth, individual A appears to have been wealthier than individual B, and was buried with typical 'men's' gear. Having been buried with a sword, he was presumably a member of the warrior-elite. Fifth, individual B was also buried with standard 'men's' kit, but without a weapon. Finally, these men seemed to have been intimately connected in both life and in death.

The five familial contexts given in Table 1 are straightforward. Each possibility is feasible as is the possibility of non-consanguine fosterage (Fowler, 2005, pp. 114–121) in consideration of the evidence at hand. It is also possible that the individuals may even have been strangers. We may turn to Homer's *Odyssey* for numerous examples in which the rules of guest-friendship (i.e., *xenia*/ξενία) affected the relationships of persons who were not personally acquainted. *Xenia* was a concept of hospitality and friendship between individuals of non-related groups and was distinctly separate from notions of relations between members of an individual's own society, kinship group, or family (Herman, 2002; Kaul, 2017b, 2018). There are also many cautions illustrating the pitfalls of breaking such rules (Herman, 2002; Frank, 2011). Indeed, hospitable treatment of strangers and friends alike was likely an essential and widespread feature of European Bronze Age society as a whole (Varberg *et al*., 2019, p. 19). Such rules of social engagement were a necessary facet of maintaining integral alliances and trade networks to the extent that they were realized

Table 1. Possible relational contexts of same-sex (male) individuals in double graves of the NBA.

	Individual A	**Individual B**	**Relationship**
1	Father	Son (or vice versa)	Consanguineous kin
2	Uncle	Nephew (or vice versa)	Consanguineous/Affinal kin
3	Grandfather	Grandson (or vice versa)	Consanguineous kin
4	Brother	Brother	Consanguineous kin
5	Cousin	Cousin	Consanguineous/Affinal kin
6	Local	Non-local	*Xenia* (guest-friendship)
7	Local or Non-local	Non-local or Local	Ambiguous
8	Warrior	Companion; *hetairos*	Fraternal (friendship/blood brothers); Fictive kin
9	Warrior	*Erastēs/eromenôs*	Fraternal (intimate/sexual); Fictive kin
10	Warrior	Enemy	Fraternal (combatant)
11	Warrior	Retainer; *therpôn*	Fraternal (hierarchical)
12	Warrior	Subordinate (bondsman, etc.)	Bondage (Hegel's '*Knechtschaft*')
13	Warrior	Victim	Human sacrifice

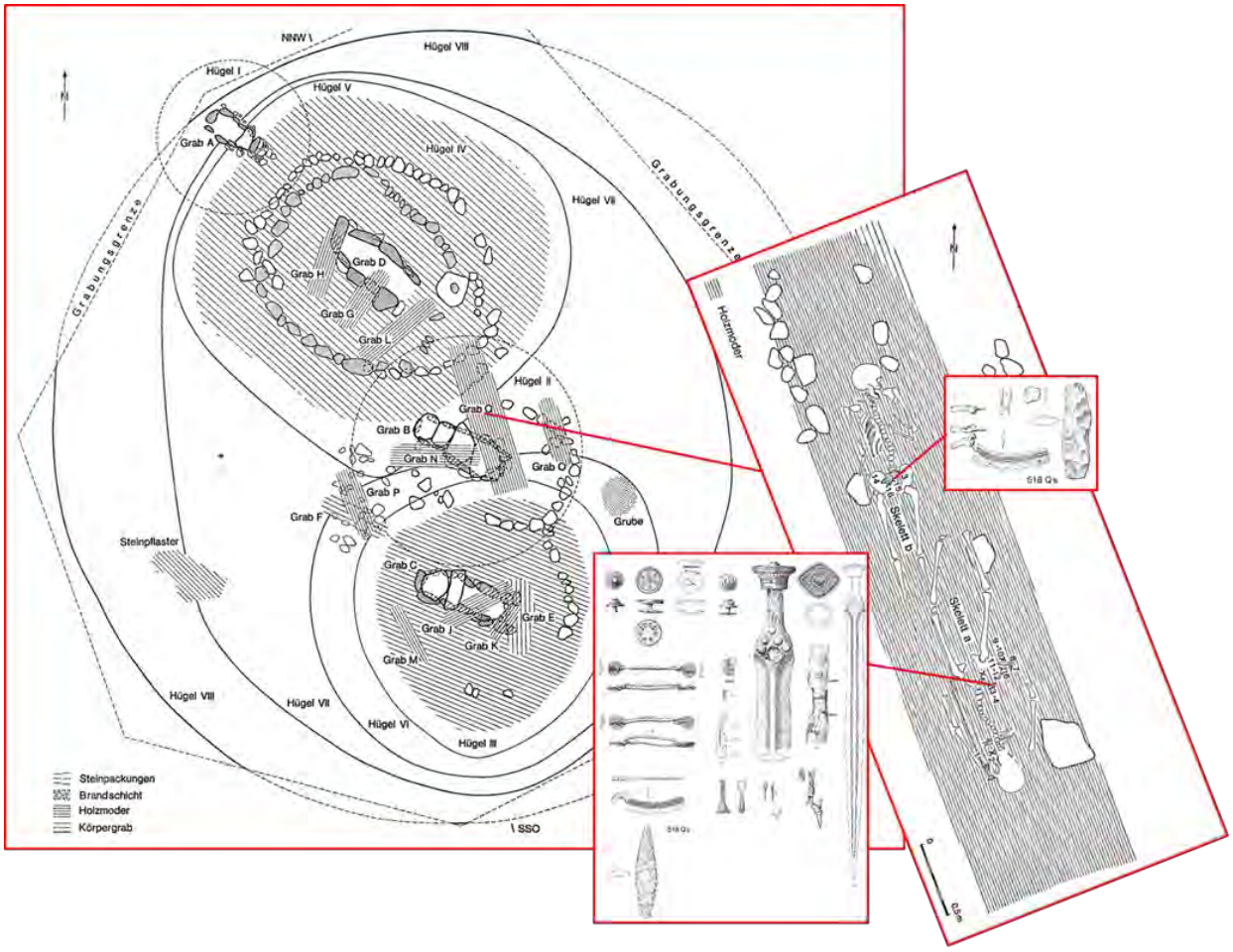

Figure 1. Double-burial Grave Q at Karlstrup, oriented north/south, with associated grave goods shown in relation to the overall layout of burial mound SB no. 4. After Aner & Kersten (1973, p. 186).

during the period (Kaul, 2017a, 2017b, 2018; Kristiansen & Larsson, 2005, p. 238). In point of fact, we may consider the possibility that these individuals may have been enemies. The story of Diomedes and Glaucus in the *Iliad* offers an anecdote in which warriors who were confronted on the battlefield recognize a shared connection based on the guest-friendship agreements of their ancestors. Upon this realization, they forego fighting each other, even entering into an unequal exchange of armour so that their ritualized alliance can be recognized by their peers (Harries, 1993; Homer, 1990, p. 199). Bonds between enemy combatants are reflected in numerous early martial traditions as common variants of rules governing the proper conduct of warriors. For example, the 7th-century AD Irish epic *Táin bó Cúailnge* (Faraday, 1904; Kinsella, 1970) details the concept of *geisi* or *geasa*—individual taboos which strictly dictated a warrior's observation of and abstinence from certain behaviours under threat of sickness, death and calamity. It is conceivable that parallel ritualized rules of engagement—potentially highly complex, individualized and historically dependent—may have dictated the commingled burial of non-biologically related men in the NBA.

The 'combatants' relationship seems improbable at first glance. This assumes a hypothetical cultural tradition with no known historic or ethnographic parallels for complex hierarchical warrior societies: that enemy combatants would be buried together should they somehow succeed in killing each other. However, many Classical sources do reiterate the importance of a proper burial for members of the warrior class. After all, when one's business is death, it is important to meet it in appropriate style. This points to the possibility of a broad honour arrangement between warriors (e.g., *nemo resideo*) that would see their remains disposed of properly should they die abroad. Such understandings are implied by Homer's disdainful description of Achilles' disrespectful treatment of Hector's corpse (Homer, 1990, p. 554). This can be contrasted with Sophocles' *Antigone*, wherein the titular character nobly attempts to bury Polyneices (decreed an outcast and enemy of the people) against the wishes of Creon (Sophocles, 2005). The burial of potential 'enemies' at Karlstrup nonetheless seems unlikely due to the great efforts expanded in the funeral arrangement (e.g., the sizeable oak coffin and interment in the mound).

The solidarity between blood-brothers is equally problematic. Specifically, we suspect that a fraternal blood-brother would have been afforded an indication of his militaristic status, i.e., weaponry, either real or symbolic. However, we must also remember the presence of a tradition of inherited weaponry (Kristiansen, 2002; Vandkilde, 2012, p. 45;) in which heirloom weapons may have been recycled over generations. For example, perhaps only warriors who died without an heir were buried with their weaponry, or at least with their complete set of personal gear. Alternately, a deceased warrior's weaponry may have been purposely destroyed as a ritual offering of one sort or another, removing it from both grave and circulation (*sensu* Melheim & Horn, 2014). It is also possible that individual B was been buried with a weapon of perishable nature such as a club, a weapon of prestige in its own right (e.g., Speidel, 2004, p. 87).

The lack of a (preserved) weapon for individual B may be indicative of another phenomenon: that of a special non-combatant status recognized within the BA warrior society. Here the *erastēs-eromenôs* relationship comes back into play. Theocritus describes the relationship between Heracles and Hylas as one such example of a warrior and non-combatant in such a relationship (Dover, 1989 (1978), p. 172). According to Theocritus (*Idyll* XIII), Hylas was both a martial companion (akin to a squire) and lover to Heracles. So great was Heracles' love of

Hylas that when the latter was abducted by nymphs, the son of Zeus and Alcmene rushed off to find him, only to be abandoned by his companions on the Argo. In the final stanzas (ll. 1336–1335) of Apollonius of Rhodes' *Argonautica*, it is suggested that Heracles never stopped looking for his lost lover (Race, 2008, p. 111). Such a relationship may be an explanation for the lack of weaponry and positioning of individual B, who may have been a non-combatant member of the warrior-elite.

In the *Iliad*, upon Patroclus' death, Achilles dreams that his friend's ghost bids him "A last request... Never bury my bones apart from yours, Achilles, let them lie together… So now let a single urn, the gold two-handled urn your noble mother gave you, hold our bones—together!" (Homer, 1990, p. 562). Achilles dutifully complied with his foster brother's request. Indeed, while such a request is imaginable within the familial and companion/blood-brother options, it is also not out of place when considering the *erastēs* or retainer scenarios as well. In point of fact, scholars have long recognized the erotic nature of Achilles' and Patroclus' relationship (e.g., Morales & Mariscal, 2003; Warwick, 2013). While Homer's writing of the *Iliad* post-dates the Early NBA by many centuries[15] and is geographically far-removed, the *Iliad* and other Classical sources illustrate that intimate same-sex male relationships were recognized and realized in mortuary traditions throughout antiquity, especially in elite-warrior class contexts.

While any of the scenarios outlined above are feasible to varying degrees, each remains a question of how we choose to perceive the evidence at hand—what interpretive perspective we take in assessing the data. Thus, we have sought above to offer as many plausible circumstances as possible to explain the contexts of our grave Q. That being said, we believe that the possibility of a same-sex relationship of an intimate nature (*sensu* Nisus and Euryalus in Virgil's *Aeneid*) has not received due consideration.

Comparing double graves

To illustrate this point, we would like to contrast the double grave at Karlstrup with another oft-referenced double grave containing two male warriors from Norby in Südschleswig-Ost, northern Germany (Kristiansen, 1999a; Kristiansen & Larsson, 2005). Both of these double graves were in large burial mounds. In terms of sheer labour and land investment, not to mention the mounds' explicit eschatological, cosmological and memorial value within NBA society, burial in such monuments was a major undertaking and marked a distinction and recognition of the deceased individuals by those constructing the burial mound (e.g., Holst *et al*., 2001; Holst & Rasmussen, 2013, pp. 127–132).

Norby

The double warrior burial at Norby (Figure 2) has previously been used to illustrate the 'chiefly twins' theory in Bronze Age cosmology (e.g., Kristiansen, 1999a; Kristiansen & Larsson, 2005). Each warrior was placed in their own oak coffin; and these were arranged side by side, separated only by a double stone setting. The coffins both rested on the same paving of stones at the base of a mound in which the two interred individuals were the sole occupants. From the position of the grave goods and some cranial remains, both individuals at Norby presumably had their heads to the WSW.

Grave A contained multiple grave goods, including a sword and its gold-plated pommel

[15]The events portrayed in the Homeric literature are believed to date to as early as 1250 B.C., placing the events and their relative cultural contexts nicely adjacent to the Early Nordic Bronze Age, albeit geographically (and probably culturally) far-removed.

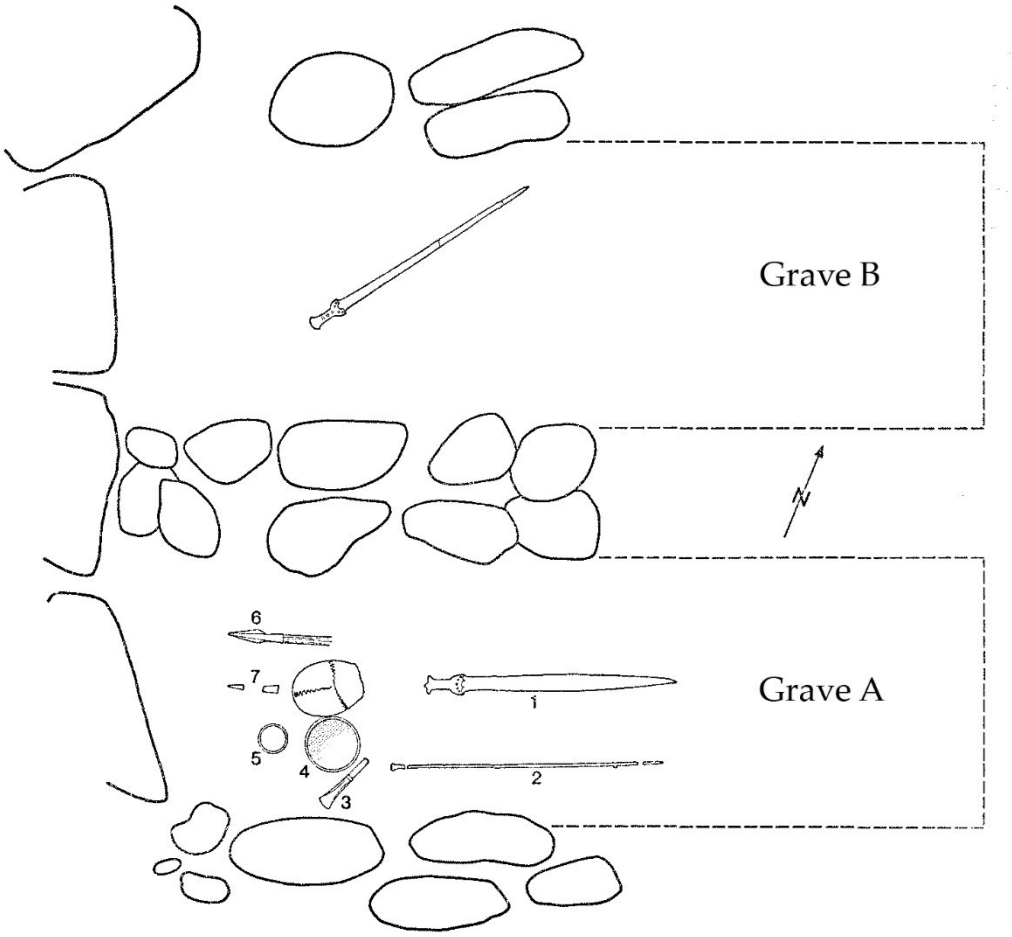

Figure 2. Double-burial Graves A-B at Norby, Südschleswig-Ost, burial mound no. 165, called "Moritzenberg". After Aner & Kersten (1978, p. 205).

as well as remnants of a leather scabbard, two spears, and an axe. In addition, there was a pair of tweezers, a wooden vessel made from aspen wood decorated with tin pins, a chisel-shaped slate pendant decorated with transverse grooves down its length, and a heavily retouched flint strike-a-light. Numerous bronze fragments suggest the presence of multiple tutuli and at least one fibula. Remnants of woollen textile were also evident. Grave A also contained a bronze goad/sceptre measuring ca. 1 m in length. This was decorated with bands of equally spaced transverse lines. Kristiansen and Larsson (2005, p. 276) observe that it is similar to the sceptres of the ruling class known from Minoan Crete, and propose that the individual in Grave A was some form of "ritual chief". Elsewhere, Kaul and Randsborg (2008) and Kaul (2017a, p. 42) suggest that the sceptre/goad from Grave A may be indicative of a prestigious chariot-driving tradition associated with leadership. Whatever the significance, the individual in Grave A can clearly be interpreted as a member of a wealthy warrior elite.

By contrast, the individual in Grave B was 'only' allocated a sword (although a sword was a significant symbol of status and identity in itself). Kristiansen and Larsson (2005, p. 276) suggest that the differences in sword types between the two graves intimates a special affiliation between the roles of the deceased individuals. Grave A had a Nordic solid-hilted sword while that in Grave B was of a widely-distributed continental, i.e., 'foreign' flange-hilted type. They posit that the individual warriors represent "twin rulers" presiding over priestly and martial domains, respectively.

However, flange-hilted swords are widely distributed in southern Scandinavia and beyond (e.g., Clausing, 2005; Rassmann, 2013; Suchowska-Ducke, 2015). Thrane (2006, p. 501) has suggested that, rather than embodying, signalling or otherwise advertising the 'foreign' in warriors' graves, the presence of flange-hilted swords may instead be indicative of supply-chain economics and a simple broad demand for swords at that particular point in time. The flange-hilted sword may consequently not necessarily reflect a certain 'warrior class', lower than the paramount chiefs, as stated by Kristiansen and Larsson (2005, pp. 275–276), as these swords also occur in graves which contain such high-status materials as gold rings or imported bronze vessels, that seemingly mark the wealth or social position of the deceased individuals among the uppermost echelons of society (Bunnefeld, 2014, 2016; Kaul, 2019).

The interment offers few clues as to the social roles of the deceased individuals. Neither was oriented or aligned in a way that indicates a strong cosmological connotation (A was at 340˚ and B at 160˚ from North), nor are the grave goods particularly atypical, including the swords. This suggests that neither individual's identity within society was overtly linked to some form of dual symbolic-leadership role, nor are ceremonial roles likely in, e.g., a sun cult or similar institution that might lead to a conspicuous orientation of the grave. However, this cannot be ruled out. Nevertheless, it is clear that both individuals are associated with a particularly martial masculinity and that their identities were explicitly enmeshed in some intimate way, although their individual graves remained very much delimited.

Discussion: the potential for gender alterity in NBA warrior ideology

The intermingled type of same-sex grave (e.g., Karlstrup) may suggest that intimate male-male relationships were one possible facet of Nordic Bronze Age warrior-elite identities. Also, *if* such relationships were symbolically recognized and enacted through mortuary customs, this double-grave type (in which the bodies of two men were intermingled in a single coffin with direct physical contact) seems a logical potential acknowledgement of an intimate, perhaps even conjugal relationship (cf. Reeder, 2000). Below, we return to Classical sources and ethnology to help illuminate the possible vicissitudes of gender diversities among male warriors in the past. Here, we focus on examples relating to the potential fluidity of masculine sexual identities, particularly, but not exclusively, in relation to martial ideologies.

The Homeric epics make no mention of homoeroticism among men, either explicitly or illusory (Dover, 1989 (1978), p. 194; Downing, 1989, p. 168).[16] Nevertheless, they tell us a great deal about the vagaries of intimate male relationships during the Bronze Age in the Mediterranean, especially regarding navigating the interpersonal social realms of warriorhood (see Vandkilde, 2006b; van Wees, 1992, 1997). Later accounts, for example of *erastēs-eromenôs* practices among the various Greek states particularly in the form of initiatory rites (Brelich, 2013 (1969); Bremmer, 1980), attest to male-male sexual congress as a permissible—or even institutionalized—practice. Similar initiatory rites can be found in many societies around the globe and have been recognized in both male

[16]However, post-Homeric takes on such pairings, e.g., by Aeschines, Aeschylus, Pindar, Plato (Bury, 1909, p. xxv) and others, do frame the relationship between Achilles and Patroclus as both brothers-in-arms *and* lovers; see reviews in Morales & Mariscal (2003) and Warwick (2013).

and female contexts (e.g., Marrou, 1956 (1948), p. 33; Bremmer, 1980, p. 280; Strathern, 1988; Dover, 1989 (1978), pp. 205–206; Downing, 1989, p. 220). While we recognize that initiatory rites and the expression of complex same-sex interpersonal relationships must be understood in their specific social and ethnohistorical contexts, it is important to note that such contexts resulting in homologous expressions of male fraternal—often sexually-charged and expressed—institutions are remarkably common around the world and throughout history (e.g., van Gennep, 1981; Conkey & Spector, 1984).

As proclivities (as opposed to sexual identities), this is especially common within hierarchical male communities such as in armies and religious sects, as well as other institutions that enforce gender segregation, such as modern prisons (e.g., Crouthamel, 2008; see also Connell *et al*., 1993; Connell, 1995, p. 40; and examples in Vanggaard, 1972). Here, we use the term non-heteronormative to represent a variety of behaviours (e.g., same-sex sexual practices or identities related to these). Logically, any of these types of behaviours may have been accepted within a warrior-associated gender category (or sexual identity) as postulated here. In short, many forms of sexual conduct could have been well within the range of acceptable masculinity and male activities throughout prehistory.

A Cretan example laid out by Bremmer (1980, p. 284, based on an account by Ephorus of Cyme, ca. 4th century B.C.), is particularly interesting in relation to male warrior society. He describes a tradition in which a youth was abducted by his own peers and then ritually initiated to traditionally 'manly' pastimes, including observation of fraternal obligations, hunting and the acquisition of trappings associated with the period's warrior elite. The fact that sex between men also took place seems to have been taken for granted. One gets a sense that this part of initiation into warriorhood was a ritual introduction to the potential practicalities of soldierly life on military campaign. Bremmer (1980, p. 281) distinguishes between Greek paederasty and identities related to same-sex attraction, making clear that ancient Greeks understood the same-sex copulation of paederastic *erastēs-eromenôs* initiation rites would end upon the youthful male initiate's marriage. We observe that this assumes a strictly binary and heteronormative gender dichotomy that may or may not have been recognized uniformly in prehistoric contexts.

