THE TIME-DEPTH OF CORDED WARE BURIAL LANDSCAPES

A comparative study of Single Grave and Battle Axe burial alignments in Denmark, The Netherlands and Sweden

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Fig. title page - Burial mounds on the alignment of Trehuse-Sjørup-Dollerup, Denmark; the Single Grave culture barrow 'Høj 20' seen from the south (Ebbesen 2006, 393, fig. 315).

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1 Introduction

Throughout large parts of Europe, the phenomenon of prehistoric burial mounds can still be seen in the present-day landscape. In some regions, there are clusters of burial mounds, and in others, there are long alignments of these barrows that can extend over dozens of kilometres. Therefore, one may speak of 'barrow landscapes', which can be composed of hundreds of burial mounds (Bourgeois 2013, 3-4).
In North-Western Europe, barrow landscapes appeared in the third and second millennia BC. The first round burial mounds usually covered an individual grave and were intentionally distributed over large areas in long alignments. This is a fundamental change from the preceding megaliths of the fifth and fourth millennia BC, which were characterised by communal burials and had a much smaller distribution (Bourgeois 2013, 5, 12; Scarre 2002, 2).

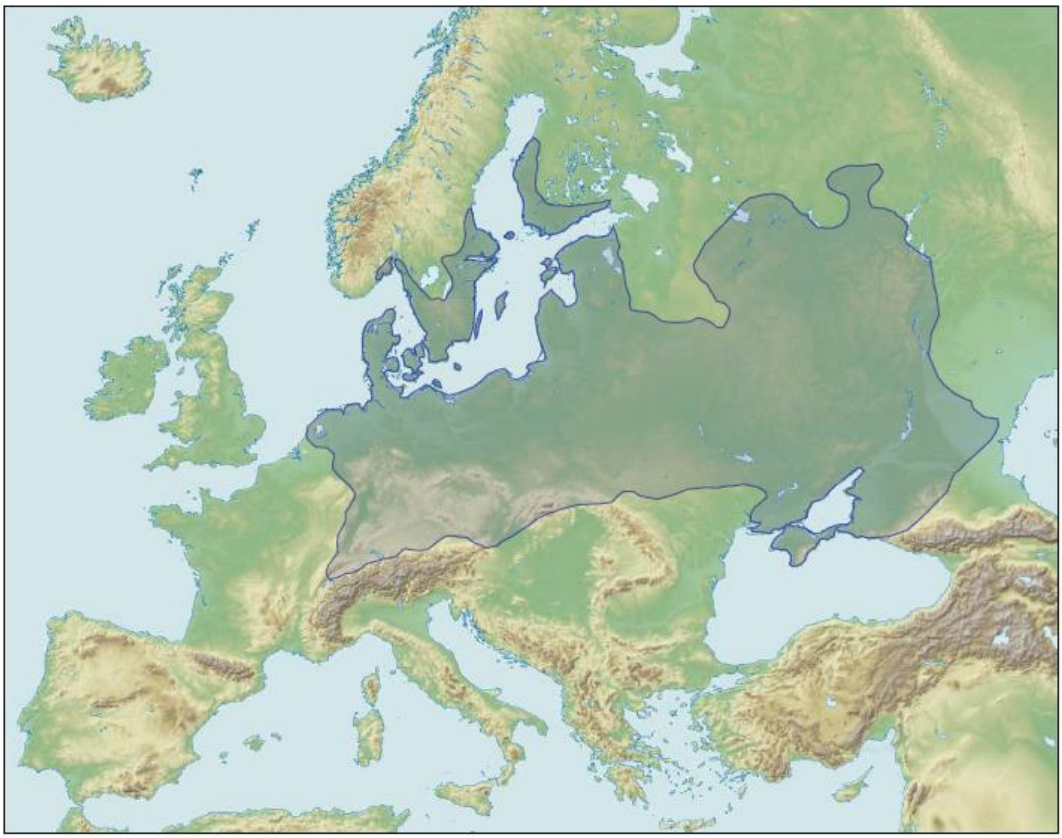

Figure 1.1 - The distribution of the Corded Ware culture (after Beckerman 2015, 15, fig. 1.1).

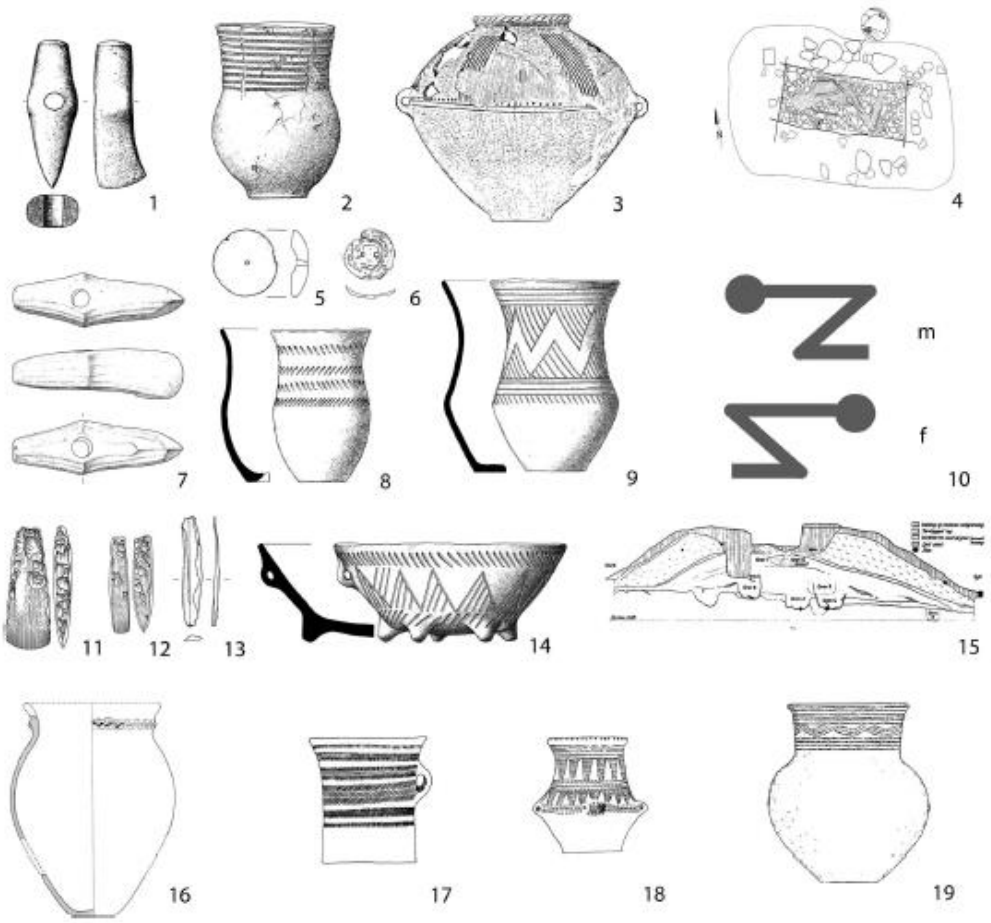

Figure 1.2 - The elements of the Corded Ware culture that recur throughout Europe. 1) Battle axes; 2) Corded Beaker; 3) 'Strichbündelamphora'; 4, 10 & 15) Single burial in a gender-specific position and beneath a barrow; 5) Amber disc; 6) Bone disc; 7) Facetted battle axe; 8) Beaker with a herring-bone decoration; 9) Beaker with a triangle-ornament; 11-13) (Flint) axe, chisel and blade; 14) Bowl; 16) 'Wellenleisten' storage vessel; 17) Straight-walled beaker; 18) Amphora; 19) Short-necked beaker (Furholt 2014, 69, fig. 2).

The first burial mounds are generally prescribed to the so-called Corded Ware culture (Bourgeois 2013, 163). This 'culture' arose in Central and Eastern Europe and spread across North-Western Europe during the Late Neolithic A (c. 2900-2450 BC) (fig. 1.1). It is characterised by a uniform burial rite: single graves of skeletons crouched in a gender-specific orientation, with beakers decorated with cord impressions and battle axes as grave goods (fig. 1.2) (Lohof 1994, 99; Schier 2014, 10). The rapid spread of the Corded Ware culture has often been associated with the dispersion of the Indo-European language and customs, including the horse and wheel (Anthony and Ringe 2015, 208, 210; Bourgeois 2014, 3-4). New results from

ancient DNA research seem to confirm that large-scale migration played a significant role in the spread of the Corded Ware culture (Kristiansen *et al.* 2017, 335). The Corded Ware culture corresponds with several regional variants, such as the Single Grave culture in The Netherlands and Denmark, and the Battle Axe culture in southern Sweden and Norway (fig. 1.3) (Ebbesen 2006, 15-6, 22; Malmer 2002, 131, 139; Schier 2014, 10). These regional variants do have certain differences; for example, in the Battle Axe culture, flat-graves are a common grave-form. This grave-form is however unusual in the Single Grave culture (Ebbesen 2006, 129).

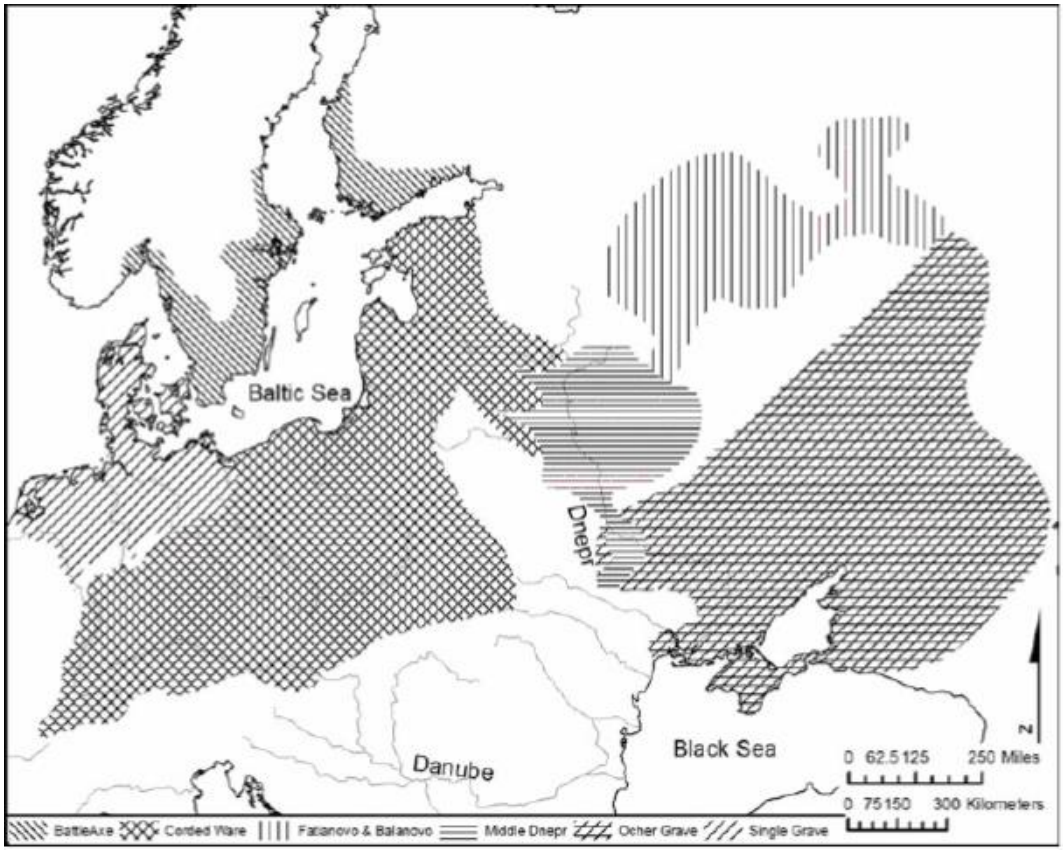

Figure 1.3 - The regional variants of the Corded Ware culture (Milisauskas and Kruk 2002, 297, fig. 9.3).

1.1 Problem statement

In the past, barrow landscapes were not investigated as a whole; only the burial mounds were studied and their graves were emphasised. Yet to understand the phenomenon of burial mounds, one must examine the barrow landscape as a whole (Bourgeois 2013, 12-3). Barrows in their entirety formed a highly visible barrow

landscape, which would have had a specific cultural and ideological value (Doorenbosch 2013, 14). The uniform burial rite of the Corded Ware culture throughout Europe indicates the presence of a shared concept of burying the dead and organising the (barrow) landscape (Bourgeois 2014, 3). Consequently, the investigation of barrow landscapes as a whole may yield valuable information about this concept and about the meaning of the barrow landscape to the Corded Ware peoples, about whom a lot is still unknown (see Chapter 2). The comparative study of barrow landscapes in different regions is important to comprehend if there really is a shared concept of burying the dead, and if so, what this concept may entail.

An important aspect of the barrow landscape is its time-depth; if several burial mounds were erected simultaneously, this would have had a significantly different meaning than if the burial mounds were built centuries apart. Each new barrow added to the physical and visual structure of the alignment, and thus meant a restructuring of the landscape and the relationships between the barrows (Bourgeois 2013, 195, 204). Throughout prehistory, and even in the Roman period, new barrows and urnfields were added to the barrow landscape. In its re-use the alignment was still present; it had become part of the collective memory, even though the meaning of the landscape and even of the concept of a burial mound itself could have changed (Bourgeois 2013, 205-6; Bourgeois and Fontijn 2012, 529-30). Even in historical and modern times, humans have interacted with the ancient burial mounds that were preserved and remained visible in heathland. In the Low Lands, the barrow landscapes were gradually seen as something outside of the Christian community and as evil, as 'heathen'. During the High Middle Ages, barrow landscapes started to be systematically destroyed, to 'Christianise' the landscape. Some barrows were used as a gallows mound, where criminals were executed and laid to rest (Bourgeois 2013, 44-5, 206; Roymans 1996, 240). Furthermore, the later interest in burial mounds as research objects, starting in the late nineteenth century, can also be seen as a way in which humans have interacted with these captivating monuments from the prehistory (Bourgeois 2013, 207; Hübner 2005, 11).

Gaining an understanding of this mysterious phenomenon, and in particular the time-depth of this phenomenon, could be part of gaining a broader understanding of how humans regard concepts such as death and burial, and its ancient presence in later landscapes. Regarding cultural heritage management, more knowledge about

barrow landscapes is also necessary. Landowners and the public are interested in more information about the barrows in certain regions (Doorenbosch 2013, 15). An in-depth understanding of the barrow landscape is crucial to tell the story of this phenomenon and to properly preserve and protect the present heritage.

This thesis is a comparative study of the time-depths of Corded Ware burial alignments in different regions. I have chosen three case-studies: 1) Trehuse-Sjørup-Dollerup (Denmark); 2) Angelslo-Emmerhout (The Netherlands); and 3) Lilla Beddinge (Sweden) (fig. 1.4). These alignments were chosen because they are located in different regions of the Corded Ware culture. Moreover, these alignments have been largely excavated, through which a lot of data has been collected. This data has been published and is accessible for research. Below I will elaborate upon the chosen dataset.

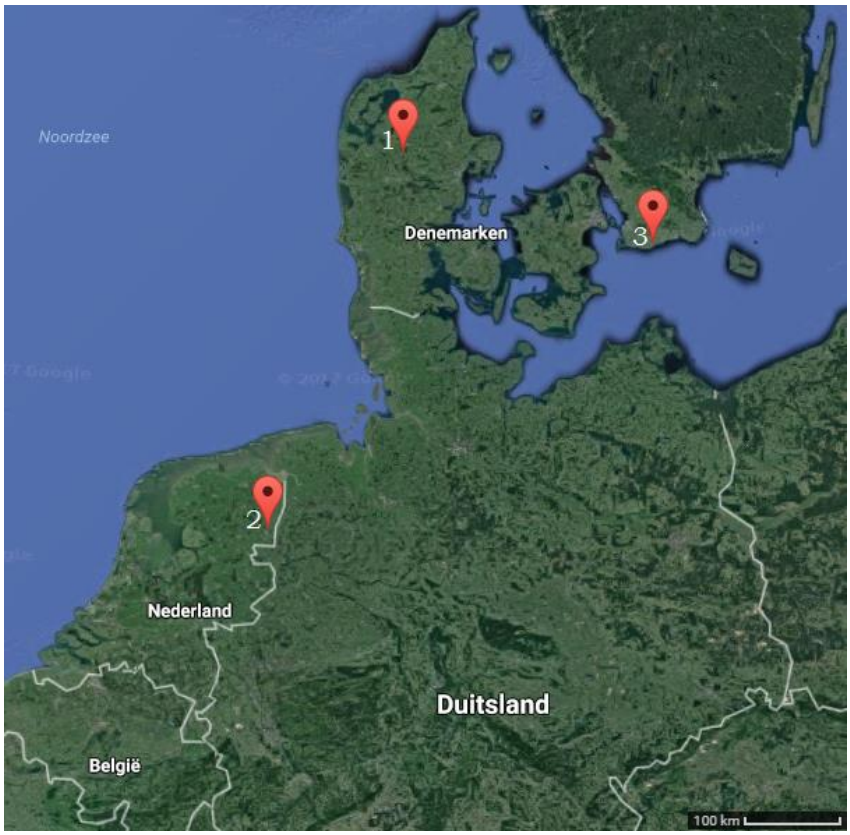

Figure 1.4 - The alignments at: 1) Trehuse-Sjørup-Dollerup; 2) Angelslo-Emmerhout; and 3) Lilla Beddinge (after Google Maps).

Research questions

The goal of this comparative study is to determine whether there is a pattern in the time-depths of burial alignments in different regions, and if this pattern can provide us with information about the barrow landscape organisation by the Corded Ware people. There are four sub-questions that I hope to answer for each alignment:

1. What are the dates of the primary burials in the alignment?
2. How much time has passed between the different primary burials in the alignment?
3. In what sequence have the primary burials been placed in the alignment?
4. What underlying pattern may explain this time-depth of the alignment?

Then I will try to answer the following two more general questions:

5. What similarities and differences can be determined between the time-depths of the different alignments?
6. What underlying pattern can explain these similarities and differences?

1.2 The dataset

The barrow alignment of Trehuse-Sjørup-Dollerup was situated in Central Jutland in Denmark. The alignment consisted of more than 40 burial mounds, of which 37 date to the Single Grave period. G. V. Blom and Th. Thomsen excavated the mounds for the National Museum in 1899-1901 (Hübner 2005, 973; Ebbesen 2007, 373).

Angelso-Emmerhout is situated in the eastern province of Drenthe in The Netherlands. The area contained more than 100 grave monuments from different periods. Fourteen of these graves were dated to the Single Grave period, four or five of which were presumably covered by a burial mound. Excavations were conducted in the 1930s by F. C. Bursch and in 1960-1968 by J. D. van der Waals (Arnoldussen and Scheele 2012, 153, 157, 159).

Lilla Beddinge is a parish in the southern province of Skåne in Sweden. Here, an alignment of thirteen Battle Axe flat-graves was found between 1913 and 1951; although these graves were not marked by burial mounds, they may have been marked in another way since they do not overlap (Malmer 2002, 138; Malmer 1962, 153, 180). I have chosen to include these flat-graves in my analysis, since the Battle Axe culture is another regional variant of the Corded Ware culture. It would be

interesting to see if there are any similarities with the other alignments of the Single Grave culture.

1.3 Methods

To investigate these burial landscapes, I will conduct a literature study; the graves have been excavated and published. The information from the publications is added in a database, in which every separate grave is described. Then, based on the typochronologies of the finds, I shall determine the relative date of the graves; the Danish alignment was excavated in the beginning of the 20th century, so there are no radiocarbon dates. The Dutch and Swedish alignments barely yielded any radiocarbon dates. However, using typochronologies to date the burials is not without problems. I will discuss the limitations of this method in Chapter 2. The dates of the burial mounds will lead to a sequence of the graves and thus a time-depth of the alignment; this time-depth will be analysed by considering the grave goods and the positions of the burial mounds in the landscape. Provided that detailed spatial information is available, I shall use a Geographical Information System for this last aspect. Lastly, the time-depths and the corresponding patterns of the different burial landscapes are compared through an interregional analysis.

1.4 Outline

Chapter 2 will be an explication of the theoretical framework that underlies this study. Here, I shall define the used terms and concepts, and also discuss the methodological limitations of establishing a chronology for the Corded Ware period. The three following chapters will present the results of the analysis for each individual burial alignment, according to region. The tables that are referred to in the text can be found in Appendix I. Chapter 3 discusses the Danish alignment of Trehuse-Sjørup-Dollerup. In Chapter 4, the Dutch alignment of Angelslo-Emmerhout is examined, and Chapter 5 analyses the Swedish alignment of Lilla Beddinge. Chapter 6 will be a discussion of the results, in which I will compare the time-depths and interpretations of the different burial landscapes and look for a general pattern that also matches the theoretical framework. I will end this thesis with a conclusion (Chapter 7), in which I shall also give recommendations for further research.

2 Theoretical framework

In this chapter, the theoretical concepts and debates related to the subject of this thesis are discussed. In the first paragraph, I shall explain what a burial mound is and how this phenomenon interacts with a landscape. Then I will discuss the Corded Ware culture and in particular specify the problems concerning its chronology, as this is relevant to the used methods in this thesis. Lastly, the chronologies of the different regions in this study are presented.

2.1 Burial mounds, barrow landscapes and temporality

As the term suggests, a 'burial mound' or 'barrow' is a mound constructed on top of a grave. The mound is part of the 'burial ritual', which is the whole set of activities carried out during the burial of a person (Lohof 1994, 99). The burial mound was built with sods, turf, chalk, sand and/or stones, and could be constructed in a wide variety of ways. Some scholars see the construction of this mound as the essential part of the burial ritual, and not necessarily the actual burial of the dead individual (Bourgeois 2013, 11-2; Ebbesen 2006, 151-2). This burial ritual was exclusive; only a select group of the total population is buried in this way. In the case of the Corded Ware culture (see 2.2), strict gender conventions were adhered to and predominantly men were buried in or under a barrow (Lohof 1994, 113). In many cases, people from later periods buried their dead in the pre-existing burial mound, added new layers of material to increase the size of the barrow or even (re)built features such as post circles around the mound. To distinguish the original mound from later additions, Bourgeois proposes to name the initial mound phase the 'primary barrow' and name the additional layers 'secondary mound phases' (fig. 2.1) (Bourgeois 2013, 28-30).

