

Exchanging fur and skin for shoe-last axes – Exploring the emergence of value, specialised hunting camps, and hunter-gatherer complexity in the Late Ertebølle Culture during the 5th millennium BC

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Zusammenfassung

Tausche Felle und Häute gegen Schuhleistenkeile – Eine Untersuchung zum Aufkommen von Wertigkeit, zu spezialisierten Jagdlagern und der Komplexität des Jäger-Sammler-Lebens in der späten Ertebølle-Kultur im 5. Jt. v. Chr.

Dieser Beitrag behandelt den Tausch von Schuhleistenkeilen aus Ackerbaugesellschaften in Nordeuropa und die Wirkung dieser fremdartigen Objekte auf die Jäger-Sammler-Gemeinschaften der späten Ertebølle-Kultur. Ein besonderer Schwerpunkt liegt darauf, ob diese Schuhleistenkeile im 5. Jt. v. Chr. im Rahmen eines Tauschnetzwerks zwischen Jägern und Sammlern und benachbarten Ackerbaugemeinschaften gegen Felle und Geweihe eingehandelt wurden. Das Aufkommen neuer, spezialisierter Jagdlager, die sich durch die große Anzahl der Nachweise von Pelztieren sowie Reh und Rothirsch auszeichnen, lässt sich am Beispiel einiger spätereboellezeitlicher Fundplätze beobachten, die zeitgleich waren mit der Zunahme an Schuhleistenkeil-Importen. Handelt es sich dabei um die kommerzielle Antwort der Jäger und Sammler auf die Nachfrage der Ackerbaugemeinschaften nach Fellen und Geweihen sowie auf das eigene Verlangen nach Schuhleistenkeilen?

Einige der Schuhleistenkeile weisen so gut wie keine Gebrauchsspuren auf. Dies deutet darauf hin, dass sie Prestigeobjekte waren. Die meisten Schuhleistenkeile von spätereboellezeitlichen Fundorten tragen jedoch Spuren von funktionellem, meist starkem Gebrauch. Sie wurden möglicherweise als Keile bei umfangreichen und intensiven Holzarbeiten eingesetzt. Der Bau größerer Hüttenstrukturen hätte es erlaubt, zu bestimmten Zeiten im Jahr mehr Menschen zu versammeln. Längere Einbäume hätten die logistischen Möglichkeiten verbessert, Waren über größere Entfernungen zu transportieren und das Tauschnetzwerk dieser Jäger und Sammler zu erweitern. Der Bau großer, ortsfester Fischreusen sicherte einen höheren wirtschaftlichen Überschuss dieser Jäger-Sammler-Gesellschaften. Änderungen bei diesen Praktiken sprechen dafür, dass die Jäger-Sammler-Gemeinschaften komplexer wurden – und zwar zeitgleich mit der Zunahme an direkten und indirekten Kontakten mit den benachbarten Ackerbaugemeinschaften in Nordeuropa. Die Schuhleistenkeile und ihr Tausch werden als Vermittler der Veränderung verstanden; und das Geschäft mit diesen Werkzeugen könnte bei den Jäger-Sammler-Gemeinschaften zur Ausbildung einer Tausch-

Summary

The exchange of shoe-last axes from agrarian communities in Northern Europe and the impact these exotic objects had upon the hunter-gatherer communities of the Late Ertebølle Culture is discussed in this article. Particular emphasis is placed upon the question whether these shoe-last axes were exchanged for fur and antler between hunter-gatherers and their neighbouring agrarian communities in an exchange network during the 5th millennium BC. The appearance of new specialised hunting camps characterised by the dominance of fur-bearing animals and roe and red deer can be observed at some Late Ertebølle sites, which is synchronous with the increase in the importation of shoe-last-axes. Is this changed behaviour the hunter-gatherers' commercialised response to the demands of agrarian communities to acquire fur and antler, combined with the hunter-gatherers' own desire to gain access to the shoe-last axes?

Some of the shoe-last axes show almost no signs of usage, indicating they were of prestigious status, but most of the shoe-last axes found at the Late Ertebølle sites show signs of functional, typically heavy, usage and were possibly used as wedges in large-scale and more intensive wood working. The building of larger hut structures would have improved the possibilities of gathering more people during specific times of the year. Longer dug-out canoes would have increased the logistical possibilities of transporting goods over greater distances and expanded the exchange networks of these hunter-gatherers. The construction of large, stationary fishing traps secured an increased economic surplus within these hunter-gatherer societies. The behaviour of these practices suggests that hunter-gatherer communities became more complex, a process which was synchronous with increased direct and indirect contacts with neighbouring agrarian communities in Northern Europe. The shoe-last axes and their exchange are interpreted as mediators of change, and the transactions of the axes could lead to a barter economy and a new awareness of the concept of value within these hunter-gatherer communities.

More studies of the scale of the different exchanged objects between agrarian and hunter-gatherer communities are, however, needed in order to confirm the initial observations and interpretations in this article.

wirtschaft und zu einem Bewusstsein für das Konzept von Wertigkeit geführt haben.

Weitere Untersuchungen zum Ausmaß des Tauschs verschiedener Objekte zwischen den Ackerbau- und den Jäger-Sammler-Gemeinschaften sind jedoch vonnöten, um die in diesem Beitrag geschilderten Beobachtungen und Interpretationen zu bestätigen.

Schlagwörter Späte Ertebølle-Kultur, Schuhleistenkeile, spezialisierte Jagdlager, Tauschwirtschaft, Wertigkeit, komplexe Jäger-Sammler-Gemeinschaften

Keywords Late Ertebølle Culture, shoe-last axes, specialised hunting camps, barter economy, value, complex hunter-gatherers

Introduction

This paper explores whether shoe-last axes from Central European agrarian societies could have been exchanged for fur and skin by hunter-gatherers of the Late Ertebølle Culture. In empirical terms, the point of departure is to combine the appearance of exotic shoe-last axes with the emergence of specialised hunting camps dominated by a faunal material of fur-bearing animals and red and roe deer during the second half of the 5th millennium BC in Southern Scandinavia. At a theoretical level, we discuss whether the exchange of shoe-last axes for fur, skin, and antler reflects a previously undiscovered awareness of the value of prestigious objects that emerged within a barter economy between agrarian and hunter-gatherer communities. And did these systems of large network exchanges of prestigious objects lead to an increased social and economic complexity and diversity within these egalitarian hunter-gatherer communities that has previously been underestimated?

The enigma of complex hunter-gatherers

The emergence of complex hunter-gatherers, defined by resource management, territoriality, and hierarchy, has, although difficult to document in the archaeological data, often been associated with the Late Ertebølle Culture in Southern Scandinavia¹. P. Wiessner (2002) argued, based on the oral histories of the Enga of highland New Guinea, that the initial signs of complex hunter-gatherers are the quest for the institutionalisation of hierarchical social inequalities. The Enga economy was transformed from hunting and fishing towards surplus production based on the introduction of sweet potatoes and intensive pig husbandry. The result was population growth and the sharing of power between many different actors consisting of skilled hunters, traders, warriors, ritual specialists, and managers of power. These actors all acknowledged the emergence of increasing hierarchy led by the few with a focus on economic growth, although some communities were more successful than others in accumulating a surplus. As a result, a growing competition for pres-

tigious objects between the communities could be documented as causing changes and different behaviour, thus setting the stage for more complex social organisations.

What can we learn from the observations of the Enga? Some signs of complex hunter-gatherers could be identified in the marked changes of their behaviour expressed in new practices, thus revealing what communities would do to get access to prestigious objects through a larger exchange system of exotic goods². Exotic and prestigious objects become ›mediators of change‹ within such hunter-gatherer communities, thus gradually transforming the complexity of societies from an egalitarian to a more economically stratified and hierarchical character, with increasing amounts of material being exchanged within larger networks (Kohler/Smith 2018; Moreau 2020). The indirect or direct contact between the Late Ertebølle Culture and neighbouring agrarian societies did result in exchanges of exotic shoe-last axes³. The question is whether these shoe-last axes were regarded as prestigious when exchanged via several actors, where the value and desirability of the objects could change in other systems of exchange, depending on different cultural preferences (Wobst 1977; Latour 1996) (Fig. 1).

Assessing the value of exotic objects

The central and often overlooked concept in the emergence of complex hunter-gatherers is their awareness of different kinds of value and the assumption of a progression towards an economic way of thinking (Price/Feinman 2010). In classic economic thinking, objects either have an inherent value or their value is the result of either the labour or the degree of usefulness and circulation of goods, giving rise to many other concepts, such as surplus gains and profits, debt, and inequality (Appadurai 1986). This involves a new awareness of the desire, time, and labour invested in finding, procuring, and producing objects of high quality and/or beauty (Graber 2001). A fundamental problem relates to the question of how value as a concept was estimated within both an agrarian and a hunter-gatherer system, and how it could be related to physical objects like shoe-last axes.

1 Price 2000; Johansen 2006; Sørensen 2014; Price 2022; Meyer 2023.

2 Sahlins 1972; Appadurai 1986; Graber 2001; Malafouris 2013.

3 Fischer 1982; Fischer 1983; Klassen 2004; Jensen/Sørensen 2023.

Fig. 1 The meaning behind an object or information within a network decreases from a target group to a non-target group.

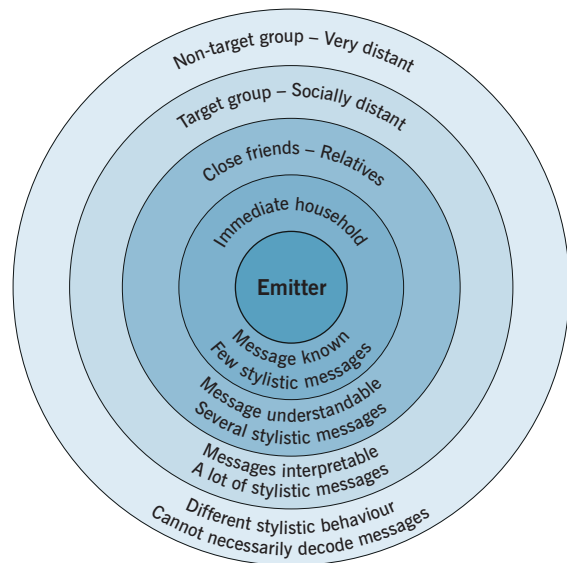
Abb. 1 Die Bedeutung eines Objekts oder einer Information nimmt innerhalb eines Netzwerks von einer Zielgruppe zu einer Nicht-Zielgruppe ab.

In the human mind, certain desirable objects could transform themselves to become commodities, thus resulting in a consensus regarding their value, so they were suitable for circulating through economic systems and being exchanged for other things (Kopytoff 1986). I. Kopytoff supports the idea of the emergence of the commodification of objects, where some types of objects are mass produced using the same raw materials, thus becoming recognisable to the human mind. The consequence is singularising and consensus regarding the value of these objects in some exchange systems. The challenge is that value varies and is thus a dynamic concept in which objects can acquire individual characters and achieve different kinds of value. It is therefore a challenge to determine the value of objects like the shoe-last axes, as this is based on the reciprocal relationship of objects within the individual human minds involved when evaluating several objects and their properties in relation to one another (Simmel 1900). Value – whether use-value or symbolic, social, or economic value – is a culturally constructed quality, which becomes embodied in commodities when they are exchanged and is thus considered to be context dependent⁴.