Intimate and sexual male relationships within martial society and have particularly been connected to life on campaign (Bremmer, 1980; see also e.g., Hirschfeld, 1941; Dover, 1989 (1978), p. 135; Crouthamel, 2008;). Dover (1978 (1989), p. 191) observes that, for the Dorians, the dynamic of the *erastēs-eromenôs* relationship between warriors drove a desire for valour in combat to impress as well as to protect one another. Plutarch's well-known account of the so-called 'Sacred Band of Thebes' explicitly states that their martial success was due to the emotional and sexual bonds between the 150 pairs of male lovers who made up the unit. The Sacred Band of Thebes was an elite fighting unit within the Theban army of the 4th century BC. Each pair of warriors comprised of an elder male and his younger lover. Elsewhere and regularly, male couples were dispersed among the "standard ranks" of the hoplite army structure, in the armies of the Greek city states. However, the leaders of the Theban army shaped this special elite force of men—devoted to each other by mutual obligations of love (Crompton, 2006). The successes of the Sacred Band of Thebes on the battlefield were noted throughout classical literature (e.g., Plutarch, 1917), although ultimately the unit was met with complete annihilation at the hands of the Macedonian army of Philip II at the battle of Chaeroneia in 338 BC. Plutarch (1917, pp. 386–387) writes that

> …after the battle, Philip was surveying the dead, and stopped at the place where the three hundred were lying, all where they had faced the long spears of his phalanx, with their armour, and mingled one with another, he was amazed, and on learning that this was the band of lovers

> and beloved, burst into tears and said: "Perish miserably they who think that these men did or suffered aught disgraceful."

Virgil's account of the deaths of Nisus and Euryalus in the *Aeneid* is also relevant, as those two male lovers exhibit the characteristic bravery and loyalty ascribed to *erastēs-eromenôs* warriors. Additionally, Dover 1989 (1978), p. 193) elucidates the complicated Spartan paradigm of martial-sexual experience, observing that "The young Spartan was not involved, as he grew up, in a simple opposition between sexual love for women and sexual loyalty to the males of his own unit.". Although the sexual and gendered realities of past warrior lifestyles were complex, it remains certain that some common aspects of warriorhood include the bonds of trust, devotion and love Platonic or romantic between soldiers (Manning, 1994).

Clearly, in parts of the ancient world, notions, expressions and acts of same-sex love between warriors were explicit reflections of masculinity, fraternity and valour, and were a valuable aspect of male interrelationships whether merely homosocial or of a sexual nature. The Classical sources suggest that, *if* same-sex relationships were permissible in NBA society, it is probable that such affiliations between warriors would have been recognized perhaps even as a vital aspect of the warrior lifestyle, certainly circumstantially acceptable, and possibly even sanctioned (Ford & Beach, 1951, p. 132; Cucchiari, 1981, p. 75). In relatively contemporary contexts, Hirschfeld dedicated an entire chapter to discussing the proliferation of homoerotic behaviours in the trenches of World War I, suggesting that the circumstances of wartime drew men attracted to other men enthusiastically into the military life of "a long time in an exclusively masculine environment"; and he goes on to observe that commonly "homosexual soldiers were very brave warriors" with many known for the benevolence they displayed to those in their charge (1941, pp. 127, 130).

Ethnologically, initiation rites of a homoerotic nature are well documented within overtly masculine traditions. For example, in various parts of Melanesia (Poole, 1981; Strathern, 1988; Keesing, 1998), as among the Etoro of Papua New Guinea, homosexual acts are thought to strengthen a young man's life-force (*hame*) and strengthen virility (Kelly, 1976, p. 46). It may be worth noting that, in such cases, female bodies and substances were considered depletive and polluted, and cross-sex sexual relations linked to senescence, weakness and death (Strathern, 2001, p. 230). Houston (2009) provides numerous other examples of similar initiatory institutions among the Classic Maya.

If, as we suggest, sexual practices and proclivities in the Bronze Age were fluid and situationally specific, then this prompts us also to return to questions of binary or non-binary genders. While traditional archaeological practices tend to reinforce sex and gender binary categories, both sex and gender are better understood as bimodal rather than binary and this can be recognized in the archaeological record (Frieman *et al*., 2019). A non-heteronormative reading of the NEBA indicates numerous examples of potentially non-binary or fluid gender identities. While clear masculine and feminine grave accoutrements are present (Sørensen, 1997; Felding *et al*., 2020), they are not necessarily universal. Ancient DNA gives us more tools to explore the overlaps between biological sex and social gender, including the identification of intersex individuals. Indeed, non-binary gender categories are known from societies around the world, even where strongly patriarchal binary systems dominate (e.g., Nanda, 2014). We highlight this here simply to acknowledge that sexual expression and gender presentation/identification are frequently linked, with specific sexual practices being tied to particular gender identities and vice versa, but that such

expressions need not be heteronormative in nature, as the Classical and ethnographic sources provided here clearly illustrate.

As a purely cultural construct, social gender is dynamic and culturally relative. It is also, therefore, very complex, especially given attempts to infer levels of gender diversity from an incomplete prehistoric archaeological record. However, as a heuristic for understanding the emergence and evolution of increasingly hierarchical and complex societies (such as those from the Bronze Age), better understanding gender and sexual diversity (or lack thereof) is critical.

We surmise that one aspect of a warrior-related gender identity was the potential recognition of intimate interpersonal male relationships, possibly of a sexual nature. We offer that such relationships may be evidenced in a very specific male-male double-grave burial tradition as exemplified at Karlstrup Q, in which: 1) both individuals are positively identifiable as adult males; 2) similarly, each individual is recognizably 'masculine' in regards to their social gender identity as based on grave goods; 3) each individual has been afforded grave offerings situating them material culture-wise within high-status masculine society (*sensu* Sherratt, 1994; Treherne, 1995); and, 4) that these 'manly' men are buried together in physical contexts which suggest that the living community recognized an exceptional intimacy between the deceased individuals which should be reified in the afterlife. Whether such relationships were strictly limited to campaign life or if they could be maintained in other social contexts remains unknown. That the Karlstrup Q pair were buried together the way that they were suggests that such a hypothetical relationship may have been possible. So, *if* the warrior class of the NBA accommodated aspects of same-sex sexuality, and *if* Grave Q represented a male-male interpersonal relationship as defined within such a category, then a great deal about individual and institutionalized social mobility in late European prehistory is illuminated.

Conclusion

At first glance, our approach here for taking a queer perspective on male martial identities risks reducing highly complex sexualities, practices, identities and attractions to a delimited sphere of military men, which also implicitly excludes them (and those behaviours) from the rest of society. However, our purpose is to suggest but one alternative interpretation of how dynamic life histories and lifestyles may have been realized and expressed in the past, here using an example of a single sub-category of ancient society (high status and martially inclined males). Further, we do not seek to box same-sex practices into a solely military sphere with specific roles or categories of personhood defined solely by sexual orientation or proclivities, gender identities, status or vocation. Indeed, we recognize that non-binary individual, social and sexual identities no doubt abounded in the past as today, whether they were overtly or covertly expressed, and whether or not those expressions survive in the archaeological record. Our purpose has been to illustrate that if, as we hypothesize, martial status carried with it some element and acceptance of same-sex practices, then we should consider the implications for such institutions more widely for the Bronze Age world, as real, dynamic, and idiosyncratic individuals inhabited it. Also, we wish to explicitly call attention to the ways that the archaeological record may in fact reflect such things (cf. Reeder, 2000). Sadly, heteronormative narratives of the past continue to bias how we interpret the archaeological record. The interpretive strength of queer and gender studies in the social sciences is that, as modes for reading the past, they allow us to counter the pre-existing heteronormativity and hegemonic masculinity which colour so many of our models and narratives of the past in

general (i.e., men are violent, women are passive, everything is binary).

That the community at Karlstrup recognized the relationship between the men in Grave Q to the extent that they buried them in such an intimate manner compels the possibility that alternative gender categories beyond the binary and intimate same-sex relationships were acceptable within NBA society. *If* such an institution(s) existed, rather than being aberrant, such proclivities may have represented a recognized and well-established potential reality of the elite warrior lifestyle (Bremmer, 1980). Clearly, given the literary and ethnographic examples presented here, warrior-specific notions of gender and sexuality associated with mobile, fraternal lifestyles spent largely in the company of men, could logically have permitted such identities and behaviours. Whatever their relationship, the two men buried together at Karlstrup were afforded valuable grave offerings and burial contexts specifically related to pronounced high social-status masculine and/or warrior identities and were sent to the afterlife reflecting their intimate relationship. We do not propose that all male-male double burials represent such relationships, and recognize that many circumstances could have resulted in grave Q. But, of those possibilities, an intimate, potentially homoerotic male relationship should be one valid interpretation based on the extant evidence.

Ultimately, the highly mobile lifestyle of the NBA warrior, defined by extended periods of travel in close quarters with like-minded men, combined with the trials, tribulations and camaraderie inherent to a martial lifestyle, may have been a gateway to expressions of gender and/or sexuality that have yet to be fully explored for the life experiences of Nordic Bronze Age men.

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References

Allentoft, M. E., Sikora, M., Sjögren, K-G., Rasmussen, S., Rasmussen, M., Stendrup, J., Damgaard, P. B., Schroeder, H., Ahlström, T., Vinner, L., Malaspinas, A-S., Margaryan, A., Higham, T., Chivall, D., Lynnerup, N., Harvig, L., Baron, J., Della Casa, P., Dąbrowski, P., Duffy, P. R., Ebel, A. V., Epimakhov, A., Frei, K., Furmanek, M., Gralak, T., Gromov, A., Gronkiewicz, S., Grupe, G., Hajdu, T., Jarysz, R., Khartanovich, V., Khokhlov, A., Kiss, V., Kolář, J., Kriiska, A., Lasak, I., Longhi, C., McGlynn, G., Merkevicius, A., Merkyte, I., Metspalu, M., Mkrtchyan, R., Moiseyev, V., Paja, L., Pálfi, G., Pokutta, D., Pospieszny, Ł., T. Price, T. D., Saag, L., Sablin, M., Shishlina, N., Smrčka, V., Soenov, V. I., Szeverényi, V., Tóth, G., Trifanova, S. V., Varul, L., Vicze, M., Yepiskoposyan, L., Zhitenev, V., Orlando, L., Sicheritz-Pontén, T., Brunak, S., Nielsen, R., Kristiansen, K. & Willerslev, E. 2015. Population genomics of Bronze Age Eurasia. *Nature* 522: 167-172.

Aner, E. & Kersten, K. 1973. *Die Funde der älteren Bronzezeit des nordischen Kreises in Dänemark, Schleswig-Holstein und Niedersachsen. Frederiksborg und Københavns Amter*. Copenhagen & Neumünster: Nationalmuseet and Karl Wacholtz Verlag.

Aner, E. & Kersten, K. 1978. *Die Funde der älteren Bronzezeit des nordischen Kreises in Dänemark, Schleswig-Holstein und Niedersachsen. Südschleswig-Ost*. Copenhagen & Neumünster: Nationalmuseet and Karl Wacholtz Verlag.

Bacagalupo, A. M. 2004. The Mapuche man who became a woman shaman: selfhood, gender transgression, and competing cultural norms. *American Ethnologist* 31 (3): 440–457.

Bennike, P. 1985. *Palaeopathology of Danish skeletons. A comparative study of demography, disease and injury*. Copenhagen: Akademisk Forlag.

Bergmann, J. 1962. Hügelgräber der älteren Bronzezeit bei Hölingen, Gemeinde Reckum, Kreis Grafschaft Hoya. *Die Kunde* 13: 53-100.

Blackmore, C. 2011. How to queer the past without sex: queer theory, feminisms and the archaeology of identity. *Archaeologies: Journal of the World Archaeological Congress* 7 (1): 75–96.

Bogoras, W. 1904–1909. *The Chukchee* (Boas, F. ed.). New York: The American Museum of Natural History.

Brelich, A. 2013 (1969). *Paides e Parthenoi*. Rome: Ediori Riuniti University Press.

Bremmer, J. 1980. An enigmatic Indo-European rite: paederasty. *Arethusa* 13 (2): 279–298.

Bunnefeld, J. H. 2014. Der Häuptling und sein Schwert?—Anmerkungen zur sozialen Stellung des Schwertträgers in der älteren nordischen Bronzezeit. In: *Gewalt und Gesellschaft. Dimensionen der Gewalt in ur- und frühgeschichtlicher Zeit. Internationale Tagung an der Julius-Maximilians-Universität Würzburg 14.–16. März 2013, Bonn: Universitätsforschungen* (pp. 133–143). Link, T. & Peter-Röcher, H. (eds.). Prähistorischen Archäologie 259. Bonn: Habelt.

Bunnefeld, J. H. 2016. Reiche Bauern, arme Bauern—Zur sozialen Differenzierung in der älteren nordischen Bronzezeit. In: *Arm und Reich—Zur Ressourcenverteilung in prähistorischen Gesellschaften. 8. Mitteldt. Archäologentag vom 22. bis 24. Oktober in Halle (Saale)* (pp. 243–272). Meller, H., Hahn, H. P., Jung, R. & Risch, R. (eds.). Halle (Saale): Tagungen Landesmuseum für Vorgeschichte, Halle 14.

Burg, B. R. 1995. *Sodomy and the pirate tradition: English sea rovers in the seventeenth-century Caribbean*. New York: New York University Press.

Bury, R. G. 1909. *The Symposium of Plato*. Cambridge: W. Heffer & Sons.

Callender, C. & Kochems, L. M. 1983. The North American Berdache. *Current Anthropology* 24 (4): 443–470.

Cavazutti, C., Skeates, R., Millard, A. R., Nowell, G., Peterkin, J., Bernaò Brea, M., Cardarelli, A. & Salzani, L. 2019. Flows of people in villages and large centres in Bronze Age Italy through strontium and oxygen isotopes. *PLoS ONE* 14(1): e0209693.

Cheng, D. 2017. Liberty in piracy. *Just* 5 (1): 1–4.

Childe, V. G. 1930. *The Bronze Age*. London: Cambridge University Press.

Clausing, C. 2005. *Untersuchungen zu den urnenfelderzeitlichen Gräbern mit Waffenbeigaben vom Alpenkamm bis zur Südzone des Nordischen Kreises: Eine analyse ihrer grabinventare und grabformen*. Oxford: British Archaeological Reports.

Cobbs, H. 2005. Straight down the line? A queer consideration of hunter-gatherer studies in North-West Europe. *World Archaeology* 37 (4), Debates in "World Archaeology": 630–636.

Conkey, M. W. & Spector, J. D. 1984. Archaeology and the study of gender. *Advances in Archaeological Method and Theory* 7: 1–38.

Connell, R. W. 1995. *Masculinities*. Cambridge: Polity Press.

Connell, R. W., Davis, M. D. & Dowsett, G. W. 1993. A bastard of a life: homosexual desire and practice among men in working-class milieux. *The Australian and New Zealand Journal of Sociology* 29 (1), 112–135.

Corvalan, J. C. & Klein, D. 2011. PTSD: diagnosis, evolution, and treatment of combat-related psychological/psychiatric injury. *Missouri Medicine* 108 (4): 296–303.

Crompton, L. 2006. *Homosexuality and civilization*. Cambridge, Massachusetts: Harvard University Press.

Crouthamel, J. 2008. Male sexuality and psychological trauma: soldiers and sexual disorder in World War I and Weimar Germany. *Journal of the History of Sexuality* 17 (1): 60–84.

Cucchiari, S. 1981. The gender revolution and the transition from bisexual horde to patrilocal band: the origins of gender hierarchy. In: *Sexual meanings: the cultural construction of gender and sexuality* (pp. 31–79). Ortner, S. B. & Whitehead H. (eds.). Cambridge: Cambridge University Press.

Dover, K. J. 1989 (1978). *Greek homosexuality*. Cambridge, Massachusetts: Harvard University Press.

Downing, C. 1989. *Myths and mysteries of same-sex love*. New York: Continuum.

Earle, T., Ling, J., Uhner, C., Stos-Gale, Z. & Melheim, L. 2015. The political economy and metal trade in Bronze Age Europe: Understanding regional variability in terms of comparative advantages and articulations. *European Journal of Archaeology* 18(4): 633-657.

Faraday, L. W. 1904. *The Cattle-Raid of Cualnge*. London: David Nutt.

Felding, L., Reiter, S. S., Frei, K. M. & Vandkilde, H. 2020. Male social roles and mobility in the Early Nordic Bronze Age. A perspective from SE Jutland. *Danish Journal of Archaeology* 9: 1–167.

Ford, C. S. & Beach, F. A. 1951. *Patterns of sexual behavior*. New York: Harper & Paul B. Hoeber.

Fowler, C. 2005. Identity politics: personhood, kinship, gender and power in Neolithic and Early Bronze Age Britain. In: *The archaeology of plural and changing identities* (pp. 109–134). Casella, E. C. & Fowler, C. (eds.). Boston: Springer.

Frank, J. I. 2011. Ξενία Πολύτροπος: the social ritual of hospitality in the *Odyssey*. *Senior Capstone Projects.* Paper 4.

Frei, K. M., Mannering, U., Kristiansen, K., Allentoft, M. E., Wilson, A. S., Skals, I., Tridico, S., Nosch, M. L., Willerslev, E., Clarke, L & Frei, R. 2015. Tracing the dynamic life story of a Bronze Age Female. *Scientific Reports* 5: 10431.

Frei, K. M., Villa, C., Jørkov, M. L., Allentoft, M. E., Kaul, F., Ethelberg, P., Reiter, S. S., Wilson, A. S., Taube, M., Olsen, J., Lynnerup, N., Willerslev, E., Kristiansen, K. & Frei, R. 2017. A matter of months: High precision migration chronology of a Bronze Age female. *PLoS ONE* 12(6): e0178834.

Frei, K. M., Bergerbrant, S., Sjögren, Jørkov, M. L., Lynnerup, N., Harvig, L., Allentoft, M. E., Sikora, M. Price, T. D., Frei, R. & Kristiansen, K. 2019. Mapping human mobility during the third and second millennia BC in present-day Denmark. *PLoS ONE* 14(8): e0219850.

Frieman, C. J., Brück, J., Rebay-Salisbury, K., Bergerbrant, S., Montón Subías, S., Sofaer, J., Knüsel, C. J., Vandkilde, H., Giles, M. & Treherne, P. 2017. Aging well: Treherne's "warrior's beauty" two decades later. *European Journal of Archaeology* 20 (1): 36–73.

Frieman, C. J., Teather, A. & Morgan, C. 2019. Bodies in motion: narratives and counter narratives about gendered mobility in European later prehistory. *Norwegian Archaeological Review* 52(2): 148–169.

Galovski, T. & Lyons, J. A. 2004. Psychological sequelae of combat violence: a review of the impact of PTSD on the veteran's family and possible interventions. *Aggression and Violent Behavior* 9 (5): 477–501.

Geller, P. L. 2017. *The bioarchaeology of socio-sexual lives: queering common sense about sex, gender, and sexuality*. Cham: Springer.

Gilchrist, R. 1999. *Gender and archaeology: contesting the past.* London: Routledge.

Glob, P. V. 1945. *Studier over den jyske enkeltgravskultur*. Aarbøger for Nordisk Oldkyndighed og Historie, 1944. Copenhagen: Gyldendalske Goghandel, Nordisk Forlag.

Glob, P. V. 1967. *Danske Oldtidsminder*. Copenhagen: Gyldendal.

Harries, B. 1993. "Strange meeting": Diomedes and Glaucus in *Iliad* 6. *Greece & Rome* 40 (2): 133–146.

Haseloff, G. 1938. Der Galgenberg von Itzhoe. Ein grabhügel aus der älteren Bronzezeit. *Offa* 3: 18-84.

Herman, G. 2002. *Ritualized friendship and the Greek city*. Cambridge: Cambridge University Press.

Hirschfeld, M. 1941. *The sexual history of the World War*, transl. unknown. New York: Cadillac Publishing Co.

Ho, T. C. 2009. Transgender, transgression, and translation: a cartography of Nat Kadaws: notes on gender and sexuality within the spirit cult of Burma. *Discourse* 31 (3): 273–317, 396.

Hollimon, S. E. 2000. Archaeology of the 'Aqi: gender and sexuality in prehistoric Chumash society. In: *Archaeologies of sexuality* (pp. 179–196). Schmidt, R. A. & Voss, B. L. (eds.). London & New York: Routledge.

Holst, M. K., Breuning-Madsen, H. & Rasmussen, M. 2001. The South Scandinavian barrows with well-preserved oak-log coffins. *Antiquity* 75: 126-136.

Holst, M. K. & Rasmussen, M. 2013. The barrow gathering. In: *Skelhøj and the Bronze Age barrows of southern Scandinavia, Vol. 2, Barrow building and barrow assemblies* (pp. 127-136). Holst, M. K. & Rasmussen, M. (eds.). Aarhus: Aarhus University Press.

Homer. 1990. *The Iliad* (Fagles, R., transl.). New York & London: Penguin Books.

Horn, C. 2013. Violence and virility. In: *Counterpoint: essays in archaeology and heritage studies in honour of Professor Kristian Kristiansen* (pp. 235–241). Bergerbrant, S. & Sabatini, S. (eds.). Oxford & New York: Oxford University Press.

Horn, C. & Kristiansen, K. 2018. *Warfare in Bronze Age society*. Cambridge: Cambridge University Press.

Houston, S. 2009. A splendid predicament: young men in classic Maya society. *Cambridge Archaeological Journal* 19 (2): 149–178.

Jacobs, S.-E., Thomas, W. & Lang, S. 1997. *Two-spirit people: Native American gender, sexuality and spirituality*. Urbana: University of Illinois Press.

Jensen, J. 1998. *Manden i kisten*. Copenhagen: Gyldendalske Boghandel, Nordisk Forlag A/S.

Jochelson, W. 1904–1907. *The Koryak* (Boas, F., ed.). New York: The American Museum of Natural History.

Jochelson, W. 1926. *The Yukaghir and the Yukaghized Tungus* (Boas, F., ed.). New York: The American Museum of Natural History.

Kaul, F. 1998. *Ships on bronzes: A study in Bronze Age religion and iconography*. Copenhagen: Publications from the National Museum.

Kaul, F. 2013. The Nordic razor and the Mycenaean lifestyle. *Antiquity* 87: 461–472.

Kaul, F. 2017a. Bronze Age archaeology and cosmology: dialogues at the crossroads. A personal perspective. *Acta Archaeologica* 88: 35–56.

Kaul, F. 2017b. The *xenia* concept of guest-friendship—providing an elucidatory model for Bronze Age communication. In: *North meets south. Theoretical aspects on the northern and southern rock art traditions in Scandinavia. Swedish Rock Art Series: Volume* 3 (pp. 172–198). Skoglund, P., Ling, J. & Bertilsson, U. (eds.). Oxford: Oxbow Books.

Kaul, F. 2018. Middle Bronze Age long-distance exchange. Early glass, amber and guest-friendship, *xenia*. In: *Bronzezeitlicher Transport, Akteure, Mittel und Wege. Ressourcenkulturen Band* 8 (pp. 189–211). Nessel, B., Neumann, D. & Bartelheim, M. (eds.). Tübingen: Tübingen University Press.