By constructing a burial mound, which was meant to be a lasting and visible monument, people physically altered the surrounding landscape and changed the meaning of this landscape. The burial mound is a *lieu de mémoire*, which turns a 'space' into a 'place', where meanings are evoked in (later) observers (Bourgeois 2013, 11). These meanings are not necessarily those intended by the original

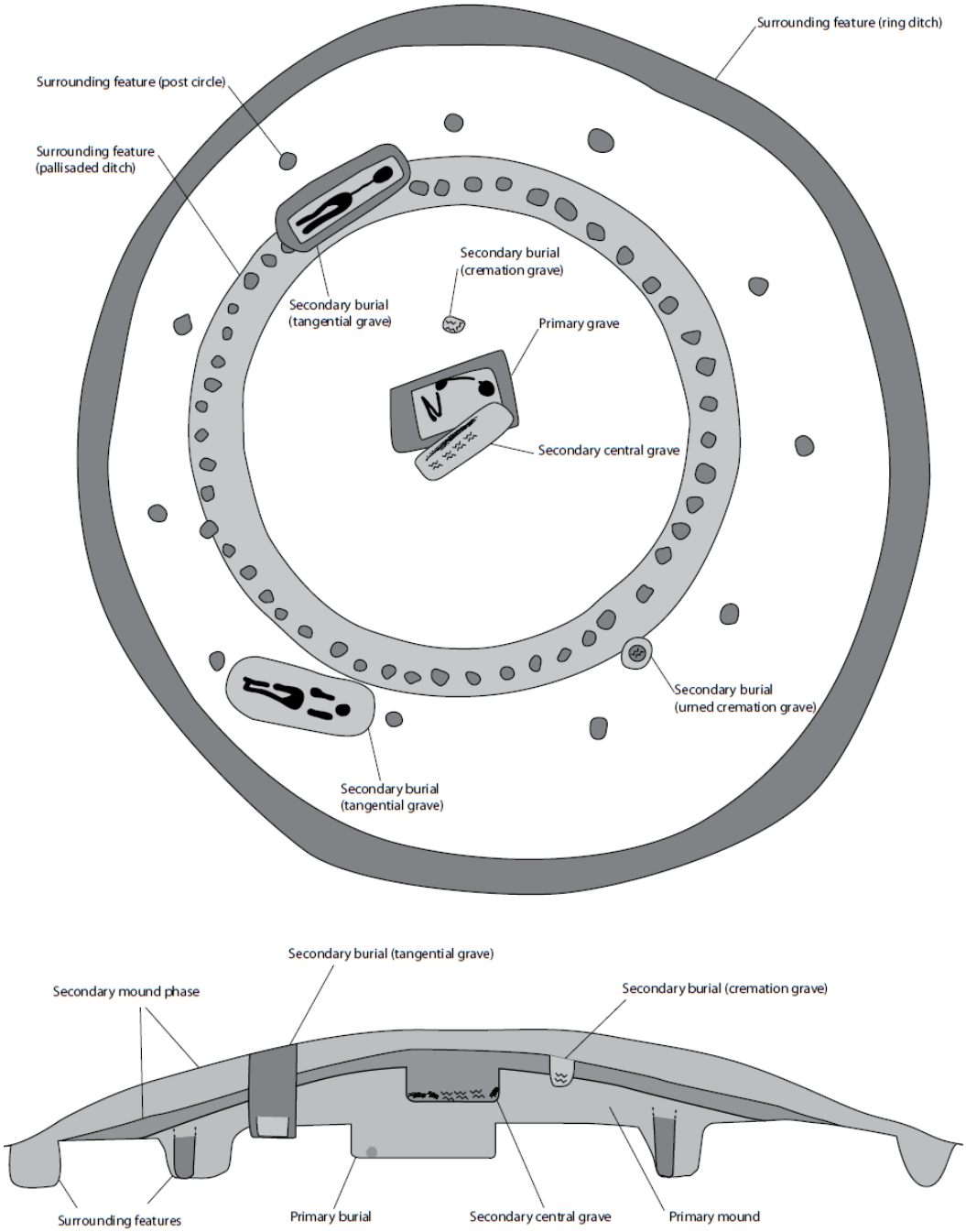

Figure 2.1 - Plan and profile of a hypothetical burial mound which consists of a primary barrow with a primary burial, two secondary mound phases, several secondary burials, and different surrounding barrow features (Bourgeois 2013, 29, fig. 3.3).

creators of the monument, since later observers interpret the place from their own cultural perceptions (Bourgeois 2013, 11-2; Scarre 2011, 1). The meaning of the burial mound must be seen from a broader perspective, as it is not a single, isolated monument. A barrow is carefully positioned within a larger whole, in the form of

alignments and/or clusters of burial mounds, and in relation to other elements in the landscape (Bourgeois 2013, 12-3, 15). The locations of monuments are often chosen in such a way that they draw attention to the monument and its place in the landscape (Scarre 2011, 6). This is definitely the case with burial mounds; the barrows are placed in the landscape in a way that they are more visible than their immediate surroundings and in some cases even more visible than other burial mounds. Each burial mound contributes to a complex, relational 'barrow landscape', shaped by the interplay between each individual barrow and other (pre-existing) structures (Bourgeois 2013, 156-7). In different periods, the primary barrows were placed in the landscape in different ways; the first burial mounds of the Late Neolithic were placed in alignments, whereas the placement of later barrows was more dispersed and less structured. The ideas behind the placement of the first barrows would also have been different than those behind the placement of later barrows (Arnoldussen and Fontijn 2006, 304; Bourgeois 2013, 188). Numerous hypotheses have been posed on why burial mounds were placed in the landscape, mainly emphasising territoriality and ancestral presence to mark property and control of land, or ritual or cosmological landscapes. These hypotheses unfortunately often depart from merely one perspective and disregard the temporal depth of the barrow landscapes, reducing the landscape to a singular event (Bourgeois 2013, 16-20).

Barrow landscapes are 'cultural landscapes'; palynological research has shown that probably most burial mounds were built in open and possibly long and narrow corridors of fully developed heathland, which means that the heath was present for at least a few decades before the barrows were built (Bourgeois 2013, 181-2; Doorenbosch 2013, 24, 225, 235). The heath landscape must have been managed, either by grazing, burning and/or sod-cutting. Grazing must have been the most common method to (unintentionally) maintain the heath, for which several households needed to cooperate; the barrow landscape probably played a role in the agricultural organisation of the prehistoric farmers. Sod-cutting must have also taken place, since the barrows were built with sods (Doorenbosch 2013, 232-3, 238). The extraction of the natural materials to construct the mound would have transformed the landscape (cutting of sods, felling trees, etc.), but these materials were transformed positively into the new monument, thus incorporating the

monument in the landscape or even visually emphasising the monument (Doorenbosch 2013, 238; Scarre 2011, 5-6).

Before the construction of a monument, a landscape may have already been mythically significant or sacred, and the construction of a monument would have given these associations a physical form (Scarre 2011, 5-6). In contrast to our modern conception of 'landscape', premodern and non-Western societies often experience and structure their landscape by means of mythical and ancestral deeds and presences (Lemaire and Kolen 1999, 16-7). In the case of Late Neolithic barrow landscapes, this may also have been the case. Doorenbosch proposes that the heathland area where the burial mounds were built can be considered as 'ancestral heaths'; people buried their ancestors here, but this landscape had also been used by their ancestors prior to the arrival of the burial mounds (Doorenbosch 2013, 237).

This brings us to the concept of 'temporality'. This term, as introduced by Ingold (1993), is a perspective which weaves time and landscape together; simply put, landscape embodies the (inter)activities of past and present generations. The landscape is a story, formed by movement. Perceiving the landscape is thus in essence an act of remembrance, in which the observer is engaged with this landscape as a participant (Ingold 1993, 152-64). The temporality of the Late Neolithic barrow landscape can be seen in the placement of barrows as *lieux des mémoires* in 'ancestral heaths', but also in their structuring in alignments. Although it is debated whether the alignments indicate prehistoric roads, it seems clear that linearity and movement may have been important to the builders of these first mounds; the linearity of the burial mounds would have been noticed when walking along the alignment, encountering a succession of monotonous mortuary symbols that commemorate the dead and their genealogical and mythical histories (Bourgeois 2013, 188-92). Depending on the time-depth of the barrow landscape, and in particular if there was a large time-span between the barrows, the identity of those buried would have probably been unknown and perhaps even mythical (Arnoldussen and Fontijn 2006, 304; Bourgeois 2013, 196).

In addition, the temporality of the barrow landscape can be seen in its reuse. Secondary mound phases and secondary interments acknowledge and reinforce the ancient burial mound in the landscape, but also alter the barrow landscape. This also

happens when new barrows are constructed; every new barrow interacted with the older monuments (Bourgeois 2013, 28, 159-60, 177).

2.2 The Corded Ware 'culture'

In many countries, a specific type of barrow was frequently encountered at the end of the nineteenth and the beginning of the twentieth century; these burial mounds contained a single individual buried in a crouched position with a standard set of grave goods: a ceramic pot decorated with cord impressions, a flint axe, a stone axe for a male (head in the west) and amber jewellery for a female (head in the east) (fig. 2.2) (Beckerman 2015, 13, 23-4; Ebbesen 2006, 153-4).[1] At that moment it was thought that material assemblages identified a particular group of people, or 'culture' (Renfrew and Bahn 2012, 32, 36). Accordingly, the burial mounds were regionally attributed to the so-called 'Single Grave culture', after the graves, the 'Protruding Foot Beaker culture', after the shape of the vessels in the graves, the 'Corded Ware culture', after the dominant technique of decoration on the beakers, or either the (Swedish-Norwegian) 'Battle Axe' or 'Boat Axe culture', after the shape of the stone axes in the graves (Beckerman 2015, 14; Larsson 2009, 59). This widespread, 'revolutionary' culture appeared suddenly and was seen as a new migrating group: the Indo-Europeans (Beckerman 2015, 13; Schier 2014, 10). The sudden spread of this culture was thought to take place during an initial, unitary

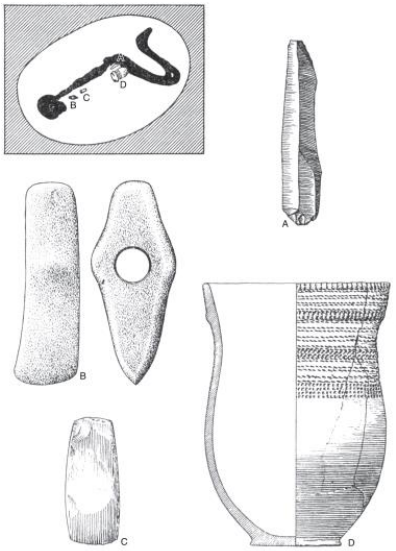

Figure 2.2 - Standard grave inventory of a Corded Ware burial (in this case Dutch Single Grave culture): gender-specific position (in this case male), flint blade (A), battle axe (B), flint axe (C) and Corded Ware beaker (D) (after Drenth 2005, 358, fig. 19)

[1] Larsson notes that the gender-specific positions and grave inventories are generalisations and exceptions are known. Moreover, the bones are often not preserved well enough for an osteological sex determination, or even to determine the position of the body; grave goods are then used, which may lead to circular reasoning. Osteological analysis does seem to confirm that battle axes are generally placed with males; the other artefacts seem to appear in both 'male' and 'female' burials, but possibly with different frequencies or positions (Larsson 2009, 61). Malmer speaks of an 'equality' between men and women in all Late Neolithic beaker cultures (Malmer 2002, 141).

phase, which was called 'A-horizon', since A-type beakers, amphorae and axes were seen to co-occur across the whole Corded Ware area during this phase (see 2.3). The existence of an A-horizon has however been disputed by numerous scholars, since the A-type objects rarely occur in association across the whole Corded Ware area (Beckerman 2015, 17; Furholt 2014, 70; Larsson 2009, 60; Schier 2014, 10).

Nowadays, the term 'culture' is often replaced by 'complex' or 'phenomenon', and it is debated what this phenomenon represents: the material expression of an ethnic or linguistic group, an ideology, etc. Yet the term 'Corded Ware culture' is still widely used, and it is still seen as a widespread, unified social phenomenon, spread across Europe from the Dutch coast to the Russian forest steppe and from Scandinavia to the Alps (Beckerman 2015, 14; Furholt 2014, 68-9; Schier 2014, 10). There are even still scholars who regard the Corded Ware culture as revolutionary; a period in which radical changes occurred in material culture, economy and social organisation, dominated by a rise of elites and martiality (Anthony and Ringe 2015, 208, 210; Beckerman 2015, 14). Recent ancient DNA research seems to confirm the idea of a large-scale migration event around the beginning of the third millennium BC (see below; Kristiansen *et al.* 2017, 335).

The Corded Ware culture is mainly known from funerary contexts, as settlements are under-represented; only in parts of The Netherlands, Germany, Switzerland, Denmark and Finland, have settlement sites been preserved and excavated (Beckerman 2015, 20, 22; Furholt 2014, 70). There are however variations in the way scholars consider burials to reflect patterns of daily life and social structures. Much is still unknown about the Corded Ware social organisation, ideology, subsistence, technology, economy and use of material culture. Numerous scholars have compiled social models for these aspects of the Corded Ware culture. Based on their burials, many associate the Corded Ware culture with the development of a more individual, stratified society with pronounced gender roles and martiality as a social value, from a group-oriented and egalitarian society in the preceding period, represented by communal megaliths (Beckerman 2015, 14, 20-5; Schier 2014, 11).

Although it is generally accepted that the Corded Ware culture is roughly dated to 2900-2200 BC, with different start and end dates varying in every region, there are still problems with the chronology of this period (see 2.3; Beckerman 2015, 14;

Furholt 2014, 70). Furthermore, there is a lot of debate regarding the nature of the spread of the Corded Ware culture, either through migration, diffusion or a combination of both. The migrationist view was common amongst the early researchers of the Corded Ware culture, whereas the diffusionist view developed under influence of the New Archaeology. The paradigm combining migration and diffusion has become popular in recent years. Social and material culture change is explained by an increase in mobility driven by marital necessities. This increase in mobility is recently supported by isotope studies, which reveals that movements of individuals or small groups were common during the Corded Ware period (Beckerman 2015, 14-6). Recent ancient DNA analysis attests that there was a widespread and abrupt genetic admixture shortly after 3000 BC between Neolithic DNA and a new gene pool, possibly originating from the Yamnaya people from the Pontic-Caspian steppe (Kristiansen *et al.* 2017, 335). This is supported by recent research by historical linguists, associating the Corded Ware culture with a spread of Indo-European dialects from the Pontic-Caspian steppe, incidentally replacing and merging with the earlier Neolithic languages (Anthony and Ringe 2015, 208, 210; Kristiansen *et al.* 2017, 340-1).

Where the Corded Ware culture originated, has also been much debated. Recently, ancient DNA research pinpoints the Pontic-Caspian steppe as the most likely origin area, but Jutland, Germany, southern Russia and Poland have also been proposed (Beckerman 2015, 17; Kristiansen *et al.* 2017, 335; Larsson 2009, 59). Numerous reasons for the spread of the Corded Ware culture have been proposed, such as economic changes (e.g. the adoption of the plough) leading to social changes and an increase in mobility, or climate change (Beckerman 2015, 18-9). According to Kristiansen *et al.*, the Corded Ware culture may have spread through seasonal activities of youthful male war-bands and exogamy between Yamnaya/Corded Ware males and indigenous females; in this view, the Corded Ware culture is the result of a hybridisation of migrant Yamnaya and indigenous Neolithic communities (Kristiansen *et al*. 2017, 338-9, 342).

The above discussion makes it clear that there is no consensus on what the Corded Ware 'culture' really is, how this phenomenon developed and from where. Nonetheless, there seemingly is a consensus on the Corded Ware culture as being a culturally uniform phenomenon (Beckerman 2015, 27). Yet according to Furholt it is

a mistake to treat the presence of similar material culture traits as a sign of uniformity; this is an over-simplification and the available archaeological evidence contradicts the existence of an A-horizon (Furholt 2014, 67-9, 75). Additionally, the large distribution area of the Corded Ware culture means that the interpretation of a regional phenomenon is not necessarily relevant for other regions (Larsson 2009, 60). Recent research emphasises the regional variability of the Corded Ware culture, which is not one 'culture' or 'ethnicity', but more a mosaic of certain novel elements that were adopted in different ways across different regions. These elements originated in different regions and were spread across the whole Corded Ware area via supra-regional networks. Hence, the Corded Ware culture incorporates both shared traits and specifically regional or even local traits (Beckerman 2015, 27-8; Furholt 2014, 75).

2.3 Corded Ware chronology

Due to the persistent idea of the Corded Ware culture as a uniform social phenomenon, scholars have regarded it acceptable to use chronologies from one region to establish a chronology for another region. Particularly the southern Scandinavian evidence has been drawn upon to establish supra-regional chronologies (Furholt 2014, 70-1).

Most chronologies of the Corded Ware culture are based on the typologies of beakers and battle axes. A 'typology' is a grouping of artefacts into types. This is based on the notion that artefacts of a given period and place have a recognisable style, the principle of 'like goes with like', and the idea of an evolutionary style development in artefacts. It follows that a 'typochronology' is the chronological order of a typology. This order is established by 'seriation', a method that deals with the associations of the different types. By matching an artefact with a well-established typochronology, one is able to assign a relative date to the artefact (Renfrew and Bahn 2012, 123-5). Typochronologies are however not unproblematic; it is based on the assumption that there is a continuous development between the different types, which would mean that different types cannot be contemporaneous and that different types have approximately the same duration. Absolute dating (see below) has determined that certain types, particularly some of the A-types, had a much longer duration than other types and that several types

were used contemporarily; stylistic variation may have been caused by other reasons than mere evolutionary development (Furholt 2014, 71).

In 1898, Müller divided the Danish Single Grave Period into three periods, based on the positions of the graves in Jutlandic burial mounds: the Underground Grave, the Ground Grave and the Overground Grave Periods. Later, Glob divided these periods further, based on his typochronology of Jutlandic battle axes: Early and Late Underground Grave, and Early and Late Ground Grave Periods (Ebbesen 2006, 149). Although Glob's chronology of battle axe and associated pottery types comprised stratigraphic observations, these observations were limited, and it is mainly based on the assumption that graves below the prehistoric land surface were the oldest. Nevertheless, his chronology became the basis for the later definition of the A-horizon; Glob's early types were regarded as early in other regions as well, hence a uniform early horizon could be 'identified' across the whole Corded Ware area (Furholt 2014, 70). Later chronologies that were established for different regions, were not based on stratigraphy or absolute dating methods, with the exception of the typochronologies of The Netherlands (see 2.3.2) and central Germany, thus leading to different and opposing chronological models that still embedded the old mass migration idea (see 2.2). In recent research, absolute dating methods have been incorporated to revise Corded Ware chronologies (Furholt 2014, 70-1). Yet there still are difficulties with establishing a chronology of the Corded Ware period; besides the difficult typochronologies, radiocarbon dates are not always reliable due to broad 'wiggles' and plateaus in the calibration curve, such as the plateaus of 2880-2580 cal BC and 2460-2200 cal BC, coincidentally the time frames in which the Corded Ware period is often said to begin and end (see below; Furholt 2003, 15-6). The precision of the radiocarbon date is also determined by the standard deviation of the date. Moreover, there are issues such as an uncertainty of association or the use of old wood and there is a lack of dendrochronological dates and of studied stratified contexts (Beckerman 2015, 14, 154-5; Bourgeois 2013, 26-7). One is therefore often still bound to relative dating, thus regional typochronologies, when dating Corded Ware burials, particularly when these burials were excavated before radiocarbon dating was available. Such is the case with two out of three burial alignments discussed in this thesis, and in the third case there are only a few radiocarbon dates. For this reason, despite the limitations of using

typochronologies, I have decided to use this method after all, where radiocarbon dates are unavailable; as long as the limitations are acknowledged and explicated, typochronologies can be used in the absence of a better alternative. In the following paragraphs, I will present the chronologies of the different regions that are investigated in this thesis.

2.3.1 The chronology of the Single Grave culture in Denmark

Above, an overview is given of the development of the chronology of the Single Grave Culture in Denmark. After the establishment of Glob's typochronology, the Danish Neolithic was divided into four periods (Early, Middle, Younger and Late Neolithic) in 1978. The Younger Neolithic was seen as the period in which the Single Grave Culture was dominant, and from 1984 onwards this period is also called the Battle Axe Period (Ebbesen 2006, 27). Ebbesen defines the Younger Neolithic (2850-2400 cal BC) as the period between the construction of the first Single Graves and the replacement of battle axes by flint daggers in men's graves (Late Neolithic) (Ebbesen 2006, 27, 29). Glob's typochronology for the Younger Neolithic has been revised separately by Hübner and Ebbesen in the 1980s and 1990s, who published their dissertations in 2005 and 2006 respectively. Ebbesen had however already completed the manuscript of his work in 1992, consequently disregarding thirteen years of archaeological research (Larsson 2006a, 230). Hübner does include references from the later 1990s and the early 2000s.

According to Ebbesen, a new chronological system was needed, as Glob's chronology mostly relied on battle axes (Ebbesen 2006, 149). Tab. 2.1 is an overview of Ebbesen's proposed new chronology, in comparison to the older chronologies in Denmark. It also shows the characteristic pottery and battle axe types per period, according to Ebbesen.

Ebbesen distinguishes two Younger Neolithic Phases (I and II). The boundary between YN I and YN II lies at c. 2600 cal BC, which is reinforced by stratigraphy and a marked change in grave inventories; whereas YN I graves contain Protruding Foot Beakers (Type I), amphorae, bowls, storage vessels, greenstone axes and amber discs, YN II graves comprise straight-walled beakers, late battle axes, gouges and clubheads (Ebbesen 2006, 29, 149). Double-bellied beakers (Type II) mainly occur

Table 2.1 - The revised periodisation of the Single Grave Period in Jutland and the Danish islands by Ebbesen (Ebbesen 2006, 29, 171).

Müller (1898)	**Glob (1945)**	**Ebbesen (2006)**		**Pottery**	**Battle axes**
Underground Grave	Early	Younger Neolithic I	YN I, 1 (2850-2775 cal BC)	Type I	Glob A, B
	Late		YN I, 2 (2775-2680 cal BC)	Type I	Glob C, D, E
Ground Grave	Early		YN I, 3 (2680-2600 cal BC)	Type I & II	Glob F, G, H
	Late	Younger Neolithic II	YN II, 1 (2600-2500 cal BC)	Type II & straight-walled	Glob H, I
Overground Grave			YN II, 2 (2500-2400 cal BC)	Type II & straight-walled	Glob K, L

Table 2.2 - The revised periodisation of the Danish Single Grave Period by Hübner (Hübner 2005, 660, 726-38).

Glob (1945)	**Hübner (2005)**		**Pottery**	**Battle axes**
Early Underground	Early Young Neolithic (YN 1)	Phase 1a (2850-2800 cal BC)	A1a	A2-3, B1-3
Late Underground		Phase 1b (2800-2700 cal BC)	A2a, A1b-2b, A1c-6c	A1, B4, C1-3, D1-5, E1-4, F1
Early Ground		Phase 1c (2700-2600 cal BC)	A3a-5a, A3b-5b	A, B, C1-3, D, E1-4, F2-6, E5-6
	Middle Young Neolithic (YN 2)	Phase 2a (2600-2525 cal BC)	A6a-7a, A7d, A9b, A10a-b	H1-2, G3-4, G7-8
Late Ground		Phase 2b (2525-2450 cal BC)	A6a-7a, A7d, A9b, A10a-b	H3-4, I1-2
	Late Young Neolithic (YN 3)	Phase 3a (2450-2350 cal BC)	B1a-c, B2b, B2f, B4a-d, B4f, B5, B6, C1b, E3, E4, E8a	I3-5, K1-2a, L3a
Overground		Phase 3b (2350-2250 cal BC)	B1d, B2a-e, B3, B4e, B6, C1a, E8b	K2b-6, L1-2, L3b

on the Danish islands and in Schleswig-Holstein, from the end of YN I (Ebbesen 2006, 78, 150). Hübner presents a different chronology than Ebbesen (tab. 2.2). Her dissertation is a revision of Glob's typology and chronology, based on correspondence analyses and radiocarbon dates. Simultaneously, her work is the first published inventory of the material that Glob had used for his typochronology;

due to financial reasons Glob had not published a catalogue himself (Furholt 2014, 72; Hübner 2005, 9, 57-8, 660-7). Hübner's work encompass 2386 graves, which is a much larger dataset compared to the 582 graves that were available to Glob in 1945 (Hübner 2005, 60; Larsson 2006b, 297). Hübner distinguishes three Younger Neolithic Phases, of which the first two roughly correspond to Ebbesen's phases, but her last phase continues until 2250 cal BC; she admits the problems of radiocarbon dating, hence maintaining a longer time-span than Ebbesen (Hübner 2005, 660-7; Larsson 2006b, 298). The pottery and battle axe types are based on Glob's typology, with some modifications (fig. 2.3 and fig. 2.4). It is notable that pottery is rare in the first phase and only becomes more common as a grave good from Phase 1b/1c (Hübner 2005, 187-8). Furthermore, it is striking that the battle axe type A1, which was regarded as the earliest battle axe by Müller and Glob, thus supporting an early A-Horizon, only occurs from Phase 1b; it seems that this supra-regional variant had developed from the regional and more complex battle axes A2-3 and B1-3 (Furholt 2014, 72-3; Hübner 2005, 151).

In sum, both Hübner and Ebbesen have revised the chronology of the Single Grave culture in Denmark. Although they differ in the details, both maintain the basic chronological sequence of Underground – Ground – Overground grave periods, in which the Underground grave period is the oldest and the Overground grave period is the youngest. I will base my analysis on Hübner's chronology, as it is more recent and it seems to be methodologically stronger than Ebbesen's chronology (Larsson 2006a; Larsson 2006b). Ebbesen's work is however still valuable as it contains a detailed catalogue; I will use it as a source for my analysis.