A way forward attempted in this paper would be to search for changed behaviour within the context of the Late Ertebølle Culture after the foreign shoe-last axes entered this hunter-gatherer exchange system. Based on the theoretical implications of value as well as the emergence of complexity, such behavioural changes should be expected if the shoe-last axes were regarded as highly valuable and prestigious within these Late Ertebølle communities.

The sources exploited to produce the shoe-last axes

The largest group of exotic and foreign objects within the Late Ertebølle Culture are the shoe-last axes, which are found in Southern Scandinavia from 4900 to around 4000 cal BC (Fig. 2). The shoe-last axes demonstrate a connection with the Linear Pottery, Stroke-Ornamented Ware, and Rössen agrarian communities⁵. The raw material of amphibole-rich metabasite was used to produce some of these shoe-last axes (Bernardini et al. 2012). Recently, the quarries for the metabasite were identified near Jistebsko in northern Bohemia in the Czech Republic (Šída/Kachlík 2009; Přichystal 2014, 192) (Fig. 2). The shoe-last axes were produced by Central European craft specialists from 5400 to 4600 BC and distributed within and beyond the agrarian networks covering large parts of Central Europe and further, towards the hunter-gatherer societies of the Swifterbant and Ertebølle Cultures (Klassen 2004; Raemaekers et al. 2010; Verhart 2012).



According to observations made by P. Šída (2007), the shoe-last axes produced at the Jistebsko source are characterised by a production involving mainly a pecking and polishing technique. Other shoe-last axes from Central Europe, made of both basalt and metabasite from unidentified sources, were made using a combination of sawing, pecking, and polishing techniques. The technological differences between the Jistebsko and some unidentified sources suggest that several sources were being exploited to produce shoe-last axes. The shoe-last axes found in Southern Scandinavia are characterised by the production technologies of both pecking and sawing (Lomborg 1962; Klassen 2004), which suggests that axes from both unidentified and the Jistebsko source ended up in the hunter-gatherer exchange system of the Late Ertebølle Culture.

Distribution of the shoe-last axes in Northern Europe

The Linear Pottery, Stroke-Ornamented Ware, and Rössen agrarian communities needed large axes, such as the shoe-last axes, to work substantial timbers used, for example, to construct large trapezoidal longhouses, which were often over 60 m long (Luley 1990). The shoe-last axes therefore had an important symbolic meaning to some of the earliest Central European agrarian cultures and have been found in burials and hoards at settlements belonging to the Stroke-Ornamented Ware and Rössen agrarian communities (Klassen 2004; Müller 2023) (Fig. 2). The importance of the shoe-last axes can also be observed in the dense distribution of these objects, which also continued to be exchanged with Central European agrarian communities and which were spread towards the Ertebølle and Swifterbant hunter-gatherer societies after the exploitation of the source at Jistebsko ended around 4600 cal BC.

4 Appadurai 1986; Bradley/Edmonds 1993; Risch 2011; Borgerhoff Mulder et al. 2009.

5 Lomborg 1962; Schwabedissen 1967; Fischer 1982; Fischer 1983; Klassen 2004.

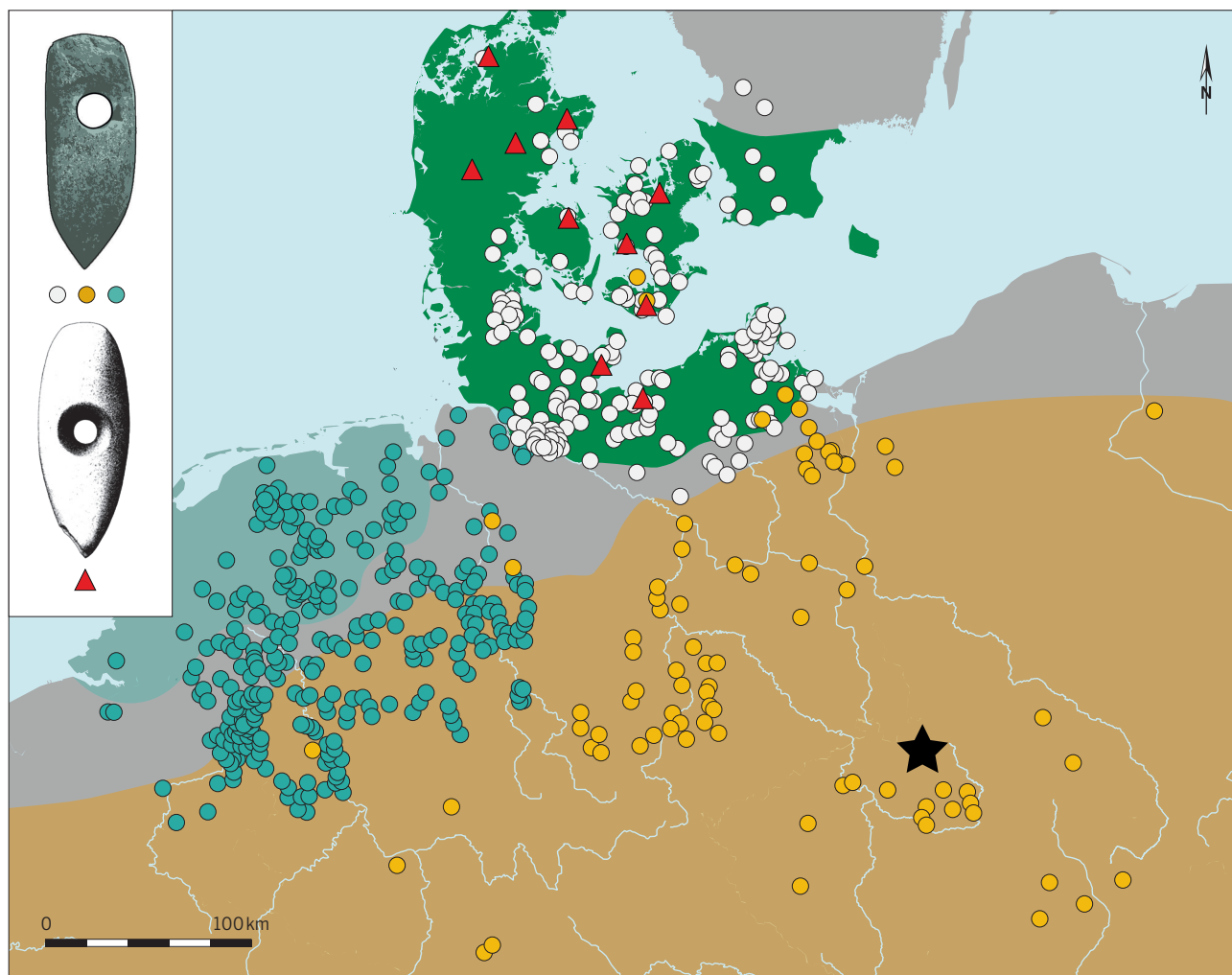


Fig. 2 Distribution of shoe-last axes (upper left; dots) in agrarian and hunter-gatherer societies in Europe together with local imitations within the Late Ertebølle Culture (bottom left; red triangles). Middle Neolithic hoards (yellow dot), together with the Ertebølle (white dot) and Swifterbant (green dot) Cultures, with the primary source of amphibole-rich metabasite near Jistebsko (black star) in Northern Bohemia, Czech Republic. Distribution of the Late Ertebølle Culture (dark green), Swifterbant Culture (light green), and Central European agrarian cultures (yellow). The grey zone is the contact area between the different hunter-gatherer and agrarian societies.

Abb. 2 Verbreitung von Schuhleistenkeilen (oben links; Punkte) in Ackerbau- sowie Jäger-Sammler-Gesellschaften in Europa zusammen mit lokalen Nachahmungen innerhalb der späten Ertebølle-Kultur (unten links; rote Dreiecke). Mittelneolithische Hortfunde (gelber Punkt), Ertebølle-Kultur (weißer Punkt), Swifterbant-Kultur (grüner Punkt) und die Hauptquelle amphibolreicher Metabasite bei Jistebsko (dt. Gistey; schwarzer Stern) in Nordböhmen, Tschechische Republik. Verbreitung der späten Ertebølle-Kultur (dunkelgrün), der Swifterbant-Kultur (hellgrün) und der mitteleuropäischen Ackerbaukulturen (gelb). Die graue Zone ist der Kontaktbereich zwischen den verschiedenen Jäger-Sammler-Gesellschaften und den Ackerbaukulturen.

The distribution of shoe-last axes indicates that they came to the Netherlands and Southern Scandinavia via the major Central European rivers, such as the Weser, Elbe, Saale, Oder, and other smaller tributaries running either into the North Sea, and via other land and river routes towards the Swifterbant Culture or into the Baltic Sea towards the Ertebølle Culture⁶. Several major concentrations of shoe-last axes have been observed in Lower Saxony (Lichardus 1976, 176) and Saxony-Anhalt (Kaufmann 2020, 392), which could represent the initial stages of the larger exchange systems towards the Swifterbant and Ertebølle Cultures.

However, many of these shoe-last axes probably existed within these agrarian and hunter-gatherer exchange sys-

tems for several hundred years, thus indicating their status, prestige, and value. According to the theories developed by A. Weiner (1992) about inalienable possessions, where she highlights the importance of keeping-while-giving, which means that some possessions can be exchanged as gifts in a balanced or unbalanced way, whilst other objects are so significant that they cannot be disposed of or exchanged, but must be retained within the communities, so that other things can circulate. Objects that cannot be exchanged at all constitute the fixed point of coherence within these communities, which can be used, destroyed, or sacrificed in symbolic rituals to maintain the social order (Godelier 1999). The emergence of such sacred objects associated with status and prestige creates a desire and demand, thus

⁶ Lichardus 1976; Klassen 2004; Raemaekers et al. 2010; Verhart 2012.

laying the foundation for increased and institutionalised competition between communities. Inspired by a combination of these theories and anthropological analogies, the shoe-last axes have been interpreted as prestigious objects, which were exchanged between Central European agrarian societies and Ertebølle hunter-gatherers (Fischer 1982; Fischer 2002; Jennbert 1984). The question is whether the status of shoe-last axes as prestigious objects also continued during several exchanges and influenced the hunter-gatherer communities of the Late Ertebølle Culture.

Shoe-last axes as prestigious and ordinary functional objects

According to the theories that have been proposed, the possession of shoe-last axes would have given increased status to the local Ertebølle hunter-gatherers who owned these objects. The systematic exchange of shoe-last axes with Ertebølle hunter-gatherers could therefore be interpreted as causing changes leading to a gradual transfer of agrarian ideas and ideology, and thus to an increasing complexity within these communities. But shoe-last axes have only been found in what have been interpreted as ordinary refuse layers at Late Ertebølle sites, which makes the interpretation

of the axes as prestigious objects seem less plausible (Klassen 2004, 409). However, many of the ordinary waste deposits should be reinterpreted, as shoe-last axes have been found in layers or features containing decorated antler axes and scattered human bone fragments (Brinch Petersen 2001; Andersen 2008). Currently, there is no consensus about or clear distinction between the interpretations of normal refuse as opposed to deliberately destroyed objects or symbolic deposits (Sørensen 2020). It is therefore difficult to separate ordinary waste from symbolic deposits, but recent discoveries at the Femernbelt site of Syltholm II (Denmark) demonstrate that ordinary objects were deliberately deposited into the ground, along with a newly discovered shoe-last axe (Sørensen 2020b; Sørensen 2023).

