How did changing cosmologies influence mortuary practices as groups in Northern Europe transitioned from foraging to farming?

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Abstract

This dissertation investigates ancient cosmological transformation and the influences on mortuary practices in the transitional period from foraging to farming. The dawn of Neolithic society across the southern Scandinavian region should have changed the existing social lifestyles and burial practices, but how did people create new burial systems and shift to them? New burial activities in rituals mean the potential changes of attitudes towards the dead and death, linking to transforming the conventional cosmology. These features can be explored in archaeological contexts by focusing on human activities in mortuary rituals through burial-related records, such as offering grave goods and food.

Data analysis represents the separation from inhumations in the late Mesolithic to other two mortuary methods in the early Neolithic, such as earthen long barrows and bog burials. However, the LM inhumations could also show some features of human attitudes towards the dead and death seen in these two burials (such as veneration for the ancestors by performing burial rituals in a specific place and a strong correlation between females and young individuals). These results suggest that the EN burial practices were not dramatic changes in ancient cosmology from the preceding period; rather, some powerful factors such as environmental change likely provoked people to shift to new Neolithic burial practices. Particularly, the sea level fluctuation in the transitional periods could influence the existing ecosystem and social organisations, which might be a plausible event that altered human activities in burial rituals. That is to say, environmental changes probably led to transforming ancient cosmology, which contributed to creating new burial systems that could meet the new social lifestyle.

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Declaration

I declare that this thesis is a presentation of original work and I am the sole author. This work has not previously been presented for an award at this, or any other, University. All sources are acknowledged as References.

1. Introduction

1.1 Aims

The aim of this dissertation is to assess the correlation between the change in ancient mortuary practices and cosmology, and the shift in lifestyle to farming. Burial practices varied between the late Mesolithic (hereafter LM) and the early Neolithic (hereafter EN) periods. This means that the living's attitude towards the dead and death potentially changed, which could be correlated to a transformed cosmology (Nilsson Stutz 2003; 2010; 2015). Paradoxically, the transformation of cosmology can be reflected in burial practices, and the social transition to farming likely coincided with the recreation of people's cosmology. Therefore, considering the ancient cosmology can help extrapolate the formation of contemporary burial mortuary practices and social background.

1.2 Objectives

The main aim of this study is to investigate what factors of the social transition to farming in the EN mainly contributed to transforming the traditional cosmology. Besides this, examining to what extent the change of cosmology influenced the existing burial practice is also an important purpose.

To achieve the aims, this project has the following objectives;

1. To establish the existing models for the changes of mortuary rituals over the transition to farming.
2. To compare the demography of burials between the LM and EN.

3. To compare the treatment of the body in death between the two periods.
4. To extrapolate the transformations of the living's attitude towards the dead and death.

1.3 Significance of the Study

Death is a universal biological event, and how the living deal with the corpse varies from culture to culture and from the past to present. Archaeologists have hitherto used various objects brought by the living's responses to the dead and death in the past and attempted to study the ancient social organisations (e.g. Binford 1972; Saxe 1970) and the symbolic role in showing the social relations among inter-persons and society (e.g. Pader 1980). On the other hand, if interpreting the mortuary-related objects as deriving from some human activities in burial rituals, we can extrapolate their "emotional and experiential" attitudes to the dead and death (Nilsson Stutz and Tarlow 2013, 2-3). Moreover, many variants in burial practices in the transition from foraging to farming (e.g. Madsen 1993; Nielsen and Brinch Petersen 1993) might suggest the transformation of the treatment of the dead body. Therefore, by focusing on human burial activities towards the deceased and scrutinising the differences between the LM and the EN, this study can contribute to demonstrating the change of mortuary practices from the viewpoint of the transformation of cosmology that occurred as people shifted their lifestyles.

1.4 Outline

The next chapter will review how burials have been studied in archaeological contexts and demonstrate the potentially useful ideas for this dissertation. Also, the chapter will introduce a target region and period of this dissertation and describe research

perspectives to investigate burial records. Then, chapter 3 will explain the reasons for selecting the region and period and discuss how to collect and the methodology to analyse the collected burial data. Moreover, the theoretical foundation to interpret the variability of burial data in the two periods will also be set up in chapter 3. Subsequently, chapter 4 will describe the result of data analysis between the two periods using graphs and tables, the consideration of which will be discussed in chapter 5. Additionally, chapter 5 will demonstrate the representative continuities and transformations of burial practices from the LM and the EN. Then, chapter 6 will attempt to analyse the human attitudes towards the dead and death and explore the diachronic continuities and changes during the LM through case studies. Finally, chapter 7 will discuss whether the potential transformations of human attitudes in the LM were inherited in the EN and demonstrate what factors could cause these transformations. Furthermore, the last section of this chapter will summarise the entire study and describe future research.

2. Literature review

This chapter comprises two sections. The first one will review the history of how the ancient mortuary practices have been studied in archaeological contexts. Death was one event of the past daily lives. Archaeologists have hitherto tried to understand responses to it from various viewpoints. Such attempts consequently provided diverse discussions and effective theories, which help us interpret materials remains related to ancient burials. The second section will explain the regional and historical contexts which will be analysed in this dissertation. The main area is southern Scandinavia, and the analytical period ranges from the LM to the EN. This region represents some unique features in the transitional period to the Neolithic, which may be useful to consider the correlation between the change in mortuary practice and cosmology.

2.1 Death and Burial in Archaeological Contexts

2.1.1 Dawn of Burial Studies

The trends in interpreting mortuary practices in the past have always changed. In the twentieth century, burials were initially studied from a chronological viewpoint within a cultural, historical framework. The typologies and seriations of materials found in the mortuary contexts became a main analytical approach, which is useful for understanding their spatial and temporal distributions in different cultures (Chapman and Randsborg 1981, 3; Nilsson Stutz 2003, 108). Subsequently, as well as this chronological approach, a normative cultural approach was proposed, which resulted in the spatial and temporal changes in burial-related materials being explained by the concept of ‘diffusion’ (Chapman and Randsborg 1981, 3). Diffusionism was a theory for

the spread of innovations from culture to culture by the process of population movement and contact between the cultural centres (Renfrew and Bahn 2005, 75). In light of the definition of ‘culture’ proposed by Childe (1956, 16) as a “recurrent assemblage of archaeological types” including burial-related objects, differences and similarities of burial features were thought to depend on the degree of inter-cultural affiliation and interaction (Nilsson Stutz 2003, 108). From these perspectives, the prime motivation for determining variants of material culture in burials was the identification of a ‘culture’ and indicated how social transitions took place between cultures.

2.1.2 New Attempt to Interpret Mortuary Practices

Since the 1960s, archaeologists have tended to regard mortuary features as sources that provide information about social structures in the past. They explored cross-cultural regulations and generalisation through analogy to ethnographic studies. Mortuary residues were understood as a medium linking static burial-related records to the dynamic activities which people in the past carried out, which created the archaeological record (Parker Pearson 1999, 27). Regarding the reference of ethnographic resources to archaeological contexts, Kroeber (1927, 313) initially argued that the ‘unstable’ features that the disposal of the dead differs among adjacent societies made it difficult to draw a boundary separating different mortuary practices in a region. Although such an argument was also suggested by Hawkes (1954, 162), some researchers partly agreed to the comparative approach through ethnographic samples, as the reliability was improved by restricting and selecting areas with a consideration of geographical and ecological resemblances (Childe 1956, 48-51; Ascher 1961, 322-323; Wylie 2002, 140). In contrast, Peter J. Ucko (1969) criticised

the idea of ‘diffusion’ and a simple application of ethnographic samples to a particular set of archaeological data for creating a universal definition. Rather, he suggested the usefulness of ethnographic data so as to “widen the horizon of the interpreter” in terms of encouraging archaeologists to re-examine their materials themselves from multifaceted perspectives (Ucko 1969, 262-264). Many ethnographic examples he used revealed the mosaic pattern of attitudes and behaviours towards death, even within different groups belonging to the same tribe. Recognising this complicates the identification of specific patterns that can help link the mortuary-related materials to a certain practice or social organisation in the past. Therefore, he maintained that archaeologists should shift their interpretative perspectives to a deductive approach for dealing with various ethnographic evidence and should understand variable burial characteristics within one society (*ibid,* 275).

Despite Ucko’s (1969) well-reasoned arguments, ethnography continued to be drawn on as a source of explanation in funerary archaeology. Binford (1972) used a cross-cultural study with the intention of determining social structure from burial evidence. His argument is mainly derived from Kroeber’s (1927, 314) suggestion that disposal of the dead is a variable practice regardless of any contemporaneous social changes and parts of biological and social activities for survival. Binford tests Kroeber’s hypothesis that the variability of mortuary practices in a given society is significantly correlated with the patterns of the social structure through non-state-organised societies’ data drawn from the Human Relations Area Files. With reference to Goodenough (1965, 7), Binford firstly classifies the dimensions of the social persona in life recognised by different mortuary treatments into age, sex, social position, social affiliation (such as

lineages and clans), conditions of death and location of death (Binford 1972, 226). Besides this, with a division of sociocultural systems into four categories (hunter-gatherers, shifting agriculturalists, settled agriculturalists and pastoralists), he reveals a close relationship between subsistence production strategies within one society and the social complexity measured by the reflective degree of social persona dimensions in mortuary occasions. Namely, while societies of minimal complexities, such as egalitarian (hunter-gatherers), tend to differentiate burial traits based on age and sex, the features in more complex sociocultural systems, such as non-egalitarian (settled agriculturalists), vary according to the deceased's social position in life (*ibid,* 227-230). Binford further analyses relationships between different dimensions of social persona and the variants in mortuary treatments. He finds some regulations (*ibid,* 233-235) that:

1. age of the dead can be distinguished by the location where the dead body was placed (for example, on a scaffold and in the river) and the grave structures for the deceased were constructed, such as a coffin;
2. sex can be divided by the orientation of the grave structures prepared for the dead and different forms of grave goods;
3. social position is represented in the variability of mortuary treatments and can be discriminated by rich and unique offerings of grave goods to the dead and the specific location of the burial.

His proposition has influenced the later studies in terms of generalisation of correlations between social structures and personal identities of the dead in life and mortuary practices by analysing many ethnographic data. Moreover, this argument has

been referred to investigate the potency of social differentiation in prehistoric society (e.g. Clark and Neeley 1987; Harrold 1980; Wright 1978).

Similarly to Binford's work in 1972, Saxe (1970) analyses three ethnographic societies: the Ashanti of West Africa, the Kapauku of New Guinea and the Bontoc Igorot of the Philippines, and suggests eight hypotheses that can help researchers determine the social structure of a culture and social persona of the deceased through patterns in the funerary record. His main focus in creating these hypotheses are three dimensions of analysis: social personae (e.g. age, sex and social position), sociocultural structure (e.g. egalitarian and non-egalitarian) and forms of funerary treatments (e.g. grave goods present/absent and disposal locations of the dead). The first four hypotheses are concerned with how a concept of "social personae" is incorporated into the different burial treatments to reflect the sociocultural system of the culture. The final four hypotheses handle the correlation between the sociocultural structures and the expression of various burial attributes. In particular, hypothesis 8 suggests the legitimacy of corporate groups maintaining formal disposal areas for the exclusive burial of the deceased (such as their ancestors) in claiming rights to manage crucial but restricted resources. Saxe (1970, 119) links this to the emergence of a cemetery and the concept of territory. That is to say, the scarcity of essential resources likely stimulates people to have the notion of the property of land, and in that case, the continuous burials of the dead in a specific location might help the group show the right of use in the land based on their ties to ancestors.

This hypothesis has been re-tested by Goldstein (1981, 60-61). By analysing more worldwide ethnographic samples than Saxe's work, she suggests that not all corporate groups that can manage crucial and restricted resources in the form of lineal descent systems maintain formal disposal areas exclusively for the death of their members. She also interprets that the continuous maintenance of a formal burial area by corporate groups can signify regular ritual activities, which enhances the relationships between the groups and their ancestors. In addition, the absence of such an area does not always indicate any forms of the past social structure (*ibid*, 61).

This Saxe's argument, especially hypothesis 8, has influenced later archaeological studies concerning the function of 'cemetery'. Renfrew (1976), for example, interpreted the construction of megalith tombs as territorial markers, which might result from the rise of population pressure on resources within a segmentary society due to the development of farming. Although such segmentary societies feature: first, simultaneously disperse distribution in small groups; second, recognising their territory by daily activities of the social members; third, no evidence of a social and political hierarchy (*ibid*, 205), the adoption of farming and subsequent population growth can lead to the development of the concept of territory, in this case, highlighted by the construction of monuments. His arguments have been useful in explaining the birth of formal disposal areas, not only in the Neolithic period (Chapman 1981a; b) but for the collective burials in Mesolithic northern Europe (Larsson 1989c). However, this approach was critiqued in terms of lacking holistic consideration, including the analysis of exceptional samples showing the weak connection between burials and the appeal to territory, and interpretation in the historical contexts of how similar burial features

were related and spread beyond regions (Hodder 1984). Moreover, Chapman (1995) complementarily states that the usage of megalithic tombs for territorial markers is a mere explanation led by the relationship between the spatial distribution of these monuments and social strategies. Given that archaeological records are a byproduct of the process of “the dynamic change” in the past cultures and societies, possessing flexible insights into the variability of sociocultural systems is necessary to study the comprehensive features of megalithic monuments (*ibid,* 48).

2.1.3 Different Approaches to the Understanding of Mortuary Practices

Unlike studies of Saxe and Binford that can link mortuary contexts to the ancient social organisations, new perspectives proposed that the finds of mortuary-related materials potentially symbolise the social relations among inter-persons and society. For example, Pader (1980) suggests the defect of Binford’s concept in that personal identities were mainly reconstructed from what quality and quantity of material was used for burials. Burial practices are composed of the preparation and some participants’ intentions, as well as the placement of the dead body and grave goods. In other words, the interpretation of social relations between the dead and the living should include the viewpoints of how and why certain types of instruments for burials were used and made. This approach can be useful for understanding not only the existence of formalised patterns for burial activities but also the symbolic meanings implied in those burial-related behaviours (*ibid*).

As other critiques of cross-cultural regularities by Saxe and Binford grew, Hodder (1980, 1982) pointed out the limit of creating a universal formula for interpreting burial

practices. Through the detailed analysis of the Nuba burial customs, he argued that death customs could show an inverted or distorted view of practices and status in life; thus, real personal relations to the society can be invisible (Hodder 1980, 167-168). A similar argument was made by Parker Pearson (1982). He investigates the variability of expressions of status and wealth in mortuary rituals from the nineteenth and twentieth centuries in Britain. For example, he surveyed the correlation between the expenditure on funerals and social status in Cambridge in 1977 and revealed that people of high social status do not always spend much money on their funeral ceremonies. Rather, those in the lower class, such as immigrants from other countries or cities, tended to perform their ceremonies lavishly due to the necessity for them to show off their financial power (*ibid*, 109-111). Additionally, the trend of social concerns also affects the burial practices, which is exemplified by the new funeral patterns in the Victorian era that the increasing importance of public hygiene and sanitation encouraged the approval of cremation (*ibid*, 111). Through Parker Pearson's arguments, we can understand that the difference in the ways of funerals is not necessarily linked to the actual relations of power; rather, it highly depends on social trends about the attitude towards the dead (*ibid,* 112).

These arguments were part of a new theoretical paradigm to a new theory for archaeologists to understand the social position of the dead individuals and their social relationships in mortuary contexts. However, debates on the two theoretical trends of how ancient mortuary relics were studied; as information about social structure in the past or as a medium of symbolising social relations between the living and the dead, consequently led to taking away the new perspectives, such as scientific analysis (e.g.

Morris 1991; Nilsson Stutz 2003). Particularly, Nilsson Stutz questioned the unilateral development of ‘theory’ and pointed out the importance of harmonisation with ‘method’ (e.g. scientific aspects) and dialectic approach between different theories and methods to understand the past people and their humanity (*ibid*, 127-129).

2.1.4 The Recent Trend for Studying Mortuary Practices

Since the 1990s, there has been an increasing importance of the viewpoint of how ancient people dealt with ‘death’ (Nilsson Stutz 2018, 326). Archaeologists have hitherto studied the dead body and the associated artificial remains as a window for accessing the personalities in life and the contemporary cultural background with some interdisciplinary perspectives (Nilsson Stutz 2018, 325; Sofaer 2006). However, ancient sensory dimensions in mortuary rituals, especially in hunter-gatherer studies, have not been deeply discussed (Sassaman and Holly 2011). These dimensions, such as beliefs, are complex to be interpreted, but the pursuit of them enables us to understand internally shared social frameworks by people and their roles in maintaining the people’s community (Peytoteo-Stijerna 2015; Tarlow 2013). Moreover, various ritual activities (e.g. the treatment of the dead, the grave goods preparation) in mortuary practices should have left some material traces, which become hints for extrapolating ancient sensory aspects (Parker Pearson 1999, 145; Van Dyke 2010, 279).

In the beginning, after the event of ‘death’, the cadaver starts the irreversible biological transformations, such as decomposition and putrefaction (Nilsson Stutz 2015, 3). This process gradually changes the dead body from the living person to a material object (Robb 2013), and Kristeva (1980) features it as the ultimate abject located in the liminal

category (cited in Nilsson Stutz 2010, 34). The concept of liminality is suggested by Turner (1969) as entities without any unambiguous and determinate facets, which are often connected with death in terms of individuals situated in unclear positions between the living and the dead. That is, the existence of the cadaver at death can be repulsive for the survivors, which might disturb the order of society and life (Nilsson Stutz 2015, 4). In order to deal with this disorder, various ritual activities in which people symbolise the deceased and redefine the relationship with the living play an important role (Folwer 2013; Tarlow 2013). Bell (1992) suggests that ritual is an essential practice for addressing the occurrence of social disorder and reconstructing or newly producing sociocultural structure. Particularly, critically distinctive social actions in the ritual occasions are defined as 'ritualisation', which emerged to manage social order, and legitimate and internalise the valued relationships between unique and other actions (*ibid*, 88-90). To understand these ritual actions and the implications in mortuary practices, exploring how people coped with funerary-related objects during the ceremonies of death is especially important (Cooper *et al.* 2019; Giles 2012; 122-126; Parker Pearson 1999, 3).

2.1.4.1 Exploring Ancient Sensory Dimensions through Grave Goods

Deeply investigating grave items could shed light on some human actions and emotions towards the dead and mortuary ceremony. For example, the use-wear analysis of a stone adze head deposited in the early Mesolithic cremation for a male at Hermitage, which might be marked by a wooden post, reveals that much time and care could be spent in making, using and abandoning the tool (Little *et al.* 2016). This item might have been polished more than necessary, used for cutting trees down to produce

the pyre and/or the wooden gravemarker, and deliberately blunted prior to its deposition into the male grave. Particularly, the final process means the end of the functional use-life of the tool, potentially suggesting the metaphor of transforming the dead body from the living and an analogy to his death (*ibid*; Brück 2004, 319-321). Moreover, considering much expenditure during his funerary rites, such as elaborately forming the stone adze and making a gravemarker, we can extrapolate that the mourners attempted to deeply share the memory of this individual in the society and hand it down to the future generations (*ibid*, 237).

In addition, if some unusual use-wear and fragmentary conditions are seen from grave goods given to child individuals, these objects were unlikely to be made for them. Rather they are likely to be inherited items over generations since we can infer that they were too young to use these items (Brück 2004, 314; Cristiani and Boric 2012). In consideration of the argument by Bloch and Parry (1982, 16) that the death of a child could mean a threat to the community's fertility, by depositing the inherited goods, the mourners probably expected them to become an intermediary between the dead and living and hoped to reconfigure the relationships between both entities for managing social order after the death.

2.1.4.2 Exploring Ancient Sensory Dimensions through the Dead Body

Another viewpoint is how people treated the dead bodies. The cadaver naturally occurs after death and shows various biological changes. In this sense, the body is no longer an animate being for the living; rather, it can be regarded as an object which people need to treat in funeral rites (Nilsson Stutz 2010; 2015). Moreover, in consideration of

the significance of grave goods to express the ancient mourners' spiritual aspects in the funeral rites, as mentioned above, the process of dealing with the cadaver in burial practices could also reflect the living's emotional movements towards the dead and aim to reproduce the relationship between both entities after the death (Fowler 2011; 2013). From these perspectives, we can interpret that the treatment of the dead body is an essential part of mortuary rituals to overcome the confusion of death and recreate social orders and the cosmology in terms of social status and attitudes towards death and life (Nilsson Stutz 2003, 57-58; 2010, 35; 2015, 7). Thus, the deceased should be positioned in the centre of these rituals for archaeological studies, which can help understand people's responses to death and the implications.

2.1.4.2.1 (A Dialectic View between Archaeology and Osteology)

How can we investigate the dead body to examine the structure of the past social orders and the cosmology in archaeological contexts? One of the important viewpoints is to regard human remains as not mere osteological objects but cultural artefacts produced by social practices (McClelland and Cerezo-Roman 2016; Sofaer 2006). Human bodies undergo various biological transitions (e.g. growth and debilities) from birth to death, and meanwhile, they sometimes experience physical changes such as the development of musculature and bone robusticity due to hard physical activities. As artificial tools being made, used and discarded by any necessities, human behaviours in daily lives should have been based on various sociocultural ideas, some of which leave osteological traces on human skeletons. This means that the human body can be likened to cultural objects and be remarkably structured within a context of interpersonal and inter-social involvements (Ingold 1998). Furthermore, if

synchronising the body with artificial products, archaeologists can view virtual features on and around the skeletons (e.g. disarticulation, cut-marks and funerary items) as the embodiment of cultural elements which capture the attitude towards the body (Sofaer 2006, 40-41). This perspective can also be sublimated by combining with osteological and scientific analysis, enabling us to reconstruct the social identity of the dead (McClelland and Cerezo-Roman 2016, 43-45; Nilsson Stutz 2018, 327-329).

As an example of these bio-cultural dialectic studies, a particular social role, shaman, has been often discussed from the viewpoint of whether the deceased were buried with rich and unusual grave goods that indicate transsexual or third gender distribution (Zvelebil 2008; Schmidt 2000; Crass 2001, 109). Besides this, skeletal deformity, such as a Mesolithic woman at Bad Dürrenberg (Porr and Alt 2006), can also be linked to shaman burial. The female individual suffered from neurological distortions due to the craniovertebral junction displaying an asymmetric feature. This osteological variation caused consciousness disturbance, and this abnormal state can be linked to the possession of spiritual power among people (*ibid*). This kind of study correlating multi-disciplinary analysis should have been beneficial to reconsidering the dead's personal profile and social roles in life. On the other hand, this perspective has mainly focused on the timeframe before death and has been insufficient for insight into the post-mortem. Re-intervention after the burials, for example, exhumation, is also useful to shed light on the relationship between the dead and the living in the past.

2.1.4.2.2 (Understanding the Posthumously Funerary Treatments)

The question of how ancient people experienced death after the burials is certainly complicated to elucidate, but detailed and theoretical analyses of the dead body help archaeologists approach the speculation of human actions in mortuary rituals. One of the methodologies, which combines natural scientific viewpoints and cultural approaches, is 'Archaeothanatology', originally called '*l'anthropologie du terrain*'.

This method was developed in France in the early 1980s and focused on clarifying the attitudes towards death through a combination of archaeological analysis with the knowledge of biology about how the human body was decomposed after death (Duday 2009: Nilsson Stutz 2003). Human skeletons uncovered at archaeological sites do not always retain their original position from the time of the final disposal and could have been transformed by various artificial, biological and taphonomical effects. These effects might obscure past human actions when dealing with the event of death and the corpses in the past. In order to resolve this opacity, archaeologists need to learn sufficient anatomical knowledge and carefully record the skeletal data found, which helps them interpret the reality of the burial in relation to the surrounding material traces, such as grave goods (Duday 2009, 6). For example, the presence of void space around the corpse created by burial structures such as coffins is likely to result in some unusual skeletal arrangements due to not only the decomposition and displacement without the support of sediment but also the subsequent disarrangement after the collapse of the structures (*ibid,* 34; Garland and Junaway 1989). In comparison, wrapping the dead body with soft materials could cause unique anatomical features, such as the clavicles lying almost vertically in the upper part of the rib cage (Duday 2009, 45; Nilsson Stutz 2003, 297). Through this perspective combined with ritual

theory, Nilsson Stutz (2003, 52) seeks to determine "what people were doing" at burial events from the related material remains. She attempts to access emotional and perceptive aspects implied by the consistency or variability of ritualised actions within a group and between groups (Nilsson Stutz 2008, 23; 2009, 657-659; 2010, 35-37). For example, one human body found from burial 28 in Skateholm, Sweden, lacks the left radius and ulna, the left iliac blade, and the left femur, but mostly retains the other parts of bones, including labile joints like those of the left hand and the left patella, which have the original anatomical positions preserved (Fig. 2.1). The loss of specific parts of bones can evidence intentional extraction after the decomposition

Fig. 2.1: Photo of human remains at grave 28 in Skateholm I (Nilsson Stutz 2003, 242, photo 28)

This also means that the burial must have been explicitly treated in some way beforehand, for example, by covering the body with soft materials and then re-opened the covering for removal. This behaviour can suggest that people did not regard the dead body as abject beings but rather intimately managed the process of the transformation from the flesh to decay and the transition of the liminality of the body from life to death (Nilsson Stutz 2003, 309-314; 2008, 24-25; 2010, 38). Therefore, this strategic analysis of the burial practices enables us to explore the reflective impacts on the living (e.g. symbols, power). Moreover, by considering "sensory experience of decomposition and the embodied knowledge of this dimension", we can reconstruct the

sequence of ritual activities and extrapolate attitude towards death and the body (Nilsson Stutz 2008, 25).

2.1.5 Key Interpretative Perspectives to be Discussed

Since death inevitably occurs, various ways of treating the dead body should have taken place. Behaviours for the dead body might be related to the personalities and social rules in ritual, which possibly influenced the treatments even after the burials. This information becomes ambiguous in archaeological contexts, but material remains can provide hints not only of how people made, used and placed or abandoned them but also why people chose them. Such human actions might be based on social conventions rather than personal intention. If so, these conventions should have been succeeded for generations because of the significance of maintaining social orders, which can be regarded as implying some absolute cosmology inside. In this sense, ritual theory and multifaceted approaches to the dead body, including comprehensive perspectives about human actions from the pre-mortem to the post-mortem, are important for reconstructing the ancient sensory dimension. Moreover, these perspectives also indicate that new burial rituals might mean changes in the traditional social conventions about attitudes towards the dead and death (Parker Pearson 1999, 145), suggesting the transformation of the existing cosmology. Therefore, by analysing the variability of human actions in mortuary rituals, we can investigate the relationship between the alterations of ancient cosmology and burial practices.

2.2 Regional and Historical contexts

This section briefly considers the specific regions and cultures explored in this dissertation.

2.2.1 The Late Mesolithic

After the end of the Pleistocene, the rise of temperature thawed glaciers, causing both repetitive fluctuation of sea level and the isostatic rebound of the land surface across southern Scandinavian regions (Douglas Price 1985, 342-345; Douglas Price *et al.* 2007, 208). As a result, the landscape simultaneously changed, with vegetation replacement from tundra to woodlands and the spread of fjords. Such ecological changes produced a rich blessing to local hunter-gatherers and allowed them to enjoy abundant natural resources for their procurement strategies (Douglas Price 1985, 346; Larsson 1990, 291).

The Mesolithic cultural sequence in this region is divided into three categories; Maglemose culture (ca. 9000-6400 cal BC), Kongemose culture (ca. 6400-5400 cal BC) and Ertebølle culture (hereafter EBK) (ca. 5400-3950 cal BC) (Bailey *et al.* 2020, 43). The latest culture is categorised as the last era of hunter-gatherer societies and ranges from Denmark and south Sweden to the Baltic coastal area of northern Germany (Klassen 2002, 306-307) (Fig. 2.2). People enjoyed abundant natural food resources, especially marine food (Brinch Petersen and Meiklejohn 2009; Fischer *et al*. 2007; Richards *et al.* 2003), and interacted with external communities, including farming groups, through bartering (Fischer 1982; Klassen 2002). In particular, the contact with the external farming groups continued during the whole of the EBK culture

(Klassen 2002, 315-316), which contributed to the introduction of new techniques and knowledge of the continental Neolithic societies, such as pottery, domestication (Andersen 2011; Povlsen 2013; Sørensen 2009).

2.2.2 The Early Neolithic

The timespan of the EN period has been estimated from 3950 to 3300 cal BC (Bailey *et al*. 2020, 43). Although the boundary between the LM and the EN period has been debated so far, Fischer (2002) suggested a certain radiocarbon dating of ca. 3950 cal BC as potentially becoming the terminus *ante quem* of the end of the EBK culture and the onset of the following Funnel Beaker Culture (hereafter TRB). This radiocarbon dating is consistent with a border in which the predominant food consumption changed from marine to terrestrial resources (Richards *et al.* 2003; Tauber 1981). The southern Scandinavian region, which was mostly the same area as the Mesolithic EBK, comprised one group of TRB cultures (Northern area) (Fig. 2.3).

During this period, the gradual change of lifestyle is shown in terms of food procurement strategies. One of the remarkable features is a shift to an agrarian lifestyle in southern Scandinavian regions. This acculturation could last for around three centuries from 4000 cal BC (Sørensen and Karg 2014), and people opened the landscape by slashing and burning and cultivating the field for sowing and growing crops (Fischer 2002, 350). Another outstanding characteristic is to use TRB pottery for daily cuisine, storage and ritual activities (Bennike and Alexandersen 2007, 132: Fischer 2002, 377).

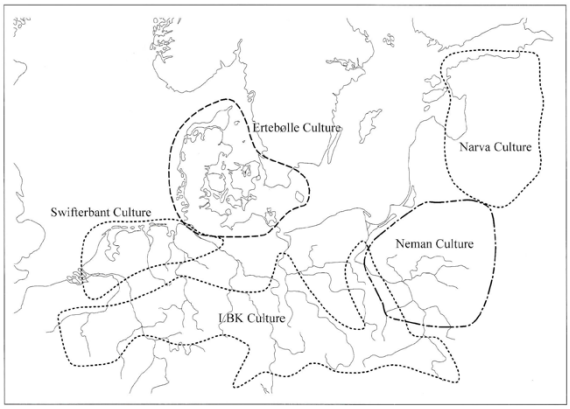


Fig. 2.2: Area of EBK culture and the surrounding contemporary cultures (Sørensen 2009, 545, fig. 81)

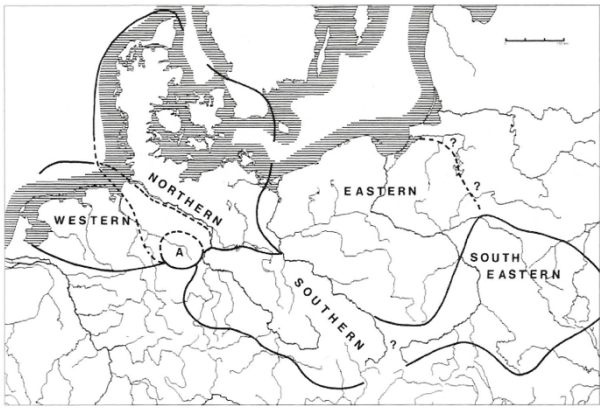


Fig. 2.3: Map showing regional groups of TRB cultures (Midgley 1992, 36, fig. 10)

These features are widely related to the shift of new dietary customs from the former period. In the EN, several palaeoenvironmental changes occurred, for example, the onset of a decline in temperature (Brown *et al.* 2011) and the sea level regression (Christensen 1995; Berglund *et al.* 2005). Moreover, it is suggestive that population density could rise across southern Scandinavian regions in the transitional period probably due to a number of immigrants from central Europe (Shenan *et al*. 2013), which probably brought the over-exploitation of the local food resources, such as oysters (Lewis *et al.* 2016). Archaeological records of food residues also exemplify this idea in the Norsminde Fjord shell midden in Denmark in terms of replacing the dominant marine resources from oysters to cockles between the LM and the EN period (Andersen 1989). In brief, such several environmental and social changes were likely to significantly affect the procurement strategies among the LM societies and become a trigger for the transition to the Neolithic society.

2.2.3 Existing knowledge about the LM and the EN burial practices

2.2.3.1 Mesolithic

The LM burials show a remarkable range of variations in the burial methods and objects found with the graves. The main way was inhumations in a position of supine extension. In addition, there were also other types of burials, such as cremations and boat graves, and the dead are placed in unique positions, for example, sitting and crouched positions (Nielsen and Brinch Petersen 1993). Besides this, the associations with grave goods are also diversified in this period, and there could be divisions based on sexes; that is to say, males tend to be buried with hunting tools (e.g. arrowheads and bone daggers) and females with decorative items such as perforated animal teeth (Grünberg 2017; Larsson 1989b).

Concerning the diversity of grave goods associated with the LM burials, O'shea and Zvelebil (1984) argue the possibility that the quality of grave items can be linked to the social status of the holders by investigating grave goods from Olenii Ostrov in northwestern Russia. Furthermore, such diversified burials intensively occurred in cemeteries like Vedbæk Bøgebbaken in Denmark, suggesting that social inequalities could be within a society to some extent (Clark and Neely 1987; Newell and Constande-Westermann 1988). On the other hand, there are counter-arguments about the LM cemetery. For example, some archaeologists suggest that the formation of the cemeteries could result from continuous use of the place as burials for generations over the period since radiocarbon dating analyses reveal that the onset of interments, such as Olenii Ostro, likely dated back to the early Mesolithic (Meiklejohn and Babb 2009; Meiklejohn *et al.* 2009).

2.2.3.2 Neolithic

In the EN, the emergence of earthen long barrows is one of the representative burial features (Midgely 2013, 3). This might start from around 3700 cal BC (Fischer 2002, 366) and be constructed with the deposition of potteries, ambers, arrowheads and flint axes as the main grave goods (Midgely 2005, 111-116; 2008, 20-21). Furthermore, simple inhumations like the LM are also recognised, and the types of objects found in these graves are similar to those from earthen long barrows (Ebbesen 1994, Sørensen 2014, 217-220). In comparing these two burial types, more time and workforce could be spent on the construction of earthen long barrows, indicating the possibility of some institutional social inequalities during this period (Fischer 2002, 383; Sørensen 2014, 220). Another burial type in the EN period is bog burials, in which some potentially sacrificed human remains have been found (Bennike 1999, Fischer *et al.* 2007). These human skeletons often coincide with animal bones and several stone artefacts such as flint axes and amber. Therefore, the EN burials in bog areas could be understood as implying distinct meanings from the other two burials, for example, fertility cult (Ebbesen 1993).

Although these differences between the LM and EN burials are often emphasised as a time of great change, Hellewell and Milner (2011) emphasise that continuity is also visible; for example, burials in shell middens could have foreshadowed burials in monuments. They conclude that there was not a great shift in ideology between the Mesolithic and Neolithic (*ibid*). On the other hand, Rassmann (2010) suggests the

influx of identity in burials in monuments and mentions the necessity to consider the hybridity combined with domestic and exotic practices.

2.3 Summary of this chapter

This chapter has examined the various existing approaches to interpreting burial records and mentioned the importance of paying attention to human actions and attitudes towards the dead and death in burial rituals. This perspective can help us examine the sensory dimensions in the funerary ceremonies, which could be related to the formation of cosmology. Also, this dissertation focuses on southern Scandinavian in the LM and the EN. Burial practices varied over the transitional periods to farming, and while some archaeologists have argued that these changes resulted from influences on existing cosmological beliefs (e.g. Rassmann 2010), others have suggested the continuity of existing cosmology (Hellewell and Milner 2011). The following chapters discuss the possibility of the cosmological transformations and the influence on mortuary practices through analysing the burial records across southern Scandinavian.

3. Material and Method

3.1 Site Data Collection

3.1.1 Area selection criteria

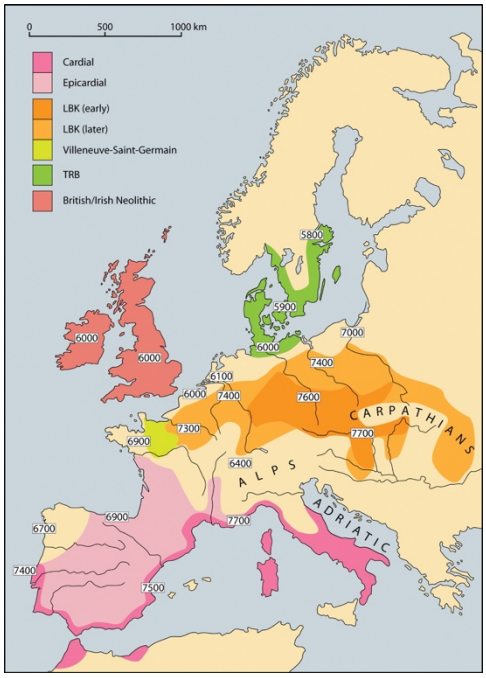


Fig. 3.1: The spread of farming across Europe and the dates (BP) (Rowley-Conwy 2011, 432, fig. 1)

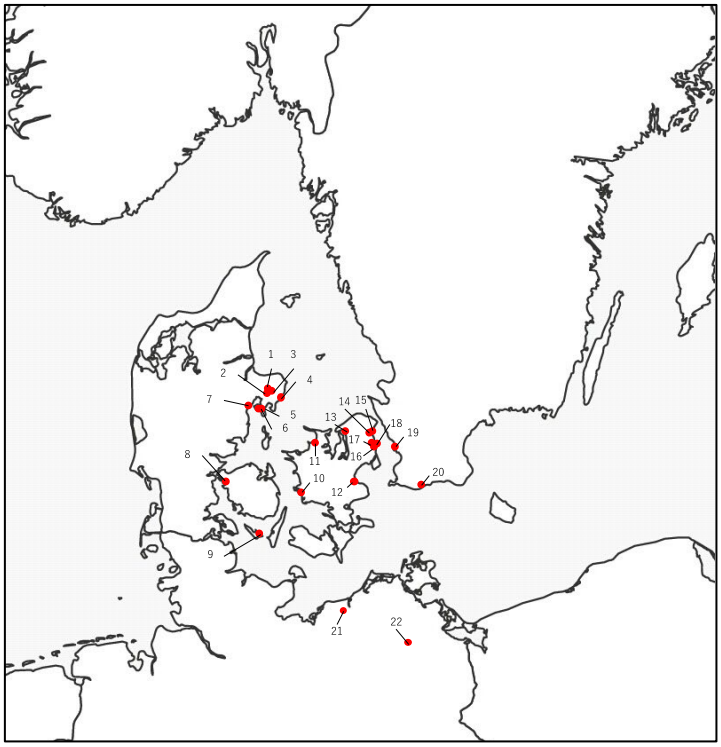
In this dissertation, burial data are collected from southern Scandinavian regions, mainly from Denmark, southern Sweden (Skåne country) and northern Germany. These regions show some unique characteristics in terms of the transition to Neolithic society. For example, in the EBK period, the frontier line of the Neolithic farming groups (TRB culture) had reached the coastal regions of northern Europe, and the EBK people existed in close geographic proximity to them for around 1500 years (Rowley-Conwy 2011) (Fig. 3.1). Across the EBK regions, many traces of interactions with farming societies have been found in forms of pottery use and other materials and remains of domestic fauna (Fischer 1982; Klassen 2002; Krause-Kyora *et al.* 2013; Sørensen 2009). However, there is no clear evidence of the transition to Neolithic lifestyles before c. 3950 cal BC, rather the EBK people were inferred to deal with these exotic materials as a prestigious product expressing the contact with farming societies (Sørensen 2009, 545; Sørensen and Karg 2014, 104). On the other hand, after that period, various alterations took place in terms of, for example, procurement strategies and burial practices, which could mean the occurrence of some significant changes in the LM societies. Furthermore, incidents

during the transitional period around southern Scandinavian regions could be powerful enough to alter the EBK cultural system that had lasted for many generations in the proximity to farming groups. This helps us analyse what factors caused the cultural alterations and how these alterations were reflected in archaeological contexts. Particularly, transforming burial practices can be correlated to the variations of human emotion towards the dead and death. Therefore, considering this correlation in the LM and the EN might be useful to extrapolate the changes in the living's cosmology in the boundary of the Neolithic transition.

3.1.2 Data Selection

All burial data belongs to the LM period, called EBK culture (ca. 5400-3950 cal BC), and the EN period (ca. 3950-3300 cal BC). The number of all analysed burial data amounts to 180 and 61, respectively. These data are listed in Appendices 1 and 2. Also, the distribution of the burial sites is illustrated in Figs. 3.2 and 3.3. Additionally, in order to analyse the directional pattern of the long axis of grave pits during the EN, data of inhumations and earthen long barrows are collected from Sørensen (2014). Their numbers are 68 for inhumation and 118 for earthen long barrows. All data of them are also listed in Appendix 3.