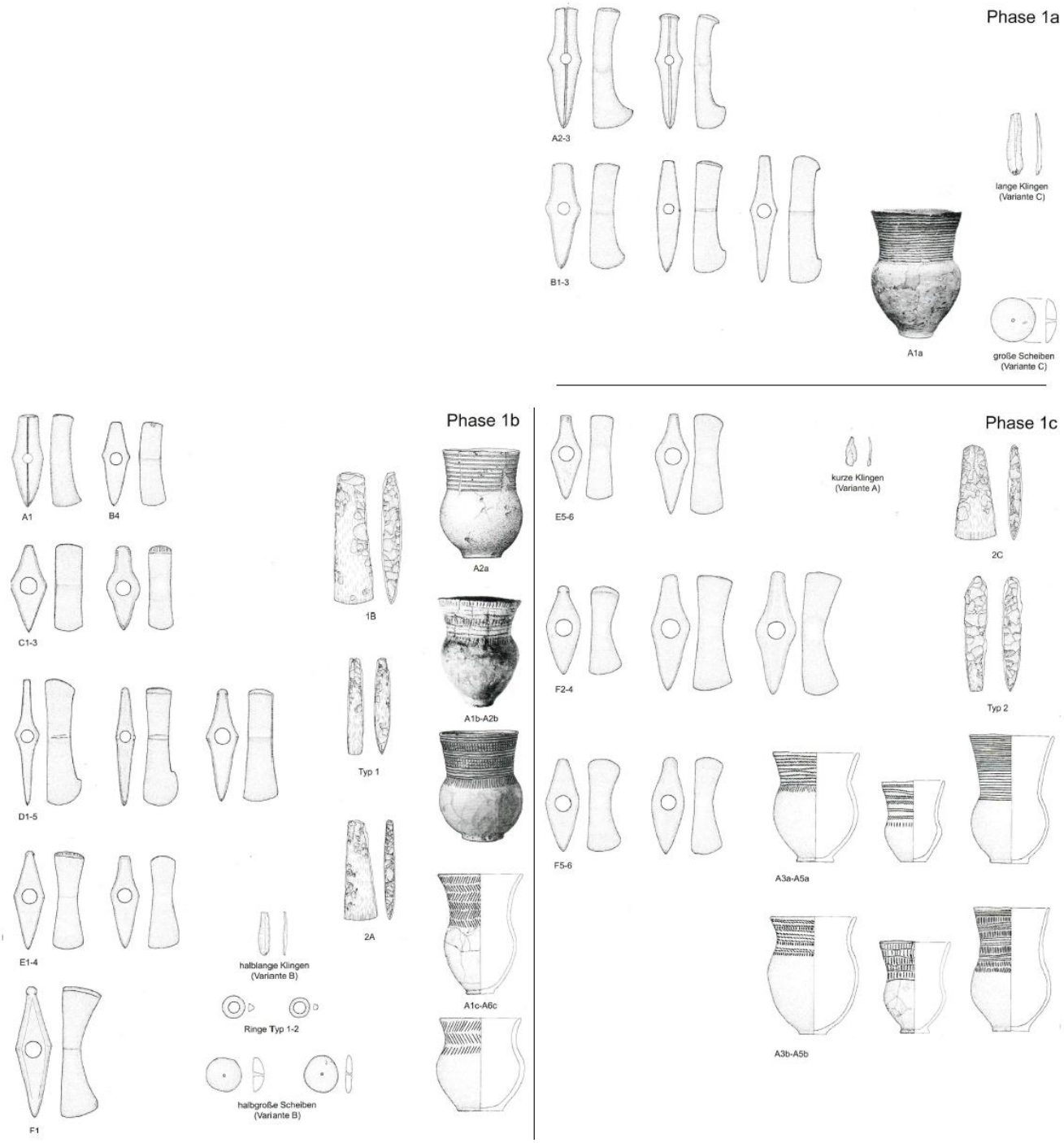

Figure 2.3 - The typochronology of Period 1 (after Hübner 2005, 726-30, fig. 502-4).

Figure 2.4 - The typochronology of Period 2 and 3 (after Hübner 2005, 732-6, fig. 505-7).

2.3.2 The chronology of the Single Grave culture in The Netherlands

As mentioned in paragraph 2.2, the Corded Ware culture was initially called the 'Protuding Foot Beaker culture' in The Netherlands, according with the shape of the vessels in the graves. In 1978, Lanting introduced the name 'Single Grave culture' (or *Enkelgrafcultuur*), to emphasise an affiliation with the Danish and north German *Enkeltgravkultur* and *Einzelgrabkultur* (Drenth 2005, 333). In The Netherlands, the chronology of the Single Grave Culture was divided into four phases by Drenth and Lanting in 1991; this chronology is still in use, after a few minor revisions by the same authors (tab. 2.3) (Drenth 2005, 347-9). Their chronology is mainly based on finds from burials, but also from settlements. According to the authors, the battle axes that have been discovered in Single Grave burials in The Netherlands are typologically similar to the battle axes found in Jutland, and here the stratigraphy of burial mounds is more known than in The Netherlands. To the authors this justifies the use of the Danish relative dates of the battle axes in their chronology of the Dutch Single Grave culture (Drenth 2005, 348). Drenth and Lanting used the typochronologies of battle axes by Glob and Struve (Jutlandic axes) and Brandt (facetted axes) and of beakers by Glasbergen (Protruded Foot Beakers) and Van der Waals (All-Over-Ornamented Beakers) (fig. 2.5) (Drenth and Lanting 1991, 42, 46). Besides typochronology, radiocarbon dates and dendrochronology have been employed in establishing their chronology (Drenth 2005, 348; Drenth and Lanting 1991, 42). The authors note that their chronology should not be taken too absolutely (Drenth and Lanting 1991, 42). In a later article, Drenth warns that the duration of every phase is an 'estimated guess' (Drenth 2005, 348). A serious drawback of Drenth and Lanting's chronology is that they have not used calibrated radiocarbon dates, which makes it a purely artificial chronology; especially the 'wiggles' and plateaus in the calibration curve lead to a profound discrepancy between uncalibrated radiocarbon dates and a calendar age (Bourgeois 2013, 26).

Table 2.3 - The periodisation of the Single Grave Culture in The Netherlands by Drenth & Lanting (Drenth 2005, 349; Drenth and Lanting 1991, 42-6).

Phase	Date	Pottery	Battle axes
Phase 1	c. 2800-2750 BC	1a, (1b, 1f) continuous cord decoration on neck	A1, A2
Phase 2	c. 2750-2650 BC	1a, 1b, 1f, (later: 1d) decoration up to broadest point of body	B/A, B, facetted type 1, (later: C, C/A (P2))
Phase 3	c. 2650-2550 BC	1a, 1b, 1c, 1d, 1e, 1f, probably first AOO (2IIb) sharp bend in body, possibly decoration of edge	D, E, (C, P2), regional derivate types, facetted type 2a
Phase 4	c. 2550-2400 BC	(1a), 1b, 1c, 1d, 1e, 1f, ZZ, AOO (2IIa-d) decoration of inside of edge, notched edge (particularly AOO)	F, G, H, P1, R/S, facetted type 2b

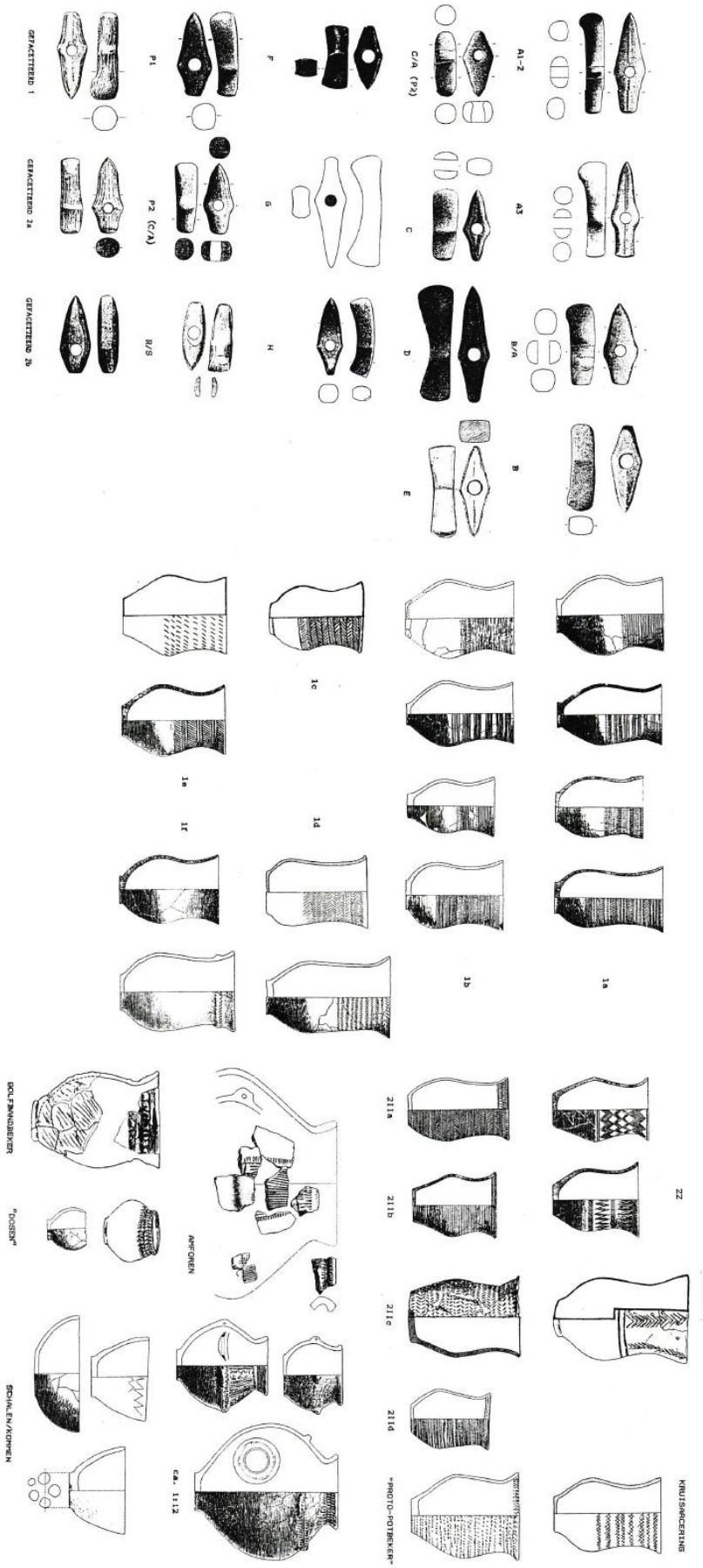

Figure 2.5 - The typologies that Drenth and Lanting have included in their chronology (Drenth and Lanting 1991, 43-5, fig. 1-3).

Table 2.4 - The renewed typochronology of Single Grave beakers in The Netherlands. The dates between brackets are less reliable (Beckerman 2015, 193, tab. 4.8). PFB: Protruding Foot Beaker; AOO: All-Over-Ornamented Beaker.

Type	**Calibrated date BC (1δ - 68.1% probability)**	**Calibrated date BC (2δ - 95.4% probability)**
PFB 1a	(3011)2876-2350	(3091)2890-2296
PFB 1b	(2566)2561-2349	(2577)2570-2301
PFB 1c	2567-2350	2578-2296
PFB 1d	(2838)2546-2347	(2866)2568-2299
PFB 1e	(2874)2836-2494(2293)	(2881)2859-2475(2210)
PFB Zig-Zag	(2874)-(2299)	(2881)-(2204)
AOO 2IIb	2871-2481(2351)	2893-2467(2298)
AOO 211c	2623-2475	2862-2460

Due to the aforementioned methodological problems with Drenth and Lanting's chronology, Beckerman has reassessed radiocarbon dates from Corded Ware settlement sites at the coast of The Netherlands in Noord-Holland in her dissertation, following Furholt. This has resulted in a new chronology of the Corded Ware pottery in The Netherlands (tab. 2.4) (Beckerman 2015, 152-184, 193). This new chronology shows that different types of Protruding Foot Beakers were in use for long periods of time. All-Over-Ornamented Beakers are demonstrated to be contemporaneous with Protruding Foot Beakers, and not intermediate between the Protruding Foot Beakers and Bell Beakers, as often presumed (Beckerman 2015, 191). This chronology may however only be regionally valid (Noord-Holland in The Netherlands) and merely applicable to settlement contexts; Beckerman admits that it is problematic to determine whether this chronology can be extrapolated to the whole of The Netherlands (Beckerman 2015, 192). Despite these limitations, I will use her chronology as a guideline in my analysis, in contrast to the even more problematic chronology by Drenth and Lanting.

2.3.3 The chronology of the Battle Axe culture in Sweden

Another regional variant of the Corded Ware culture is the 'Swedish-Norwegian Battle Axe culture'. This term was coined by Malmer in his dissertation (1962), which is still the leading work on the period; for this reason, although the same phenomenon is sometimes called the 'Boat Axe culture', 'Battle Axe culture' is most common (Larsson 2009, 44, 59). In Scandinavia, this culture is dated to the Middle

Neolithic B (c. 2900/2800-2400/2300 BC), and in southern Sweden it co-existed with the 'Pitted Ware culture', which is seen as representing a 'de-neolithisation', with a return to marine hunting (Larsson 2009, 17, 45). The basic shape of Battle Axe pottery is a small rounded beaker with little or no neck; although it also has an S-shape, it is more globular and wide-mouthed than the slim, long-necked beakers of the Protruding Foot Beakers of the Single Grave culture. The decoration may vary between the Battle Axe and Protruding Foot Beakers as well (Malmer 2002, 131; Larsson 2009, 60, 64). Malmer thought that the Battle Axe pottery may deviate from the continental pottery because of influences from both the Pitted Ware culture and the earlier Funnel Beaker culture (Malmer 2002, 131). According to Larsson, the Battle Axe culture was developed when Pitted Ware communities interacted and practiced exogamy with Finnish Corded Ware communities, who themselves were influenced by the Polish and perhaps even Russian Corded Ware communities (Larsson 2009, 257-61). Swedish-Norwegian battle axes (fig. 2.6) are also different from Danish and North Germane battle axes, except for type A, which corresponds with the typical Corded Ware A-type, and type C1, which corresponds with the Danish battle axe type B (Malmer 2002, 156, 168; Larsson 2009, 65).

While Malmer's typochronology (tab. 2.5) was first published in his dissertation, he published shorter, yet updated versions in 1975 and 2002 (Larsson 2009, 121). Malmer's typochronology is still in use as the seriation holds up well with new finds and because absolute dating has not been able to revise the chronology; organic remains are scarce and as mentioned before, there are problems with the radiocarbon calibration curve for this period (Larsson 2009, 132). The typochronology is mainly based on the pottery (fig. 2.7); types A and B are associated with Corded Ware, whereas types G, H and J, bear similarities with the later Bell Beakers. It follows that these five groups follow up on each other, in which the younger group gradually replaces the older group, forming five distinguishable periods (Malmer 2002, 134-6). Battle axe types have been placed in the chronology based on their occurrence with pottery in graves; they can be grouped into early types (periods 1-3) and late types (periods 3-5) (Malmer 2002, 156).

Table 2.5 - The periodisation of the Battle Axe culture in Sweden (Malmer 1962, 89, 651; Malmer 2002, 136-7, 156).

Period	Pottery	Battle axes	
1	A, E1	Early phase (1-3)	Early part of phase: A, B, C1a Later part of phase: C1b, D1a, D1b
2	B, E1		
3	G, M		C2
4	H, M	Late phase (3-5)	C2, D2
5	J		C2, E1, E2

Despite that Malmer's typology of pottery and battle axes is still seen as correct and useful, it has been criticised; it highlights some aspects, while minimising other aspects and emphasising homogeneity, hence disregarding interregional variation and particularities (Larsson 2009, 64, 132; Olausson 2015, 104-5). It is now acknowledged that the chronological sequence of the different types is not a straight line, but that the types are partially contemporaneous and that there are regional differences, although it is unclear which exact pottery types co-existed and for how long (Edenmo 2008, 45; Larsson 2009, 132).

Recently, Edenmo (2008) has revised Malmer's typochronology, to cater to the regional differences of the battle axes; according to him, Malmer's typology and chronological scheme makes a regional perspective hard to develop (Edenmo 2008, 74, 271). Based on regional combination diagrams of ceramics and battle axes in graves, he split the Battle Axe culture into three broad periods (tab. 2.6) (Edenmo 2008, 96-9, 113). Within these periods there are no evident chronological differences between the types, and this applies to the whole of Battle Axe Sweden (Edenmo 2008, 113, 271). This new chronology cannot be assigned any absolute dates, in the same manner as Malmer's typochronology, and it does not contradict the earlier typochronology either (Edenmo 2008, 113-4; Larsson 2009, 132). In fact, it still makes use of Malmer's typochronology; the periods are simply broader. Despite its limitations, I will use Malmer's typochronology, since Edenmo's alternative does not seem to be of added value to my analysis,

Table 2.6 - The revised typochronology of battle axes during the Battle Axe period in Sweden by Ebenmo (Ebenmo 2008, 113).

Period	Battle axes
MN BI	A, B, C1a, (D1a)
MN BII	C1b, D1a, D1b, C2, D2
MN BIII	(C2), E1, E2

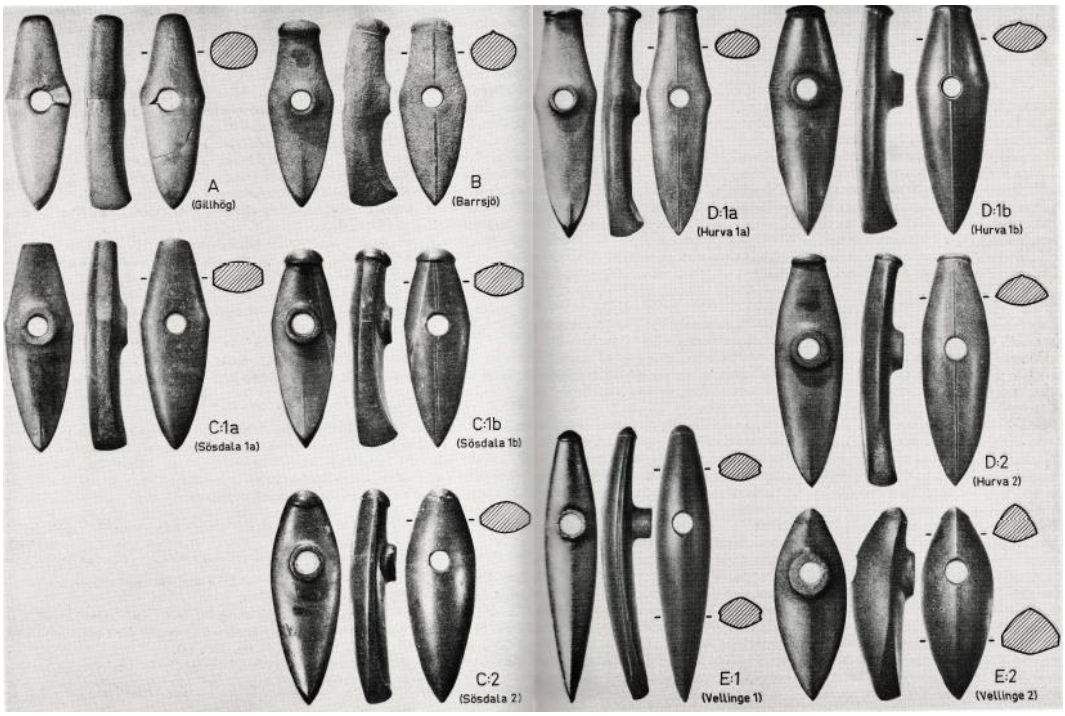

Figure 2.6 - The typology of Swedish-Norwegian battle axes (after Malmer 1962, 614-5, fig. 110-1).

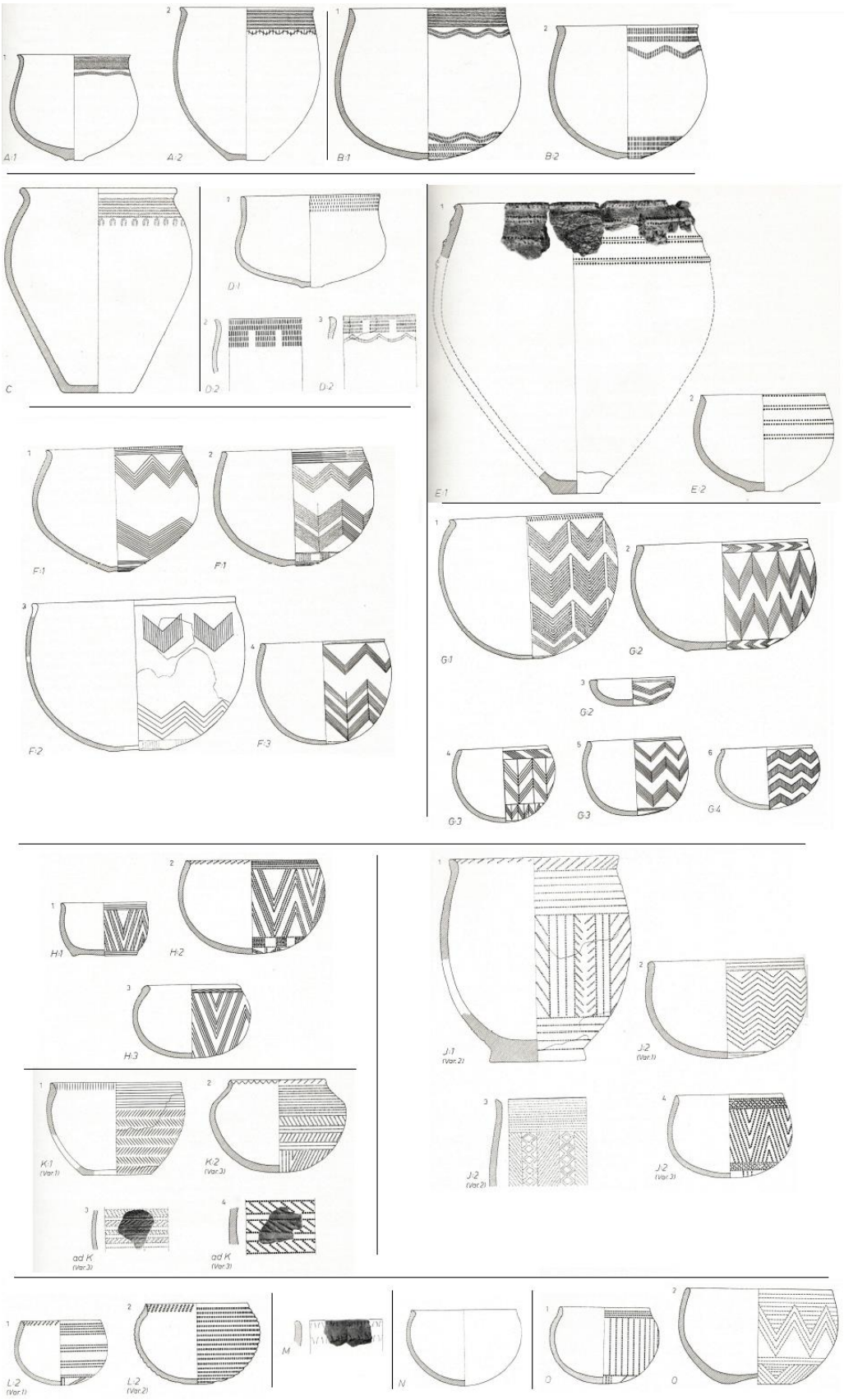

Figure 2.7 - The typology of Battle Axe pottery (after Malmer 1962, 9-36, fig. 1-2, 4, 6-7, 11-14, 16).

3 The Danish alignment of Trehuse-Sjørup-Dollerup

In this chapter the first case study will be discussed: the alignment of Trehuse-Sjørup-Dollerup, in Mid-Jutland, Denmark. Before I present the results from the analysis, I will describe the alignment and its research history. Lastly I will discuss the dates of the barrows and the resulting time-depth of the alignment. Unfortunately, I had no access to detailed geographical data of the alignment; hence, I could not apply a GIS analysis.

3.1 Introduction: the research history of Trehuse-Sjørup-Dollerup

Between the towns of Trehuse, Sjørup and Dollerup (fig. 3.1), there used to be an alignment of burial mounds, consisting of more than 40 barrows. This alignment had a north-south orientation and was one of the largest burial mound alignments in Jutland. The landscape in which the alignment was located, is characterised by low hills, directly to the west of the moraine landscape of the *Hovedopholdslinjen*, which marks the boundary of the ice sheet during the Weichselian glaciation (fig. 3.2). Further to the west, the landscape flattens out towards a large heathland (Ebbesen 2006, 373; Jørgensen 1977, 9).

The alignment has now mostly disappeared due to ploughing and the building of (rail)roads. South of Sjørup, however, the alignment extends across the east side of the forest Havredal Plantage (fig. 3.3); more than 50 unexcavated burial mounds are still located here, amongst which the Store Ståhøj, a 3.5 m high barrow. Hence, the alignment used to be more than 5 km long (Miljø- og Fødevareministeriet. Naturstyrelsen).