Most of the shoe-last axes found in Late Ertebølle contexts show significant use-wear and damage to the neck, thus indicating a purely functional usage in, for example, heavy wood working (Klassen 2004; Raemaekers et al. 2010). But there are also a few examples of shoe-last axes, such as the one found recently in connection with the Femernbelt excavations at Syltholm II, which show limited signs of heavy usage. No use-wear analyses have so far been conducted on the shoe-last axes from Late Ertebølle contexts, which could reveal whether some of the objects had been associated with prestige or with more domestic activ-

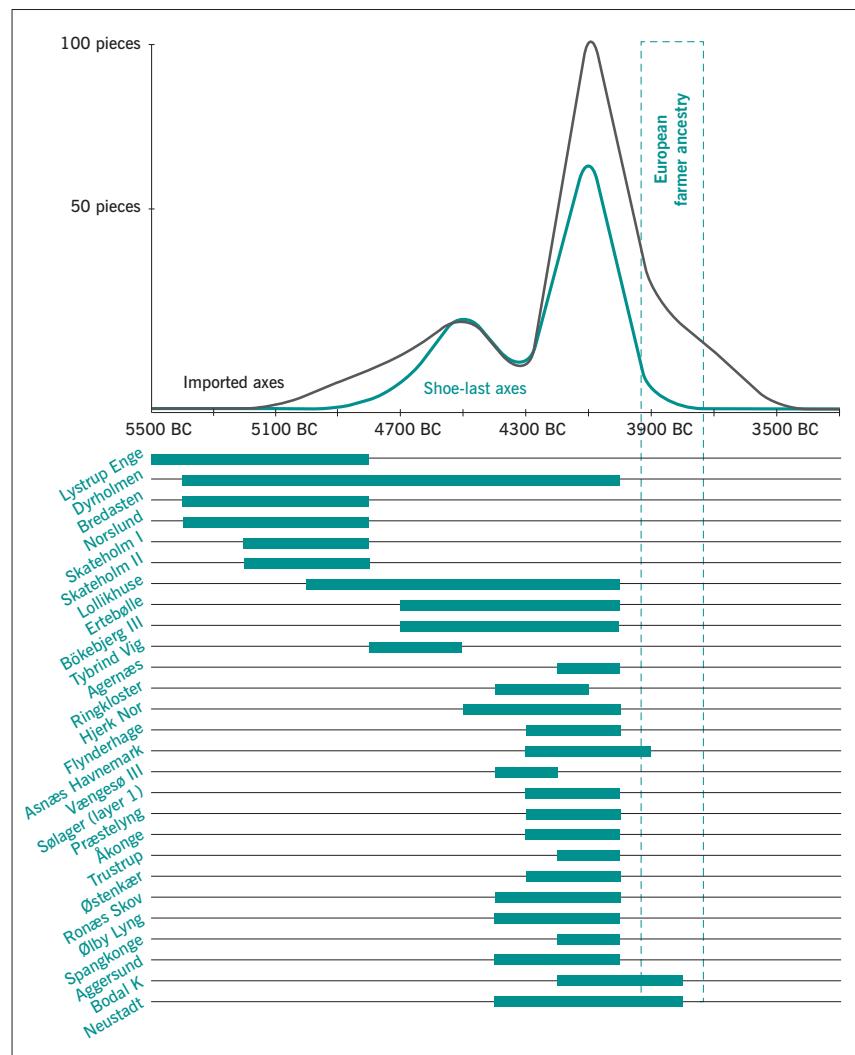


Fig. 3 Radiocarbon dates of Late Ertebølle sites containing substantial amounts of faunal material, combined with the import and exchange of shoe-last axes and other exotic axes, from the 5th millennium BC in Southern Scandinavia.

Abb. 3 Radiokarbon daten von spätereibøllezeitlichen Fundorten mit umfangreichem tierischen Material in Kombination mit dem Import und Tausch von Schuhleistenkeilen und anderen fremden Äxten/Beilen des 5. Jts. v. Chr. in Südschweden.

ities (Skak-Nielsen 2007). Personal circumstances and preferences of the hunter-gatherer communities probably played important and dynamic roles in defining what were perceived as normal or more symbolic activities, and when objects could be associated with power and status or perceived as ordinary domestic items (Sørensen 2012; Sørensen 2020b). Here, future use-wear studies combined with the investigations of the contextual information are of crucial importance.

Local imitations of shoe-last axes

Another problem associated with the interpretation of shoe-last axes as prestigious objects is the lack of local imitations of these axes. If the ownership of such axes was associated with increased status and the objects functioned as powerful mediators of certain ideas, then local imitations would be expected. Such imitations, although very rare, do exist, especially at Late Ertebølle sites in Southern Scandinavia and Northern Germany, where the type has been observed at Ertebølle, Ringkloster, Vængesø II–III, Agernæs, Kassemose, Romvig, Vester Ulslev, Karrebæk (all Denmark), Rosenhof and Timmendorf-Nordmole (both Germany; Andersen 1998; Andersen 2018; Klassen 2004, 132) (Fig. 2). The local imitations of shoe-last axes are often made of diabase or gabbro, with a central, biconical, and hourglass-shaped shaft hole, which is pecked. They vary in size, with a length ranging from 15 to 23 cm, a width of up to 10 cm, and a thickness of as much as 7 cm, as was the case in one example from the Late Ertebølle site of Vængesø II (Andersen 2018, 181).

In general, the limited number of imitations of the shoe-last axes could indicate that the idea behind the axes, as items of prestige and status, may have been lost in a Mesolithic network of contacts. If an artefact is exchanged indirectly several times and reaches marginal regions of a network, then the original meaning behind the object can be lost and change to something different (Wobst 1977; Latour 1996) (Fig. 1). Such an interpretation may apply, but the fact that local imitations exist points towards a demand for the shoe-last axes and difficulties in obtaining access to such exotic objects within the Late Ertebølle exchange networks. An increasing desire to gain access to shoe-last axes could have resulted in altered behaviour within the Late Ertebølle communities in their response to Southern Scandinavian demands for specific goods from either neighbouring hunter-gatherers in Northern Germany or agrarian communities in Northern Europe.

The appearance of shoe-last axes and changed hunting behaviour in the Late Ertebølle Culture

During the Ertebølle Culture from 4900 to 4000 cal BC, an increasing importation of the foreign shoe-last axes together with other exotic axes (adzes as well as disc and point-

ed-butted axes) can be observed in Southern Scandinavia, which reached its peak during the period of 4300–4000 cal BC, right at the end of the Late Ertebølle Culture (Klassen 2004, 101). Some of the many sub-types of shoe-last axes classified by Klassen (2004, 24 ff.) have, in other studies, instead been interpreted as the result of continuous resharpening processes, rather than representing actual types (Rae-maekers et al. 2010; Müller 2023). Nevertheless, the appearance of the earliest shoe-last axes is supported by an AMS date (4941–4729 cal BC) for the shaft that was preserved in the hole of a shoe-last axe from Rosenhof LA 58, thus indicating the starting point of the appearance of the shoe-last axes in the Late Ertebølle Culture (Hartz 2004; Hartz et al. 2007). Although more direct AMS dates are needed for the contexts the shoe-last axes have been found in, the general trend of increasing importation of the shoe-last axes culminating in a peak at the end of the Ertebølle Culture seems to apply (Klassen 2004; Sørensen 2014) (Fig. 3).

In addition, from around 4700 to 4000 cal BC, changed behaviour within the Late Ertebølle Culture can be observed in the form of new specialised hunting camps. At these sites, there was an increased focus on exploiting fur-bearing animals on a much larger scale than has previously been observed. The animals being hunted and systematically slaughtered were especially beaver (*Castor fiber*), wild cat (*Felis silvestris*), otter (*Lutra lutra*), pine marten (*Martes martes*), fox (*Vulpes vulpes*), and lynx (*Lynx lynx*). These new practices can be observed at sites such as Ringkloster, Agernæs, Tybrind Vig, Hjerk Nor, and Bodal K (all Denmark; Richter/Noe-Nygaard 2003; Hatting et al. 1973; Gotfredsen 2003) (Fig. 4).

Another changed behaviour during the Late Ertebølle Culture, also from around 4700 to 4000 BC, is an increase in the hunting of roe (*Capreolus capreolus*) and red deer (*Cervus elaphus*), as observed at several sites, including Bökebjerg III, Agernæs, Ringkloster, Asnæs Havne-mark, Præstelyng, Åkonge, Østenkær, Spangkonge, Bodal K, and Smakkerup Huse (all Denmark; Fig. 5)⁷. The aim of these hunter-gatherers was clearly to exploit the meat, bone, and antler as well as the highly-quality skins of these animals, and the hunting also included newborn roe and red deer calves, the skin of which is of superb quality.

Exchanging fur for shoe-last axes?

Such specialised hunting camps may have resulted from a growing demand for foreign shoe-last axes within the Late Ertebølle Culture, which in a barter economy could be exchanged for fur and skin. If the skin was exchanged to agrarian communities as finished products, then it could explain how amber beads, shell buttons, and perhaps even grandeln teeth of red deer or even T-shaped antler axes from the Late Ertebølle Culture may have spread to the agrarian societies in Central Europe during the late 5th millennium BC (Bogucki 2008, 55–56; Heumüller 2012; Row-

⁷ Eriksson/Magnell 2001; Richter/Noe-Nygaard 2003; Price 2022; Noe-Nygaard

1995; Gotfredsen 1998; Gotfredsen 2003; Enghoff 2011; Price/Gebauer 2005.