Data of burial attributes such as age, sex, position, head orientation and grave goods are referred from each site report and paper. However, age categories are based on the criterion shown by Falys and Lewis (2011, 710-713) and Cox and Mays (2000, 9-10), and categorised into seven groups and two congregations (Table 3.1). Each group is named as 'Foetus', 'Infant' (<1), 'Juvenile' (1-12), 'Adolescent' (13-17), 'Young Adult' (18-25), 'Young Middle Adult' (26-35), 'Old Middle Adult' (36-45), and 'Mature Adult'



1: Holmegård, 2: Nederst,

3: Fannerup, 4: Koed, 5: Vænge Sø,

6: Helgenæs, 7: Norsminde,

8: Tybrind Vig, 9: Møllebaget II,

10: Korsør Nor, 11: Dragsholm,

12: Strøby Egede, 13: Melby,

14: Nivå 10, 15: Nivågaard,

16: Vedbæk Bøgebbaken,

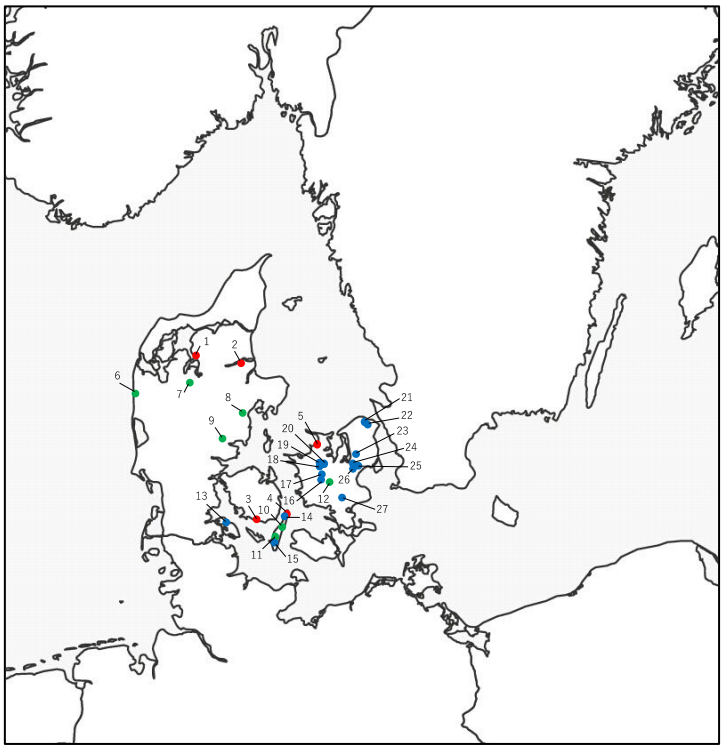
17: Gøngehusvej 7,

18: Vedbæk Boldbaner,

19: Tågerup, 20: Skateholm I & II,

21: Plau, 22: Groß Fredenwalde

Fig. 3.2: Site distribution in the LM



Inhumation

1: Ertebølle, 2: Åmølle,

3: Nab-Kildegård,4: Lohals,

5: Dragsholm

Earthen Long Barrow

6: Tarp, 7: Skibhøj, 8: Århus,

9: Byholm Nørremark, 10: Stengade,

11: Strynø, 12: Grøfte

Bog Burial

13: Bolkilde, 14: Andemosen,

15: Myrebjerg Mose, 16: Ulvemose,

17: Døjringe, 18: Hesselbjerg,

19: Øgårde 13, 20: Østrup, 21: Paarup,

22: Ferle Enge, 23: Viksø Mose,

24: Sigersdal, 25: Tysmosen,

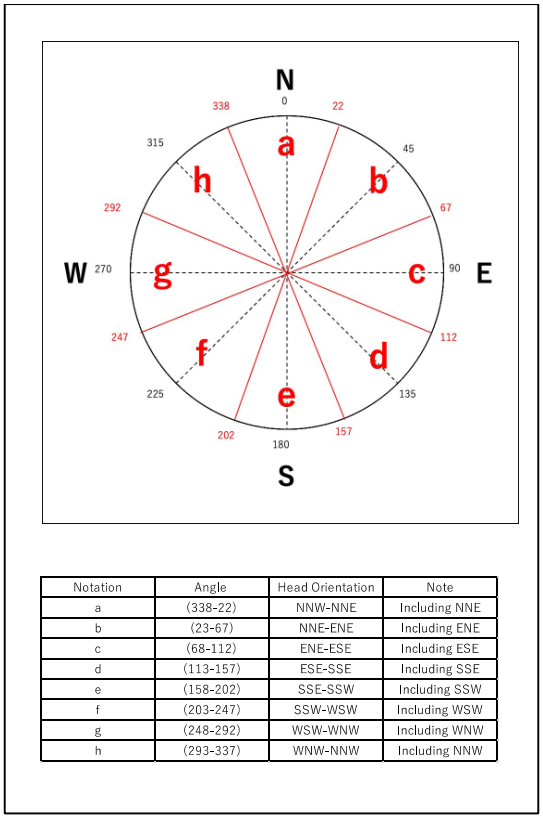
26: Vibygårds, 27: Porsmose

Fig. 3.3: Site distribution in the EN

(>46). Moreover, in the case in which there is no specific age record, these are classified into three divisions; ‘young’ estimated into ‘Adolescent’ age group and under, ‘adult’ into ‘Young Adult’ age group and over, and ‘Undetermined’. The existence of grave goods associations and their positional relationship with human remains are also referred from each site report and paper.

3.1.3 Definition of Data Notation

The notation of the age category follows Table 3.1. The position of the dead is mainly divided into two different groups; the first contains two positions (supine and prone), and the other does four categories (extension, hocker, sitting and standing upright). Larsson (1989a, 215) defines ‘Hocker’ as a position with the extremities of the dead being bent, and some individuals in this position are found with their knees reaching in front of their faces. He also mentions a sitting position comprising upright sitting and reclined, half-sitting postures (*ibid*, 371). Subsequently, the head orientation of the dead is divided into eight directions, the notation of which is used by small English letters from ‘a’ to ‘h’. The definition of the divisions is shown in Fig. 3.4. The direction of the grave pits’ long axis is also classified into four groups. For instance, a pit directing the north-south is written as ‘a-e’. Finally, the notation of the positional relationship of grave goods with human remains is based on Fig. 3.5. However, some data lack the detailed descriptions of the location, for instance, “A short bone point and a flint knife lay adjacent to the child’s thigh” at grave 41 in Skateholm I (Larsson 1989c, 373). In this case, it is difficult to examine the correct placement; hence, they are noted as their approximate locations, such as LL.



Notation	Angle	Head Orientation	Note
a	(338-22)	NNW-NNE	Including NNE
b	(23-67)	NNE-ENE	Including ENE
c	(68-112)	ENE-ESE	Including ESE
d	(113-157)	ESE-SSE	Including SSE
e	(158-202)	SSE-SSW	Including SSW
f	(203-247)	SSW-WSW	Including WSW
g	(248-292)	WSW-WNW	Including WNW
h	(293-337)	WNW-NNW	Including NNW

Fig. 3.4: Criterion of head orientation and its notation

Table 3.1: The summary of age category

Category	Age	Abbreviation	Congregation
Feotus		F	young
Infant	<1	I	
Juvenile	1-12	J	
Adolescent	13-17	A	
Young	Feotus - Adolescent		
Young Adult	18-25	YA	adult
Young middle Adult	26-35	YMA	
Old middle Adult	36-45	OMA	
Mature Adult	46-	MA	
Adult	Young Adult - Mature Adult		

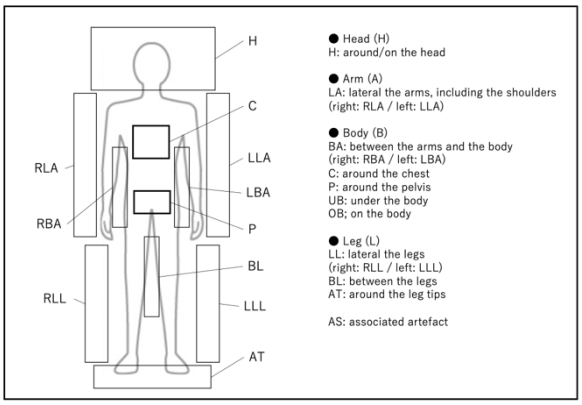


Fig. 3.5: Criterion of grave goods positions and its notation

3.2 Theoretical Setting (Analytical Process)

3.2.1 Foundational Concept

First of all, this dissertation refers to the concept of the reciprocal relationship between makers (production) and users (consumption) in the process of manufacturing materials. This concept is suggested by Dietler and Herbich (1998) that creating a material style is a composite of serial interrelated operational choices, such as from resource availability, the feasibility in the view of technology to the formation and decoration, with reference to *Chaîne opératoire*. The paper adds that makers learn the series of production but also need to respond to various social demands of users, which results in the slight variability of material styles within a society.

How do we infer the perception among people to follow these productive processes? A helpful viewpoint can be '*Habitus'*, proposed by Bourdieu (1977) as conceptualising human actions embedded in everyday life. This indicates that people learn everyday activities through experience, encounter, imitation and encouragement, and routinise them without considering how and why, rather merely know how to do them (Renfrew and Bahn 2005, 240-242). Although the foundation of these routinised performances among people is the common social practices, the process of learning them differs from individual to individual. Therefore, *habitus* can be regarded as "the site of the interplay between people and social structures or constraint", and people always work as far as they can do in the range of their knowledge (*ibid*, 241). Moreover, considering everyday activities in this situation, we may postulate that the variable archaeological artefacts in the form and decoration normally and unintentionally come into being within one society.

In ethnographic contexts, Dietler and Herbich (1998) exemplify such variability of artefacts within one social group of the Luo people of western Kenya. The Luo women play a role in producing pottery and are constituted into six different potter communities, which are mixed through their marriage. The females learned the local technical and authentic trends from their mothers-in-law or other senior women, but not through any rigorous rule of craft procedure. In fact, despite being manufactured within a single potter community, water storage-cooling pots show a variety of decorative patterns (*ibid*, 250-252). The reason is postulated that for married women, learning the craft can be a mere introduction of the local style in response to new demands for their

husband's social group, which might be understood as the personal transformation of *habitus* (*ibid*, 253). In other words, as long as meeting social demands for users, material styles are potentially transformed without any consciousness according to the makers' background and skills (Dietler and Herbich 1998, 247). Such a mutual relationship between makers and users can be viewed as underlying their social structures.

Finally, such a nicely harmonised social system might change when "the arbitrariness of social institutions and practices embodying asymmetrical relations of power are exposed" (Dietler and Herbich 1998, 248). This suggestion can be interpreted that the conventional social system that is naturally structured by the relationship between providers and consumers of materials was questioned due to some internal or external factors. This means the occurrence of the sense of arbitrary alteration in the traditional system, which could result from any significant impact on societies.

3.2.2 Application to the sequence of burial practices

As mentioned above, some researchers have attempted to regard human remains as cultural artefacts produced by social practices to consider the sociocultural system through analysing the osteological features of the human body (McClelland and Cerezo-Roman 2016; Sofaer 2006). Likewise, if the concept of creating material style and the variability applies to the ancient burial practices, the people's perception towards the burial-related activities can be extrapolated. As illustrated in Fig. 3.6, by identifying makers with the mourner, they might experience burial activities based on their communal practices that meet their social demands for overcoming the confusion

of death. In addition, although there could be influxes of different burial styles through inter-social interactions, the new incoming knowledge probably had no outstanding influence on the local people. Rather, it was possible that this was a simple personal transformation of *habitus* and that the variability of burial features took place within the range of their social demands.

Furthermore, changing the perspective, we can infer that social demands are an invariable dimension and have been successively practised for generations. Namely, they might be regarded as distinctively ritualised actions to reproduce social disorder caused by death (Bell 1992, 88-90), and the inheritance helps us understand the implied memory and belief (Bell 2007, 281). Moreover, the alteration of these behaviours can be equivalent to transforming the significant perceptive system of people, the cause of which is probably any notable impact on their society.

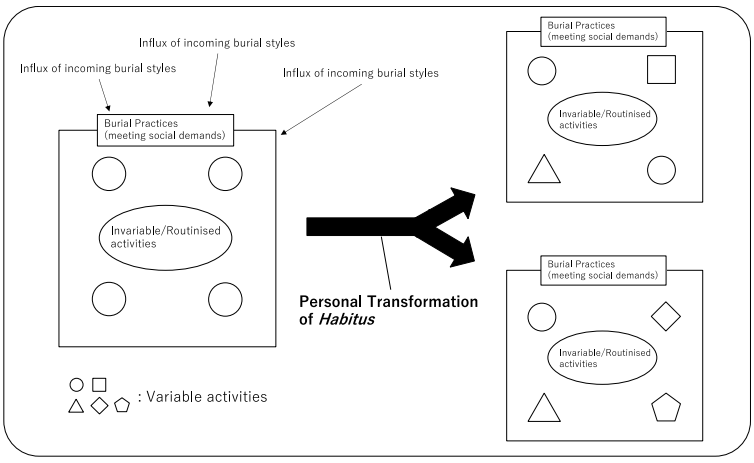


Fig. 3.6: The variations of the concept *'Habitus'* that applies to burial practices within a society

3.2.3 Proper Burial

To explore the invariable elements in ritualised burial activities, the concept of 'Proper Burial', suggested by Nilsson Stutz (2003), may be effective. This is an idea of the

repetitively performed burials which is “deeply rooted and allows for a clear discrimination between right and wrong” and also coincident with variation due to “repeated recreation of a partially vaguely defined concept” (*ibid*, 322). This idea includes not only the treatment and disposal of the dead body but also other works, such as the preparation for the pits, ritual feasts by the burial and filling of the pits (*ibid*, 324).

As mentioned in the explanation of *habitus*, all people do not learn the actual meanings of the series of burial practices. Instead, they merely share the idea of “what a proper burial would be like”, which is embodied by participating in burial rituals (Nilsson Stutz 2015, 6). Moreover, such active participation in rituals can contribute to creating a sense of the structure of their society (*ibid*). In other words, the sequence of the proper burial can be regarded as significantly relating to the social constitution, that is, to the form of cosmology. Therefore, the transformation of imagery of death is a severe incident to alter the concept of death and the process of identification of the dead body (*ibid*, 7-8).

3.3 Methodology

The process of analysing burial data and interpreting the result of the analysis will be mostly divided into two steps.

3.3.1 First Step

In the next chapter, I will analyse the collected burial data separately into the LM and the EN period and into the dimension of ‘pre-mortem’ and ‘post-mortem’ to consider the

ancient people's attitude towards the dead. For the pre-mortem treatments, I will describe burial features based on sex and age at death. For the post-mortem, the collected burial data will be analysed in sections of 'Burial Method', 'Position/Head Orientation', 'Grave Goods/Red Colouring (Overall)', 'Grave Goods Compositions', 'Grave Goods/Red Colouring Positions' and 'The Size of the Grave Pits'. Besides this, the positional relationship of burials will be examined individually in the LM and the EN period from the viewpoints of 'Cenotaph' and 'Overlapping, Disturbance and Extension'.

Based on these analyses, chapter 5 will firstly discuss the similarities and differences between the LM and the EN period. The similarities can be inferred as the continuity of the local burial practices from the LM, whereas the differences could mean that the traditional customs in funerals were transformed due to some internal or external factors. Therefore, this comparison can be effective in revealing not only the general burial trends between the two periods but also what parts of them were mainly influenced in the transition period.

3.3.2 Second Step

The subsequent step will focus on human actions related to burial rituals and the implied emotions. Discussion of the data analysis above will show the variability of burial practices in the two periods; thus, it may be difficult to understand how the emotional dimensions are reflected in burials. However, by exploring the aspect of what people do in the whole process of the treatment of the dead body through material records, it can be feasible to shed light on their fundamental practices in

burials and infer their perceptions towards the dead and death.

In order to consider these people's perceptions, chapter 6 will discuss what the proper burials were practised based on Fig. 3.7. This diagram, which is made with reference to a biographical approach suggested by Morris (2018), illustrates four phases of the whole burial practices, and each phase is further composed of several activities. This approach focuses on the multi-temporal dimensions of burials from life and death to the deposition and attempts to consider human actions behind each dimension through individual archaeological artefacts (*ibid*). Particularly, the body after death is highly subjected to the various treatments by the living, such as dismemberment of bones and burning down. Morris mentions that these body transformations can express the transition of the dead into "new objects with completely different social meanings", which are mainly practised above-ground before infilling (*ibid*, 120). In addition, the above-ground events for the treatments towards the dead and death can be regarded as the ritualised activities in a part of people's daily lives, helping us extrapolate "a way of expressing cosmological, social and practical concerns into a specific action" (*ibid*, 117). Such an analytical process of biographical approach can be compatible with understanding not only the concept of 'proper burial' by Nilsson Stutz (2003) but also that of what human actions are ritualised for reproducing social disorder against death suggested by Bell (1992) and Nilsson Stutz (2010; 2015).

Therefore, I will attempt to investigate human actions implied in burial-related archaeological records through case studies for Skateholm. This site comprises two different sites, Skateholm I and II, and provides abundant Mesolithic graves containing

human remains and detailed reports. Also, Eriksson and Lidén (2003) mention that these two sites are chronologically sequenced from Skateholm II to I, with a part of the period overlapping. These features can be useful to infer the people's repetitive performances and emotions towards the dead and death in each phase shown in Fig. 3.7 between the two sites. In addition to these above-ground events, chapter 6 will also consider underground effects. This is rephrased as treatments after infilling, which means that the dead body can be subjected to their future generations, as well as their contemporaries. These underground dimensions can be considered by reinvestigating human remains from the perspective of archaeothanatology. However, this method needs detailed descriptions and photographs which explain the state when the human remains were excavated. In this dissertation, archaeothanatology will be applied to only burials in Skateholm I and II with reference to Nilsson Stutz (2003) due to the lack of well-described data for this method.

Analysing data results in various burial practices, but if there are some invariable aspects, they can be seen as essential and routinised activities that meet social demands; in other words, they can be ritualised practices. Moreover, these practices might imply memory and belief inherited from the ancestors (Bell 2007, 281) and allow us to extrapolate the form of cosmology. Hence, by comparing the general burial trends in the EN with the results of biographical approaches in Skateholm, I will further discuss what internal or external factors strongly impacted the ancient mortuary practices and stimulated the cosmological transformations.

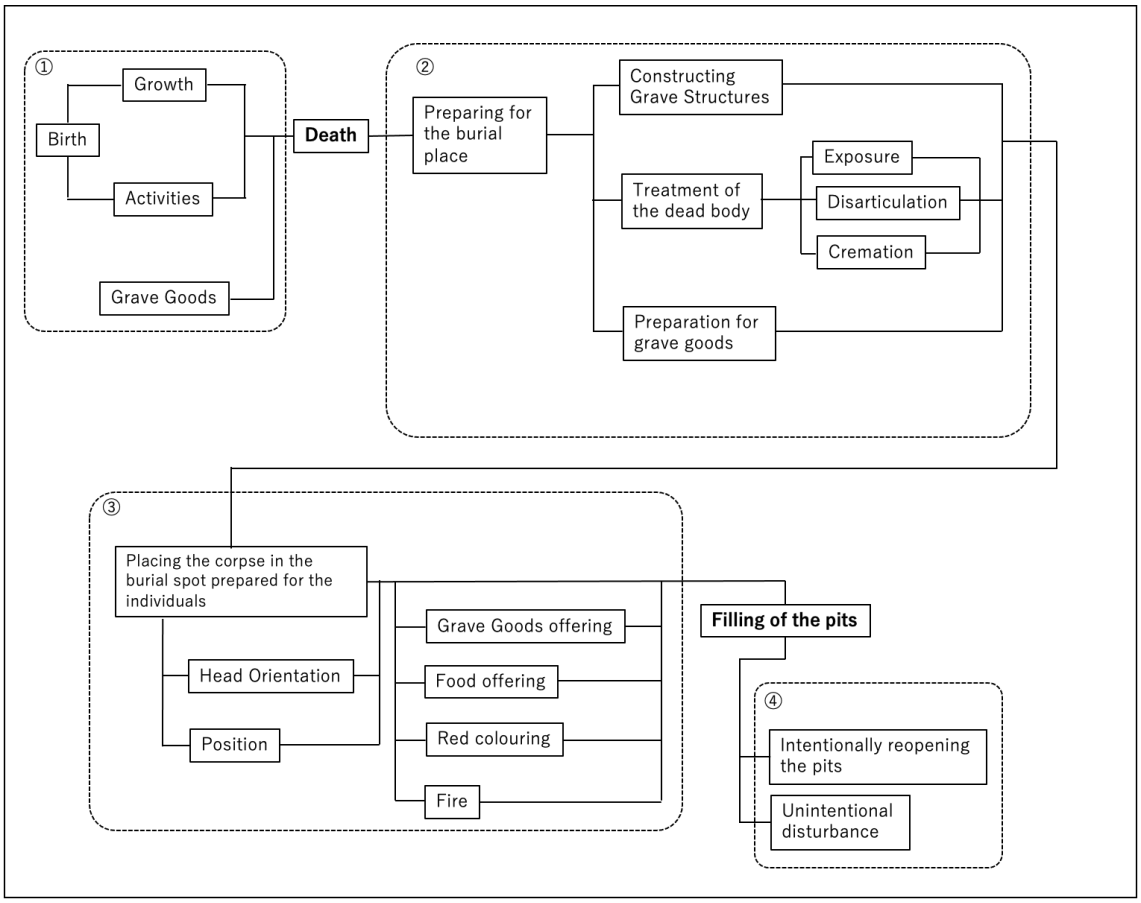


Fig. 3.7: The deposit's biography of the dead body

4. Data Analysis

This chapter comprises two sections. In the first section, the pre- and post-mortem treatments, and the LM and the EN contexts are separately handled, respectively. The second section discusses the positional relationship of burials between the two timeframes.

The pre-mortem contexts consist of sex and age at death, which are assessed by measuring some specific parts of human skeletons. Some skeletal morphological differences, for example, in the pelvis, skull, mandible and teeth, help identify the sex of the dead (Cox and Mays 2000; Mays 2010). Particularly, the former two parts have been viewed as the most reliable areas (Mays 2010, 49; White *et al.* 2012, 411). However, if sexing-related morphological differences are obscure, osteological sexing cannot clearly divide into two biological sexes even when the skeleton is well preserved and often classifies people into M, M?, unidentified, F and F?. Besides, the sex determination of juveniles and under is difficult because their skeletal morphological differences are still inadequate for reliably determining sex (Cox and Mays 2000, 12).

Age at death can be assessed by the stage of tooth eruption and the progressive patterns of epiphyseal fusion until approximately the young adult age group because the final epiphyseal fusion occurs on the medial clavicles around 21-30 years (White *et al.* 2012). However, the age of adults is more complicated and judged by combining multiple methods, such as teeth wear, pubic symphysis and cranial suture closure

(*ibid*). Some researchers suggest that such multiple methods can improve the accuracy of age estimation (e.g. Lovejoy *et al.* 1985), but others disagree with the effectiveness (e.g. Martille *et al.* 2007).

All sex-related patterns identified in this thesis are based on the collected pre-mortem data. Also, these data consist of many sex-indeterminate individuals. However, such individuals are mostly composed of young people, as shown in Fig. 4.1 and 4.21. Therefore, there can be little influence on implications for any sex-related pattern identified.

4.1 Detailed Data Analysis

4.1.1 Mesolithic

4.1.1.1 Pre-mortem

4.1.1.1 .1 (Sex and Age at death)

The pie chart (Fig. 4.1) shows no apparent difference in frequency between males and females. The remaining category, 'Undetermined', also represents a similar number to both sexes identified. On the other hand, the 'Adult' category shows 19 individuals, suggesting that the possibility of discrimination based on sex cannot be ruled out.

Concerning age at death, Fig. 4.2 illustrates the age distribution divided between adults (YA-MA, Adult) and non-adults (F-A, Young), and Fig. 4.3 shows the further detailed classification of age at death. These two graphs represent that adult people have a remarkably higher percentage than young individuals. In detail, although most adult age categories have higher values than young individuals, the only number of YMA

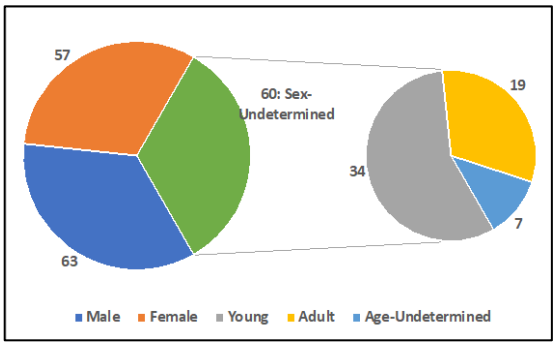


Fig. 4.1: Proportions of sex in the LM (n=180)

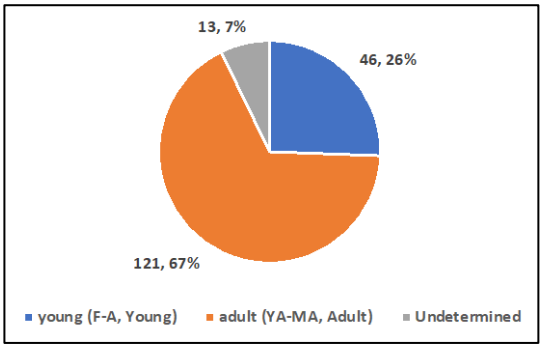


Fig. 4.2: Proportions of age group in the LM (1) (n=180)

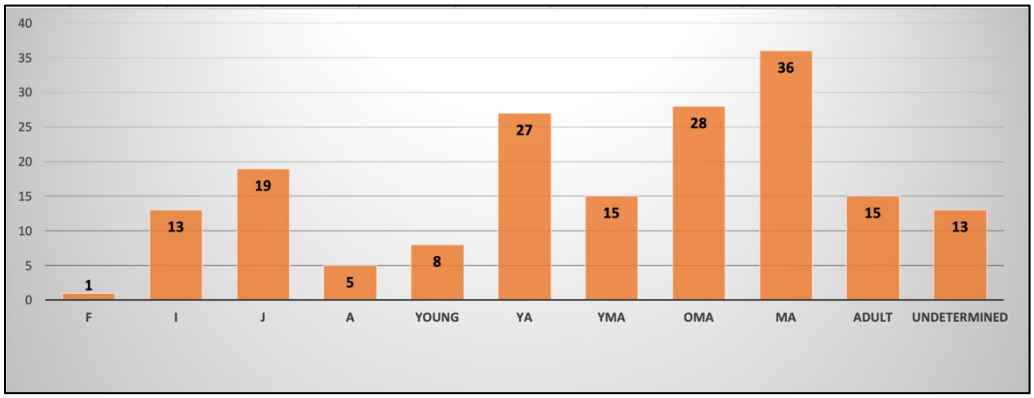


Fig. 4.3: Proportions of age group in the LM (2) (n=180)

category is smaller than that of juveniles at 15 and 19, respectively. An accumulative graph (Fig. 4.4) shows a similar pattern between both sexes, except for a slight gap in the YMA group. We would explain this gap that while some adult females might die before reaching the YMA group due to childbirth, others could survive until OMA and MA.

4.1.1.2 Post-mortem

4.1.1.2.1 (Burial Method): From the post-mortem perspective, most of the deceased were inhumed (Fig. 4.5). Cremations are also recognised at some burial sites, for example, Gøngehusvej 7 (Feature Æ, N and Ø), Vedbæk Boldbaner, Nivå 10 (Grave 4,

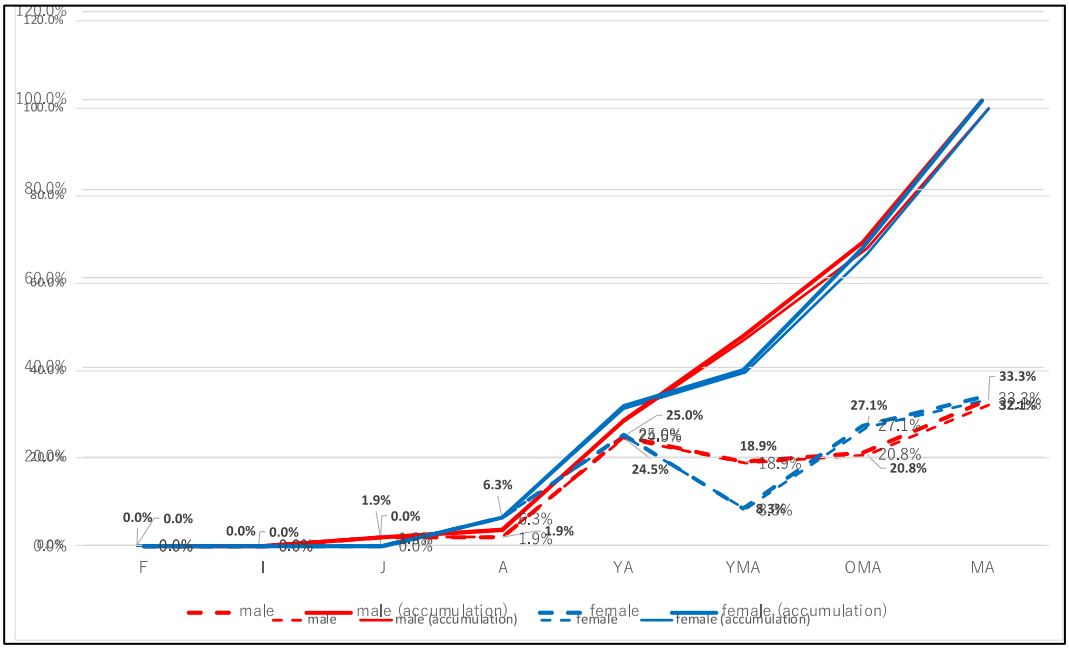


Fig. 4.4: Accumulative graph between males and females in the LM

5 and 9), Skateholm I (Grave 11 and 20) and Skateholm II (Grave XVIII). However, the comparison between the frequency of inhumations and cremations represents that the former was the main burial method in the LM. For example, there are only two cremations at Skateholm I despite 59 burials in total. On the other hand, a few individuals were buried with wooden structures which could have been burnt in mortuary practices, such as Grave 26 and 60 at Skateholm I. Nilsson Stutz (2003, Appendix, 52) suggests that this type of structure was probably constructed above the grave and burned down during the burial ritual. She also mentions the presence of a wooden structure in cremation burial at grave 11 (*ibid*, 38). It is noteworthy that burning down wooden structures is a common feature, while there is a difference between inhumation and cremation at the same site. For example, cremation coincides with the remarkable transformation of the dead body, which can indicate the transition to new objects and the bestowing of clearly distinctive social meanings from other inhumed

individuals (Morris 2018, 120). In consideration of the rarity of cremation in this period, the treatment of firing connotes special or abnormal ritual meanings.

4.1.1.2.2 (Position/Head Orientation): The analysis shows that ‘Extension’ is the main position (65 %), followed by ‘Hocker’ and ‘Sitting’ with 21 % and 13%, respectively (Fig. 4.6). Also, Fig. 4.7 represents nearly 80 % of the ‘Supine’ category, and one-fifth of human remains are found with their bodies turning to the lateral sides. Individuals turning to the right side account for 9 % and those to the left for 11%, showing no clear difference. On the other hand, individuals buried in a sitting are only found at Skateholm I and II, suggesting that this position might play some important roles within these sites.

The distribution of head orientation (Fig. 4.8) indicates that the approximately west direction could be the most frequent pattern, followed by the roughly north direction. In addition, the northwest direction (‘h’) also has a relatively larger figure in the eight categories, which suggests that the direction between the north and west might be a general trend for the heads’ deposition. Fig. 4.9 re-categorises the axis of grave pits into four patterns and shows that the north-to-south (‘a-e’) and east-to-west (‘c-g’) directions indicate the approximately same proportion at 30 % and 31 %, respectively. Interestingly, the east-to-west (‘c-g’) orientation, which represents the highest percentage, contains the second smallest category ‘c’ in number in Fig. 4.8. This implies that the west direction might hold some special meaning for ancient people.

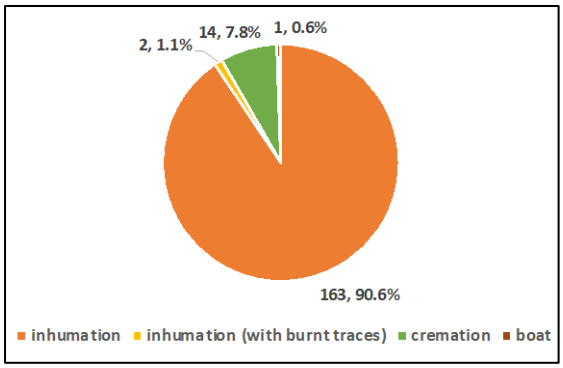


Fig. 4.5: Proportions of burial types in the LM

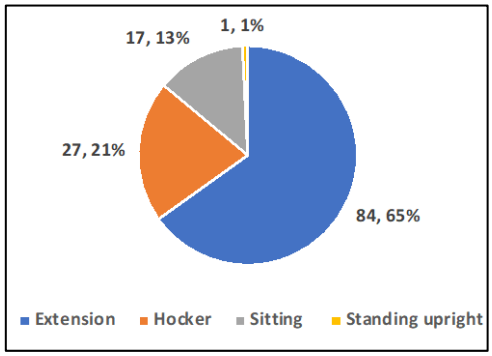


Fig. 4.6: Proportions of the positions of the dead in the LM (1)

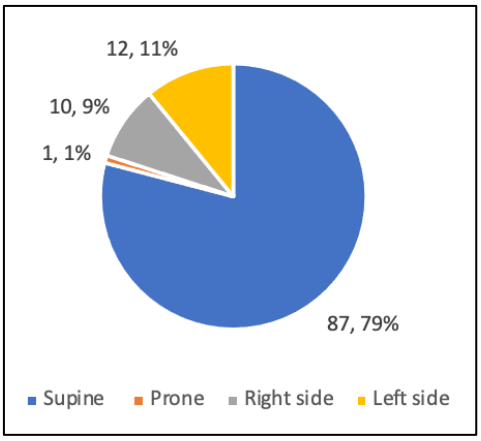


Fig. 4.7: Proportions of the positions of the dead in the LM (2)

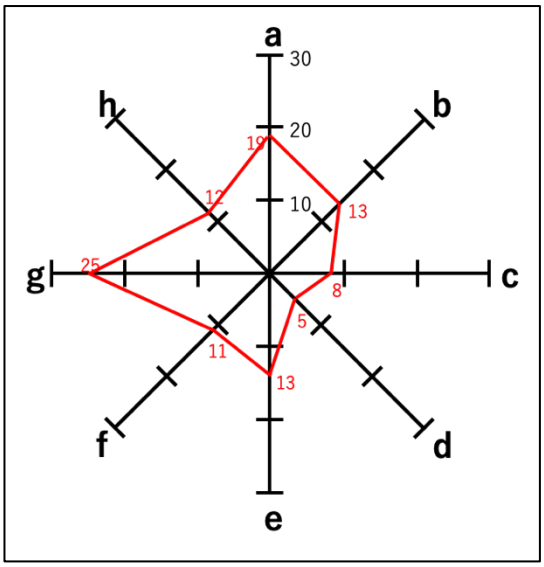


Fig. 4.8: Head Orientation of the LM in the eight directional divisions

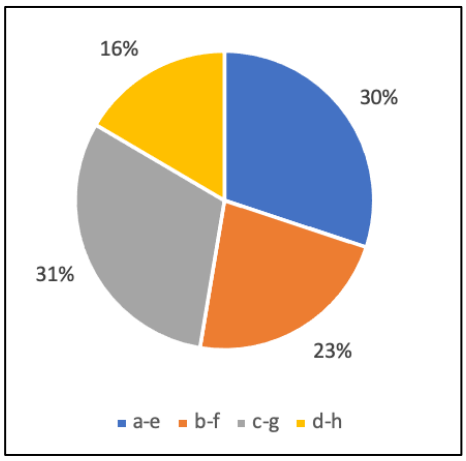


Fig. 4.9: Proportions of the grave pits' directions in the LM

Subsequent analysis will combine the pre-mortem contexts (sex and age at death) with the data of position and head orientation (Figs. 4.10, 4.11). In Fig. 4.10.1, while females relatively show predominance in the ‘Hocker’ category, the ‘Extension’ position represents no clear tendency towards either sex. The ‘Undetermined’ group in the ‘Extension’ and ‘Hocker’ categories show over 25 %, respectively. However, in the outbreak of the group, ‘Young’ individuals account for the most proportion with 75 % and 71%, respectively. This indicates little influence on the sex-related pattern in the body positions identified. Besides this, there was no evident relationship between the selection of position and age group at death (Fig. 4.11.1). Moreover, comparisons between the body orientation and sex and age group (Figs. 4.10.2 and 4.11.2) represent no obvious features, except for females buried in the position of side-lying to the right at 60 %.

In contrast, the distribution of head orientation partly has obvious correlations with the pre-mortem contexts. Through Fig. 4.10.3, the ‘c’ category is mostly found in male burials. Also, individuals belonging to the ‘b’ and ‘f’ categories are relatively often seen among males, which results in a higher proportion of the ‘b-f’ category for males (Fig. 4.10.4). On the other hand, in Fig. 4.10.3, females are remarkably dominant in the southeast division (‘d’). Furthermore, the percentage of the ‘g’ category of females is twice as high as that of males. Considering that the ‘c’ category is mostly recognised in male burials, we can interpret that there was discrimination in that the approximate east direction was for males and the west for females. In the comparison between head orientation and age group (Fig. 4.11.3), young individuals (F-A, Young) tend to be buried with the head towards the north, south and northwest (‘a’, ‘e’ and ‘h’,

respectively). Interestingly, these three directions represent relatively large percentages in the 'Undetermined' groups in Fig. 4.10.3, which corresponds with the high frequency in the 'a-e' category of the axis of grave pits (Fig. 4.11.4). Likewise, the northwest direction ('h') was also potentially for young people as well as females. On the other hand, the categories of 'b', 'f' and 'g' are predominant in adult individuals, and grave pits directing the axis towards the northeast-to-southwest ('b-f') could be mostly made for this age group (Figs. 4.11.3 and 4.11.4).

4.1.1.2.3 (Overall Grave Goods/Red Colouring): The placement of grave goods and/or red colouring by the deceased could be one of the Mesolithic burial features. As shown in Table 4.1, just over half of interments were accompanied by grave items at 55.0 % in total, and red colouring was perhaps conducted for more limited individuals (36.7 %). However, people buried with both features are much more limited, with 26.1 % in total, suggesting that interments with red colouring could imply more significant meanings compared with grave goods.

In comparing the distribution of individuals with grave goods and/or red colouring with the pre-mortem information, Fig. 4.12 represents that males show relatively higher percentages of all three categories than females. Notably, the proportions of males in all categories are larger than that in the total (35.0 %). Additionally, the 'Undetermined' groups also have higher percentages than females in the three categories, but over 60% of each group is composed of young individuals (F-A, Young). This can strengthen the possibility of men's predominance concerning the practices of grave goods offerings and/or red colouring. Besides this, categorisation based on age group

(Fig. 4.13) reveals some eminent patterns. When focusing on the proportion of Young Adult (YA) people, while co-burials with grave goods are relatively more often found, the frequency of red colouring dramatically falls. A similar pattern is also seen in the 'MA' age group. In contrast, the proportion of Juveniles (J) with red colouring is very high when the total number of this age group is considered. This pattern also remains in the 'both' category. These analyses indicate that red colouring and the combination with grave goods offering and red colouring were proportionally practised for children, mostly for juvenile individuals, whereas people in the 'YA' and 'MA' categories were frequently discovered with grave goods instead of red colouring.

4.1.1.2.4 (Grave Goods Compositions):

This section compares the number of individuals buried with stone-made or bone-made goods with the pre-mortem contexts. In total, 71 people are found with stone-made items (Fig. 4.14.1). Out of them, 36 people, which accounts for over 50 % alone, are associated with knife/blade tools, and flint flake follows this with 20 individuals in number. In comparison with the pre-mortem information (Fig. 4.14.2), stone-made tools mostly coincide with males and adult people. On the other hand, amber could be used for ornaments, unlike the other stone-made tools, and this item tends to be associated with females. However, the total number of amber holders is only 6, so it is difficult to suggest the different usage of amber from the other stone tools in burial practices.