Most of the barrows at Trehuse-Sjørup-Dollerup have been excavated. Around the *fin de siècle*, the idea was that the alignment represented the course of an important prehistoric road (Ebbesen 2006, 373). Therefore, the National Museum of Denmark decided to investigate 45 of the burial mounds (fig. 3.4). In 1899, museum assistant Thomsen and painter Blom excavated 20 mounds in the municipalities of Sjørup, Over Testrup and Trehuse. The other 25 mounds, in Trehuse and Dollerup, were excavated in 1901 (Ebbesen 2006, 373; Hübner 2005, 973). The results of the

Figure 3.1 - Aerial photograph of the area of the barrow alignment of Trehuse-Sjørup-Dollerup (after Google Maps).

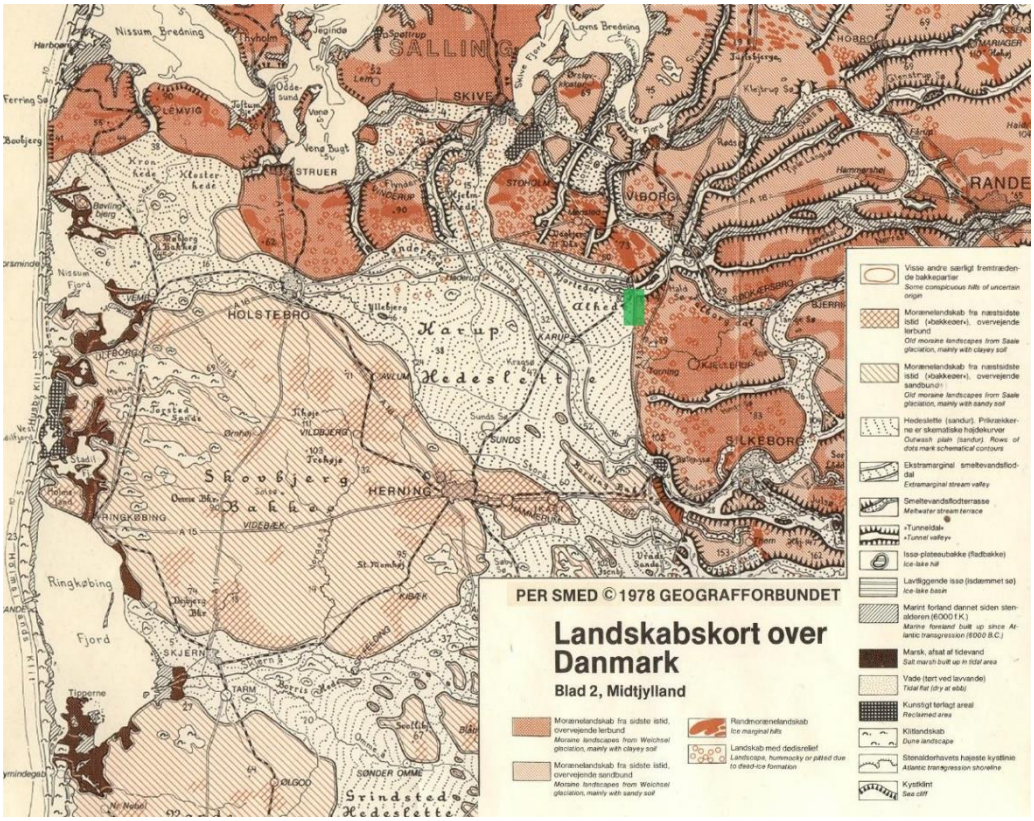

Figure 3.2 - The approximate location of the barrow alignment of Trehuse-Sjørup-Dollerup (green) in relation to the *Hovedopholdslinjen* (after Smed 1978).

excavations have been published by Müller in 1904 and Glob in 1944, and have been republished in the two independent catalogues of Hübner and Ebbesen (Hübner 2005, 973; Ebbesen 2006). Nearly all burial mounds turned out to be Single Grave barrows; two barrows had been built during the Bronze Age (Høj 16 and Høj 19), four barrows were stone cairns without burials or grave goods (Høj 40, 41, 42 and 43), and Høj 44 and 45 were not related to the alignment (Ebbesen 2006, 373, 421-2). Hence, 37 barrows (Høj 1-15, 17-18 and 20-39; database numbers 1-37) are part of my analysis, which is based on the data from the catalogues by Hübner and Ebbesen (tab. 3.1). Remarkably, not all excavated burial mounds are included in the catalogue by Hübner; Ebbesen was the only source for twelve of the barrows (see fig. 3.4).

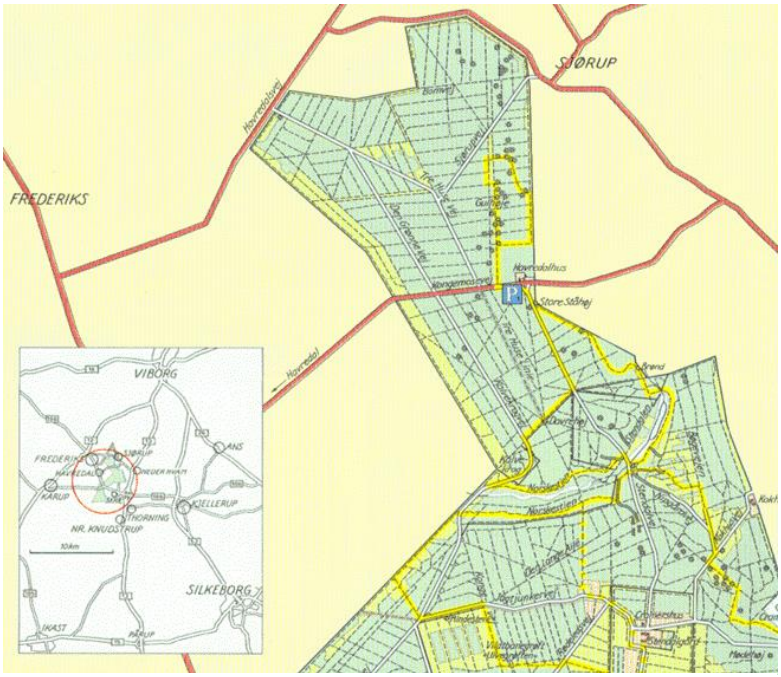

Figure 3.4 (above) - The alignment continues south of Sjørup; the black dots are burial mounds. The Store Ståhøj is located just to the southeast of the 'P' sign (after Miljø- og Fødevareministeriet. Naturstyrelsen).

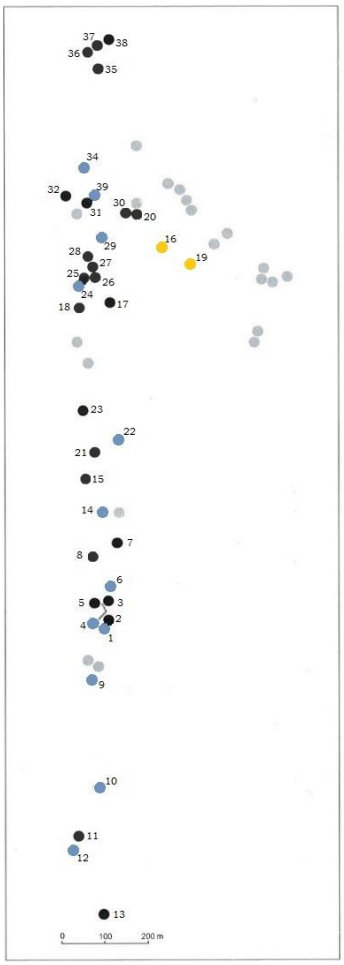

Figure 3.3 (right) - The alignment of Trehuse-Sjørup-Dollerup. The coloured dots are excavated burial mounds; the grey are unexcavated. The numbers are the original numbers that the excavators gave the barrows. Unfortunately, Høj 33 is not shown on the map. Black: in the catalogue of Hübner and Ebbesen; blue: in the catalogue of Ebbesen; yellow: Bronze Age burial mounds (after Hübner 2005, 973; Ebbesen 2006, 374).

3.2 Results

Most barrows at Trehuse-Sjørup-Dollerup were between 1 and 2 m in height and 11-19 m in diameter, but eight were smaller than 1 m (21,6% of the total), and five were larger than 2 m (13,5% of the total). The smallest barrow was Høj 37: 12-25 cm in height and 7 m in diameter. The largest barrow was Høj 32: 2.74 m in height and c. 19 m in diameter. At least seventeen barrows had been disturbed by ploughing before the excavations (Høj 9, 11, 14, 15, 17, 18, 21, 22, 23, 24, 25, 26, 27, 28, 29, 35, 36; 48,6% of the total). No flat-graves are known at Trehuse-Sjørup-Dollerup.

In three burial mounds, no graves were found: Høj 1, Høj 9 and Høj 14. The landowner had excavated Høj 9a and Høj 9b before the National Museum excavations; these barrows did not yield any graves either, nor finds. I have added these two barrows to my database under number 25, together with Høj 9. Eighteen burial mounds only revealed a primary grave, whereas twelve mounds had been re-used, either in a later stage of the Young Neolithic or during the Bronze Age (fig. 3.5). There are four burial mounds that did not produce a clear picture; Høj 15 may have had two primary graves, Høj 8 and Høj 36 may or may not have been re-used, and Høj 29 contained an Iron Age urngrave but also three pits with an unknown function. Nevertheless, it is possible to give an overview of the different types of primary graves (fig. 3.6). Tab. 3.2 is an overview of the 29 Underground graves at Trehuse-Sjørup-Dollerup; Høj 18 and Høj 33 have two Underground graves. These graves had been dug into the underground before the burial mound was built over the grave, and are generally considered to be the oldest burial type (see Chapter 2) (Furholt 2014, 72). Tab. 3.3 is an overview of the primary Ground graves at Trehuse-Sjørup-Dollerup; these graves were located on the old surface under the mound. There are at least five primary Ground graves; Høj 8 may also have a Ground grave and Høj 15 possibly has two Ground graves. Only one barrow has a secondary Ground grave (Høj 38). Lastly, tab. 3.4 shows the two primary Overground graves, out of a total of thirteen Overground graves at Trehuse-Sjørup-Dollerup.

A total of nineteen barrows (54,4% of the total) demonstrated remains of features surrounding their graves (tab. 3.5; fig. 3.7). Eleven primary graves (57,9%) were surrounded by a stone construction, such as a stone frame (Høj 6, 10, 12, 13, 15, 26, 34, 35, 36, 37 and 39). Additionally, twelve secondary graves, in six barrows

(Høj 12, 20, 26, 28, 31 and 32), were enclosed by a stone construction, such as a stone cist. Høj 4 produced traces of a ring ditch, and Høj 21 a ring-bank. Høj 31 revealed traces of a broad belt with red burnt soil and charred wood. Indications for a wooden coffin were found in three barrows (15,8%): Høj 7, Høj 11 and Høj 12. No post circles or palisaded ditches were encountered (or recognised).

The orientation of the primary grave is known for 31 barrows (83,8% of the total) (tab. 3.6). Eighteen of these displayed an E-W orientation (58,1%), most of which were Underground graves (Høj 2, 3, 4, 5, 10, 12, 13, 18, 21, 33, 35, 36 and 37). Three E-W oriented primary graves were Ground graves (Høj 15, 20 and 26) and one an Overground grave (Høj 8). Eight graves have a NE-SW orientation (Høj 17, 24, 27, 28, 31, 32, 34, 38; 25,8%), and two an ENE-WSW orientation (Høj 7 and Høj 23; 6,5%). All ten are Underground graves. Two Underground graves have a NW-SE orientation (Høj 6 and 39; 6,5%). One Overground grave, in Høj 11, had a WNW-ESE orientation (3,2%).

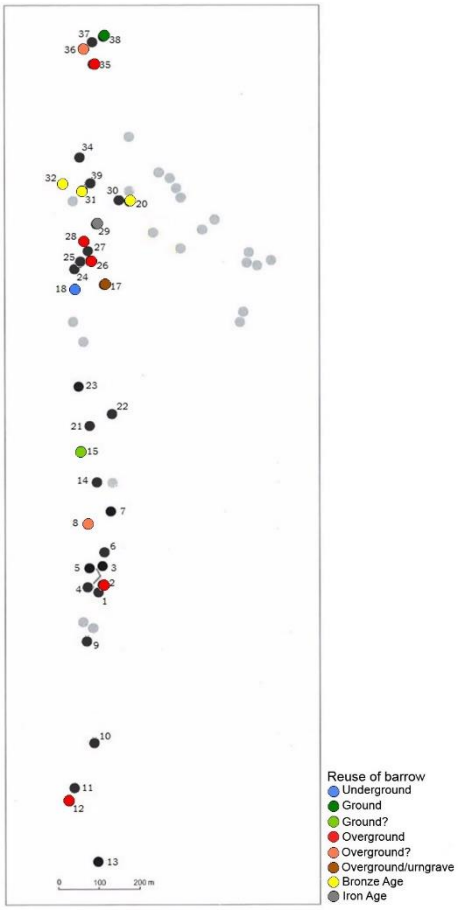

Figure 3.6 - The reused barrows at Trehuse-Sjørup-Dollerup (after Hübner 2005, 973).

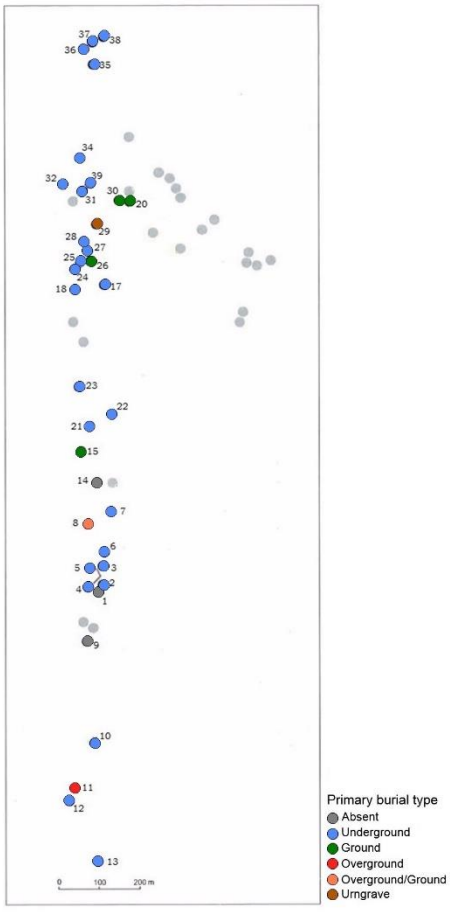

Figure 3.5- The primary graves in the barrows atTrehuse-Sjørup-Dollerup (after Hübner 2005, 973).

There are seventeen graves (45,9% of the total) with traces of human remains (tab. 3.7); twelve of these were the primary graves. Although the Minimum Number of Individuals (MNI) in four of these graves is higher than 1, this is related to the re-use of these barrows; there seem to be no double- or mass-graves in this alignment. In ten of the primary graves, a soil silhouette was preserved of the buried individual. These soil silhouettes were not preserved equally well; in two primary graves only some tooth remains were found. Nevertheless, in ten cases (58,8%) it could be determined where the head of the body used to be (eight heads in the west; two heads in the southwest), and in eight cases (47%) the position of the rest of the body could also be determined. One primary grave (Høj 21; 5,9%) displayed a body that was buried on its back; the other bodies (47,1%) had been buried on their right side, which could indicate a male grave (Furholt 2014, 70).

28 barrows (75,7% of the total) included grave goods with certainty (tab. 3.8); for several barrows, it is unsure whether a find is a grave good or not. Seven barrows yielded pottery (Høj 12, 17, 26, 30, 32, 34, 36; 25%), and six a battle axe (Høj 8, 25, 30, 35, 36, 38; 21,4%). Nine graves contained a flint axe (Høj 3, 11, 13, 15, 28, 31, 36, 37; 32,1%); eight were thick-butted (type 1; Hübner 2005, 328), of which one is of the type 1A, and one axe was thin-butted (type 2; Hübner 2005, 340). Other grave goods were flint blades of varying uses and lengths (variant A: <5.1 cm; variant B: 5.2-8.5 cm; variant C: >8.5 cm; Hübner 2005, 411) (Høj 2, 7, 8, 12, 17, 18, 21, 23, 25, 29, 31, 32, 34, 36, 38; 64,3%) and amber beads and discs (disc variant A: ø <4 cm; variant B: ø

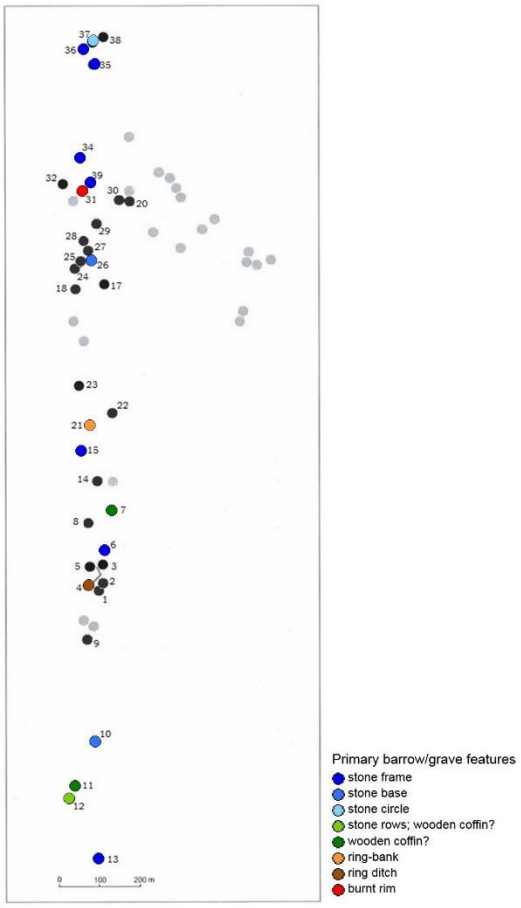

Figure 3.7 - The primary barrow features at Trehuse-Sjørup-Dollerup (after Hübner 2005, 973).

4.1-6 cm; variant C: ø >6 cm; Hübner 2005, 378) (Høj 2, 5, 17, 20, 27, 28, 32; 25%). Several secondary graves produced bronze objects, and in one case an iron nail (Høj 29).

3.3 The time-depth of Trehuse-Sjørup-Dollerup

There are unfortunately no radiocarbon dates of the barrows at Trehuse-Sjørup-Dollerup; the alignment had been excavated before this technique was available. To reconstruct the time-depth of the alignment, I have to date the barrows by means of relative dating.

Tab. 3.9 is an overview of the dates of the barrows, including the source of the date. Three barrows could not be dated, due to the absence of a grave or finds (Høj 9, 14 and 29). In fifteen cases, the date of the primary barrow is based on the grave type: Underground, Ground or Overground (Høj 4, 6, 8, 10, 17, 20, 22, 23, 24, 25, 26, 27, 33, 35, 38, 39; 40,5% of the total). For three barrows, the grave type was decisive for the date of its reuse (Høj 2, 12 and 17). However, these dates are not unproblematic. Underground graves can occur throughout all Single Grave phases (Hübner 2005, 739). The distinction between the grave types also seems to be arbitrary, particularly between the Ground and Overground graves (e.g. Høj 35 had an Overground grave extending to c. 18 cm above the old land surface, whereas the Ground grave in Høj 30 is located at c. 20-30 cm above the surface). The depth of a grave is in many cases hard to tell from the excavator's drawings.

For the remaining barrows (59,5% of the total), the typology of the grave goods determined its date, albeit in combination with the grave type and/or a grave feature. These relative dates are based on the typochronologies of battle axes, beakers, flint blades and amber discs, that Hübner has established by means of correspondence analyses and radiocarbon dates (see Chapter 2; Hübner 2005). Thus, these dates are more reliable than the dates based on the grave types. Yet all dates have a large time span; several artefact types were in use across several phases, or I was not able to determine the exact type of an artefact, such as in the case of the flint axes. Moreover, the periods themselves often have a long time span, due to wiggles in the calibration curve; radiocarbon dates cannot provide a higher resolution than this (see Chapter 2).

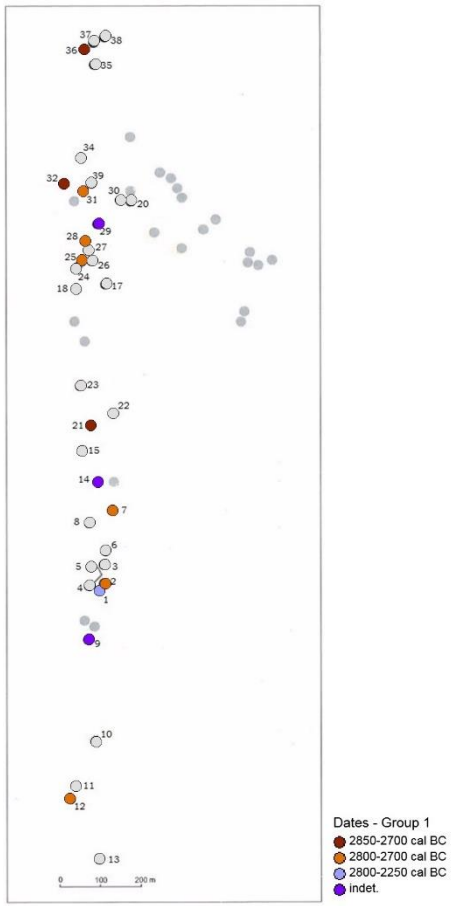

Figure 3.8 - Group 1 of the sequence at Trehuse-Sjørup-Dollerup (after Hübner 2005, 973). The remaining barrows are marked grey.

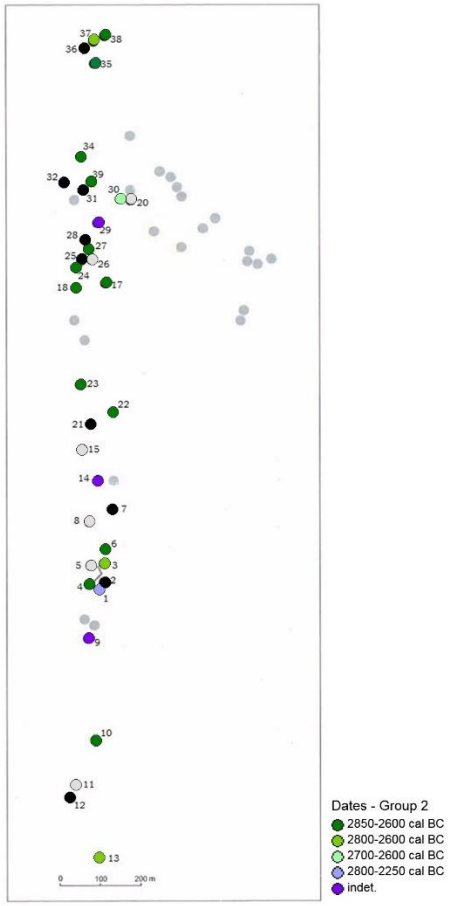

Figure 3.10 - Group 2 of the sequence at Trehuse-Sjørup-Dollerup (after Hübner 2005, 973). The barrows that have already been constructed, are marked black.

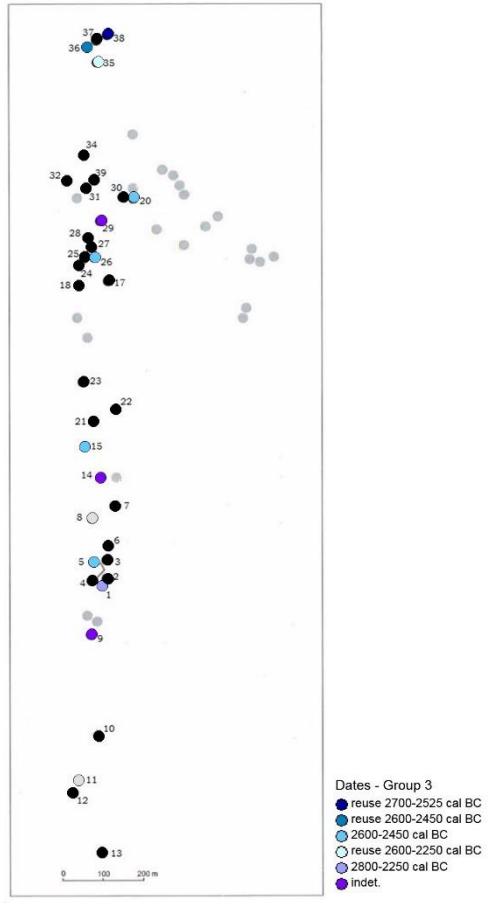

Figure 3.11 - Group 3 of the sequence at Trehuse-Sjørup-Dollerup (after Hübner 2005, 973).