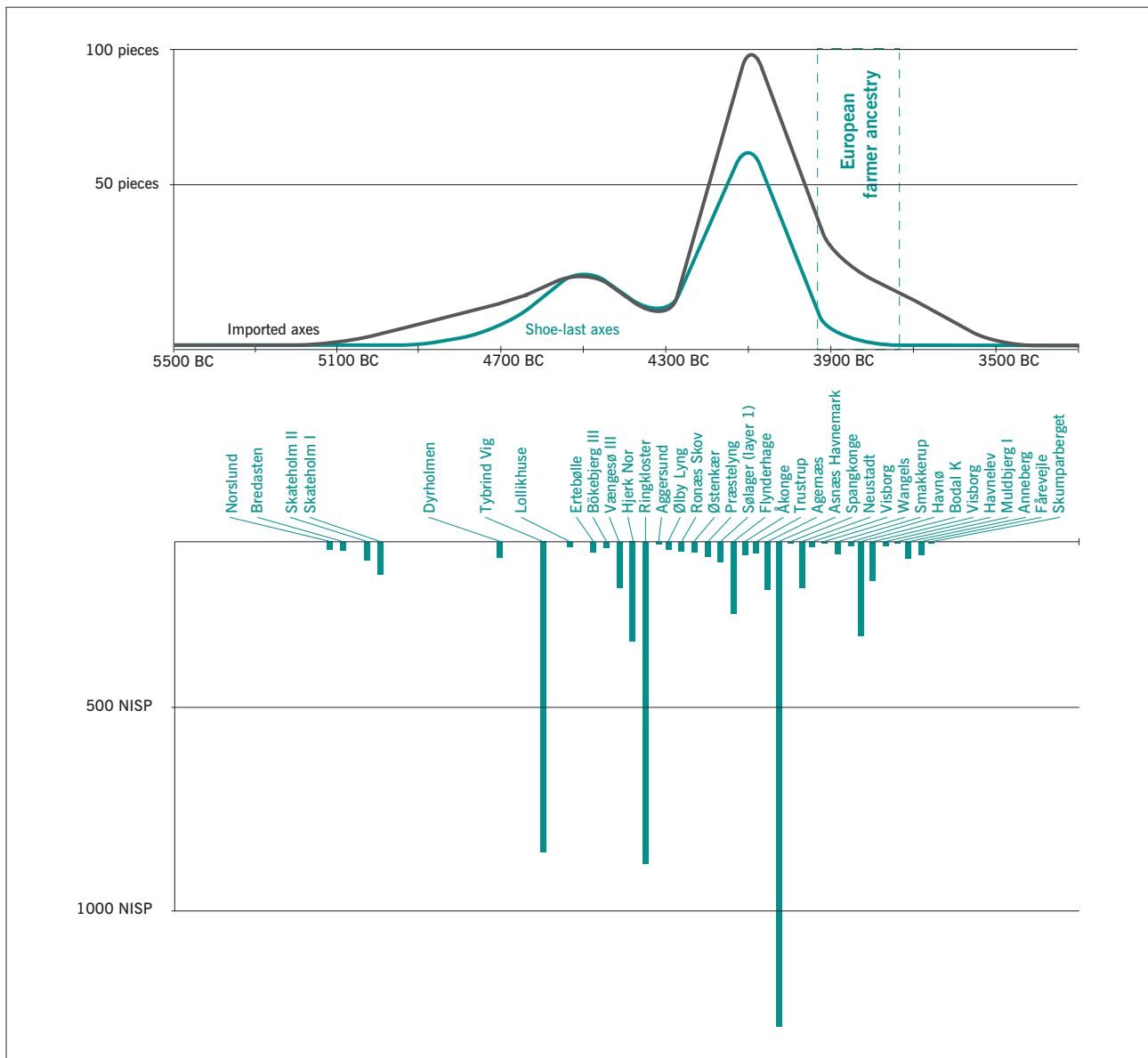


Fig. 4 The NISP values (Number of Identified Specimens) of fur-bearing animals beaver (*Castor fiber*), wild cat (*Felis silvestris*), otter (*Lutra lutra*), pine marten (*Martes martes*), fox (*Vulpes vulpes*) and lynx (*Lynx lynx*) from Late Ertebølle sites, combined with the import and exchange of shoe-last axes and other exotic axes from the 5th millennium BC in Southern Scandinavia.

Abb. 4 NISP-Werte (Anzahl der identifizierten Exemplare) von Pelztieren: Europäischer Biber (*Castor fiber*), Europäische Wildkatze (*Felis silvestris*), Fischotter (*Lutra lutra*), Baummartener (*Martes martes*), Rotfuchs (*Vulpes vulpes*) und Eurasischer Luchs (*Lynx lynx*) von spätereibøllezeitlichen Fundorten in Kombination mit Import und Tausch von Schuhleistenkeilen und anderen fremden Äxten/Beilen des 5. Jts. in Südsandinavien.

ley-Conwy 2014, 196). The wider exchange networks of the Late Ertebølle Culture objects found within agrarian communities in Northern Europe could be interpreted as a commercialisation process, in which these hunter-gatherers in Southern Scandinavia reorganised their economy to meet the demands of agrarian communities, with their commercial interests further afield involving many exotic objects, including fur, as proposed by M. Zvelebil (2001, 7).

The exchanges involving the shoe-last axes could either have been indirect, with neighbouring hunter-gatherers across the Baltic Sea, along the North German coast – at sites like Rosenhof, Neustadt, Siggeneben-Süd, and Wangels –, or direct, with agrarian communities located further inland in Central Europe (Fig. 6). Direct exchanges between Late Ertebølle hunter-gatherers and pioneering farmers from

Central Europe could also have occurred during their scouting visits to Southern Scandinavia. Evidence of such direct contact with pioneering Central European agrarian communities is associated with the two axe hoards from Ud Stolpe (Denmark), containing one pointed-butted axe and two shoe-last axes (Lomborg 1962) (Fig. 7), and with the Askø hoard (Denmark), containing two shoe-last axes (Jensen/Sørensen 2023; Müller 2023), which point towards occasional visits by scouting farmers to Southern Scandinavia (Anthony 1990; Sørensen 2014; Gron/Sørensen 2018).

Axe deposits of shoe-last axes are usually found in Central European agrarian societies and may have been symbolic offerings made by scouts searching for new territories and exchanging specific objects with the ingenious hunter-gatherers in the north (Sørensen 2020; Gebauer/

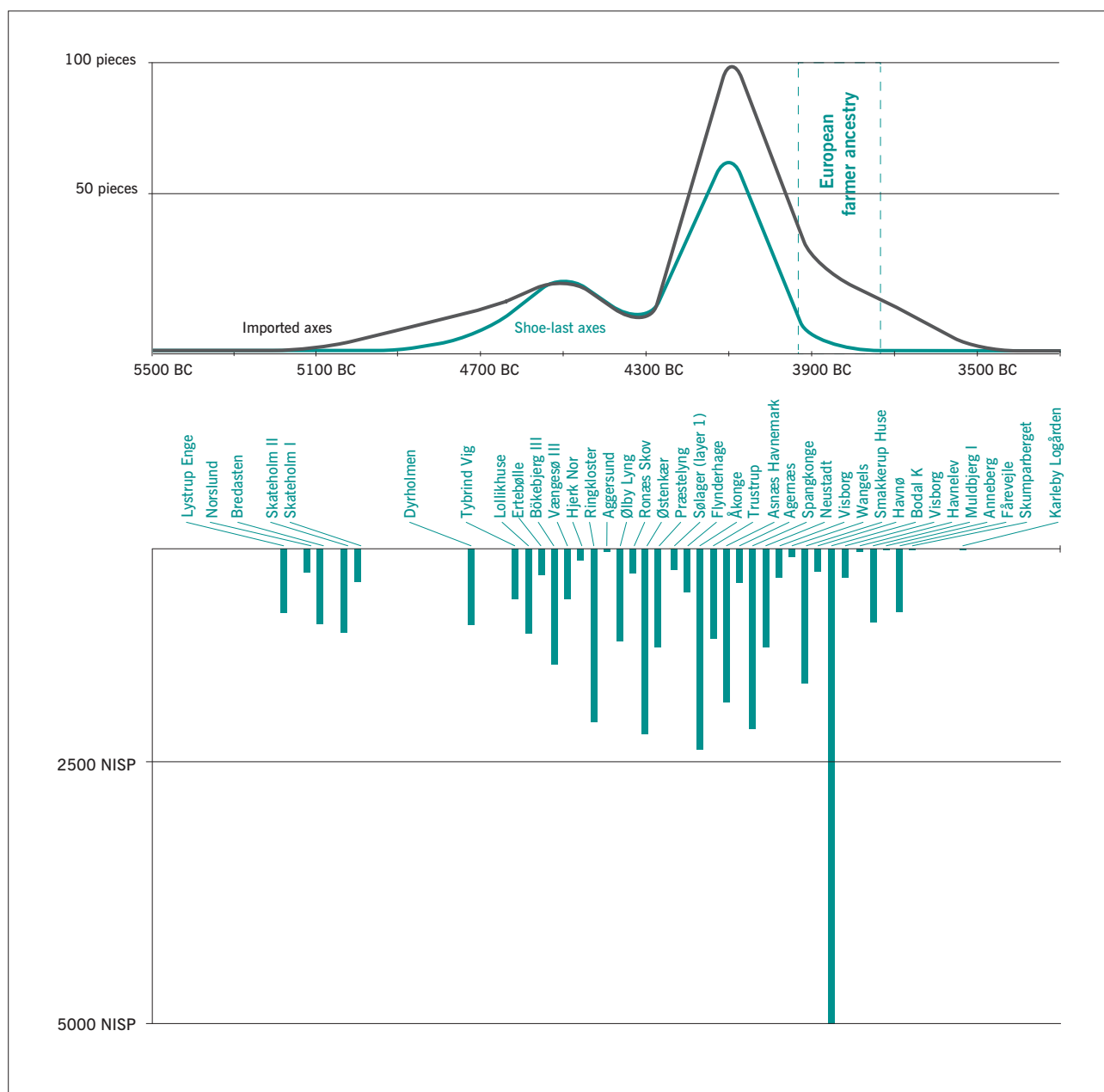


Fig. 5 The NISP values (Number of Identified Specimens) of roe (*Capreolus capreolus*) and red deer (*Cervus elaphus*) from Late Ertebølle sites, combined with the import and exchange of shoe-last axes and other exotic axes, from the 5th millennium BC in Southern Scandinavia.

Abb. 5 NISP-Werte (Anzahl der identifizierten Exemplare) von Reh (*Capreolus capreolus*) und Rothirsch (*Cervus elaphus*) von spätereboellezeitlichen Fundorten in Kombination mit Import und Tausch von Schuhleistenkeilen und anderen fremden Äxten/Beilen des 5. Jts. in Südsandinavien.

Sørensen 2022; Müller 2023). The greatest concentration of shoe-last axes in Southern Scandinavia is located on Lolland-Falster (Denmark), where the Ud Stolpe and Askø hoards have been found. In the same region, other exotic stray finds have also been documented, such as an amphibolite disc macehead at Vejro, a pointed-butted axe of Alpine jadeite on Lolland, and a copper flat axe from Vantore, which indicate that this is one of the regions that had continuous contact with agrarian communities in Central Europe (Klassen, 2004; Pétrequin et al. 2012).

Contact between Central European agrarian communities and the Late Ertebølle hunter-gatherers is also attested by the bone rings, which are imitations of the rings made of marble or amphibolite associated with the Rössen Culture

(Andersen 1998). Bone rings have been found at various sites in Denmark dating to the Middle and Late Ertebølle Culture, from around 4600 to 4400 cal BC (Klassen 2004).

Another example of possible contact between local hunter-gatherers and pioneering agrarian scouts has been identified at the site of Dąbki 9 in North Poland. The site was characterised by large quantities of beaver bones and was therefore interpreted as a beaver-hunting station, with an additional amber workshop (Hartz et al. 2015; Schmölcke/Nikulina 2015). Agrarian groups from the Bodrogkeresztúr Culture may have visited the Baltic coast and exchanged amber and beaver furs for domesticated animals, Neolithic pottery, and copper artefacts with hunter-gatherer groups living at Dąbki 9 (Kotula et al. 2015).