Kaul, F. 2019. Late Bronze Age oath rings from Boeslunde, Zealand. Their function and meaning. In: *Ringe der Macht/Rings of Power. Halle (Saale): Tagungen des Landesmuseum für Vorgeschichte Halle, Band* 21/II (pp. 375–388). Meller, H., Kimmig-Völkner, S. & Reichenberger, A. (eds.). Halle (Saale): Landesamt für Denkmalpflege und Archäologie Sachsen-Anhalt. Landesmuseum für Vorgeschichte.

Kaul, F. & Randsborg, K. 2008. Hurtige vogne. *Skalk* 2008 (2): 3–7.

Keesing, R. M. 1998. Prologue: toward a multidimensional understanding of male initiation. In: *Rituals of manhood: male initiation in Papua New Guinea* (pp. 1–43). Herdt, G. (ed.). New Brunswick & London: Transaction.

Kelly, R. C. 1976. Witchcraft and sexual relations: an exploration in the social and semantic implications of the structure of belief. In: *Man and woman in the New Guinea Highlands* (pp. 36–53). Brown, P. & Buchbinder, G. (eds.). Washington, D.C.: American Anthropological Association.

Kersten, K. 1936. Das totenhaus von Grünhof-Tefperhude, Kreis Herzogtum Lauenburg. *Offa* 1: 56-87.

Kinsella, T. 1970. *The Tain*. Oxford: Oxford University Press.

Knipper, C., Mittnik, A., Massy, K., Kociumaka, C., Kucukkalipci, I., Maus, M., Wittenborn, F., Metz, S. E., Staskiewicz, A., Krause, J. & Stockhammer, P. W. 2017. Female exogamy and gene pool diversification at the transition from the Final Neolithic to the Early Bronze Age in central Europe. *Proceedings of the National Academy of Sciences of the United States of America* 114 (38), 10083–10088. DOI: 10.1073/pnas.1706355114

Kristiansen, K. 1984. Krieger und häuptlinge in Der Bronzezeit Dänemarks. Ein beitrag zur geschichte des Bronzezeitlichen schwertes. *Jahrbuch Des Römisch-Germanischen Zentralmuseums Mainz* 31: 187–208. https://doi.org/10.11588/jrgzm.1984.0.58781.

Kristiansen, K. 1999a. Symbolic structures and social institutions: The twin rulers in Bronze Age Europe. In: *Glyfer och arkeologiska rum—En vänbok till Jarl Nordbladh* (537-552). Gustafsson, A. & Karlsson, H. (eds.) Gothenborg: Novum Grafiska AB.

Kristiansen, K. 1999b. The emergence of warrior aristocracies in later European prehistory. In: *Ancient warfare: Archaeological perspectives* (175–189). Carman J. & Harding, A. (eds.). Phoenix Hill: Sutton Publishing.

Kristiansen, K. 2002. The tale of the sword – Swords and swordfighters in Bronze Age Europe. *Oxford Journal of Archaeology* 21(4): 319-32. https://doi.org/10.1111/1468-0092.00166.

Kristiansen, K. & Larsson, T. B. 2005. *The rise of Bronze Age society: Travels, transmissions and transformations*. Cambridge: Cambridge University Press.

Kristiansen, K. & Suchowska-Ducke, P. 2015. Connected histories: the dynamics of Bronze Age interaction and trade 1500–1100 BC. *Proceedings of the Prehistoric Society* 81: 361–392.

Kristiansen, K., Melheim, L., Bech, J.-H., Mortensen, M. F. & Frei, K. M. 2020. Thy at the crossroads: a local Bronze Age community's role in a macro-economic system. In: *Contrasts of the Nordic Bronze Age* (pp. 269–282). Austvol, K. I., Eriksen, M. H., Fredriksen, P. D., Melheim, L., Prøsch-Danielsen, L. & Skogstrand, L. (eds.). Turnhout: Brepols Publishers.

Ling, J., Chacon, R. & Chacon, Y. 2018. Rock art, secret societies, long-distance exchange, and warfare in Bronze Age Scandinavia. In: *Prehistoric warfare and violence: quantitative and qualitative approaches* (pp. 149–176). Dolfini, A., Crellin, R. J., Horn, C. & Uckelmann M. (eds.). Springer online. https://doi.org/10.1007/978-3-319-78828-9

Manning, F. J. 1994. Morale and cohesion in military psychiatry. In: *Textbook of military medicine, Part I: Military psychiatry: preparing in peace for war* (pp. 2–18). Jones, F. D., Sparacino, L. R., Wilcox, V. L. & Rothberg, J. M. (eds.). Falls Church, Virginia: U.S. Department of the Army, Office of the Surgeon General.

Maringer, J. 1942. Menschenopfer im Bestattungsbrauch Alteuropas. *Anthropos* 37/40: 1–112.

Marrou, H. I. 1956 (1948). *A history of education in antiquity*. (Lamb, G., transl). Madison: The University of Wisconsin Press.

Medicine, B. 2002. Directions in gender research in American Indian societies: two spirits and other categories. In *Online readings in psychology and culture* (Unit 3, Chapter 2). Lonner, W. J., Dinnel, D. L., Hayes, S. A. & Sattler, D. N. (eds.). Bellingham: Western Washington University. http://www.wwu.edu/~culture

Melheim, L. & Horn, C. 2014. Tales of hoards and swordfighters in Early Bronze Age Scandinavia: the brand new and the broken. *Norwegian Archaeological Review* 47 (1): 1–24.

Meller, H. 2018. *Die Himmelscheibe von Nebra. Der Schlüssel zu einrer untergegangenen Kutur im Herzen Europas*. Berlin: Propyläen.

Meller, H. 2019. Princes, armies, sanctuaries. The emergence of complex authority in the central German Únětice Culture. *Acta Archaeologica* 90 (1): 39–80.

Morales, M. S. & Mariscal, G. L. 2003. The relationship between Achilles and Patroclus according to Chariton of Aphrodisias. *The Classical Quarterly* 53 (1): 292–295.

Nanda, S. 2014. *Gender diversity: crosscultural variations*. Long Grove: Waveland Press.

Ortner, S. B. 1981. Gender and sexuality in hierarchical societies: the case of Polynesia and some comparative implications. In: *Sexual meanings: the cultural construction of gender and sexuality* (pp. 359–409). Ortner, S. B. & Whitehead, H. (eds.). Cambridge: Cambridge University Press.

Ortner, S. B. & Whitehead, H. 1981. *Sexual meanings: the cultural construction of gender and sexuality*. Cambridge: Cambridge University Press.

Otto, T., Thrane, H. & Vandkilde, H. (eds.). 2006. *Warfare and society: archaeological and social anthropological perspectives*. Aarhus: Aarhus University Press.

Plutarch. 1917. *The Parallel Lives. Vol. V*. (Perrin, B. transl.). London: Loeb Classical Library Edition.

Poole, F. J. P. 1981. Transforming "natural" woman: female ritual leaders and gender ideology among Bimin-Kusksmin. In: *Sexual Meanings: The cultural construction of gender and sexuality* (pp. 116–-165). Ortner, S. B., & Whitehead H. (eds.). Cambridge: Cambridge University Press.

Price, T. D., Frei, R., Brinker, U., Lidke, G., Terberger, T., Frei, K. M. & Jantzen, D. 2019. Multi-isotope proveniencing of human remains from a Bronze Age battlefield in the Tollense valley in northeast Germany. *Archaeological and Anthropological Sciences* 11 (1): 33–49.

Prine, E. 2000. Searching for third genders: towards a prehistory of domestic space in Middle Missouri villages. In: *Archaeologies of sexuality* (pp. 197–219). Schmidt, R. A. & Voss, B. L. (eds.). London & New York: Routledge.

Race, W. H. (transl.) 2008. Apollonius Rhodius' *Argonautica*. Cambridge & London: Harvard University Press.

Randsborg, K. 1968. Bronze Age grave finds in East Denmark (Period III). *Inventaria Archaeologica DK* 16.

Rassmann, C. 2013. *Crossing Blades and Crossing Borders - A Re-Examination of Octagonal-Hilted Swords and Their Paradigms*. PhD, Aarhus: Aarhus: Aarhus University. Reeder, G. 2000. Same-sex desire, conjugal constructs, and the tomb of Niankhkhnum and Khnumhotep. *World Archaeology* 32 (2): 193–208. DOI: 10.1080/00438240050131180

Roscoe, W. 1987. Bibliography of Berdache and alternative gender roles among North American Indians. *Journal of Homosexuality* 14 (3–4): 81–172.

Schmidt, R. A. 2000. Shamans and northern cosmology: the direct historical approach to Mesolithic sexuality. In: *Archaeologies of sexuality* (pp. 220–235). Schmidt, R. A. & Voss, B. L. (eds.). London & New York: Routledge.

Sherratt, A. 1987. Warriors and traders: Bronze Age chiefdoms in central Europe. In: *Origins: the roots of European civilization* (pp. 54–66). Cunliffe, B. W. (ed.). London: BBC Publications.

Sherratt, A. 1994. The emergence of elites: earlier Bronze Age Europe, 2500–1300 BC. In: The *Oxford illustrated prehistory of Europe* (pp. 244–276). Cunliffe, B. (ed.). Oxford: Oxford University Press.

Skogstrand, L. 2016. Warriors and other men: Notions of masculinity from the Late Bronze Age to the Early Iron Age in Scandinavia. Oxford: Archaeopress Archaeology.

Solli, B. 1999. Odin the queer? On *ergi* and shamanism in Norse mythology. In: *Glyfer och arkeologiska rum—En Vänbok till Jarl Nordbladh* (pp. 341–349). Gustafsson, A. & Karlsson, H. (eds.). Gothenburg: Novum Grafiska AB.

Sophocles. 2005. *Antigone*. Clayton: Prestwick House, Inc.

Sørensen, M. L. S. 1992. Gender archaeology and Scandinavian Bronze Age studies. *Norwegian Archaeology Review* 25 (1): 31–49.

Sørensen, M. L. S. 1997. Reading dress: The construction of social categories and identities in Bronze Age Europe. *Journal of European Archaeology* 5(1): 93-114.

Speidel, M. P. 2004. *Ancient Germanic warriors: Warrior styles from Trajan's Column to Icelandic sagas*. London & New York: Routledge.

Sperber, L. 1999. Zu den Schwertträgern im westlichen Kreis der Urnenfeldkultur: profane und religiöse Aspekte. In: *Eliten in der Bronzezeit. Ergebnisse zweier Kolloquien in Mainz und Athen* (pp. 605–659). Römisch-Germanisches Zentralmuseum Mainze (RGZM) Forschungsinstitut für Vor- und Frühgeschichte (eds.). Mainz: Römisch-Germanisches Zentralmuseum.

Strathern, M. 1988. *The gender of the gift: problems with women and problems with society in Melanesia.* Studies in Melanesian Anthropology, 6. Berkeley & Los Angeles: University of California Press.

Strathern, M. 2001. Same-sex and cross-sex relations. In: *Gender in Amazonia and Melanesia: an exploration of the comparative method* (pp. 221–244). Gregor, T. A. & Tuzin, D. (eds.). Berkeley: University of California Press.

Suchowska-Ducke, P. 2015. The dissemination of Naue II swords: a case study on long-distance mobility. In: *Forging identities. The mobility of culture in Bronze Age Europe*, Vol. 2 (pp. 257–265). Suchowska-Ducke, P., Reiter, S. S. & Vandkilde, H. (eds.). Oxford: British Archaeological Reports, International Series 2772.

Sweely, T. L. 1999. *Manifesting power: gender and the interpretation of power in archaeology*. London & New York: Routledge.

Thrane, H. 2006. Swords and other weapons in the Nordic Bronze Age: technology, treatment, and contexts. In: *Warfare and society: archaeological and social anthropological perspectives* (pp. 491–504). Otto, T., Thrane, H. & Vandkilde, H. (eds.). Aarhus: Aarhus University Press.

Treherne, P. 1995. The warrior's beauty: the masculine body and self-identity in Bronze Age Europe. *Journal of European Archaeology* 3 (1): 105–144.

van Gennep, A. 1981. *Les Rites de Passage: étude Systematique des Rites*, vol. 2. Paris: A. & J. Picard.

van Wees, H. 1992. *Status warriors. Warfare in Homer and history.* Amsterdam: J. C. Gieben.

van Wees, H. 1997. Homeric warfare. In: *A new companion to* Homer (pp. 668–693). Morris, I. & Powel, B. (eds.). Leiden, New York & Cologne: Brill.

Vandkilde, H. 1996. *From stone to bronze: The metalwork of the Late Neolithic and earliest Bronze Age in Denmark.* Aarhus: Jutland Archaeological Society Publications.

Vandkilde, H. 2006a. Warriors and warrior institutions in Copper Age Europe. In: *Warfare and society: archaeological and social anthropological perspectives* (pp. 393–422). Otto, T., Thrane, H. & Vandkilde, H. (eds.). Aarhus: Aarhus University Press.

Vandkilde, H. 2006b. Warfare and gender according to Homer: an archaeology of an aristocratic warrior culture. In: *Warfare and society: archaeological and social anthropological perspectives* (pp. 515–528). Otto, T., Thrane, H. & Vandkilde, H. (eds.). Aarhus: Aarhus University Press.

Vandkilde, H. 2007. *Culture and change in central European prehistory*. Aarhus: Aarhus University Press.

Vandkilde, H. 2012. Warfare in northern European Bronze Age societies. In: *The archaeology of violence: interdisciplinary approaches* (pp. 37–62). Ralph, S. (ed.). Albany: SUNY Press.

Vanggaard, T. 1972. *Phallós. A symbol and its history in the male world*. New York: International Universities Press, Inc.

Varberg, J., Kaul, F. & Gratuze, B. 2019. Bronze Age glass and amber. Evidence of Bronze Age long-distance exchange. *Adoranten* 2019: 5–29.

Voss, B. L. 2000. Feminisms, queer theories, and the archaeological study of past sexualities. *World Archaeology* 32 (2): 180–192.

Warwick, C. 2013. The chaste consecration of the thighs: post-Homeric representations of Achilles and Patroclus in Classical Greek literature. *Explorations: The UC Davis Undergraduate Research Journal* 15: 1–15.

Whitehead, H. 1981. The Bow and the burdenstrap: A new look at Institutionalized homosexuality in Native North America. In *Sexual Meanings: The Cultural Construction of Gender and Sexuality* (pp. 80-115). Ortner, S. B. & Whitehead, H. (eds.). New York: Cambridge University Press.

Williams, W. L. 1986. Persistence and change in the Berdache tradition among contemporary Lakota Indians. In: *The many faces of homosexuality: anthropological approaches to homosexual behavior* (pp. 181–200). Blackwood, E. (ed.). New York: Harrington Park Press.

Williams, W. L. 1992. *The spirit and the flesh: sexual diversity in American Indian culture*. Boston: Beacon Press.

Young, A. 2000. *Women who become men: Albanian sworn virgins*. Oxford: Berg.

Zerach, G., Solomon, Z., Horesh, D. & Ein-Dor, T. 2013. Family cohesion and posttraumatic intrusion and avoidance among war veterans: a 20-year longitudinal study. *Social Psychiatry and Psychiatric Epidemiology* 48 (2): 205–214.

Bronze Age expressions

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Integral to our current interpretation and understanding of any past society are the expressions that people—through creativity, work and daily life—mediated, both explicitly and implicitly. Interpretation of material culture is to a large extent synonymous with the study of such expressions.

The Nordic Bronze Age is in many ways a distinct example of the importance and variations of expressions. And, consequently, the archaeological data for studying expression from the Nordic Bronze Age are both voluminous and multi-faceted. The material available evidences a wide-ranging, but also strikingly coherent imagery and iconography (e.g., Kaul, 2013). Expressions in the Nordic Bronze Age also encompassed a large material base for their mediation, including stone (Bradley, 2015), textile (Bergerbrant, 2007), ceramics (Eriksson, 2008) and of course, bronze (Kaul, 1998; Nørgaard, 2018).

The two papers presented in this section stem from two different sessions at the *15th Nordic Bronze Age Symposium* held in Lund in 2019. Melheim's paper was originally presented in the *Rock art, iconography and Bronze Age lifeworlds—An integrated perspective* session. Melheim challenges the relationship between materiality, temporality and narrative in rock art expression. Drawing on a comparative analysis including cases beyond the chronological scope of the Nordic Bronze Age, she argues that rock art had the capacity to both preserve and mediate narratives. Hence, Melheim encourages an expansion of the narrative turn in rock art studies, grounded in a holistic approach to narratology, encompassing temporality, spatiality, diachronic change or stability as well as the crucial importance of the changeability of rock art in all these aspects.

Botwid's paper, originally presented in the *Bronze Age craft, technique and technology* session, introduces artisanal interpretative perspectives in the context of material analysis, specifically in connection to contract archaeology. Utilizing this perspective, the paper explores several possibilities of interpretating the operational chains of ceramic craft. In result, often ambiguous material categories such as craft debris or craft-related artefacts can be studied and, by extension, activity and workshop areas, otherwise obscured in schematic site interpretation, can be suggested. Botwid presents several arguments for future inclusion of the artisanal perspective in material analysis and interpretation. Its applicability may be utilized within both contract archaeology as well as research projects.

Combined, the two papers disclose distinctly differing aspects of Bronze Age expressions. The contribution by Melheim discusses the expression of narratives that constituted the backbone of their communities' cosmological and social structures. The contribution by Botwid, on the other hand, offers perspectives to further the archaeological interpretation of a medium of expression thoroughly used throughout many aspects of Bronze Age life—ceramics. The two papers converge in their aim to further our insights into the expressions of the Nordic Bronze Age and how these permeated all aspects of society.

This concluding section of the proceedings from the *15th Nordic Bronze Age Symposium* offers an opportunity to reflect on the expressions intrinsic to all aspects of Bronze Age material culture. These expressions

mediated diverse meanings, which offered explanation of a perceived worldview and consolidated a cosmological and social order. These expressions could be grand or modest in scale, they could be monumentally expressed, or serve as ornamentation on pocket-sized personal possessions. Whichever the case, they offer to archaeology today opportunities to interpret and gauge the structuring mental concepts surrounding *Life and afterlife in the Nordic Bronze Age*.

References

Bergerbrant, S. 2007. *Bronze Age identities: costume, conflict and contact in northern Europe 1600–1300 BC.* Stockholm: Stockholm University.

Bradley, R. 2015. Mixed media, mixed messages: religious transmission in Bronze Age Scandinavia. In: *Picturing the Bronze Age.* Swedish Rock Art Series, Volume 3. (pp. 37–46). Skoglund, P., Ling, J. & Bertilsson, U. (eds.). Oxford: Oxbow Books.

Eriksson, T. 2008. Pottery and feasting in central Sweden. In: *Breaking the mould: challenging the past through pottery*. Prehistoric Ceramics Research Group: Occasional Paper 6 (pp. 47–55). Berg, I. (ed.). BAR International Series 1861. Oxford: Archaeopress.

Kaul, F. 1998. *Ships on bronzes. A study of Bronze Age religion and iconography*. Publications from the National Museum, Studies in Archaeology and History, vols. 3.1 & 3.2. Copenhagen.

Kaul, F. 2013. Mythological aspects of Nordic Bronze Age religion. In: *The handbook of religions in ancient Europe* (pp. 70–76). Christensen, L. B., Hammer, O. & Warburton, D. (eds.). Durham: Acumen.

Nørgaard, H. W. 2018. *Bronze Age metalwork: techniques and traditions in the Nordic Bronze Age 1500–1100 BC*. Oxford: Archaeopress.

Much more than motor skills—mapping Bronze Age ceramists' knowledge

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Abstract

One possibility, when large-scale excavations have exposed areas where it is obvious that different activities have been undertaken in the prehistoric past (so-called "activity areas"), is to suggest that they can be made more informative by applying an artisanal perspective. This short and, I hope, useful paper includes examples of artisanal interpretations of practices that can be derived from excavations, leaving the focus on higher-profile artefacts behind for once.

To apply an artisanal viewpoint in interpreting paved open areas, areas with groups of pits, and small houses or possible workshops, creates a platform for studying artisanal residues that will hopefully enrich the excavation results. When recent excavations have applied artisanal knowledge during the pre-excavation planning, the results have highlighted the importance of including artisanal expertise early in the process (Sjölin 2019a; Sjölin & Balkefors, 2019b; Petersson, in press). Many examples of artisanal residues, that have previously not been taken into consideration as findings belonging to the archaeological context, have now been recognized. Providing methods, such as mapping (i.e. defining keywords for artisanal analysis), as a key to extracting knowledge of ancient crafting has been productive. Hopefully this contribution will give inspiration to further efforts in these matters.

Keywords: ceramics, interdisciplinary, skill, artisanal perspective, contract archaeology, mapping

Craft-related examinations are the focus of this contribution. The aim is to provide a practical method that can apply artisanal research to the field of contract archaeology. A further aim is to enhance the recognition of what can be regarded as important prehistoric residues. Categorization of raw materials, artisanal residues, and traces of action are in focus.