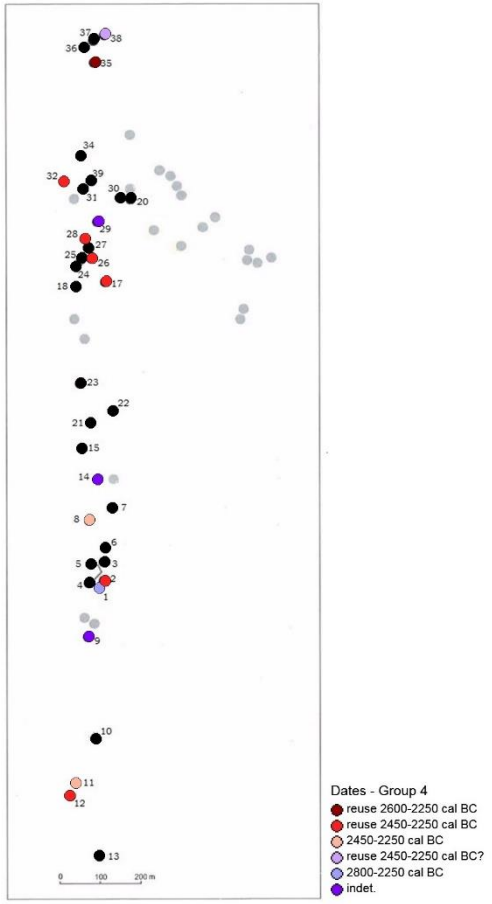

Figure 3.9 - Group 4 of the sequence at Trehuse-Sjørup-Dollerup (after Hübner 2005, 973).

Fig. 3.8-3.11 show the resulting chronological sequence of the alignment during the Single Grave period. I have grouped the dates into four, based on their maximum and minimum dates and their lifespan. Because of the low resolution of the dates, it is possible that barrows in the same group are actually decades (or even centuries!) apart, and that barrows in different groups may be contemporaneous. I want to emphasise that these groups do not necessarily signify separate construction events; there are no strict boundaries between the four groups. There are four barrows that occur in each of the groups: Høj 1, 7, 14 and 29. These could not be dated (properly). The reuse of Høj 35 extends across groups 3 and 4. The division is simply a (visual) tool, meant to help with recognising a pattern.

The first group of dates (fig. 3.8) consists of nine barrows that are likely to have been constructed between 2850-2700 cal BC (24,3% of the total): Høj 2, 7, 12, 21, 25, 28, 31, 32 and 36. These barrows were constructed within 150 years. The primary graves of these barrows were Underground graves, and all contained one or two grave goods: flint blades of the variant C (Høj (12), 21, (32), 36; 44,4%) or B (Høj 2, 7, 25, 28, 31, (32); 66,7%), flint axes type 1(A) (Høj 28, 31; 22,2%), an amber disc of the variant B (Høj 2) and a battle axe A1 (Høj 25). Five barrows (55,6%) showed traces of grave/barrow features: a wooden coffin (Høj 7), two stone rows lining a coffin (Høj 12), a ring-bank (Høj 21), a burnt rim (Høj 31) and a stone frame (Høj 36). The orientations of the graves were either E-W (Høj 2, 12, 21, 25, 36; 55,6%) or (E)NE-(W)SW (Høj 7, 28, 31, 32; 44,4%). Four graves (44,4%) revealed traces of human remains, which all indicated that the body was lain with its head in the west (Høj 21, 28, 31, 36). Two bodies had been buried crouched on its right side (Høj 28, 31), and one body had been buried on its back (Høj 21).

Sixteen barrows were constructed in 2850-2600 cal BC (43,2% of the total), a period of 250 years (fig. 3.9). These barrows were: Høj 3, 4, 6, 10, 13, 17, 18, 22, 23, 24, 27, 30, 34, 35, 37, 38 and 39. These barrows may be more or less contemporaneous with the nine barrows of group 1, as their primary graves are also Underground graves (or even two Underground graves in the case of Høj 18). Seven of these graves (43,8%) did not disclose any grave goods and are purely dated by their grave type. The nine graves (56,3%) that did contain grave goods (mostly just one; Høj 37 had two) show more variation than the graves in Group 1: a fragment of an A-type beaker (Høj 34), flint axes of the type 1 (Høj 3, 13) or 2 (Høj 37), flint

blades of the variant B (Høj 18) or of an unknown type (Høj 23, (35)) and an amber bead (Høj 27). Høj 30 is an exception in two ways: its primary grave was a Ground grave, and it included six grave goods: a battle axe E3 (dating the Ground grave to 2700-2600 cal BC), a grinding stone, a fire flint and a fragmented flint dagger. Eight barrows (50%) comprised grave/barrow features: a ring-ditch (Høj 4), a stone base (Høj 10), a stone circle (Høj 37) and in most cases a stone frame (Høj 6, 13, 34, 35, 39). The graves were again mainly oriented E-W (Høj 3, 4, 10, 13, 18, 35, 37; 43,8%) or (E)NE-(W)SW (Høj 17, 23, 24, 27, 34, 38; 37,5%). Two graves had a NW-SE orientation (Høj 6, 39; 12,5%). Six graves yielded traces of a body, again all with the head in the west (Høj 13, 17, 18, 23, 27, 30; 37,5%). All bodies except the one in Høj 13 demonstrate to be buried on its right side and crouched.

The third group (fig. 3.10), of dates between 2600-2450 cal BC, introduces the reuse of older barrows: Høj 35, 36 and 38. These secondary graves were Overground graves (Høj 35, 36) or a Ground grave (Høj 38). Additionally, four barrows (10,8% of the total) were constructed within 150 years: Høj 5, 15, 20 and 26. These primary graves were either an Underground grave (Høj 5) or a Ground grave (Høj 15, 20, 26). Only Høj 26 did not provide any grave goods and was dated by means of its grave type. The other graves (85,7%) had at least one grave good (Høj 5 had 35, Høj 20 had 10 and Høj 36 had 8): amber beads (Høj 5, 20), amber discs of the variant A (Høj 5), flint axes of the type 1 (Høj 15, 36), battle axes F(2)/G (Høj 35, 38), a weathered battle axe (Glob G?) (Høj 36) and potsherds (Høj 36). Only two graves (28,6%) displayed features: a stone frame in Høj 15 and a stone base in Høj 26. The graves were mostly oriented E-W (Høj 5, 15, 20, 26, 35; 71,4%); the grave in Høj 38 was oriented NE-SW. Only Høj 26 revealed weak traces of a soil silhouette.

The last group (fig. 3.11) consists of the graves dating to 2450-2250 cal BC; these are mainly reused barrows (seven or eight): one Overground grave in Høj 2, 17, 32, 35 and possibly 38, and two Overground graves in Høj 12, 26 and 28. The two graves in Høj 12 were covered by a stone, one of the graves in Høj 26 was surrounded by a stone frame, and one of the graves in Høj 28 was topped by a stone layer. Only two new barrows, Høj 8 and 11 (5,4% of the total), both with an Overground grave and Høj 11 possibly with a wooden coffin, were constructed, over a period of 200 years. Eight or nine graves comprised grave goods: possibly a battle

axe D1 (Høj 8), battle axes F(2)/G (Høj 35, 38), a flint axe of the type 1 (Høj 11), amber beads (Høj 17, 28, 32), C1c and B6 beakers (Høj 26) and potsherds (Høj 12). Again the graves were mainly oriented E-W (Høj 2, 17, 26, 28, 32, 35); the grave in Høj 26 had an orientation of NW-SE. One cremation may be dated to this period (Høj 12). Two graves revealed traces of a body with its head in the west; Høj 26 had a body lying on its back and Høj 17 had a crouched body lying on its right side.

The division in four groups seems to bring out an interesting pattern. The first two groups only involve primary barrows; no barrows are reused yet. This amounts to 25 barrows (67,6% of the total), that have been constructed within 250 years, or approximately over ten to twelve generations (c. 20-25 years per generation). The barrows cover a primary Underground grave, or in one case a primary Ground grave. Group 3 and 4 on the other hand combine the reuse of nine older barrows with the construction of six new barrows (16,2% of the total), over a period of 350 years (c. fourteen to seventeen generations). These graves are mainly Overground graves, but there are also some Ground graves and one Underground grave.

I suggest that this pattern may indicate two different use-phases of the alignment of Trehuse-Sjørup-Dollerup during the Single Grave culture: one earlier, more active phase, and a second phase in which the Single Grave people were less active in burying their dead on the alignment. The graves of the first phase generally contain one or two grave goods, which are mainly flint blades (52%). There are only few beakers and battle axes (4% and 8% respectively). The graves are oriented either E-W (48%) or NE-SW (40%), and 52% of the graves have a feature. The second phase includes graves with more than two grave goods. There also seems to be an increase in beakers (20%), battle axes (26,7%) and amber beads (40%) compared to the earlier phase. Lastly, the later graves are more dominantly oriented E-W (73,3%), and 46,7% of the graves have a feature. There does not seem to be a significant difference in the position of the dead between the two phases.

3.4 Conclusion

At least 31 out of 45 excavated burial mounds on the alignment of Trehuse-Sjørup-Dollerup can be dated to the Single Grave period. The dates are based on the typochronologies of graves, ceramics, battle axes, flint axes, flint blades and amber discs as described by Hübner (2005).

Due to the limitations of typochronologies and a complete lack of absolute dates, the dates of the barrows are highly problematic. The resulting time-depth of the alignment may nevertheless reveal an interesting pattern; the Single Grave people may have constructed and added to the alignment in two phases: an earlier, more active phase, dating to c. 2850-2600 cal BC, during which about ten to twelve generations constructed 25 primary barrows, and a later phase, dating to c. 2600-2250 cal BC, when nine older barrows were reused and six new barrows were added to the alignment by about fourteen to seventeen generations of Single Grave people. In the second phase we see an increase in the use of beakers, battle axes and amber beads as grave goods, and some graves have more than only one or two grave goods. Moreover, the graves are more uniformly oriented E-W.

There is no abrupt boundary between the two phases; the low resolution and limited reliability of the dates cannot support this. If there indeed was a development from a more active construction phase to a less active construction phase, this would have been gradual, probably unintended, and a logical consequence of centuries of barrow construction (i.e. the best spots had already been taken!). There is also the possibility that during the later phase, the Single Grave people did still actively bury their dead on the alignment, just more to the south, in present-day Havredal Plantage, or elsewhere.

4 The Dutch alignment of Angelslo-Emmerhout

The second case-study, that of the alignment of Angelslo-Emmerhout in The Netherlands, will be discussed here. First, I shall describe the alignment and its research history. Then I will present the results of the literature study and the GIS analysis. Lastly, I will discuss the resulting time-depth of the alignment.

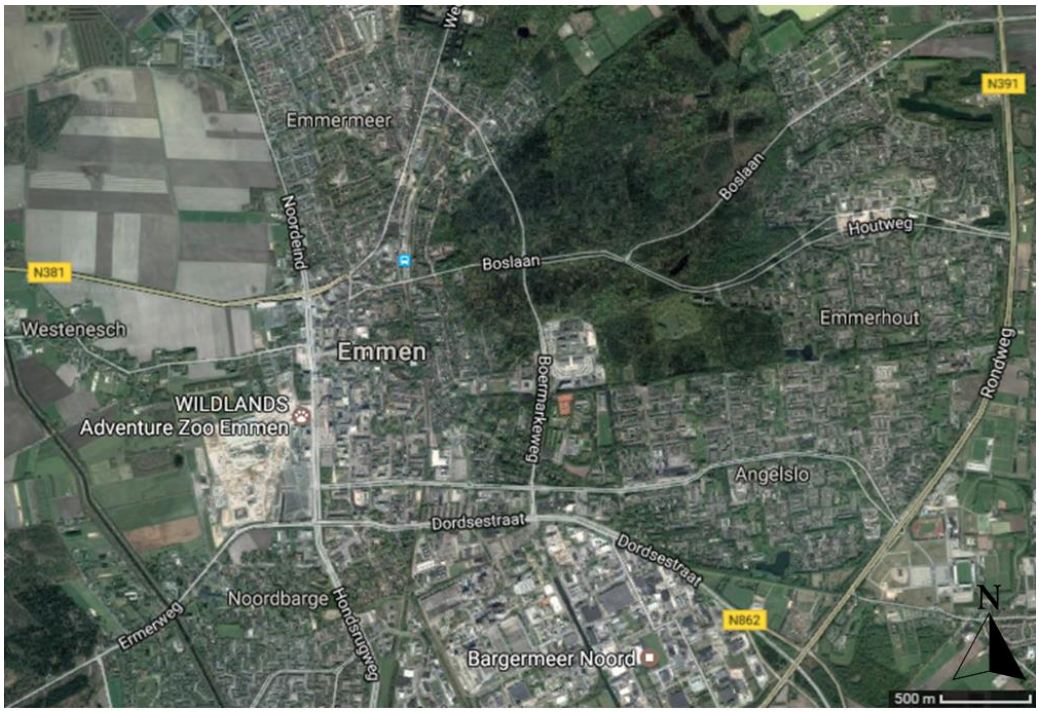

Figure 4.1 - Aerial photograph of the districts Angelslo and Emmerhout, to the east of the town Emmen (after Google Maps).

4.1 Introduction: the research history of Angelslo-Emmerhout

In the 1960s, the Biological-Archaeological Institute of the University of Groningen conducted large-scale excavations near the town of Emmen in Drenthe, The Netherlands. Here the residential districts of Angelslo and Emmerhout were to be developed (fig. 4.1) (Kooi 2008, 327). Angelslo-Emmerhout is located in a former heathland area of c. 110 ha, on a part of the ridge complex of the Hondsrug where coversand covers ground moraine deposits. The archaeological potential of this area had already been demonstrated by research in the 1930s (Arnoldussen and Scheele 2012, 153; Kooi 2008, 330). In 1931, 1932 and 1933 F. C. Bursch conducted

excavations in the south and the east of the woodland Emmerdennen, unearthing ten prehistoric burial mounds and two urnfields (fig. 4.2 and 4.3) (Bursch 1936, 56; Bursch 1937, 42, 51, 53-4). Between 1960 and 1968, a further 13 ha was excavated, under the supervision of professor H. T. Waterbolk and J. D. van der Waals (Arnoldussen and Scheele 2012, 153; Kooi 2008, 330, 327). During these excavations, 106 funerary monuments were investigated, among which two megalithic graves (the *hunebedden* D46 and D47) and three flat-graves from the Middle Neolithic, and nine Single Grave inhumation graves, of which only two (or three) were covered by a barrow (fig. 4.4 and fig. 4.5) (Arnoldussen and Scheele 2012, 153, 156-9). It was also found that later graves, burial mounds, secondary burials and two urnfields had been added to this funerary landscape throughout the Late Neolithic B until the Early Iron Age. New barrows reinforced the NNW-SSE alignment, that was begun with the megalithic graves and the Single Grave barrows, and that mirrors the direction of height differences in the local landscape (Arnoldussen and

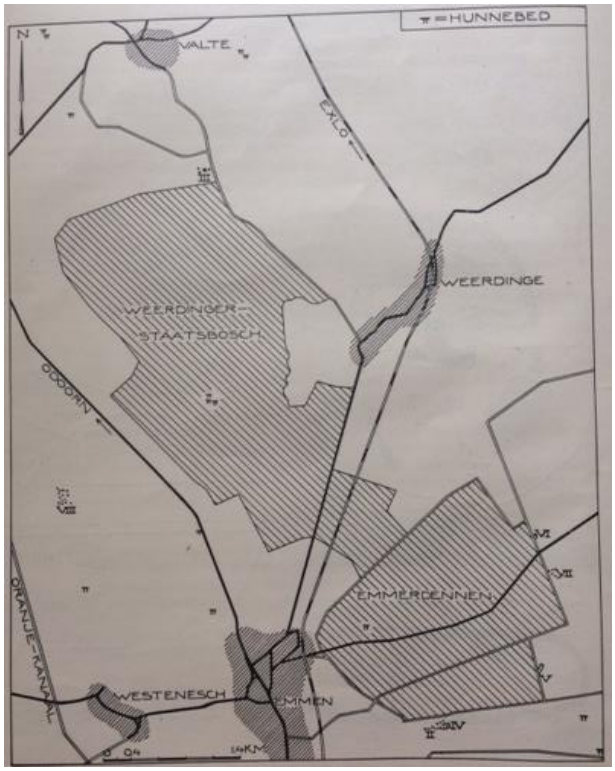

Figure 4.2 - The locations of the excavations around the Emmerdennen by Bursch in the 1930s (Bursch 1937, 42, fig. 13). II and IV: burial mounds and urnfield, excavated in 1931-1932; V: urnfield, excavated in 1933; VI and VII: stone heap cremation graves and Roman burial mounds, excavated in 1937.

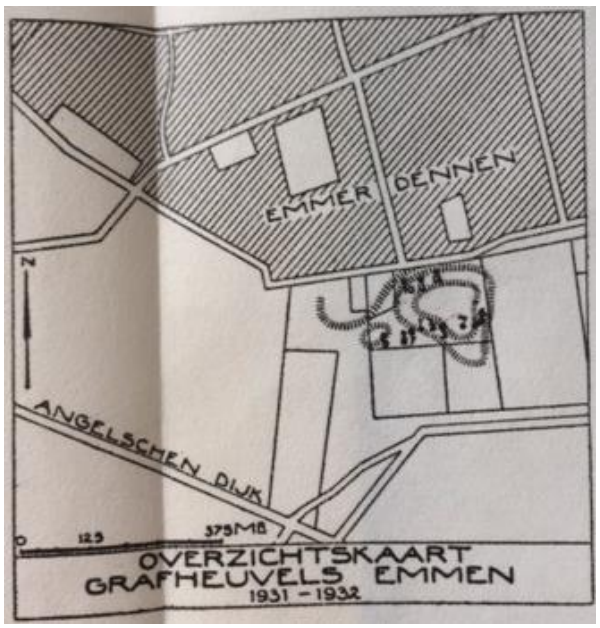

Figure 4.3 - Plan of the burial mounds to the south of the Emmerdennen (II in fig. 4.2), excavated in 1931-1932 (Bursch 1936, situation map).

Scheele 2012, 160-177). Additionally, house plans from the Middle Bronze Age B onwards were uncovered, indicating an intertwined funerary and domestic usage of this prehistoric cultural landscape (Arnoldussen and Scheele 2012, 166-78).

Van der Waals has published the preliminary results of the excavations in 1962, 1963, 1967 and 1968 in the *Nieuwe Drentse Volksalmanak*; a proper report was unfortunately never published, although some findings were published in the 1970s. In his dissertation on Bronze Age burial mounds, Lohof (1991) included the barrows of Angelslo-Emmerhout in his catalogue, but not the flat-graves (Lohof 1991, 35, 38). A proper overview of the site was finally published by Arnoldussen and Scheele in 2012. This article discusses the results from the excavations east of the Emmerdennen. Yet in 1960-1961, Van der Waals had re-excavated the terrain to the south of the Emmerdennen, where Bursch had found burial mounds and an urnfield in 1931-1932 (fig. 4.6). Between the remnants of the burial mounds and ring ditches of the urnfield, Van der Waals unearthed three Single Grave flat-graves (Van der Waals 1963, 251-2; Bakker and Van der Waals 1973, 18-9).

Although Arnoldussen and Scheele did not explore this area in their 2012 study, I suggest that the burial mounds and flat-graves in this area are part of the broader barrow landscape surrounding the alignment of Angelslo-Emmerhout (fig. 4.7). Two (and possibly even four) of the ten barrows that Bursch excavated, were Single Grave burial mounds (Lohof 1991, 43, 47, 48). Furthermore, this terrain is located only 1,2 km to the west of the alignment of Angelslo-Emmerhout (Arnoldussen and Scheele 2012, 178-9). It is known that prehistoric barrow landscapes are only partially preserved (Bourgeois 2013, 39). Thus, it is not impossible that there used to be more Single Grave barrows here. Perhaps one might even imagine two alignments in this area: one running NNW-SSE at Angelslo-Emmerhout, and one running E-W at the south of the Emmerdennen. Consequently, I have decided to include the four barrows and three flat-graves at Emmerdennen-South in my analysis, which now comprises a total of sixteen graves (database numbers 38-53) (tab. 4.1). For clarity's sake, I will refer to the graves by their database number in the following paragraphs; No. 38-43 are located in Angelslo, No. 44-46 in Emmerhout and No. 47-53 in Emmerdennen-South.

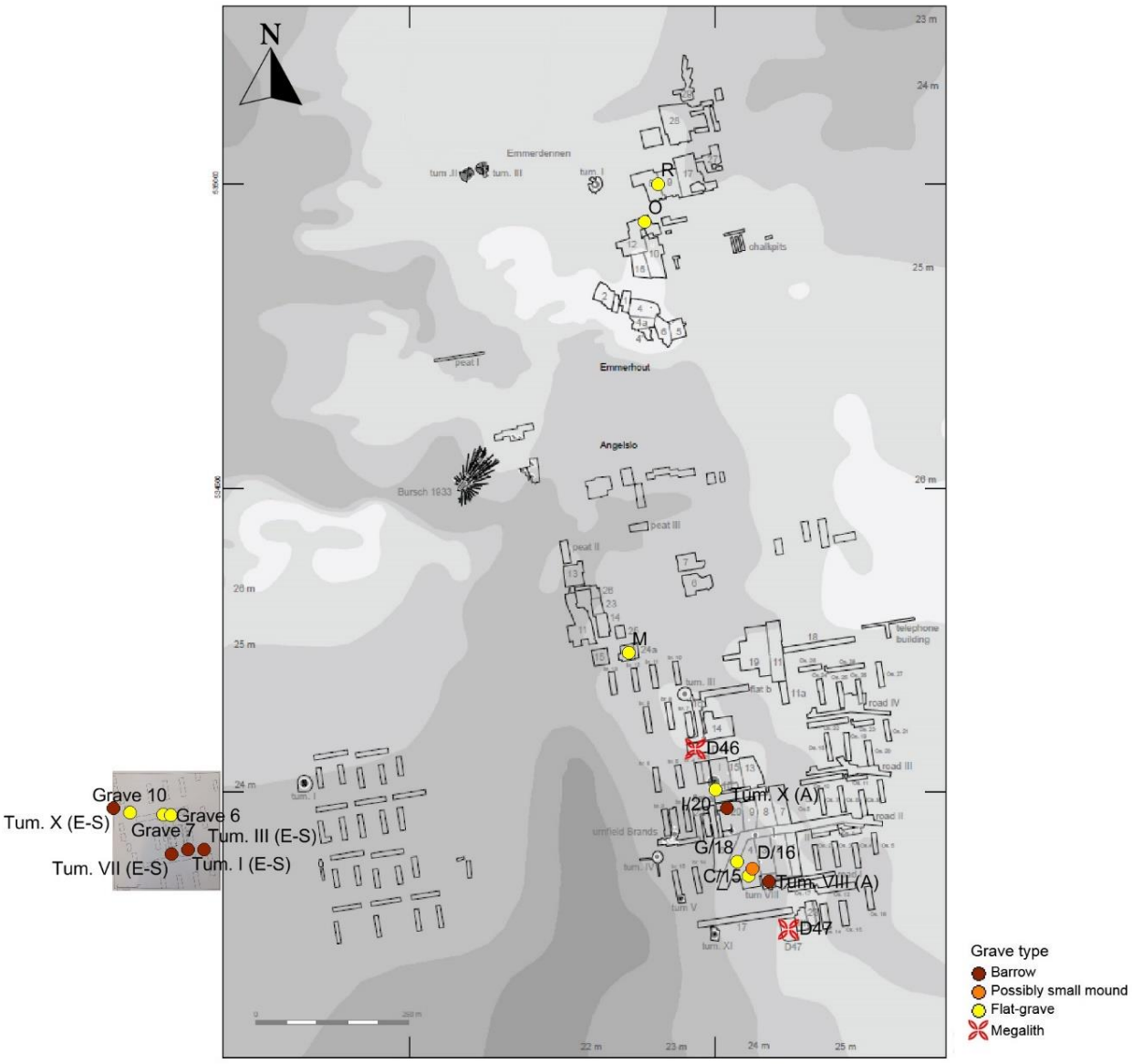

Figure 4.4 - The excavation trenches at Angelslo-Emmerhout and Emmerdennen-South (see fig. 4.6), with the discovered Single Grave burial mounds and flat-graves and the megalithic graves/*hunebedden* (large map: after Arnoldussen and Scheele 2012, 154, fig. 1; small map: after Bakker and Van der Waals 1973, 18, fig. 2). The location of the graves at Emmerdennen-South is an estimation, based on broad coordinates, the assumption that 'I' is Tum. I, excavated by Bursch in 1931, and the imprecise situation map by Bursch (Bursch 1936; Lohof 1991, 35, 48).