Concerning the bone-made items, overall, there is no discrepancy in the frequency between both sexes. Nevertheless, looking at each category, we can see that animal teeth and animal bones tend to be buried with females (Fig. 4.14.3). Interestingly,

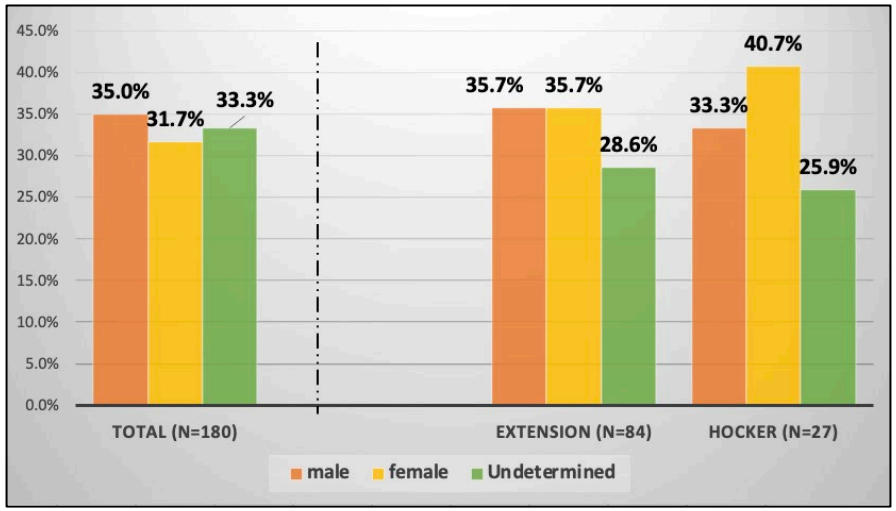


Fig. 4.10.1: Comparison between the proportions of position and sex

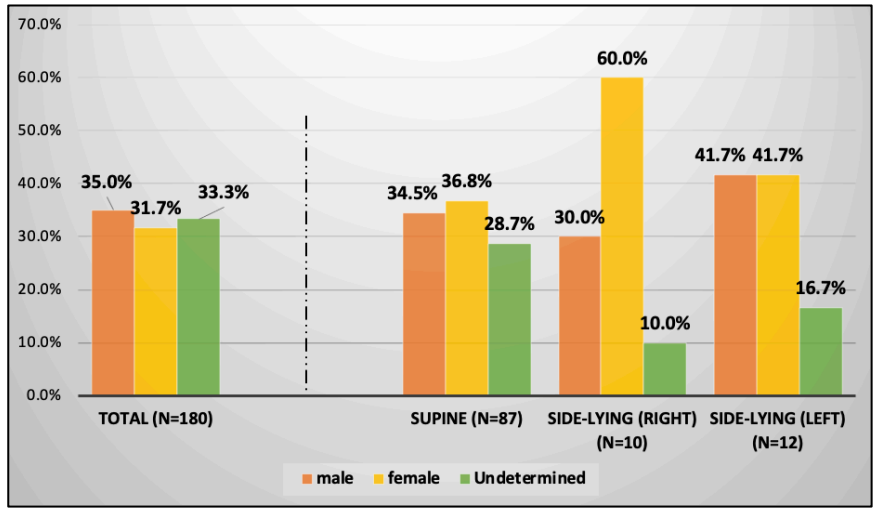


Fig. 4.10.2: Comparison between the proportions of body orientation and sex

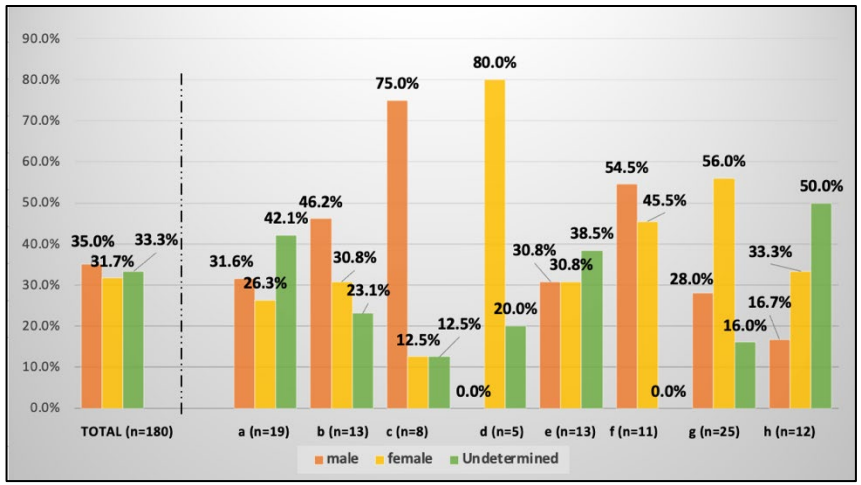


Fig. 4.10.3: Comparison between the proportions of head orientation and sex

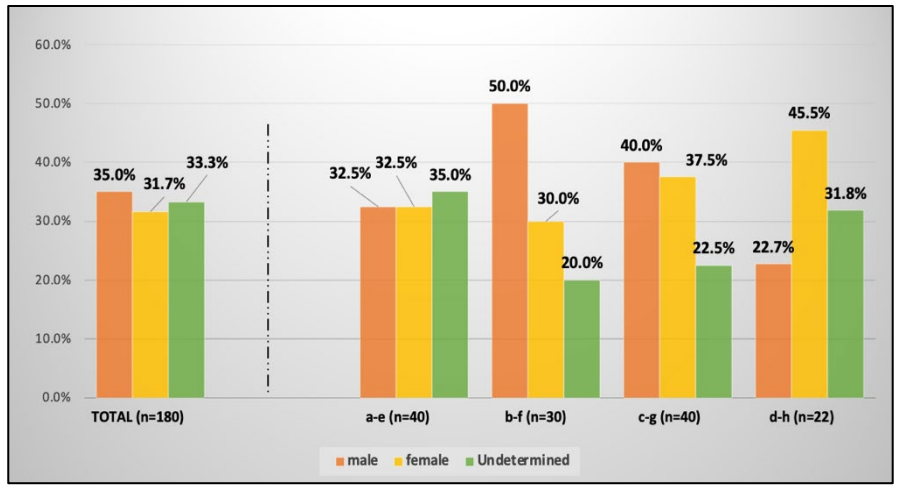


Fig. 4.10.4: Comparison between the proportions of grave pits' orientation and sex

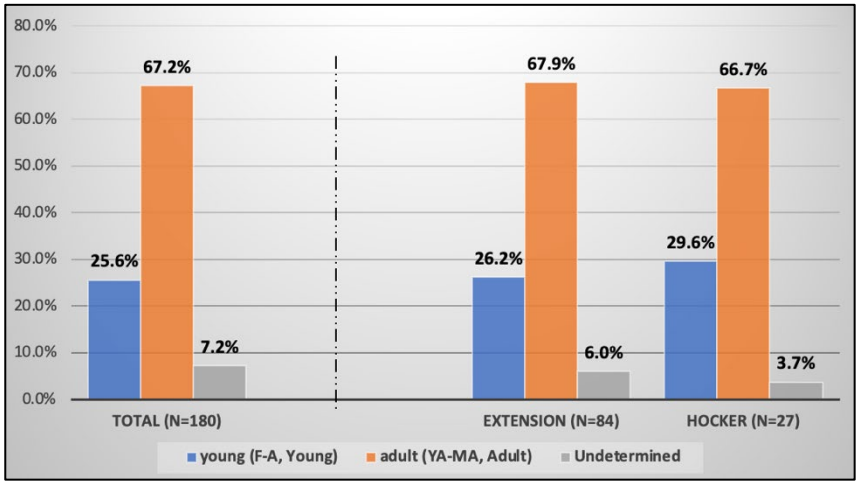


Fig. 4.11.1: Comparison between the proportions of position and age group

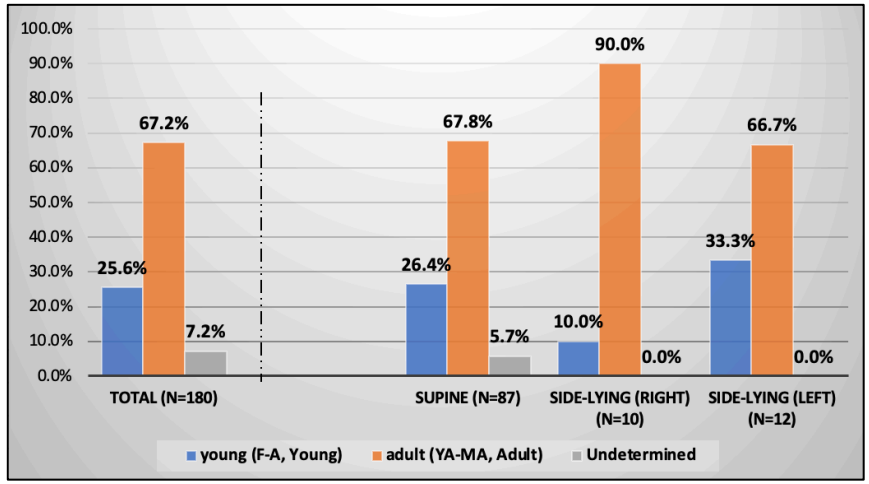


Fig. 4.11.2: Comparison between the proportions of body orientations and age group

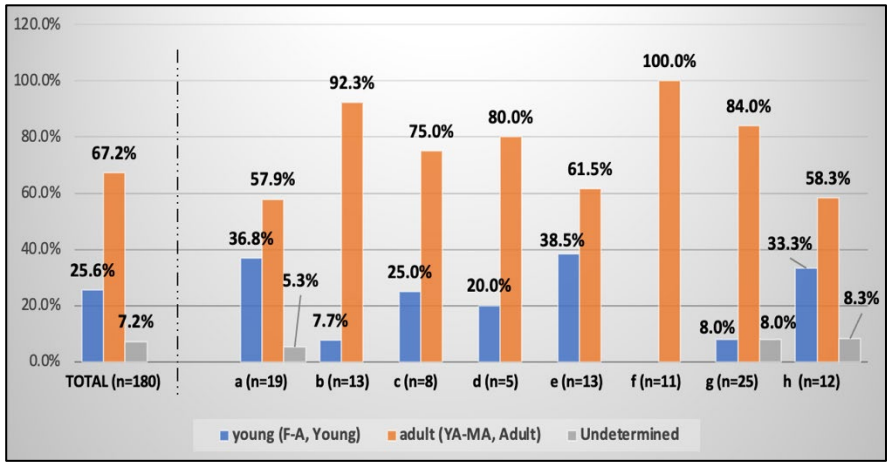


Fig. 4.11.3: Comparison between the proportions of head orientation and age group

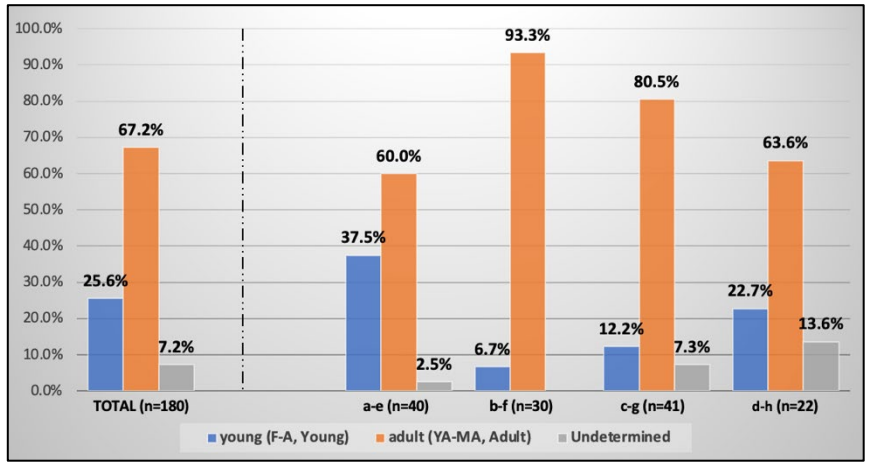


Fig. 4.11.4: Comparison between the proportions of grave pits' orientation and age group

these two items also denote relatively higher proportions among young individuals when looking at both items of ‘Sex-Undetermined’ and Fig. 4.14.4, suggesting the possibility that these goods were mainly prepared for young people as well as females. In the other categories, despite no notable differences, the association of antlers tends towards males. In Fig. 4.14.4, adult people are more frequently found with bone-made items in all categories. Notably, antlers are offered to only adult individuals, despite 11 holders in the total number.

4.1.1.2.5 (Grave Goods/Red Colouring Positions): The position of grave goods deposition is classified based on Fig. 3.6. The total analysable number of individuals in this perspective is 76, and the result is shown in Table 4.2. The main area of grave goods deposition is around the pelvis with 32 individuals, which is followed by the position around the head and leg with 32 and 21 individuals, respectively. In combination with the pre-mortem information, Figs. 4.15 and 4.16 focus on four grave goods positions (head, chest, pelvis and leg areas) and compare these positions with the overall proportion of the total number of individuals with grave goods. Firstly, the remarkable predominance in male burials for grave goods deposition can be seen around the leg area with 46.4 %. However, the ‘Undetermined’ category shows a similar proportion with 42.9 %, and adult individuals contained in the category account for 58.3 %. In consideration of the difference in the ratio of sexes in the total, it is possible that the leg area is not such an important area as grave goods deposition in male burials. Likewise, the ‘pelvis area’ category also shows a higher percentage for males, but it is unclear to evaluate this area for grave items accompanied by men because of a similar ratio of sexes in the total. In contrast, the chest area can be

Fig. 4.12: Comparison between the proportions of grave goods/red colouring and sex

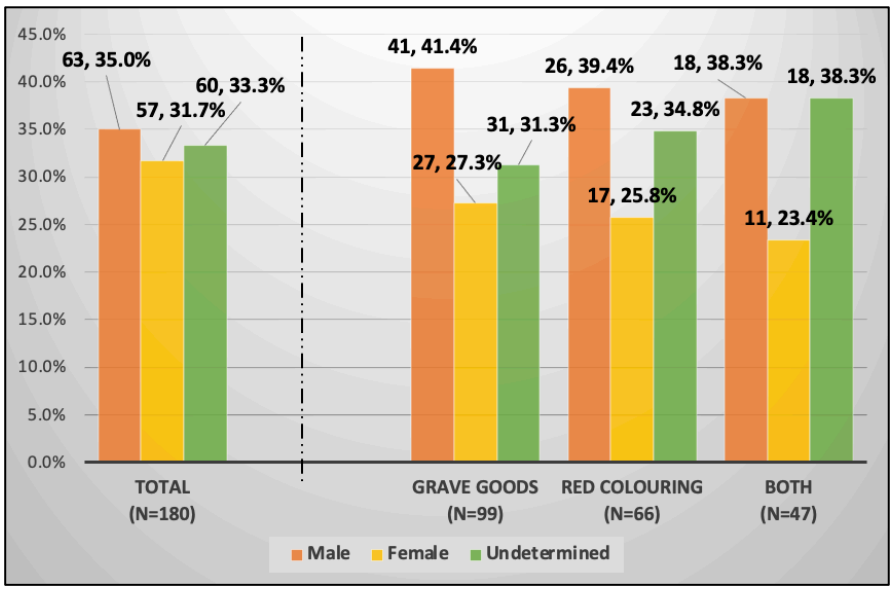
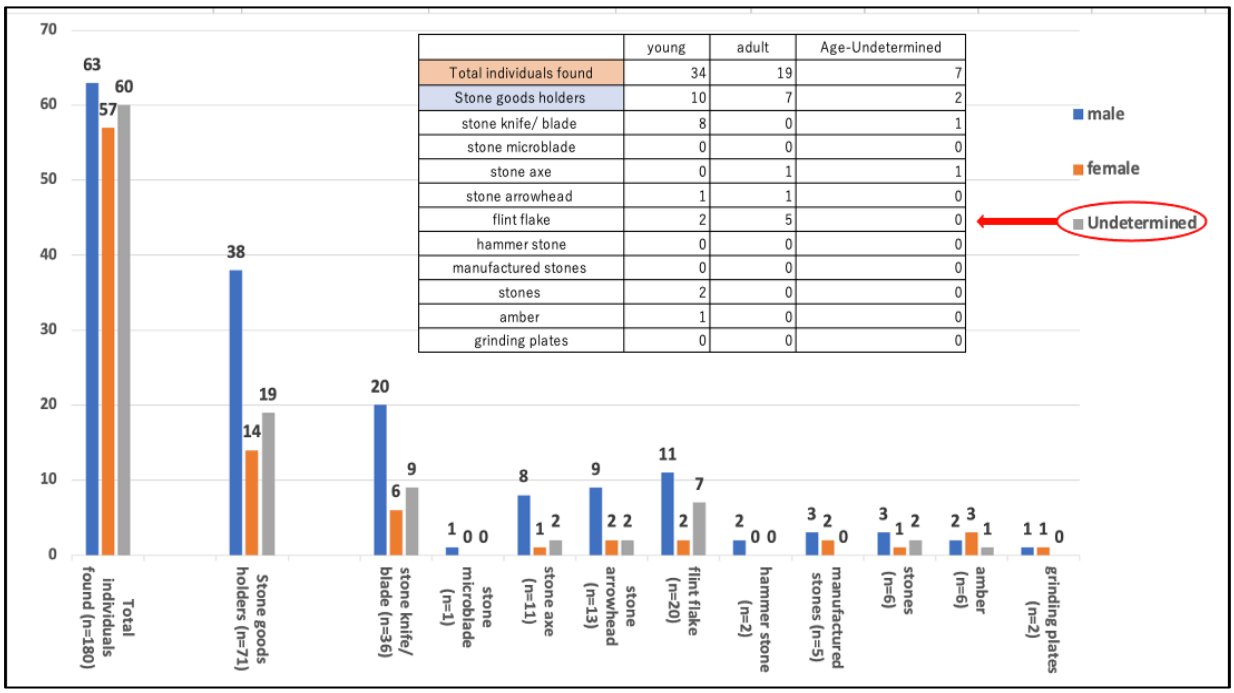


Table 4.1: The number and percentage of individuals buried with grave goods and/or red colouring

	grave goods	red colouring	both
present	99	66	47
%	55.0%	36.7%	26.1%

Fig. 4.13: Comparison between the proportions of grave goods/red colouring and age group



	young	adult	Age-Undetermined
Total individuals found	34	19	7
Stone goods holders	10	7	2
stone knife/ blade	8	0	1
stone microblade	0	0	0
stone axe	0	1	1
stone arrowhead	1	1	0
flint flake	2	5	0
hammer stone	0	0	0
manufactured stones	0	0	0
stones	2	0	0
amber	1	0	0
grinding plates	0	0	0

Fig.4.14.1: Comparison between stone-made grave goods and sex

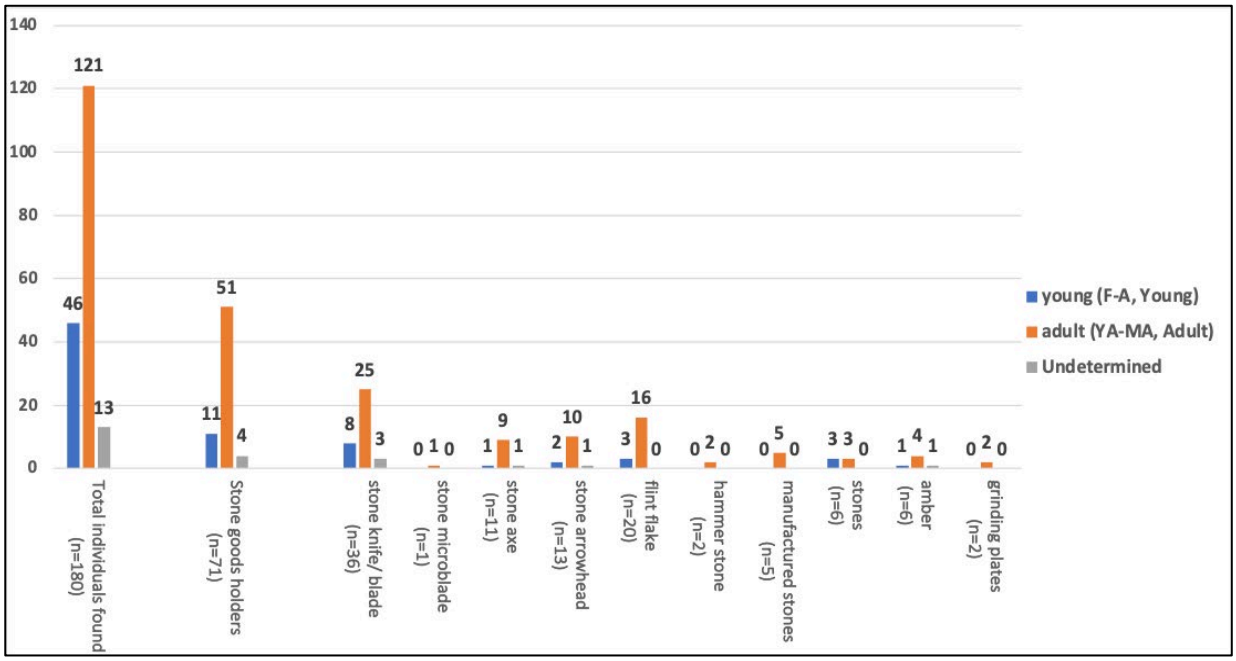
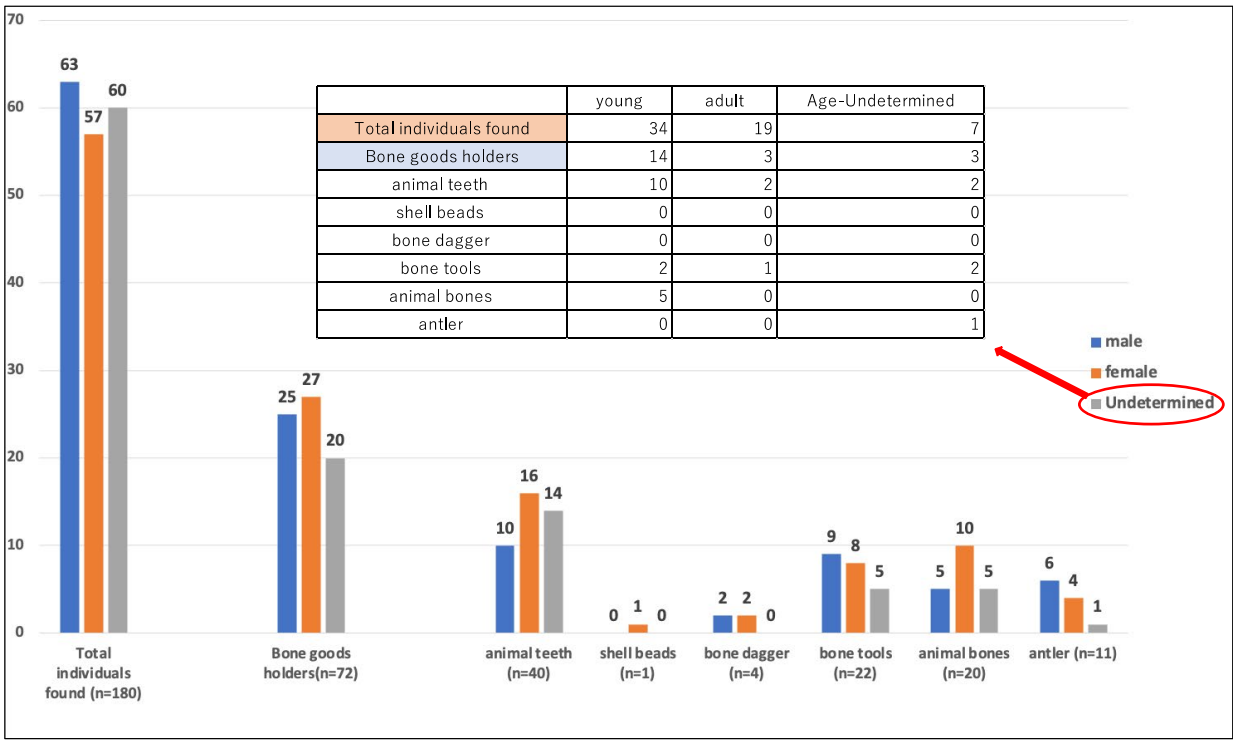


Fig.4.14.2: Comparison between stone-made grave goods and age at death



	young	adult	Age-Undetermined
Total individuals found	34	19	7
Bone goods holders	14	3	3
animal teeth	10	2	2
shell beads	0	0	0
bone dagger	0	0	0
bone tools	2	1	2
animal bones	5	0	0
antler	0	0	1

Fig.4.14.3: Comparison between bone-made grave goods and sex

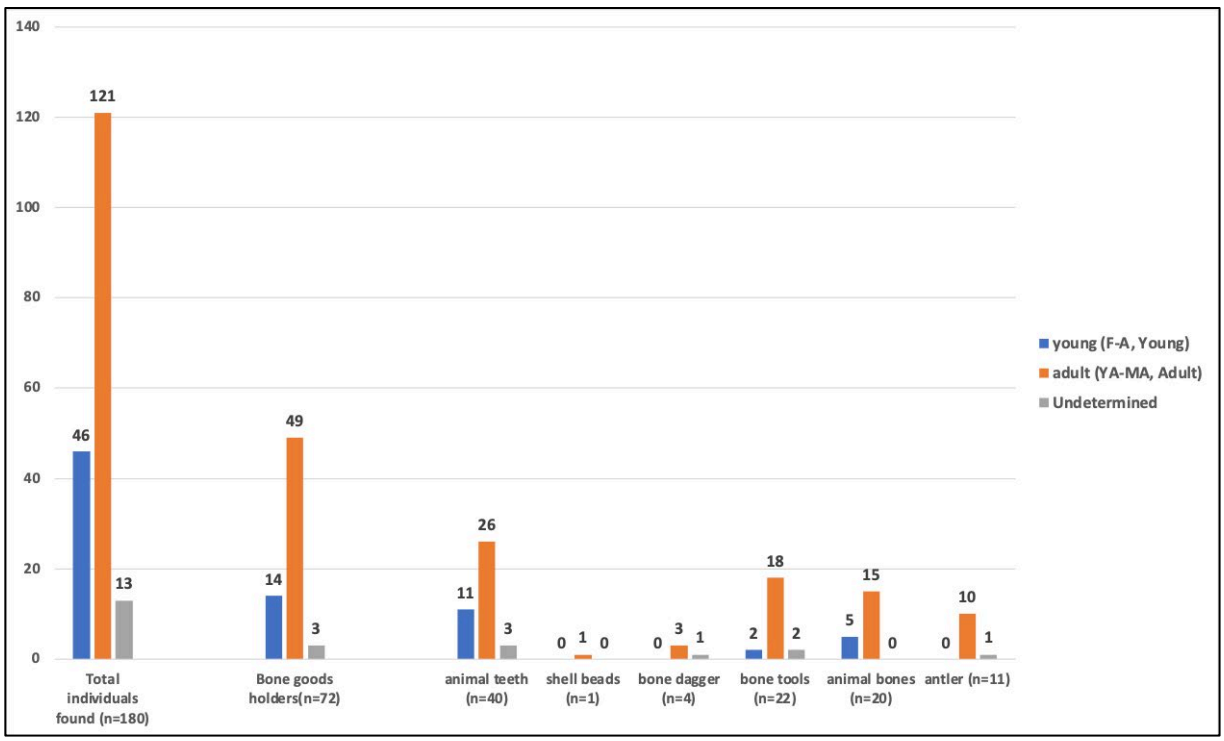


Fig.4.14.4: Comparison between bone-made grave goods and age at death

regarded as grave goods for females. Moreover, in Fig. 4.16, the percentage of this area among young people is the largest, suggesting that offering grave goods around the chest area could be general for females and young individuals. Finally, the percentages of the ‘head area’ category are similar between both sexes, and the least proportion of young people are found with grave goods around this area (Figs. 4.15 and 4.16). This pattern can be inferred that placing grave goods around the head is practised for specific adult people, and burials for the young with items around this area might imply some distinctive meanings.

The area distribution of red colouring is a different pattern from the grave goods position. As shown in Table 4.3, the head and pelvis are more frequent areas at 39.4 % and 27.3 %, respectively. By analysing those two areas based on the pre-mortem contexts (Figs. 4.17 and 4.18), there is no clear difference in the ‘head area’ between both sexes. Furthermore, most of the people in the ‘Undetermined’ group in the ‘head area’ comprise young individuals, supporting the interpretation of no sex-related discrimination in this area. On the other hand, the proportion of females found with red colouring around their pelvis is approximately twice as high as males. Looking at other areas, we can see that both legs and the entire body show the third-highest percentage with 21.2 % (Table 4.3). Interestingly, while the former area is equally distributed in males and females as a red colouring position, the latter area is predominant in males (Fig. 4.17). Moreover, more young people tend to be discovered with their entire body coloured than adult people (Fig. 4.18), indicating that colouring in this position can be a feature for young individuals as well as males. Other evident distributional characteristics can be seen in the ‘chest area’ category, with males showing a higher

Table 4.2: Grave goods positions in the LM

Total analysable individuals with grave goods in the late Mesolithic (n=58)			
Abbrev.	Individual no.		
Head (H)			
H: around the head	32		
Arm (A)			
LA: the lateral arms, includinng the shoulders	10	Right: RLA	6
		Left: LLA	4
Body (B)			
BA: between the arms and the body	5	Right: RBA	4
		Left: LBA	1
C: around the chest	14		
P: around the pelvis/waist	32		
UB: under the body	6		
OB: on the body	3		
Leg (L)			
LL: the lateral legs	21	Right: RLL	4
		Left: LLL	11
BL: between the legs	10		
AT: around the leg tips	3		

Table 4.3: Red colouring positions in the LM

Total individuals with red colouring (n=66)		
Red Colouring Area	Individual no.	%
Head	26	39.4%
Chest	7	10.6%
Pelvis	18	27.3%
Legs	14	21.2%
Arms	3	4.5%
Entire Body	14	21.2%
left side	2	3.0%

proportion than females. Regarding the other areas (‘arm area’ and ‘left side’), it is difficult to analyse the features due to the limited number.

4.1.1.2.6 (The Size of Grave Pits): The size of grave pits is analysed through the relationship between the maximum and minimum length of the outline of grave features, and the grave data are collected from Skateholm I and II. Grave pits were constructed by the living and potentially had relations to some human activities for mortuary practices.

Fig. 4.19 represents that while grave features for children coloured by red dot show the out of approximate curve upwards, the multiple burials enclosed by an orange circle are distributed roughly along the approximate curve. Also, burials associated with grave structures, such as wood structures enclosed by green circles, tend to be made in a relatively larger size. In particular, two young individuals and one adult were buried in remarkably large grave pits, measuring the length/width with 2.4/1.6 (grave 42),

2.5/2.0 (grave 60) and 3.5/2.5 (grave 11), respectively. Interestingly, the adult burial at grave 11 is cremation, and one of the young individuals at grave 60 also indicates the trace of a burned wooden structure. Through these analyses, the size of grave pits could result from complex factors, not simple reasons such as the number of co-buried individuals. This interpretation can also be drawn from Fig. 4.20, showing that grave pits with grave goods are comparatively larger than those without any items. In short, the LM burials for young individuals and using fire during the mortuary rituals might become one aspect of enlarging the size of the grave pit.

4.1.2 Neolithic

In the EN context, the total number of individual data analysed is 61, and they can be divided into three categories according to the grave attributes; inhumation, buried in long barrows and bog burial. The analysis of the burial data will be handled altogether with and separately based on these three grave attributes.

4.1.2.1 Pre-mortem

4.1.2.1.1 (Sex and Age at death): As shown in Fig. 4.21 and 4.23, the numbers of males and young individuals are notably larger than that of females. Particularly, the percentages of juvenile (21.3%) and Adolescent (16.4%) are remarkably higher than any other age categories between Feotus and Mature Adult (Fig. 4.22). In addition, it is noteworthy that as age categories get older, from ‘YA’ to ‘OMA’, the number of human remains found is gradually decreasing, and there is no data in the ‘MA’ age group. These analyses suggest the possibility that young people, in general, could be prioritised compared with adult people. This interpretation also corresponds with the

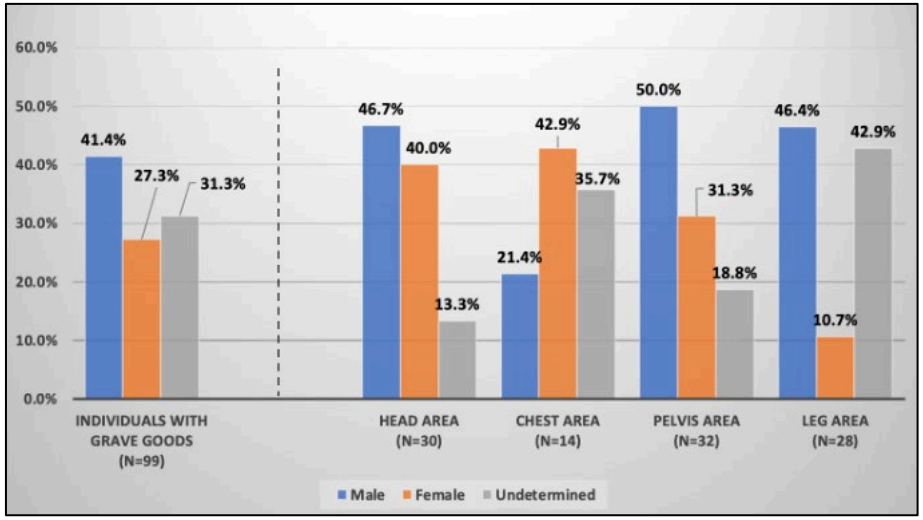


Fig. 4.15: Comparison between the proportions of grave goods position and sex

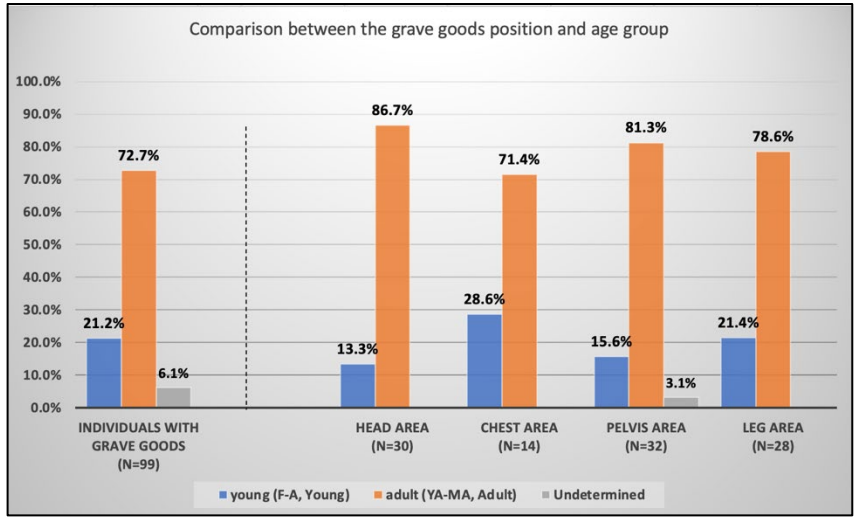


Fig. 4.16: Comparison between the proportions of grave goods position and age group

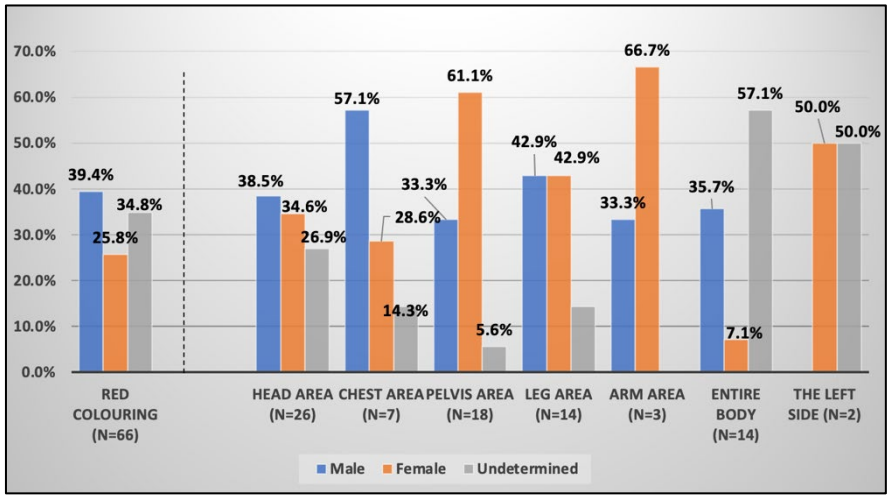


Fig. 4.17: Comparison between the proportions of red colouring position and sex

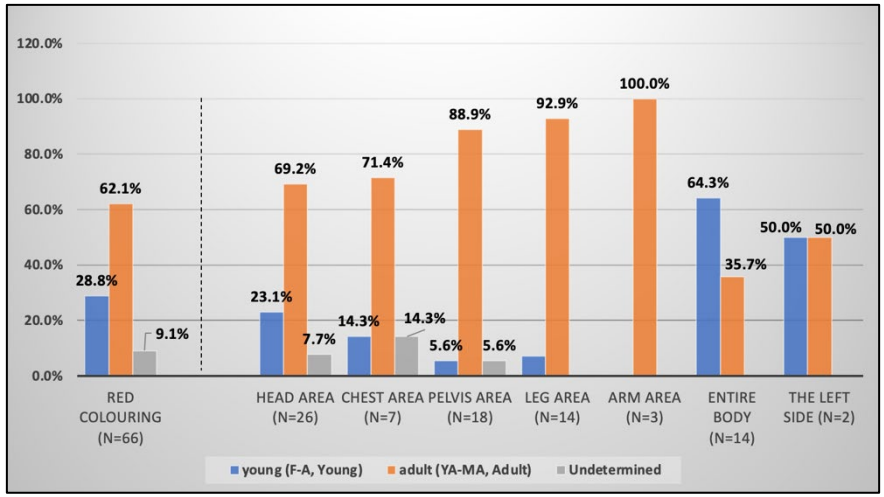


Fig. 4.18: Comparison between the proportions of red colouring position and age group

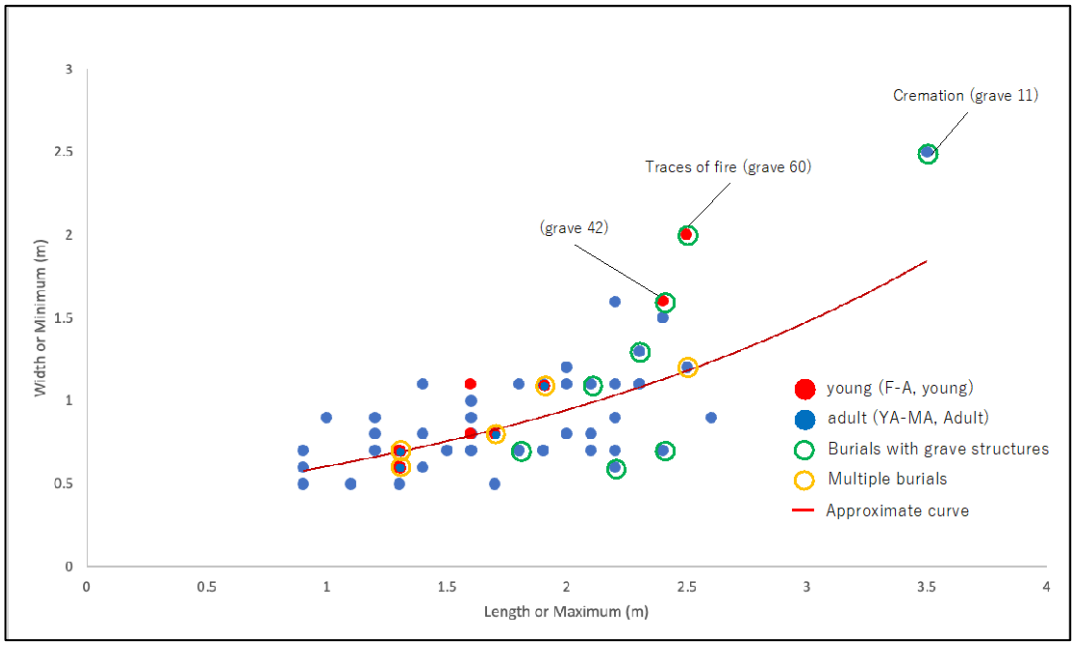


Fig. 4.19: Comparison of the ratio of grave-pits' Length/Width in Skateholm I and II

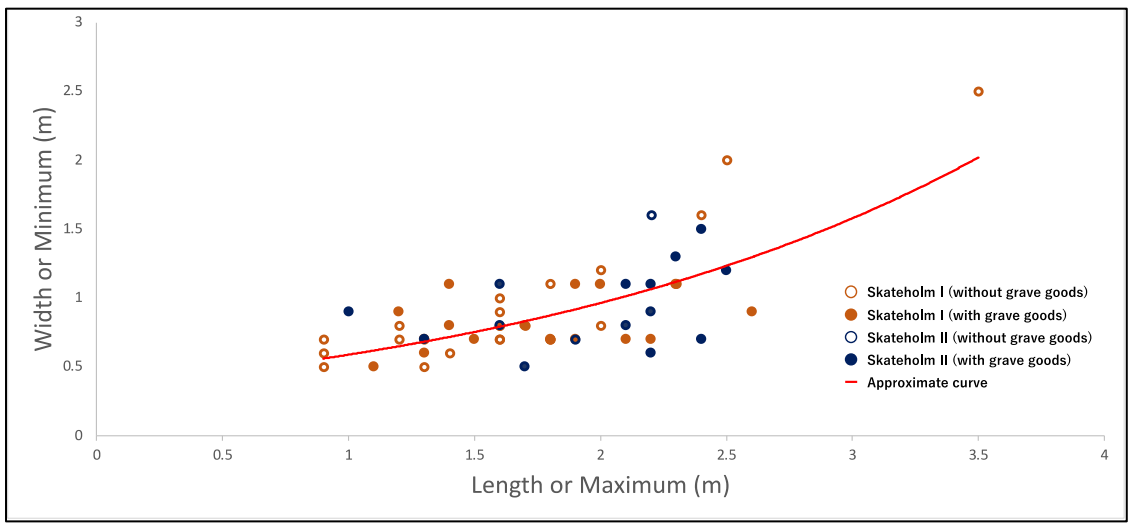


Fig. 4.20: Comparison of the ratio of grave-pits' Length/Width with and without grave goods in Skateholm I and II

comparative data between young individuals and adult individuals in Fig. 4.23, representing that the number of the former slightly exceeds that of the latter. Therefore, there were likely to be some regularities in burials concerning sex and age at death; namely, males and young people could be prioritised more in mortuary rituals.

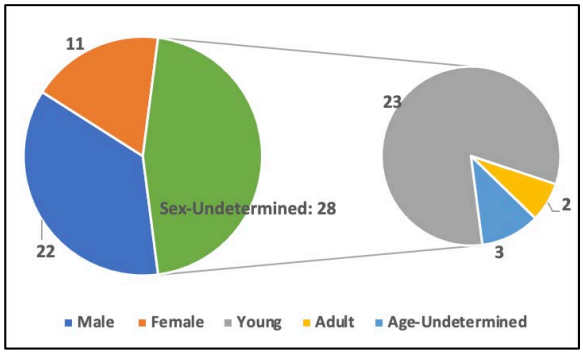


Fig. 4.21: Proportions of sex in the EN (n=61)

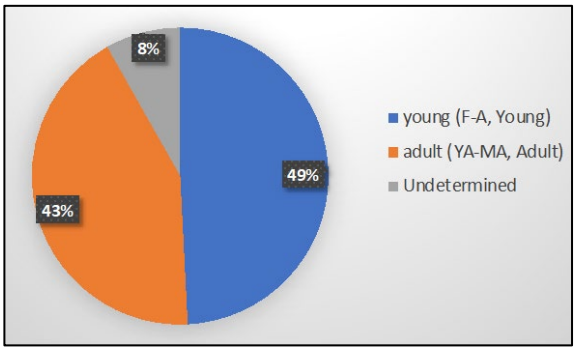


Fig. 4.23: Proportions of age group in the EN (2) (n=61)

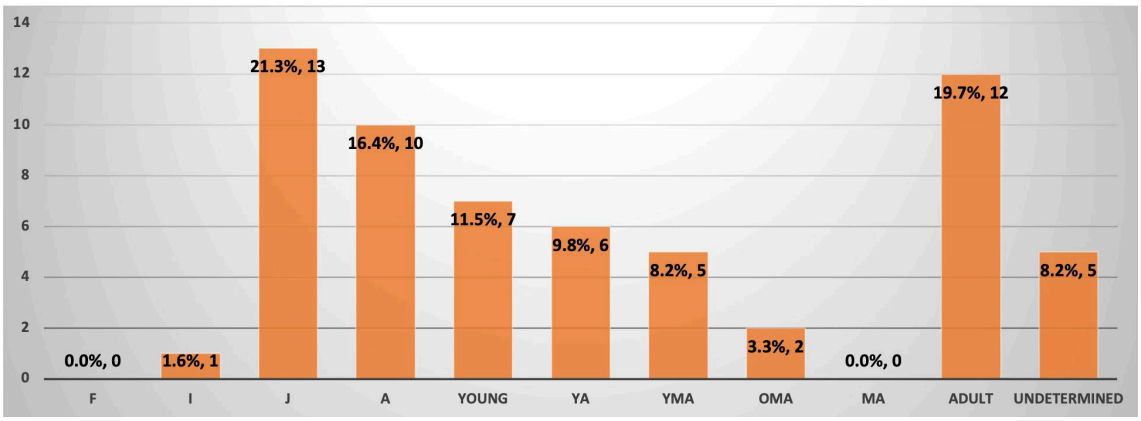


Fig. 4.22: Proportions of age group in the EN (1) (n=61)

The result of data analysis by the three grave attributes is shown in Tables 4.4 and 4.5. Table 4.4 reveals a dominant feature in people categorised as 'Male' and 'Undetermined' in the three attributes. Additionally, most of the individuals in the 'Undetermined' category are estimated as the young age group in the 'Long Barrow' and 'Bog Burial' divisions, allowing us to interpret that burials for young individuals and males could be emphasised. In contrast, we can also infer that burials for females were relatively disregarded during this period.

On the other hand, Table 4.5 indicates different patterns and that bog might be preferred as a burial place among young people, whereas relatively more adult people

Table 4.4: Breakdown of the number of individuals based on sex

Sex		
Inhumation (n=7)	Male	3
	Female	1
	Undetermined	3
Long barrow (n=18)	Male	7
	Female	2
	Undetermined	9
Bog Burials (n=36)	Male	12
	Female	8
	Undetermined	16

Table 4.5: Breakdown of the number of individuals based on age at death

Age at death				
Inhumation (n=7)	young	1	J	1
	adult	4	YMA	1
			Adult	3
	Undetermined	2		
Long barrow (n=18)	young	9	I	1
			J	7
			A	1
	adult	8	YA	2
			OMA	1
			Adult	5
	Undetermined	1		
Bog Burials (n=36)	young	20	J	5
			A	9
			Young	6
	adult	14	YA	4
			YMA	4
			OMA	1
			Adult	5
	Undetermined	2		

tended to be inhumed than the young. Besides this, there is no discrimination between the young and the adult in the ‘Long Barrow’ division. Despite the lower number of inhumed individuals, such differences in age at death by the three burial types likely implied some ritual meanings in this period.

4.1.2.2 Post-mortem

4.1.2.2.1 (Burial Method): The ways of interment appear to be diversified. However, inhumation remains a common feature, and there were another two main ways of the deposition of the dead bodies in the EN; burying in long barrows and bog areas. The number of the collected individuals from inhumation, long barrow and bog area is 7, 18 and 38, respectively (Tables 4.5 and 4.6). In particular, the bog area is suitable for preserving human bones due to the wet condition and provides over half of the analysed individuals in this period.

In addition, using fire in the burial rituals is also recognised in this period. Madsen (1979) suggests that finds of grave structures frequently coincide with the trace of deliberate destruction, such as burning down. Particularly, the survey of the grave structures at Grøfte long barrow reveals the use of fire after the interment of the deceased, but before the end of the construction (Ebbesen 1988). Coincidence with human remains and fire use is also recognised from Byholm Nørrenmark and Skibhøj. Interestingly, the burned human skeletons at Skibhøj appear to be just scorched, not disturbed (Madsen 1979, 305), from which it can be inferred that firing the dead bodies in the EN would be different activities from cremations as seen in the LM.