Background

From an interdisciplinary position as an artisan, craftsperson *and* an archaeologist, I have been striving to implement craft knowledge and levels of skill into craft-related archaeology. Over the last ten years I have put forward silent or tacit knowledge as an evaluative factor of technological choices and levels of skill (Botwid, 2009a, 2009b, 2013, 2014a, 2014b, 2016; 2020; Botwid & Eklöv Pettersson, 2016). The inclusion of contemporary artisans as experts in their specific craft has resulted in valuable collaborations within archaeology. The result has been a sharing of knowledge and hopefully establishing a way of making more valid evaluations of ancient crafts (Botwid, 2022). This paper will not deal with evaluation of skill *per se*, though. The knowledge in ceramic craft used for this paper derives from my own practice as a ceramist working with ceramic technologies and techniques (north European traditions and contexts). When

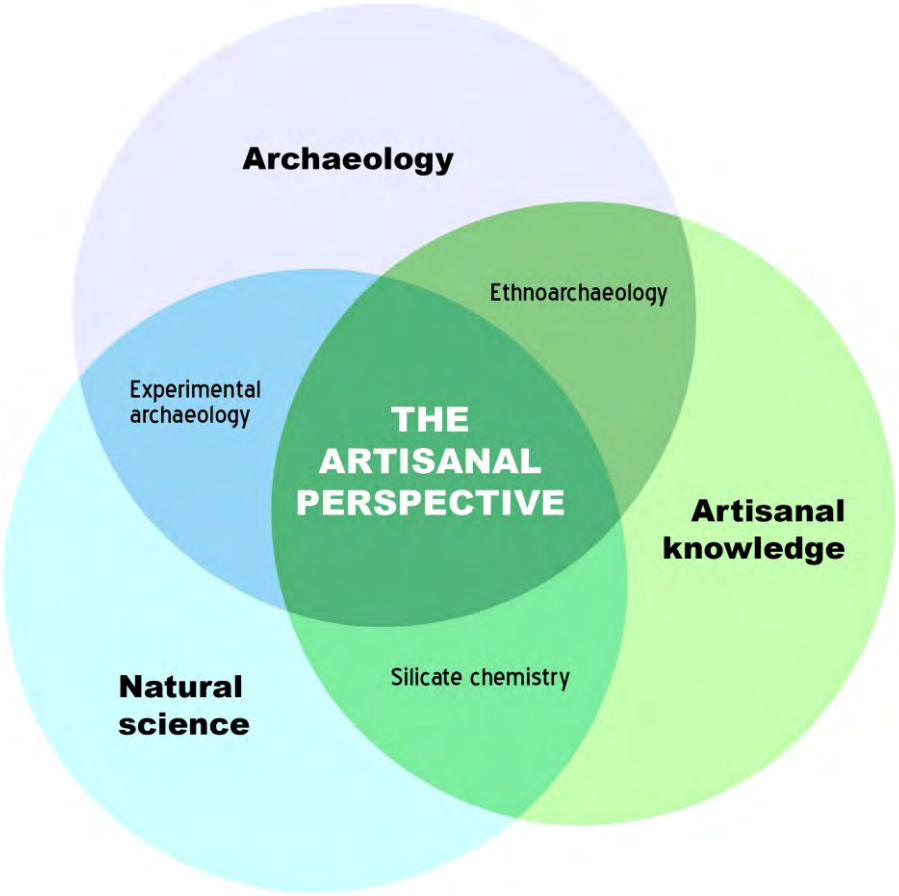

Figure 1. The diagram shows the artisanal perspective's overlap with connecting fields. Disciplines cannot always be separated (Illustration: Henning Cedmar Brandstedt; modified from Botwid, 2020, p. 233).

possible, I strive to refer to ceramic literature from different discourses (e.g., Jensen, 1917; Lyngaard, 1972; Hodder, 1982; Arnold, 1985; Vincentelli, 2003; Freestone & Gaimster, 1997; Lave, 2011; Heitz & Stapfer, 2017; Dissanyaki, 2019; Roux, 2019).

Most of the ceramic techniques are still in use and there is no break in traditions, creating the so-called "lineage of practices"; this conservatism is also visible in anthropological studies (Roux, 2019, p. 315). In contemporary pedagogic situations (learning ceramic craft) these practices (techniques) are handed down in a master-apprentice-like relationship. Different time aspects in transferring or developing technologies are visible in the Late Bronze Age (Bergerbrant, 2007; Budden, 2008; Budden & Sofaer, 2009; Kuijpers 2013, 2018; Nørgaard, 2018 and Sperling, 2016, 2019; Sörman, 2018).

The explorative scope of the *artisanal perspective* allows a more detailed presentation (Figure 1). It concerns all artisanal questions and is active in all craft-related research. The artisanal perspective can be used for the study of craft and skill of the past (Botwid, 2016).

In short, *artisanal interpretation* relies on tacit or silent knowledge. Forms of knowledge are mostly explored within the field of theoretical philosophy of knowledge, evolutionary biology, pedagogic research and in craft research (e.g. Polanyi, 1966, pp. 39–43.; Pye, 1978, pp. 4–8; Molander, 1996, pp. 170–171; Gustavsson, 2002, pp. 88–89; Niedderer & Townsend, 2014; Gärdenfors & Högberg,

2015). Some research refers to this concept as embodied knowledge or "knowing in action", implying that it is not possible to learn something without practising constantly, until reaching the stage when the knowledge seeps into the individual's own physical motions, and becomes a part of him/her as second nature (see Polanyi, 1966; Marchand, 2010).

My intention when proposing a practical sensory assessment method based on tacit knowledge and declarative objective criteria (artisanal interpretation) was that sensory assessment should have a wide application to different crafts and topics. I also intended that it should allow the person doing the archaeological interpretation to either utilize his or her own craft knowledge or to consult an artisan when differentiating or evaluating skill.

Aims

Collaborations are one of the corner-stones of global interactive research. My aim is to form ways or methods that make it easy to adopt the results of my artisanal research within field archaeology. In this paper I will present experiences and extracts from meetings with the team of the 2016 excavations at Fiskeby, near to the site of Pryssgården (Borna-Ahlkvist *et al*., 1998); the latter which has been one of the major focuses in my previous artisanal research (Botwid, 2016, 2017). My aim is to highlight artisanal residues or other interpretable findings (non-categorised artefacts) and propose a usable method for field archaeology.

Points of departure

As a result of my research studies and artisanal interpretations of Pryssgården artefacts, activity areas and small buildings (Botwid, 2016), I was invited to give a seminar to a group of field archaeologists. The project leaders, Maria Petersson and Marita Sjölin, were commencing an excavation season in areas close to the previous excavations, starting in June 2016 in the Fiskeby area. A one-day field seminar was held in which I presented my research to the archaeological team at the site. The aim of the introduction of the artisanal perspective was to highlight this approach, and in co-operation explore new methods of applying artisanal perspectives (theories and method) *before* excavation, such as by introducing field archaeologists to the recognition and registration of materials that usually might not be collected or appreciated in planning the forthcoming excavation. The presentation was undertaken in co-operation with the National History Museums (NHM) contract archaeology division, Linköping. In this contribution I will present two selected extracts.

Material, artisanal reconstruction and results

The Pryssgården site is located in the modern city of Norrköping, connected to Sweden's east coast via 50 km of natural waterways. Pryssgården is a rich Bronze Age settlement with 1,600 petroglyphs in close proximity. I have worked for a better understanding of the day-to-day activities at the Pryssgården settlement from different vantage points. I will focus on the ceramic craft in this example.

It is a time-consuming challenge to produce archaeological interpretations from excavation plans, hence working together with an experienced archaeological illustrator is crucial. In co-operation with Henning Cedmar Brandstedt, over 60 illustrations based on the excavation plans were produced (Botwid, 2017).

The reconstruction (extract I) shows a complex workshop that represents all the different techniques that are visible (as crafting traces) in the ceramic assemblage. Recreated tools are based on the ceramic technologies used at Pyssgården, and are put into context in the workshop furnished for working as a ceramic workshop.

The interpretations rely on archaeological plans and reports, together with the three years of examining the Pryssgården finds (2012–2015): all together 7,900 ceramic finds, of which it was possible to evaluate 349 (4.9%) according to levels of skill (Botwid, 2013, 2016, 2017, p. 32). In addition, there were about 2,500 finds of other materials, making a total of about 10,400 finds.

The field seminar

The following extracts (I and II) were part of the one-day field seminar at the excavation site in Fiskeby, near to Pryssgården. The seminar was a way to prepare the archaeologists for an exploration and integration of an artisanal interpretative perspective already at the start of the excavation. With this aim, I gave a lecture introducing artisanal research, theories and methods. I then presented examples of ceramic techniques, reconstructions of firings, hand-building of ceramics, drying processes, decoration, colour making, children in crafting, and the reconstructions of artisanal tools, learning processes and also the evaluation of skills, etc. (see Botwid, 2017).

A week later I revisited the site and some questions were raised, for example, why there were small amounts of clay (0.5–1 kg) well-defined in the profiles of excavated pits. To determine if this clay was of interest, I collected samples from these small clay accumulations consisting of different reddish colours. The clays appeared to be in connection to building areas, and we reflected over what kind of raw material could be further expected. In order to keep the raw materials in mind, we made a list that could be used by the archaeologists during further excavation.

The two extracts from the field seminar presented here give a good understanding of the scope of the presentation and are good departure points to understand the developing mapping method (i.e. defining keywords for artisanal analysis).

The first extract (I) consists of my own artisanal interpretation and reconstruction of a small house as a possible workshop. The second extract is a reconstruction of clay-making processes and the use of "weathering" techniques (extract II, a possible procedure). Some brief results will be presented following the extracts. Thereafter I will present the emerging mapping method.

Extract I, reconstructing a workshop

Building 152 was originally excavated and categorized as a "small house" a possible workshop, the hearth dated to 1129–910 BC (Borna-Ahlkvist *et al*., 1998).

The house has a stone floor and contains a storage pit that is estimated to be able to hold at least 20 parcels of clay, each weighing 10 kg, (Figure 2: pit in the excavation plan). Figure 4 shows the estimation of the amount of clay stored, together with an estimation of the amount of textile that would have been required to wrap the clay parcels (Botwid, 2017, pp. 118-119).

The reconstruction of heat resistance in the building 152 relies on an archaeological experiment undertaken at Vitlycke in Tanumshede in 2014, where I had the opportunity to measure heat in and around a pit-firing in the hearth that was built in a reconstructed house of the same size as building 152. The firing of the ceramics went on for three hours, and the temperature measurements shows that firing ceramics indoors can be considered safe. (Fig. 2). This kind of indoor firing is preferable when firing smaller and higher-worth objects because the

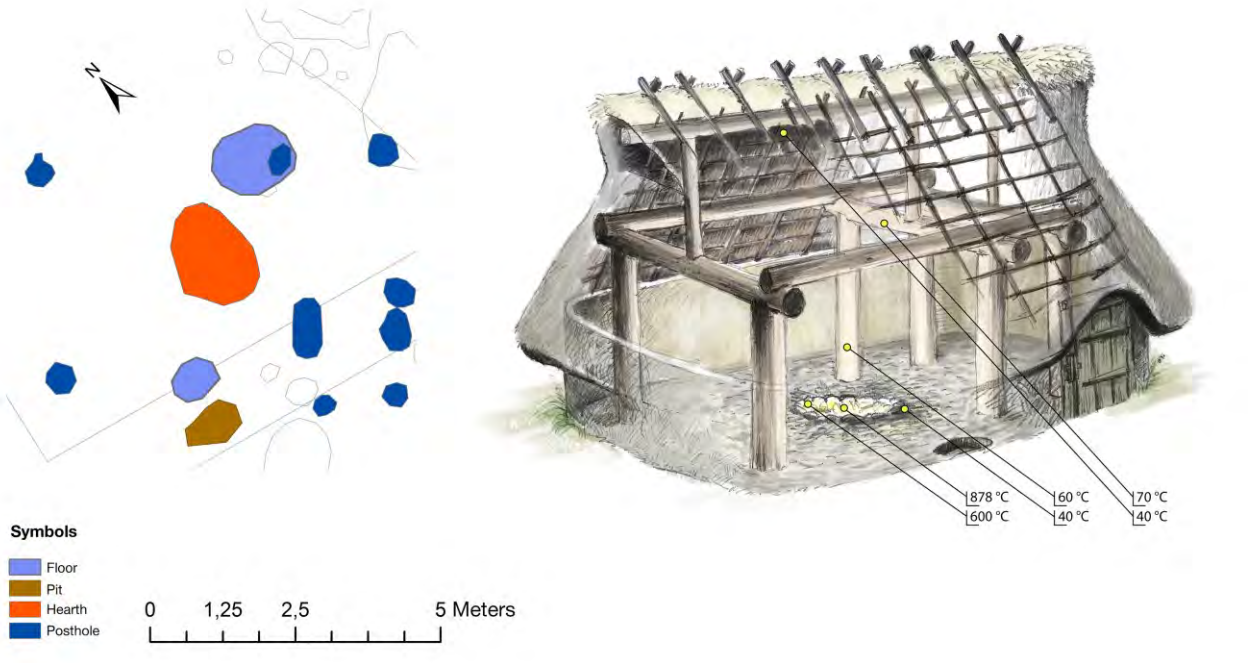

Figure 2. Using the excavation plan (left), building 152 is reconstructed as a crafting workshop (right). The measurement points (yellow dots) in the experiment at Vitlycke Open Air Museum are placed at the same distance as the distance between posts and hearth in the excavation plan of building 152 (Botwid 2017, p. 115). Illustration: Henning Cedmar Brandstedt.

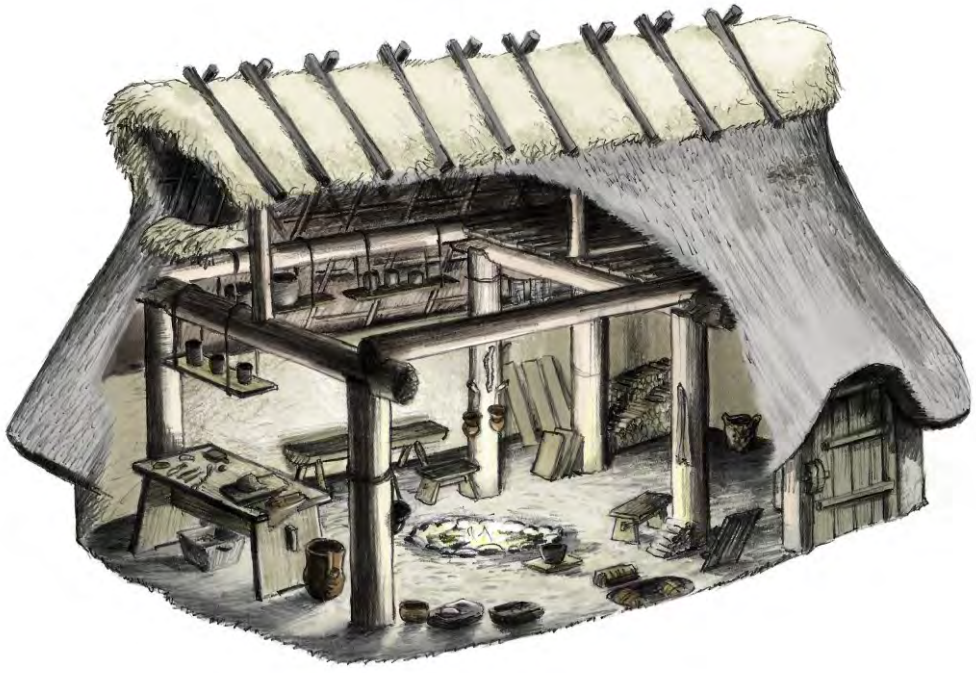

Figure 3. Building 152 is reconstructed and furnished as a possible workshop for ceramics (Botwid 2017, p. 117) Illustration: Henning Cedmar Brandstedt.

Approximation of the storage pit in building 152, interpreted as frost-free storage for prepared base clay wrapped in technical textile.		
Calculation of storage pit volume	*Amount of clay*	*Amount of reused textile*
Ø 90 cm average ⊥ 20 cm deep	0,5 $dm^3 \approx$ 1 kg normally tempered pottery clay	cloth needed to wrap a 10 kg parcel of clay ≈ 50 cm x 40 cm
≈ 127 dm^3	≈ 20 parcels at 10 kg each	≈ 8 m of 50 cm wide textile (4 m^2)

Figure 4. The storage pit in building 152 (area G in Pryssgården) interpreted as storage for maturing clay as parcels wrapped in reused textile during the winter season. Calculations in the figure showing the capacity of the pit, number of clay parcels possible and the proposed amount of technical textiles used to keep the clay parcels humid.

fire is easier to control due to the absence of the variables created by wind, rain or sun, and so the risk of a failed firing is lessened. Visual measurement of estimated heat (i.e., that determined by eye) is easier to do in a darker room.

The temperature (in the experiment) was measured with a KIMO KIRAV 300 IR thermometer calculated and set for ceramics.

Extract II, clay making

Weather as a technological factor in craft is to my knowledge somewhat under-investigated in field archaeology. A great contribution and relevant references can be found in Dean Arnold's book *Ceramic theory and cultural process* (1985, pp. 61–98), in which the field archaeologist can find the information relevant to the specific type of society and climate zone in their case. To contribute to developing the discussions on this important aspect I will go through the various stages of the procedure of making clay: weathering – adding temper– mixing – maturing – storing, that are visible in the archaeological record, and thereby I hope to enhance the visualization of ceramic technology in a Swedish context. To understand the whole process and the "chaînes opératoires" of ceramic technologies in an anthropological context, see Roux (2019).

It should be possible to detect the technical preparations of the raw material, and these are often connected to activity areas excavated at archaeological excavations.

In the clay-making process, good-quality clay suitable for ceramic production is required to ensure that production is successful (Hamer & Hamer 2004, p. 387; Roux, 2019, pp. 30–-31). To collect the clay, a pit is dug into the clay bed. When excavated archaeologically, these pits usually have a rounded profile, and the walls of the pit will be soft, flat and smooth, and "fatty" to the touch (if the wall is damp).The clay is preferably dug up late in the summer when the ground isn't waterlogged. After this, the clay is spread out in a 10- to 20-cm-thick layer in a pit dug into the ground (Figure 5 A). Sometimes the bottom of the pit is lined with stones, or if possible, the pit is dug in sandy ground, preferably near the

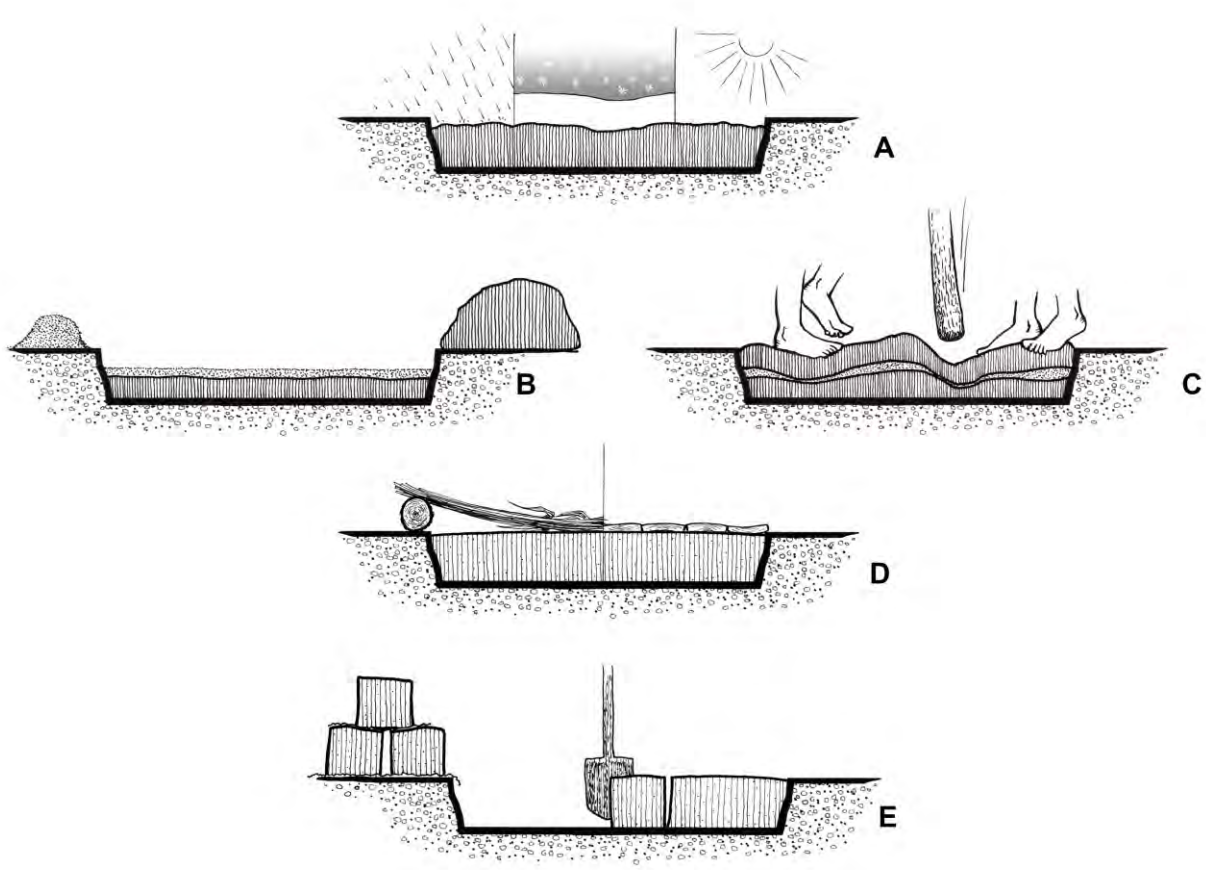

Figure 5. A, Weathering raw clay, B, Preparing the clay body, C, Mixing the clay, D, Maturing the clay, E, Dividing the clay. Illustration: Henning Cedmar Brandstedt

workshop. The shallow pits vary considerably in size, ranging between 2 to 5 m in length and 1 to 2 m in width. The larger pits would hold up to a ton of wet clay. The clay is watered by autumn rain and frost (Botwid, 2016, Appendix, pp. 126–131), which separates the clay particles (for warmer climates, see Roux 2019, p. 31 fig 2.6a). When the spring warmth dries up the excess water, the clay is "weathered" and fragmented, ready for the next stage.

The clay is now crumbly, which makes mixing in the basic temper easier (Figure 5 B). Half the clay is removed from the pit, then carefully chosen sand is spread out in a layer over the clay left in the pit, and the sand is then covered with the rest of the clay. About 20% of the volume consists of sand; the added amount can vary somewhat depending on the natural amount of sand in the clay. The clay and sand is mixed by treading on it and/or stamping it with a club or similar tool to obtain as homogenized a mass as possible (see Figure 5 C).

The smooth clay is allowed to rest in the pit and mature for several weeks. At this point it is protected from rain or drying out, perhaps by boards or mats woven from reeds being placed over the pit. Before the clay is divided up into suitable parcels for storing, it is tested by rolling out a coil and making a knot. The clay should be plastic but not too "fat"—if it is, more sand can be added. This test (Hamer & Hamer, 2004, p. 387) is made throughout the tempering process. If the clay is "short", the clay breaks before the knot can be completed,

indicating that this clay is not suitable for ceramic forming but may be preferred for other uses.

The next step is to divide the basic clay into chunks suitable to be carried and stored. Several households can take their shares and store them in a temperature-controlled (to avoid both frost and moisture) storage pit, as in buildings such as building 152 and 172 at Pryssgården (Botwid, 2017, pp. 86–91). In three of four late bronze age buildings at Köpingebro clay parcels with textile imprints where found (Tesch, 1993, p. 138, 165). The clay parcel wrapped up in cloth can be sprinkled regularly with water to keep it moist while in storage. For textiles supporting another craft, in this case ceramics, I propose the term *technical* textiles. In ceramic craft reused textiles will suffice. (see Figure 4: estimated amount of clay and textile in the storage pit of building 152 at Pryssgården). If the clay dries out or freezes, the whole procedure must be re-done. Maturing clay is a technology encountered in many contemporary traditions, and can last from days, to weeks, months and years, up to one hundred years in Japan (Roux, 2019). The possibility of archaeological traces of storage in frost-free cellars should be taken into consideration.