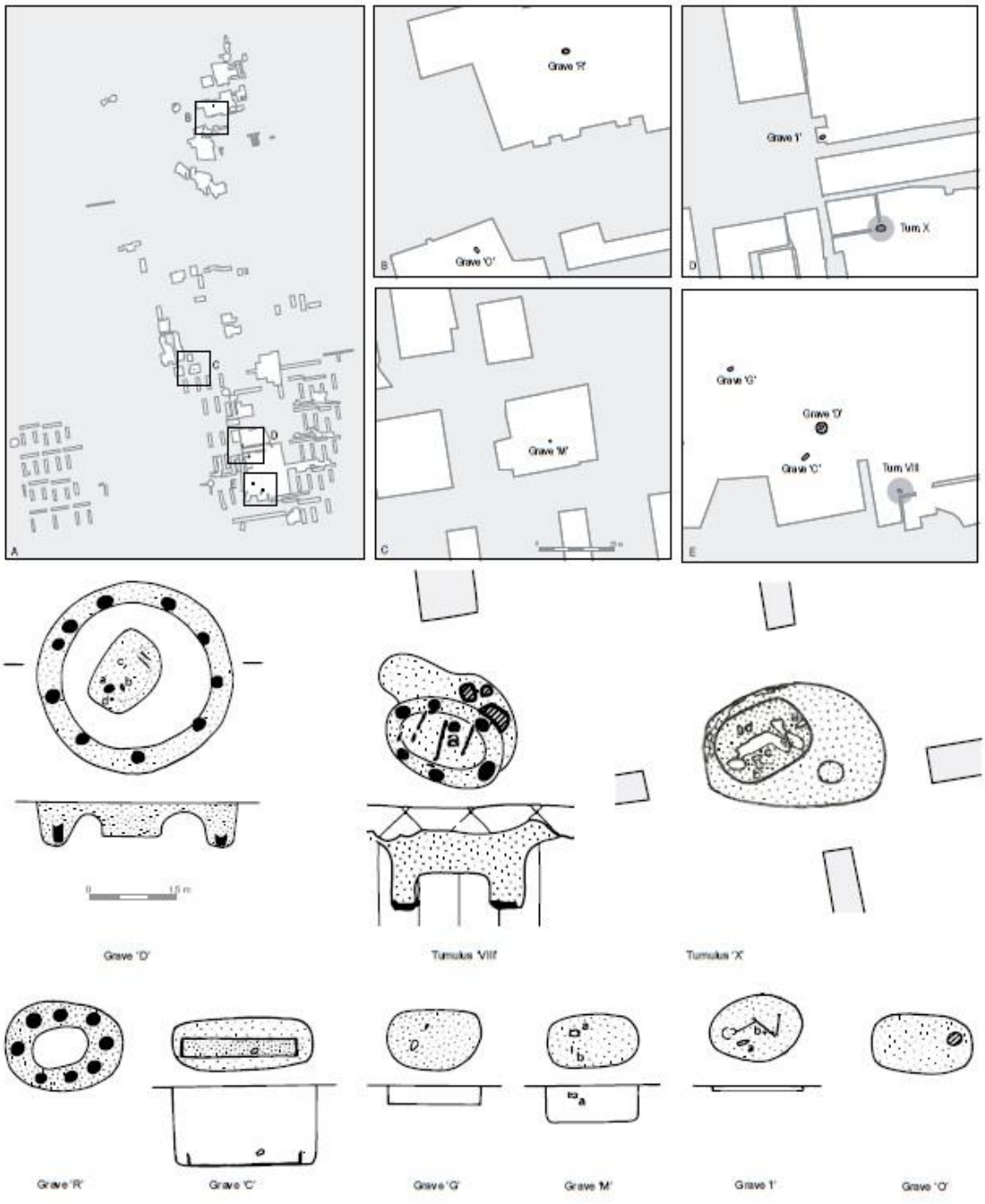

Figure 4.5 - The Single Grave Culture graves at Angelslo-Emmerhout (Arnoldussen and Scheele 2012, 158, fig. 3).

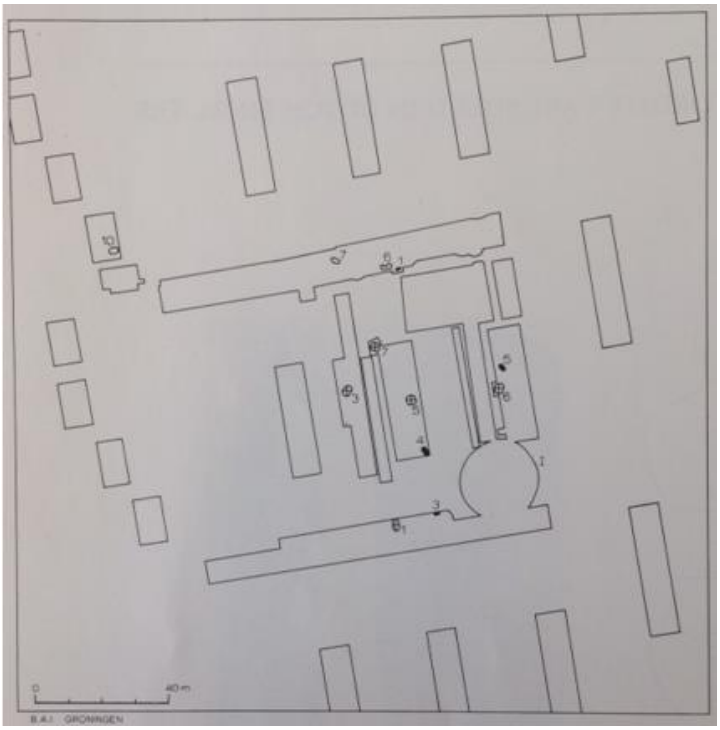

Figure 4.7 - Excavation trenches to the south of the Emmerdennen (see fig. 4.2, II and IV), where Van der Waals excavated in 1960-1961. Black & crossed symbols: Funnel Beaker graves and settlement pits; open symbols: Single Grave flat-graves (Bakker and Van der Waals 1973, 18, fig. 2).

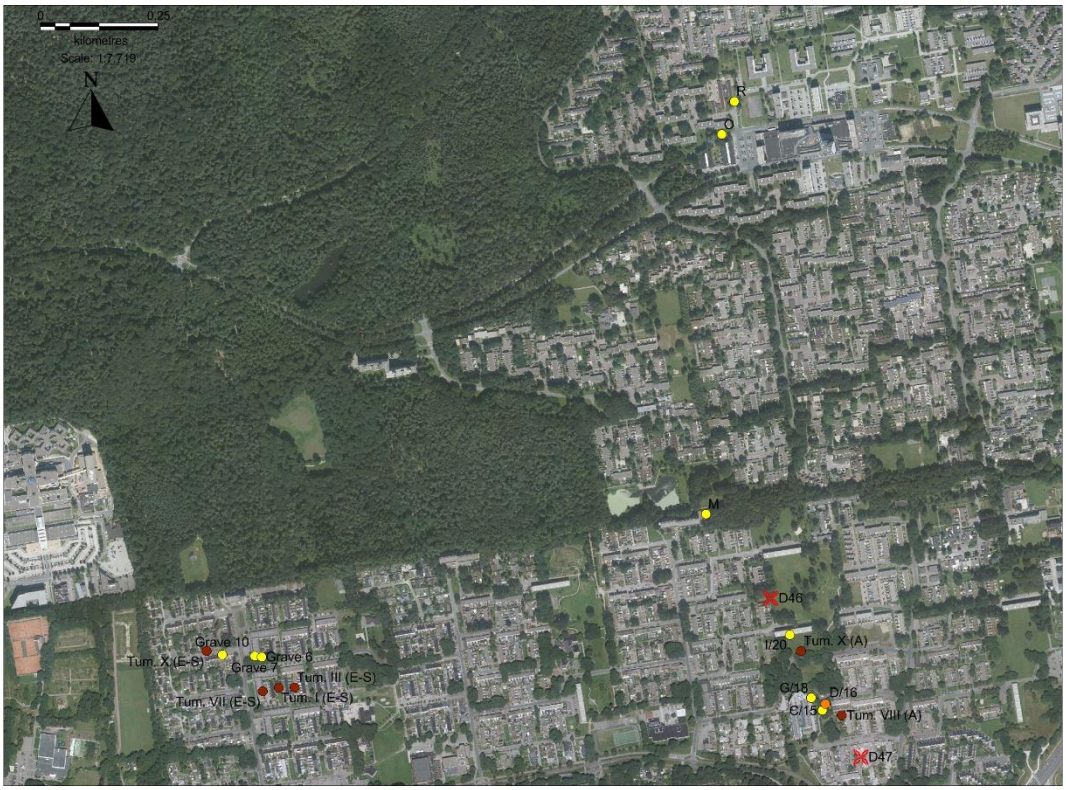

Figure 4.6 - The graves of Emmerdennen-South (western cluster, approximate locations) and of Angelslo-Emmerhout (eastern alignment) on the aerial map of the area, showing the proximity of both sites (after Nationaal Georegister).

4.2 Results

The excavations at Angelslo-Emmerhout and Emmerdennen-South yielded at least fourteen primary graves from the Single Grave Culture (tab. 4.2). Four or five of these graves had been covered by a burial mound (grave name: 'Tumulus' and Roman number; 28,6% or 35,7%); the other ten or nine were flat-graves (grave name: 'Grave' and a letter or number; 71,4% or 64,3%). Two additional barrows may have been built during the Late Neolithic (No. 50, 53). Six graves (37,5% of the total) displayed traces of a barrow feature: a 'beehive' construction (No. 38, 46; 33,3%), a palisade ditch (No. 41, 51; 33,3%) and a ring-ditch (No. 52, 53; 33,3%). All six barrows had been reused during the Middle Bronze Age or the Iron Age, with the addition of secondary interments, secondary barrow phases and/or barrow features. Four primary graves revealed traces of a tree-trunk or wooden coffin (No. 40, 50, 52, 53). Of four graves it could be determined that it had an E-W orientation (No. 39, 50, 52, 53; 25% of the total).

Only four primary graves (25% of the total) showed traces of the burial, in the form of a soil silhouette (tab. 4.3). Two of the soil silhouettes indicate that the body was laid on its right side, crouched and with its head in the west. The soil silhouette in No. 53 was very badly preserved, but demonstrated that the head of the body was located in the east. Unfortunately, Van der Waals did not describe the position of the soil silhouette in No. 41 (Van der Waals 1967, 211). Moreover, Van der Waals reported that remains of crouched soil silhouettes were found in No. 47, 48 and 49, but it is unclear whether this means that each flat-grave had a soil silhouette. There are also no remarks about the position of these soil silhouettes (Van der Waals 1963, 251).

Fourteen of the graves (87,5% of the total) contained grave goods (tab. 4.4). Three of the graves (21,4%) disclosed one object; the other ten (71,4%) had numerous grave goods. Nine graves included (fragments of) Protruding Foot Beakers (No. 38, 40, 44, 45, 47, 48, 49, 51, 52; 64,3%). No. 39, 41 and 45 produced battle axes (21,4%). Other finds were a flint axe (No. 39), greenstone axes (No. 42, 43, 48; 21,4%), a grindstone (No. 39), a flint arrowhead (No. 41), characteristic flint daggers from Grand-Pressigny in France daggers (or a lookalike) (No. 49, 51; 14,3%) and flint flakes, blades or bladelets (No. 39, 41, 42, 43, 44, 47, 48, 52; 57,1%). The

remaining three primary graves without grave goods are No. 46, 50 and 53; the grave goods in Graves No. 51 and 53 are secondary.

4.2.1 GIS analysis

Unfortunately, the graves at Emmerdennen-South have no exact coordinates; they are not depicted on the map by Arnoldussen and Scheele, and Lohof's catalogue discloses such imprecise coordinates that some graves would be located on the same spot. However, I have been able to find their approximate locations, by using three of Lohof's coordinates (for No. 47, 50, 53), the map by Bakker and Van der Waals (see fig. 4.6; assuming that the 'I' is Tum. I/No. 50) and the situation map by Bursch (see fig. 4.3). Consequently, I was able to incorporate these approximate locations in the GIS analysis together with the exact coordinates of the graves at Angelslo-Emmerhout.

An unavoidable obstacle turned out to be the fact that the whole area is a residential district. Because of this, the topographical and geological maps (including the soil map) could not give any insights into the landscape of the area. The AHN map, which shows the relief of the landscape, includes buildings and roads and therefore was of no use either. The geomorphological map did happen to be useful (fig. 4.8). By projecting the graves over the geomorphological map, it becomes clear that the burials lie directly on top of the eastern part of the Hondsrug ridge complex. This complex consists of parallel ridges of ground moraine and boulder till, separated by valleys formed by glacial meltwater (Jongmans *et al.* 2013, 236-7, 294). The burials at Angelslo-Emmerhout are located on ground moraine, in a sloping landscape on the east side (see fig. 4.4). Slightly to the west, the burials at Emmerdennen-South are located on the geomorphological unit of 'Anthropogenic', at an area where this unit seems to overlap a meltwater valley. If this is indeed the case, this difference may confirm that there are two different groups of burials in this area: a NNW-SSE alignment in Angelslo-Emmerhout, on top of the ground moraine, and an E-W oriented group or alignment in Emmerdennen-South, in the meltwater valley.

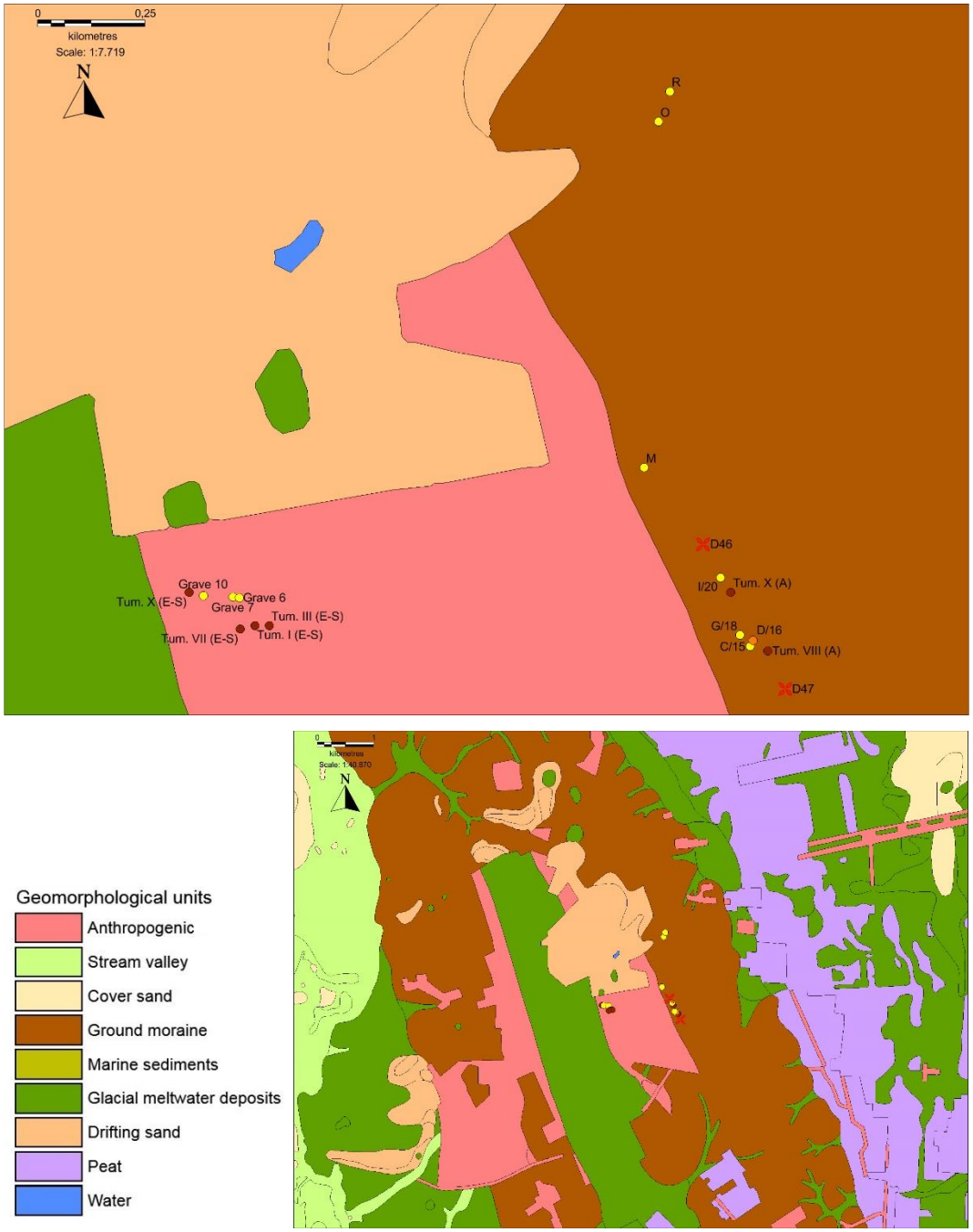

Figure 4.8 - The geomorphological map of Angelslo-Emmerhout/-Emmerdennen (above) and the surrounding area (below), with the (approximate) locations of the graves (after Geoportaal provincie Drenthe).

4.3 The time-depth of Angelslo-Emmerhout

Assigning a date to the Single Grave burials at Angelslo-Emmerhout/-Emmerdennen appeared to be a difficult task. The only Single Grave burial that has been dated by radiocarbon dating is No. 38 (Arnoldussen and Scheele 2012, 159). No. 39 has also produced a radiocarbon date, but this date is associated with the later use of the burial mound during the Middle Bronze Age (Lohof 1991, 41). The chronological sequence of the graves therefore has to be established by dating the graves with typochronologies (tab. 4.5).

Seven graves could be dated with Beckerman's typochronology of Protruding Foot Beakers (No. 40, 44, 45, 47, 48, 49, 52) (Beckerman 2015, 193). It is notable that the dates have a very large timespan; most types appear to have been used for long periods of time, but the timespan is also partly the result of the chosen interval. Beckerman uses the 1δ interval to show that there is a long lifespan of certain characteristics due to plateaus in the calibration curve, and the 2δ interval for more precision, but this has an even longer lifespan (Beckerman 2015, 193). To be safe, I have chosen the dates with the 2δ interval. The dates between brackets had a 1 minus ranking after Beckerman's assessment of the reliability of the radiocarbon dates; although I added these dates in the table, I calculated the timespan based on the more reliable dates (Beckerman 2015, 193, 155).

Unfortunately, Beckerman does not include battle axes in her chronology of the Corded Ware culture, nor any other grave good category. It follows that the graves that did not produce any datable ceramics, but did yield other grave goods, had to be dated with the chronology by Drenth and Lanting and the corresponding relative dates by Drenth (Drenth and Lanting 1991; Drenth 2005, 349). There are two graves that contained a battle axe, but no Beaker (No. 39, 41). Two graves had to be dated by their greenstone axe (No. 42, 43), and one by its Grand-Pressigny flint dagger (No. 51).

No. 46, 50 and 53 did not disclose any grave goods. No. 46 could however be dated by its grave feature, a so-called 'beehive' construction, which is a lowered foundation trench with postholes directly adjacent to the grave, meaning that the burial was lined with wickerwork or a small palisaded wall (Arnoldussen and Scheele 2012, 157; Bourgeois 2013, 35). In his dissertation, Bourgeois (2013) presented a typochronology of barrow features, based on both contextual evidence

and radiocarbon dates (Bourgeois 2013, 30). The two remaining graves, No. 50 and 53, were dated to the Late Neolithic or the Early Bronze Age by Lohof (Lohof 1991, 48). No. 53 exposed a ring-ditch, thus confirming the Bronze Age date (Bourgeois 2013, 30). No. 50 did not contain a primary barrow feature and cannot be dated more precisely.

These dates can be grouped into two types. Group 1 (fig. 4.9) are the dates that have such a long timespan, that these graves could have been placed during the whole of the Single Grave culture. There are six flat-graves (No. 40, 44, 45, 47, 48, 49) and one barrow in this group (No. 52). In two graves (No. 40, 52), a tree-trunk coffin was found, and No. 52 had a barrow feature (five posts and a ring-ditch). All graves had one to three grave goods, among which a Protruding Foot Beaker. Group 2 (fig. 4.10) are the graves that are dated to a more limited period, albeit still with a maximum of 350 years. These graves are three barrows (No. 38, 39, 51), a possible barrow (No. 41) and three flat-graves (No. 42, 43, 46). Two graves had a 'beehive' construction (No. 38, 46) and another two had a palisade ditch (No. 41, 51). One grave was without grave goods (No. 46), the other graves had one to six grave goods, which did not include ceramics, but mainly flint and stone objects. The difference in grave goods between Group 1 and 2 reflects the means by which the graves were dated. There is no difference in the grave orientations, nor in the body positions of those buried, between the two groups of dates. The grave types and grave features do not reveal any pattern either.

Despite the very large timespans of the dates by Beckerman (Group 1) and Bourgeois (Group 2, No. 46), i.e. a low resolution of these results, these dates are probably the most reliable. Although No. 38 (Group 2) has a radiocarbon date, there may be technical problems with the sample, such as poor quality, inadequate preparation, contamination and the so-called reservoir effect. Likewise, there may be archaeological problems, such as a lack of association and the possibility that it was old wood when it was burnt (Beckerman 2015, 154). Thus, the reliability of this radiocarbon date is not known. Meanwhile, the dates by Drenth (the remaining graves in Group 2) are not very reliable at all, since they are based on uncalibrated radiocarbon dates. In fact, calibrated radiocarbon dates cannot uphold such a fine resolution; Bourgeois proposes that Drenth's four phases should be considered as contemporaneous (Bourgeois 2013, 26-7). It follows that five dates are very

unreliable (No. 39, 41, 42, 43, 51, all in Group 2; 31,3% of the total), one date is not very reliable because it is based on 1 minus ranking radiocarbon dates (No. 52, Group 1; 6,3% of the total), and another date is of uncertain reliability (No. 38, Group 2; 6,3% of the total). This means that only eight graves (50% of the total) have a reliable date. Yet these dates have such a low resolution, that they may all be contemporaneous (except No. 53, dating to the Bronze Age). Consequently, there is no indication for a chronological difference between the graves at Angelslo-Emmerhout/-Emmerdennen. The time-depth of the alignment(s) is inconclusive.

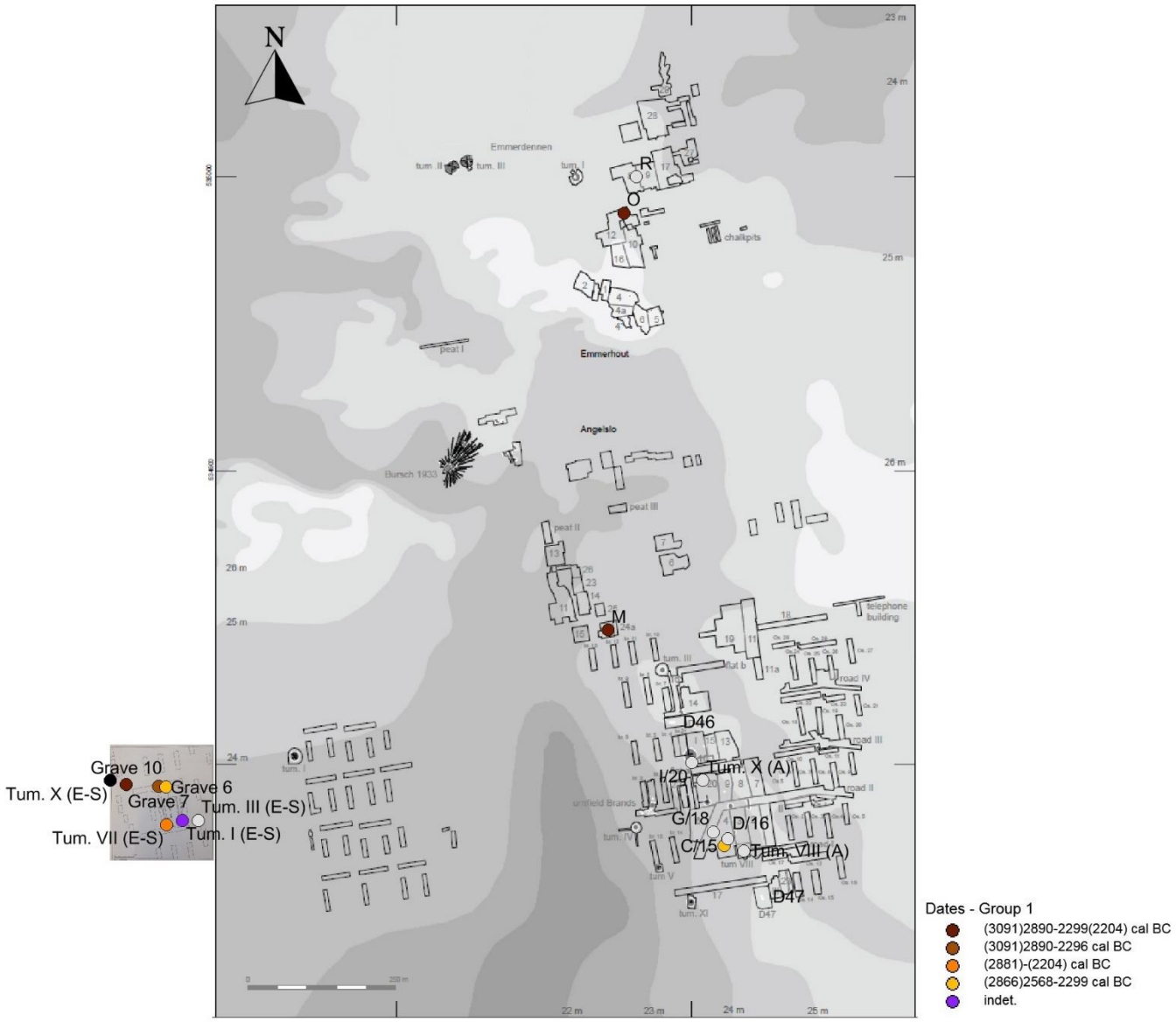

Figure 4.9 - Group 1 of dates of the graves at Angelslo-Emmerhout/-Emmerdennen (after Arnoldussen and Scheele 2012, 154, fig. 1; after Bakker and Van der Waals 1973, 18, fig. 2). Grey: graves not included in this group; Black: Bronze Age barrow.