Fig. 6 Exchange of fur, T-shaped antler axes, shell buttons, and amber beads from hunter-gatherers in Southern Scandinavia and Northern Germany with shoe-last axes, Neolithic pottery and domesticated animals from the neighbouring agrarian communities in Northern Europe. Border zones are marked in the Baltic Sea and Northern Germany between hunter-gatherer groups (dashed red lines), which may have had direct and indirect contact with agrarian communities. Distribution of the Late Ertebølle Culture (dark green), Swifterbant Culture (light green), and Central European agrarian cultures (yellow). The grey colour is the contact zone between the hunter-gatherer and agrarian societies. The black hatching marks areas of loess sediments, where a high concentration of agrarian sites and activities have been documented.

Abb. 6 Tausch von Fellen, T-förmigen Geweihäxten, Muschelknöpfen und Bernsteinperlen von Jägern und Sammlern in Südschweden und Norddeutschland gegen Schuhleistenkeile, neolithische Keramik und domestizierte Tiere von benachbarten Ackerbaugemeinschaften in Nordeuropa. In der Ostsee und in Norddeutschland sind Grenzlinien zwischen Jäger-Sammler-Gruppen markiert (rote Strichlinien), die möglicherweise direkten und indirekten Kontakt zu den Ackerbaugemeinschaften hatten. Verbreitung der späten Ertebølle-Kultur (dunkelgrün), der Swifterbant-Kultur (hellgrün) und der mitteleuropäischen Ackerbaukulturen (gelb). Die graue Farbe stellt die Kontaktzone zwischen den Jäger-Sammler-Gesellschaften und den Ackerbaukulturen dar. Die schwarze Schraffur kennzeichnet Gebiete mit Lösssedimenten, in denen eine hohe Konzentration von Ackerbaustandorten und -aktivitäten dokumentiert wurde.

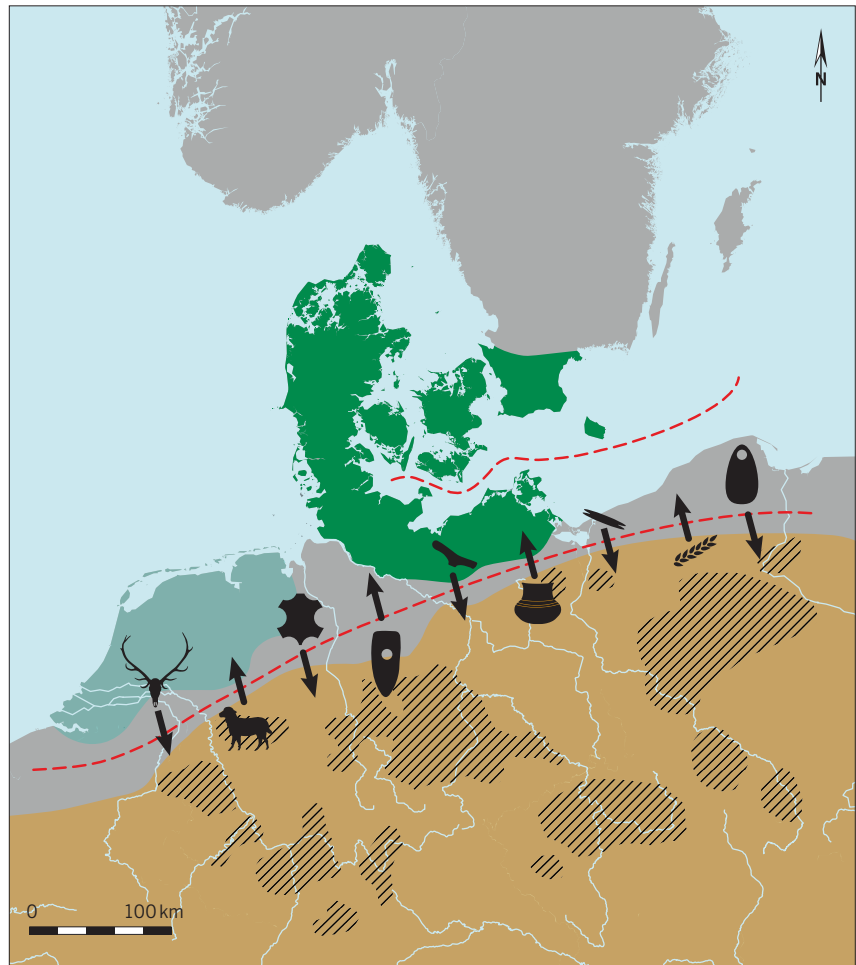


Fig. 7 Deposition of two shoe-last axes and one pointed-butted stone axe of metabasites from Ud Stolpe, Lolland (Denmark).

Abb. 7 Depotfund zweier Schuhleistenkeile und eines Spitznackenbeils aus Metabasit aus Ud Stolpe, Lolland (Dänemark).



Fig. 8 Shoe-last axes from the Late Ertebølle Culture on Zealand (Denmark) with considerable damage to the butt and cutting edge, which could be evidence of use in heavy woodworking activities.

Abb. 8 Schuhleistenkeile der späten Ertebølle-Kultur auf Seeland (Dänemark) mit starken Beschädigungen am Nacken und an der Schneide, die auf die Verwendung bei schweren Holzarbeiten hinweisen könnten.

It is tempting, based on this changed hunting behaviour within the Late Ertebølle Culture, to draw an analogy with the Native American fur trade: here, fur and deerskin commodities were also exploited to a much greater extent by the Native Americans and exchanged for exotic goods, such as guns, pearls, and metal, when the incoming European settlers came to North America. This provides an interesting parallel from the ethnographic and historic records (Pavao-Zuckerman/Reitz 2006; Pavao-Zuckerman 2007).

The conceptual and practical impact of the exchange of shoe-last axes

If the idea is accepted that there was a connection between the hunter-gatherers' desire to gain access to the shoe-last axes and the resulting appearance of specialised hunting stations exploiting fur-bearing animals as well as roe and red deer in a barter-like exchange system, then objects would have begun to be associated with greater economic value. This would have revolutionised the mindset of these hunter-gatherer communities towards becoming more competitive, commercialised, and complex in their management of resources, as well as in their social organisation. The question is: Why did these hunter-gatherers require the exotic shoe-last axes, and could they have given their owners some practical advantages? One typical feature that can be observed on most of the shoe-last axes found in Late Ertebølle contexts is the significant use-wear and damage to

the neck; this may indicate that these axes were used and had a special role in the heavy woodworking involved in important symbolic, logistic, and economic constructions (Fig. 8). Large house structures, which, based on the width of the postholes, consisted of very thick pieces of timber, were being built during the Late Ertebølle Culture; they covered an area of 30–70 m², and the larger houses in particular have been interpreted as winter houses (Grøn 2003). The construction of large hut structures would have made it possible to integrate several hunter-gatherer communities, possibly stimulating greater group identity, increased competition, and more network exchanges (Fig. 9).

A similar increase has been observed in the sizes of the dug-out canoes from the Late Ertebølle Culture, which are up to 10 m long. Such canoes could have been used to transport a number of people and considerable quantities of goods through the water routes in this maritime landscape and beyond towards the larger rivers running out into the Baltic Sea, helping maintain and expand the networks involved in various kinds of exchanges (Christensen 1990).

Interpretations of forest management have even been suggested in connection with the construction of large stationary fishing traps consisting of hundreds or perhaps even thousands of hazel stakes, which increase in intensity and size during the Late Ertebølle Culture. The stakes had been selected based on their thickness and were often around 3 cm in diameter, and therefore an average of seven years old (Christensen 1997). Furthermore, studies of their growth rings indicate that they were cut either in the spring

or autumn, suggests a harvesting pattern and thus forest management (Price 2022). Recently, the argument in favour of forest management during the Late Ertebølle Culture has been criticised, as hazel stakes can also be selected from natural openings in forests, and it has been stated that such management did not occur in the Late Mesolithic or the Neolithic (Out et al. 2020). Nevertheless, historical records indicate that the hazel stakes required to construct large stationary fish traps would have required large clearings in the forest, covering several hectares (Pedersen et al. 2018). Pollen diagrams also demonstrate that openings in the forest did exist during the Late Ertebølle Culture: The increase of ribwort plantain (*Plantago lanceolata*) and wild grasses before the elm decline indicate that there were possible clearings, which increased the areas available for hunting wild game (Göransson 1986; Kolstrup 1988; Regnéll 1989).

The construction of larger stationary fishing traps during the Late Ertebølle Culture would have secured a substantial economic subsistence surplus for these hunter-gatherers and perhaps also have resulted in an increase in territorial conflicts over the best fishing grounds and fjords between these hunter-gatherer communities (Fig. 10). Territories could have existed during the Late Ertebølle Culture, as has been proposed based on several different types of flake axes on Zealand (Vang Petersen 1984) and on various types of ornamentation on the painted or carved paddle blades in Eastern Jutland (Andersen 2013; Skriver et al. 2018).

Evidence of violence has also been observed in the form of cranial injuries, which have often been recorded on individuals within the Øresund region during the Middle-Late Mesolithic (Bennike 1985). Today, around 100 to 120 skeletons of a Mesolithic date are known from Southern Scandinavia, with around one in ten of these showing signs of serious injuries (Andersen 2015). Most skull injuries are observed in adult males, although some women also have serious injuries that were caused by violence. Most of the head injuries have healed, however, and only in three or four examples involving the individuals buried at Henriksholm-Bøgebakken, Vængesø II, Skateholm, and Tågerup (all Denmark) has the violence indicated by the evidence appeared fatal (Sørensen/Nielsen 2024). It is, however, difficult to assess the amount of violence in the latest part of the Ertebølle Culture, as burials disappear after 4700 BC, subsequently consisting of loose human remains found at the different settlements (Sørensen 2016). Nevertheless, there are signs which could be interpreted as an emerging complexity within these hunter-gatherer societies, where they were building larger wood constructions, which were meant to last for generations.

All these examples demonstrate that woodworking involving large timbers intensified during the Late Ertebølle Culture, with the shoe-last axes perhaps the main tool that was used in such activity. Moreover, when such foreign objects were used, they may also have had symbolic meaning, as such shoe-last axes could have been carriers of stories of past owners, places, and constructions, thus functioning as mediators of a new kind of ideology that was embedded in them (Chapman 2000; Bradley 2005). A recent study of the decorated antler axes indicates that the decoration of these objects stops around 4700 cal BC, and

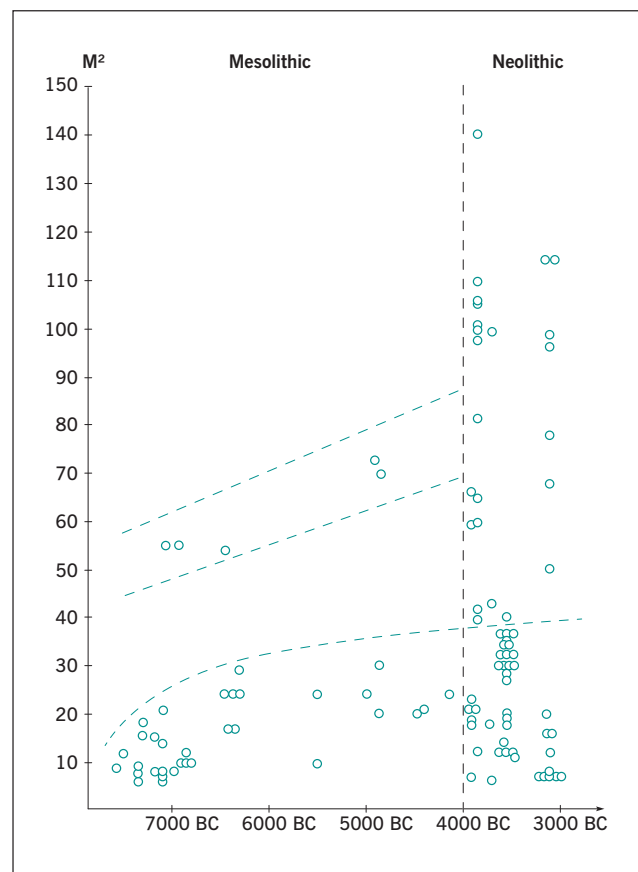


Fig. 9 Estimated floor space areas of dwellings (circles) over time from the Mesolithic to the Early Funnel Beaker Culture in Southern Scandinavia. The dashed lines mark the possible summer huts below 30 m², while larger hut structures above 50 m² mark the possible winter huts.