4.1.2.2.2 (Position/Head Orientation): The number of analysable human remains in this section is only 16, and the breakdown of the three grave attributes (inhumation, long barrow and bog burial) comprises 4, 9 and 3 individuals, respectively. Although this rarity of observable human skeletons makes it difficult to evaluate the existence of specific patterns in this period, there is a different trait between ‘Position’ and ‘Head Orientation’. Concerning the position of the dead, all individuals are buried in a supine extension. On the other hand, the heads are placed in various directions (Fig. 4.24), but it is unclear whether the head orientations correlated with each of the three grave attributes.

Figs. 4.25 and 4.26 categorise the axis of grave pits for inhumation and long barrow into four patterns, like Fig 4.9. The data used in these graphs are referred from Sørensen (2014). The total number of pits for inhumation, including those found in bog areas, is 68, and that of data from long barrows is 118. These two pie charts commonly

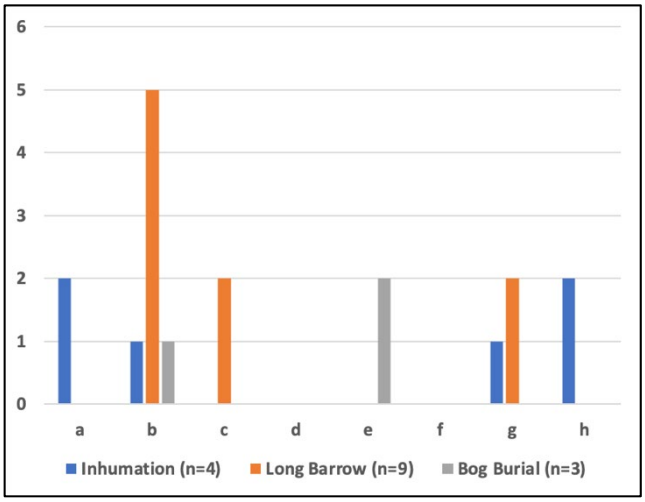


Fig. 4.24: The distributions of head orientation according to burial methods in the EN

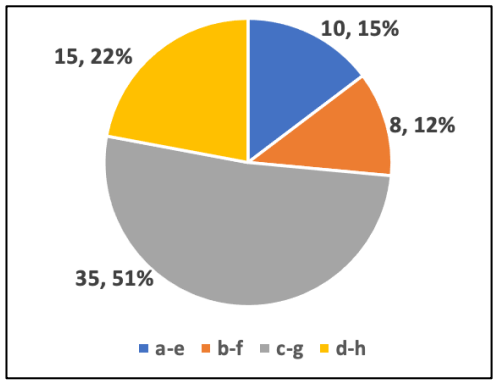


Fig. 4.25: The proportions of the grave pits' directions for the EN inhumations (n=68)

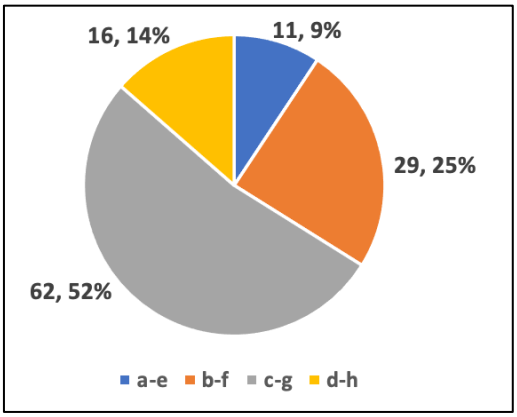


Fig. 4.26: The proportions of the grave pits' directions for the EN long barrows (n=118)

Table 4.6: The number and percentage of individuals buried with grave goods

	All analysed individuals	Individuals with grave goods	%	Note
Inhumations	7	5	71.4%	4 burials
Long Barrows	18	14	77.8%	8 burials
Bog Burials	38	20	52.6%	9 burials
Total	63	39	61.9%	

Table 4.7: Breakdown of grave goods types and the number and percentage of individuals buried with grave goods: Stone-made grave goods contain blade, axe, amber, arrowhead, flake and whetstone. Bone-made grave goods comprise a tool for wrist guard and parts of animal bones (e.g. antler, bird and pig). Clay-made grave goods are potteries.

	grave goods (stone)	grave goods (bone)	grave goods (clay)
Total (n=39)	20	9	21
	51.3%	23.1%	53.8%
Inhumation (n=5)	4	1	3
	80.0%	20.0%	60.0%
Long Barrows (n=14)	14	0	4
	100.0%	0.0%	28.6%
Bog Burials (n=20)	2	8	14
	10.0%	40.0%	70.0%

represent the remarkably highest proportion in the east-to-west (‘c-g’) category. Likewise, the frequency of the north-to-south (‘a-e’) category is commonly low. On the other hand, the category showing the second-highest percentage differs in the two charts. In Fig. 4.25, the northwest-to-southeast (‘d-h’) follows the ‘c-g’ category at 22%, but in the data of long barrows (Fig. 4.26), the ‘b-f’ category accounts for roughly 30 %.

These analyses can suggest that while the east-to-west was a standardised direction for grave pits, digging the pits in the north-to-south was an unusual practice and implied some unusual meanings in burial rituals. Moreover, the clear difference in the category of the second-highest proportion also possibly indicates some meanings.

4.1.2.2.3 (Grave Goods/Red Colouring): Although the number of buried individuals found with grave goods and traces of red colouring is limited, the proportion of those to all individuals is relatively high. As shown in Table 4.6, over three-quarters of the dead in long barrows are associated with grave goods, and overall, it is inferred that the living generally placed the deceased together with some grave items in mortuary practices. Looking at the contents of grave goods in detail (Table 4.7), we can see that stone-made items are usually discovered together with individuals inhumed and buried in long barrows. In contrast, few examples of stone tools are found in bog burials, with only 10 %. Concerning clay goods, while people inhumed and buried in bog areas are frequently associated with this item, the deposition in long barrows could be comparatively unusual. Finally, bone-made goods are rare to be found with human remains in this period. In particular, there are no examples of the association of these items from inhumation and long barrows, except for a male in Dragsholm.

Comparisons between the possession of grave goods and the pre-mortem information are shown in Fig.4.27.1 and 4.27.2. Despite the limited samples available for analysis, overall, young-aged people tend to be buried with some grave goods. Looking at the sex division, we can see that males are frequently found with grave items, except for bone-made goods in bog burials. However, although the sex of many individuals from long barrows and bog burials is categorised as 'undetermined', they are likely to be young people (F-A, Young). This indication corresponds with more young individuals in Fig. 4.27.2. Particularly, people found with stone goods from long barrows and those with clay items in bog areas are mostly classified into 'young'. This means that offering grave goods could be mainly for young individuals. In contrast, despite a few examples of inhumed people, most grave goods, regardless of the grave goods' types, are associated with adult burials.

These analyses suggest that stone items might be mainly offered for people inhumed and buried inside long barrows. Moreover, types of stone tools placed with the dead could be intentionally selected in the EN period (Appendix 4). This interpretation results from the fact that amber is found in five out of ten sites of inhumations and long barrows (Dragsholm, Byholm Nørremark, Skibhøj, Asmusgård and Tarp) and stone tools for axe and arrowhead from six sites (Dragsholm, Lohals, Byholm Nørremark, Skibhøj, Stengade and Stynø). Pottery might also be a general item as grave goods and used as a container for food and beverage offerings (Fischer 2002, 377; Midgley 2008, 20). On the other hand, the association of bone items was likely to be unusual in this period. Although this type of tool could disappear due to natural decomposition, the

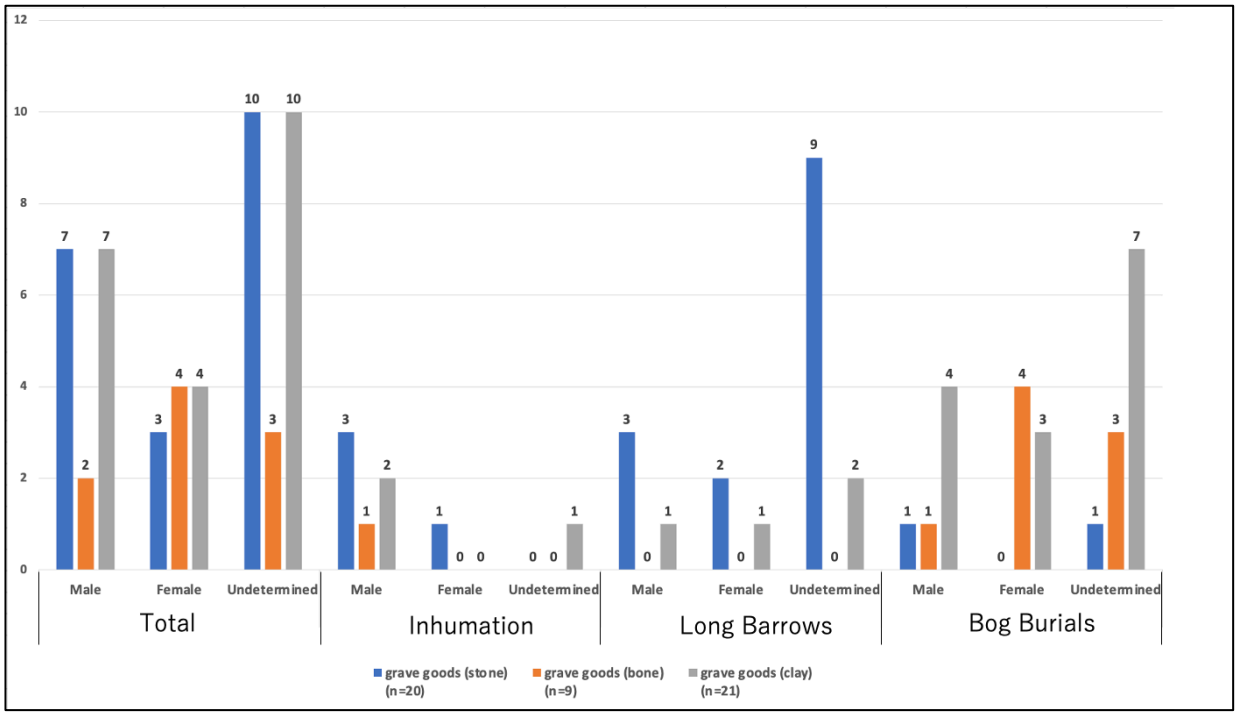


Fig. 4.27.1: Comparison of between the three grave attributes and the three types of materials for grave goods based on sex

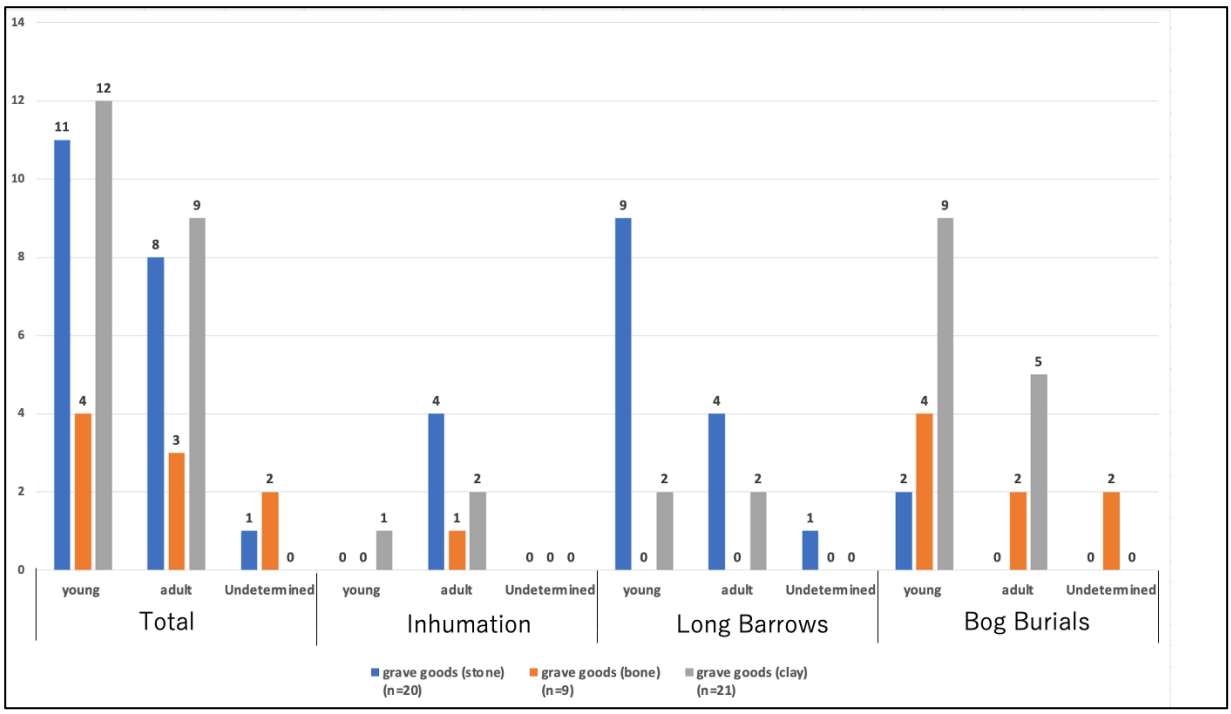


Fig. 4.27.2: Comparison of between the three grave attributes and the three types of materials for grave goods based on age at death

rarity of bone goods from inhumations and long barrows potentially suggests the decline of significance implied in these goods in mortuary practices. Rather, finds of animal bones from bog burials should be regarded as the remains of ritual feasts or symbols of spiritual power; for example, waterbirds are viewed as a guide so that souls of the dead could enter the other world (Zvelebil 2003, 67). Furthermore, it is interesting that the pattern in which adult males in inhumation are more frequently buried with grave goods is obviously different from the tendency that young people in long barrows and bog burials are mostly discovered with grave goods. This can be regarded as variant mortuary practices based on the three burial methods, but the implied meanings will need to be further discussed.

Table 4.8: Grave goods' position in the EN

Total analysable individuals with grave goods in the early Neolithic (n=3)			
Abbrev.	Individual no.		
Head (H)			
H: around the head	3		
Arm (A)			
LA: the lateral arms, includinng the shoulders	1	Right: RLA	1
		Left: LLA	1
Body (B)			
BA: between the arms and the body	1	Right: RBA	1
		Left: LBA	1
C: around the chest	1		
P: around the pelvis/waist	1		
UB: under the body			
OB: on the body			
Leg (L)			
LL: the lateral legs	1	Right: RLL	
		Left: LLL	1
BL: between the legs	1		
AT: around the leg tips			

Grave goods position can be analysed from only a few individuals at Dragsholm and Lohals. The result is shown in Table 4.8 and represents that the upper parts of the body, especially around the head, are the main areas. A comparison of the deposition between the right and left parts shows no clear discrimination. However, the number of observable individuals is very limited, making it challenging to demonstrate the feature of grave goods' position in this period.

Regarding red colouring, the trace of this practice is only recognised from a five-years

child at Strynø. This feature is also found in one part of the long barrow structure at Stengade I, II and Thershøj in Denmark, but the example is scarce. This could suggest a significant drop in the importance of ochre in death rituals during the EN. However, because of the scarcity of the data, it is hard to understand the feature of this period.

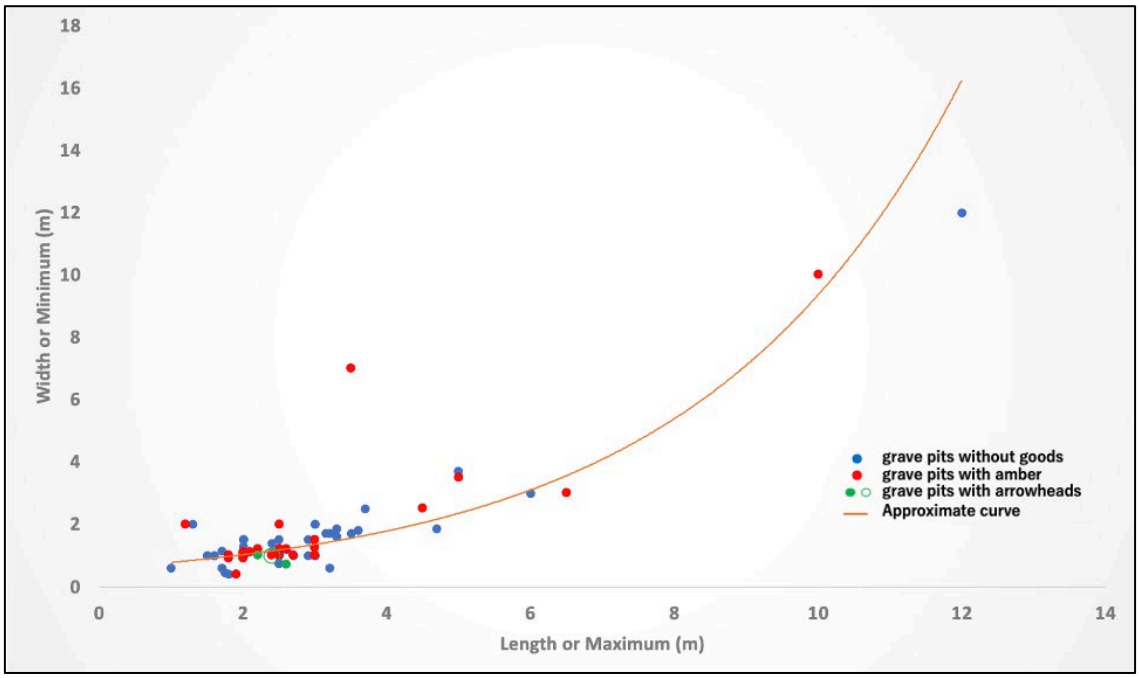


Fig. 4.28: Comparison of the ratio of grave-pit's Length/Width in the EN with and without grave goods

4.1.2.2.4 (The Size of the Grave Pits): From the collected data, grave pits for inhumation whose sizes are reported are only two burials; Lohals and Nab-Kildegård. The ratio of the length/width of the two grave pits, referred from Sørensen (2014), is 2.5/1.5 m and 1.6/1.0 m. Considering that while the former is a double burial containing two adults, the latter is for a child, we can postulate that the size of grave pits could simply depend on the number of individuals placed and their age. However, since the analysable data are very limited, it is ambiguous to demonstrate the existence of the relationship between the size and burial practices.

As the alternative analysis, Fig. 4.28 compares the length and width of grave pits for inhumation, including those without human remains. The data are Sørensen (2014) (Appendix 3). The scatter plots, with information on whether two types of grave goods (amber and arrowheads) are associated, are shown by three different colours. This graph suggests that most of the collected grave pits are concentrated in the area with the length ranging from 1m to 4m and the width from 0 to 2m. This feature is not related to whether grave items are found together, indicating that the grave goods association did not influence the determination of the size of the grave pits. This interpretation can also be applied to data outside of the concentrated area. These data are mixed with grave pits with and without grave goods and placed around the approximate curve, suggesting that the construction of grave pits in the EN could be standardised to some extent. Moreover, erecting extensive pits could simply depend on mortuary practices regardless of the co-burials with grave goods. In this sense, the two grave pits with human remains and grave goods (Lohals and Nab-Kildegård) can be interpreted to be constructed in a standard norm, and the difference in the size might easily result from the difference in the number of inhumed individuals.

4.2 Treatments and arrangements of the dead body (Attitude towards the dead)

This section will demonstrate how people recognised and treated the past burials and attempt to investigate the living's attitude towards the dead between the two periods. This perspective is analysed from the arrangement of the graves and the state of preservation inside the grave pits, such as burials that are disinterred, disturbed, and

Fig. 4.29: Photograph of structure 8 at Skateholm II with three red deer antlers and without human remains (Larsson 2004, 385, fig. 20.13)

Fig. 4.31: Photograph of grave XV containing a male in a sitting position with several grave goods, such as red deer antlers (Larsson 2016, 181, fig. 6)

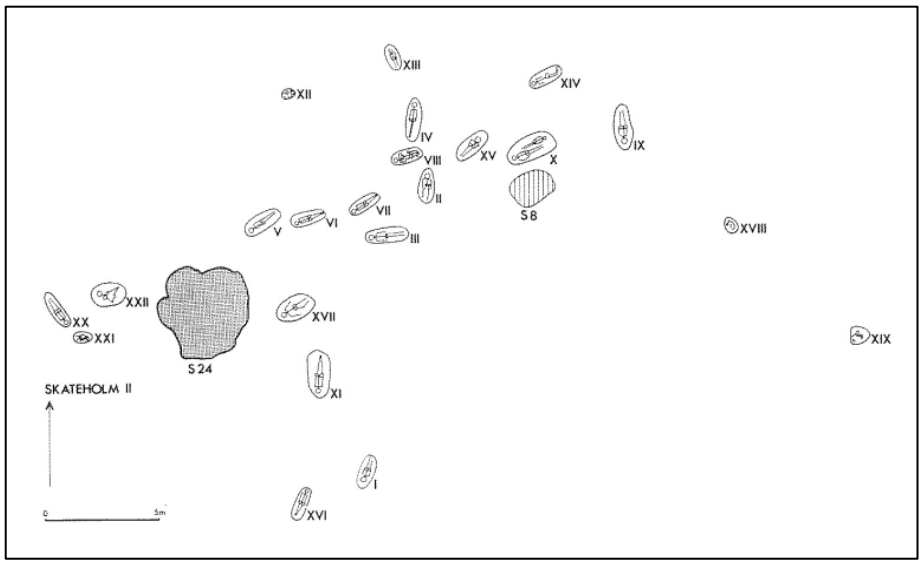


Fig. 4.30: The distribution of burials and two construction remains (structure 8 and 24) (Larsson 1998, 7, fig. 2)

constructed in parallel or a concentration with others. If there is a series or a concentration of burials, we may infer that the living perceived the location of the older graves and selected the specific places for the subsequent burial. This may also mean that there were some norms for establishing graves. On the other hand, if the entire or parts of the older graves are disturbed by new graves, the constructors of the new possibly had no veneration towards the older burials or intentionally destroyed them based on some ritual rules.

4.2.1 Mesolithic

4.2.1.1 Cenotaph

This word is defined by Karsten and Knarrström (2003, 88) as symbolic graves which never contained skeletal parts. The potential traces of this feature are recognised from grave 11 at Vedbæk Bøgebbaken and structure 8 at Skateholm II (Fig. 4.29). These two pits were commonly found with antlers of red deer but without human remains. Interestingly, the former grave pit is located in parallel and the middle between two male burials (graves 10 and 12) and contains a core-axe, a bone awl and traces of a wooden dug-out canoe inside. Albrethsen and Brinch Petersen (1976, 9) report the stratification of the fill and suggest that this grave should have opened shortly after the burial to remove the human body. In view of the fact that the man in grave 10 lay on two antlers, grave 11 could be prepared for a man (*ibid*, 9), and he should have been once placed onto antlers. Likewise, structure 8 at Skateholm II is southerly adjacent to a double burial (grave X) in which two males in two different positions (sitting and supine extension) are co-buried. Looking at graves around structure 8 (Fig. 4.30), we can see that grave XV is situated to the northwest and parallel to this structure. Grave XV (Fig. 4.31), unlike grave X, contains three antlers (two are by his head and the other by his legs), and it is inferred that a shelf was constructed at one end of this grave pit where the head of this sitting male individual was leaning (Nilsson Stutz 2003, Appendix, 110). From this viewpoint, structure 8 could be originally constructed for a man, and the inside antler deposits probably indicate some internal grave structures.

4.2.1.2 Overlapping, Disturbance and Extension

Partly disturbing the previous graves also provides evidence of re-access to the older

burials by the living. Such burials are recognised in the LM from Vedbæk Bøgebbaken, Skateholm I and Tågerup[1], which might imply that the ancient living perceived the past burials. For example, the right upper limb and femur in grave 34 at Skateholm I are disturbed by the later burial (grave 35) (Nilsson Stutz 2003, Appendix, 59-60). In Fig. 4.32, we can see that the superior area of the later human remains reaches the right side of the older human skeleton. If the living continued to enlarge the later grave pit to the superior direction, the pit would have disturbed the lower parts of the older body. In other words, it was likely that people stopped to enlarge the pit when they encountered the older individual and placed the newly dead body at that moment in a hocker position. In this case, the position of the individual at grave 35 might be determined by the size of the grave pit. Interestingly, another two pairs of burials (graves 1 and 2, 40 and 41) at Skateholm also demonstrate a similar feature. In the later burials (graves 2 and 41), the deceased were also inhumed in sitting or hocker positions, probably because their grave pits would be partly superimposed on the older ones (Fig. 4.33).

In contrast, grave 47 at Skateholm I extensively destroyed the underlying burial (grave 46). Nilsson Stutz (2003, Appendix, 73) suggests that the younger grave (grave 47) heavily damaged the central section of the older one (grave 46), and the filling of the younger grave contained skeletal fragments and artefacts. This suggestion might mean that the builders of grave 47 continued to dig after they found the older skeleton of grave 46 and completed a grave pit in which the dead individual could be placed in an

[1] Vedbæk Bøgebakken (two sets of burials: graves 8 and 9, 6 and 15) / Skatehlom I (five sets of burials: graves 1 and 2, 34 and 35, 40 and 41, 46 and 47, 56 and 57) / Tågerup (grave 3 and 4)

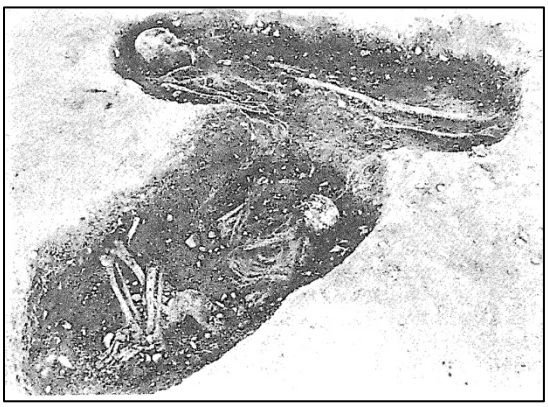


Fig. 4.32: Photos of graves 34 and 35; an older grave 34 containing an adult individual in a supine extension and the later grave 35 in

Fig. 4.33: Photos of graves 40 and 41: the burial of a single hocker individual (grave 40) is older than the deeper double burial (grave 41). The feature of the later grave pit appears around the hip area of the older body in dark colour, which could slightly damage the pelvis of the older one. People would stop to construct the pit of grave 41 due to the encounter with the older skeleton and bury the double individuals at that moment. (Left: Larsson 1984, 24, fig. 13; Right: Nilsson Stutz 2003, 216, photo 3)

extension. Likewise, grave 6 at Vedbæk Bøgebakken was also constructed soon after grave 15 was made and severely damaged the older interment (Albrethsesn and Petersen 1976, 14). This can indicate that although the living potentially recognised the presence of grave 15, they destroyed it and newly constructed grave 6.

4.2.2 Neolithic

The scarcity of human remains found in the EN makes it challenging to evaluate the relationships between the living and the past burials. However, in this period, the systematic destruction of grave chambers in long barrows, for example, by burning, widely took place in the ritual practices (Madsen 1993, 98). In addition, extensions and

alterations of existing burial mounds are also well-known as one of the characteristics of this period (Midgley 2008, 14). For example, Grøfte long barrow in Zealand comprises two grave chambers and a stone setting (Fig. 4.34). Ebbesen (1988, 63-64) points out that a grave structure containing a blade and a funnel beaker had once lain under the stone setting, which was overlaid by an earthen barrow. This barrow was subsequently extended to the southeast, which covered the two grave chambers. Likewise, Bygholm Nørrenmark yields information on a series of the establishment of this barrow (Fig. 4.35). It started from a house, and then, the house was replaced by a grave, and another grave was constructed to the west part at the same time within a wooden palisade. Synchronically, a facade at the east end and a house-like structure close to the central grave were added. Finally, these constructions were removed, and all features, including graves, were covered by an earthen mound (Madsen 1979, 307; Rzepecki 2011, 54-56). Through these analyses, although the direct re-access to buried individuals cannot be recognised, we can understand that people obviously perceived the position of older burials and were intentionally engaged in modifying burial structures.

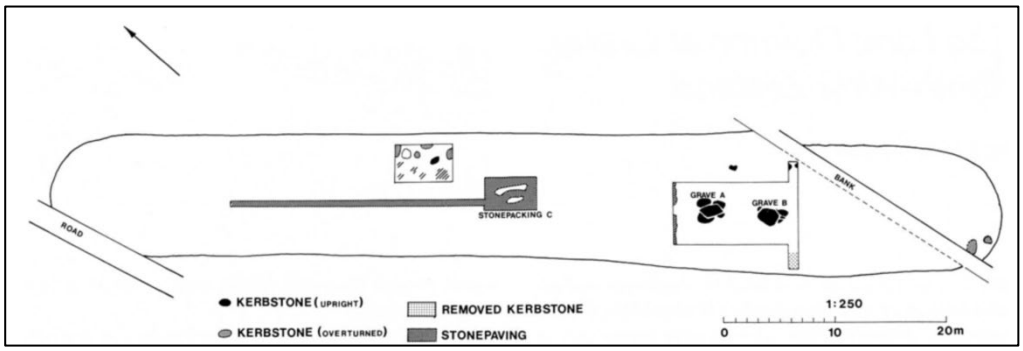


Fig. 4.34: The layout of grave structure at Grøfte long barrow (Ebbesen 1988, 54, fig. 2)

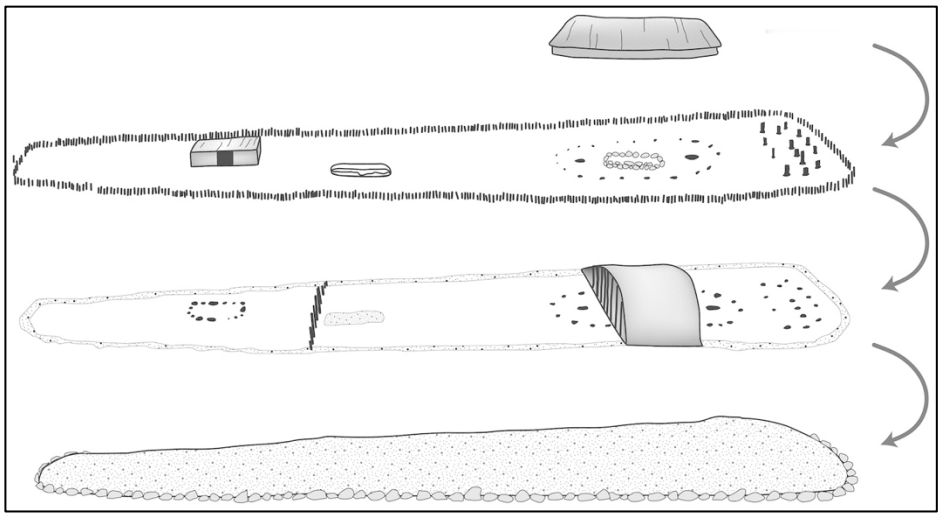


Fig. 4.35: The process of transforming from a house to an earthen long barrow at Bygholm Nørremark (Noble 2017, 92, fig. 4.12)

5. Considering the results of data analysis

This section will attempt to consider the implications of various similarities and differences in burial practices between the two periods. This attempt might be helpful to reveal the remarkable burial variables to be paid attention to in examining the transformations of ancient cosmology.

5.1 Comparison of the detailed data analysis

5.1.1 Similarities

From the perspective of the pre-mortem practice, adult individuals tend to be inhumed between the two periods. Additionally, it is also a common feature that inhumed adult males are frequently buried with grave goods.

Concerning the post-mortem practice, similar ways of burying the dead are recognised in the two timeframes. The deceased are not only frequently inhumed but also found in wet areas. For example, boat burials, like individuals at the Mesolithic Møllebaget II and the Neolithic Øgårde III (Fig. 5.1), are a common feature, and these two burials are also associated with traces of using fire beside the dead (Christensen 1990, 132). In terms of using fire, although cremation is a rarer practice in the EN period, some traces of burnt wooden structures are reported from the burial sites of both periods, such as Skateholm and Skibhøj. In addition, supine extension is the main position in common, and the axis of grave pits is often oriented in the west-east direction (‘c-g’). Notably, the significant change in the proportions of this direction (Figs. 4.9, 4.25 and 4.26) obviously points out that this trend could become stronger from the LM to the EN.

Despite the low numbers of data on human remains, if the direction of the head orientation in the later period also represents a common feature of the former period, we can infer that the west direction (‘g’) would continuously imply some special meanings for the ancient mortuary practices. Regarding the positional relationship between the dead body and grave goods and red colourings, the surrounding head area remains the focus between the two periods. However, further analysis is impossible due to the limited number of human remains in the EN. Finally, only a few red colourings are noted from the EN, but this feature might be for young people, such as a five-year-old child at Strynø. Likewise, as shown in Fig. 4.13, red colouring in the LM can be relatively regarded as a practice for the young.

The limited number of Neolithic individuals inhumed makes it difficult to clearly evaluate the existence of some continuous mortuary features between the two periods. However, several possibilities of the analysed continuities suggest that ancient people could have similar mortuary norms, from the selection of the burials to the treatment of the dead. This also means that the attitude towards the dead might not have dramatically changed from the LM to the EN, like the argument of Hellewell and Milner (2011). On the other hand, there are various differences in mortuary practices, which will be explored in the next section.

5.1.2 Differences

The EN burials differ in many aspects from the preceding period, especially in terms of the classification of burial methods and standardisation of how the dead are placed.

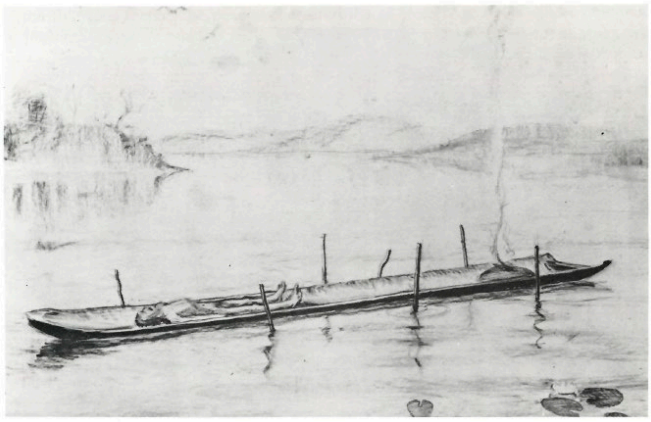


Fig. 5.1: Illustration of a boat burial at Ølgårde III (Christensen 1990, 127, fig. 9)

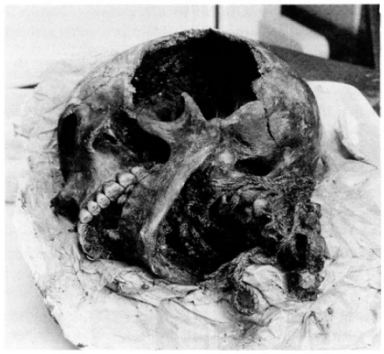


Fig. 5.2: A skull discovered from Sigersdal with the remains of cord preserved around the cervical vertebrae (Bennike *et al.* 1986b, 93, fig. 13)

(Left) Fig. 5.3: A skull found at Porsmose with a bone arrow embedded in the maxilla (Bennike, 1999, 29, fig. 6.5)

Besides this, the significance of burials for young individuals also changes in earthen long barrows and bog burials.

One of the outstanding differences is the variation of burial methods; long barrows and bog burials as well as inhumations. Notably, long barrows are a monumental construction for burials and should have taken many workforces and spent a long time, which could imply different meanings from inhumations in the LM. In addition, bog burials also represent some unique characteristics in terms of many finds of sacrificed individuals. For example, the remains of rope were discovered around the neck of human remains at Sigersal bogs (Fig. 5.2), and the skull with an arrow embedded in the maxillary bone was found at Porsmose (Fig. 5.3). This distinctiveness possibly

results from the difference in connotative meanings.

In the pre-mortem contexts, males are more frequently recognised than females in all three burial methods (Table 4.4), which is clearly different from the approximately equal proportion of males to females in the LM (Fig. 4.1). Moreover, the number of young individuals and adult individuals is almost the same (Fig. 4.21) in the EN, unlike the roughly threefold percentage of adult people than that of young in the LM (Fig. 4.2). In particular, individuals estimated in the 'MA' and 'OMA' age groups, who account for over 50 % in the LM (Fig. 4.3), are rarely found in the EN (Fig. 4.22). Although this may simply result from the decline of life expectancy, the high frequency of young people and the scarcity of the 'MA' and 'OMA' individuals could indicate changes in the intentional selection of the dead.

Regarding post-mortem practices, we can see various changes in treatments for young deceased, especially young children. Firstly, the significant rise in the proportion of the west-east oriented graves ('c-g') between the two periods could result from increasing standardisation or burial norms. Interestingly, while the trend of the west-east direction is common between inhumations and long barrows (Figs. 4.25 and 4.26), the rarity of the north-south ('a-e') direction, in which relatively more young people are placed in the LM, is also a similar pattern. This might reflect that in the EN, the significance of burials for young individuals decreased or was converted to other burial types, probably to bog burials, since more young people are discovered in this burial type than adults (Table 4.5).

Secondly, the practice of grave goods offering might change. Comparing the percentage between the total individuals and the owners of grave items in both timeframes, we can see that the main age group of the deceased with grave goods shifted from adult to young people, except for inhumations (Fig. 4.13 and Table 4.8). In consideration of no clear distinction between the number of young and adult people found (fig. 4.23), offering grave goods in burial rituals could mostly be performed for the young generation in the EN.

Finally, concerning the size of grave pits, those in the EN tended to be larger than the LM (Fig. 5.4). However, while the Mesolithic grave pits for young individuals or together with grave goods and the trace of grave structures are relatively extensive (Fig. 4.19), that of the Neolithic could simply depend on the number of individuals placed and their age (Fig. 4.28). This feature can indicate that the significance of each burial in the LM is expressed by the discrimination of the treatment of the dead, such as child interments and grave goods association. In contrast, meanings implied in the Neolithic inhumation might be less diversified. Rather, the variation of burial methods, such as long barrows and bog burials, could instead play an important role in distinguishing the meanings of each burial during this period.

At a glance, these analyses suggest the change of implications in burials for young people in the EN. However, such various changes can be partly seen during the preceding period. Fahlander (2008) argues that while children aged from 0 to 8 had been individually buried around the peripheral area and close to dog burials in Skateholm II and the southern part of Skateholm I, co-burial with children and adults

started and were located separately with dog burials in the western and eastern parts of Skateholm I. Moreover, all children are found with red ochre in the former site, but the main holders of the trace of red colouring shifted from children to adults in the latter (Fahlander 2012). This evidence can represent that some distinctive ritual roles were initially embedded in the child burials, and the significance probably changed over the time of Skateholm sites (*ibid*, 27). However, how can we interpret such distinctive burials for the child?

The special treatments for children in burials have been widely recognised in ethnographic perspectives (e.g. Carr 1995) and archaeological contexts (e.g. Boric and Stefanovic 2004; Georgiadis 2011). Particularly, young children are immature to gain various skills to survive and have not been a member who manages their society. Namely, they have not reached the adult stage, consequently leading to the different ways of treating their dead body because they could be regarded as ambiguous entities; in other words, being in a liminal phase (Fahlander 2011, 19; Svedin 2005, 55). Therefore, burying children could imply contact with the spiritual world through them (Finlay 2000), and the mourners perhaps believe in some protective power, such as the well-being of the community (Georgiadis 2011, 39; Houby-Nielsen 2000, cited in Baxter 2005, 103). Besides this, the association with animal bones, including burials close to dogs, might also suggest some symbolic meanings, such as guardians and messengers (Munt and Meiklejohn 2007, 167; Strassburg 2000, 161). These viewpoints could indicate that Fahlander's arguments (2008; 2012) are reasonable that children buried around the peripheral area in the Skateholm sites could play a role in outlining the burial area and probably protecting the place from any dangers, especially

coming from the sea. If so, we can also extrapolate that several analysed data showing unique features in child burials, such as the grave pits' size and relatively high frequent association of bone items (Fig. 4.19, 4.20 and Table 4.8), potentially reflect the mourners' distinctive attitude towards the child deceased.

Moreover, several variations in burial practices during the LM, like the arguments by Fahlander (2008; 2012), could help understand some unique features analysed in the EN. For example, shifting the main objects of red colouring to adults might reflect the decrease in the significance of child burials, which could link to converting the main burial type for this age group to bog burials in the Neolithic. Besides this, considering that the variation of burial methods (e.g. inhumations, earthen long barrows) possibly expressed the distinctiveness of burials, we can understand that red colouring might have been hardly important in the EN. If so, we could interpret that this becomes one reason for the scarcity of red colouring in this period. Additionally, bone items were mostly offered to young people in bog burials during the EN but were scarcely associated with those in the other burial types. Particularly, the numbers of young and adult individuals in earthen long barrows are very similar, suggesting that the significance of offering bone items could have changed and been converted to burials in bog areas, probably together with young people. From these viewpoints, we can infer that some analysed variations of burial practices and implications in them between the two periods could have already started during the Mesolithic period.

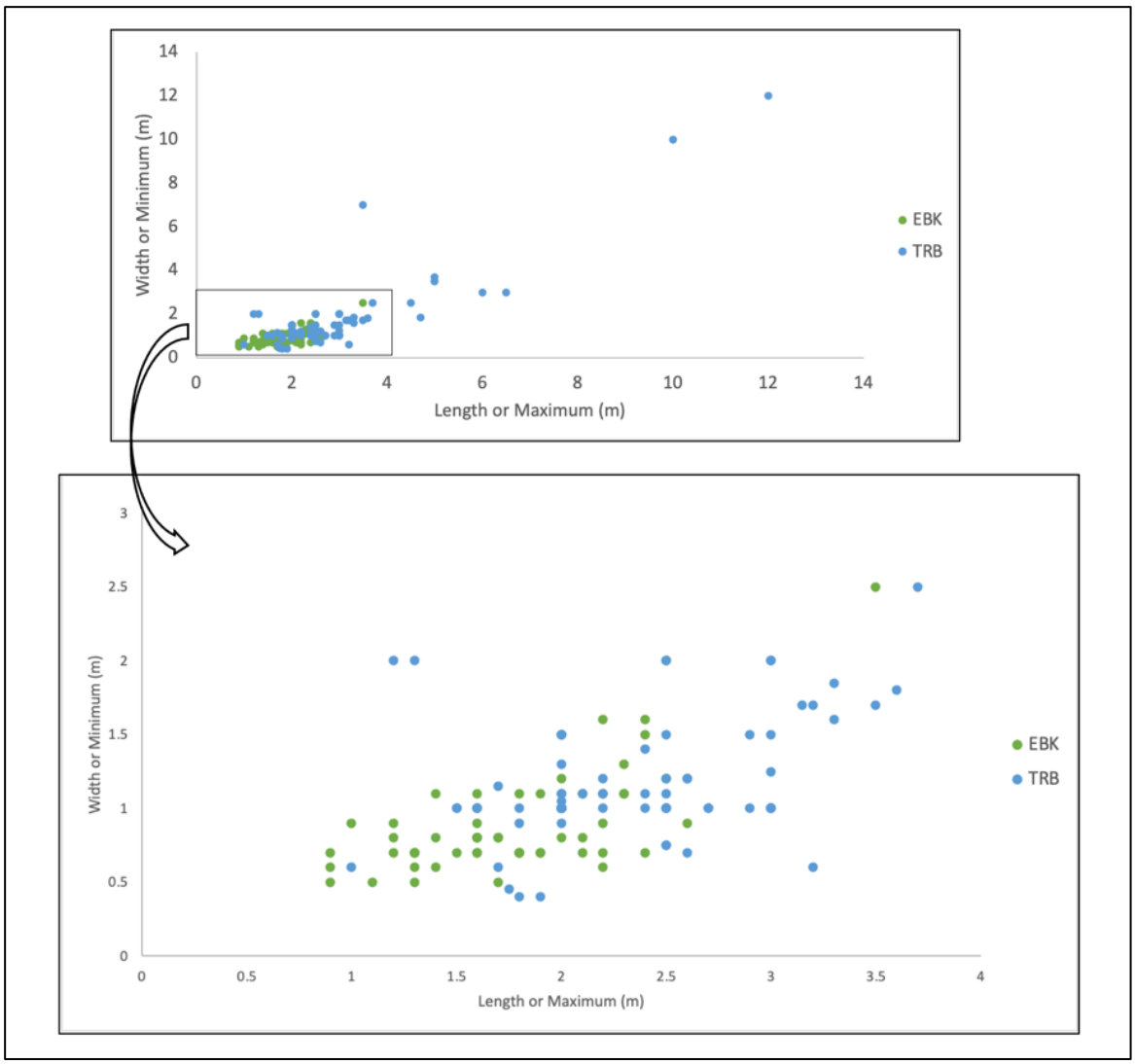


Fig. 5.4: Comparison of the ratio of grave-pits' Length/Width between the two periods: The bottom is an enlarged one in the range of an area enclosed by a black box in the upper diagram.