The making of a clay body

The basic clay body requires further preparation before ceramics can be made from it. The first stage is the mixing-in of additional temper. For large vessels, the temper can be very coarse with small pieces of brittle stone up to 1 cm in diameter, such as are visible in Pryssgården sherds. (Botwid, 2017). This extremely coarse temper is good for pots which must tolerate considerable changes in temperature, but can also be a choice made when producing vessels of large size. For medium-coarse, smaller pots for cooking, one often sees a considerably more sandy consistency in the temper, where brittle stone is ground down with a grinding stone. Sometimes the artisan chooses to add crushed, already fired clay (chamotte) in the clay to be used for small and medium-sized vessels. Chamotte seems to be added in the amount of between 10–20% (Roux, 2019, p. 35) and mixing with additional fine sand (often sourced from river or stream mouths or the beach) up to 40% (Botwid, 2017, p. 129). Different kinds of temper can also be mixed with each other to achieve, for example, very heat-tolerant technical ceramics (Arnold, 1985, p. 29). The choice of temper is one of the parameters that can be tracked over time: different artisans can have different backgrounds and thus choose very different tempers. In these cases, even though the mineral content of the clay in the ceramics does not differ from the local clays, one should be able to identify an unusual technical craft knowledge, which most likely means that certain vessels were made in a non-local tradition.

When starting to form objects, the clay parcel is first divided into several pieces, which are kneaded, and additional temper is added according to need. Thereafter they are pinched or built up with the paddle and anvil method (Hamer & Hamer, 2004, pp. 116, 251). The mix of temper can be a clue to discerning unusual technologies (Botwid, 2017, 70–73).

Summary interpretations of ceramic craft at Fiskeby and Pryssgården

This will be a very brief presentation of early results from the artisanal interpretation at Fiskeby 2016 (Petersson, in press) and Pryssgården I and II (Sjölin, 2019). What is already shown is that there is workable and very rich fatty clay in the area of Fiskeby (over the whole area), and that this clay is easily accessible and can be used for pottery. However, the excavations from 1993–1994 (Borna-Ahlkvist *et al*., 1998) were unable to show where in the area extraction of clay was undertaken. There are Late Bronze Age

Figure 6. Two examples of minerals gathered from the excavation at Fiskeby in 2016. From left; mica used to decorate or temper clay to enhance a shimmery surface on small cups or vessels; haematite (non-magnetic iron mineral) that can be used, for example, to enhance reddish colour in engobes, for painting or for make-up. Photo: Katarina Botwid.

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buildings at the Fiskeby site (Petersson, in press) and as it is situated close to Pryssgården, there is no doubt that Fiskeby was at least one of the rich prehistoric clay sources that was used in this area. The Bronze Age ceramics from Fiskeby (Petersson, in press) have a very similar character and bear evidence of the same techniques as those from Pryssgården (Botwid, 2017), and the clay procedure does not seem to have differed at all between the two sites.

Finds of particular minerals are interesting when interpreting ceramic artefacts (Petersson, in press). Some clay pots have been tempered with high proportions of mica (Figure 6, on the left). The mica is interpreted to be collected from elsewhere. It was then crushed and mixed with a clay slurry used to give vessels a decorative effect that reflects light from the sun or from fire.

The haematite can be used for many purposes, some of which are shown in Figure 6: make-up, painting and engobe (coloured fine-grained clay). The inclusion of this material in the ceramic craft repertoire hence show variation and specialization. By broadening the materials studied in the analyses of ceramic craft, new interpretations can be forwarded concerning the variety of raw material utilization and artisanal knowledge.

Attempt to formalize the method of mapping

Mapping artisanal knowledge is an interactive method to observe craft-related finds. It is used to visualize and verbalize technologies used to gather information important for enhancing the number of findings available for later interpretations. Using the experience from co-operation with field archaeologists over the years, I have found that it is possible to interpret artisanal activities using the results from contract archaeology. The goal here was to introduce the artisanal perspective in collaboration with the excavation team, and this has been explored on excavations carried out by Arkeologerna Linköping between 2016–2019. Testing observations based on extracts of my artisanal research showed that new categories of findings were recognized, and researchers, artisans and field archaeologists alike experienced a new way of enhancing the interpretations of the so-called activity areas.

Further, defining craft keywords together with an expert or experienced craftsperson clarifies the complex layers of a craft—and by extension what connections to look for.

Figure 7 describes the four main elements of the ceramic craft, with accompanying ceramic

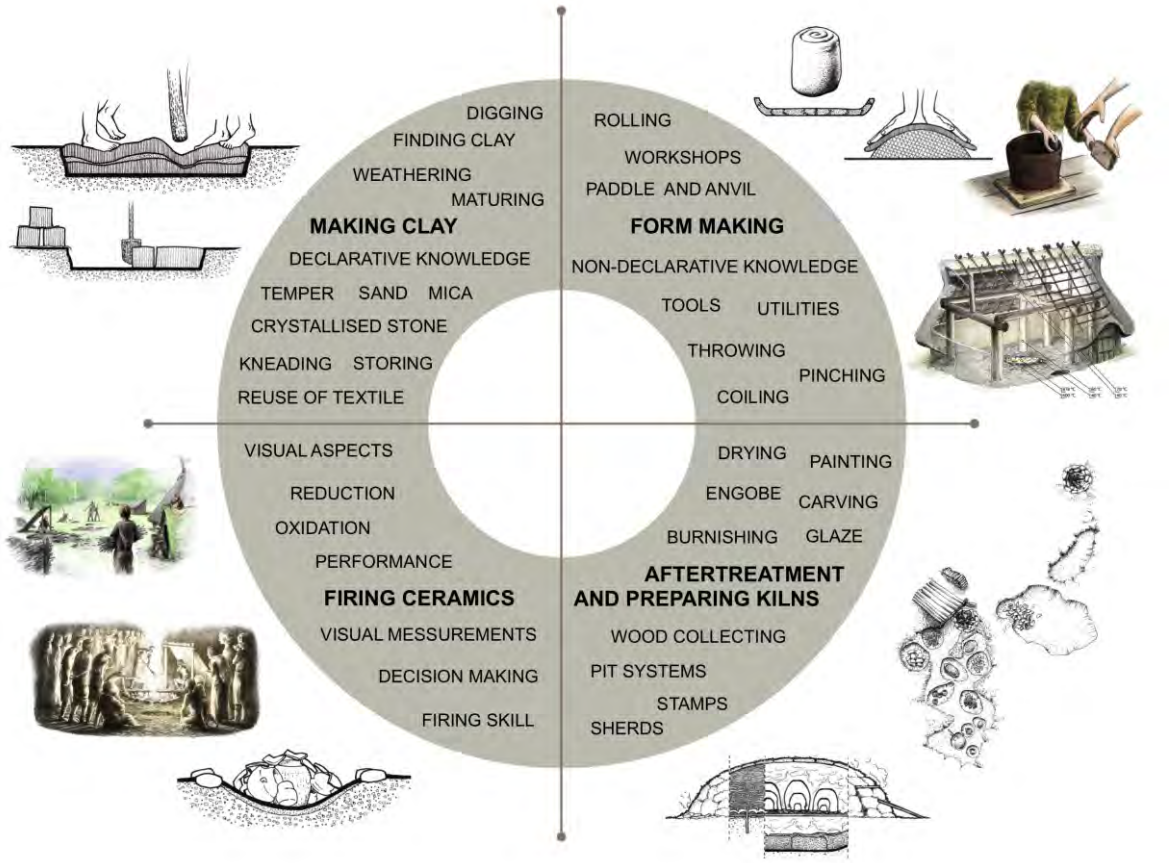

Figure 7. The artisanal wheel visualizes different aspects of (in this case) ceramic crafting at a site. The keywords are connected to four main crafting elements: making clay, form making, firing, and after-treatment. Illustration: Henning Cedmar Brandstedt.

terms: making the clay body, forming the object, after-treatment, and firing. The clay body should preferably be mixed to suit the object. The object has to dry in different stages according to how it is to be decorated or painted. Preparing kilns is also a part of this stage. The last stage is firing: turning clay into ceramics. For anthropological observations of ceramic technologies, see e.g., Arnold (1985) and Roux (2019); for contemporary traditionaland modern ceramic techniques, *The potter's dictionary* by Hamer and Hamer (2004) is very useful.

To a craftsperson, in this case a ceramist, every keyword can be associated with required conditions, specific tools, and collective or specialized actions (for a short glossary of ceramic terms, see Botwid, 2017, p. 153 and Appendix, p. 145). When dealing with other crafts this way of mapping will show similar patterns but with other concepts, tools, techniques, and materials.

Discussion and conclusions

To understand the artisanal universe, the archaeologists analysing artisanal remains found in the archaeological record will often also have an interest comprising evaluation of skills, technologies, cognition, evolution, social relations, religion, senses, embodied knowledge, materials, science, intra-disciplinarity, and cross-cultural research. It is

a wide, open area and, as presented earlier, hard to grasp. The prehistoric craft environment appears in activity areas recorded on archaeological sites, but it can be challenging to interpret. In an attempt to increase artisanal interaction within archaeology I have presented easily accessible methodological tools. The artisanal wheel (Figure 7) is a tool for untangling the rich artisanal language, meanings and objects, in this case from the ceramic craft. This mapping of keywords hopefully offers a way to share craft knowledge and create new artisanal glossaries for use in archaeology. In this presentation contract archaeology is highlighted as a fruitful field for this research, e.g., by asking questions about artisanal activity areas in preparation for excavation. Co-operation between contract archaeology and academia is still mostly a question of sending samples of charcoal, or trying new scientific methods that produce evidence that can be displayed in diagrams. These routines have become commonplace, and it is a passable way to work because we are used to it. New categories are seldom recognized, and the diversity of artisanal residues is seldom discussed. The artisanal interpretations of ceramics from Pryssgården (Botwid, 2016; 2017), have been guiding the collection of haematite, mica, quartz, and clay of different colours from the recent excavations near the Pryssgården site (Pryssgårdsparken II, 2019 and Fiskeby 2016), which will enrich interpretations of the ceramic knowledge and activities in the prehistoric community of ceramic artisans (examples in Figure 6).

Collecting craft-related raw materials helps to give a more complex view of the prehistoric artisanal knowledge at a site. It is possible to understand preferences of the raw material at hand and to examine if there are minerals obtained from more distant natural resources, and therefore consider if some technologies seem to have originated with other artisanal communities. Going "back to the material" allows reinterpretation and also prompts insights for new knowledge and steps forward. One can also understand "how clay makes the maker" in the special relation between the artisan and his or her raw materials, how artisans can learn how to master and how to fail in their understanding of the process of making clay (for detailed information, see Roux, 2019, pp. 33–43). The more skilled the artisans, the more different techniques can be seen among the materials and residues found on site. Ceramic and clay is crucial for everyday life in Bronze Age contexts. Finding and evaluating raw material, usable for buildings, kilns and hearths, technical ceramics as tuyères and crucibles, for cooking and storing pots, and for status objects, is a part of forming the full picture of the community. Finding additional information about artisanal knowledge from ancient contexts gives an insight into the daily life of the prehistoric artisan. Interpretations can be executed in a similar way as when interpreting husbandry and organized grazing (Petersson, 2006). Categories such as craft-related materials could help archaeologists to see the pattern of areas that often seem to be out of focus and hard to understand. Furthermore, an understanding of materials and craft processes, through interdisciplinary projects and collaborations between artisans and archaeologists, is starting to assert itself. Many contemporary artisans have a great interest in archaeology and artefacts and work with reconstructions or products for museums with contemporary or ancient techniques.

Therefore, it is important to consider the collaborations with contemporary artisans and find the suitable artisanal knowledge for the task. Interdisciplinary archaeologists/artisans are often familiar with or connected to networks of artisans and can help archaeologists to find the appropriate expert.

To summarize, the combination of artisanal knowledge and archaeology can bring new knowledge into interpretations of the Bronze Age communities. By opening up to collaboration between artisanal research and the contract excavation units, archaeology gains benefits from both discourses. The aim

of the National History Museum is *"to conduct modern and effective archaeology with high scientific ambitions and rational methods"* (arkeologerna.com/about us/2021), which makes the artisanal research dependent on further development to meet the standards and needs of modern contract archaeology.

This contribution is an attempt to show how artisanal research, adopted and exemplified in contract archaeology, creates new directions in the effort to enhance interdisciplinary knowledge.

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References

Arnold, D. E. 1985. *Ceramic theory and cultural process*. Cambridge: Cambridge University Press.

Bergerbrant, S. 2007. *Bronze Age identities: costume, conflict and contact in northern Europe 1600–1300 BC*. Ph.D. thesis, Stockholm University.

Borna-Ahlkvist, H., Lindgren-Hertz, L., & Stålbom, U. 1998. *Pryssgården. Från stenålder till medeltid. Slutundersökning RAÄ 166 och 167, Östra Eneby socken, Norrköpings kommun, Östergötland*. UV Linköping rapport 1998:13.

Botwid, K. 2009a. *Från Skärva till helhet–keramisk hantverkskunskap som redskap för djupare förståelse av artefakter och arkeologisk kontext* [From sherd to whole (pot)–ceramic artisanal knowledge as tool for in-depth understanding concerning artefacts and archaeological context]. B.A. thesis, University of Gotland.

Botwid, K. 2009b. *Offrad keramik–mossfynd från romersk järnålder i Käringsjön i Halland* [Offered ceramics—tarn findings from Roman Iron Age (Sweden 200–400AD) in Käringsjön (women's lake) in Halland parish]. M.A. thesis, University of Gotland.

Botwid, K. 2013. Evaluation of ceramics: professional artisanship as a tool for archaeological interpretation. *Journal of Nordic Archaeological Science* 18: 31–44.

Botwid, K. 2014a. Från hand till hand–arkeologisk forskning ur ett hantverksperspektiv. In: *Att befolka det förflutna: fem artiklar om hur vi kan synliggöra människan och hennes handlingar i arkeologiskt material*. (pp. 55–71). Carlie, A. (ed.). Kalmar: Riksantikvarieämbetet.

Botwid, K. 2014b. Bilaga 9. Hantverkstolkning av keramik—en undersökning av forntida keramikers hantverksskicklighet. (pp. 223–246). In: *Gustavslund. En by från äldre järnålder. Skåne, Helsingborgs stad, Husensjö 9:25 (Gustavslund), RAÄ 184.* Aspeborg, H. (Ed.). Arkeologisk undersökning 2010. UV Rapport: 2014:132.

Botwid, K. 2016. *The artisanal perspective in action: archaeology in practice*. Ph.D. thesis, Lund University. http://lup.lub.lu.se/record/859.

Botwid, K. 2017. *Understanding Bronze Age life: Pryssgården (LBA) in Sweden from an artisanal perspective*. Lund: Institute of Archaeology and Ancient History.

Botwid, K. 2020. Skill in high-temperature crafts: an artisanal perspective on fire. In: *Detecting and explaining technological innovation in prehistory* (pp. 231–246). Spataro, M. & Furholt, M. (eds.). Leiden: Sidestone Press.

Botwid, K. 2022. Craft Knowledge in the Service of Archaeology: Tracing Skill, Knowledge and Invisible Tools. In :*Craft Sciences* (pp. 248–68). Westerlund, T., Growth, C. & Almevik, G. (eds.). Acta Universitatis Gothoburgensis, Gothernburg studies in conservation 53, University of Gothenburg: Kriterium.

Botwid, K. & Eklöv Petterson, P. 2016. Use traces on crucibles and tuyères? An archaeological experiment in ancient metallurgy. In: *Prehistoric pottery across the Baltic: regions, influences and methods* (pp. 21–28). Eklöv Pettersson, P. (ed.). British Archaeological Reports, International Series S2785. Oxford: British Archaeological Reports Ltd.

Budden, S. 2008. *Skill amongst the sherds: understanding the role of skill in the early to late Middle Bronze Age in Hungary*. Oxford: Archaeopress.

Budden, S. & Sofaer, J. 2009. Non-discursive knowledge and the construction of identity potters, potting and performance at the Bronze Age tell of Szlzhalombatta, Hungary. *Cambridge Archaeological Journal* 19: 203–220.

Dissanayake, E. 2019. What Art Is and What Art Does: An Overview of Contemporary Evolutionary Hypotheses (pp. 1-14). In: *Evolutionary and Neurocognitive Approaches to Aesthetics, Creativity and the Arts*. Martindale, C. (Ed.). New York: Routledge.

Freestone, I. & Gaimster, D. R. M. (eds.). 1997. *Pottery in the making: world ceramic traditions*. London: British Museum Press.

Gärdenfors, P. & Högberg, A. 2015. Evolutionary mechanisms of teaching. *Behavioral and Brain Sciences* 38, e41.

Gustavsson, B. 2002. *Vad är kunskap? En diskussion om praktisk och teoretisk kunskap* [What is knowledge? A discussion about practical and theoretical knowledge]. Stockholm: Statens skolverk.

Hamer, F. & Hamer, J. (2004). *The potter's dictionary of materials and techniques*. 5th ed. Philadelphia: University of Pennsylvania Press.

Heitz, C. & Stapfer, R. (eds.). 2017. *Mobility and pottery production: archaeological and anthropological perspectives*. Leiden: Sidestone Press.

Hodder, I. 1982. *Symbols in action: ethnoarchaeological studies of material culture*. Cambridge: Cambridge University Press.

Jensen, A G. 1917. Jydepotten-vort lands ældste haandværk. København. Levin & Munksgaards forlag

Kuijpers, M. 2013. The sounds of fire, taste of copper, feel of bronze, and colours of the cast: sensory aspects of metalworking technology. In: *Embodied knowledge: perspectives on belief and technology* (pp. 137–150). Stig Sørensen, M. L. & Rebay-Salisbury, K. (eds.). Oxford: Oxbow.

Kuijpers, M. 2018. The Bronze Age, a world of specialists? Metalwork from the perspective of skill and material specialisation. *European Journal of Archaeology* 21 (4): 550–571.

Lave, J. 2011. *Apprenticeship in critical ethnographic practice*. Chicago: University of Chicago Press.

Lynggaard, F. 1972. *Jydepotter & ildgrave*. Copenhagen: Clausens forlag.

Marchand, T. H. (2010). Embodied cognition and communication: studies with British fine woodworkers. *Journal of the Royal Anthropological Institute, 16*, pp. 100-120.

Molander, B. 1996. *Kunskap i handling* [Knowledge in action]. Gothenburg: Daidalos.

Niedderer, K. & Townsend, K. 2014. Designing craft research: joining emotion and knowledge. *The Design Journal* 17 (4): 624–647. DOI 10.2752/175630614X14056185480221

Nørgaard, H. W. 2018. *Bronze Age metalwork: techniques and traditions in the Nordic Bronze Age 1500–1100 BC*. Oxford: Archaeopress.

Petersson, M. 2006. *Djurhållning och betesdrift: djur, människor och landskap i västra Östergötland under yngre bronsålder och äldre järnålder*. PhD thesis. Uppsala: Uppsala University.

Petersson, M. (in press). *Fiskeby-gårdar och grophus från äldre järnålder*. Stockholm: Arkeologerna, Statens historiska museer.

Polanyi, M. 1966 .*The Tacit Dimension*. New York: Doubleday.

Pye, D. 1978. *The nature and art of workmanship*. rev. ed. London: Herbert Press.

Roux, V. 2019. *Ceramics and society: a technological approach to archaeological assemblages*. In collaboration with Courty, M. A. Cham: Springer.

Sjölin, M. (ed.). 2019. *Pryssgården II mellan Östra stambanan och E4: arkeologisk förundersökning: Östergötland län, Östergötland, Norrköpings kommun, Östra Eneby socken, Pryssgården 1:1, 1:13, Östra Eneby 178:1 (L2009:5959), Norrköping 339 (L2008:2266) och Norrköping 450 (L2008:8327)*. Stockholm: Arkeologerna, Statens historiska museer.

Sörman, A. 2018. *Gjutningens arenor: metallhantverkets rumsliga, sociala och politiska organisation i södra Skandinavien under bronsåldern*. Ph.D. thesis, Stockholm University.

Sperling, U. 2016. Bronze Age connections across the Baltic Sea. Discussing metalwork as source of maritime contacts in prehistory. In: *Marine ventures—archaeological perspectives on human-sea relations* (pp. 399–416). Bjerck, H. B., Breivik, H. M., Fretheim, S. E., Piana, E. L., Tivoli, A. M., Zangrando, A. F. J. & Skar, B. (eds.). Sheffield: Equinox Publishing.

Sperling, U. 2019. Bronze casting debris in settlements and within dwellings. Revisiting a frequent phenomenon with the case of Asva (Estonia). Conference paper given at the 15th Nordic Bronze Age Symposium (NBAS), Lund University 2019.

Tesch, S. (1993). *Houses, Farmsteads, and Long-term Change: A Regional Study of Prehistoric Settlements in the Köpinge Area, in Scania, Southern Sweden*. Ph.D. thesis. Department of Archaeology, Uppsala University.

Vincentelli, M. 2003. *Women potters: transforming traditions*. New Brunswick, New Jersey: Rutgers University Press.

Internet references

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The stoniness of stone

Some notes on rock art and epic poetry

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Abstract

This paper argues that rock art had the capacity to preserve narratives and aid storytelling. Oral recitation of, among other things, epic poetry is likely to have been part of the diverse practices surrounding Bronze Age rock art. My take is inspired by the new narrative turn in rock art studies, and especially, semiotic approaches. In order to show how the materiality and temporality of a rock art panel may add substance to narrative structure, I will revisit and reinterpret the iconic Fossum panel in Tanum, Sweden. A comparison is made with much later rock-carving practices: Iron Age and medieval picture stones. On this basis, and stressing similarities in narrative technique, I highlight commemoration and retrospection as keys to understanding the Fossum panel.

Keywords: Rock art, narrative, commemoration, temporality, archaeological comparison

How could complex narratives be communicated through something as hard and inflexible as rock? The medium itself—the rock face—has been at the fore of much attention in rock art studies; increasingly so with new studies focusing on the materiality of the rock, and the gradual development of image compositions. Does this imply that there was no message, and no stories to be conveyed or discovered? In favour of continued research on the communicative and narrative aspects of rock art, this article calls for a return to so-called "thick" descriptions, as coined by Clifford Geertz (1973), or, in other words, an interpretative turn, where the many webs of meaning created by the people engaged in the production of rock art are part of the interpretation. The flourishing and many-faceted field of rock art research in Scandinavia is today both theory-driven and methodologically advanced. Adding to ongoing discussions, I will maintain that symbols and metaphors are important discursive phenomena, and that by combining the insights gained from new materiality studies with interpretations of visual narrative, thicker descriptions can be attained.

In this paper, I apply a comparative approach, where later commemorative practices, rune and picture stone traditions are used as templates for understanding how visual and oral narratives could mutually inform each other in the Bronze Age. Clearly, rock art communication was structured by the medium itself, its limitations, but also the inherent persistence and durability of the bedrock. This is the "the stoniness of stone", as Tim Ingold once expressed it, in a comment on Christopher Tilley's book The materiality of stone (Ingold, 2005, 2007, p. 13). As pointed out by philosopher Irene Klaver (2001), although stone is involved in shifting relations of meaning, it is prone to be taken for granted as the silent witness of past times, and a reference to the absent other. Therefore, the materiality of stone predisposes cultural practices aimed at commemoration, such as, for example, inscriptions or rock art (Klaver, 2001, pp. 178–179). However, unlike the stone, petroglyphs had to be renewed to last

beyond generations; to be "switched on" (Wahlgren, 2004), and both during processes of renewal and through intentional modification, the significance of the images was altered and their connotations reconstituted.