Abb. 9 Geschätzte Grundflächen von Wohnbauten (Kreise) im Laufe der Zeit vom Mesolithikum bis zur frühen Trichterbecherkultur in Südschweden. Die gestrichelten Linien markieren die möglichen Sommerhütten unter 30 m², während größere Hüttenstrukturen über 50 m² die möglichen Winterhütten markieren.

they become an undecorated tool at the beginning of the Late Ertebølle Culture, which is also the time when the shoe-last axes are being imported (Andersen 2023). After this, decorations during the Late Ertebølle Culture are observed on pottery and painted or carved paddle blades. Another major change that occurs around 4700 cal BC is a significant decline in burials and an increase in loose human bones at the habitation sites (Sørensen 2016).

All these changes reflect an important shift in burial practices, and thus also in fundamental social and ideological changes, which are synchronous with the appearance of new objects in the material culture, such as pottery, T-shaped antler axes, bone rings, and shoe-last axes. The shoe-last axes can clearly be regarded as an agent and mediator of change at both a conceptual and practical level within these hunter-gatherer communities in the Late Ertebølle Culture.

Concluding remarks

One of the ideological causes of change was the Late Ertebølle hunter-gatherers' direct or indirect interaction

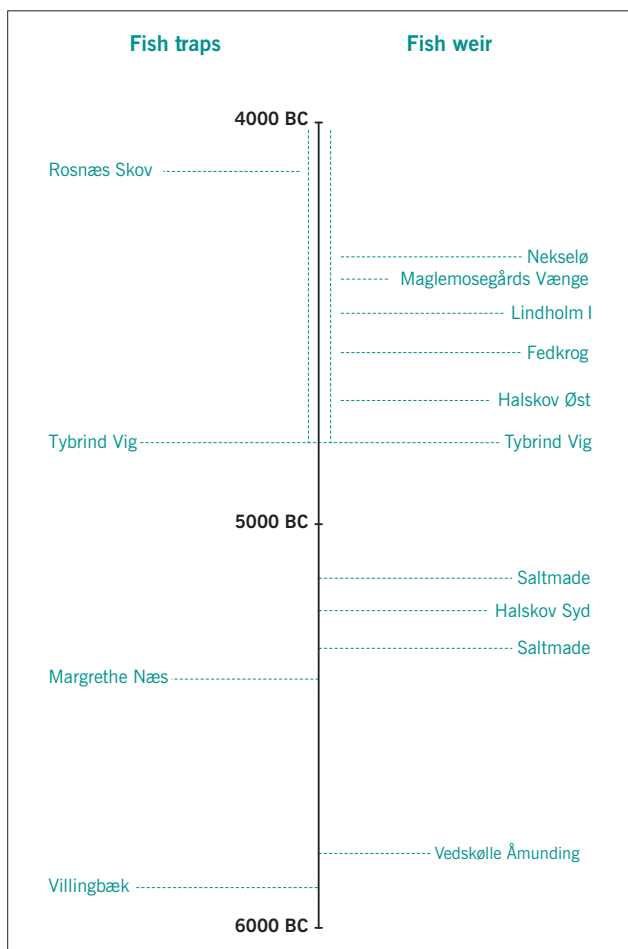


Fig. 10 Overview of the stationary fish traps from the Ertebølle Culture in Southern Scandinavia.

Abb. 10 Übersicht der ortsfesten Fischreusen der Ertebølle-Kultur in Südsandinavien.

with the Central European agrarian communities in connection with the exchange of fur and skin for shoe-last axes. Such transactions could lead to a barter economy and a new awareness of the concept of value, thus forcing these hunter-gatherers to change their normal behaviour and engage themselves in specialised hunting of fur-bearing animals and red and roe deer, exploiting their antlers and skin far beyond their own needs. The increased contact did not, however, result in a transition towards full agrarian cultivation or husbandry practices for these hunter-gatherers of the Late Ertebølle Culture. The interaction did, on the other hand, probably have an impact on their mindset, as they became aware of concepts such as the value of things, thus paving the way for becoming increasingly complex hunter-gatherers, although evidence of major inequality and hierarchical organisations remains difficult to detect in the archaeological material. But this example and hypothesis of fur for shoe-last axes involves so many perspectives that it invites more detailed and further investigations in the future.

Bibliography

- Andersen 1998**
S. H. Andersen, Ringkloster. Ertebølle trappers and wild boar hunters in eastern Jutland. A survey. *Journal Danish Arch.* 12, 1994/95 (1998), 13–59.
- Andersen 2008**
S. H. Andersen, A report on recent excavations at the shell midden Havnø im Denmark. *Mesolithic Miscellany* 19, 2008, 2–5.
- Andersen 2009**
S. H. Andersen, Ronæs Skov. *Marinarkæologiske undersøgelser af en kystboplads fra Ertebølle-tid.* *Jysk Ark. Selskabs Skr.* 64 (Aarhus 2009).
- Andersen 2013**
S. H. Andersen, Tybrind Vig. Submerged Mesolithic settlements in Denmark. *Jutland Arch. Soc. Publ.* 77 (Aarhus 2013).
- Andersen 2015**
S. H. Andersen, Den voldsomme jæger-fisker-stenalder. In: N. B. Thomsen/P. Hoffmann/B. Staal/J. Petersen/A. Tomlinson et al. (eds.), *Krig og vold i fortiden. Sammenslutningen af Danske Amatorarkæologers 25-års-jubilæum* (Højby 2015) 10–22.
- Andersen 2018**
S. H. Andersen, Vængesø and Holmegaard. Ertebølle Fischers and Hunters on Djursland. *East Jutland Mus. Publ.* 4 (Aarhus 2018).
- Andersen 2023**
S. H. Andersen, Ertebøllekunstens teknik og kronologi – nye fund fra den jyske Ertebøllekultur. *Kuml* 72, 2023, 41–80.
- Andersen/Malmros 1965**
S. H. Andersen/C. Malmros, Norslund. En kystboplads fra ældre stenalder. *Kuml* 1965, 35–114.
- Anthony 1990**
A. Anthony, Migration in Archaeology: The Baby and the Bathwater. *Am. Anthropologist* 92, 1990, 895–914.
- Appadurai 1986**
A. Appadurai, Introduction: commodities and the politics of value. In: A. Appadurai (ed.), *The Social Life of Things* (Cambridge 1986) 3–63.
- Bennike 1985**
P. Bennike, Palaeopathology of Danish Skeletons. *A Comparative Study of Demography, Disease and Injury* (København 1985).
- Bernardini et al. 2012**
F. Bernardini/A. De Min/D. Lenaz/P. Šída/C. Tuniz et al., Shaft-hole axes from Caput Adriae made from amphibole – rich metabasites: Evidence of connections between northeastern Italy and Central Europe during the fifth millennium BC. *Archaeometry* 54, 2012, 427–441.
- Bogucki 2008**
P. Bogucki, The Danubian-Baltic Borderland: Northern Poland in the fifth millennium BC. In: H. Fokkens/B. Coles/A. L. van Gijn/J. P. Kleijne/H. H. Ponjee et al. (eds.), *Between Foraging and Farming. Analecta Praehist. Leidensia* 40 (Leiden 2008) 51–65.
- Borgerhoff Mulder et al. 2009**
M. Borgerhoff Mulder/S. Bowles/T. Hertz/A. Bell/J. Beise et al., Intergenerational Wealth Transmissions and the Dynamics of inequality in Small-Scale Societies. *Science* 326, 2009, 682–688.
- Bradley 2005**
R. Bradley, *Ritual and Domestic Life in Prehistoric Europe* (London 2005).
- Bradley/Edmonds 1993**
R. Bradley/M. Edmonds, *Interpreting the Axe Trade. Production and Exchange in Neolithic Britain* (Cambridge 1993).
- Brinch Petersen 2001**
E. Brinch Petersen, Mesolitisk grave og skeletter. In: O. Lass Jensen/S. A. Sørensen/K. M. Hansen (eds.), *Danmarks jægerstenalder – status og perspektiver* (Hørsholm 2001) 43–58.