5.2 Comparison of treatments and arrangements of the dead body

Various traces of re-accessing past burials in both periods can be examined, allowing us to extrapolate the living's distinctive attitude towards the dead (Chang 1983, cited in Van Dyke and Alock 2003, 4). For example, the partially removed human skeleton without disturbing the other skeletal parts in grave 28 at Skateholm (Fig. 2.1) denotes a deliberate contact with the ancestors by the living. Moreover, grave 60 in Skateholm I,

containing a woman, is inferred to be marked by an object akin to a gravestone, allowing future generations to remember her death. These commemorative behaviours might mean the continuation of the impact of the dead on the community after the death, perhaps with the dead remaining active as the memory of the society (Boric 2010, 64; Little *et al*. 2016; Van Dyke 2010, 278). Particularly, Little *et al*. (2016) focus on various works related to a Mesolithic cremation with a wooden post and polished stone adzehead in Hermitage, Britain, and argue that social interactions in funerary rituals retain the social memory longer even after physical remains, like a wooden post, had been lost. If so, the four pairs of partly overlapping burials in Skateholm I and Vedbæk Bøgebakken would show that although any gravemarkers had already been invisible, the social memory of the past burials still remained. That is, builders of the later grave pits deliberately avoided extending the pits when the older dead body was removed as an act of respect towards them. Similarly, a child burial (grave 3 in Tågerup), which was superimposed on a female burial (grave 4) minutes or hours after her inhumation as the last part of the funeral ceremony (Karsten and Knarrström 2003, 201-202), could also represent respect for the early dead.

However, cenotaphs can also be interpreted differently. For example, structure 8 in Skateholm II, containing no human skeleton, shows similarities with the surrounding graves in terms of the forms and compositions in the fillings and is interpreted that the interred individual had once existed together with three red deer antlers and been removed for some reasons (Larsson 1984, 32; 1993, 55). While this practice might also be linked to the re-access to the past dead, Van Dyke and Alock (2003, 2) argue that memory of society “emerges and evolves from acts of both remembering and

forgetting". That is, the behaviour of removing the complete human skeleton can also be regarded as, in a sense, the obliteration of the ancestors from the place (*ibid*, 3: Van Dyke 2010, 277). Interestingly, grave 12 at Vedbæk Bøgebakken, which is northerly located to the cenotaph (grave 11), is estimated to be the last construction in the burials that can be measured by radiocarbon dating (Brinch Petersen *et al.* 2015, 111). The three features (graves 10, 11 and 12) in Vedbæk Bøgebakken are arranged in parallel, which could show the close relationship with these three graves and be established in the final phase of this site. If so, we can infer that the cenotaph would be functioned as signifying the end of mortuary activities in that place as the living forgot the earlier dead (Boric 2010, 65).

On the other hand, a few exceptional burials mostly destroyed the older graves, like grave 47 at Skateholm I and grave 6 at Vedbæk Bøgebakken, which suggests little care for the individual in the first burial. Fahlander (2010, 30) maintains that the older burial (grave 47) can be interpreted as an aggressive manipulation, which likely resulted from the social stress that occurred during the periods of the mixture of different groups and traditions. Such manipulation could be performed by immigrants who did not venerate the dead buried by previous occupants.

Unlike the LM period, the EN burials are standardised to some extent in terms of the systematic destruction of grave chambers in long barrows and extensions and alterations of existing burial mounds, such as Grøfte and Bygholm Nørrenmark. However, despite no trace of direct re-access to the buried human skeletons, dealing

with burials for generations at a specific place could imply the possession of special feelings towards the locals and/or the ancestors buried there.

In comparison between the two periods, veneration for the ancestors might be a common feature, but the methods of expressing it in burial rituals were more systematic in the later period. Moreover, the chronological context of the LM burials is obscure due to a lack of radiocarbon dating. However, disrespect for the ancestors, like grave 47 at Skateholm I, could be a consequence of a significant social change, for example, a transition to Neolithic society.

5.3 Interpretations of the similarities and differences in burials

How can we understand the existence of similarities? Given that a clear change of social transition from the Mesolithic to the Neolithic occurred, burial practices should have normally been transformed. However, several similarities between the two periods should be regarded as the partial continuity of the treatments and attitudes towards the dead and death. In contrast, differences need to be considered as transformations of burial practices. This section will pick up the use of fire as a continuous ritual, classify burial types as a transformed practice and consider the implication of these features.

5.3.1 Fire

The use of fire in burial rituals is continuously recognised from the data in both periods, but the significance could vary based on how this practice is carried out. Fire has hitherto been argued to connote destruction, transformation and creation (e.g. Larsson

2002a). Particularly, cremating the dead leads to transforming their bodies, such as discolouration of the bone and sometimes destroying them. Through this ritual treatment, the dead body can be transitioned from abject beings for societies remaining in the living's world (Nilsson Stutz 2010, 34) to inanimate beings in the afterworld. In other words, cremation could play a role in releasing the spirit remaining inside the dead body to the supernatural world (Gräslund 1994, 20-21). Furthermore, there is no evidence of cremations in the EN (such as took place in the LM, in which burnt human bones are destroyed and collected in a small pit), but Larsson (2002a; 2011) notes the presence of burnt human bone fragments with many fire-altered stone artefacts at the late Neolithic site of Kverrestad, Skåne. He argues that the craft of flint axes by fire transformation and creation to new shapes can link to the endowment of new life (Larsson 2002a; 2011). This argument allows us to infer that burning human bones implies the transportation to afterword like the LM cremation, and the association of these flint axes is evocative of regeneration.

However, burnt wooden structures around graves are found in both periods. These differ from the practice of using fire as mentioned above in that some of the individuals in these graves show no traces of severe damage by fire, such as individuals in graves 26 and 60 at Skateholm I. Considering the report from Nilsson Stutz (2003, Appendix, 87) that fire for grave 60 would not be strong enough to produce the clear soot concentration, we can interpret that the practice of burning was not for transforming the dead body; rather, it might emphasise the rise of smoke which accompanied with the spirit of the dead to the afterlife (Gräslund 1994, 20). Likewise, human remains from the EN burial, Skibhøj, are found in a scorched state but not destroyed (Madsen 1979,

305). Besides this, burning as part of the rituals at Grøfte also does not damage the burials (Ebbesen 1988, 68). Ebbesen mentioned that this ritual could be performed to purify the burial place as a sacred spot (*ibid*); it is also possible to interpret the link of the smoke with the journey to the afterlife, which could be continued from the LM period.

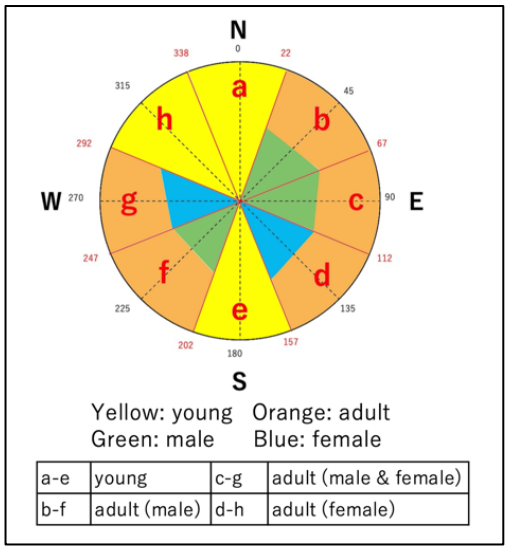


Fig. 5.5: The high frequency of the LM head and the long axis of grave pits according to the pre-mortem contexts (sex and age at death)

5.3.2 Classification of burials into three types

5.3.2.1 Separating from the LM inhumations

As shown in Fig. 5.5, we can infer some correlations between the head and the long axis of grave pits' orientation and the pre-mortem contexts (sex and age at death). In the LM, the general orientations of grave pits are the north-east('a-e') and the east-west ('c-g') (Fig. 4.9), and the former is frequently seen for the young burials, and the latter is for adult burials (Fig. 4.11.4). In contrast, non-general orientation, named as 'b-f' and 'd-h' categories, can be regarded as distinctive features by changing the perspective. Interestingly, a relatively high percentage of the 'b-f' category accounts for males and that of the 'd-h' for females (Fig. 4.10.4).

These divisions based on the sex in the LM can provide some hints for understanding the enlargement to the three burial types and the dramatic proportional rises of the east-west orientation for grave pits' orientation in the EN (Figs. 4.25 and 4.26). First of all, the clear decline of the north-south orientation ('a-e') for inhumations and earthen

long barrows could denote the removal of young people as a subject of these burial types. Secondly, bog burials show a relatively high frequency in young people (Table 4.5). Also, the number of females from bog areas is greater than those from the other two burial types (Table 4.4). Namely, these two data show that most young people and some females started to be buried in bog areas instead of inhumations and earthen long barrows. Finally, people who were buried in the grave pits whose long axis orientated the northeast-southwest (‘b-f’) could also be removed from a subject for inhumations and converted to earthen long barrows. Hence, there is an approximately twofold difference in the proportion of the ‘b-f’ category between inhumations and earthen long barrows. In contrast, the LM general orientation, ‘c-g’, was probably continued to the EN.

Therefore, considering the relative change of percentages shown in Figs. 4.9, 4.25 and 4.26, the remarkable frequency of the east-west orientation (‘c-g’) could merely result from the reduction of female and the young burials for inhumations and earthen long barrows, rather than the presence of more standardised practices. On the other hand, the distribution of grave pits’ orientation for earthen long barrows (Fig. 4.26) represents the second-highest proportion in the ‘b-f’ category in contrast to the low percentages in the ‘a-e’ and ‘d-h’. This distribution might suggest the possibility of high significance for male burials in earthen long barrows.

5.3.2.2 Implications in burial practices that had been transformed

Is it truly possible to understand these separations from the Mesolithic inhumations as resulting from a change in the living’s cosmology? Indeed, the emergence of earthen

long barrows indicates the possibility of ancient cosmological transformations, but detailed comparisons between burials for inhumations and earthen long barrows question such a simple indication.

Firstly, compared to the size of grave pits in the LM, that in the later period lacks the variations regardless of coincidence with grave items (Fig. 4.28). This trend suggests that distinctive burials, such as those associated with grave structures, could be separated from inhumations and probably shifted to earthen long barrows and bog burials. In consideration of the extreme predominance of males in earthen long barrows (Table 4.4), the aforementioned interpretation that burials belonging to the 'b-f' category, which is mainly recognised from males, might be converted from the LM inhumations to the EN earthen long barrows would support this suggestion. Secondly, young individuals in earthen long barrows show an almost equal distribution to adult people (Table 4.5). Also, the frequency of grave goods association is relatively higher for the young, but the quantity and quality of these items between burials for young and adult individuals do not clearly differ (Tables 4.9 and 4.10). These trends could indicate the equalisation of burial practices between the two age groups compared with the LM, in which there are many more adult burials and a relatively higher proportion of young burials found with red colouring. Concerning child burials, some scholars argue that they are often dealt with in distinguishable ways from adults and assumed to be seen as a member of 'invisible society' because of their vulnerability to disease and the high mortality (Binford 1972, 211; Ucko 1969, 270). However, paradoxically, the roughly equal burial treatments regardless of age at death in the EN long barrows can be interpreted as implying the same significance in burials between the young and adult.

Thirdly, although earthen long barrows represent the different burial features from the LM, people's attitudes towards these monumental tombs are inferred to be partly continued from the preceding period, for example, supine extension for the dead's position, use of fire in rituals and re-access to the older burials.

From these viewpoints, constructing earthen long barrows in the EN can be interpreted as an improved version of the LM inhumations. That is, the LM inhumations with significant meanings could be transformed into earthen long barrows. Nevertheless, what is the distinctive significance implied in earthen long barrows? This question can be inferred from the almost equal burial treatments between the young and adults. This feature means that the living had the equivalent attitudes towards the dead in the two age categories buried in the specific area (earthen long barrow), which could indicate some special importance to the deceased themselves or the location. Indeed, ancestor worship could be performed like the preceding period, but the practice of constructing monumental structures might be additionally emphasised in the sense of visibility above ground. Namely, such a visible feature of earthen long barrows can be effective not only in signifying the exact location of ancestors for the living and future generations but also create a social identity (Furholt and Müller 2011, 17; Müller 2010, 9-10). Moreover, this social identity is inferred to be produced through human interactions such as participating in the erection of these structures (Rassmann 2010, 3); thus, the repetitive extension of monumental buildings, exemplified by Byholm Nørremark and Grøfte, could play a role in constantly reproducing their group identity. These reproductive functions would be independent of the LM inhumations and further advanced as a distinct burial significance in earthen long barrows.

In summary, the differences in burial practices between the LM and the EN do not mean a dramatic change in cosmology, but rather result from the development of the existing traditional cosmology. In particular, re-creating social identity through cooperatively building monuments is one of the representative features in the EN period. Furthermore, considering some burial practices in the preceding period, especially the repetitive burials within a specific area such as Skateholm and Vedbæk Bøgebakken, we can postulate that the origin of human attitudes towards the dead in the EN probably partially dated back to the EBK time frame.

5.3.2.3 Distinctiveness of bog burials

Burials in wet areas are seen during the LM, such as a boat burial at Møllegabet II in Denmark, indicating that the boat might play a role in transporting the dead to the afterworld (Gron and Skaarup 1991). This means that the origin of the EN bog burials potentially dated back to the Mesolithic, but burial practices in bog areas during the later period represent unique features in that the relatively high frequency of young people and females and the dead. Moreover, Koch (1999, 125) suggests the offerings of clay vessels and animal bones as other characteristics of bog burials.

Concerning the discovery of sacrificed individuals, most adult victims of this burial type are relatively young, ranging from the ‘YA’ to ‘YMA’ category (Table 4.5). In consideration of generally low mortality in these age groups, this age distribution in bog burials suggests that people might intentionally select the victims and create the dead body (Bennike *et al.* 1986a, 203). Besides this, some human remains found in bog

areas display skeletal deformation that could cause physical disability in their daily lives, such as those from Bolkide bog (Bennike *et al.* 1986a, 201-203) and Døjringe bog (Bennike 1999, 31). Furthermore, some ethnographic studies have proposed such a human sacrifice in rituals. For example, Adams (1823, 97) reports the custom on the west coast of Africa that people impaled an alive young female soon after the vernal equinox to “propitiate the favour of the goddess presiding over the rainy season”. Also, in combination with other archaeological arguments linking skeletal deformity to shaman burial in the Mesolithic woman at Bad Dürrenberg (Porr and Alt 2006), we can interpret that the burials of intentionally sacrificed people with osteological abnormality could imply distinctive ritual meanings.

Furthermore, animal bones are often found in bog areas. For instance, there is a discovery of ceramic vessels surrounded by three sheep skulls at Storelyng VI in the bog Store åmose, which can be interpreted as a trace of clearly intentional human ritual actions and signifying the sacred places (Koch 1999, 127). Additionally, in the proximity area to two individuals at Sigersal bog, ten goat skulls and probable aurochs skulls are deposited (Bennike *et al.* 1986b, 96). These animal bones can be seen as the trace of ancient food eaten in rituals, but Davidson (2015) denies the importance of feast meals through many studies of ethnographic reports. Rather, he emphasises the blood or life of the animal, which implies various human beliefs in rituals. Davidson proposes at least 18 beliefs people could possess towards animal sacrifice, and one of them is to secure and celebrate a good harvest (*ibid,* 96). This faith is similar to the aforementioned implication of human sacrifice on the west coast of Africa, suggesting the possibility that bog burials can be no simple funeral activities taken place for the

dead body; rather, a fertility cult routinely carried out at the cost of the lives of specific persons and animals. In this sense, the practice of bog burials likely represents the distinctive ritual cosmology from the other two burial types.

5.4 Summary of this chapter

Various considerations in this chapter represent not only the changes in burial practices between the LM and the EN but also the potential implications of these transformations. Particularly, while the use of fire can be regarded as a continuous practice, the meanings probably vary based on how the living utilise fire in their rituals. Moreover, earthen long barrows and bog burials are distinctive burial practices, and the potential implications are also unique. On the other hand, some human activities for these two burial methods, such as intensive burials in a specific area and burials in wet areas, would have originated from the preceding period, suggesting the possibility that the EN burial practices were not complete transformations from the LM. Paradoxically, this means that the origin of the Neolithic burial practices had already been recognised during the LM period. Also, we can postulate that some factors might become a trigger for shifting burial styles from the Mesolithic to Neolithic, which will be discussed in the following chapters.

6. Case Study

This chapter attempts to consider human actions and the related emotions from detailed viewpoints using burial data from Skateholm I and II. The last chapter demonstrated the inheritance of ritual meanings for using fire in burials and the burial alterations in terms of improving parts of the traditional inhumations into burials for earthen long barrows and the new distinctive practice of bog burials. It might be reasonable to infer that these alterations derived from the social transition between the LM and the EN, but the most potent factors which caused these changes are still unclear. In order to demonstrate the impacts of these factors, the following case studies aim to examine the diachronic continuities and transformations of human attitudes towards the dead and death and discuss a proper burial during the LM.

6.1 Skateholm I and Skateholm II

These two sites are located in the southern parts of the Skåne region and adjoining the ancient lagoon (Fig. 6.1). Skateholm II preceded and partially overlapped the other, and both sites belonged to the LM period in the range from approximately c. 5370 to 5000 cal BC (Eriksson and Lidén 2003, 1-2). Geographical studies propose the transgression of sea level during this period, suggesting that these two burial sites were situated on small islands in an ancient lagoon (Larsson 1984, 5). Also, Skateholm II is placed on a lower level than Skateholm I and was once submerged due to the sea transgression in the LM period, which forced people to leave this site and move to the other (Larsson 2016, 176).

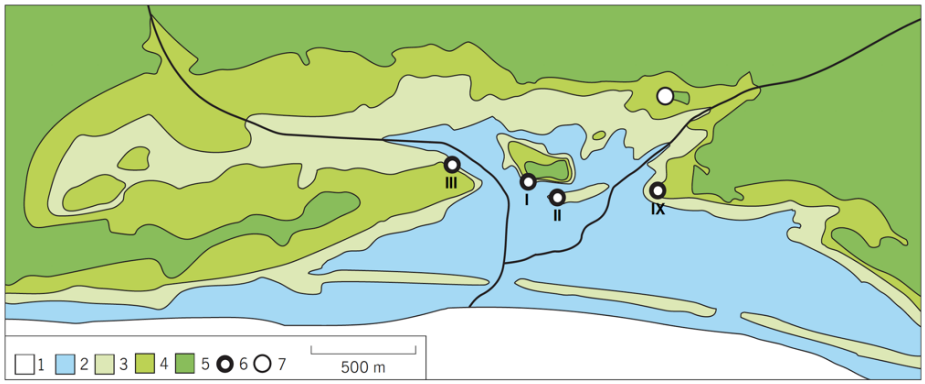


Fig. 6.1: The relation of land and sea during stages of the LM. 1. Present sea level; 2. The situation during the occupation of Skateholm II (2 to 3m a.s.l.); 3. The situation during the occupation of Skateholm I (3 to 4m a.s.l.); 4. The situation during the occupation of Skateholm III (4 to 5m a.s.l.); 5. area above 5m a.s.l.; 6. large settlement site with the cemetery; 7. large settlement site. (Larsson 2016: 176)

The first trial excavation was carried out around Skateholm I in 1980, and many flint artefacts and a co-existence of settlement area and burial area were recognised (Larsson 1984, 1988). From the following year to 1984, archaeological investigations were conducted intermittently, which uncovered another burial site, Skateholm II, to the 200 m southeast and an intact thin occupation layer overlying a stratum containing disturbed subsoil at Skateholm I. From the viewpoint that a human skull was discovered just below the disturbance, some graves at Skateholm I could be constructed older than or at the same timespan as the occupation layer deposition (Larsson 1984, 6). Moreover, the timeframe in which people inhabited the Skateholm area comprised two phases of aceramic and ceramic. Burials at Skateholm I and II and the settlement at Skateholm II are estimated to occur in the aceramic, and the settlement at Skateholm I might fall into the ceramic phase (Larsson 1989c, 369; Stilborg and Bergenstråhle 2000, 25).

6.2 Investigation of Burial Data

6.2.1 Overview

Skateholm I provides 60 individuals with 54 graves, and Skateholm II does 22 individuals with 20 graves (Figs. 6.2, 4.30). The proportion of sex is almost the same between the two sites (Figs. 6.3 and 6.4). Likewise, categorisation based on age at death is similar in that adult individuals account for over 80 % (Figs. 6.5 and 6.6).

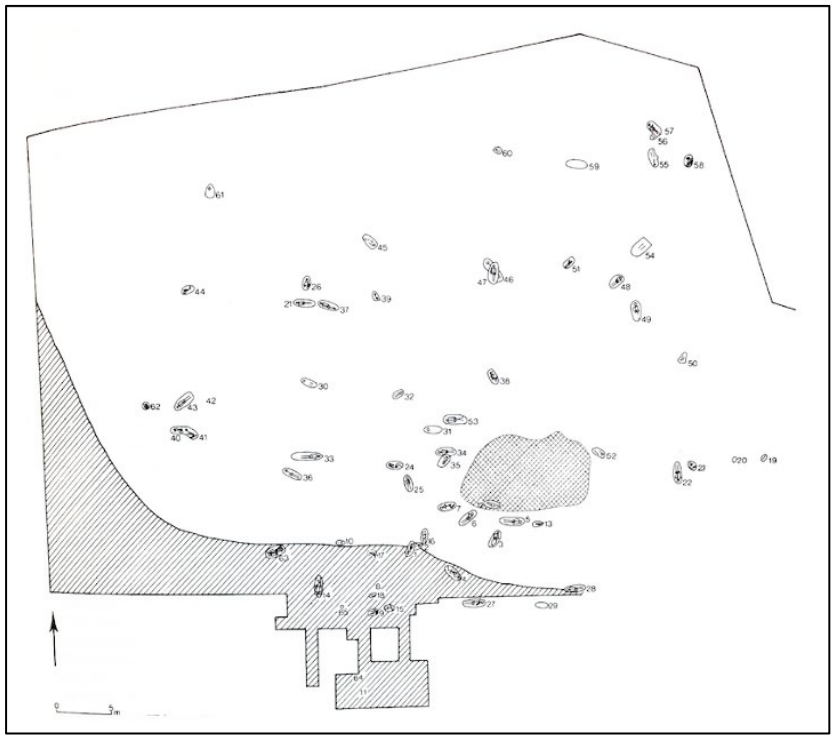


Fig. 6.2: Burial distribution in Skateholm I (revised from Larsson 1989c, 371, fig. 3)

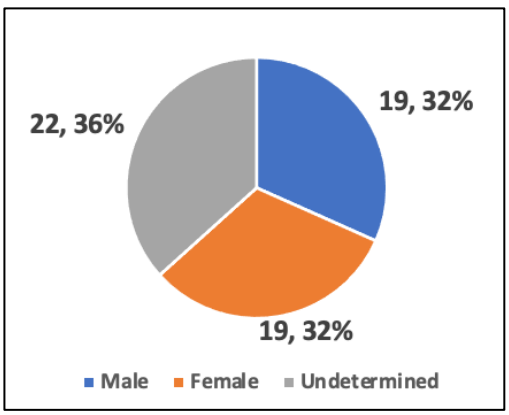


Fig. 6.3: The proportions of sex in Skateholm I (n=60)

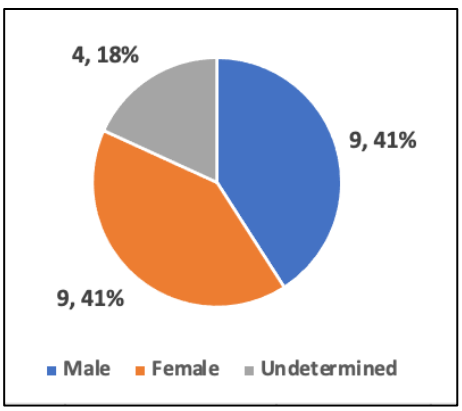


Fig. 6.4: The proportions of sex in Skateholm II (n=22)

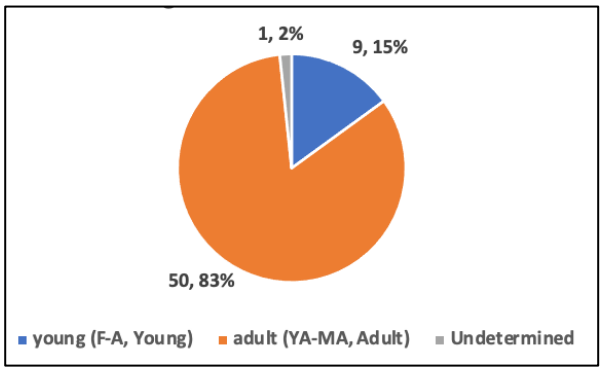


Fig. 6.5: The proportions of age group in Skateholm I (2) (n=60)

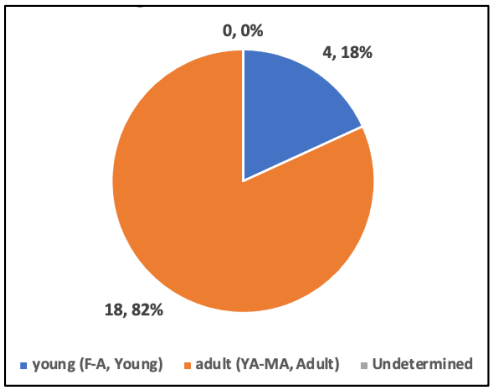


Fig. 6.6: The proportions of age group in Skateholm II (2) (n=22)

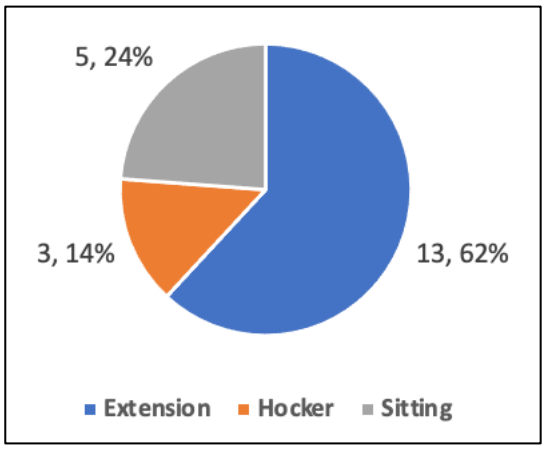


Fig. 6.7: The proportions of the positions of the dead in Skateholm II (1)

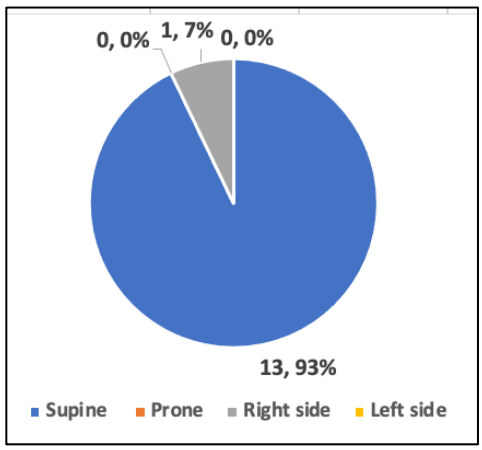


Fig. 6.8: The proportions of the positions of the dead in Skateholm II (2)

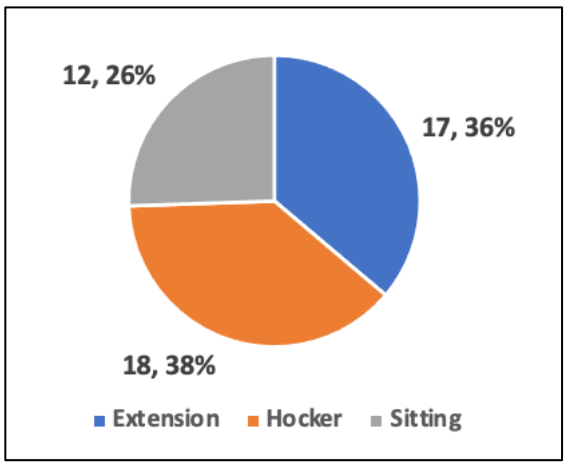


Fig. 6.9: The proportions of the positions of the dead in Skateholm I (1)

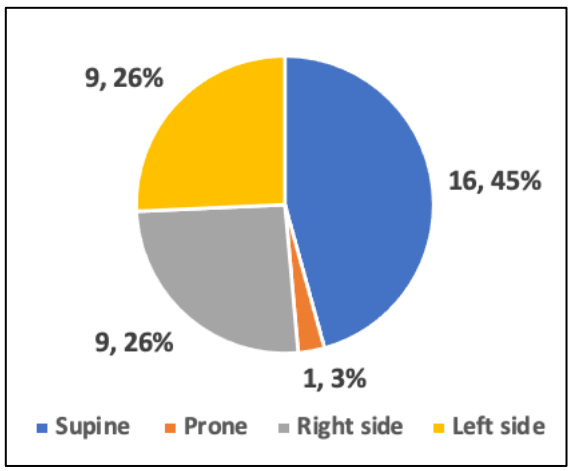


Fig. 6.10: The proportions of the positions of the dead in Skateholm I (2)

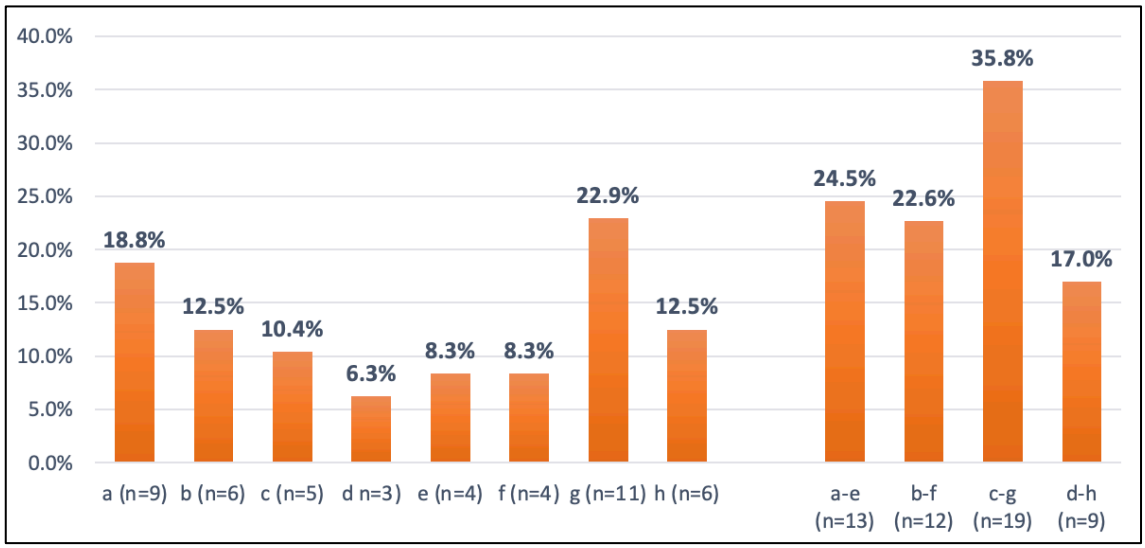


Fig. 6.11: The proportions of head/grave pits' orientation in Skateholm I

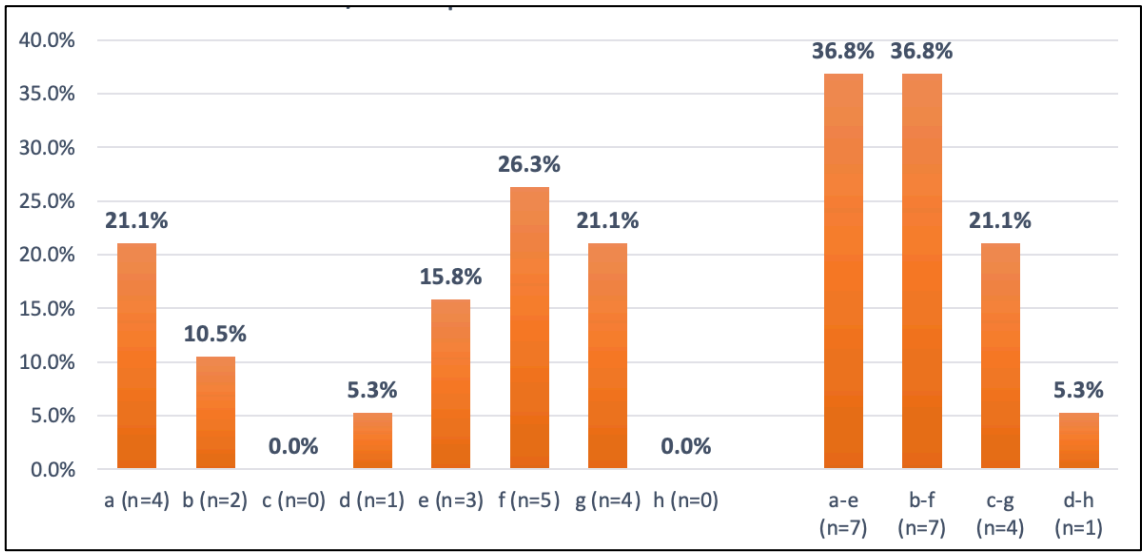


Fig. 6.12: The proportions of head/grave pits' orientation in Skateholm II

In contrast, analysis of the dead's position and head/grave pits' orientation presents a clear difference between the two sites. In Skateholm II, most people were placed in supine extension (Figs. 6.7 and 6.8). However, this pattern changes in Skateholm I, and the frequency of individuals buried in a hocker position becomes almost the same as those in a supine extension with 38 % and 36 %, respectively (Fig. 6.9). Besides

this, there is an increasing number of people with bodies turning to the right or left side, which becomes the approximately same percentage as those in supine position (Fig. 6.10). Regarding the head/grave pits' orientation (Figs. 6.11 and 6.12), the north-south ('a-e') and northeast-southwest ('b-f') are the main directions for grave pits construction in Skateholm II. Particularly, the southwest ('f') and north ('a') have relatively higher proportions for directions of the dead's head placement with 26.3 % and 21.1 %, respectively. Moreover, although 21.1 % of people, which is the same percentage of the 'a' category, are discovered with their heads towards the west ('g') direction, there is no data of the opposite direction, east ('c'). On the other hand, these features are changed in Skateholm I (Fig. 6.11). The most frequent orientation of grave pits is the east-west direction ('c-g') at 35.8 %, followed by the 'a-e' and 'b-f' categories with 24.5 % and 22.6 %, respectively. Furthermore, the west and north ('g' and 'a') show relatively higher percentages for head orientation with 22.9 % and 18.8 %, respectively. Interestingly, the 'h' category, which represents no data in Skateholm II, has the third-highest proportion in Skateholm I.

Through these analyses, between the period of Skateholm II and I, the general orientation of grave pits changed from the north-south ('a-e') and northeast-southwest ('b-f') to the east-west direction ('c-g'), which corresponds to the proportional rise of the 'g' and 'c' categories in Skateholm I. Considering that the 'c-g' category also shows the highest number for grave pits' orientation in the EN (Figs. 4.25 and 4.26), we can postulate that the trend for this orientation could begin in the period of Skateholm I. Likewise, the decline of the north-south direction ('a-e') for grave pits' orientation might also originate from this period. In addition, the new occurrences of the northwest and

east directions (‘h’ and ‘c’, respectively) in the later period likely denote the influxes of external knowledge.

6.2.2 Investigating the correlation between the pre-mortem and post-mortem contexts

6.2.2.1 Position

Comparing the data of sex and age at death with positions of the dead body (Figs. 6.13~6.16), we can see that the hocker position was for females or young people in Skateholm II. However, in Skateholm I, males also started to be buried in a hocker position, whereas the proportion of this position among young people clearly fell. Although the low total number of young individuals in a hocker position in Skateholm II needs to be considered, this dramatic decline might link to the transformation of burial rituals for this age group in Skateholm I. Additionally, it is interesting that a sitting position is commonly recognised in only adult people and relatively predominant in males in both sites. This indicates the existence of social norms concerning this position, which might be succeeded between both sites.

6.2.2.2 Head/Grave Pits’ orientation

The way of placing the dead’s head and establishing grave pits may suggest an outstanding feature that helps us distinguish between males and females. Fig. 6.17 shows that all individuals belonging to the east-west and northwest-southeast categories (‘c-g’ and ’d-h’, respectively) are female in Skateholm II. On the other hand, grave pits belonging to the ‘a-e’ and ‘b-f’ categories could be mainly for males. Particularly, the northeast direction (‘b’) is limited to males. However, these patterns slightly changed in Skateholm I (Fig. 6.19). While the ‘d-h’ category continuously

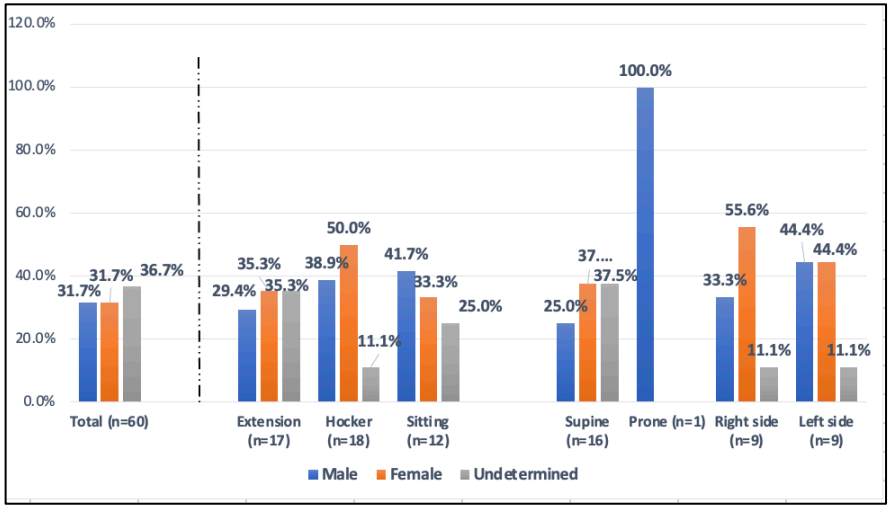


Fig. 6.13: Position proportions based on sex in Skateholm I

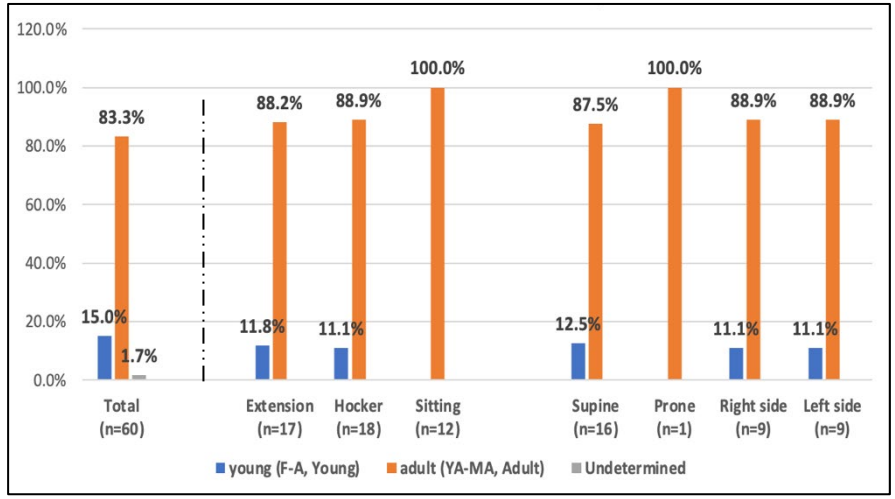


Fig. 6.14: Position proportions based on age group in Skateholm I

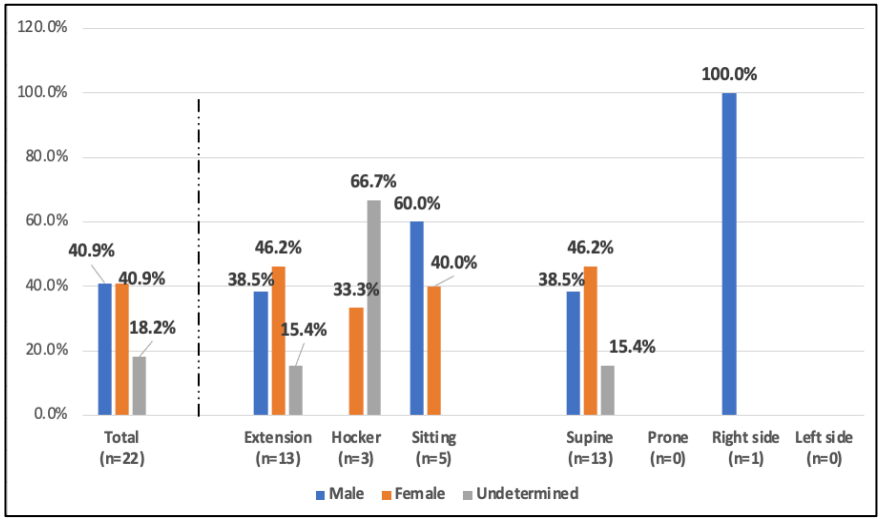


Fig. 6.15: Position proportions based on sex in Skateholm II

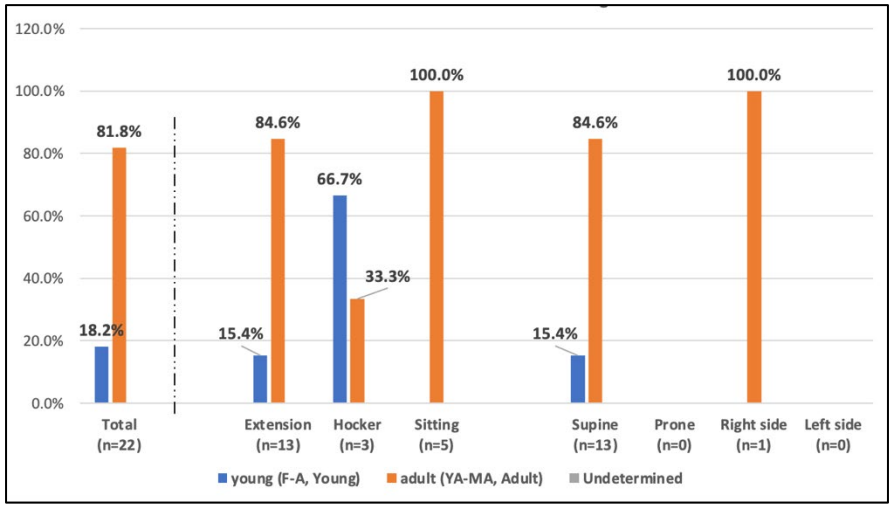


Fig. 6.16: Position proportions based on age group in Skateholm II

shows a larger number for females, the predominance in the ‘c-g’ category shifts to males. In particular, the east direction (‘c’), which has no data in Skateholm II, is recognised among only males, suggesting the possibility of adopting new burial practices. Similarly, the new occurrence of samples belonging to the ‘h’ division in Skateholm I may also link to the interaction with external social groups. Moreover, no male individuals buried with the heads pointing towards the southeast (‘d’) is a common trait between the two sites, which could denote the inheritance of this practice.