Narrativity was originally a term coined in literature studies to specify genres with a narrator, i.e., epic poetry as opposed to other forms of storytelling, but was soon extended to cover other written genres, and also nonverbal, visual articulations and a whole range of modes within them (Ryan, 1992). This article will address narrativity in the original sense, focusing on oral recitation. Although focus will be on the techniques that enabled carvers to communicate in and through a notoriously hard medium, expressing complex messages with the help of an economy of signs, the paper tries to combine a narrative approach with an understanding of material, topographic and temporal dimensions of rock art panels.

Trends in rock art research

Two dominant strands of thought can be found in rock art scholarship in Scandinavia: practice-oriented perspectives and message-oriented perspectives, and with an underlying dichotomy between materiality and representation, ritual and myth (as pointed out by e.g., Goldhahn *et al*., 2010b; Ljunge, 2010). Studies of microstructure and the introduction of new and sophisticated 3D documentation techniques revealing that many panels were altered through time, have significantly challenged the idea of a message, and reinforced the first strand (e.g., Horn & Potter, 2018). The evolving archaeological literature on visual culture has tended to focus on what images do rather than what they were intended to depict (e.g., Back Danielsson *et al*., 2012). In line with this, the ambiguity of many motifs is taken as an indication that rock art images were meant to affect the world rather than to represent it (e.g., Wahlgren, 2002, p. 182; Goldhahn, 2010; Nimura, 2016, p. 129; Fahlander, 2019a, 2020; Horn & Potter, 2020; Jones, 2020).

The other strand of thought, while not necessarily arguing against the first, goes in favour of seeing rock art as a way of communicating core values and stories (e.g., Nordbladh, 1978; Goldhahn, 1999, pp. 164–170; Fredell, 2003, pp. 213–217; Gjerde, 2010, pp. 115–119; Ling & Cornell, 2010; Helskog, 2012; Fuglestvedt, 2018). On the basis of art theory and semiotics, a number of scholars have recently maintained that rock art scenes can be interpreted as *representing* narratives (e.g., Skoglund, 2010; Ranta *et al*., 2019, 2020; Rédei *et al*., 2019, 2020; Robb, 2020; see, however, critique by Fahlander 2019b). Importantly, Ranta and co-authors (2019) identified three levels of narrativity in rock art: single events, stories, and master-narratives. This ties into previous attempts at identifying images, themes or scenes in Bronze Age rock art that may be connected to larger narratives or myths. Fredell (2003), for instance, described the narrative structure of Bronze Age rock art as episodic, meaning that complex stories could be expressed through a few, important events (cf. also Wahlgren, 2002, pp. 201–202; Kristiansen, 2010). She understood rock art images as *mimesis* (imitation) and memory work, and as a material form of storytelling similar to oral traditions, based on repetition, metonyms and gestures.

The renewed interest in narrative, myth and storytelling in Scandinavian Bronze Age rock art studies seems to have arisen from collaboration between researchers crossing the chronological divide between northern and southern rock art traditions (see Goldhahn *et al*., 2010a; Ling *et al*., 2015; Stebergløkken *et al*., 2015; Skoglund *et al*., 2017). This trend taps into a wider, global discourse (e.g., Goldhahn, 2019a, 2019b; Nash & Mazel, 2019). In a fascinating study of Mesolithic rock art, Fuglestvedt (2018) argued that a key mythological element (*moteme*) was the visual thematization of the enigmatic and ontological

relationship between humans and big game. Fuglestvedt was clear, however, that rock art did not depict myth, but emerged from mythical thinking: "… they represent a different medium of the mythical mind, namely a figural and visual one. […] The stage of their origin is a rock panel, and the rhythm of its making is different from the one existing in an oral situation around the campfire." (Fuglestvedt, 2018, p. 85). Interestingly, Robb (2020) has argued that the European Bronze Age saw the birth of narrative art, and that macro-changes following the social and historical trajectories of the 3rd millennium BCE led to an increased focus on representation and narrative in rock art. Robb goes far in suggesting that this imagery may have referenced particular myths or stories, perhaps used by gendered age groups on certain occasions, to accompany oral storytelling.

Scope and aim

To create thick descriptions, all the elements which may have added significance to rock art should ideally be considered, including the socially embedded superstructure of symbols, metaphors and myth. By stressing the representational side of the images, I do not intend that the cultural significance of, or the human perception of the images or surrounding landscape features remained unchanged through time, or were unaffected by the eyes of the beholder. In my opinion, understanding rock art images as *mimesis* is compatible with at the same time seeing them as material, spatial and temporal phenomena (cf. Horn, 2019; Rédei *et al*., 2019; Horn & Potter, 2020; Robb, 2020).

Symbols are multivocal and ambiguous; this is why they work so well as identity markers and containers for ideology. Frequently occurring in Bronze Age rock art and other iconography are ambiguity (Fredell, 2003, p. 210; Fahlander, 2019a), partiality (Fahlander, 2020), and hybridity (Ahlqvist & Vandkilde, 2018; Skoglund *et al*., 2020). These and other means such as size (Horn, 2018), perspective (Karlenby, 2011, pp. 9–12) and stationary points (Janik, 2014) were used intentionally by carvers to create multiple layers of meaning. Shifting viewpoints may create surprising transformations as the motif changes and becomes something else (Rédi *et al*., 2020). Further, research into rock art narrative has demonstrated how images can function as associative fields where stories are created and recreated, and myths evolve and change (Fuglestvedt, 2018, pp. 174–175; Nyland & Stebergløkken, 2021).

In this text, building on the above-mentioned approaches to narrativity, I will focus on relationships between images and oral tradition, more precisely epic poetry. In order to explore possible interplays between images and poetry, I use archaeological comparison, and compare rock art narratology with Iron Age and medieval memorial art, understood as representing narratives. Moreover, these much later visual practices will serve as analogies for exploring Bronze Age commemorative practices.

Archaeological comparison

Although Bronze and Iron Age carving practices should not be treated as an unbroken tradition, it is clear that Bronze Age petroglyphs continued to attract attention during the Iron Age and in following times, and with some overlapping traits.[17] Evidence of continued use and veneration of Bronze Age rock art occurs as traces of Iron Age ritual connected to the panels (e.g., Johansen, 1979; Bengtsson & Ling, 2007; Bengtsson, 2010;

[17]An example of rock art most untypical for its time comes from Storhedder in Setesdal, Norway, where carvings exhibiting reindeer, an archer, horses, a lynx, a pentagram and runic inscriptions were cut into a block of stone and on the walls of a rock shelter during the medieval period (Hagen & Liestøl, 1947).

Nilsson, 2012, 2017). Himmelstalund in Norrköping, Sweden is a relevant instance. Here, a ship belonging to the Bronze Age tradition was later accompanied by a runic text (Nilsson, 2017, pp. 172–175). A similar situation occurs at Kårstad in Stryn, Norway, only here the boat images superimposed by runic inscriptions date to ca. 400 CE (Mandt, 2005). At Fuglie in Scania, Sweden, a Viking Age runic text was inscribed on a stone with cup marks of assumed Bronze Age date (Lund, 2020). Clearly, Iron Age visual culture had retrospective traits. This is seen in the choice of motifs, e.g., the Häggeby stone from Uppland, Sweden, ca. 500 CE, with a horse-fighting scene reminiscent of Bronze Age imagery (Kaliff & Oestigaard, 2018, p. 183). Also, motifs and iconographic schemes identified on Gotlandic picture stones have been understood as creating bonds to the distant Bronze Age (Andrén, 2014, pp. 136–139). A recurring motif is the left-sailing ship interpreted as the ship of death, and argued to pick up conventions from Bronze Age iconography. Depictions of sailing ships at Stora Hammers, vaguely similar to "fleets" of ships in Bronze Age rock art, have been used as an example of material culture traits, argued to indicate similarities in sociopolitical and ritual structure between the Bronze and Iron Ages (Glørstad & Melheim, 2016, pp. 98–99). Ranta and co-authors (2019) compared Bronze Age rock art scenes to the particular form of serial pictorial storytelling found on Viking Age tapestry. On this basis, I hold that the narrative techniques and the relationships between images and oral traditions identified in Iron Age scholarship can inform interpretations of Bronze Age rock art.

Aided by a local corpus of written sources, students of Viking Age and medieval iconography have been able to systematically analyse and comprehend how oral traditions were expressed in various rock media (Andrén, 2014, p. 118). In a groundbreaking study of Gotlandic picture stones, Andrén (1993) demonstrated how epic poetry could be transmitted into visual art in a quite orderly manner, while iconographic references to other forms of poetry, e.g., wisdom poetry, appeared as less stringent. Importantly, he argued that the images themselves could inspire the metaphors or kennings used in poetry.[18] Kennings are figurative expressions, often compounds, used in epic poetry to replace a noun or a name. In a later study of Viking Age rune stones, Andrén (2000) pointed out that design, text, image and location should be interpreted as coherent elements, which added significance to each other. He showed how iconographic elements like snakes and crosses were used to structure runic inscriptions, and added value to the texts (cf. also Zilmer, 2011). Moreover, students of rune stones have emphasized the role of the *thulr*, a reciter or a skald (Imer, 2016, p. 247), thus suggesting that oral recitations were part of the practices surrounding such monuments.

The often-complex relationship between text and image, myth and visual representation calls for stringent analysis, and a critical approach to the identification of, for instance, saga motifs (Liepe, 1989). Parallel to the use of new documentation techniques in rock art studies, a similar trend has led to refined interpretations of signs and compositions on

[18]This phenomenon, *ekphrasis*, is described in poems like *Húsdrápa* and *Haustlöng* (Andrén, 2020, p. 191). It also occurs in the legendary saga of St. Olaf, where the skald Thormodr is asked to compose verses about scenes on a wall-hanging (*Den Legendariske Olavssaga*, 2000, p. 69).

Figure 1. Stora Hammers I, Lärbro, Gotland, Sweden. Photo: Wikimedia Commons. CC BY-SA 4.0

picture and rune stones (e.g., Oehrl, 2012, 2019). The materiality of the stone and its position in the landscape are crucial in today's approaches. For example, Lund (2009, pp. 134–148) pointed out how the location of the runic inscription on the stone body related to established metaphors and cosmological concepts, for example, the significance of bridges, and, further, how both inscriptions and images were structured by the materiality of the stone (Lund, 2020). Commemoration is an important aspect in understandings of picture and rune stones (e.g., Zachrisson, 1994; Andrén, 2000; Sawyer, 2000). According to

Lund (2020), memorial stones served to (re-) establish social relations between the living, between the living and the dead, and also between the living and the landscape. Through the practice of raising such stones, she argued, links were created to recent and distant pasts (cf. Back Danielsson, 2015). While this could be a way of claiming rights to the land, raising a memorial also meant that the deceased individual and his/her kin were materialized in the stone body and the surrounding landscape (Lund, 2020).

Memory work and commemoration are thematized in interpretations of Bronze Age rock art in connection with burials (Goldhahn, 1999, 2009, 2012; Kaul, 2004, pp. 141–156; Oestigaard & Goldhahn, 2006; Johannsen, 2013). A case in point is the Early Bronze Age Kyrkje-Eide stele from Stryn, Norway, which is probably best interpreted as a memorial stone commemorating a dead or absent female (Engedal, 2010, p. 302).[19] However, the memorial aspect is seldom articulated in rock art studies per se (see, however, Goldhahn, 2014). Exceptions are Østmo (1997, 2017), who argued that rock art commemorated past (male) heroes and events, and Vandkilde (2013), who suggested that a hero cult involving worship and remembrance of dead ancestors may have occurred at rock art panels.

In this article, as part of a broader discussion of narrativity and commemoration, I will consider how remembrance and retrospection may be relevant for a renewed understanding of the Fossum panel. I will present three quite different case studies from the Viking Age and medieval period, which together offer comparative templates for the interpretation of Bronze Age rock art, its materiality and temporality, and linkages between art and poetry. The Stora Hammers site has produced four Viking Age picture stones with mythological scenes. Stora Hammers I has six panels with religious and martial imagery, including a sacrifice scene and a battle scene where a woman is standing between a longship manned with armed warriors, and another army (Figure 1). This scene, which is our focus here, is interpreted as alluding to the legend of Hildr Högnadóttir and the never-ending battle (Guðmundsdóttir, 2012). The Hildr legend was long-lived and widespread, documented in written sources in Germanic languages from the 7th through to the 14th centuries CE. The name Hildr occurs in skaldic poetry as part of kennings relating to battle. Hildr is mentioned in the prose Edda as well as several poems, e.g., *Voluspá*, as a woman capable of reviving dead warriors and as the personification of battle. Guðmundsdóttir (2012, p. 64) compared these kennings to visual images, and argued that some familiarity with the legend was a prerequisite for understanding the often minimalist iconography. Hildr is identified on another Gotlandic picture stone, Stenkyrka Smiss I, and on the wooden cart from the Oseberg burial, as well as on several tapestries from Norway. Mostly, Hildr depictions occur in funerary contexts, and show Hildr standing between a ship and a group of men. This scene was enough, Guðmundsdóttir argued, to evoke the whole story of Hildr. She also pointed out that a wolf is often present, a symbol for warriors or treachery, which may have aided the onlooker's identification of the Hildr myth.

Ramsundsberget in Eskilstuna, Sweden, dated to 1030 CE (Figure 2) is a rare instance of a commemorative runic inscription on an open-air panel. The text is accompanied by a depiction of the myth of Sigurd Fávnesbane, a Nordic version of the Germanic Siegfried myth, widely spread in Europe from the 5th century CE onwards. The Sigurd legend belongs to a myth cycle—the Volsung cycle—depicted on a large number of monuments in Scandinavia in the 11th—14th centuries CE, among these several pieces of church art from Norway and nine rune stones from Sweden (Liepe, 1989; Andrén, 2000).

[19]A more ambiguous example is the Villfara stone from Simris, but its exact location in the burial mound from where it derived is not known (Kaul, 2004, pp. 154–155; Johannsen, 2013; Skoglund, 2016).

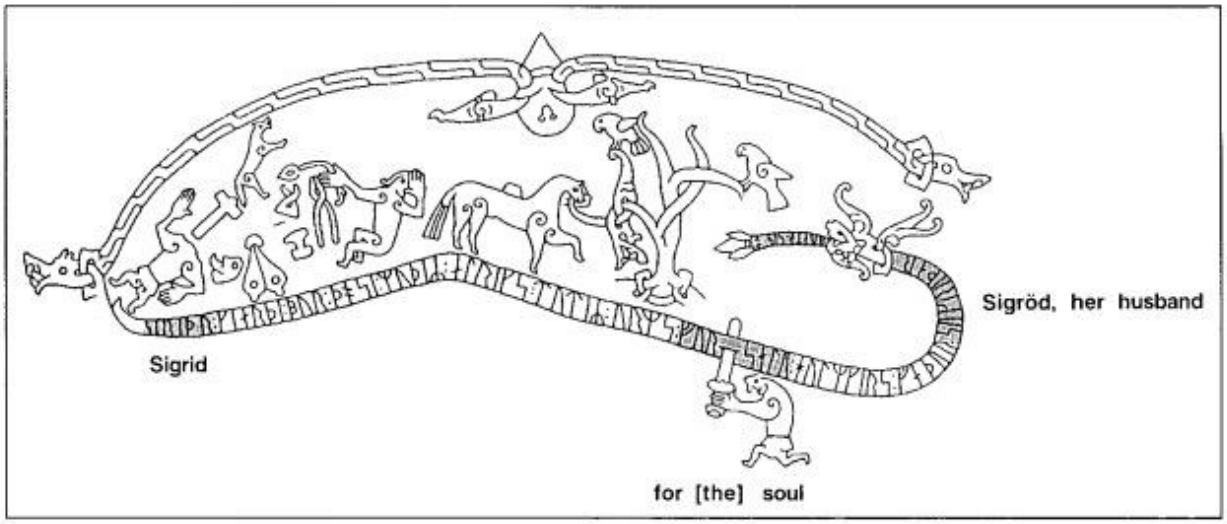

Fig. 9. Runic inscription at Ramsundsberget (Sö 101). This famous monument with illustrations of the Volsunga saga *is another example of the close relationship between text and image. On the basis of the images the partly obscure inscription can be interpreted as follows:*
"Sigrid, *Alrik's mother, Orm's daughter made this bridge* for [the] soul *of Holmger's father* Sigröd, her husband".

Figure 2. a (top). Rock carving panel, Ramsundsberget, Eskilstuna, Södermanland, Sweden. Photo: Wikimedia Commons. CC BY 5.0; b (bottom): Interpretation of the relationship between image and text on the Ramsund carving by Andrén (2000, Fig. 9).

The narrative structure of the Ramsund carving is episodic, and yet complex in respect of the order of events and time-space dimensions, which is non-linear. One scene shows a man sitting naked in front of a fire in a smithy and preparing a heart. Following the myth, this is Sigurd, the heart is the dragon Fafnir's, and the meal is intended for Sigurd's foster-father Regin. The second scene shows two birds sitting in a tree. According to the myth, the birds say that Regin will try to kill Sigurd, which causes Sigurd to cut off Regin's head. In a third scene, a decapitated man lies dead, and scattered around are smith's tools. According to the myth, the smith Regin reforged Sigurd's sword. A man sticking a sword into the dragon refers to the previous event when Sigurd killed Fafnir. A final scene shows Ótr, Regin's brother, in the shape of an otter, which brings us back to the saga's beginning. According to the Volsúnge saga, Ótr is killed by the gods and as a compensation his skin is filled with gold stolen from a dwarf, of which booty a ring plays a particularly dramatic role.

The runic text is ambiguous and has no apparent connection with the figurative narrative, but mentions a woman named Sigridr who commemorates a man called Sigröd, possibly her husband, by building a bridge for his soul. Against the idea that the text's connection to the legend of Sigurd was merely semantic, Andrén (2000, pp. 20–21) argued for a close connection between the text and the images, and that the choice of myth was motivated by Sigröd being a local variant of Sigurd. The narrative is framed by a band of dragons; its lower part embodying the runic text and creating an interplay between image and text. Sigurd thrusts his sword into the body of the dragon, thus dividing the text where it reads "for the soul". According to Andrén, this indicates that the Sigurd myth had blended with Christian ideas. Another interesting aspect is the connection between the carving and the Gök carving, made on a natural boulder a few miles from Ramsund. Based on a visual interpretation, Liepe (1989) argued that the Gök carving was connected to the story on the Ramsund carving, but showed a different and more dramatic part of the story, focused on the stolen golden ring.

A rune stone with biblical scenes from Dynna in Hadeland, Norway (Figure 3) is an example of memory work and retrospection during the transitory phase when Christianity gained ground in Scandinavia. The stone was erected during the first half of the 11th century CE on a burial mound in a ritual landscape with a long history of use (Lund, 2020). The artist used elements of the heathen commemorative tradition to express Christian values. The images on the front of the stone have been interpreted as showing the epiphany and scenes from the New Testament: the three wise men following the star to Bethlehem and the victorious Christ (Staecker, 2004; Steinsland, 2014). The reading of the images follows a prescribed form, from the bottom up. The translation of the Norse inscription reads: "Gunnvor, Trýdrik's daughter made a bridge in memory of Ástrídr, her daughter. She was the handiest maiden in Hadeland" (Spurkland, 2001, p. 105). Lund (2020, p. 10) pointed out that the spatial structuration of the inscription, one line in a band, follows a Christian scheme that found no parallels in previous rune stone traditions. She also drew attention to the fact that the name of the dead person, Astrid, is placed so high up that a visitor would be compelled to lift his/her head and look up to see it, thus introducing the concept of heaven in a very physical way.

The three examples showcase how complex narratives could be expressed in minimalist ways, with the help of an economy of signs, which must have required the viewer to have had background knowledge of the narrative, or, perhaps more likely, to be guided by a reciter. In all cases, the narratives had a long history of use, transmitted orally before being written down. The epiphany scene on the Dynna stone is a biblical myth of high age. The legends of Hildr and Sigurd belong to so-called mythological cycles widely spread across

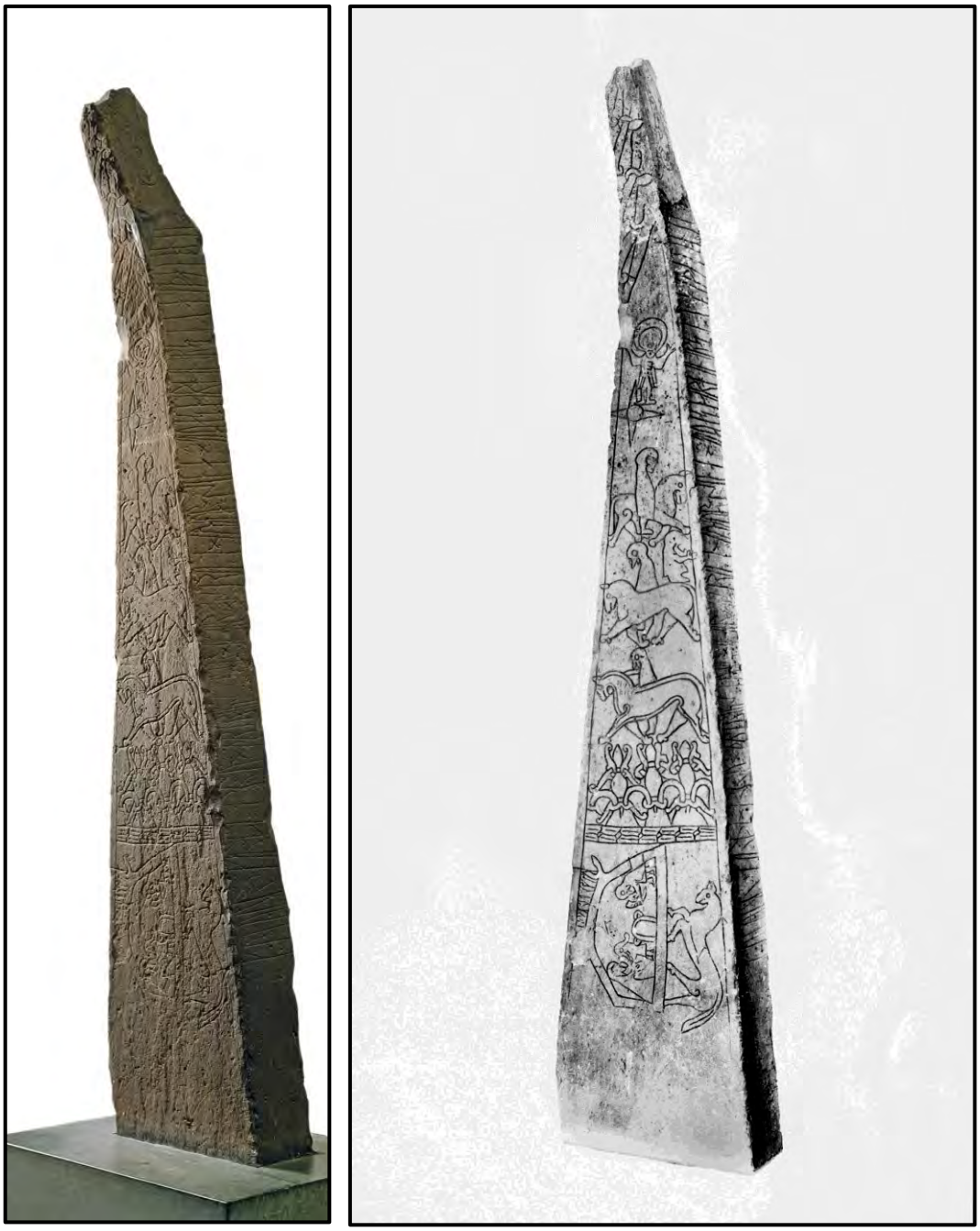

Figure 3. Memorial stone from Dynna, Innlandet, Norway. Photos: Museum of Cultural History. CC BY-SA 4.0

northern Europe, and with substantial time-depth. Both legends occur on commemorative monuments and religious artworks spanning almost a millennium. As on the later Dynna stone, at Stora Hammers I, the myth of Hildr and several other mythological scenes are presented in a strictly ordered manner, in rows. The Ramsund carving is on the other hand reminiscent of Bronze Age rock art in the way it unfolds on the panel in a non-linear manner and utilizes the topography of the bedrock, and how it makes use of cardinal directions. Also, the jumps in time and space are interesting, and seem to indicate that the story is repeating itself, or, that several *tempi* are presented as existing simultaneously

Discussion: revisiting the Fossum panel (Raä 255, Tanum, Sweden)

Following Ranta et al. (2019), I consider the Fossum panel to be a visual master-narrative with substantial time-depth. Despite being critical towards mythological interpretations of rock art, Kaul considered this panel a rare example of the solar myth inscribed in rock, as indicated i.e., through the sailing direction of the ships. He identified different tempi on the panel: the ritual present/the world of men vs. a mythical past/the world of heroes (Kaul 1998, pp. 265–268). While the ship images belong to periods IV–V, students of the Fossum panel have highlighted the archaic ceremonial axes and other gear (a palstave, scabbards and lures) which recall artefact types belonging in periods II–III of the Nordic Bronze Age (NBA) (Ling & Bertilsson, 2016). The depiction of old-fashioned weaponry to memorialize a heroic past would go well with a noted revival of NBA II shapes in NBA IV–V; for instance, as seen in wide-edged cultic axes resembling those from the Early Bronze Age.[20] But how is the 500-year difference in the dating of the axes and the ship images best explained?