- Chapman 2000**
J. Chapman, Fragmentation in archaeology. People, places and broken objects in the prehistory of South Eastern Europe (London 2000).
- Christensen 1990**
C. Christensen, Stone Age Dug-Out Boats in Denmark: Occurrence, Age, Form and Reconstruction. In: D. E. Robinson (ed.), *Experimentation and Reconstruction in Environmental Archaeology* (Oxford 1990) 119–141.
- Christensen 1997**
K. Christensen, Egestammer fra Halskøvfjorden. In: L. Christensen/A. Fischer/B. Aaby (eds.), *Storebælt i 10.000 år. Mennesket, havet og skoven* (København 1997) 37–44.
- Enghoff 2011**
I. B. Enghoff, Regionality and biotope exploitation in Danish Ertebølle and adjoining periods. *Scien. Danica ser. B. Biologica* 1 (Copenhagen 2011).
- Eriksson/Magnell 2001**
M. Eriksson/O. Magnell, Det djuriska Tågerup. Nya rön kring Kongemose- och Ertebøllekulturens jakt och fiske. In: P. Karsten (ed.), *Tågerup. Specialstud.* (Stockholm 2001) 156–237.
- Fischer 1982**
A. Fischer, Trade in Danubian Shaft-Hole Axes and the introduction of Neolithic Economy in Denmark. *Journal Danish Arch.* 1, 1982, 7–12.
- Fischer 1983**
A. Fischer, Handel med skolæstøker og landbrugets indførelse i Danmark. *Aarb. Nordisk Oldkde. og Hist.* 1981, 1983, 5–16.
- Fischer 2002**
A. Fischer, Food for Feasting? An evaluation of explanations of the neolithisation of Denmark and southern Sweden. In: A. Fischer/K. Kristiansen (eds.), *Food for feasting. The neolithisation of Denmark – 150 years of debate.* *Sheffield Arch. Monogr.* 12 (Sheffield 2002) 341–393.
- Gebauer/Sørensen 2022**
A. B. Gebauer/L. Sørensen, Super Regional Contacts and the earliest metallurgy in South Scandinavia during the Mesolithic and Neolithic transition. In: F. Klimscha/M. Heumüller/D. C. M. Raemaekers/H. Peeters/T. Terberger (eds.), *Stone Age Borderland Experience: Neolithic and Late Mesolithic Parallel Societies in the North European Plain.* *Veröff. Arch. Slg. Landesmus. Hannover* 54 = *Materialh. Ur- u. Frühgesch. Niedersachsen* 60 (Rahden/Westf. 2022) 323–337.
- Glykou 2011**
A. Glykou, Neustadt LA 156: a submarine site from the Late Mesolithic-Ertebølle and earliest Neolithic-Funnel Beaker in northern Germany – fine results of the typological and technological analysis of the ceramics. In: S. Hartz/F. Lüth/T. Terberger (eds.), *Frühe Keramik im Ostseeraum – Datierung und Sozialer Kontext.* *Internationaler Workshop in Schleswig vom 20. bis 21. Oktober 2006.* *Ber. RGK* 89, 2011, 277–286.
- Godelier 1999**
M. Godelier, *The Enigma of the Gift* (Cambridge 1999).
- Göransson 1986**
H. Göransson, Man and the forests of nemoral broad-leaved trees during the stone age. In: L. K. Königsson (ed.), *Nordic Late Quaternary Biology and Ecology.* *Stria* 24 (Uppsala 1986) 143–152.
- Gotfredsen 1998**
A. B. Gotfredsen, En rekonstruktion af palæomiljøet omkring tre senmesolitiske boplads i Store Åmose, Vestsjælland – baseret på pattedyr- og fuglekogler. *Geol. Tidsskr.* 2, 1998, 93–104.
- Gotfredsen 2003**
A. B. Gotfredsen, Tamt og vildt i de første bønders kødgyder. Analyse af knoglemateriale fra stenalderbopladsen Spangkonge, Store Åmose, Sorø/Vestsjællands amt. *Report fra Zoologisk Museum og Kalundborg og Omegns Museum* (København, Kalundborg 2003).
- Graber 2001**
D. Graber, *Toward an Anthropological Theory of Value. The False Coin of Our Own Dreams* (New York 2001).
- Gron 2013**
K. J. Gron, *The Ertebølle Faunal Economy and the Transition to Agriculture in Southern Scandinavia.* Unpubl. Diss. Univ. Wisconsin-Madison (Madison 2013).
- Gron/Sørensen 2018**
K. J. Gron/L. Sørensen, Cultural and Economic Negotiation during the Neolithisation of Southern Scandinavia. *Antiquity* 92,364, 2018, 958–974.
- Grøn 2003**
O. Grøn, Mesolithic dwelling places in south Scandinavia: their definition and social interpretation. *Antiquity* 77, 2003, 685–708.
- Hallgren 2008**
F. Hallgren, Identitet i Praktik. Lokala, regionala och överregionala sociala sammanhang inom nordlig trättbägerkultur (Uppsala 2008).
- Hartz 2004**
S. Hartz, Aktuelle Forschungen zur Chronologie und Siedlungsweise der Ertebølle- und frühesten Trichterbecherkultur in Schleswig-Holstein. *Neue Forschungen zur Steinzeit im südlichen Ostseebiet.* *Jahrb. Bodendenkmalpfl. Mecklenburg-Vorpommern* 52, 2004, 61–81.
- Hartz et al. 2007**
S. Hartz/H. Lübke/T. Terberger, From fish and seal to sheep and cattle: new research into the process of neolithisation in northern Germany. In: A. Whittle/V. Cummings (eds.), *GOING OVER, The Mesolithic-Neolithic Transition in Northwest Europe.* *Proc. British Acad.* 144 (Oxford 2007) 567–594.
- Hartz et al. 2015**
S. Hartz/J. Kabaciński/D. C. M. Raemaekers/T. Terberger, The Dąbki Site and the Neolithisation of the northern lowlands – a short introduction. In: J. Kabaciński/S. Hartz/D. C. M. Raemaekers/T. Terberger (eds.), *The Dąbki Site in Pomerania and the Neolithisation of the North European Lowlands (c. 5000–3000 calBC).* *Arch. u. Gesch. Ostseeraum* 8/Arch. Hist. Baltic 8 (Rahden/Westf. 2015) 13–20.
- Hatting et al. 1973**
T. Hatting/E. Holm/K. Rosenlund, En pelsjægerboplads fra stenalderen. *Kaskelot* 10, 1973, 13–21.
- Heinrich 1999**
D. Heinrich, Die Tierknochen des frühneolithischen Wohnplatzes Wangels LA 505. Ein Vorbericht. *Offa* 54/55, 1999, 43–48.
- Heumüller 2012**
M. Heumüller, Schmuck als Zeichen weit gespannter und lang andauernder Kommunikationsräume im 5. und frühen 4. Jahrtausend. In: R. Gleser/V. Becker (eds.), *Mitteleuropa im 5. Jahrtausend vor Christus* (Berlin 2012) 359–387.
- Jennbert 1984**
K. Jennbert, Den Produktiva Gåvan. Tradition och innovation i Sydskandinavien för omkring 5300 år sedan. *Acta Arch. Lundensia* 4,16 (Lund 1984).
- Jensen/Sørensen 2023**
T. Z. T. Jensen/L. V. Sørensen, Duality in the early Neolithic of Lolland-Falster and South Scandinavia. In: D. Groß/M. Rothstein (eds.), *Changing Identity in a Changing World. Current Studies on the Stone Age around 4000 BCE* (Leiden 2023) 89–107.
- Johansen 2006**
K. L. Johansen, Settlement and Land Use at the Mesolithic-Neolithic Transition in Southern Scandinavia. *Journal Danish Arch.* 14, 2006, 201–223.
- Jonsson 1988**
L. Jonsson, The vertebrate faunal remains from the Late Atlantic settlement Skateholm in Scania, south Sweden. In: L. Larsson (ed.), *The Skateholm project I. Man and environment* (Stockholm 1988) 56–88.
- Kaufmann 2020**
D. Kaufmann, *Die Rössener Kultur in Mitteldeutschland. Die rössenzeitlichen Geräte aus Felsgestein.* *Veröff. Landesamt Denkmalpfl. u. Arch. Sachsen-Anhalt* 72,5 (Halle [Saale] 2020).
- Klassen 2004**
L. Klassen, Jade und Kupfer Untersuchungen zum Neolithisierungsprozess im westlichen Ostseeraum unter besonderer Berücksichtigung der Kulturentwicklung Europas 5500–3500 BC. *Jutland Arch. Soc.* 47 (Århus 2004).
- Koch 1998**
E. Koch, Neolithic Bog Pots from Zealand, Møn, Lolland and Falster. *Nordiske Fortidsminder Ser. B* 16 (København 1998).
- Kohler/Smith 2018**
T. A. Kohler/M. A. Smith, *Ten Thousand Years Of Inequality. The Archaeology of Wealth Differences* (Tucson 2018).
- Kolstrup 1988**
E. Kolstrup, Late Atlantic and early Subboreal vegetational development at Trundholm, Denmark. *Journal Arch. Scien.* 15, 1988, 503–513.
- Kopytoff 1986**
I. Kopytoff, The cultural biography of things: commoditization as process. In: A. Appadurai (ed.), *The Social Life of Things* (Cambridge 1986) 64–91.
- Kotula et al. 2015**
A. Kotula/A. Czekaj-Zastawny/J. Kabaciński/T. Terberger, Find distribution, taphonomy and chronology of the Dąbki site. In: J. Kabaciński/S. Hartz/D. C. M. Raemaekers/T. Terberger (eds.), *The Dąbki Site in Pomerania and the Neolithisation of the North European Lowlands (c. 5000–3000 cal BC).* *Arch. u. Gesch. Ostseeraum* 8/Arch. Hist. Baltic 8 (Rahden/Westf. 2015) 113–136.
- Latour 1996**
B. Latour, On Actor Network Theory: A few Clarifications. *Soziale Welt* 47,4, 1996, 369–381.
- Lichardus 1976**
J. Lichardus, Rössen-Gatersleben-Baalberg. Ein Beitrag zur Chronologie des Mitteldeutschen Neolithikums und zur Entstehung der Trichterbecher Kulturen. *Saarbrücker Beitr. Altkde.* 17 (Bonn 1976).
- Lomborg 1962**
E. Lomborg, Zur Frage der bandkeramischen Einflüsse in Südsandinavien. *Acta Arch.* 33, 1962, 1–38.
- Luley 1990**
H. Luley, Die Rekonstruktion eines Hauses der Rössener Kultur im archäologischen Freilichtmuseum Oerlinghausen. In: M. Fansa (ed.), *Experimentelle Archäologie in Deutschland.* *Arch. Mitt. Nordwestdeutschland, Beih.* 4 (Oldenburg 1990) 31–44.
- Magnusson 2007**
B. Magnussen, En Geologisk og Zooarkæologisk Analyse af Kystbopladsen. *Lollikhuse*