Turning to Figs. 6.18 and 6.20, we can see that young individuals tend to be buried in grave pits orientating the north-south (‘a-e’) in Skateholm II. However, because of the limited number of young age groups on this site, it is difficult to understand the relationship between head and grave pits’ orientation and age groups. During the timeframe of Skateholm I, burials for the young are concentrated into the three categories of ‘a’, ‘b’ and ‘h’. Besides this, the ‘c-g’ category does contain no samples of young people’s burials, indicating that the east-west direction could be specialised for adult people.

Interestingly, the three categories of ‘a’, ‘b’ and ‘h’, to which all young people belong during Skateholm I, show the predominance of females in Fig. 6.19. On the other hand, the two categories of ‘a’ and ‘e’ for young individuals in Skateholm II do not represent clear differences between sexes. From these perspectives, the correlation between females and the young likely became stronger during Skateholm I.

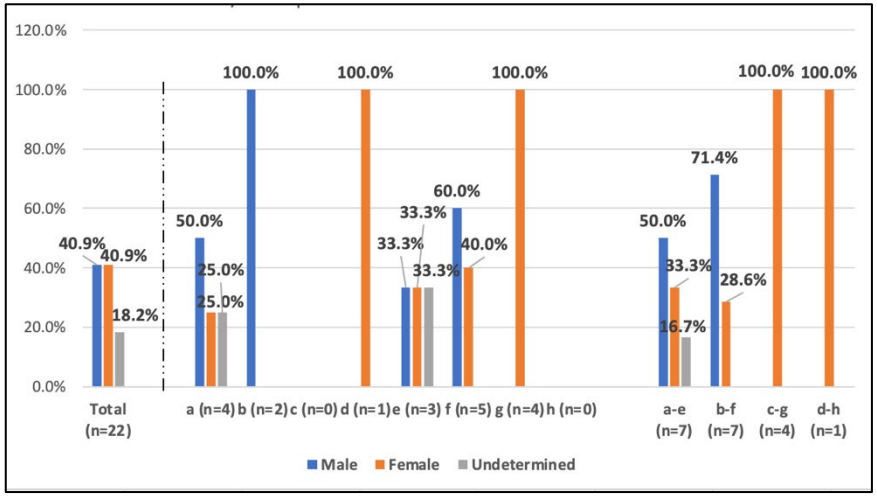


Fig. 6.17: The proportions of head/grave pits' orientation based on sex in Skateholm II

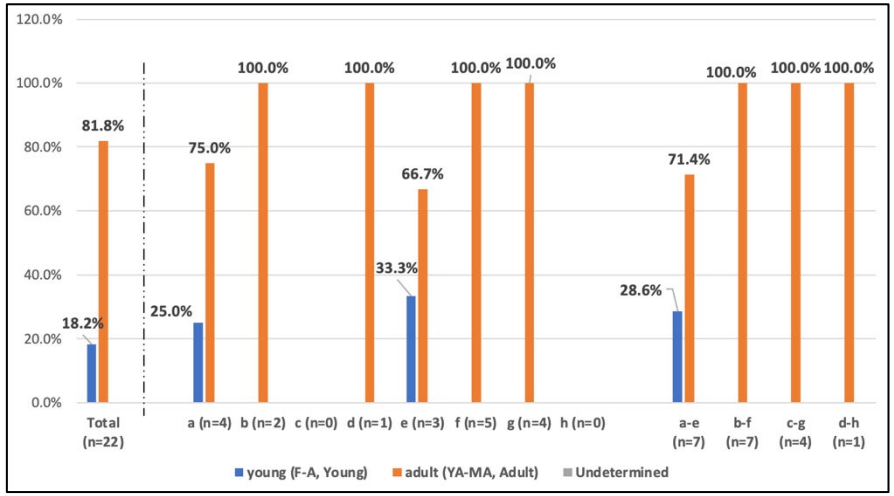


Fig. 6.18: The proportions of head/grave pits' orientation based on age group in Skateholm II

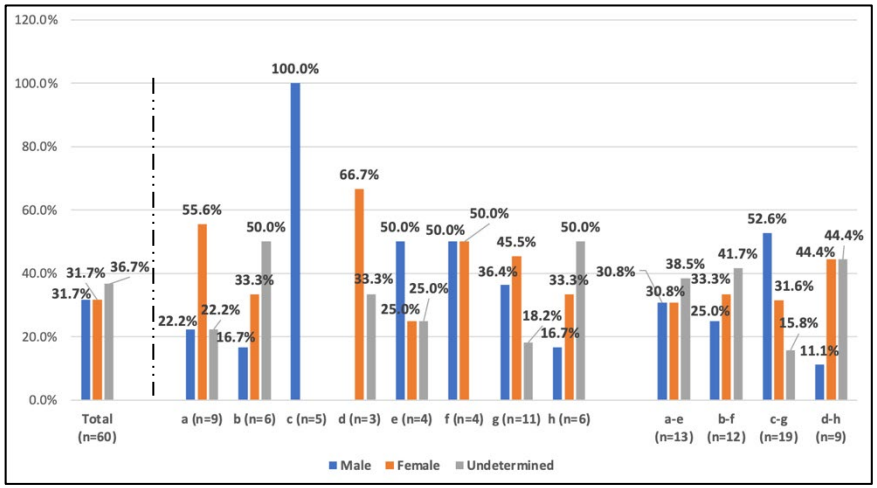


Fig. 6.19: The proportions of head/grave pits' orientation based on sex in Skateholm I

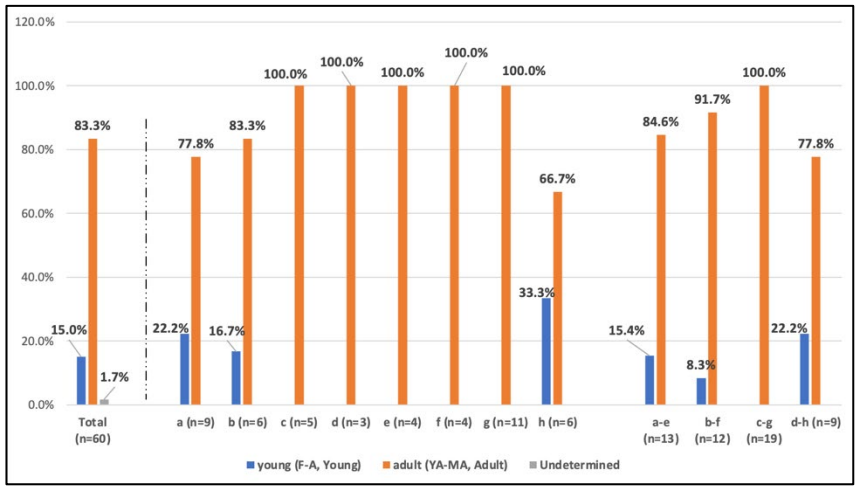


Fig. 6.20: The proportions of head/grave pits' orientation based on age group in Skateholm I

6.2.2.3 Grave goods and red colouring position

As shown in Table 6.1, the proportion of the possession of grave goods in Skateholm II is 81.8 %, which is remarkably higher than the figure in Skateholm I, with 48.3 %. In contrast, the frequency of the red colouring association in Skateholm II is slightly lower than that in Skateholm I, with 22.7 % and 30.0 %, respectively. Nevertheless, burials found with both features represent a similar proportion between the two sites. These data indicate the potential transformation of burial norms. That is, offering grave goods is much more general in Skateholm II, which paradoxically implies the higher significance of the red colouring association for the dead. On the other hand, this trend changed in Skateholm I, and the gap between the percentages of the two features got smaller than Skateholm II. This change could suggest the gradual equalisation of social meanings for the coincidence with grave goods and red colouring. Furthermore, the proportions of the association with both features in the two sites are almost the same, indicating the continuity of the importance of this burial practice.

Regarding the positional relationship of grave goods (Tables 6.2 and 6.3) based on the criterion (Fig. 3.5), although the total analysable number of individuals in Skateholm II is roughly half of those in Skateholm I, most of the area categories in both sites show similar frequencies. However, the number of the ‘head area’ category exceptionally falls from 10 to 4 between the two sites. Moreover, the dramatic decrease in frequency around the head area is also seen in red colouring positions (Tables 6.4 and 6.5). These two tables denote that the main area for red colouring was replaced from the head area in Skateholm II to the pelvis and leg area in Skateholm I. These results can link to the transformation of the significance of the head area as a place in which

Table 6.1: The numbers and proportions of individuals with grave goods and/or red colouring in Skateholm I and II

	Grave goods	Red Colouring	Both
Skatehom I (n=60)	29	18	12
	48.3%	30.0%	20.0%
Skatehom II (n=22)	18	5	4
	81.8%	22.7%	18.2%

Table 6.2: Grave goods positions in Skateholm I (n=27)

Analysable individuals with grave goods in Skateholm I (n=27)			
Abbrev.	Individual no.		
Head (H)			
H: around the head	4		
Arm (A)			
LA: the lateral arms, includinng the shoulders	3	Right: RLA	1
		Left: LLA	2
Body (B)			
BA: between the arms and the body	0	Right: RBA	0
		Left: LBA	0
C: around the chest	4		
P: around the pelvis	6		
UB: under the body	2		
OB: on the body	2		
Leg (L)			
LL: the lateral legs	11	Right: RLL	2
		Left: LLL	5
BL: between the legs	5		
AT: around the leg tips	1		

Table 6.3: Grave goods positions in Skateholm II (n=15)

Analysable individuals with grave goods in Skateholm II (n=15)			
Abbrev.	Individual no.		
Head (H)			
H: around the head	10		
Arm (A)			
LA: the lateral arms, includinng the shoulders	2	Right: RLA	2
		Left: LLA	0
Body (B)			
BA: between the arms and the body	0	Right: RBA	0
		Left: LBA	0
C: around the chest	2		
P: around the pelvis	8		
UB: under the body	2		
OB: on the body	0		
Leg (L)			
LL: the lateral legs	7	Right: RLL	1
		Left: LLL	4
BL: between the legs	1		
AT: around the leg tips	1		

Table 6.4: The numbers and proportions of analysable individuals with red colouring and the positions in Skateholm I (n=17)

Red Colouring Area	Individual no.	%
Head	3	16.7%
Chest	2	11.1%
Pelvis	7	38.9%
Legs	7	38.9%
Entire Body	4	22.2%

Table 6.5: The numbers and proportions of analysable individuals with red colouring and the positions in Skateholm II (n=5)

Red Colouring Area	Individual no.	%
Head	4	80.0%
Chest	0	0.0%
Pelvis	1	20.0%
Legs	0	0.0%
Entire Body	0	0.0%

some ritual activities are carried out.

The following analysis compares these grave goods and the red colouring position with the pre-mortem contexts (Figs. 6.21~6.24). Through the data in Skateholm II (Figs. 6.21 and 6.22), while there is no clear difference in grave goods offerings between males and females, red colouring is only seen among males and young people. This pattern suggests that the practice of red colouring could be more special and carried out for more specific people. On the other hand, in Skateholm I, females began to be buried with red colouring (Fig. 6.23), and the proportion of this feature among women is similar to that of men, with 27.8 % and 33.3 %, respectively. Besides this, the discrepancy of grave goods offerings between both sexes becomes remarkable in Skateholm I, with 37.9 % for males and 24.1 % for females, respectively. Furthermore, looking at the 'both' category of young people in Figs. 6.22 and 6.24, we can see that the proportion is roughly similar. Nevertheless, while the percentage of this category in Skateholm II (25.0 %) is lower than that of red colouring (40.0 %), the number of the same category in Skateholm I (33.3 %) is larger than that of red colouring (22.2 %). This difference can be explained that young people in Skateholm I were more lavishly decorated in burials using grave items and colouration than contemporary adult individuals. In contrast, despite the limited analysable number of individuals in Skateholm II, there could be a distinction to some extent between the subject of grave goods offering and red colouring; for example, the association for the young burials was red colouring, not grave items.

Comparison between the distribution of grave goods position and sex and age groups

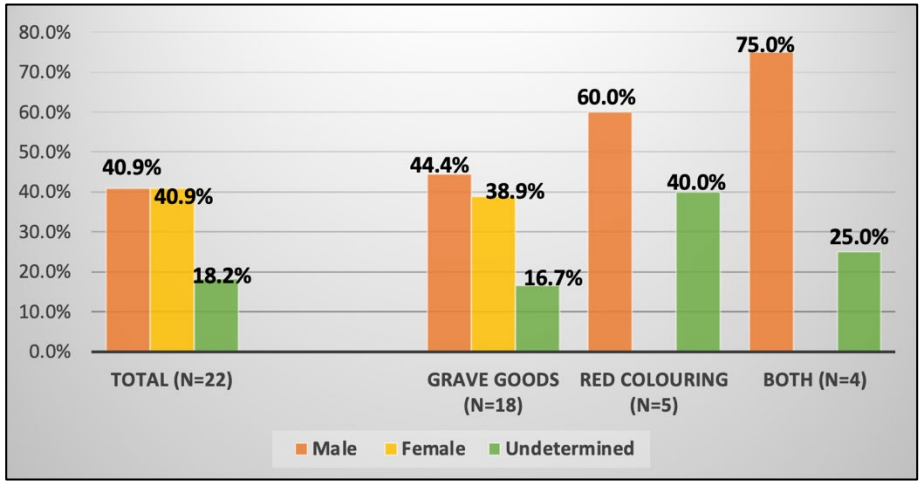


Fig. 6.21: Comparison between the proportions of grave goods/red colouring and sex in Skateholm II

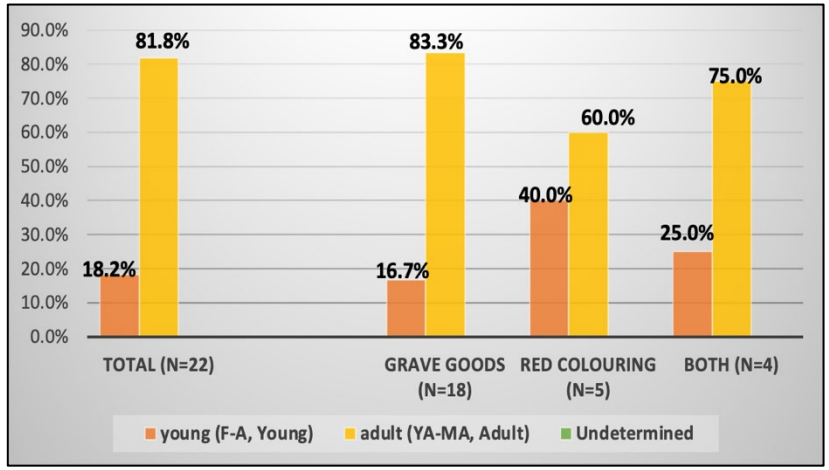


Fig. 6.22: Comparison between the proportions of grave goods/red colouring and age group in Skateholm II

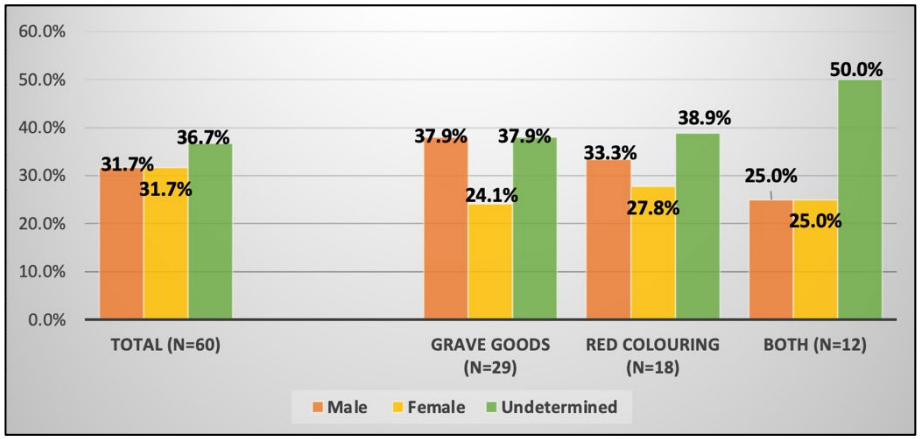


Fig. 6.23: Comparison between the proportions of grave goods/red colouring and sex in Skateholm I

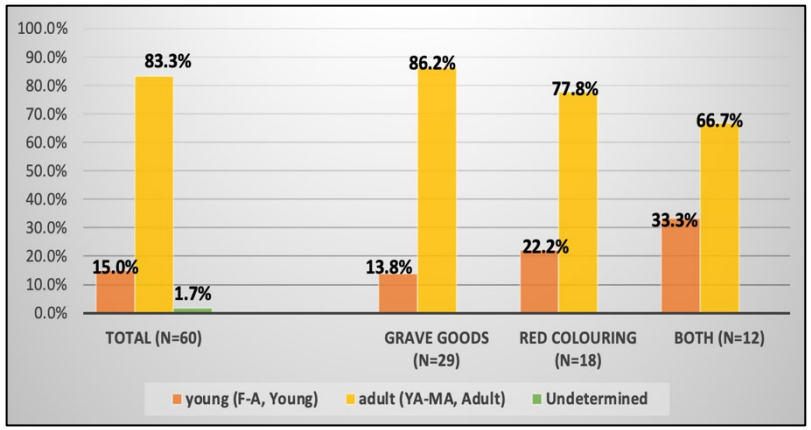


Fig. 6.24: Comparison between the proportions of grave goods/red colouring and age group in Skateholm I

is illustrated in Figs. 6.25~6.28. Figs 6.25 and 6.27 show that the chest area continuously shows the same percentages between the two sites. Moreover, although placing grave goods around the head area obviously tended towards males in Skateholm II, the frequency of this practice between sexes in Skateholm I became the same. On the other hand, the leg area was mainly for males as a grave goods deposition in both sites. Interestingly, while there is a large proportional difference in the grave goods association based on sexes in the total in Skateholm I, two areas (around the head and chest) represent the same percentages between sexes (Fig. 6.27). Instead, the 'pelvis area' and 'leg area' categories show the predominance in males, but the difference in percentage between sexes is very similar to that in the total. Notably, the analysable number of individuals belonging to the 'leg area' category is the largest among the other ones, and grave goods deposition around this area is also mainly recognised among males in Skateholm II (Fig. 6.25). From these viewpoints, we can postulate that the living continuously understood only the leg area as the placement of men's grave items. Moreover, Fig. 6.28 reveals that grave goods for young people tended to be offered around the chest area, but few observable data on the grave goods position in the young burials make it difficult to evaluate some features from Figs. 6.26 and 6.28.

Finally, regarding the relationship between red colouring position and the pre-mortem contexts, head and pelvis areas were mostly for males in Skateholm II (Fig. 6.29), and after that, the predominance of these two areas in Skateholm I shifted to females (Fig. 6.31). Furthermore, most individuals coloured around the entire body are estimated to be young (Fig. 6.32). This indicates that they were likely to be dyed using more red

pigment than the other coloured young individuals, which could imply some unique meanings. Also, in Skateholm II, colouring around the head area shows an equal percentage between the young and adults (Fig. 6.30). However, due to the limited observable individuals with red colouring, it is challenging to examine the difference in this feature between the two sites.

6.3 Biographical Approach (continuity and transformation of burial practices between Skateholm I and II)

Based on Fig. 3.7, human activities related to burials are categorised into four phases, each of which will be examined through data analysis at Skateholm I and II. The first phase contains every event until death, and pathological features and the possession of exotic materials, as well as the pre-mortem contexts, can be effective in considering this phase. The second and third phases range from the moment of death to infilling of the grave pits. Each phase can be further divided into various activities, helping us investigate the general and peculiar process of people's treatment for the dead. The final phase is the potential intervention after the infilling and can be recognised from some burials.

6.3.1 Phase 1

6.3.1.1 Pre-mortem contexts (sex and age at death)

The sex distribution is equal, and the proportions of young and adult people are also similar. This indicates no change in selecting people who should be treated for burials between Skateholm I and II.

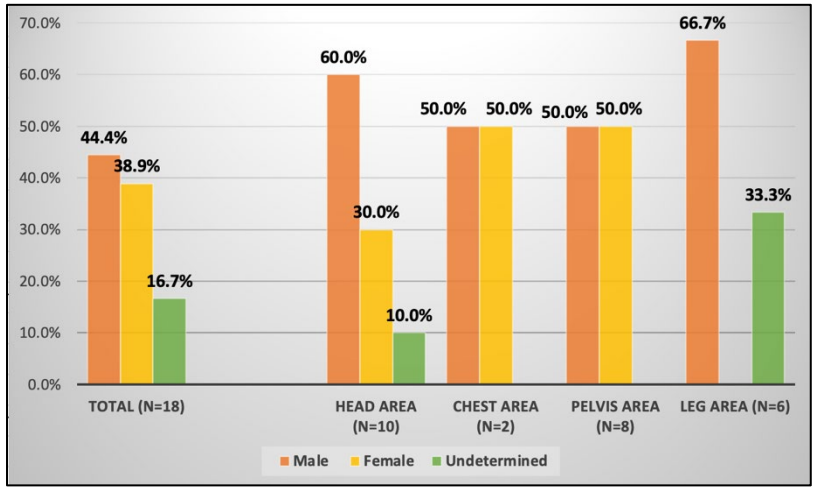


Fig. 6.25: Comparison between the proportions of grave goods positions and sex in Skateholm II

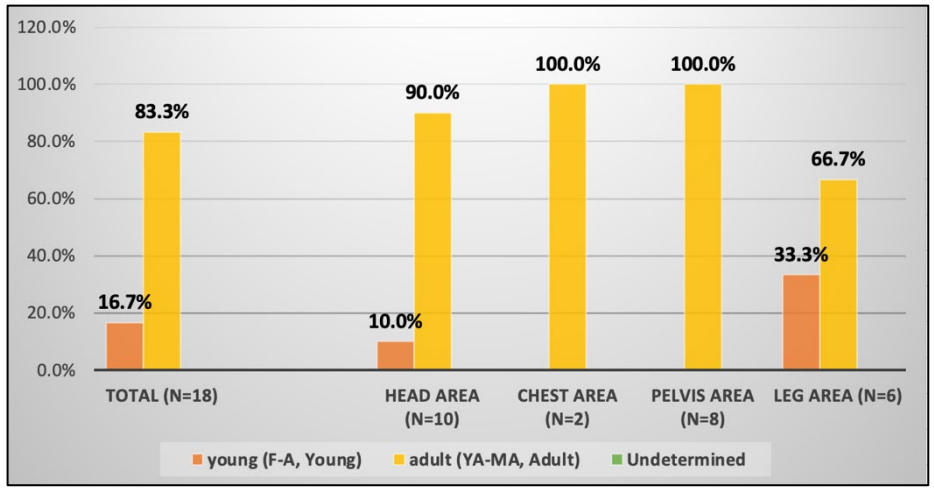


Fig. 6.26: Comparison between the proportions of grave goods positions and age group in Skateholm II

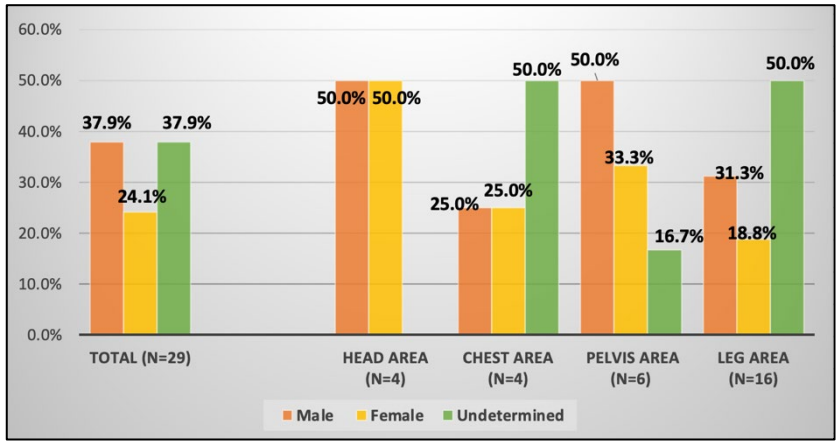


Fig. 6.27: Comparison between the proportions of grave goods positions and sex in Skateholm I

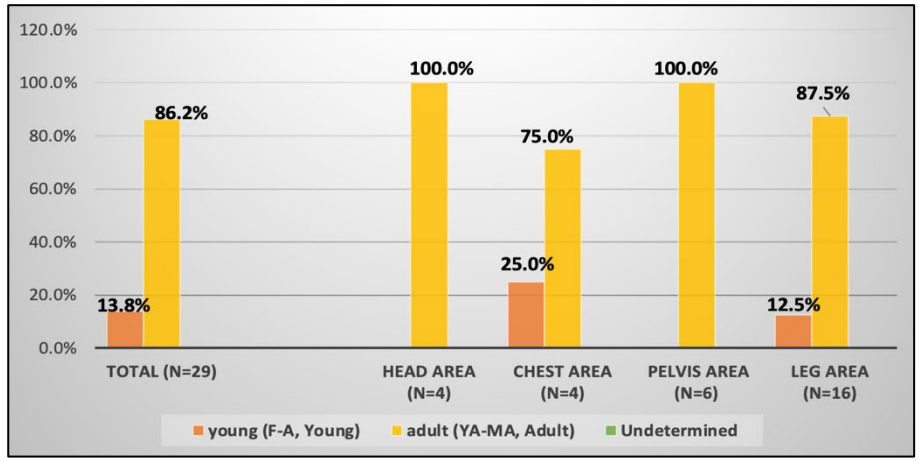


Fig. 6.28: Comparison between the proportions of grave goods positions and age group in Skateholm I

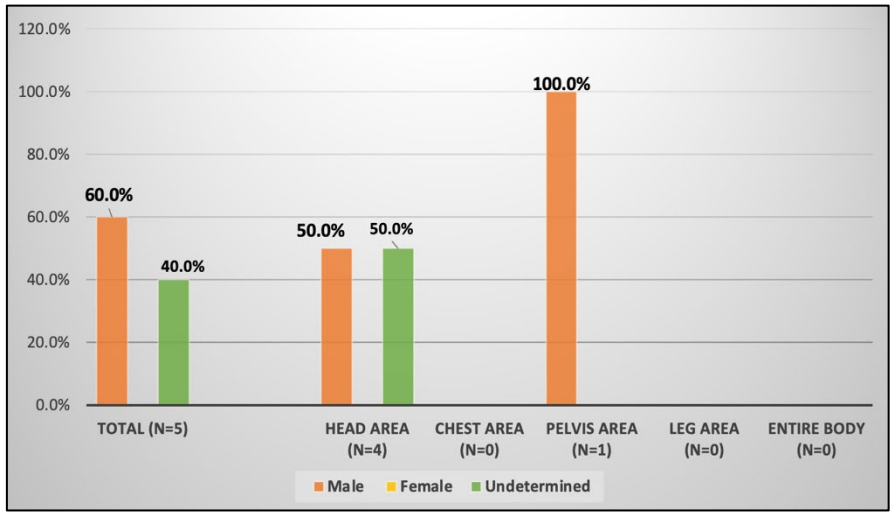


Fig. 6.29: Comparison between the proportions of red colouring positions and sex in Skateholm II

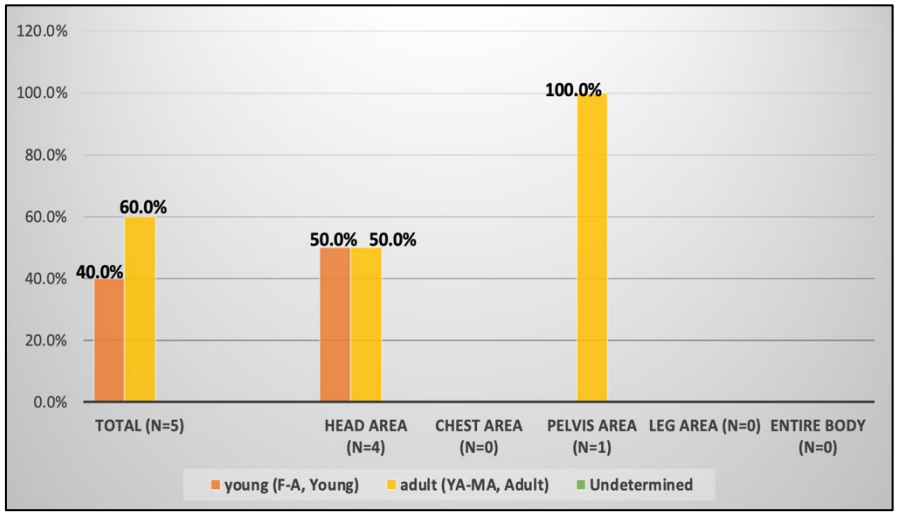


Fig. 6.30: Comparison between the proportions of red colouring positions and age group in Skateholm II

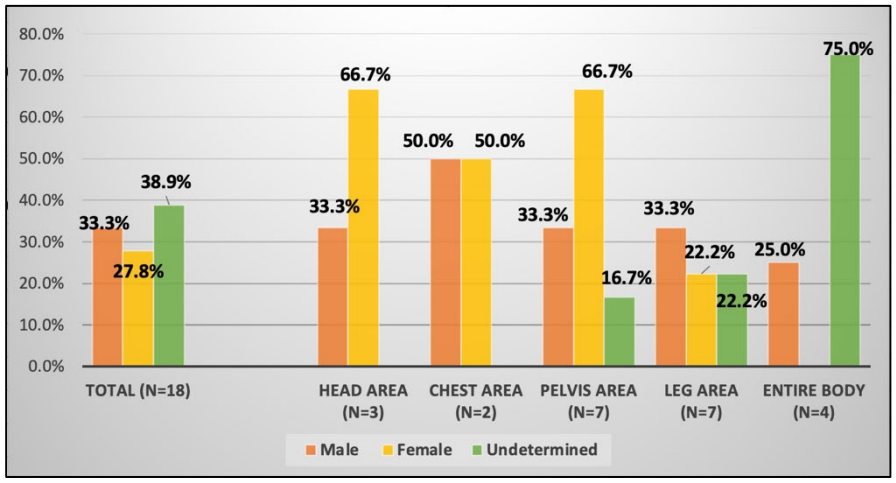


Fig. 6.31: Comparison between the proportions of red colouring positions and sex in Skateholm I

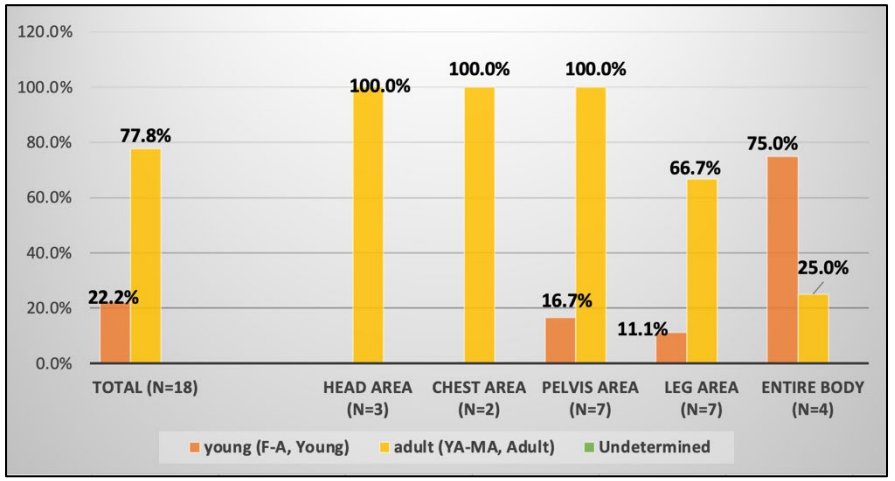


Fig. 6.32: Comparison between the proportions of red colouring positions and age group in Skateholm I

6.3.1.2 Osteological contexts

The osteological analysis shows the possibility of slight differences in their daily lives. Alexandersen (1988, 160) suggests a higher frequency of enamel hypoplasia in Skateholm I than in Skateholm II (Table 6.6). Particularly, during Skateholm I, the percentage of males with this feature is much larger than females. Enamel hypoplasia is marked as an irreversible defective enamel matrix caused by strong stresses like malnutrition in childhood (Ogden 2008, 284), which might show that males might be unhealthier than females. However, the osteological paradox, advocated by Wool *et al.* (1992), allows us to interpret that males with this pathological trait could live long enough to exhibit skeletal lesions than females. This idea can also be applied to the different frequencies in this trait between the two sites, and people in Skeholm I likely led a healthier lifestyle than those in Skateholm II. In addition, other pathological features, the degree of severity of activity-induced stress phenomena (Table 6.7), also represent relatively higher values in Skateholm I (Newell and Constande-Westermann 1988, 168-169). This pattern possibly links to the difference in lifestyle between the two sites. This table also shows the clear distinction of the values of legs between males and females in Skateholm I, unlike those values in Skateholm II, which probably suggests the division of roles in daily lives based on sexes.

Table 6.6: The numbers and proportions of individuals with enamel hypoplasia (made from Alexandersen 1988, 60)

	Males		Females	
Skateholm I	11/14	78.6%	5/10	50.0%
Skateholm II	4/8	50.0%	3/8	37.5%
total	15/22	68.2%	8/18	44.4%

Table 6.7: The degree of severity of activity-induced stress on five different body parts (made from Newell and Constande-Westermann 1988, 169)

	Skateholm I			Skateholm II	
	Males	Females		Males	Females
Spine	3.80	4.12		3.48	3.00
Right arm	3.42	3.63		2.36	2.49
Left arm	3.37	3.37		2.70	2.37
Right leg	3.41	2.68		2.12	3.10
Left leg	3.83	2.76		2.66	2.20

Table 6.8: Graves with exotic materials: all burials for adults, except for grave 41 (coloured in green), sexes are distinquished by different colours (males in black and females in red). (made from Taffinder 1998, 58-62)

	Skateholm I	Skateholm II
The Danubian axes		II, IV
tooth beads (elk, aurochs, bear)	6, 21, 41, 46, 53	VIII, Xa, Xb, XVII, XX, XXII

6.3.1.3 Exotic materials

Furthermore, possessing exotic materials can become a hint for considering human activities while alive. Table 6.8 represents that two adults are found with the Danubian axes and eleven individuals with tooth beads made from animals that had been extinct in the period of Skateholm I and II. Interestingly, while there is no clear difference between sexes among the exotics‘ holders in Skateholm II, all of them are females in the later site, except for a child at grave 41. Exotic materials have been understood as prestige goods signifying higher status in society or items brought in as barters (Brinch Petersen *et al.* 2015, 138-141; Parker Pearson 1999, 79). However, Brinch Petersen *et al.* (2015, 151) also suggest that a woman at grave 53 in Skateholm I probably migrated from other regions through isotope data reported in Eriksson and Lidén (2003). Considering various arguments concerning the continuous contact between the EBK people and TRB farmers (Fischer 1982; Klassen 2002; Rowley-Conwy 2011), it is plausible that exotics in the two sites indicate inter-regional interactions. Moreover, the high frequency of women with exotics in Skateholm I can mean more female migrants, probably for marriage.

These analyses represent that despite no discrimination and change in burials based on the pre-mortem contexts, the difference in health conditions and roles in daily lives between sexes could exist. Particularly, the trend of this difference likely became stronger in Skatehelm I, which might be related to the possibility that females often moved for marriage.

6.3.2 Phase 2

This phase likely starts from the preparation of the burial place. Also, the exposure of the cadaver might occur, like ethnographic data of Siberia (Zvelebil 1993, 59), but the burial data in Skateholm show no clear trace of such practices. Therefore, this section will not explore this practice.

6.3.2.1 Preparing for the burial place

Primarily, people dug grave pits for the dead. The size of the pits could be based on how the deceased were buried, especially in the dead positions. The comparison between the size and positions (Fig. 6.33) supports this hypothesis and represents the tendency that grave pits for the dead in an extension are more largely constructed than those for hocker and sitting positions in both sites. In other words, likely, the living did not randomly dig the grave pits; rather had determined the size in advance.

On the other hand, there are three distinctive burials concerning the larger size in relation to the grave structure and child interments (graves 11, 42 and 60 in Skateholm I). That is, while the size of grave pits in the two sites could be mainly determined beforehand based on the position of the dead, the three exceptional graves were likely

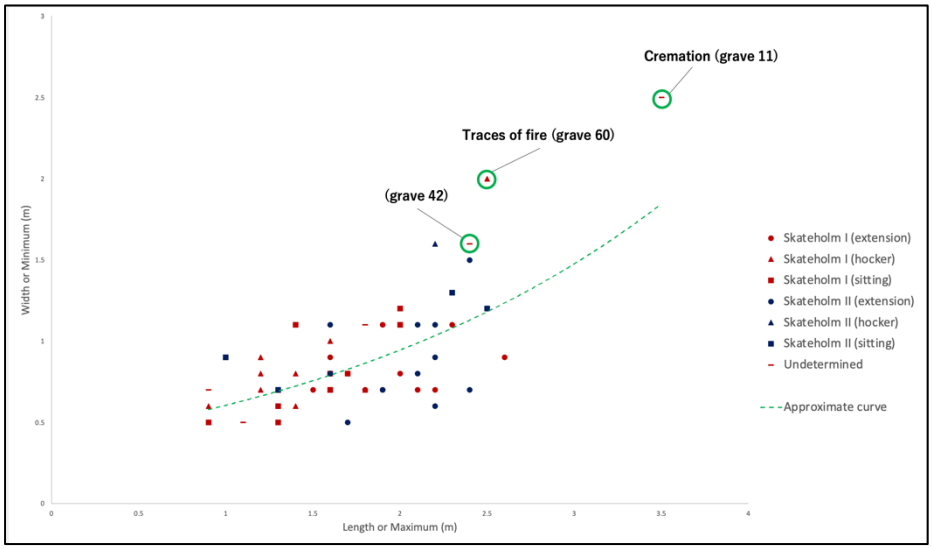


Fig. 6.33: The ratio of grave-pits' Length/Width and comparison based on the dead positions in Skateholm I and II

to be constructed for some special meanings. Probably, the meanings would be implied in the course of the burial practices, for example, using fire and adding grave structures.

6.3.2.2 Constructing grave structures

After or while digging pits, grave structures were installed in some graves (Appendix 5). For example, five graves in Skateholm I (11, 20, 26, 42 and 60) were found with the trace of wooden structures or post holes inside, which could be inferred as scaffolds from the evidence that 4 out of them were burned down later. On the other hand, from Skateholm II, traces of wooden dug-out canoes (grave IV and XX) and a shelf (grave XV) are recognised (Larsson 2016). Besides this, Nilsson Stutz (2003, 335) demonstrates the possibility that there was once some supporting structure immediately behind the woman's back at grave IX (Fig. 6.34) because the right rib bones collapse backwards, and the posterior extremities are projected forward. In

belief, adding some grave structures to the burials for some individuals is common in both sites, but while those in Skateholm I could be prepared to conduct specific ritual activities (e.g. burning), those in Skateholm II are probably furnished as a container or base for the dead placements. Besides this, there is no clear discrimination in preparing these structures between sexes (Appendix 5).

6.3.2.3 Treatment of the dead body

During this phase, the living might also deal with the dead body. In Skateholm, two ways of treatments for the body are recognised; dismembering and wrapping of the human remains. For example, most parts of the body from grave 13 in Skateholm I are mutilated (Fig. 6.35). These disturbed skeletons are buried together with the intact parts remaining in the anatomical position (the left underarm, wrist and hand bones, the right foot bones), except for the left foot and right hand (Persson and Persson 1984, 20). This feature indicates that the body was dismembered before the decomposition of the flesh, but we cannot explore whether the disarticulation was conducted before or after digging the grave pit. Nilsson Stutz (2003, 328) mentioned that the reason for this practice could be a punishment within the group or imply ritually significant activities. However, there is no visible cut mark on the bone surface, and the burial is not situated in the peripheral area with the grave pit constructed by the living. These features suggest the living's careful treatment for this individual and distinctive meanings rather than punishments. Other unique treatments for the dead body are also recognised from a woman in Skateholm II (grave XVI) (Fig. 6.36) who could be tightly wrapped by some organic material (*ibid*, 300). The arrangement of the human skeleton showing this treatment, like this woman, is characteristic because of the bi-

lateral pressure to the sagittal plane; for example, the clavicles are lying approximately vertically (*ibid*, 297). Individuals showing this feature is rare not only in the two Skateholm sites but also across southern Scandinavian regions, such as burials for a male in Nivå 10 (grave 8A) and a female in Vedbæk Bøgebakken (grave 22) (Jensen 2016, 99; Nilsson Stutz 2003, 298). Therefore, wrapping the dead body in burials can be regarded as a distinctive practice, and the living possibly tried to hide the process of decomposition or putrefaction of the dead body before the final deposition into the grave pits.

6.3.2.4 Preparation for grave goods

Understanding the preparation of grave goods is complex since some goods might be used while alive. For example, Knutsson (1995, cited in Taffinder 1998, 71) argues that forty-one flint objects found from graves at Skateholm present many types of microwear which could be derived from the frequent use in a great variety of different ways. In contrast, the pecked stones from grave 47 at Skateholm I represent no trace of use-wear (Larsson 1984, 23), suggesting that these stone tools were likely to be made for this burial. Additionally, in grave 6 in Skeholm I containing a female and a child, thirty-two perforated wild boar teeth pendants are found in two or three superimposing rows above and beneath the child (Rainio and Tamboer 2018). The position of these teeth items can be understood that there was once an organic material, like a baby sling, with these pendants attached by which the child was wrapped (*ibid*). From these perspectives, we can infer that people in the two Skateholm sites not only selected tools that the dead potentially used while alive as grave goods but also sometimes produced items for specific burials.