With the help of new digital tools, Ling and Bertilsson (2016) were able to document that some motifs had been modified, and they argued on this basis that the panel was most probably two-phased: the armed humans were carved first, and the ships several hundred years later. Hence, they argued that the Fossum carving can no longer be read as a grand, cosmological narrative from a particular part of the Bronze Age. The deep lines may indicate that the carvings were engraved multiple times (cf. Goldhahn, 2013, p. 568). A third possibility therefore, which finds support in Ling and Bertilsson's observations, is that the panel was continuously modified and developed, as has been demonstrated to be the case for other rock art panels (Horn & Potter, 2018; Milstreu, 2018). These new observations add a new and intriguing dimension to previous interpretations seeing the imagery as a coherent story. Kaul's (1998, pp. 266–267) seminal reading of the panel presupposed that it was carved in one go, but he pointed out that the humans and the ships represented two different dimensions: the ritual reality of men vs. the mythological world of the ships. I will argue in the following that it is possible to sustain the idea of a coherent epic narrative, in the shape it had during NBA IV–V, but emerging from the much older narrative carved in NBA II–III.

In a previous article (Melheim, 2013), I tested out a two-stage interpretation of the panel aimed at identifying myth themes, starting with an analysis of images and narrative structure, before seeking parallels in myth topics known from later, written sources (cf. Fredell & García Quintela 2009, 2010). Since the nascence of rock art studies in Scandinavia, various texts, both historical and ethnographic, have been utilized in order to try to explain rock art and reach absolute interpretations (as summed up excellently by Goldhahn et al., 2010b, pp. 7–14). Being aware of the pitfalls of such direct comparison, my aim was a context-based reading of the panel, where written sources contemporary to the rock carvings were used as relational analogies in order to further detail possible interpretations.

Karlenby (2011, pp. 9–11, 270–271) read the Fossum panel (Figure 4) as a narrative about three gods or heroes (cf. Melheim, 2004). Others have identified the male figures occurring at the Fossum panel as the "Divine Twins" (Østmo, 1997; Kaul 2004, pp. 80, 345; Kristiansen, 2010). The so-called Divine Twins appear under various names in a myth corpus which was shared across a large part of the Bronze Age world, and in areas as wide

[20] For instance, the unique large ceremonial axe found at Kallerup, Thy, Jutland and dating to ca. 1000 BCE or NBA IV (http://museumthy.dk/nyheder/kallerupfundet.aspx) can be seen as replicating earlier axe types.

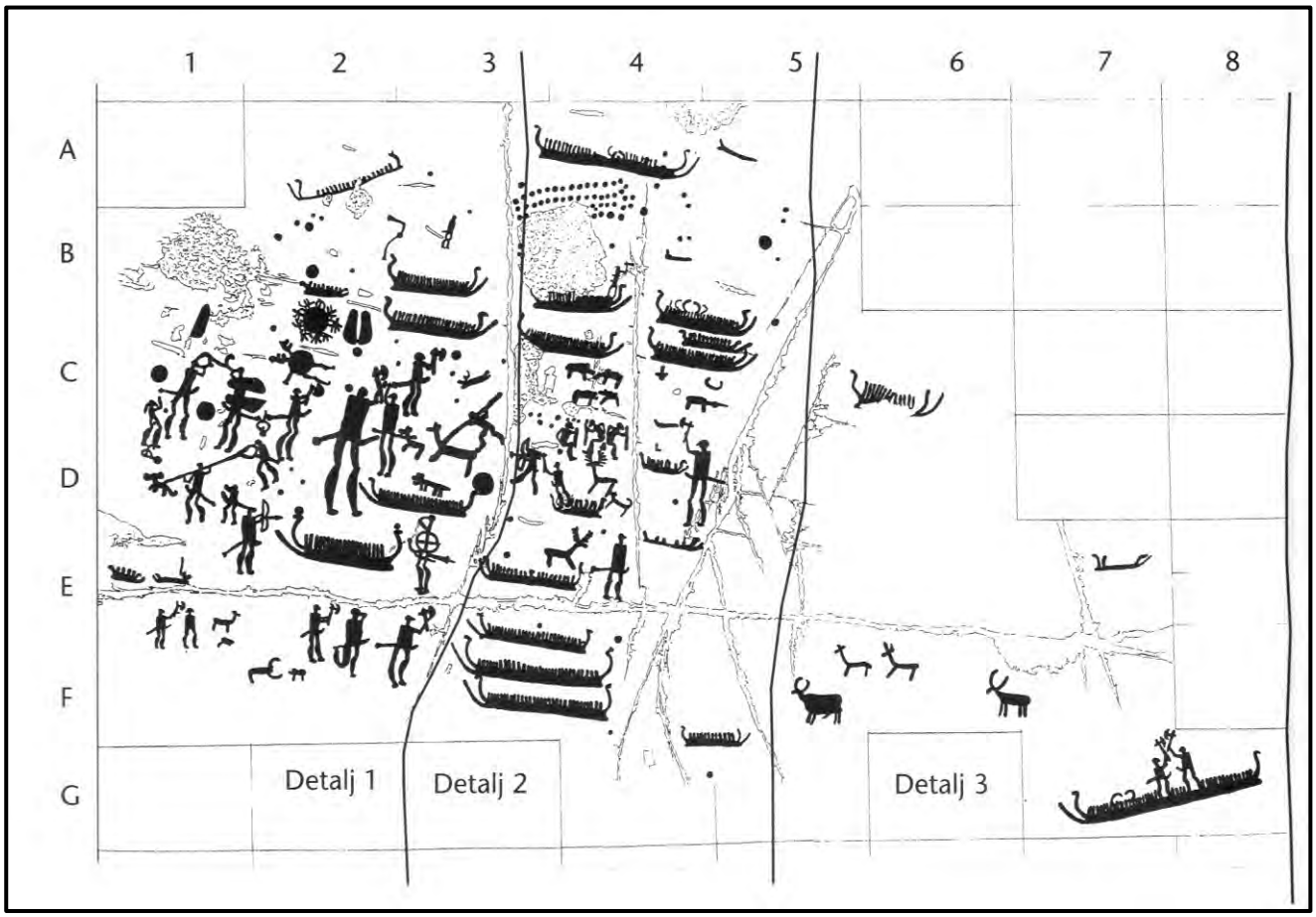

Figure 4. Main panel. Drawing by Milstreu and Prøhl (1999).

apart as India, Greece and Scandinavia (Østmo, 1997; Kaul, 2004, pp. 80, 345; Kristiansen, 2010; Melheim, 2013). For example, the Áshvins, or Nasatyas are the subject of more than 50 hymns in the 10th-century BCE text *Rig Veda*, where they are portrayed as horsemen and saviours at sea. Concurring that the Fossum tale is about two such heroes and different challenging missions, who then, is the third man? The Fossum panel is outstanding for several reasons, among which is because it is so coherent. It is situated at 45 masl., and hence not on the sea-shore as for many other panels, but rather it is part of a higher-lying group of rock art panels associated with roads or lines of passage (Ling & Bertilsson, 2016). It is located in one of the most rock art-dense regions of Scandinavia, in what was most certainly a locus for seasonal gatherings attracting many people. The main panel is ca. 65 sq. m, hence quite monumental. Studies of micro-topography indicate that rock art images were seldom inserted onto an empty "canvas", but were integrated into the rock face, creating a three-dimensional micro-cosmos (e.g., Bradley et al., 2003). This is also the case with the Fossum panel, where cracks in the rock face create natural borders, utilized by the carvers as natural frames for the different scenes, hence also dividing the panel into spheres (cf. Milstreu & Prøhl, 1999).

Building on Kaul's (1998, pp. 259, 266) left-right, up-down logic, I argued that different temporal levels were indicated on the Fossum panel with the help of size, body schemes and a combination of cardinal points (east-west, north-south) and body perspective (right-left,

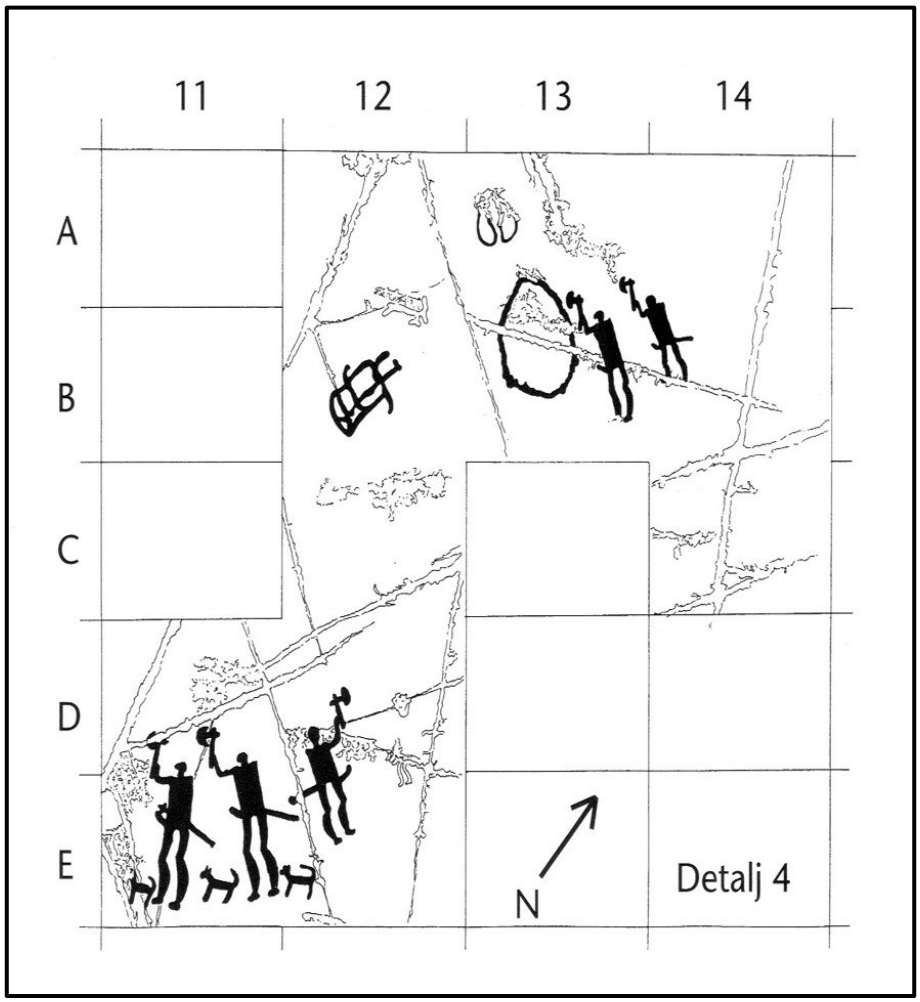

Figure 5. Opening scene. Drawing by Milstreu and Prøhl (1999).

up-down). Differences in size and perspective were used by the Fossum artists to indicate the different temporalities of the represented story (past, present, future), and to create a narrative structure (Melheim, 2013). Spatially, the panel is organized in three dimensions, which may be interpreted as the world of gods, the world of men and the underworld, or, the skies, the earth and the waters. In order to further explore physical and spatial aspects of the panel, and the temporal dimensions, I will draw attention to the rock body itself, and how moving around it must have significantly shaped the audience's experience of the images.

We cannot know how such movement would have been structured in the past, or if there were restrictions, taboos etc. which prevented some forms of movement or direct contact with the rock body. However, when approaching the panel today, a visitor is led past an isolated scene, 3 m to the right and north-east of the main panel (Figure 5). Here, a scene with three men, separated from main panel, sets the agenda (Melheim, 2013). Arguably, this scene helps the audience identify key narrative elements, and provides clues to the interpretation of the other scenes: three similar-looking men with animal face, phallus, axe and sword are accompanied by three dogs. The third man has turned his back on the others and is rendered in a smaller scale, arguably indicating that he is farther away in time or space. Further up, and to the right, there is a scene with just two men facing right and towards a large circle, an abyss or void, and a pair of footprints. Since footprints are held to

symbolize divine presence or physical absence/death (Wahlgren, 2002, p. 71), I argued that this is a representation of the third man, who is no longer present in the panel's real time. The third man is constantly ambiguous, never interacting directly with the others. This is supported by the right-left logic: his body is turned leftwards. On this basis, I argued that the two men were launching on a journey through the underworld, to rescue the third.

On the main part of the panel, the three men appear in a number of different scenes performing what seem to be ritual activities (e.g., a stylized combat, a horse sacrifice, and a dance), mostly concentrated to the middle part of the panel and between the two rows of ships (Melheim, 2013). In another scene, to the left, one man is distant while two men co-operate in stabbing or trapping a small animal with long ears and a curved tail, probably a canid (dog or wolf). The busy upper left part of the panel is where, in Kaul's interpretation, the night ships sailing to the left are replaced by day ships sailing to the right, indicating the critical moment when the sun is lifted to its zenith position at noon (Kaul, 1998, p. 266). A number of cosmologically loaded symbols can be identified in the upper left part of the panel, among which are a dead giant and a motif interpreted as a representation of the rising sun or creation (cf. Fredell 2003, p. 236). To the left are also two lure-blowers accompanied by footprints, and a pony-tailed figure, quite probably a woman, with a cup-mark between her legs, and a *hieros gamos* (seen from above). These scenes represent the narrative's turning point: where the story restarts, possibly depicting a never-ending, cosmic battle (Melheim, 2013).

Moving leftwards, the next a visitor will meet is a ship sailing to the left, with two men in a combat scene, next a suite of animals (Figure 4, "Detalj 3", following Milstreu & Prøhl, 1999), and then, in a part of the panel framed by fissures, there is first a small ship, next three larger ships sailing to the left (Figure 4, "Detalj 2"). The direction of the ships indicates that we are on our way down, towards the sea, the night, or the underworld (Kaul, 1998, p. 259; cf. Bradley *et al*. 2003).

Walking along the panel, and even when moving along the present-day boardwalk, the long stretch of the travel into the underworld can be physically experienced. Another element to consider is the sun, which highlights different parts of the panel during sunrise and sunset (Figure 6). The fissure running parallel to the ground across the panel accentuates that we are now in another sphere. In the next scene, when approaching from the right, judging from the rendering of the legs, one man is hurt or weakened (cf. Fredell & García Quintela, 2009, 2010) (Figure 4, "Detalj 1"). The crowd of men, followed by animals, is moving rightwards and up. In a final scene, the three men have split up, and have been transformed, one of them now embodying the sun. The underworld scenes, I argued, shows the two men rescuing the third, a representation of the sun (Melheim, 2013). The three ships sailing leftwards but up seem to further underscore this critical turning point, and stress the inherent motion of the rescue scene.

To the left and up, above the horizontal fissure and to the left of a large, vertical fissure, is the above-described crescendo of the narrative, where the sun is lifted to the skies. The drama unfolding in this part of the panel, perhaps a cosmic battle, was expressed with the help of loaded symbols, familiar to the audience. Just as was argued to be the case for the much later Dynna stone, visitors raise their heads to the Fossum panel, and look up to see how the crucial stages of the narrative unfolded. This part of the panel is not visible from the stationary point of a visitor looking at the opening scene, but only when he or she has descended the slope. Thus, the experience of the narrative's crescendo would be very physical.

In my previous interpretation, I drew attention to a particular hymn in the *Rig Veda*, where the Áshvins save Bhujyu, a representation of the sun, from drowning (Melheim, 2013). With altogether more than a thousand hymns, the *Rig Veda* is the first extensive religious corpus in any Indo-European language. The poet played a prominent role among Indo-European speaking groups, and the complex linguistic formulae of Indo-European poetry (e.g., Homeric, Vedic etc.) are considered to be of high age (Watkins, 1995). The transmitted *Rig Veda* text corpus is roughly contemporaneous with the Fossum ship images, following Ling and Bertilsson (2016), but derives from a much older oral tradition going back to the time when the human figures were carved. Linguistic evidence suggests that the hymns originated ca. 1500–1200 BCE (Mallory, 1991, pp. 37–42; Anthony, 2007, p. 49; Wikander, 2010, pp. 196–197).

The particular stanza of the *Rig Veda* hymn reads: "With birds that flew on for three nights and three days you Nasatyas brought Bhujyu to the far shore of the ocean, to the edge of the wetness, in three chariots with six horses and a hundred feet." (O'Flaherty, 1981, Rig Veda 1.116:4). Readings interpret the chariots and horses as kennings for a fleet of ships, the feet as oars, the numerology as representing an approximate solar year (360 days), and the three nights and three days as a reference to the winter solstice (Frawley 1995, pp. 52–53, 189; West 2007, p. 189). The number of ships corresponds exactly with the number of ships on the Fossum panel, and how they have been arranged in pairs (Melheim, 2013, p. 279). If the rock art images are interpreted accordingly, it seems that the ship images may allude to kennings used in epic poetry. Kennings are minimalist and economic expressions of often complex messages, and the audience would not necessarily have understood their significance without background knowledge.

Further detailing of overlaps and horizontal stratigraphy etc. is warranted in order to fully understand the temporal dimensions of the Fossum panel. However, if the refined dating of the panel is correct, it may seem that the original narrative based on the three men's actions and the cosmic battle was altered at a later stage, with the addition of ship images depicting the sun's cycle. However, the NBA II–III story about the three men remained, and was integrated into the final shape of the panel's visual narrative; in fact, the ship images underscore the motion of the epic drama and the men's movement through different spheres.

Ranta and co-authors (2019) argued that knowledge of verbally communicated stories was necessary to be able to identify persons or decode decisive moments within a wider story. Fredell (2003, pp. 70, 176) had earlier gone further, pointing out how visual art works in oral societies as semasiographic systems that aid memory, and that rock art images could function as mnemonic devices for oral recitations. Andrén (2020, p. 191) pointed out that the interplay, or remedialization between picture, oral culture and written text in Iron Age material implies that images were used actively as sources to new narratives. Through the identification of pictorial kennings on the Fossum panel, I have argued for a direct link between images and literary tropes, underscoring the theory that the audience's understanding of the Fossum imagery was aided by oral recitations of epic poetry. The ship images may in fact, if they were added later, have served to illustrate and explain otherwise complicated figurative language expressions (chariots, horses and feet) of an archaic epic poem. Epic poetry is notoriously conservative, and rhythm, metrical feet, figurative expressions etc. serve to preserve their contents, and aid the reciter's memory (Watkins, 1995). In a similar way, images may help preserve the contents of a story. Through time, however, they may have inspired new poets to formulate new verses or new kennings.

Figure 6. Launching on a travel to the underworld at sunset, on a modern boardwalk. Photo: Lene Melheim.

Vandkilde (2013) reintroduced hero cult as an aspect of Bronze Age religion and argued, on the basis of iconography, that dead ancestors or heroes were understood as being able to travel between different spheres, and to cross

cosmological boundaries, among other things by taking the shape of various animals (cf. Ahlqvist & Vandkilde, 2018). The three men on the Fossum panel are a case in point, depicted with animal faces, and criss-crossing between different spheres. The modifications and amendments underscore the endurance and power of the Fossum panel and its display of a spectacular story, perhaps venerating particular ancestors, by association to the three men. This retrospective dimension may have been added to through physical engagements with the panel, where the recreation of images served to "switch on" or recreate past events. When the ships were added, the materialization of the sun-ship myth in its Late Bronze Age version added significance to the visual narrative about the rescue of a male creature associated with the sun.

Results and conclusions

Not all rock art panels depict myth, but some clearly do. By engaging with one of the most durable natural media there is—stone—the myths that the Bronze Age communities lived by were made to last, and to be reinterpreted by past and current generations. The exceptional

female figure on the Fossum panel, surrounded by lure-blowers and the killing of a canid, was interpreted as an allusion to the never-ending battle. Clearly, this character resembles depictions of Hildr on picture stones like Stora Hammers I, and the allusions to battle that characterized her verbal kennings in Scaldic poetry. What has interested me here is, however, not the time-depth of Norse myth in Scandinavia, but how it was expressed in stone. The much later image-making and memory practices enable us to better understand complex interplays between narrative (oral/text) and imagery in Bronze Age rock art. Most importantly, the comparison sheds light on how the spatial dimensions of a rock could be used to convey cosmographic relations, hence establishing links between the micro-cosmos of the rock and the macro-cosmos of the human landscape, as well as the supra-cosmos of myth and the world of heroes and gods.