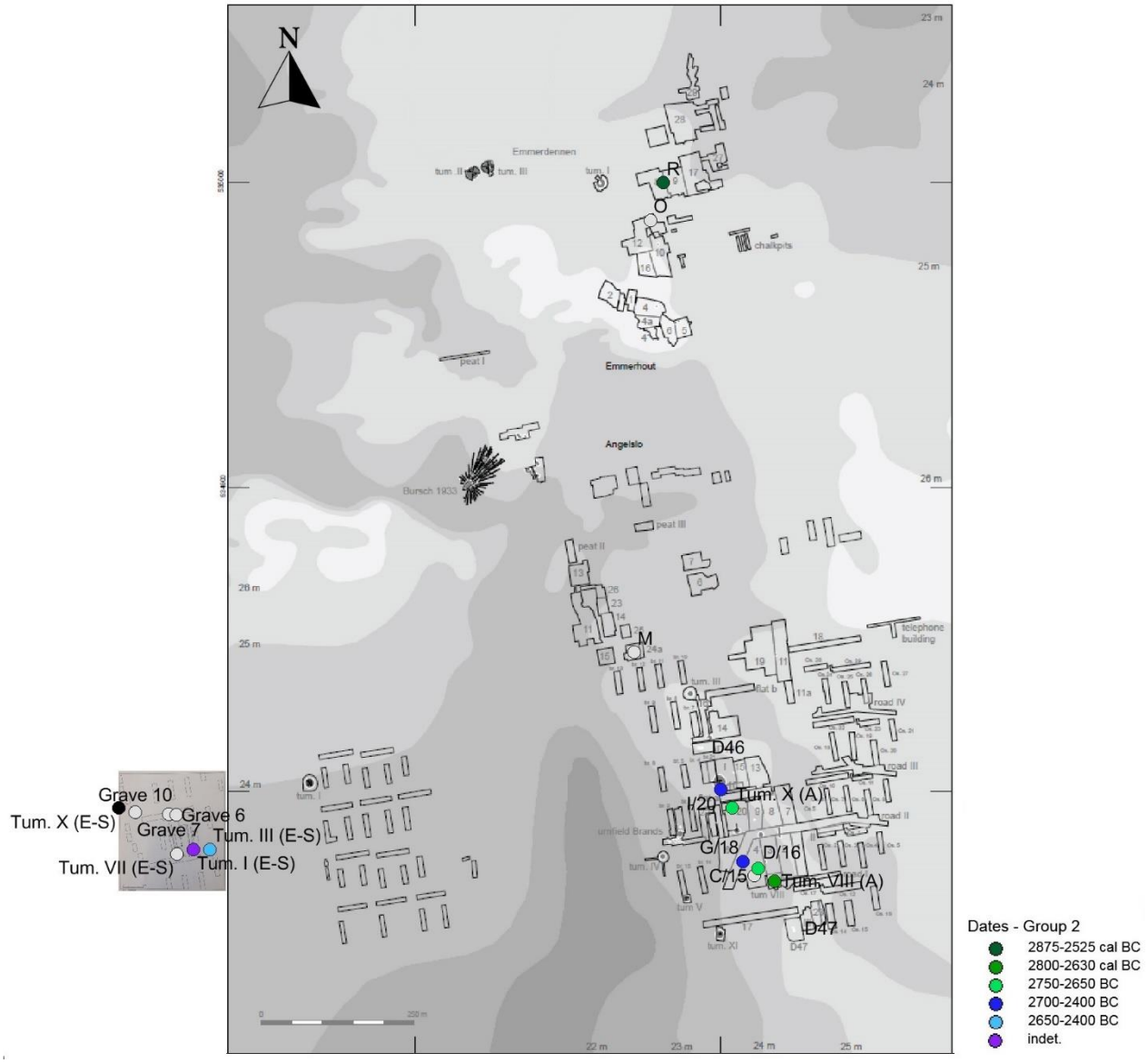

Figure 4.10 - Group 2 of the dates at Angelslo-Emmerhout/-Emmerdennen (after Arnoldussen and Scheele 2012, 154, fig. 1; after Bakker and Van der Waals 1973, 18, fig. 2). Grey: graves not included in this group; Black: Bronze Age barrow.

4.4 Conclusion

The Single Grave burials at Angelslo-Emmerhout/-Emmerdennen are arranged in two different groups or alignments that may or may not be contemporaneous. The first is a NNW-SSE oriented alignment, at the east of the Emmerdennen ('Angelslo-Emmerhout'). This orientation follows the local topography of the ground moraine plateau on which the alignment is located. The alignment was started with the two megalithic graves from the Middle Neolithic, and consisted of either two or three Single Grave burial mounds and six or seven flat-graves. Later barrows and urnfields had been added to the alignment.

The second group is located to the south of the Emmerdennen ('Emmerdennen-South'), about 1,2 km to the west of the first group, possibly in a valley created by glacial meltwater. This group is composed of two or three Single Grave burial mounds that may have been positioned in an E-W oriented alignment. However, this alignment may have been created during the Bronze Age, when new barrows were added to the group. Between the northern and southern sections of the group, three Single-Grave flat-graves were found. Although they do not align with the burial mounds in an E-W orientation, they do demonstrate an E-W alignment in relation to each other. There do not seem to be any substantial differences between the two groups; both groups of graves have yielded Protruding Foot Beakers and flint and stone objects. No pattern can be observed in barrow features, grave orientations or positions of the bodies.

Unfortunately, it is not possible to draw any conclusions about the time-depth of the burials in both groups; too few burials can be dated in a reliable manner, and the reliable dates have a very low resolution. It is possible that the fourteen Single Grave burials were built contemporaneously, or that they date decades or even centuries apart.

5 The Swedish alignment of Lilla Beddinge

This chapter is a discussion of the last case study: Lilla Beddinge in Southern Sweden. Again, I will first describe the alignment and its research history, before presenting the results from the literature study and the resulting time-depth of the alignment. I have not conducted a GIS analysis on the graves at Lilla Beddinge; I could only access a geological map, on which the graves were already projected.

Figure 5.1 - Aerial photograph of the area of the burial alignment of Lilla Beddinge (after Google Maps).

5.1 Introduction: the research history of Lilla Beddinge

The 'cemetery' of Lilla Beddinge is located at the south coast of Skåne, Sweden, about 1 km from the beach and on a slight elevation in the cultivated landscape, on a moraine hill with glacial sediments (fig. 5.1, fig. 5.2) (Malmer 1962, 152). The cemetery is one of the biggest known of this period, consisting of thirteen flat-graves (fig. 5.3), most of which (Graves 41-46, 48-51) were found during work on the field by the landowner (Malmer 1962, 152; Malmer 2002, 137-8). In the 1910s, Hansen investigated three graves (Graves 41-43) and published his findings in 1917, and Frödin excavated one of the graves (Grave 44) (Malmer 1962, 153-5; Hansen 1917, 68-72). These graves were located to the south of the moraine hill, on a flat terrain

(Malmer 1962, 152). In the 1930s, Hansen returned to Lilla Beddinge to excavate five additional graves (Graves 45, 46, 48-50) (Malmer 1962, 156, 162-3). In 1950 and 1951, Malmer investigated the last four graves (Graves 47, 51-53), two of which (Graves 47 and 53) were discovered during a systematic field survey of the terrain (Malmer 1962, 158, 164, 168, 176). In his dissertation, Malmer (1962) studied the thirteen flat-graves. All graves were made up of an extensive subterranean stone construction, often only 30 cm under the surface, and therefore most of the graves were found during the ploughing of the land (Malmer 1962, 152).

Somewhere near Graves 41-43, a hollow-edged flint axe and two flint blades were recovered by the landowner in 1915. These finds were under a stone heap, together with a misplaced vessel, and possibly belonged to another grave. Malmer has added it to his table with grave finds (Malmer 1962, 919, Tab. 100, 'Grave 54'), but since the location is unknown, I have not included this in my analysis. Three additional graves in the south of the cemetery may have been destroyed; the total amount of graves in the field should possibly be eight, but there is a lack of evidence to support this. Nevertheless, there may have been more graves in this southern part of the cemetery (Malmer 1962, 156).

Besides the thirteen inhumation graves, fourteen urngraves and other cremation graves from the Bronze Age were encountered at the cemetery. Twelve of these graves were very close to Graves 48-52. Furthermore, several hearths were found, of which at least a few can be dated to the Iron Age (Malmer 1962, 152-3). Further away, more Battle Axe graves have been discovered; three to the north of the stream Tullstorpså (Graves 85-87), which is located just north of the marked area in fig. 51, and three more at 5 km to the west of the cemetery of Lilla Beddinge (Graves 107-108) (Malmer 1962, 152). These graves are excluded from my analysis, since they do not seem to belong to the alignment at Lilla Beddinge directly and are not mapped by Malmer. My analysis comprises thirteen graves in total (database numbers 54-66) (tab. 5.1).

Figure 5.2 - The geology of the cemetery of Lilla Beddinge. The blue polygon is the alignment of Graves 45-66, whereas the southern icon is the alignment of Graves 41-44 (after Swedish National Heritage Board Riksantikvarieämbetet).

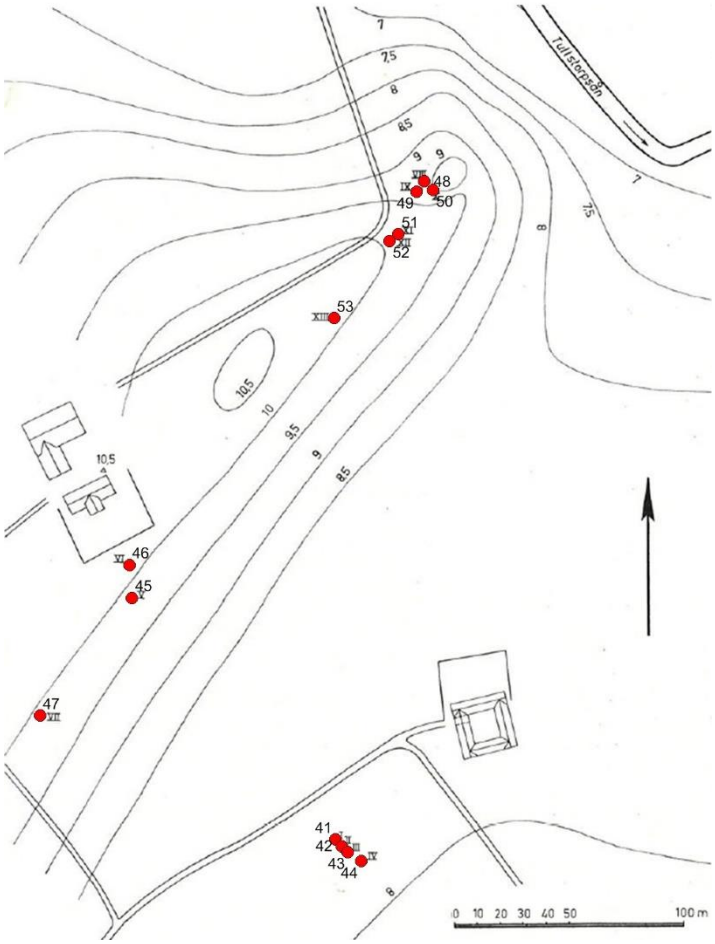

Figure 5.3 - Map of the thirteen flat-graves at Lilla Beddinge (after Malmer 1962, 153, fig. 36).

5.2 Results

As stated above, thirteen flat-graves have been found at Lilla Beddinge with certainty (Tab. 5.2). All graves except Grave 48 undoubtedly were stone constructions; Grave 48 had been discovered by the landowner while he was digging for gravel so it is possible that this also was a stone construction. Four graves had a stone frame (Grave 45, 50, 51, 52; 30,8% of the total), two of which also revealed traces of a wooden coffin (Grave 51, 52). Grave 49 was a stone chamber with possibly a wooden coffin or base. Three stone constructions (Grave 43, 47, 53; 23,1% of the total) were funnel-shaped, and Grave 47 was additionally boat-like, while Grave 53 also produced traces of a wooden coffin. Six graves had a NNW-SSE orientation (Grave 41, 42, 43, 44, 45, 53; 46,15% of the total), and six had a NE-SW or NNE-SSW/ENE-WSW orientation (Grave 46, 47, 49, 50, 51, 52; 46,15%). Two graves had been reused; the excavators detected a secondary cremation grave in Grave 46 and 47.

Tab. 5.3 shows the presence of human remains; all graves accommodated an inhumation, although some skeletons were better preserved than others. Some of the skeletons have undergone osteological examination. Most graves have a Minimal Number of Individuals (MNI) of one (76,9% of the total); three graves (23,1% of the total) had more than one individual buried. Grave 52 was a double-grave of two young individuals, of which one turned out to be male, lying in mirrored positions; both are lying on their sides, crouched and facing SE, but the young man is on its right side, with his head in the SW, and the other body is on its left side, with its head in the NE. Grave 47 and 49 are both mass graves, of at least ten and five individuals respectively. Grave 47 yielded a primary burial of a young woman with deformities in her arms, lying on her back and with her head in the SSW. Above her grave, another layer of the boat-like stone construction was built, in the form of a stone frame. Here, five skulls without mandibles had been placed in the NE part, and on top of these skulls, a heap of mainly long bones. Due to the strange nature of this grave, and the deformities in the young woman's arms, Malmer has interpreted this grave as possibly indicating human sacrifice (Malmer 2002, 141). In Grave 49, three adults crouched in a half-sitting position were buried in a row, all facing the SE. Between the middle adult and the adult in the SW, two infants had been placed.

According to Malmer, this grave may also be interpreted as human sacrifice (Malmer 2002, 141).

Grave 48 and 50 were the only graves that did not contain any grave goods, and Grave 46 only produced secondary grave goods from its Bronze Age cremation grave (Tab. 5.4). Most graves count more than five grave goods (90%), while Grave 51 had 63, and Grave 52 had 122 items. Grave 49 only had one grave good: a bone needle. Grave 47 only had one primary grave good, a bone awl (the sherd undoubtedly came up while digging the grave), but at the skulls there was a clayey lump that Malmer suggests was dye, used as body paint (Malmer 2002, 163). This material was also encountered in Grave 51. Eight graves yielded pottery (80%) and in six of these cases, the pottery was associated with the primary grave and could be determined (Grave 41, 42, 43, 45, 51, 52). Three battle axes were found, of the same type, in Graves 42, 43 and 44 (30%). Nine thick-butted, hollow-edged flint axes were uncovered in eight graves (80%): Grave 41, 42, 43, 44, 45, 51, 52 (two axes) and 53. Most were of the variant 1 (>17 cm long and often incompletely polished, but the edges are always polished carefully); the one in Grave 44 was of the variant 2 (17-24 cm long, completely polished). Malmer defined the one in Grave 53 as of the variant 6, but he does not explicate this variant further than that this variant is uncommon in graves (Malmer 2002, 152). Other finds from the graves were flint blades (Grave 41, 42, 43, 44, 45, 52, 53; 70%), flint splinters or pieces (Grave 41, 44; 20%), a flint scraper (Grave 43), a grindstone (Grave 44), a copper ornament (Grave 52), amber beads (Grave 51, 52; 20%), bone beads (Grave 51), bone awls or needles (Grave 44, 47, 49, 51, 52, 53; 60%), a bone comb (Grave 52), pierced boar tusks (Grave 45), a weapon made of deer antler (Grave 53) and animal bones (Grave 52, 53).

5.3 The time-depth of Lilla Beddinge

In his dissertation, Malmer presented a chronology of the cemetery at Lilla Beddinge, mainly based on the pottery and the stone construction types (Malmer 1962, 180). He argued that the graves were dated to the Periods 3 to 5, and some Late Neolithic or later. The oldest Battle Axe periods were absent, or simply not found, as it may have not been customary to build a stone construction over the grave in Period 1-2 (Malmer 1962, 180, 186). Early graves were simply a wooden coffin or log placed in a pit (Larsson 2009, 72). In 2002, Malmer adheres to his

earlier sequencing, except that he gave Grave 49 a more specific date (Period 4), because of the combination of the bone needle and the stone construction. Grave 53 is dated to Period 5. In 2003, Furholt however published a conflicting radiocarbon date, of a tooth of the skeleton in this grave: 3350-2880 cal BC. This places the grave in the earliest period of the Battle Axe culture. Tab. 5.5 is an overview of the dates of the graves, and fig. 5.4 shows these dates on the map of the cemetery.

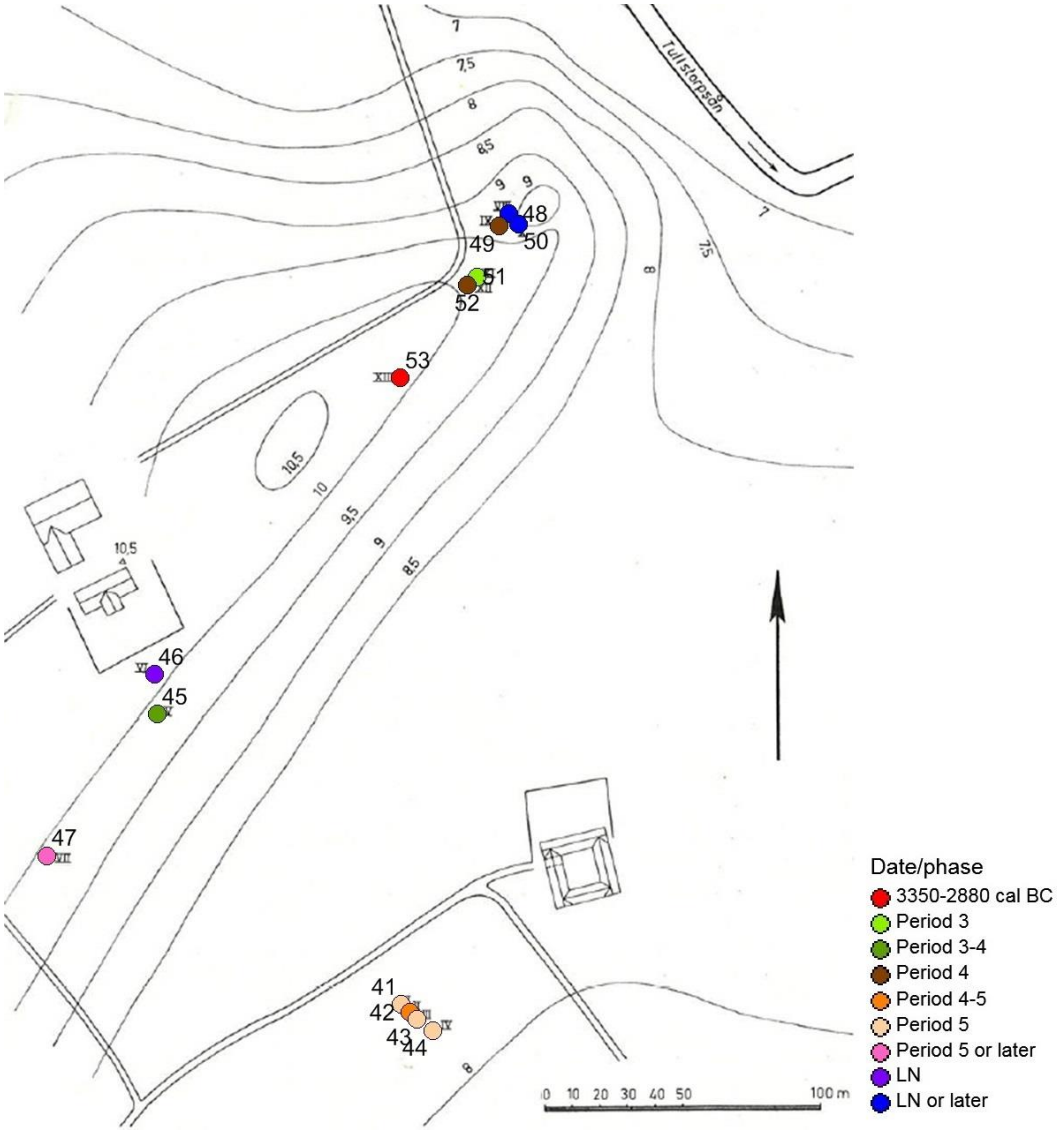

Figure 5.4 - The dates of the graves at Lilla Beddinge (after Malmer 1962, 153, fig. 36).

The discrepancy between Malmer's date and the radiocarbon date firstly reveals that graves of the earliest phase of the Battle Axe apparently were present at Lilla Beddinge, and that early graves could be composed of a (funnel-shaped) stone construction. Secondly, this indicates that Malmer's chronology is not reliable. Although in Chapter 2, Malmer's typochronology is presented as 'still correct and useful', a strong limitation is that it is not associated with any absolute dates. In fact a typochronological date of the last phase of the Battle Axe culture may have an absolute date of the earliest period, as Grave 53 demonstrates. It follows that the time-depth of the cemetery, as described above, is probably inaccurate, but it cannot be deduced to what degree it is inaccurate. There is also no other way of determining the dates of the graves, unless perhaps additional skeletons are radiocarbon dated, or Malmer's typochronology is revised. Yet it is clear that the cemetery was probably initiated with Battle Axe graves, which may or may not be contemporaneous, and that it remained in use for a long period of time; people probably returned to this area to bury their dead during the Late Neolithic and in later periods, considering the numerous Bronze Age cremation graves that were encountered here.

With regards to the location of the graves, it is interesting to note that the three unique graves (Grave 47, 49, 52) are each located on the NE-SW alignment. The graves on the NW-SE alignment are remarkably similar (particularly Graves 41-43), which contrasts the variety in the graves on the longer alignment. Therefore, there seems to be a difference between the Battle Axe graves on each alignment at Lilla Beddinge; possibly we can even speak of two different groups. Malmer argues that the alignments may lie along paths or roads; the longer and 'earlier' alignment runs along the top of the moraine hill and parallel to the shore, whereas the shorter and 'later' alignment possibly corresponds to the shortest way down to the shore. According to Malmer, the different alignments probably mark two different locations of a village that moved periodically (Malmer 2002, 138). While the difference between the two groups of burials is notable, this does not necessarily verify Malmer's hypothesis of moving settlements. Be that as it may, fig. 5.5 shows that in the close proximity of the cemetery there may indeed have been villages; in areas of c. 120 x 100 m (fig. 5.5, 3) and c. 80 x 50 (fig. 5.5, 4) scatters of flint flakes were found (area 3) and axes and black soil (area 4) (Swedish National Heritage

Board Riksantikvarieämbetet). It cannot be determined either whether the alignments mark roads between these settlements or not. In any way, the locations of the graves do seem to have been known to the prehistoric people in this area, regardless of whether the graves followed a road or were marked above ground in another way; there is no overlap between any of the graves.

Figure 5.5 - The immediate surroundings of the cemetery of Lilla Beddinge yielded more archaeology (after Swedish National Heritage Board Riksantikvarieämbetet). 1: the short NW-SE alignment; 2: the long NE-SW alignment; 3 and 4: possible Stone Age settlement sites; the other areas are approximate findspots of loose finds.