6.3.2.5 Fire

The possibility of using fire somewhere before placing the dead body and carrying the burnt bones to the burial place has been reported (e.g. Gansum 2008, 144: Nilsson Stutz 2003, 345). In fact, a burnt skeleton at Gøngehusvej 7 (cremation Æ), Denmark, was bundled with a fire damaged fragments of flint blade, but no charcoal from the original pyre (Brinch Petersen and Meiklejohn 2003), suggesting the move from the cremation spot to the deposition area of the dead.

However, there is no clear example of such cremation in Skateholm. Rather, some individuals with timber structures burnt down (e.g. graves 26 and 60) indicate that using fire could occur at the same place of placing the dead body.

In summary, obvious special practices before the final deposition of the dead body were not frequently carried out. In addition, we cannot see clear differentiation according to sexes and age at death during this phase. However, special treatment for the deceased could be occasionally conducted. Particularly, while the distinctively larger size of grave pits and potential preparation of grave goods for specific burials are only recognised from Skateholm I, the trace of tightly wrapping is from Skateholm II. Furthermore, the feature of grave structures differs between the two sites. Although evaluating the degree of the significance of these distinctive burial practices is complex, the existence of these differences in the two sites represents some changes in human activities in burial rituals and would link to the cosmological transformations.

Fig. 6.34: Photo of human remains at grave IX in Skateholm II (Nilsson Stutz 2003, 236, photo 22)

Fig. 6.35: Photo of human remains at grave 13 in Skateholm I (Nilsson Stutz 2003, 220, photo 6)

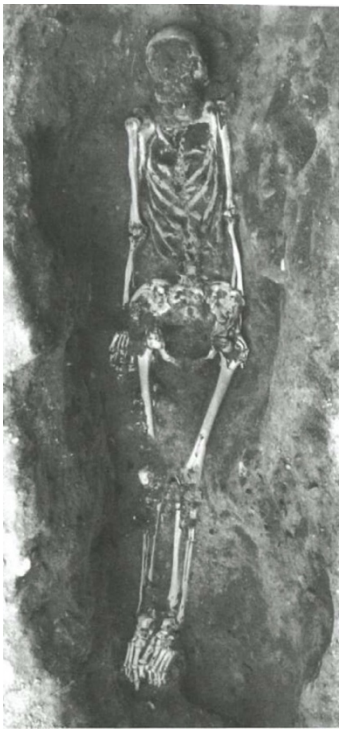


Fig. 6.36: Photo of human remains at grave XVI in Skateholm II (Nilsson Stutz 2003, 239, photo 25)

6.3.3 Phase 3

6.3.3.1 Body placed in the pits

This phase starts from the deposition of the dead body to the infilling of the grave pits. The first decision by the living is the position of the dead and the head orientation. Most people are buried with the anterior side of the bodies directed above (supine) and the legs extended (extension) in Skateholm II. However, in Skateholm I, although the extension position remains in the highest frequency, the position types become more diversified. Likewise, concerning the head orientation, the new occurrences of the east

('c') and northwest ('h') directions in Skateholm I also indicate the diversification of burial practices.

On the other hand, in determining the corpse's position, the living might attempt to distinguish the sex and age at death of the deceased. This hypothesis can be suggested from the continuous predominance of sitting positions in adult people in both sites. Moreover, the differentiation between sexes and ages at death could be continuously carried out based on the direction of the head placements. Notably, the distribution of the head orientations in Skateholm I suggests the possibility of some strong connections between burials for females and young people.

6.3.3.2 Grave goods offerings

Offering grave goods could be carried out during phase 3 and shows variations in how the living performed this practice in the two sites. In particular, the potential differentiation between sexes could be expressed from the deposition of grave goods in Skateholm II; for example, the predominance in males associated with items around the head or legs (Fig. 6.25). Moreover, the chest and pelvis areas as grave goods deposition, which shows the same proportion, might be linked to general practices; in other words, these were possibly ones that imply no specific meanings. However, this trend slightly changed in the later sites (Fig. 6.27). Although the leg area for grave goods placements among males remained relatively high, the living avoided selecting the head area compared with the preceding period (Table 6.2). This probably implies that the importance of the leg area in burial rituals continued, unlike the head area. Considering the higher values of the severity of activity-induced stress in legs among

males in Skateholm I (Table 6.7), the difference in social roles in daily lives based on sexes, such as hunting by males, could be reflected as the position of the grave goods deposition.

6.3.3.3 Food offerings

From Skateholm I and II, 22 individuals are found with traces of food offerings, especially fish (Appendix 6). The main position in which such offerings can be recognised is around the head, legs and pelvis area, but we cannot see the clear preference of the living for the deposition point (Fig. 6.37). These food remains suggest the possibility of a ritual feast near the grave, and people might eat fish soup or stew (Jonsson 1986, 71; Larsson 2002b; 5). Similar features are discovered from a female burial (grave 22) in Vedbæk Bøgebakken, representing some rituals for sending the dead spirit to the afterlife (Brinsh Petersen *et al.* 2015, 196). Besides this, there are other interpretations suggested by Larsson (2002b, 4) that the concentration of fishbone beside the dead body, such as grave 7 in Skateholm I, can be the trace of a container in which the food was stored.

On the other hand, finds of fish remains around the stomach could also be the residue of the last meals which had not been digested. In fact, eight burials from both sites show the trace of food remains around the area, and it is difficult to assess whether the remains are the food offered by the living or the mere residue of meals while alive. However, in comparison of fish species found around the stomach area and those around the other areas in the grave, there are no outstanding differences (Larsson 2002b, 7). This result indicates that fish species eaten daily and those used in mortuary

practices could be almost the same (*ibid*). Furthermore, paradoxically, we can postulate from his suggestion that the living did not emphasise the practice of ritual feasting and food offering in themselves, rather did the participation in the ritual activity. If this hypothesis were true, the ritual feasting in Skateholm would be linked to not respect for the dead body but animal sacrifice in a fertility cult.

In addition, it is interesting to note that we can see the change in the frequency of the trace of food offering between the sexes (Fig. 6.37). While in Skateholm II, more males were buried together with food deposition than females, the trend became reversed in Skateholm I. This alteration means that the survivor changed the main subject of this practice in burial activities, which could also be related to the ancient cosmological transformations.

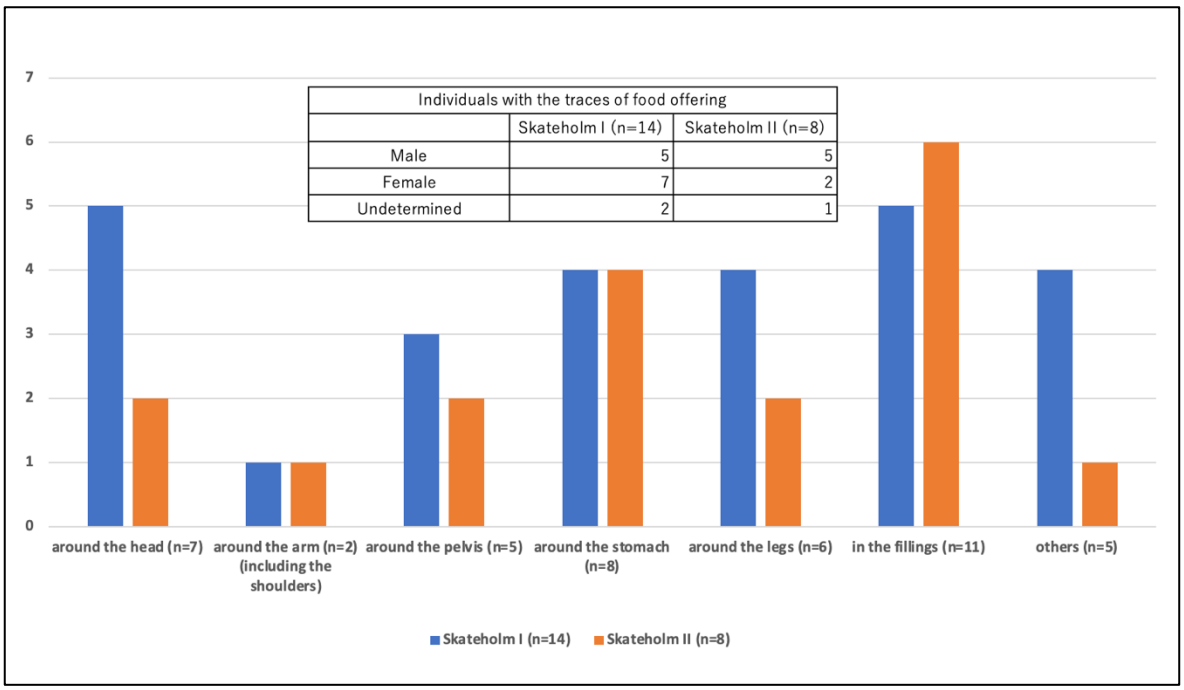


Figure 6.37: Food offerings positions, and the proportions of individuals with this practice based on sex in Skateholm I and II (made from Jonsson 1986; Larsson 2002; Nilsson Stutz 2003, Appendix)

6.3.3.4 Red colouring

The red colouring can also be carried out before infilling the grave pits. This practice accounted for most proportion in the head area as a colouring position among male burials during Skateholm II, but remarkable changes occurred in Skateholm I. Firstly, the head area as a red colouring position dramatically declined between the two sites, and females started to be buried together with this feature in the later period. Particularly, the latter trend means the equalisation concerning this practice between sexes. Moreover, some young people were likely to be more lavishly buried in the combination of grave goods and red colouring in Skateholm I, which could imply that the living changed the way of treating the females and the young in burials between the two sites.

6.3.3.5 Fire

The use of fire in burials at Skateholm is probably conducted before infilling the grave pits, but some traces of this feature could show the post-infilling activity. For example, there are three cremations (grave XVIII in Skateholm II and graves 11 and 20 in SKateholm I), which are the practice before the dead bodies are completely infilled. Likewise, the wooden structures which could be burned down in graves 26 and 60 in Skateholm I also represent the pre-infilling activities. On the other hand, the hearth traces are discovered close to grave 38 (Nilsson Stutz 2003, 328), and the potential hearth structure was once situated on grave 61 because of much soot-admixed sand and the amount of flint inside the sediment of the pit (*ibid*, Appendix 88). These hearth structures were possibly used after infilling the grave pits, but the occurrence of smoke using fire on these hearths could be commonly related to the connotation of the journey

to the afterlife. Interestingly, while there was only a cremation that destroyed the human bones in Skateholm II, the living in the later period experienced several types of this practice, including lightly burning the human remains with wooden structures and use of a hearth as well as the traditional cremation. This diversification might denote the change of human activities in burials and result from the new influx of knowledge or some internal transformations like cosmology.

6.3.3.6 The order of these practices during phase 3

Investigating this question is important to reveal the general process of burial practices during phase 3. In the first place, the fact that there are only a few individuals whose grave goods are found under the bodies (Table 6.2 and 6.3) suggests that the placement of the dead in the grave pits mostly preceded the grave goods depositions. Also, food offerings are often found near the deceased, and some of them are inferred to be cooked in rituals. Therefore, it is reasonable that food deposition could be generally carried out after laying the dead body. Nevertheless, the contextual relationship between grave goods and food offerings is unclear, and possibly both practices could be conducted simultaneously.

Concerning red colouring, a few burials show the practice under the dead body. For example, analysing a male at grave 28 in Skateholm I from the photograph (Fig. 2.1) indicates that the body was placed after the base of the grave pit was partially coloured in red. In contrast, the colouration of a child in grave 41 is interpreted that red ochre was strewn over this child's body (Larsson 1984, 22). Besides this, the photograph of a sitting individual in grave X in Skateholm II (Fig. 6.38) shows that parts of the pelvis,

femora, left ulna and radius are coloured in red. From these perspectives, red colouring could be mainly practised after the placement of the dead body.

Subsequently, the contextual relationship between red colouring and grave goods deposition can be interpreted from the photos and reports by Nilsson Stutz (2003). For example, regarding a child burial from grave 40 in Skateholm I (Fig. 4.33), she reports that “red ochre occurs in front of the body”, and a collection of tooth beads beside the body is slightly coloured (*ibid*, Appendix 66). This indicates that the grave goods placement preceded the red colouring. Likewise, from grave IV in Skateholm II (Fig. 6.39), a collection of grave goods placed behind the head appears to be influenced by the surrounding red-coloured soil. Considering Nilsson Stutz’s argument (2003, Appendix 98) that these grave goods were wrapped by some organic material, we can extrapolate that the wrapping material was initially dyed in red, and then the red colour was transferred to the underlying items as the wrapping was decomposed. Similarly, evaluating the order of colouring and food offerings can be inferred from the report by Nilsson Stutz (2003), but the coincidence with these practices is rare[2]. For instance, the red colouring at grave 6 occurred together with many fish bones behind the right tibia and at the hip of a female individual (*ibid*, Appendix, 35). Also, the colouration at grave 59 is found together with fish bones in the western part of the grave pit (*ibid*, Appendix, 86). Although it is difficult to assess the contextual relationship from the two

[2] Six burials are recognised, at graves 6, 22, 25, 48 and 59 in Skateholm I and XV in Skateholm II. Out of them, two burials (grave 6 and 59) show the deposition of food offerings and red colouring at the same area.

reports, the potentially simultaneous deposition of grave goods and food beside the dead allows us to infer that food offerings could be carried out before colouring.

Fig. 6.38: Photo of human remains at grave X in Skateholm II (left) and photo closing up around the pelvis part of the sitting individual (right) (Nilsson Stutz 2003, 226, photo 12)

Fig. 6.39: Photo of human remains at grave IV in Skateholm II (Larsson 2016, 179, fig. 4)

Finally, the use of fire was probably the last stage during phase 3 since the cremation burial in grave 11 contains burnt various fauna bones (Nilsson Stutz 2003, Appendix, 38). Moreover, if the hypothesis mentioned in chapter 5 that this practice was to transform the dead body into inanimate beings or create the smoke for the accompaniment of the journey to the afterlife were correct, it would be reasonable that burning every object offered to the deceased after death was performed as a final ritual activity.

In summary, the general burial process in this phase can be understood as starting from the placement of the dead body. The next step might be the offerings of grave

goods and/or food, and then the colouration in red. Finally, through the practice of burning, the living likely completed every burial activity during phase 3.

6.3.4 Phase 4

In this phase, the living's activities could be intentional or unintentional re-accesses to the older burials. For example, a male burial at grave 28 without specific bones (Fig. 2.1) helps us interpret the intentional and careful reopening after the interment. Likewise, Nilsson Stutz (2003, 346) argues the possibility that two hocker individuals in Skateholm I (grave 7 and 35) were also deliberately disturbed because of the loss of their left femurs. Particularly, these three individuals commonly lost their left femurs, which suggests the living had determined which parts of the skeleton should be removed beforehand. In contrast, five burials in Skateholm represent the potential unintentional destruction of the older burials (graves 1 and 2, 34 and 35, 40 and 41, 46 and 47, and 56 and 57). Interestingly, while all burials discussed here are from Skateholm I, there is no evidence in Skateholm II that the living could have intervened later. Moreover, each site provides a representative burial that shows the possible grave markers. For instance, grave XI coincides with four single antler beams and one complete antler crown beside this inhumation (Nilsson Stutz 2003, Appendix, 107), and grave 42 contains the trace of a post hole with no trace of burning. From these perspectives, we can infer that the living commonly recognised the location of previous graves, but the attitude towards the dead could be different between the two sites.

6.4 A proper burial and the transformations in the LM

6.4.1 General process

Before the event of death, there could be different lifestyles between the two sites of Skateholm and the division of social roles based on sexes (e.g. hunting, marriage). Moreover, males in Skateholm I likely lived more healthily than females. However, after the event of death, these features were not generally reflected in treating the dead body until the phase of placing the dead into the grave pits. Instead, there were some exceptional treatments for the dead (e.g. extensive grave pits, mutilation and wrapping), but these also showed no clear differentiation in sexes. In the next stage, the living attempted to distinguish the sexes and age at death through the positions of the dead, head orientations, the positions of grave goods and red colouring, and food offerings. Particularly, the sitting position is only seen among adults. After these practices, although some burials were burned and disarticulation, considering most human remains retain the anatomical positions, we can interpret that the living infilled the grave pits mostly prior to the decomposition of the corpse. Finally, they probably constructed some kinds of grave markers to recognise the location of the previous graves.

These general processes are common between Skateholm I and II, suggesting that there could be long-lasting features in burials. This also means the existence of some highly structured ritual activities that expressed how to respond to the dead. For the living, the dead body is an ambiguous entity that is located between the living subjects and the inanimate objects, might disturb the social order and cause various emotions such as anxiety (Nilsson Stutz 2015, 4; 2016, 22). Therefore, by burying the deceased carefully in a fixed manner, people probably attempted to share the process of

identifying the dead as beings living in afterworld and manage the feeling of anxiety related to the ambiguity (Chesson 2016; Nilsson Stutz 2016).

6.4.2 Distinctive practices

There were some exceptional treatments for the dead, such as extensive grave pits, mutilation and wrapping of the dead, and the use of fire in burials. These are rare to be found and could be carried out between death and placing the dead body into the grave pits (Phase 2). This can suggest that most distinctive ritual activities had already been performed before various practices in phase 3.

These distinctive rituals are in contrast to the invariant practices mentioned above. It is indicative that the living possibly needed different treatments in burials to deal with some specific death because they could not avoid the anxiety caused by the death, such as sacrifice and criminals (Nilsson Stutz 2003, 338; Williams 2007, 112-113). For example, destruction and discolouration by burning would become a clearer practice for expressing the transformation of the dead into beings in afterworld (Larsson 2002a) and help the mourners manage such an emotional disorder. Moreover, the burial with the body partly disarticulated (e.g. grave 13 in Skateholm I) obviously displays abnormal treatments to the mourners, which can result from some distinctive impact of the deceased. Perhaps, they would strive to ‘neutralise’ and deal with the impact on society through such atypical mortuary rituals (Nilsson Stutz 2016, 36).

If these inferences were correct, the practice of placing the dead body would be the boundary for separating the purpose of ritual activities in burials; that is, while those in

phase 2 were to express the significance of the specific dead, those in phase 3 were to denote the personal profiles. Moreover, the use of fire in phase 3 could imply different meanings from the practice in phase 2; perhaps, it emphasised the rise of smoke which travelled with the spirit of the dead to the afterlife (Gräslund 1994, 20).

6.4.3 Transformations between the sites

Comparing burial characteristics between the two Skateholm sites shows various changes. One of the representative alterations can be seen from the frequency of red colouring; that is, while the proportion of male burials with this feature dropped, that of female burials with colourations increased up to approximately the same level as males. Similarly, some young people in the later sites were more lavishly decorated using both grave items and colouration than contemporary adult individuals. Such a trend can be related to the potential strong correlation between young and female people and mean that the living likely changed the perception of the death of both people and the ritual activities in burials. Another representative alteration is that residents in Skateholm I began to intentionally or unintentionally intervene in the older burials. This can imply the transformation of the attitude towards the ancestors during phase 4 despite the common practice of establishing some kind of grave markers.

6.5 Summary of this chapter

The case study shows the variations in burial practices, but the process of burial rituals by the living is probably similar in the two Skateholm sites. For example, distinctive burial practices towards the corpse and differentiations between sexes are commonly carried out during Phase 2 and 3, respectively, suggesting a proper burial in the LM.

This process of burial rituals can be highly related to forming ancient cosmology (Bell 2007; Nilsson Stutz 2015), the transformation of which possibly led to the changes in burial practices during the EN, such as constructing earthen long barrows. On the other hand, there are two remarkable burial variables from Skateholm II and I; a strong correlation between females and young individuals and some burials disturbing the older ones. These transformations could occur during the LM, and investigating the trigger of these burial changes can help us understand the formation of the EN mortuary practice, which will be discussed in the next chapter.

7. Discussion and Conclusion

This chapter will compare the burial practices in the LM with those in the EN and discuss how the living's attitudes towards the dead and death were influenced by the social transition from foraging to farming. The data analysis (chapters 4 and 5) shows that while the EN burials represent unique expressions of venerations for the dead through using fire and classifying burial types, some burial practices might be regarded as originating from the preceding period. Then, the last chapter showed the two representative burial changes during the LM regarding venerations for the ancestors and a strong correlation between females and young individuals. These alterations were continued or transformed in the EN, and there are likely to be some factors that caused these continuities and transformations in burials. Therefore, investigating the factors can be useful in understanding the process of transitioning burial practices and ancient cosmology between the LM and the EN period.

7.1 Continuity or transformation in the EN?

7.1.1 Venerations for the dead

7.1.1.1 Mesolithic

The dead occurs at the time of death, but they need to be treated in various ritual practices to be separated from the living world and identified as ancestors (Ion 2020, 349; Nilsson Stutz 2010, 35). As mentioned in the last chapter, these ritual practices are probably carried out from phases 2 to 3 and completed by infilling the grave pits. If so, post-infilling ritual activities to the early graves, which belongs to phase 4, would mean not the treatments for the dead, rather the re-access to the ancestors.

Through investigating the LM burial practices, we can see that the potential ritual activities during phase 4 consist of intentional or unintentional interventions in the past graves. One of the deliberate disturbances is the removal of parts of the human skeletons, such as skull and long bones, which is also known from Skateholm I, Vedbæk Bøgebakken and Nivå 10. This practice reflects a strong intention to contact the ancestors, and the living presumably hoped that they played some important roles in society. For example, in several superimposed burials at Vlasac, Serbia, people co-buried the disturbed older dead bodies into new graves, suggesting the attachment of ancestral power to the new burials (Boric 2010). Although few burials contain the older dead body parts in southern Scandinavia, several disinterment activities in this region might be linked to constructing relationships between the living and the ancestors, like the example of Vlasac, which could help create an intergenerational bond to maintain their communities (Ion 2020, 359; Kuijt *et al.* 2009, 117). Moreover, from these viewpoints, we can understand that burials that extensively damaged the older graves (e.g. grave 47 in Skateholm I and grave 6 in Vedbæk Bøgebakken) mean the break of the bond with the ancestors. Similarly, cenotaph features (e.g. structure 8 at Skateholm II and grave 11 at Vedbæk Bøgebakken) also indicate the possibility of an intentional end of the relationship with the ancestors buried in the area.

Furthermore, if the living attempted to re-access the ancestor's graves, these graves could need to be marked, potentially with some easily visible objects like gravestones. However, although these markers are found, such as the trace of post holes at grave 60 in Skateholm I, why did the LM people not avoid disturbing these graves? This

question can be postulated by combining evidence of bone removal with burial data at grave V at Skateholm II.

Grave V contains a female in supine extension with undisturbed phalanx (probably foot bones) between her two femora (Nilsson Stutz 2003, Appendix, 98). This kind of burial trait is not found in Skateholm I, but three individuals from graves 7, 28 and 35 lose their left femurs probably due to the livings' intentional re-access to their burials. Also, the left foot bones are also removed from a mutilated individual (Grave 13). Through these features, we can infer that people in Skateholm I had some special meanings in this part of the bone. Moreover, ethnographic data suggested by Bjerre (1954, cited in Brinch Petersen 2016, 54) show that adorning children with a part of the dead body like fingers as amulets is carried out in New Guinea, indicating that residents in Skateholm could regard specific parts of the deceased as, for example, a guardian against evils.

The important point is the low durability of this practice. That means that, as shown in Fig. 7.1, the third generations would decorate with parts of the dead bodies of the second generations, probably not the first generations; thus, the veneration for the first generations might not be inherited for more than two generations. If this hypothesis were correct, the establishment of grave markers in Skateholm would not also be succeeded for long generations. In fact, the finds of grave markers, such as four single antler beams and one complete antler crown beside grave XI and the trace of a post hole inside grave 42, were probably easy to be removed and destroyed by future generations or the decomposition. Similarly, there could be a small tent-like structure made by red deer antlers over the interment for four adults in Hoëdic (Schulting 1996,

344), but this structure might also be easy to collapse. Therefore, it is inferred that the succession of the burial location for long generations was difficult in the LM, and consequently, some burials which unintentionally disturbed the older ones occurred.

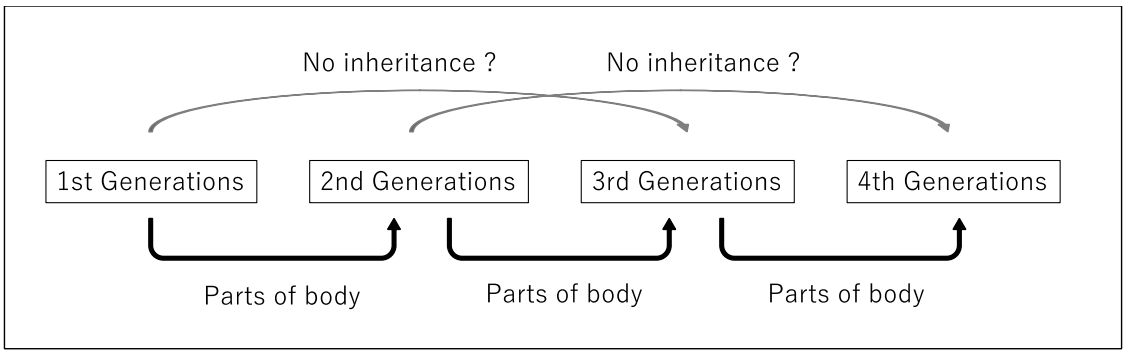


Fig. 7.1: Diagram showing how venerations could be inherited between generations through decorating the parts of the dead

7.1.1.2 Potential change of the veneration during the LM

The sites of Skateholm I and Vedbæk Bøgebakken contain both graves that partially disturbed and severely destroyed the older ones, respectively, which could mean the possible transformations of the veneration for the ancestors during the LM. In order to examine this possibility, it can be helpful to discuss why burials disturbing the older graves are found only in Skateholm I, not in Skateholm II, although the periods of both sites partially overlapped. Moreover, this question can also be considered using the hypothesis that the last Mesolithic residents could perceive the graves of just a few previous generations.

First of all, the area of Skateholm II was submerged due to the sea transgression, and the residents needed to change their burial area to Skateholm I (Larsson 2016, 176). At this time, they could continuously have practised venerations for burials in

Skateholm I. However, considering the difficulties of perceiving the long past graves during this period, we can postulate that the locations of some graves in Skateholm I might become obscure for people who had once lived in the Skateholm II area. Therefore, when builders of the later grave pits found the previous ones, they possibly avoided extending the new pits (such as the four sets of graves 1 and 2, 34 and 35, 40 and 41, and 56 and 57).

On the other hand, only grave 47, which extensively destroyed the older one, likely implies different meanings in that the maker of the pit could be immigrants who did not venerate the previous burials (Fahlander 2010, 30). Additionally, a LM house structure (construction 10), which was situated beside many burials in Skateholm I (Fig. 6.2), destroyed the head and shoulder of a female at grave 12 (Larsson 1985, 201). Considering the finds of EBK pottery from the northeastern area, we can understand that this structure occurred after constructing burials in Skateholm I (Stilborg and Bergenstråhle 2000, 25), and possibly destroyed other burials which had once lain within the zone of this building. The chronological context between construction 10 and grave 47 is unclear due to the lack of radiocarbon dating, but the fact that the pecked stone axes without use-wear are co-buried in this grave represent distinctive burial practices in that these grave goods might be specialised for this burial. This indicates new styles of ritual activities in rituals, which could be introduced from other regions, potentially through population movements. In fact, the isotope analysis from a woman at grave 53 represents that some immigrants could be included among residents in Skateholm I (Eriksson and Lidén 2003). From these viewpoints, we can extrapolate

that extensively destroying the older burials in Skateholm I could result from immigrants who had distinct burial practices.

7.1.1.3 Neolithic

Unlike the burials in the LM, what makes the Neolithic burial practices discriminate is to construct and systematically destroy and extend earthen long barrows. Through these activities, the exact locations of older burials could become visually clear for longer generations compared with the preceding period, probably signifying that the Neolithic people greatly emphasised the location in which their ancestors were buried.

Some scholars argue the importance of maintaining 'location' as a communal place for the living to re-recognise their social group through some cooperative rituals such as erecting monuments and burials (Bell 2007, 282; Midgley 2008, 15). Moreover, archaeological evidence that some earthen long barrows lay upon disused settlements with chronological sequences, such as Bjørnsholm (Andersen and Johansen 1990), also shows the living's intentional selection of the location as a burial area. Namely, the ancestors could be regarded for the living as symbolising the origin of their society in the EN, and by routinely participating in burial rituals and extensions of the monuments, they were able to reproduce the social identity for a long time (Furholt and Müller 2011, 17; Müller 2010, 9-10). In this sense, we can extrapolate that the Neolithic people possessed stronger ancestor worship and more systematically expressed it than the Mesolithic.

7.1.2 Strong correlation between females and young individuals

7.1.2.1 Mesolithic

This trend can be seen in the perspectives of head orientations and red colouring in Skateholm I. In addition, across the southern Scandinavian region, young individuals, especially juveniles, tend to be often buried with red colouring when the total number of this age group is considered (Fig. 4.13). On the other hand, the frequency of female burials with this practice is lower than males (Fig. 4.12), but some double burials in which a female and child are co-buried represent colouration in red, such as grave GØ at Gøngehusvej 7 and grave 8 at Vedbæk Bøgebakken. Particularly, the child at the former site could be placed with the body carried by a sling made by a roe deerskin (Brinch Petersen *et al.* 2015, 93). Also, the other burial at the latter site contains many beads on the right side of the female skull, which can be inferred as protective amulets attached to a baby carrier, like a papoose (Vang Petersen 2016). These burial features might reflect the presence of distinctive correlations between females and young individuals in the LM. Moreover, the case study in the last chapter shows that the practice of colouring among females began in Skateholm I, which could imply some significant ritual meanings between red colouring and burials for females and young people.

The functions of colouration in red have been hitherto argued in various ways. For example, Hovers *et al.* (2003, 509) interpret the colour of red as symbolising the blood of the menstruation of females to pray for fertility. In addition, colouring in red can play a practical role in tanning animal hide to prevent putrefaction and desiccation and preserving foods (Rainio and Tamboer 2018, 5; Rifkin 2011, 132). From archaeological evidence in Skateholm, some red colouring data show practical functions, such as

tanning the potential organic coloured materials wrapping grave goods in grave IV (Fig. 6.35). However, considering that many burials for females in Skateholm I were coloured in red around the pelvis area, we can postulate that the living likely emphasised the symbolic meanings of the colour, such as childbirth. Moreover, in combination with some young individuals lavishly adorned with red colouring and grave goods during Skateholm I, it is reasonable to infer that the practice of red colouring was carried out as a part of fertility cults.

7.1.2.2 Neolithic

In the EN, a strong correlation between females and young individuals can be recognised in bog burials. As mentioned in chapter 5, people belonging to these two categories are relatively often found with animal bones in bog areas. Notably, some persons, as well as animal bones, could be sacrificed, which produced blood. Blood can be symbolised as praying for not only a good harvest (Davidson 2015, 96) but also fertility, like the Mesolithic red colouring. Although it is difficult to assess the correct symbolic meaning of bog burials, the important point is that both some females and young individuals were commonly buried through ritual activities associated with red colour in the LM and the EN. This common feature can explain the reasons for the scarcity of red colouring among the EN burials; this is, a way of expressing the symbolic meanings of red colour might change from colouring in red to producing blood, for example, by sacrificing humans or animals in bog burials. Furthermore, we can extrapolate that the speciality of bog burials in the Neolithic, in a sense, could date back to the Mesolithic period in terms of some distinctive burials for females and young individuals.

7.2 What factors potentially influenced ancient cosmology and led to changing mortuary practices?

Some cosmologies implied in the EN burial practices could be derived from the LM. This corresponds with the argument by Hellewell and Milner (2011) that suggests the continuity of sensory dimensions such as ancestral worship in the Mesolithic-Neolithic transition in Britain. However, the introduction of new burial styles, like earthen long barrows, also really happened, indicating that any changes in the existing cosmologies should have coincided. Particularly, these transformations in the transitional periods have been influenced by the changes in social organisations due to the introduction of agriculture and domestication (e.g. Sherratt 1990, 149).

However, comparisons of burials and cosmologies between the two periods represent not dramatic but gradual alterations. Moreover, considering that interactions with the farming societies in central Europe had already started during the EBK period (Fischer 1982; Klassen 2002; Krause-Kyora *et al.* 2013; Sørensen 2009), we can infer that the influx of the farming lifestyles was unlikely to influence the LM burial practices. If so, there should have been other factors. One of the plausible factors can be the environmental changes like the fluctuations of the sea level because the sea transgression and regression might happen between Skateholm I and II (Larsson 2016, 176) and between the LM and the EN (Christensen 1995; Berglund *et al.* 2005), respectively.

7.2.1 Relationship between the sea transgression and burial and cosmological changes in the LM

The change in sea level near the LM burial sites is recognised in Skateholm (Larsson 2016), Vedbæk Bøgebakken (Christensen 1995) and Nivå 10 (Jensen 2016). Notably, the sea transgression around the Skateholm sites turned a lagoon with fresh or brackish water into a bay with an increased proportion of saltwater, and people changed their preference for consumption to much more saltwater species in Skateholm I (Jonsson 1988, 82; Larsson 1992, 21). Moreover, the aforementioned pathological investigations (e.g. enamel hypoplasia and activity-induced stress phenomena) also represent the trend in which some divisions of social roles based on sexes potentially occurred in Skateholm I. These features signify the transformations of human activities in their daily lives, which might perhaps have something to do with the sea transgression from the period of Skateholm II. If so, we can infer that variations in burial practices between the two Skateholm sites could be derived from this environmental change.

However, burials in two Skateholm sites share the process of a proper burial starting from death. This means that, as shown in Fig. 3.6, invariable activities in burials did not change; rather, various burials variations can be regarded as merely personal transformations of *habitus* (Dietler and Herbich 1998, 253). Namely, immigrants or interregional interactions provided various influxes of new burial styles. However, the new incoming knowledge did not probably influence the existing burial styles in the Skateholm area and was merely adopted as far as they could meet the local social demands. These viewpoints help us interpret that the sea transgression during the LM could become a trigger for the burial variability, but not for transforming the existing cosmology.

7.2.2 Relationship between the sea regression and burial and cosmological changes in the EN

Unlike the Mesolithic, transformations of the EN burials and cosmologies from the preceding period are more obvious. In the transitional period, the sea environment changed like the sea regression (Christensen 1995; Berglund *et al.* 2005), and the living's main food consumption was replaced from marine to terrestrial resources (Larsson 1992, 21; Richards *et al.* 2003). In addition, the availability of oysters declined; instead, the EN people preferred consuming cockles (Andersen 1989). These suggestions show the change of procurement strategies in the EN, which might result from the sea regression to some extent. Besides this, the argument by Shennan *et al.* (2013) that population density in southern Scandinavian regions rose probably because of a large number of immigrants from central Europe is also important since the decline of oyster consumption could be caused by over-exploitation (Lewis *et al.* 2016, 316). This indicates that ecological destruction and the great change in the residential environment in the EN happened due to combining these factors.

How can we understand the factors causing the transformations of ancient cosmology and burial practices from these environment and ecological changes? Obviously, changing the sea environment and increasing population density had a big impact on traditional food procurement, which probably caused people to alter their existing routine social activities. In fact, during the EN, settlement patterns changed, and a number of small-scale social groups, which might be composed of family-centred units, scattered across southern Scandinavian regions (Johansen 2005; Larsson 1992). If so,

it would be unfeasible to continue traditional burial styles and necessary to form new styles. Possibly, under this social situation, the influxes of incoming burial knowledge from other regions could play an important role in modelling new mortuary practices, unlike the LM.

Indeed, while the EN burials represent some traditional mortuary practices from the EBK across southern Scandinavia (such as the position in supine extension), various similarities to the TRB burials in north Germany, like building barrows, are also recognised (Rassmann 2010, 10-11). Particularly, constructing earthen long barrows can be a discriminative aspect for expressing the venerations for the ancestors in the EN period, as mentioned before. Moreover, erecting monuments could be essential to reproduce social identity, especially for maintaining small-scale collective groups; thus, these buildings were likely to be emphasised as a place for assembly and ritual activities to re-recognise their belongings (Furholt and Müller 2011, 29; Larsson 1992, 37).

Similarly, because of reducing the social scale, bog burials could also be started in order to let social members participate in rituals (Larsson 2011, 74). However, the purpose of this burial was probably different from earthen long barrows since the living placed the dead in wet areas and selected more females and young individuals. Notably, bog burials likely imply the intentional selection of wet areas as a burial place. Moreover, wet areas might be related to water or underground spirit, and some scholars argue that these can be regarded as a source for all organisms' lives (e.g. Larsson 2007, 67; Stewart and Strathern 2002, 116). Considering that the changes in

the environment and population density in the EN might cause ecological destruction, we can extrapolate that bog burials were possibly focused on the prey for fertility through deliberately burying more females and young individuals with animal bones.

From these viewpoints, we can extrapolate that the combination of environmental and ecological changes influenced not only the residential conditions but also traditional burial styles. Firstly, people needed to alter their social organisations on a small scale and form new burial styles that helped maintain their society by participating in ritual activities, possibly through constructing monuments and bog burials. This might mean the transformation of ancient cosmology and the necessity to adopt new burial knowledge. Therefore, beginning to construct earthen long barrows and bog burials in the EN can be regarded as not the personal transformation of *habitus* but the change of the existing invariable activities in burials.

7.3 Conclusion and further study

In conclusion, investigating the living's attitude towards the dead and death in funerary rituals through burial data represents no dramatic changes in ancient cosmology and burial practices between the LM and the EN. Rather, the potential origins of the EN burial features had already been recognised during the preceding timeframe, suggesting the continuity of the traditional invariable dimensions related to burial rituals in the LM. This means that some powerful impacts, which took place in the transitional period, caused the living to adopt new burial styles.

The case study in Skateholm sites shows that the sea level change potentially affected the mortuary practices and attitudes towards the dead and death and slightly changed them. Particularly, two remarkable burial transformations, venerations for the ancestors and a strong correlation between females and young individuals, occurred during the LM. Similarly, in the transitional period, the sea regression happened, and the population density rose. These factors might cause ecological destruction and the EN residents to create new lifestyles, such as living in small-scale groups composed of family-centred units. Simultaneously, it is inferred that traditional routinised burial rituals (e.g. inhumations) needed to be changed, which also meant the transformations of a proper burial and ancient cosmology.

Notably, earthen long barrows and bog burials can be regarded as representing the alterations of the traditional proper burial in the EN. For example, constructing monumental burials might be an improved version of the LM inhumations and greatly emphasise the locations of ancestors' graves. This played an important role in reproducing the social identity by participating in the systematic destructions and extensions of the buildings, which was likely to be important for people to maintain their small-scale social groups. Moreover, bog burials are potentially carried out for fertility cults by burying females and young individuals. The feature of this burial style could date back to the strong correlation between both people in the LM in terms of the colour of red, which can be found from the practice of red colouring in the LM inhumations and blood, occasionally caused by animal and human sacrifices, in the EN bog burials. Considering that burying in wet areas might also be related to water or

underground spirit, we can interpret that bog burials imply a stronger prayer for fertility, such as good harvest as well as childbirth.

These alterations of human attitudes in burial rituals can be interpreted as the transformations of the burial-related invariable dimensions, which likely resulted from the ecological changes in the transitional period. That is, ecological changes influenced the existing social organisations and burial rituals, leading to cosmological transformations. Then, these provoked the EN residents to create new burial practices that could meet the new social lifestyles and help maintain their societies.

This thesis mainly investigates burial data in the LM and the EN. In addition, there are several arguments for votive depositions, such as pottery and stone tools, around the area of earthen long barrows and bog burials in southern Scandinavia (e.g. Andersen and Johansen 1990; Kristensen 1989; Larsson 2007, 62). These objects are unclear to what extent related to contemporary mortuary practices, but for further research, examining them can be helpful in understanding ancient cosmology not only in burial rituals but also in daily lives. Besides this, adding more radiocarbon dating data to this examination can explore a clearer process of changing ancient cosmology and the influences on burial practices. Furthermore, sex determination in this project is based on the collected data, but osteological sexing sometimes shows unclear division. Therefore, a DNA analysis which can provide more information about biological sex will enhance the accuracy and might change the sex-related patterns identified in this thesis. Finally, this research limits the burial data to the LM and the EN periods across southern Scandinavia. By analysing the contemporary burial practices around the area,

such as northern Germany, we will be able to compare the cosmological transformations and the influences on mortuary practices with other areas. This comparison can help consider the general idea of how human attitudes towards the dead and death in burials could be changed in the transitional periods from foraging to farming.