Revisiting the Fossum panel, I have focused on temporal and spatial dimensions. With its prominent position in the landscape, the Fossum carving is monumental in the same way as the much later Ramsund carving, and the experience of the panel is structured by its monumental size, and the way you have to move around it to see the different scenes. The reading of the story is spatially structured, and the identification of the three heroes is reliant on the first scene, the opening scene, which is separated from the main part of the panel and sets the stage. I have argued that the engagement with this rock face over a long period of time had a retrospective dimension, aimed at commemorating past heroes. The conservative traits that characterizes orally cited epic poetry may have contributed to preserving the key elements of this narrative through centuries, by being recited at the panel on certain occasions.

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References

Ahlqvist, L. & Vandkilde, H. 2018. Hybrid beasts of the Nordic Bronze Age. *Danish Journal of Archaeology* 7 (2): 180–194.

Andrén, A. 1993. Doors to other worlds. Scandinavian death rituals in Gotlandic perspectives. *Journal of European Archaeology* 1 (1): 33–56.

Andrén, A. 2000. Re-reading embodied texts—an interpretation of rune-stones. *Current Swedish Archaeology* 8: 7–32.

Andrén, A. 2014. *Tracing Old Norse cosmology. The world tree, middle earth, and the sun in archaeological perspectives.* Vägar til Midgård 16. Lund: Nordic Academic Press.

Andrén, A. 2020. Images. In: *The Pre-Christian religions of the north. History and structures, Volume I: Basic premises and consideration of sources* (pp. 161-193). Schjødt, J.P., Lindow, J. & Andrén, A. (eds.). Turnhout: Brepols Publishing.

Anthony, D. W. 2007. *The horse, the wheel, and language. How Bronze-Age riders from the Eurasian steppes shaped the modern world.* Princeton, New Jersey: Princeton University Press.

Back Danielsson, I.-M. 2015. Walking down memory lane. The mnemonic agency of Late Iron Age Scandinavian rune stones. In: *Memories in the making. The materialities, biographies and landscapes of early medieval stone monuments* (pp. 62–86). Gondek, M., Kirton, J. & Williams, H. (eds.). New York: Boydell Press.

Back Danielsson, I.-M., Fahlander, F. & Sjöstrand, Y. (eds.). 2012. *Encountering imagery. Materialities, perceptions, relations.* Stockholm Studies in Archaeology 57. Stockholm: Stockholm University.

Bengtsson, L. 2010. To excavate images: some results from the Tanum Rock Art Project 1997–2004. In: *Representations and communications. Creating an archaeological matrix of late prehistoric rock art* (pp. 116–131). Fredell, Å., Kristiansen, K. & Criado Boado, F. (eds.). Oxford: Oxbow Books.

Bengtsson, L. & Ling, J. 2007. Scandinavia's most finds associated rock art site. *Adoranten* 2007: 40–50.

Bradley, R., Jones, A. M., Nordenborg-Myhre, L. & Sackett, H. 2003. Sailing through stone: carved ships and the rock face at Revheim, southwest Norway. *Norwegian Archaeological Review* 35 (2): 109–118.

Den Legendariske Olavssaga. Transl. by Flokenes, K. Erling Skjalgssonselskapet, 2000.

Engedal, Ø. 2010. *The Bronze Age of northwestern Scandinavia.* Ph.D. thesis, University of Bergen.

Fahlander, F. 2019a. Fantastic beings and where to make them. Boats as object-beings in Bronze Age rock art. *Current Swedish Archaeology* 27: 191–212.

Fahlander, F. 2019b. The mediality of rock and metal exploring formal analyses of rock art through graffiti. In: *Artistic practices and archaeological research* (pp. 31–40). Gheorghiu, D. & Barth, T. (eds.). Oxford: Archaeopress.

Fahlander, F. 2020. The partial and the vague as a visual mode in Bronze Age rock art. In: *Images in the making: art-process-archaeology* (pp. 204–217). Back Danielsson, I.-M. & Jones, A. M. (eds.). Manchester: Manchester University Press.

Frawley, D. 1995. *Gods, sages and kings: Vedic secrets of ancient civilization.* Dehli: Motilal Banarsidass.

Fredell, Å. 2003. *Bildbroar. Figurativ bildkommunikation av ideology och kosmologi under sydskandinavisk bronsålder och förromersk järnålder.* Ph.D. thesis, GOTARC series B, Gothenburg Archaeological thesis no. 25. University of Gothenburg.

Fredell, Å. C. & García Quintela, M. V. 2009. In search of Indo-European structures: the dual significance of the warriors' knees. In: *Departure from the homeland. Indo-Europeans and archaeology. Selected papers from the 12th European Association of Archaeologists (EAA) Annual Meeting, Krakow, Poland, 19th to 24th September 2006* (pp. 91–110). Vander Linden, M. & Jones-Bley, K. (eds.). Washington: Institute for the Study of Man.

Fredell, Å. C. & García Quintela, M. V. 2010. Bodily attributes and semantic expressions. Knees in rock art and Indo-European symbolism. In: *Representations and communications. Creating an archaeological matrix of late prehistoric rock art* (pp. 75–92). Fredell, Å. C., Kristiansen, K. & Criado Boado, F. (eds.). Oxford: Oxbow Books.

Fuglestvedt, I. 2018. *Rock art and the wild mind. Visual imagery in Mesolithic northern Europe.* London & New York: Routledge.

Geertz, C. 1973. Thick description: toward an interpretive theory of culture. In: *The interpretation of cultures: selected essays* (pp. 3–30). New York: Basic Books.

Gjerde, J. M. 2010. *Rock art and landscapes. Studies of Stone Age rock art from northern Fennoscandia.* Tromsø: University of Tromsø.

Glørstad, Z. T. & Melheim, L. 2016. Past mirrors: Thucydides, Sahlins and the Bronze and Viking Ages. In: *Comparative perspectives on past colonisation, maritime interaction and cultural integration* (pp. 87–108). Melheim, L., Glørstad, Z. T. & Glørstad, H. (eds.). New Directions in Anthropological Archaeology. Sheffield: Equinox Publishing.

Goldhahn, J. 1999. *Sagaholm. Hällristningar och gravritual.* Studia Archaeologica Universitatis Umensis 11. Jönköping: Jönköpings Läns Museum.

Goldhahn, J. 2009. Bredarör on Kivik: a monumental cairn and the history of its interpretation. *Antiquity* 83 (320): 359–371.

Goldhahn, J. 2010. Emplacement and the hau of rock art. In: *Changing pictures—rock art traditions and visions in northern Europe* (pp. 106–126). Goldhahn, J., Fuglestvedt, I. & Jones, A. (eds.). Oxford: Oxbow Books.

Goldhahn, J. 2012. On war and memory and the memory of war—the Middle Bronze Age burial from Hvidegården on Zealand in Denmark revisited. In: *N-TAG TEN. Proceedings from 10th Nordic-TAG conference at Stiklestad, Norway 2009* (pp. 237–250). Berge, R., Jasinski, M. E. & Sognnes, K. (eds.). British Archaeological Reports, International Series 2399, Oxford.

Goldhahn, J. 2013. *Bredarör på Kivik—en arkeologisk odyssé.* Kalmar Studies in Archaeology 9. Kalmar: Artes Liberales AB.

Goldhahn, J. 2014. Engraved biographies. Rock art and life-histories of Bronze Age objects. *Current Swedish Archaeology* 22: 97–136.

Goldhahn, J. 2019a. On unfolding present and past (rock art) worldings. *Time and Mind* 12 (2): 63–77.

Goldhahn, J. 2019b. Rock art worldings. *Time and Mind* 12 (3): 165–167.

Goldhahn, J., Fuglestvedt, I. & Jones, A. (eds.). 2010a. *Changing pictures—rock art traditions and visions in northern Europe*. Oxford: Oxbow Books.

Goldhahn, J., Fuglestvedt, I. & Jones, A. 2010b. Changing pictures—an introduction. In: *Changing pictures—rock art traditions and visions in northern Europe* (pp. 1–22). Goldhahn, J., Fuglestvedt, I. & Jones, A. (eds.). Oxford: Oxbow Books.

Guðmundsdóttir, A. 2012. Saga motifs on Gotland picture stones: the case of Hildr Högnadóttir. In: *Gotland's picture stones. Bearers of an enigmatic legacy* (pp. 59–71). Karnell, M. H. (ed.). Reports from the Friends of the Historical Museum Association 84. Gotland: Fornsalen Publishing, Gotland museum.

Hagen, A. & Liestøl, A. 1947. Storhedder. *Viking* 11: 141–233.

Helskog, K. 2012. Bears and meanings among hunter-fisher-gatherers in northern Fennoscandia 9000–2500 BC. *Cambridge Archaeological Journal* 22. DOI: 10.1017/S0959774312000248.

Horn, C. 2018. Fast like a war canoe: pragmamorphism in Scandinavian rock art. In: *Prehistoric warfare and violence. Quantitative methods in the humanities and social sciences* (pp. 109–127). Dolfini, A., Crellin, R., Horn, C. & Uckelmann, M. (eds.). Cham: Springer.

Horn, C. 2019. Showmen and fighters—Bronze Age rock art and weaponry in Scandinavia. In: *Materialisation of conflicts. Proceedings of the Third International LOEWE Conference, 24–27 September 2018 in Fulda* (pp. 45–65). Hansen, S. & Krause, R. (eds.). Bonn: Verlag Dr. Rudolf Habelt GmbH.

Horn, C. & Potter, R. 2018. Transforming the rocks—time and rock art in Bohuslän, Sweden. *European Journal of Archaeology* 21 (3): 361–384.

Horn, C. & Potter, R. 2020. Set in stone? Transformation and memory in Scandinavian rock art. In: *Places of memory: spatialised practices of remembrance from prehistory to today* (pp. 97–107). Horn, C., Wollentz, G., Di Maida, G. & Haug, A. (eds.). Oxford: Archaeopress.

Imer, L. 2016. *Danmarks Runesten. En fortælling.* Copenhagen: Gyldendal.

Ingold, T. 2005. Comments on Christopher Tilley: *The materiality of stone: explorations in landscape phenomenology*. Oxford: Berg, 2004. *Norwegian Archaeological Review* 38 (2): 122–129.

Ingold, T. 2007. Materials against materiality. *Archaeological Dialogues* 14 (1): 1–16.

Janik, L. 2014. Seeing visual narrative. New methodologies in the study of prehistoric visual depictions, *Archaeological Dialogues* 21 (1): 103–126.

Johannsen, J. W. 2013. The Villfara monument: rock carvings, death, cosmology and rituals in Early Bronze Age Scania. *Lund Archaeological Review* 19: 19–34.

Johansen, Ø. 1979. New results in the investigation of the Bronze Age rock carvings. *Norwegian Archaeological Review* 12 (2): 108–114.

Jones, A. M. 2020. An archaeology of affect: art, ontology and the carved stone balls of Neolithic Britain. *Journal of Archaeological Method and Theory* 27: 545–560.

Kaliff, A. & Oestigaard, T. 2018. *The great Indo-European horse sacrifice. 4000 years of cosmological continuity from Sintashta and the steppe to Scandinvian skeid.* Occasional Papers in Archaeology 72. Ödeshög: Uppsala University.

Karlenby, L. 2011. *Stenbärarna. Kult och rituell praktik i skandinavisk bronsålder.* Uppsala: Uppsala University.

Kaul, F. 1998. *Ships on bronzes. A study in Bronze Age religion and iconography.* Publications from the National Museum Studies in Archaeology & History 3. Copenhagen: National Museum of Denmark.

Kaul, F. 2004. *Bronzealderens religion. Studier af den nordiske bronzealders ikonografi.* Copenhagen: Det Kongelige Nordiske Oldskriftselskab.

Klaver, I. 2001. Phenomenology on (the) rocks. *Research in Phenomenology* 2001 (31): 173–186.

Kristiansen, K., 2010. Rock art and religion. The sun journey in Indo-European mythology and Bronze Age rock art. In: *Representations and communications. Creating an archaeological matrix of late prehistoric rock art* (pp. 75–92). Fredell, Å. C., Kristiansen, K. & Criado Boado, F. (eds.). Oxford: Oxbow Books.

Liepe, L. 1989. Sigurdssagan i bild. *Fornvännen* 84: 1–11.

Ling, J. & Bertilsson, U. 2016. Biography of the Fossum panel. *Adoranten* 16 (14): 58–72.

Ling, J. & Cornell, P. 2010. Rock art as social format. In: *Changing pictures—rock art traditions and visions in northern Europe* (pp. 73–88). Goldhahn, J., Fuglestvedt, I. & A. Jones (eds.). Oxford: Oxbow Books.

Ling, J., Skoglund, P. & Bertilsson, U. (eds.). 2015. *Picturing the Bronze Age.* Swedish Rock Art Research Series 3. Oxford: Oxbow Books.

Ljunge, M. 2010. Rock art and the meaning of place: some phenomenological reflections. In: *Changing pictures—rock art traditions and visions in northern Europe* (pp. 88–105). Goldhahn, J., Fuglestvedt, I. & Jones, A. (eds.). Oxford: Oxbow Books.

Lund, J. 2009. *Åsted og vadested. Deponeringer, genstandsbiografier og rumlig strukturering som kilde til vikingetidens kognitive landskaber.* Acta Humaniora 389. Oslo: University of Oslo.

Lund, J. 2020. Rune stones as material relations in Late Pagan and Early Christian south Scandinavia. *Danish Journal of Archaeology* 2020 (9): 1–20.

Mallory, J. P. 1991. *In search of the Indo-Europeans. Language, archaeology and myth*. London: Thames & Hudson.

Mandt, G. 2005. Kårstad i Stryn—møteplass for ulike kulttradisjoner i eldre jernalder? In: *Fra funn til samfunn. Jernalderstudier tilegnet Bergljot Solberg på 70-årsdagen* (pp. 51–67). Bergsvik, K. A. & Engevik, A. (eds.). UBAS Nordisk. Bergen: University of Bergen.

Melheim, A. L. 2004. I mørket er alle katter grå. Om overgangen til branngravskikk i bronsealderen. In: *Mellom himmel og jord. Foredrag fra et seminar om religionsarkeologi Isegran 31. januar–2. februar 2002* (pp. 392–421). Melheim, L., Hedeager, L. & Oma, K. (eds.). Oslo Archaeological Series 2. Oslo: University of Oslo.

Melheim, L. 2013. An epos carved in stone: three heroes, one giant, and a cosmic task. In: *Counterpoint: essays in archaeology and heritage studies in honour of Professor Kristian Kristiansen* (pp. 273–282). Bergerbrant, S. & Sabatini, S. (eds.). BAR International Series 2508. Oxford: Archaeopress.

Milstreu, G. 2018. Updating rock art. Re-cut rock art images (with a special emphasis on ship carvings). *Adoranten* 2018: 37–47.

Milstreu, G. & Prøhl, H. (eds.). 1999. *Documentation and registration of rock art in Tanum 2. Fossum med angränsande områden.* Tanumshede: Tanums Hällristningsmuseum.

Nash, G. & Mazel, A. (eds.). 2019. *Narratives and journeys in rock art: a reader*. Oxford: Archaeopress.

Nilsson, P. 2012. The beauty is in the act of the beholder. South Scandinavian rock art from a uses of the past-perspective. In: *Encountering imagery. Materialities, perceptions, relations* (pp. 77–96). Back Danielsson, I.-M., Fahlander, F. & Sjöstrand, Y. (eds.). Stockholm Studies in Archaeology 57. Stockholm: Stockholm University.

Nilsson, P. 2017. *Brukade bilder. Södra Skandinaviens hällristningar ur ett historiebruksperspektiv.* Ph.D. thesis, Stockholm University.

Nimura, C. 2016. *Prehistoric rock art in Scandinavia: agency and environmental change.* Swedish Rock Art Research Series 4. Oxford & Philadelphia: Oxbow Books.

Nordbladh, J. 1978. Images as messages in society. Prolegomena to the study of Scandinavian petroglyphs and semiotics. In: *New directions in Scandinavian archaeology* 1 (pp. 63–78). Kristiansen, K. & Pauldan Müller, C. (eds.). Copenhagen: National Museum.

Nygaard, L. Oslo: Pax.

Nyland, A. J. & Stebergløkken, H. 2021. Changing perceptions of rock art: storying prehistoric worlds. *World Archaeology*. DOI: 10.1080/00438243.2021.1899042.

O'Flaherty, W. D. 1981. *The Rig Veda. An anthology. One hundred and eight hymns, selected, translated and annotated by W. D. O'Flaherty.* Harmondsworth: Penguin Books.

Oehrl, S. 2012. New iconographic interpretations of Gotlandic picture stones based on surface re-analysis. In: *Gotland's picture stones. Bearers of an enigmatic legacy* (pp. 91–106). Karnell, M. H. (ed.). Reports from the Friends of the Historical Museum Association 84. Gotland: Fornsalen Publishing, Gotland museum.

Oehrl, S. 2019. Re-interpretations of Gotlandic picture stones based on the Reflectance Transformation Imaging method (RTI): some examples. In: *Myth, materiality, and lived religion in Merovingian and Viking Scandinavia* (pp. 141–189). Wikström af Edholm, K., Jackson Rova, P., Nordberg, A., Sundqvist, O. & Zachrisson, T. (eds.). Stockholm: Stockholm University Press.

Oestigaard, T. & Goldhahn, J. 2006. From the dead to the living: death as transactions and re-negotiations. *Norwegian Archaeological Review* 39. DOI: 10.1080/00293650600703928.

Østmo, E. 1997. Horses, Indo-Europeans and the importance of ships. *The Journal of Indo-European Studies* 25 (3/4): 285–326.

Østmo, E. 2017. Bronze Age heroes in rock art. In: *Usque ad radices. IndoEuropean studies in honour of Birgit Anette Olsen* (pp. 619–631). Hansen, B. S. S., Hyllested, A., Jørgensen, A. R., Kroonen, G., Larsson, J. H., Whitehead, B. N., Olander, T. & Søborg, T. M. (eds.). Copenhagen: Museum Tusculanum Press.

Ranta, M., Skoglund, P., Rédei, A. & Persson, T. 2019. Levels of narrativity in Scandinavian Bronze Age petroglyphs. *Cambridge Archaeological Journal* 29 (3): 497–516.

Ranta, M., Skoglund, P., Persson, T. & Gjerde, J. M. 2020. Hunting stories in Scandinavian rock art: aspects of 'tellability' in the north versus the south. *Oxford Journal of Archaeology* 39: 228–246.

Rédei, A. C., Skoglund, P. & Persson, T. 2019. Applying cartosemiotics to rock art: an example from Aspeberget, Sweden. *Social Semiotics* 29: 543–556.

Rédei, A. C., Skoglund, P. & Persson, T. 2020. Seeing different motifs in one picture: identifying ambiguous figures in south Scandinavian Bronze Age rock art. *Cogent Arts & Humanities* 7 (1): 1802804. DOI: https://doi.org/10.1080/23311983.2020.1802804.

Robb, H. 2020. Art (pre)history: ritual, narrative and visual culture in Neolithic and Bronze Age Europe. *Journal of Archaeological Method and Theory*. DOI: https://doi.org/10.1007/s10816-020-09471-w.

Ryan, M.-L. 1992. The modes of narrativity and their visual metaphors. *Style* 26 (3): 368–387.

Sawyer, B. 2000. *The Viking-Age rune stones: custom and commemoration in early medieval Scandinavia.* Oxford: Oxford University Press.

Skoglund, P. 2010. Cosmology and performance: narrative perspectives on Scandinavian rock art. In: *Changing pictures—rock art traditions and visions in northern Europe* (pp. 127–138). Goldhahn, J., Fuglestvedt, I. & Jones, A. (eds.). Oxford: Oxbow Books.

Skoglund, P. 2016. *Rock art through time: Scanian rock carvings in the Bronze Age and Earliest Iron Age.* Swedish Rock Art Research Series 5. Oxford: Oxbow Books.

Skoglund, P., Ling, J. & Bertilsson, U. (eds.). 2017. *North meets south: theoretical aspects on the northern and southern rock art traditions in Scandinavia.* Swedish Rock Art Research Series 6. Oxford: Oxbow Books.

Skoglund, P., Persson, T. & Cabak Rédei, A. 2020. A multisensory approach to rock art: exploring tactile and visual dimensions in the southern Scandinavian rock art tradition. *Proceedings of the Prehistoric Society* 86: 95–110.

Spurkland, T. 2001. *Norwegian runes and runic inscriptions.* Transl. van der Hoek, B. Woodbridge: Boydell Press.

Staecker, J. 2004. Hjälter, kungar och gudar. In: *Minne och myt. Kunsten at skapa det förflutna* (pp. 39–80). Berggren, Å., Arvidsson, S. & Hållans, A.-M. (eds.). Lund: Nordic Academic Press.

Stebergløkken, H., Berge, R. & Lindgaard, E. (eds.). 2015. *Ritual landscapes and borders within rock art research. Papers in honour of Professor Kalle Sognnes.* Oxford: Archaeopress.

Steinsland, G. 2014. En kvinne velger gudsbilde. In: *Kvinner i vikingtid. Vikingatidens kvinnor* (pp. 149–165). Coleman, N. L. & Løkka, N. (eds.). Oslo: Spartacus.

Vandkilde, H. 2013. Bronze Age voyaging and cosmologies in the making: the helmets from Viksö revisited. In: *Counterpoint: essays in archaeology and heritage studies in honour of Professor Kristian Kristiansen* (pp. 165–177). Bergerbrant, S. & Sabatini, S. (eds.). BAR International Series 2508. Oxford: Archaeopress.

Wahlgren, K. H. 2002. *Bilder av betydelse: hällristningar och bronsålderslandskap i nordöstra Östergötland.* Stockholm Studies in Archaeology. Lindome: Bricoleur Press.

Wahlgren, K. H. 2004. Switching images on and off. Rock-carving practices and meaning in the Bronze Age life-world. In: *Prehistoric pictures as archaeological source* (pp. 149–166). Milstreu, G. & Prøhl, H. (eds.). Tanumshede: Tanums Hällristingsmuseum.

Watkins, C. 1995. *How to kill a dragon. Aspects of Indo-European poetics.* New York & Oxford: Oxford University Press.

West, M. L. 2007. *Indo-European poetry and myth.* Oxford: Oxford University Press.

Wikander, O. 2010. *De indoeuropeiske språkenes historie. Et tre med mange grener.* Transl.

Zachrisson, T. 1994. The odal and its manifestations in the landscape. *Current Swedish Archaeology* 2: 219–238.

Zilmer, K. 2011. Crosses on rune-stones: functions and interpretations. *Current Swedish Archaeology* 19: 87– 112.

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