- på Overgangen Mellem Mesolitikum og Neolitikum. Unpubl. MA thesis Copenhagen Univ. (Copenhagen 2007).
- Malafouris 2013**
L. Malafouris, *How things shape the mind: A theory of material engagement* (Cambridge 2013).
- Mathiassen et al. 1942**
T. Mathiassen/M. Degerbøl/J. Troels-Smith, Dyrholmen. En Stenalderboplads på Djursland. Ark. Kunsthist. Skr. (København 1942).
- Meyer 2023**
A.-K. Meyer, Long-term perspectives on Neolithisation. Pottery use in the Ertebølle Culture and its connection to the development of settlement patterns and hunter-gatherer complexity. In: D. Groß/M. Rothstein (eds.), *Changing Identity in a Changing World*. Current Studies on the Stone Age around 4000 BCE (Leiden 2023) 109–126.
- Moreau 2020**
L. Moreau, Social inequality without farming: what we can learn from how foraging societies shape(d) social inequality. In: L. Moreau (ed.), *Social inequality before farming? Multidisciplinary approaches to the study of social organization in prehistoric and ethnographic hunter-gatherer-fisher societies* (Cambridge 2020) 1–18.
- Müller 2023**
M. Müller, Evidence of a base model for Neolithic depositions in Central and Northern Europe. In: D. Groß/M. Rothstein (eds.), *Changing Identity in a Changing World*. Current Studies on the Stone Age around 4000 BCE (Leiden 2023) 265–278.
- Møhl 1970**
U. Møhl, Oversigt over dyreknoerne fra Ølby Lyng. En Østsjællandsk kystboplads med Ertebøllekultur. Aarbøger for nordisk Oldkde. og Hist. 1970, 43–77.
- Møhl 1978**
U. Møhl, Aggersund-bopladsen zoologisk belyst. Svanejagt som årsag til bosættelse? Kuml 27,27, 1978, 57–75.
- Noe-Nygaard 1995**
N. Noe-Nygaard, Ecological, sedimentary and geochemical evolution of the late-glacial to postglacial Åmose lacustrine basin, Denmark. *Fossils Strata* 37 (Oslo 1995).
- Out et al. 2020**
W. A. Out/C. Baittinger/K. Cufar/O. Lopez-Bulto/K. Hänninen et al., Identification of woodland management by analysis of roundwood age and diameter: Neolithic case studies. *Forest Ecology and Management* 467, 2020, 118136.
- Pavao-Zuckerman 2007**
B. Pavao-Zuckerman, Deerskins and Domesticates: Creek Subsistence and Economic Strategies in the Historic Period. *Am. Ant.* 72, 2007, 5–33.
- Pavao-Zuckerman/Reitz 2006**
B. Pavao-Zuckerman/E. J. Reitz, Introduction and Adoption of Animals from Europe. In: D. Ubelaker (ed.), *Environment, Origins and Population*. Handbook North Am. Indians 3 (Washington DC 2006) 485–491.
- Pedersen 1995**
L. Pedersen, 7000 years of fishing: stationary fishing structures in the Mesolithic and afterwards. In: A. Fischer (ed.), *Man & Sea in the Mesolithic*. Coastal settlement above and below present sea level. Proceedings of the International Symposium, Kalundborg, Denmark 1993. Oxbow Monogr. 53 (Oxford 1995) 75–86.
- Pedersen et al. 2018**
L. Pedersen/A. Fischer/T. Bartholin, Nekselø – fishing and woodland management on a grand scale. In: A. Fischer/L. Pedersen (eds.), *Oceans Of Archaeology*. Jutland Arch. Soc. Publ. 101 (Aarhus 2018) 86–88.
- Pétréquin et al. 2012**
P. Pétréquin/S. Cassen/M. Errera/L. Klassen/A. Sheridan et al. (eds.), *JADE. Grandes haches alpines du Néolithique européen. Ve et IVe millénaires av J.-C. Tome 1–2* (Besançon 2012).
- Price 2000**
T. D. Price, *Europe's First Farmers* (Cambridge 2000).
- Price 2022**
T. D. Price, Seeking the first farmers in Western Sjælland, Denmark. The Archaeology of the Transition to Agriculture in Northern Europe (Oxford, Philadelphia 2022).
- Price/Feinman 2010**
T. D. Price/G. M. Feinman, Social Inequality and the Evolution of Human Social Organisation. In: T. D. Price/G. M. Feinman (eds.), *Pathways to Power. New Perspectives on the Emergence of Social Inequality* (New York 2010) 1–14.
- Price/Gebauer 2005**
T. D. Price/A. B. Gebauer, Smakkerup Huse: a Late Mesolithic Coastal Site in Northwest Zealand, Denmark (Århus 2005).
- Přichystal 2014**
A. Přichystal, *Lithic Raw Materials in Prehistoric Times of Eastern Central Europe 2013* (Brno 2014).
- Raemaekers et al. 2010**
D. C. M. Raemaekers/J. Geuverink/M. Schepers/B. P. Tuin/E. van der Lagemaat et al., A Biography in Stone: Typology, Age, Function and Meaning of Early Neolithic Perforated Wedges in the Netherlands (Groningen 2010).
- Regnéll 1989**
J. Regnell, Vegetation and Land Use during 6000 Years. Palaeoecology of the Cultural Landscape at two Lake Sites in southern Skåne, Sweden. LUNDQUA thesis 27. Department of Quaternary Geology Univ. Lund (Lund 1989).
- Richter/Noe-Nygaard 2003**
J. Richter/N. Noe-Nygaard, A late mesolithic hunting station at Agernæs, Fyn, Denmark: Differentiation and specialization in the late Ertebølle-culture, heralding the introduction of agriculture? *Acta Arch.* 74, 2003, 1–64.
- Risch 2011**
R. Risch, Social and economic organisation of the stone axe production and distribution in the western Mediterranean. In: V. Davis/M. Edmonds (eds.), *Stone Age Studies III* (Oxford 2011) 99–118.
- Rowley-Conwy 2007**
P. Rowley-Conwy, Foragers and farmers in Mesolithic/Neolithic Europe, 5500–3900 cal BC: beyond the anthropological comfort zone. In: F. Foulds/H. Drinkall/A. Perri/D. Clinnick/J. Walker (eds.), *Wild things: recent advances in palaeolithic and mesolithic research* (Oxford 2014) 185–201.
- Sahlins 1972**
M. Sahlins, *Stone Age Economies* (Chicago 1972).
- Schmölcke/Nikulina 2015**
U. Schmölcke/E. Nikulina, Mesolithic beaver hunting station or base camp of supra-regional Stone Age fur trade? New archaeozoological and archaeogenetic results from Dąbki 9. In: J. Kabaciński/S. Hartz/D. C. M. Raemaekers/T. Terberger (eds.), *The Dąbki Site in Pomerania and the Neolithisation of the North European Lowlands (c. 5000–3000 calBC)*. Arch. u. Gesch. Ostseeraum 8/Arch. and Hist. Baltic 8 (Rahden/Westf. 2015) 65–86.
- Schwabedissen 1967**
H. Schwabedissen, Ein horizontierter »Breitkeil« aus Satrup und die mannigfachen Kulturverbindungen des nordnennenden Neolithikums in Norden und Nordwesten. *Palaeohist.* 12, 1967, 409–468.
- Seegerberg 1999**
A. Seegerberg, Bälunge mossar. Kustbor i Uppland under yngre stenålder. *Aun* 26 (Uppsala 1999).
- Šída 2007**
P. Šída, Využívání kamenne suroviny v mládsi a pozdní době kamenne. The use of stone raw materials in the Neolithic and Eneolithic. The workshop areas of the Upper Jizera Basin. *Diss. Arch. Brunenses Pragensesque* 3 (Praha 2007).
- Šída/Kachlík 2009**
P. Šída/V. Kachlík, Geological setting, petrology and mineralogy of metabasites in a thermal aureole of Tanvald granite (northern Bohemia) used for the manufacture of Neolithic tools. *Journal Geosci.* 54, 2009, 269–287.
- Simmel 1900**
G. Simmel, A Chapter in the Philosophy of Value. *Am. Journal Sociol.* 5, 1900, 577–603.
- Sjögren 2003**
K. G. Sjögren, »Mångfallidige uhrminnes grafvar...« Megalitgravar och samhäll i Västsverige. Gotarc Ser. B. Gothenburg Arch. Theses 27. Univ. Gothenburg (Gothenburg 2003).
- Skaarup 1973**
J. Skaarup, Hesselø – Sølager. Jagdstationen der südsandinavischen Trichterbecherkultur. *Ark. Stud.* 1 (København 1973).
- Skak-Nielsen 2007**
N. V. Skak-Nielsen, The function of perforated shoe-last axes. *Acta Arch.* 78, 2007, 79–86.
- Skriver et al. 2018**
C. Skriver/P. Astrup/P. Borup, Hjarnø Sund – all year, all inclusive. A submerged Late Mesolithic coastal sites with organic remains. *Danish Journal Arch.* 7.2, 2018, 195–217.
- Sørensen 2012**
L. Sørensen, Fremmede okser som sædekorn for neolithisering – Agrarsamfundenes ekspansion mod Sydsandinavien. In: F. Kaul/L. Sørensen (eds.), *Agrarsamfundenes ekspansion i nord*. Symposium på Tanums Hällerstningsmuseum, Underslöv, Bohuslän, d. 25.–29. Maj 2011 (København 2012) 8–30.
- Sørensen 2014**
L. Sørensen, From hunter to farmer in Northern Europe – migration and adaptation during the Neolithic and Bronze Age. *Acta Arch.* 85, 1–3, 2014, 1–794.
- Sørensen 2016**
S. A. Sørensen, Loose human bones from the Danish Mesolithic. In: J. Grünberg/B. Gramsch/L. Larsson/J. Orschiedt/H. Meller (eds.), *Mesolithic Burials – Rites, symbols and social organisation of early postglacial communities*. International Conference Halle (Saale), Germany, 18th–21st September 2013. Tagungen Landesmus. Vorgesch. Halle 13,1 (Halle [Saale] 2016) 63–72.
- Sørensen 2020**
L. Sørensen, Biased data or hard facts? Interpretation of the earliest evidence of agrarian activity in southern Scandinavia from 6000 to 4000 cal BC in a theoretical discourse on random down-the-line exchanges and structured migrations. In: K. J. Gron/L. Sørensen/P. Rowley-Conwy (eds.), *Farmers at the Frontier – a Pan-European Perspective on Neolithisation* (Oxford 2020) 289–316.
- Sørensen 2020a**
L. Sørensen, Monuments and social stratification within the early Funnel Beaker Culture

in South Scandinavia. In: A. B. Gebauer/L. Sørensen/A. Teather/A. C. de Valera (eds.), *Monumentalising Life in the Neolithic: Narratives of Change and Continuity* (Oxford 2020) 73–87.

Sørensen 2020b

S. A. Sørensen, Ritual depositions in the coastal zone. In: A. Schülke (ed.), *Coastal Landscapes of the Mesolithic. Human Engagement with the Coast from the Atlantic to the Baltic Sea* (London, New York 2020) 394–414.

Sørensen 2023

S. A. Sørensen, Neolithisation in Denmark from a depositional perspective. In: D. Groß/M. Rothstein (eds.), *Changing Identity in a Changing World. Current Studies on the Stone Age around 4000 BCE* (Leiden 2023) 165–176.

Sørensen/Nielsen 2024

L. Sørensen/P. O. Nielsen, Noble hunter-gatherers and cruel farmers – a discussion of the

evidence of human sacrifices during the Mesolithic and Neolithic in South Scandinavia. In: M. J. Walsh/S. O’Niell/L. Sørensen (eds.), *In the Darkest of Days. Exploring Human Sacrifice and Value in Southern Scandinavian Prehistory* (Oxford 2024) 1–12.

Vang Petersen 1984

P. Vang Petersen, Chronological and Regional variation in the Late Mesolithic of Eastern Denmark. *Journal Danish Arch.* 3, 1984, 7–18.

Verhart 2012

L. Verhart, Contact in stone: adzes, Keile and Spitzhauen in the Lower Rheine Basin. Neolithic stone tools and the transition from Mesolithic to Neolithic in Belgium and the Netherlands 5300–4000 cal BC. *Journal Arch. Low Countries* 4,1, 2012, 1–31.

Weiner 1992

A. Weiner, *Inalienable Possessions: The Paradox of Keeping-while-Giving* (Berkeley 1992).

Wiessner 2002

P. Wiessner, The vines of complexity. Egalitarian structures and the institutionalization of inequality among the Enga. *Current Anthr.* 43, 2002, 233–269.

Wobst 1977

H. M. Wobst, Stylistic behavior and information exchange. In: C. Cleland (ed.), *For the director: research essays in the honour of James B. Griffin*. *Anthr. Papers* 61, 1977, 317–342.

Zvelebil 2001

M. Zvelebil, The agricultural transition and the origins of Neolithic society in Europe. *Doc. Praehist.* 27, 2001, 1–26.

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- 5 after Mathiassen et al. 1942; Andersen/Malmros 1965; Møhl 1970; Møhl 1978; Hatting et al. 1973; Skaarup 1973; Jonsson 1988; Noe-Nygaard 1995; Gotfred-

- sen 1998; Gotfredsen 2003; Koch 1998; Heinrich 1999; Segerberg 1999; Eriksson/Magnell 2001; Richter/Noe-Nygaard 2003; Sjøgren 2003; Klassen 2004; Price/Gebauer 2005; Magnusson 2007; Hallgren 2008; Enghoff 2011; Andersen 2009; Andersen 2013; Glykou 2011; Gron 2013; Price 2022
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- 9 after Grøn 2003; Sørensen 2020a
- 10 after Pedersen 1997; Andersen 2009

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