Appendix

Appendix 1: Burial data collection in the late Mesolithic

Site	Grave No	Age	Sex	Position	Head Orientation (or Pit Direction)	Grave Goods (Stone)	Grave Goods (Bone)	Grave Gods Position	Red Colouring Position	References
Vedbåk Bøgebakken	1	young	Female	Supine Extension						(Albrethsesn and Petersen 1976; Brinch Petersen *et al*. 2015)
	2	MA	Male	Supine Extension						(Albrethsesn and Petersen 1976; Brinch Petersen *et al*. 2015)
	3	OMA	Female	Supine Extension	a-e				P	(Albrethsesn and Petersen 1976; Brinch Petersen *et al*. 2015)
	4	?	Male	Supine Extension	a	· blade-knife of flint	· slottet bone dagger · five heavily destroyed front teeth of wild pig · a single canine	RBA, P	P, C	(Albrethsesn and Petersen 1976; Brinch Petersen *et al*. 2015)
	5	adult	Male	Supine Extension	b	· flint blade		P	Entire Body	(Albrethsesn and Petersen 1976; Brinch Petersen *et al*. 2015)
	6	MA	Male	Supine Extension	a-e	· three flint blades	· antler axe	RBA	Present (around the intact part of the skeleton)	(Albrethsesn and Petersen 1976; Brinch Petersen *et al*. 2015)
	7	J	?	Supine Extension	c-g				Entire Body	(Albrethsesn and Petersen 1976; Brinch Petersen *et al*. 2015)
	8	(A) YA	Female	Supine Extension	c		· pendants (190 beads made from red deer teeth, wild pig front teeth) · pendants (a clod of perforated snail shells: Theodoxus=Neritia fluviatilis) · pendants (several rows of snail shells of the same species) · pendants (50 beads with red deer teeth, seal and elk)	H, P	H, P	(Albrethsesn and Petersen 1976; Brinch Petersen *et al*. 2015)
		(B) I	?	Supine Extension	c	· truncated blade	· swan's wing	P, UB	Entire Body	(Albrethsesn and Petersen 1976; Brinch Petersen *et al*. 2015)
	9	adult	Male	Supine Extension	c-g		· pendant? (a single front wild pig tooth)	H	Entire Body	(Albrethsesn and Petersen 1976; Brinch Petersen *et al*. 2015)
	10	MA	Male	Supine Extension	h	· two large flint blades · five big stones	· a pair of red deer antlers	P, AT	H	(Albrethsesn and Petersen 1976; Brinch Petersen *et al*. 2015)
	11		Male	*no skeleton	c-g	· a core-axe	· a red deer antler · a bone awl	?	H	(Albrethsesn and Petersen 1976; Brinch Petersen *et al*. 2015)
	12	MA	Male	Supine Extension	f	· two trucated flint blades	· a bone spatula	P	H, L	(Albrethsesn and Petersen 1976; Brinch Petersen *et al*. 2015)
	14	adult	Male	Supine Extension	c-g	· a flint blade · a core-axe		P, RLA	H	(Albrethsesn and Petersen 1976; Brinch Petersen *et al*. 2015)
	15	(A) adult	Female	Supine Extension	a-e					(Albrethsesn and Petersen 1976; Brinch Petersen *et al*. 2015)
		(B) I	?	Supine Extension	a-e					(Albrethsesn and Petersen 1976; Brinch Petersen *et al*. 2015)
	18	I	?	Supine Extension	b-f		· single decorative element ("Lower jaw of Mustela)	?	Entire Body	(Albrethsesn and Petersen 1976; Brinch Petersen *et al*. 2015)
	19	(A) YMA	Female	Supine Extension	g				C. P	(Albrethsesn and Petersen 1976; Brinch Petersen *et al*. 2015)
		(B) J	?	Supine Extension	g				H, C	(Albrethsesn and Petersen 1976; Brinch Petersen *et al*. 2015)
		(C) OMA	Female	Supine Extension	g	· a small blade-knife	· beads (fifty-odd tooth: three from human, six from red deer, two from wild pig, and one from an aurochs) · one half of the lower jaw from a pine marten · the distal end of a metacarpus or metatarsus and a phalanx from the same roe deer bone	H, C	H, A, P, L	(Albrethsesn and Petersen 1976; Brinch Petersen *et al*. 2015)
	20	young	Female	Hocker (left side)	a-e					(Albrethsesn and Petersen 1976; Brinch Petersen *et al*. 2015)
	21	I	?	Hocker						(Albrethsesn and Petersen 1976; Brinch Petersen *et al*. 2015)
	22	MA	Female	Supine Extension	g		· a pair of red deer antlers	H		(Albrethsesn and Petersen 1976; Brinch Petersen *et al*. 2015)
Gøngehusvej 7, Grave GØ	Double burial	YMA	Female	Supine Extension			· bone perforated skinning knives · a tooth pendant from a red deer · nine lower joints, metacarpal/metatarsal bones and astragalus (ankle bone) from roe deer · hairpin made of roe deer	H, C	H, P, L	(Brinch Petersen *et al.* 2015)
		J	?	Hocker (left side)		· a truncated flint blade · a white stone with a small, but natural hole at one end	· two complete sets of front teeth from red deer and roe deer, respectively · five single tooth pendants from the following species, boar, elk, aurochs, brown bear, and red deer · four metacarpal/metatarsal joints and anastragalus from roe deer	RBA, C	Entire Body	(Brinch Petersen *et al.* 2015)
	Feature Æ	YA	Female	Cremation		· a fire cracked fragment of flint blade · unburnt, flint blade	· unburnt remians of a complete corpse of a roe deer faun	?		(Brinch Petersen *et al.* 2015) (Brinch Petersen and Meiklejohn 2003)
	Feature N	YA	Male	Cremation		· two fragmented flintblades · a small microblade · a lump of unworked amber	· five front teeth from a young dog or a fox · five tooth pendants · front teeth from red deer · a set of bird wings · the claw of a crow	?		(Brinch Petersen *et al.* 2015) (Brinch Petersen and Meiklejohn 2003)
		YA	Female	Cremation						(Brinch Petersen *et al.* 2015) (Brinch Petersen and Meiklejohn 2003)
		A	?	Cremation						(Brinch Petersen *et al.* 2015) (Brinch Petersen and Meiklejohn 2003)
		J	?	Cremation						(Brinch Petersen *et al.* 2015) (Brinch Petersen and Meiklejohn 2003)
		I	?	Cremation						(Brinch Petersen *et al.* 2015) (Brinch Petersen and Meiklejohn 2003)
	Feature Ø	I	?	Cremation			· animal tooth	?		(Brinch Petersen et al, 2015)
Vedbæk Boldbaner		adult	Female	Cremation						(Brinch Petersen and Meiklejohn 2003)
Nederst	1		?	Supine Extension	h	· a flint blade		?	H	(Kannegaard 2016)
	2	OMA	Male	Supine Extension	b	· no less than two types of axes (ground stone axe, flake) · two blade knives · six transverse arrowheads · a flake axe and four flint flakes with a hook-shaped edge	· an antler axe · the epiphysis of a red deer metatarsal · perforated tooth pendants placed between his thighs (40 incisors of red deer, aurochs, elk)	H, LBA, P, RLL, BL	H, P	(Kannegaard 2016)
	3	YMA	Male	Hocker		· blade knife		?	Present	(Kannegaard 2016)
	4	MA	Female	Supine Extension	b	· a piece of amber	· six tooth pendants (red deer incisors)	H, LLA		(Kannegaard 2016)
	5	adult	Female	Supine	b	· 8 irregular bladelets	· a total of 25 tooth pendants (incisors of roe deer, red deer, aurochs, wild boar) · bone dagger	RLA, UB, C	H, P	(Kannegaard 2016)
	6	J	?	Supine Extension	h	· blade knife · a coarse flint flake with a hook-shaped edge	· perforated teeth pendants (six wild boar incisors, a single aurochs incisors) · a tooth ornament (four red deer incisors and small aurochs incisors)	RBA, C, LLL, BL	Entire Body	(Kannegaard 2016)

Nivå10	1 (A41)		Male	Supine	d-h					(Jensen 2016)
	2 (A122)	OMA	Male		b-f				H	(Jensen 2016)
	3 (A124)	YMA	Male	Supine	a-e	· a hammer stone of quartize · a small flint blade	· red deer antler	C, LLL, BL		(Jensen 2016)
	4 (A127)		?	Cremation					Present	(Jensen 2016)
	5 (A128)	adult	?	Cremation						(Jensen 2016)
	6 (A129)	YMA	Male	Supine Extension	e	· a flint phallus	· tooth ornament from a red deer · eight tooth pendants from roe deer	H, P	H, C, L (between his femora)	(Jensen 2016)
		J	?	Supine Extension	e		· two tooth pendants	BL	Left side	(Jensen 2016)
	7 (A136)	OMA	?	Supine	c-g					(Jensen 2016)
	8 (A137)	YA	Male	Supine Extension	a-e					(Jensen 2016)
		A	Female	Supine Extension	a-e					(Jensen 2016)
	9 (A144)	YMA	Male	Cremation						(Jensen 2016)
	10 (A151)	YMA	Male	Supine	d-h				H, C, A, L	(Jensen 2016)
		OMA	Female	Supine	d-h				H, A, L	(Jensen 2016)
	11 (A161)	A	Female	Supine	d				H	(Jensen 2016)
	12 (A162)	MA	Male	Supine Extension	b-f	· a flint kife and flint blade		P		(Jensen 2016)
Dragsholm	1 (A)	YA	Female	Supine Extension	h		· bone dagger (made from the metacarpus/metatarsus of a red deer) · a belt (adorned with a string of deer tooth pendants)	P	Entire Body	(Douglas Price *et al*. 2007)
	1 (B)	MA	Female	Supine Extension	h	· a single transverse arrowhead	· pelvic girdle of red deer 22 teeth (a single aurochs incisor) · three incisors of a wild boar · perforated seven front teeth of aurochs · a bone bin (hairpin?)	H, RLA, C, P	H, Left side	(Douglas Price *et al*. 2007)
Norsminde		YMA	Female		f					(Andersen 1989) (Fischer et al. 2007)
Melby		OMA	Male	Supine Extension	g	· two round butted axes		H		(Hansen *et al.* 1972)
Mollegabet II	1	YA	Male				· antler?	?		(Grøn and Skaarup 1991)
Strøby Egede (mass grave)	A	MA	Female	Supine Extension	e		· hairpin	H		(Strassburg 1997)
	B	J	?	Supine Extension	e		· 10 red deer tooth beads	P		(Strassburg 1997)
	C	YA	Female	Supine Extension	e	· a small blade knife	· 8 red deer tooth beads · hair pin	P		(Strassburg 1997)
	D	YMA	Male	Supine Extension	a	· 5 large flint blades/ blade knives	· a flat bone dagger	H		(Strassburg 1997)
	E	J	?	Supine Extension	a	· 2 blade knives		P	H	(Strassburg 1997)
	F	I	?	Supine Extension	e		· an elongated boar tooth · parts from 2 roe deer hooves	H		(Strassburg 1997)
	G	I	?	Supine Extension	a	2 small blade kinives		P		(Strassburg 1997)
	H	I	?	Supine Extension	a		· one elongated boar tooth · 12 red deer tooth beads	H	H	(Strassburg 1997)
	extra	YMA	Male	Supine Extension	g	· flake axe	· 2 long and heavily eroded bone points: by ne of the calves	H, L	P	(Strassburg 1997)
Nivågaard	1	J	?	Supine Extension						(Rasmussen *et al*. 2009) (Meiklejohn *et al.* 2009)
Fannerup	1	OMA	Male	Supine Extension	b	· two flint-flakes	· an decorated antler staff	P, H	Present	(Rasmussen 1990) (Bennike and Alexandersen 1990)
	2		?				· a single tooth-bead	?	Present	(Rasmussen 1990)
Koed	1	young	Male						Entire Body	(Rasmussen 1990) (Meiklejohn *et al.* 2009)
	2	young	Male						Present	(Rasmussen 1990) (Meiklejohn *et al.* 2009)
	3	adult	Male						Present	(Rasmussen 1990) (Meiklejohn *et al.* 2009)
	4	young	Female						Present	(Rasmussen 1990) (Meiklejohn *et al.* 2009)
	5		?						Present	(Rasmussen 1990) (Meiklejohn *et al.* 2009)
Holmegaard-Jutland	1	YA	Male	Extension	b-f					(Andersen *et al.* 1986) (Meiklejohn 2009)
Vænge Sø	1	YA	Male	Extension	d-h					(Andersen *et al.* 1986) (Meiklejohn 2009)
	2		Female	Extension	d-h					(Andersen *et al.* 1986) (Meiklejohn 2009)
Helgenæs	1		Male			· a flint knife · a transverse arrowhead · a small piece of amber		OB		(Brinch Petersen and Meiklejohn 2009)
Korsør Nor	1	OMA	Male	Supine Extension		· a blade knife		?		(Schilling 1997) (Bennike 1997)
	2	MA	Male							(Schilling 1997) (Bennike 1997)
	3	adult	?							(Schilling 1997) (Bennike 1997)
	4	adult	?							(Schilling 1997) (Bennike 1997)
	5	adult	?							(Schilling 1997) (Bennike 1997)
	6	J	?							(Schilling 1997) (Bennike 1997)
	7	J	?							(Schilling 1997) (Bennike 1997)
Tybrind Vig	I	A	Female	Supine Extension	a					(Malm 1995) (Andersen 1985) (Andersen *et al.* 2013)
		I	?	Supine Extension	h					(Malm 1995) (Andersen 1985) (Andersen *et al.* 2013)
	A	YA	Female				· a red deer perforated pendants?	?		(Malm 1995) (Andersen 1985) (Andersen *et al.* 2013)
	B	OMA	Female							(Malm 1995) (Andersen 1985) (Andersen *et al.* 2013)
	II		Male	Supine Extension	g					(Malm 1995) (Andersen 1985) (Andersen *et al.* 2013)
			Female	Supine Extension	g					(Malm 1995) (Andersen 1985) (Andersen *et al.* 2013)

Skatehlom I	1	MA	Male	Hocker (left side)	f	flint		P		(Larsson 1988)
	2	MA	Male	Sitting	c				C, L	(Larsson 1988) (Brinch Petersen *et al.* 2015)
	3	YA	Female	Sitting	b					(Larsson 1988)
	4	MA	Female	Hocker (left side)	d					(Larsson 1988) (Persson and Persson 1984)
	5	YA	Male	Sitting	c				LLL	(Larsson 1988)
	6	(A) OMA	Female	Sitting	b		· bone tool	LLL	P, L	(Larsson 1984; 1988; 1989) (Nilsson Stutz 2003)
		(B) F	?		b		· 32 perforated teeth of wild boar · unperforated tooth of an elk	OB, UB	P, L	(Larsson 1984, 1988, 1989) (Nilsson Stutz 2003)
	7	OMA	Male	Hocker (right side)	g	· a transverse arrowhead · a blade	· a bone needle	RLA, H		(Larsson 1988) (Persson and persson 1984)
	8	J	?		?					(Larsson 1988)
	11	MA	Male		?					(Larsson 1988; 1989c) (Persson and Persson 1984)
	12	YA	Female	Supine Extension	c-g	· amber	· bone awl	RLL		(Larsson 1988)
	13	OMA	Male		c-g	· a transverse arrowhead		P		(Larsson 1984; 1988; 1989) (Persson and Persson 1984) (Nilsson Stutz 2003)
	14	(A) MA	Male	Supine Extension	e	· flint flake		C		(Larsson 1984; 1988) (Persson and Persson 1984)
		(B) YA	Female	Hocker (right side)	e	· iron-bearing material	· a large portion of a marten cranium · fragments of jaws from red deer, roe deer and wild boar	OB, H		(Larsson 1984; 1988) (Persson and Persson 1984)
	16	YA	Male	Sitting	c	· a transverse arrowhead	· 32 deer teeth	L, LLL		(Larsson 1988) (Persson and Persson 1984)
	20	?	?		?					(Larsson 1988) (Persson and Persson 1984)
	21	YA	Female	Supine Extension	g		· head-band made from several deer-teeth · adornment made from teeth of wild boar	H, P	H, P	(Larsson 1988)
	22	MA	Male	Sitting	e	· five flint flakes	· shafted-holed, ornated antler axe	UB, LLL	H	(Larsson 1984; 1988) (Persson and Persson 1984) (Nilsson Stutz 2003)
	24	MA	Female	Hocker (left side)	g					(Larsson 1988) (Persson and Persson 1984) (Nilsson Stutz 2003)
	25	OMA	Female	Sitting	a				P, BL	(Larsson 1988) (Persson and Persson 1984)
	26	OMA	Female	Hocker (left side)	a				H, P	(Larsson 1984; 1988; 1989c) (Persson and Persson 1984)
	27	OMA	Male	Supine Extension	c	· two flints		BL		(Larsson 1988) (Persson and Persson 1984)
	28	MA	Male	Supine Extension	g		· 3 antlers (perccusion points)	H	P	(Larsson 1984, 1988) (Persson and Persson 1984) (Nilsson Stutz 2003)
	32	YA	Male	Sitting	b	· flint flake		P		(Larsson 1988) (Persson and Persson 1984)
	33	MA	Male	Prone Extension	c	· two transverse arrowheads		BL, AT		(Larsson 1984, 1988) (Persson and Persson 1984) (Karsten and Knarrström 2003)
	34	OMA	?	Supine Extension	g	· transverse point	· 22cm-long pointed object of bone · worked bone	L, C, ?		(Larsson 1988) (Persson and Persson 1984)
	35	OMA	Female	Hocker (right side)	f					(Larsson 1988) (Persson and Persson 1984)
	36	OMA	?	Supine Extension	h				Entire Body	(Larsson 1988) (Persson and Persson 1984)
	37	MA	Female	Supine Extension	g					(Larsson 1988) (Persson and Persson 1984)
	38	YA	Male	Hocker (left side)	a					(Larsson 1988) (Persson and Persson 1984)
	39	MA	?	Sitting	a					(Larsson 1988)
	40	OMA	Female	Hocker (right side)	g		· a collection of tooth beads of boar	C	C	(Larsson 1984; 1988) (Nilsson Stutz 2003)
	41	(A) MA	Male	Hocker (right side)	h					(Larsson 1984; 1988; 1989c) (Nilsson Stutz 2003)
		(B) J	?	Hocker (left side)	h	· a flint knife · four perforated pieces of amber	· two perforated eye-teeth of bear · a short bone point	C, LL	Entire Body	(Larsson 1984; 1988; 1989c) (Nilsson Stutz 2003)
	42	J	?		?					(Larsson 1988)
	43	MA	Female	Supine Extension	f					(Larsson 1988)
	44	MA	?		g					(Larsson 1988)
	45	YMA	?	Hocker (right side)	d	· a flint	· animla teeth	P, LL	in the central part of the feature	(Larsson 1988)
	46	MA	Female	Supine Extension	h	· four pieces of amber	· three sets of red-deer fore-teeth (all in their correct dental order) · fragments of the upper jaw	H		(Larsson 1984; 1988)
		child	?							
	47	(A) A	Male	Supine Extension	a	· no less than three pecked stone axes · a large flake · an oblong stone	· two tooth beads	LLA, BL	Entire Body	(Larsson 1984; 1988) (Nilsson Stutz 2003)
		(B) I	?	Supine Extension	a		· animal bones	?	Entire Body	(Larsson 1984; 1988) (Nilsson Stutz 2003)
	48	adult	?	Sitting	b	· flint flake		RLL	L	(Larsson 1988)
	49	MA	?	Supine Extension	a	· flint knife		LLL		(Larsson 1988)
	50	adult	?		b-f					(Larsson 1988)
	51	MA	Male	Hocker (right side)	f				P, L	(Larsson 1988)
	52	MA	Female	Hocker (left side)	d					(Larsson 1988)
	53	YA	Female	Supine Extension	g		· 30 perforated teeth, some from elk (including auroches?) · perforated teeth of elk, red deer and wild boar	P, LLA, LLL		(Larsson 1984; 1988; 1989)
	54	adult	?	Sitting	b-f					(Larsson 1988)
	55	adult	?	Supine Extension	e	· flint flake		BL		(Larsson 1988) (Nilsson Stutz 2003)
	56	adult	?		b					(Larsson 1988)
	57	YA	?	Supine Extension	h	· flint flake		BL		(Larsson 1988)

Skatehlm I	58	MA	Female	Hocker (right side)	a					(Larsson 1988) (Nilsson Stutz 2003)
	59	YA	?		c-g		· around 20 teeth of wild boarand red deer	?	in the western part	(Larsson 1988)
	60	young	Female	Hocker (right side)	h					(Larsson 1988) (Nilsson Stutz 2003)
	61	OMA	?		a	· an axe (Nilsson Stutz 2003, Appendix, 88)		LL		(Larsson 1988) (Nilsson Stutz 2003)
	62	MA	Female	Sitting	?					(Larsson 1988)
	63	(A) OMA	Male	Hocker (left side)	g					(Larsson 1988)
		(B) OMA	Male	Hocker (left side)	g					(Larsson 1988)
	64	I	?		?					(Larsson 1988)
Skateholm II	I	J	?	Supine Extension	e	· transverse point		LLL		(Larsson 1988)
	II	YMA	Male	Sitting	a	· a long ang narrow stone axe with one vaulted and one plane side · two transverse arrowheads	· a fragmentary, ornamented bone tool	H, RLL, LLL		(Larsson 1984; 1988) (Persson and Persson 1984) (Nilsson Stutz 2003)
	III	YMA	Female	Supine Extension	g		· fossil	?		(Larsson 1988) (Persson and Persson 1984)
	IV	OMA	Male	Supine Extension	a	· a pecked stone axe · a pecked stone axe · two grinding plates · four blades · a round stone	· a bone harpoon · a long, norrow, bone needle · a slotted bone knife	H, UB	H	(Larsson 1984; 1988; 1989c) (Nilsson Stutz 2003)
	V	OMA	Female	Supine Extension	f					(Larsson 1988)
	VI	MA	Female	Supine Extension	g		· fossil	P		(Larsson 1988)
	VII	MA	Male	Supine Extension	f					(Larsson 1988)
	VIII	OMA	Female	Sitting	g		· a row of some 100 tooth beads from red deer	P		(Larsson 1984; 1988; 1989c) (Nilsson Stutz 2003)
	IX	MA	Female	Supine Extension	e	· an arrowhead	· a fragment of a wild boar ulna	C		(Larsson 1988) (Nilsson Stutz 2003)
	X	(A) YMA	Male	Supine Extension	f	· a flint blade · a pecked stone · a transverse arrowhead	· a wild boar's tusk · a perforated tooth	H, P, LLL, BL		(Larsson 1984; 1988) (Nlsson Stutz 2003)
		(B) YA	Male	Sitting	b	· beads and a nodule of ferrous material remain	· tooth beads from red deer, wild boar and elk · broken joints of bone (neck decoration) · a long and narrow bone artefacts	H, C, P, LL	P	(Larsson 1984; 1988) (Nlsson Stutz 2003)
	XI	YA	Male	Supine Extension	e	· some flint flakes		H		(Larsson 1984; 1988; 1989c)
	XII	(A) J	?	Hocker	?	· two flint blades		?	H	(Larsson 1988; 1989c) (Nilsson Stutz 2003)
		(B) J	?	Hocker	?		· a long bone point	?	H	(Larsson 1988; 1989c) (Nilsson Stutz 2003)
	XIII	I	?	Supine Extension	a	· stone plate · flint flake		L, H		(Larsson 1988)
	XIV	MA	Female	Hocker (right side)	f					(Larsson 1988)
	XV	YA	Male	Sitting	b	· two flint blades · a core axe	· two antlers of red deer · a large antler · a row of perforated teeth of red deer (the remains of a more elaborate head-dress) · several teeth of wild boar	H, RLA, P, LLL, AT	H	(Larsson 1988; 1989c) (Nilsson Stutz 2003)
	XVI	MA	Female	Supine Extension	a	· Flint flake		H		(Larsson 1988) (Nilsson Stutz 2003)
	XVII	YMA	Male	Supine Extension	f	· flint blade	· the maxilla and skull of a pine marten · a porpoise vertebra	RLA, P		(Larsson 1988)
	XVIII	MA	Male		?	· flint		?		(Larsson 1988)
	XX	YA	Female	Supine Extension	d	· three flint knives	· a row perforated tooth beads (including teeth from aurochs) · tooth beads · a red deer antler · an ornamented hammer of red deer antler	H, P, UB		(Larsson 1988; 1989c) (Nilsson Stutz 2003)
	XXII	OMA	Female	Sitting	g	· a parforated rectangular schist plaque	· an antler · two perforated marten mandibles	H, P		(Larsson 1988) (Nilsson Stutz 2003)
Tågerup	3	J	?	Supine Extension	g	· a used knife · a used blade knife and flake knife	· twelve tooth beads (made of red deer)	H, C, P	Entire Body	(Ahlström 2003) (Karsten and Knarrström 2001; 2003)
	4	OMA	Female	Supine Extension	g	· one butt fragment of a small core axe · a polygonal core · a rejuvenation flake · a little grindstone · eight blades	· a concentration of teeth · a handle of red deer antler · traces of a mandible	H, LLA	P, L	(Ahlström 2003) (Karsten and Knarrström 2001; 2003)
	6	J	Male	Hocker (left side)	c					(Ahlström 2003) (Karsten and Knarrström 2001; 2003)
Groß Fredenwalde	feature 1/4	YA	Male	Standing Upright		· about 30 flint artefacts (blade) · two large trucated blades · a small bladelet core (used as a hammer stone)	· two bone awls?	?		(Terberger *et al.* 2015)
Plau (northen Germany)	1		?	Hocker			· two worked boar canines · three tooth pendants on red deer · a red deer antler axe	?		(Brinch Petersen and Meiklejohn 2009) (Meiklejohn *et al.* 2009)

Appendix 2: Burial data collection in the early Neolithic

	Site	Grave No	Age	Sex	Position	Head Orientation	Grave Goods (Stone)	Grave Goods (Bone)	Grave Goods (Clay)	Grave Goods Position	References
Inhumations	Dragsholm	2	YMA	Male	Supine Extension	g	· three flint blades · four transverse arrowheads · a strike-a-light flint · six transverse arrowheads · a battleaxe of greenstone · amber pendants	· an antler beam · A bone spatula · a wrist guard of bone	· a ceramic pot	H. LLA, RLA, RBA, LBA, OC	(Douglas Price *et al.* 2007)
	Lohals (northern Langeland)	double burial	Adult	Male	Extension	a	· the blade of a thin-butted flint axe		· a collared flask	H, LLL	(Strassburg 2000, 357)
			Adult	Female	Extension	a	· a thin-butted flint axe · a thin-bladed thin-butted flint axe			H, BL	(Strassburg 2000, 357)
	Ertebølle		Adult	Male	Supine Extension	b	· two truncated flint blades			?	(Brinch Petersen and Meiklejohn 2009), (Fischer et al. 2007)
	Nab-Kildegård		I						· a collar bottle · an eyelet bottle	?	(Sørensen 2014, 202) (Ebbesen 1994, 88)
	Åmølle				Supine Extension	h					(Strassburg 2000, 356-357) (Madsen *et al.* 1900, 100-101)
					Supine Extension	h					(Strassburg 2000, 356-357) (Madsen *et al.* 1900, 100-101)
Earthen Long Barrows	Grøfte	chamber A	YA	Male			· half a halberd		· two lugged flasks · two undecorated side-sherds	?	(Ebbesen 1988) (Bennike 1988)
			Adult	Male							(Ebbesen 1988) (Bennike 1988)
		chamber B	OMA	Female			· some sherds of a whetstone		· a lugged flask	?	(Ebbesen 1988) (Bennike 1988)
	Byholm Nørremark	grave 1	A				· an amber and an arrowhead				(Madsen 1979, 307) (Midgley 1985, 289-290)
		grave 2	Adult	Male	Supine Extension	2 individuals with the heads towards the east direction (c) and the other 2 individuals towards the west direction (g)					(Madsen 1979, 307) (Midgley 1985, 289-290)
			Adult	Male	Supine Extension						(Madsen 1979, 307) (Midgley 1985, 289-290)
			Adult	Male	Supine Extension						(Madsen 1979, 307) (Midgley 1985, 289-290)
			Adult	Male	Supine Extension						(Madsen 1979, 307) (Midgley 1985, 289-290)
	Skibhøj	grave 1	YA		Supine Extension	b	· 1 flint axe · amber beads · an amber ornament with perforated edge				(Madsen 1979, 305) (Midgley 1985, 298)
			J		Supine Extension	b					(Madsen 1979, 305) (Midgley 1985, 298)
			J		Supine Extension	b					(Madsen 1979, 305) (Midgley 1985, 298)
			J		Supine Extension	b					(Madsen 1979, 305) (Midgley 1985, 298)
			I			b					(Madsen 1979, 305) (Midgley 1985, 298)
	Asmusgård (Århus)		?				· 5-6 ambers				(Ahlers 2018, 127-129) (Ebbesen 1992, 93)
	Stengade	grave 1	J				· 4 transverse arrowheads		· sherds of a lugged beaker · lugged jug	?	(Madsen 1979, 308) (Midgley 1985, 298-299)
	Tarp		J	Female			· amber				(Ahlers 2018, 127-129)
			J	Male							(Ahlers 2018, 127-129)
	Strynø		J				· an unpolished thin-butted flint axe		· one large lugged vessel	?	(Strassburg 2000, 357)
Bog Burials	Bolkilde	Skeleton I	A	Male	Supine Extension	e					(Bennike et al. 1986a)
		Skeleton II	YMA	Male	Supine Extension	e					(Bennike et al. 1986a)
	Sigersal	Skeleton A	YA	Female					· a lugged vessel	?	(Bennike et al. 1986a, b) (Ahlers 2018, 201)
		Skeleton B	A								(Bennike et al. 1986a, b) (Ahlers 2018, 201)
	Tysmosen		Young								(Bennike 1999)
			Young								(Bennike 1999)
	Myrebjerg Mose		Young								(Bennike 1999)
			Young								(Bennike 1999)
			J								(Bennike 1999)
			J								(Bennike 1999)
			Adult								(Bennike 1999)
	Porsmose		OMA	Male							(Bennike 1999) (Ahlers 2018, 201) (Strassburg 2000, 361)
	Andemosen		A	Male					· a collared flask	?	(Bennike 1999) (Ahlers 2018, 201)
	Østrup bog		A	Female				· a swan	· seven relinquished pots	?	(Bennike 1999) (Fischer et al. 2007) (Strassburg 2000, 360)
			Young	Male			· flints and flint flakes				(Bennike 1999) (Fischer et al. 2007) (Strassburg 2000, 360)
			Adult	Female							(Bennike 1999) (Fischer et al. 2007) (Strassburg 2000, 360)
	Døjringe bog		YA	Male							(Bennike 1999) (Ahlers 2018, 201) (Strassburg 2000, 361)
			Young	Male							(Bennike 1999) (Ahlers 2018, 201) (Strassburg 2000, 361)
	Vibygårds		Adult	Male							(Bennike 1999) (Ahlers 2018, 201) (Strassburg 2000, 361)
	Øgårde 13		Adult	Male			· two flint flakes	· a dagger from a cattle bone	· a pot	?	(Strassburg 2000, 359) (Koch 1998, 311-312)
	Hesselbjerg		A					· Pig, red deer, beaver and crane			(Koch 1998, 254)
			YMA	Female							
	Paarup		J								(Koch 1998, 258)
	Ferle Enge		YMA	Female				· parts of two pigs, bones from sheep and roe deer			(Koch 1998, 261)
			A								
	Viksø Mose			Male				· some animal bones (birds)			(Koch 1998, 277)
				Female							
			Adult	Female	Supine Extension	b					
	Ulvemose		YA	Male					· collard flasks	?	(Koch 1998, 376)
			YA	Male							
			YMA	Female							
			A								
			A								
			A								
			J								
			J								

Appendix 3: List of grave-pit's Length/Width measurements in the Early Neolithic inhumations and earthen long barrows (made from Sørensen 2014)

Inhumation				Earthen Long Barrow	
Site	Orientation	Length (m)	Width (m)	Site	Orientation
Dragsholm, male grave	E-W			Almhov long barrow 1, A41	E-W
Musholmparken	E-W	3.5	7	Almhov long barrow 2, A33	E-W
Gislingegård II, N23	N-S	3.7	2.5	Almhov long barrow 3, A34	E-W
Sallingelunde, grave A	E-W	4.7	1.85	Almhov long barrow 4, A37	E-W
Sallingelunde, grave B	E-W	3.3	1.6	Almhov long barrow 5	E-W
Sallingelunde, grave C	E-W	1.7	1.15	Hö rlanders väg	E-W
Strynø	E-W	2	1	Söder om Hans Win- bergs väg, north	NW-SE
Fakkebjerg	N-S			Söder om Hans Win- bergs väg, south	NW-SE
Lohals	NE-SW	2.5	1.5	Jättegraven	E-W
Klokkehøj	E-W	3	2	Örnakulla	E-W
Stengade II, grave HO	E-W	3.3	1.85	Skogsdala	ENE-WSW
Ny Burholt	NW-SE	1.8	1	Southern Kristineberg	E-W
Sønderhede	NW-SE	2	1	Northern Kristineberg	E-W
Søndergård grave I	E-W			Southern Krångeltofta	NE-SW
Søndergård grave III	E-W			Northern Krångeltofta	NE-SW
Hjørring Bjerge	N-S	2.5	2	Southern Kåglinge	NE-SW
Bjergby II	SE-NW	2	1	Northern Kåglinge	NE-SW
Bjergby I	SE-NW	2	1	Fosie 9	E-W
Tårs	E-W			Lockarps bageri	E-W
Nørhågårdsvej	NW-SE	5	3.5	Asnæs Forskov	N-S
Torderup	E-W	2.1	1.1	Grøfte	SE-NW
Sejlflod grave, PY	E-W	2.4	1	Hyldebækgård 1	E-W
Stistrup	SE-NW	12	12	Kildegård 2	E-W
Vivetergårde	SE-NW	3	1.5	Kokkedal station	E-W
Tolstrup Mark	NW-SE	3.15	1.7	Lindebjerg	E-W
St. Ajstrup I, II (several phases)	E-W	2.5	1.2	Onsved Mark	E-W
Enggårds Mark	N-S	2	1	Oreby Skov	NE-SW
Skivum Østerkrat, grave A	E-W	1.75	0.45	Strandegaard	N-S
Skivum Østerkrat, grave B	E-W	2.4	1.4	Vedskølle	ENE-WSW
Svanfolk	NW-SE		1.2	Ølstykke	N-S
Kløvermarken	NW-SE	2	0.9	Have Borupvej	N-S
Søttrup	E-W	2	1	Kelderød	NE-SW
Astrup	E-W	1.8	0.4	Gulstav Østerskov	E-W
Hvorvarp	E-W	2.2	1.2	Illebølle	ENE-WSW
Nørregade 57	NE-SW	3	1	Stengade I	ENE-WSW
Øster Teglgård, grave Q	SE-NW	1.5	1	Stengade II	ENE-WSW
Vammen	NE-SW	3	1	Stengade	ENE-WSW
Fastrup, southern/ northern grave	E-W	2.5	1	Højensvej Høj 7	E-W
Tohøj	E-W	2	1	Højensvej Høj 3	E-W
Storgård V, grave B	E-W	3.2	0.6	Toftelund	E-W
Vroue Bjerg	E-W	2.6	0.7	Søndersø	ENE-WSW
Vroue Hede, grave 1	NE-SW	1.9	0.45	Strandby Skovgrav	SE-NW
Vroue Hede, grave 2	NE-SW	2	1.05	Sarup Gamle Skole XII	ENE-WSW
Vroue Hede, grave 3	NW-SE	2.2	1.1	Lundehøj	ENE-WSW
Vroue Hede VI, grave 1	NW-SE	2.6	1.2	Strynø	SE-NW
Søvsøgård	E-W	1.7	0.6	Aistrupgaarde	ESE-WNW
Hedevang 1, grave V	E-W	2.7	1	Anshede (possible long barrow)	E-W
Volling	WSW-ENE	2.5	1	Assing	NW-SE
Thorsø	E-W			Barkær A/ grave 3-4	ESE-WNW
Krejbjerg Hede	N-S	2.9	1.5	Barkær B/ grave 1-2	ESE-WNW
Vester Grønning	E-W	2	1	Bjerregrav Station	ESE-WNW
Rimsø	SE-NW	3.2	1.7	Bjørnsholm	SE-NW
Langkastrup	N-S	1.5	1	Blegsø Banke	ENE-WSW
Konens Høj	SW-NE	6.5	3	Brendkroggård	ENE-WSW
Østermarken	N-S	3.6	1.8	Bygholm Nørremark	E-W
Sandmarken 2	E-W	3	1	Bøgholt	SE-NW
Årslev	NW-SE	6	3	Den svenskestald	N-S
Asmusgård I	N-S	4.5	2.5	Engedal	N-S
Høiris II	N-S	2	1	Forum	E-W
Ibsgårde	N-S	2.7	1	Fredensholm, grave I-III	NW-SE
Højgård	E-W			Frøslev Polde	ESE-WNW
Kærbølling	E-W			Gartnerhaven	N-S
Jattrup	WSW-ENE	2	1.1	Gelsbro	N-S
Vesterbæk	E-W	2	1	Harreby I	E-W
V. Sognstrup	E-W	2	1.5	Harreby II	ENE-WSW
Forum	E-W	2.9	1	Havnbjerg Skov	E-W
Gl. Jerne	E-W			Hedegårde, grave 1-2	E-W
Sønder Ønlev	ESE-WNW	2	1.5	Hedelykke	N-S
Oxie		3.5	1.7	Højring	E-W
Almhov, A15849		5	3.7	Herrup XI, grave 178 and 186	ENE-WSW
Almhov, A12671		2.6	1.2	Højtvedgård	E-W
Nab-Kildegård		1.6	1	Kongsager	E-W
Stengade II, grave HE		1	0.6	Krogsgård	E-W
Aldershvile		2	1	Lomborg	E-W
Flade		2	1	Morup Mølle N1, 2, 3 & 4	NW-SE
Hørmested		2.5	1.1	Mosegården/ Toftum	ESE-WNW
Stenbakken		1.8	0.9	Møgelvang	NE-SW
Østergård II		1.2	2	Nybøl Vestermark	E-W
Tolstrup, grave, IV		2	1.5	Nygaard I-II (possible long barrow)	E-W
Lund		3	1.25	Nørregård	N-S
Storgård V, grave D		2.5	0.75	Nr. Hedegård A173	E-W
Trevad		2	1.3	Piletoftegård, phase 1-2	ENE-WSW
Skive		2.5	1	Ravning Mark I-II (possible long barrow)	E-W
Ginderup		2.4	1.1	Rokær	WSW-ENE
Krejbjerg		1.6	1	Rude II, AN, west	E-W
Bukkær		2.2	1	Rude II, AO, east	E-W
Sønderupgård		1.3	2	Rustrup Ia	E-W
Tarp, grave C-D		3	1	Rustrup I	E-W
Kjestrup		10	10	Rustrup II	E-W
Grønhøj		2	1	Råegårde phase A-B	SE-NW
Søgård Søndergård		2.5	0.75	Sædderup	WSW-ENE
Augustenhof		3	2	Sædding	E-W
				Salten Langhøj	E-W
				Sjørup Plantage	SE-NW
				Skibshøj	E-W
				Spanggårde	SE-NW
				Storgård IV, phase 1	NE-SW
				Storgård IV, phase 2	NE-SW
				Storup	N-S
				Surløkke	E-W
				Sønderris	E-W
				Søst Bygade	E-W
				Teglværksgården	SE-NW
				Thomasminde	ENE-WSW
				Thorshøj	E-W
				Tjæreborg	ENE-WSW
				Tolstrup/Bakkegården	SE-NW
				Troelstrup, 2 phases	ESE-WNW
				Trindbæk	E-W
				Troelstrup	ESE-WNW
				Vamdrup	E-W
				Vedsted	E-W
				Vroue Hede VIIIb	ESE-WNW
				Ølstrup	E-W
				Østergårds Mark A	NE-SW
				Østergårds Mark B	NE-SW
				årslev (possible long barrow)	SE-NW
				Brondum	E-W

Appendix 4: List of all burial data found together with grave items in the early Neolithic period

	Site	Grave No	Age	Sex	Grave Goods (Stone)	Grave Goods (Bone)	Grave Goods (Clay)
Inhumations	Dragsholm	2	YMA	Male	· three flint blades · four transverse arrowheads · a strike-a-light flint · six transverse arrowheads · a battleaxe of greenstone · amber pendants	· an antler beam · A bone spatula · a wrist guard of bone	· a ceramic pot of TRB A style
	Lohals (northern Langeland)	double burial	Adult	Male	· the blade of a thin-butted flint axe		· a collared flask
			Adult	Female	· a thin-butted flint axe · a thin-bladed thin-butted flint axe		
	Ertebølle		Adult	Male	· two truncated flint blades		
	Nab-Kildegård		J				· a collar flask · an eyelet flask
Earthen Long Barrows	Grøfte	chamber A	YA	Male	· half a halberd		· two lugged flasks · two undecorated side-sherds
			Adult	Male			
		chamber B	OMA	Female	some sherds of a whetstone		· a lugged flask
	Byholm Nørremark	grave 1	A		· an amber · an arrowhead		
	Skibhøj	grave 1	YA		· 1 flint axe · amber beads · an amber ornament with perforated edge		
			J				
			J				
			J				
			I				
	Asmusgård (Århus)		?		· 5-6 ambers		
	Stengade	grave 1	J		· 4 transverse arrowheads		· sherds of a lugged beaker, lugged jug
	Tarp		J	Female	· amber		
			J	Male			
	Strynø		J		· an unpolished thin-butted flint axe		· one large lugged vessel
Bog Burials	Sigersal bog		YA	Female			· the lugged vessel
			A				
	Andemosen		YA	Male			· collared flasks
	Østrup bog		A	Female		· a swan	· seven relinquished pots
			Young	Male	· flints and flint flakes		
	Øgårde 13		Young		· two flint flakes	· a dagger from a cattle bone	· a pot
	Hesselbjerg		A			· Pig, red deer, beaver and crane	
			YMA	Female			
	Paarup		J				
	Ferle Enge		YMA	Female		· parts of two pigs, bones from sheep and roe deer	
			A				
	Viksø Mose			Male		· some animal bones (birds)	
				Female			
			Adult	Female			
	Ulvemose		YA	Male			· collard flasks
			YA	Male			
			YMA	Female			
			A				
			A				
			A				
			J				
			J				

Appendix 5: List of individuals whose graves are constructed with some grave structures

Skateholm I	Sex	Note
Grave 11	Male	This grave contains a cremated male and a wooden structure which presumably had some connection with the burial act, arranging in two rows (one with three and one with four holes) (Nilsson Stutz 2003, Appendix, 38).
Grave 20	Undetermined	This grave contains a small accumulation of burnt human bones and the trace of post hole which could be used for some kinds of ttem poles (Larsson 1988, cited in Karsten and Knarrström 2003, 79).
Grave 26	Female	This grave contains a cremated female which and surrounding the traces of four post holes. Wooden structure would be built over the grave, had been burned down in the course of the burial ritual (Larsson 1984, 21-22; 1989, 372).
Grave 42	Undetermined	This grave contains a child estimated in a juvenile age group and occurs with post holes to the west of this grave feature (Nilsson Stutz 2003, Appendix, 69).
Grave 60	Female	This grave contains a female individual and is found with post holes in the periphery of this grave feaure. These holes suggest the trces of wooden structures which would be burned, but this practice was inferred to be insufficient to leave the extreme soot concentration observed here (Nilsson Stutz 2003, Appendix, 87).
Skateholm II	Sex	Note
Grave IV	Male	This grave contains a male individual and prenents a long and narrow band of dark-coloured soil. This feature is found at the level immediatery above the body, which could suggest a wood structure like wooden dug-out canoe (Larsson 2016, 178-179)
Gravw IX	Female	This grave contains a female individual. The right and left hemi-thoraxes of the skeleton collapse backward and outward and the posterior parts of the rib bones are lifted up. This skeketal arrangement can indicate an empty volume behind the back which occurred by the decompostion of some structures made from organic materials (Nilsson Stutz 2003, Appendix, 104).
Grave XV	Male	This grave contains a sitting male individual. This grave pit comprises two different-depth bases in the one end, which can be regarded as a construction of shelf (Nilsson Stutz 2003, Appendix, 110).
Grave XX	Female	This grave contains a femle indiviual who is surrounded by a discoloured band, which would be traces of wooden structure like wooden dug-out canoe (Larsson 2016, 178-179)

Appendix 6: List showing the information of individuals who are found with the traces of food offerings in Skateholm I and II (Jonsson 1986; Larsson 2002: Nilsson Stutz 2003)

Skateholm I	age	sex	The location of food offerings
4	MA	female	around the pelvis
6	(A) OMA	female	around the pelvis
7	OMA	male	by the feet/ in the filling/ Next to the head
11	MA	male	mixture with cremated human bones and burnt various fauna bones
22	MA	male	behind the feet
24	MA	female	around the stomach
25	OMA	female	around the stomach/ at the skeletal level
33	MA	male	between the jaws/ around the stomach area/ Dark area of the right side of the body/ Under the body/ in the filling
35	OMA	female	in the region of the feet/ in the filling/ Next to the head
37	MA	female	behind the head
41	(A) MA	male	around the stomach/ Next to the head
43	MA	female	around the pelvis/ in the filling
48	adult	?	In the filling/ between the tibias
59	YA	?	in the filling/ in the western part of the pit
Skateholm II	age	sex	The location of food offerings
II	YMA	male	around the stomach
IX	MA	female	next to the right shoulder/ On the left shoulder/ Between the legs/ at the skeletal level/ In the filling/ around the stomach
X	(A) YMA	male	around the stomach/ In the filling
XI	YA	male	around the stomach/ In the filling
XIII	I	?	Next to the head
XV	YA	male	Next to the head/ around the pelvis/ Between the knees/ Dark area in the West part/ Next to the feet/ In the filling
XVI	MA	female	in the filling
XVII	YMA	male	around the pelvis/ In the filling

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