5.4 Conclusion

The cemetery of Lilla Beddinge comprises thirteen flat-graves, spread over two alignments. Three of the graves may be dated to the Late Neolithic. The other ten were placed during the Battle Axe period, although it is unclear in what sequence; they may all be contemporaneous. There is a notable difference between the two alignments; the long, NE-SW alignment consists of nine flat-graves, which show a larger variety of grave features, grave goods and the positions of those buried than the other alignment, which runs NW-SE and includes four quite similar graves. This may attest that the graves on the NW-SE alignment were placed around the same time, and that the graves on the NE-SW alignment were placed in another period. The NE-SW alignment follows the orientation of the ground moraine hill, on top of

which it is located. The NW-SE alignment on the other hand is oriented from the hill towards the shore. Although Malmer interprets the duality in the cemetery as the result of moving settlements, and the alignments as indicating roads, this cannot be verified.

6 Discussion

This chapter encompasses an interregional analysis of the Single Grave and Battle Axe cultures, by means of a comparison between the three case-studies of the preceding chapters. The goal is to determine whether a general pattern can be observed, which might aid in understanding the Corded Ware burial landscape. After presenting the results of the comparison, I will discuss whether the comparison demonstrates homogeneity between these regional variants of the Corded Ware culture, or variability.

6.1 Comparison of the case-studies: Trehuse-Sjørup-Dollerup, Angelslo-Emmerhout and Lilla Beddinge

One difference between the three alignments has become clear almost instantaneously; Trehuse-Sjørup-Dollerup exclusively consists of burial mounds, whereas Lilla Beddinge contains only flat-graves, and Angelslo-Emmerhout comprises both burial mounds and flat-graves. There is also an obvious difference in size; Trehuse-Sjørup-Dollerup is a very large alignment, involving 31 Single Grave barrows, and perhaps extending over 5 km. Angelslo-Emmerhout was made up of only two or three Single Grave barrows and six or seven Single Grave flat-graves, in one or two alignments of c. 2 km and c. 100 m km. Lilla Beddinge has ten Battle Axe flat-graves, in two alignments of only c. 240 m and c. 20 m. These two differences may however reflect a research bias (only excavating barrows, limited excavated area) or preservation differences (destruction of other graves). At the time of the excavations, the alignments of both Trehuse-Sjørup-Dollerup and Angelslo-Emmerhout were located in a heathland, while the graves of Lilla Beddinge were located in arable land; yet in all three cases, graves had partly been destructed by ploughing. It is interesting to note that each alignment has a different orientation (Trehuse-Sjørup-Dollerup: N-S; Angelslo-Emmerhout: NNW-SSE / E-W; Lilla Beddinge: NE-SW / NW-SE), because they follow the local topography. The three alignments are all located in a hilly or high location in the landscape, near or on top of ground moraine.

The graves themselves display a remarkable variety even within one alignment. At Trehuse-Sjørup-Dollerup, there are Underground, Ground and Overground

graves, which can either be without a barrow or grave feature, or have any of nine different types of features: a ring-ditch, a ring-bank, a burnt rim, a wooden coffin, two rows of stones lining a wooden coffin, a stone frame, a stone base, a stone circle or a stone construction. 54,5% of the graves have a barrow or grave feature. There is also a variety of orientations; most common is E-W and NE-SW. At Angelslo-Emmerhout we mainly see featureless barrows and flat-graves, but also beehive constructions, palisade ditches, a construction of five posts and a ring-ditch, wooden coffins and tree-trunk coffins. 37,5% of the grave have a feature. Only 25% of the graves revealed their orientation, of E-W. All graves at Lilla Beddinge have a stone construction of some sort; some are funnel-shaped, others are composed of a stone frame, one is boat-like, one is a stone chamber with perhaps a wooden base, and some have wooden coffins. The graves are oriented NNW-SSE or (N)NE-(S)SW. Although those buried are typically placed on a certain side, and in a particular direction (Trehuse-Sjørup-Dollerup: right side, head in the west; Angelslo-Emmerhout: right side, head in the west; Lilla Beddinge: left side, head in the NNW), here we also see variety. At Trehuse-Sjørup-Dollerup, one body is placed on its back, while at Angelslo-Emmerhout one body is placed with its head in the east. Meanwhile, at Lilla Beddinge, where human remains are much better preserved than in the Danish and Dutch cases, we see three very peculiar graves; one is a mass-grave, composed of skeletal remains of at least ten individuals, another is a mass-grave of three adults and two infants, and the last is a double grave of two adults in mirrored positions. As far as we know, the Danish and Dutch alignments did not include any double or mass-graves.

In terms of grave goods, there are also marked differences between the three alignments, although in all three cases, a majority of the graves yielded at least one grave good, and the same find categories recur at each site (particularly pottery, battle axes, flint axes and flint blades, but also grindstones and amber). At Trehuse-Sjørup-Dollerup, 75,7% of the graves yielded grave goods. Mainly flint blades were found (64,3% of the graves with grave goods). To a lesser extent, flint axes (32,1%), beakers (25%), amber beads and discs (25%) and battle axes (21,4%) were present. A unique category was fire flint (7,1%). At Angelslo-Emmerhout, 87,5% of the graves had grave goods. There is also a lot of flint (57,1% of the graves with grave goods), but especially beakers (64,3%) were represented here. Again, battle axes

were present in 21,4% of the graves with grave goods. Amber was only present as a secondary grave good, but instead there are greenstone axes (21,4%) and Grand-Pressigny daggers (14,3%). At Lilla Beddinge, 76,9% of the graves contained grave goods. Pottery (80% of the graves with grave goods), flint axes (80%) and flint blades (70%) are dominant, while there are not as many battle axes (30%). Moreover, organic artefacts are preserved; mainly bone awls and needles (60%), but in one grave boar tusk ornaments and in another a weapon made of deer antler. Another unique find category is a copper ornament. Additionally, there are two graves with a high amount of grave goods: one has 63, the other has 122.

Only two graves have a radiocarbon date: one at Angelslo-Emmerhout and one at Lilla Beddinge. The dates of the other 64 graves had to be determined by means of typochronologies, even though this method has a lot of limitations. Nevertheless, at Trehuse-Sjørup-Dollerup, an interesting pattern can be observed regarding its time-depth. There seem to have been two phases; an early phase, during which most of the barrows were constructed, the graves have either one or two grave goods and variation occurs between the orientations of the graves, and a later phase, during which reuse of older barrows occurs for the first time, and only a few new barrows are added to the alignment. However, we see that the orientation of E-W is more strictly adhered to, and that some graves have more than two grave goods. We also see an increase in both beakers and battle axes. At Angelslo-Emmerhout, the dates do not allow for a reconstruction of the time-depth; half of the dates are unreliable, due to uncalibrated radiocarbon dates in the typochronology. or of uncertain reliability, and the other half have such a low resolution that the graves could be both contemporaneous, or centuries apart. It is interesting to note bethat the alignment was started with two megalithic graves from the preceding period; the Single Grave people clearly added to an existing burial landscape. This is reinforced by the presence of flat-graves, which is also a continuation from the Funnel Beaker culture. The time-depth at Lilla Beddinge cannot be reconstructed either; the graves were dated by Malmer based on his typochronology, yet a radiocarbon date has demonstrated that his periodisation is not only inaccurate, but also that it is unsure to which degree it is inaccurate. All three burial landscapes have been added upon in later periods, particularly during the Bronze Age but also the Iron Age.

6.2 Homogeneity versus regional variability?

Despite the obvious differences between the three case-studies (barrows and/or flat-graves, size of the site, preservation of human remains), there are a lot of similarities between the three case-studies. Firstly, all three alignments follow the local topography, which in all three cases is related to ground moraine ridges. This implies an emphasis on movement through the landscape, and a preference for high (and visible!) locations in the landscape. Secondly, although each site has its own unique find categories and barrow or grave features, there are some shared traits that all three alignments bear witness to: single burials of an individual in a standardised, crouched and lateral position, with certain typical grave goods (pottery, flint axes, battle axes, flint blades). These 'concepts' are however performed in unique manners, which may perhaps be 'typical' on a regional level – or not at all. In fact, the third similarity is that even within the same alignment, there is a lot of variety. The burial rites do not seem to be as homogeneous as the idea of 'regional variants of the Corded Ware culture' implies. Even if the burial ritual is embedded within cultural and social traditions (Lohof 1994, 99-100) and calls upon certain shared concepts, every burial would have been a unique and personal event for those who were burying their loved one. Moreover, the time-depth of the alignment also influences the variability among the graves; surely graves that were placed at around the same time are more 'homogeneous' than if they are decades or centuries apart. This brings us to the last similarity between the three case-studies; although I was only able to recognise a pattern in the dates of the graves at Trehuse-Sjørup-Dollerup, it has become clear that each alignment was used for many centuries. Subsequent generations returned to the alignment to bury their dead here, and this continued until in the Bronze Age and even the Iron Age. In the case of Angelslo-Emmerhout, it seems like the landscape had already been used for centuries before the arrival of the first burial mounds. For societies with an oral history, accurate historical knowledge does not extend further than four generations (c. 80-100 years) at the most; after this, the historical past is transformed into a mythical past and the memory of the buried individual becomes 'patchy' (Bourgeois 2013, 196; Lohof 1994, 102). The long use-life of the three case-studies reveals that the temporality of the landscape played an essential part of the burial rites that took place here; generation after generation returned to these ancestral burial grounds to

bury their dead, even though – or perhaps because – the earlier graves were *lieux des mémoires* that may have acquired mythical status.

In conclusion, the general pattern that we can observe in the characteristics and time-depths of the three alignments is that of regional – and even local – variability; there seem to be shared traits on an interregional scale, but these are expressed in local practices and idiosyncrasies and are thus not homogeneous. Through time, these local practices probably changed, even if the shared traits remained the same, albeit with different (local) meanings attached to them. All three case-studies show a deep temporality of the burial landscape, during the Corded Ware period, but also in the (preceding and) succeeding periods.

7 Conclusion

The objective of this thesis was to determine the time-depths of the burial alignments of Trehuse-Sjørup-Dollerup in Denmark, Angelslo-Emmerhout in The Netherlands, and Lilla Beddinge in Sweden and to conduct a comparative study between these case-studies. The goal of this was to recognise a pattern that may provide us with information about the burial landscape organisation by the Corded Ware people. Six sub-questions were defined to achieve this goal:

1. What are the dates of the primary burials in the alignment?
2. How much time has passed between the different primary burials in the alignment?
3. In what sequence have the primary burials been placed in the alignment?
4. What underlying pattern may explain this time-depth of the alignment?
5. What similarities and differences can be determined between the time-depths of the different alignments?
6. What underlying pattern can explain these similarities and differences?

It turned out that my sources do not allow for reconstructing a detailed time-depth of the three burial alignments, since dating the graves with a fine resolution is simply not possible. Firstly, radiocarbon dates are largely unavailable. Secondly, radiocarbon dates are unreliable for the Corded Ware period; the calibration curve consists of numerous 'wiggles', and thus plateaus, which leads to a very large timespan of the calibrated date. The only other method available to date the graves, is the relative dating method of typochronology. In recent years, the Danish and Dutch typochronologies have been revised, by associating the periods with calibrated radiocarbon dates. Unfortunately this has not been done for the Swedish typochronologies. Despite the recent revisions, this method still has its limitations; artefact typologies are still based on certain choices and assumptions, and the wiggles in the radiocarbon calibration curve result in large lifespans of artefact types. Hence, attempting to sequence dates based on these methods, can only lead to an artificial division in consecutive phases; the resolution of the dates is so low that graves dated to different phases could in fact all be contemporaneous, and graves dating to the same phase could actually be decades or centuries apart.

Hence the first part of my goal could not be achieved. Nevertheless, I have been able to find a pattern during my interregional analysis; the alignments each show a very long use-life. This suggests that temporality was an important aspect in the burial landscape of these people. Older graves possibly had acquired a mythical meaning, and by adding to the ancient alignment, new relationships between the monuments were shaped and the meaning of the landscape was altered. Although the precise pace by which this occurred cannot be reconstructed, this general motif does accord with recent theories regarding the development of prehistoric barrow landscapes.

The three alignments show a lot of differences, but in their differences they reveal a lot of similarities as well; it seems that there are certain interregionally shared traits, but that these concepts are practiced locally, with a lot of variation. There is no such thing as a homogeneous Corded Ware 'culture', or even homogeneity within a 'regional variant of the Corded Ware culture'. The regional variants do not directly develop from a uniform group of people, but are more likely the result of an interplay between the preceding local cultures and an incoming new ideology, which may have spread by means of migration (as recent DNA analysis suggests). Moreover, the Corded Ware burial landscape can also be a continuation of an older burial landscape; at Angelslo-Emmerhout, it is shown that the alignment is begun with two megalithic graves from the Funnel Beaker period.

For future research into the time-depth of the burial landscapes of regional variants of the Corded Ware culture, I would recommend including later barrows and graves; in this thesis, I have only analysed the graves from the Single Grave or Battle Axe phases, in the hope to reconstruct a precise sequence. Yet as this is not possible for this particular period, it would be useful to compare the broad time-depth of the 'Corded Ware' phase of an alignment with the time-depth of later phases. This might reveal interesting patterns. I would also like to suggest investigating to which degree the burial landscapes of the regional Corded Ware variants are influenced by the preceding local cultures. This might help explain local idiosyncrasies, and support the ongoing investigation into what the Corded Ware 'culture' really is.

Summary

Barrow landscapes appeared in the third and second millennia BC throughout North-Western Europe; these first barrows were constructed by people of the Corded Ware culture and placed in alignments. The Corded Ware 'culture' has several regional variants, such as the Single Grave culture and the Battle Axe culture. This thesis is an interregional comparative study, to determine whether there is a pattern in the time-depths of the burial alignments of Trehuse-Sjørup-Dollerup in Denmark, Angelso-Emmerhout in The Netherlands and Lilla Beddinge in Sweden. The analysis is conducted by means of a literature study and the application of typochronologies; although typochronologies have strong limitations, there are only a few radiocarbon dates available for these alignments and there are no other means for establishing a time-depth of the three alignments.

The construction of a barrow was an important part of the burial ritual, by which the prehistoric people physically and symbolically altered the landscape. The barrow is not an isolated monument, but is in constant interaction with the other monuments and phenomena in the landscape. Corded Ware barrows were encountered from the end of the nineteenth century, and are recognisable by the burial of a single individual in a standardised and gender-specific position with a standardised grave inventory. Although the Corded Ware 'culture' is still seen as a widespread, unified social phenomenon that is the result of migration, a lot is still unknown about this culture. Recently more emphasis is placed on the regional variability of the phenomenon.

Regional variability is also what we see in the three case-studies; in fact, perhaps one may better speak of 'local variability', as each case-study reveals a remarkable variety even within one alignment. Even though there do seem to be interregionally shared traits, these are expressed in local practices. Due to the limitations of my methods, I have only been able to reconstruct a careful time-depth for Trehuse-Sjørup-Dollerup. All three alignments nevertheless reveal a long use-life; even in the Bronze and Iron Ages, prehistoric people buried their dead here. Temporality seems to have been an important aspect of the 'Corded Ware' burial landscape.

Samenvatting

In de derde en tweede millennia v. Chr. zijn grafheuvellandschappen in Noordwest-Europa ontstaan; de eerste grafheuvels werden geplaatst door prehistorische mensen van de Corded Ware cultuur in lange rijen door het landschap. De Corded Ware 'cultuur' omvat verschillende regionale varianten, zoals de Enkelgrafcultuur en de Strijdhamercultuur. Deze scriptie is een interregionaal, vergelijkend onderzoek, om te achterhalen in hoeverre er een patroon is in de tijdsdieptes van de rijen van graven van Trehuse-Sjørup-Dollerup in Denemarken, Angelso-Emmerhout in Nederland en Lilla Beddinge in Zweden. De analyse bestond uit een literatuuronderzoek en de toepassing van typochronologieën: ondanks de grote beperkingen van typochronologieën, zijn er maar enkele koolstofdateringen beschikbaar voor de casestudies en is er geen andere manier om de tijdsdieptes van de drie rijen te reconstrueren.

Het opwerpen van een grafheuvel was een belangrijk onderdeel van het grafritueel, waarbij de prehistorische mensen het landschap fysiek en symbolisch veranderden. Een grafheuvel is geen geïsoleerd monument, maar bevindt zich in een constante wisselwerking met andere grafheuvels en fenomenen in het landschap. Corded Ware grafheuvels zijn vanaf het einde van de negentiende eeuw ontdekt. Ze zijn gekenmerkt door de begraving van één individu in een gestandaardiseerd en genderspecifieke positie met een gestandaardiseerd grafset. De Corded Ware 'cultuur' wordt nog steeds gezien als een wijdverbreid, verbonden sociaal fenomeen wat het resultaat is van migratie, maar veel is nog onbekend. In de laatste tijd wordt regionale variabiliteit steeds meer benadrukt.

Regionale variabiliteit komt ook tot uiting bij de drie rijen van graven; misschien kunnen we zelfs beter spreken van 'lokale variabiliteit', aangezien elke casestudy een opvallende variatie vertoont, zelfs binnen één rij. Ondanks dat er interregionaal gedeelde kenmerken lijken te zijn, komen deze kenmerken tot uitdrukking in lokale gebruiken. Door de beperkingen van mijn methoden, was het slechts mogelijk een voorzichtige tijdsdiepte te reconstrueren van Trehuse-Sjørup-Dollerup. Alle drie sites vertonen echter een lange gebruiksperiode; zelfs in de Bronstijd en IJzertijd, begroeven de prehistorische mensen hun doden hier. Temporaliteit blijkt een belangrijk aspect te zijn geweest voor het 'Corded Ware' funerair landschap.

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Appendix I: Tables

3 Trehuse-Sjørup-Dollerup

Table 3.1 - The excavation dates of the barrows at Trehuse-Sjørup-Dollerup and the consulted sources for my analysis.

Database number	Barrow	Excavation date	Reference
1	Høj 1 - Sjørup	1899 (Blom)	Ebbesen 2006, 373, 423 (fig. 367, 2); Hübner 2005, 328, 982
2	Høj 2 - Sjørup	1899 (Thomsen)	Ebbesen 2006, 373-4, 376 (fig. 289), 423 (fig. 367, 9), 424 (fig. 368, 4), 427 (fig. 371, 1); Hübner 2005, 378, 411, 981-2
3	Høj 3 - Sjørup	1899 (Thomsen)	Ebbesen 2006, 374-6 (fig. 290), 423 (fig. 367, 4); Hübner 2005, 328, 980-1
4	Høj 4 - Sjørup	1899 (Blom)	Ebbesen 2006, 375-7 (fig. 291-2)
5	Høj 5 - Sjørup	1899 (Blom)	Ebbesen 2006, 376-9 (fig. 293-4), 427 (fig. 371, 2-15, 17-23, 25, 27, 28); Hübner 2005, 980-1 (Abb. 547)
6	Høj 6 - Sjørup	1899 (Thomsen)	Ebbesen 2006, 378-9 (fig. 295)
7	Høj 7 - Sjørup	1899 (Blom)	Ebbesen 2006, 379, 424 (fig. 368, 6); Hübner 2005, 411, 982
8	Høj 8 - Sjørup	1899 (Blom)	Ebbesen 2006, 379-81 (fig. 296), 425 (fig. 369,1); Glob 1945, 27; Hübner 2005, 94, 980
9	Høj 9 & Høj 9a-b - Sjørup	indet. / 1899 (Blom)	Ebbesen 2006, 381
10	Høj 10 - Sjørup	1899 (Thomsen)	Ebbesen 2006, 381-2 (fig. 297-8)
11	Høj 11 - Sjørup	1899 (Blom)	Ebbesen 2006, 382-3 (fig. 299-301), 423 (fig. 367, 5); Hübner 2005, 328, 982
12	Høj 12 - Sjørup	1899 (Blom)	Ebbesen 2006, 383-5 (fig. 302-3), 423 (fig. 367, 10), 424 (fig. 368, 2, 18); Hübner 2005, 411
13	Høj 13 - Sjørup	1899 (Thomsen)	Ebbesen 2006, 385-6 (fig. 304-6), 423 (fig. 367, 3); Hübner 2005, 328, 982
14	Høj 14 - Trehuse	1899 (Blom)	Ebbesen 2006, 386-7 (fig. 307), 424 (fig. 368, 8)
15	Høj 15 - Trehuse	1899 (Thomsen)	Ebbesen 2006, 388-9 (fig. 308-9), 423 (fig. 367, 6); Hübner 2005, 328, 973-4
16	Høj 17 - Trehuse	1899 (Thomsen)	Ebbesen 2006, 389-90 (fig. 310-1), 424 (fig. 368, 13), 427 (fig. 371, 50-7); Hübner 2005, 974
17	Høj 18 - Trehuse	1899 (Thomsen)	Ebbesen 2006, 390-2 (fig. 31-4), 424 (fig. 368, 7); Hübner 2005, 411, 974, (Taf. 64, 7)
18	Høj 20 - Trehuse	1899 (Thomsen)	Ebbesen 2006, 393-6 (fig. 315-23), 427 (fig. 371, 31-9); Hübner 2005, 976
19	Høj 21 - Trehuse	1901 (Thomsen)	Ebbesen 2006, 395-6 (fig. 324), 428 (fig. 372, 2); Hübner 2005, 411, 973, 974, (Taf. 64, 5)
20	Høj 22 - Trehuse	1901 (Thomsen)	Ebbesen 2006, 396-7 (fig. 325); Hübner 2005, 973
21	Høj 23 - Trehuse	1901 (Thomsen)	Ebbesen 2006, 396-8 (fig. 326-7), 428 (fig. 372, 4); Hübner 2005, 973, 974, (Taf. 64, 6)
22	Høj 24 - Trehuse	1901 (Thomsen)	Ebbesen 2006, 397-8 (fig. 328), 428 (fig. 372, 5); Hübner 2005, 973
23	Høj 25 - Trehuse	1901 (Thomsen)	Ebbesen 2006, 397-9 (fig. 329), 428 (fig. 372, 1, 5); Glob 1945, 18; Hübner 2005, 83, 411, 973, 974-5, (Taf. 64, 8, 9)
24	Høj 26 - Trehuse	1901 (Thomsen)	Ebbesen 2006, 399-401 (fig. 330-3), 426 (fig. 370, 1, 10); Glob 1945, 92, 112; Hübner 2005, 272-3, 283, 973, 975
25	Høj 27 - Trehuse	1901 (Thomsen)	Ebbesen 2006, 400-1 (fig. 334), 427 (fig. 371, 39); Hübner 2005, 973, 975

26	Høj 28 - Trehuse	1901 (Thomsen)	Ebbesen 2006, 401-4 (fig. 336-7), 423 (fig. 367, 8), 424 (fig. 368, 9); Hübner 2005, 328, 411, 973, 975
27	Høj 29 - Trehuse	1901 (Thomsen)	Ebbesen 2006, 403-4 (fig. 338); Hübner 2005, 973
28	Høj 30 - Trehuse	1901 (Thomsen)	Ebbesen 2006, 404-6 (fig. 339-40), 424 (fig. 368, 17), 425 (fig. 369, 2); Glob 1945, 32; Hübner 2005, 100, 975-6
29	Høj 31 - Trehuse	1901 (Thomsen)	Ebbesen 2006, 405-8 (fig. 341-3), 423 (fig. 367, 1), 424 (fig. 368, 16); Hübner 2005, 331-2, 411, 976-7 (Abb. 545)
30	Høj 32 - Trehuse	1901 (Thomsen)	Ebbesen 2006, 408-410 (fig. 344-9), 424 (fig. 368, 5), 426 (fig. 370, 9), 427 (fig. 371, 41-9); Glob 1945, 100; Hübner 2005, 248, 411, 976-9 (Abb. 546)
31	Høj 33	1901 (Thomsen)	Ebbesen 2006, 411 (fig. 350-1)
32	Høj 34 - Dollerup	1901 (Thomsen)	Ebbesen 2006, 68, 411-3 (fig. 352-4), 424 (fig. 368, 10), 426 (fig. 370, 5)
33	Høj 35 - Dollerup	1901 (Thomsen)	Ebbesen 2006, 414-15 (fig. 355), 425 (fig. 369, 3); Glob 1945, 34, 36; Hübner 2005, 104, 112, 986-7
34	Høj 36 - Dollerup	1901 (Thomsen)	Ebbesen 2006, 415-8 (fig. 356-8), 423 (fig. 367, 9), 424 (fig. 368, 1), 425 (fig. 369, 4), 426 (fig. 370, 2, 3, 4, 7, 8); Hübner 2005, 328, 411
35	Høj 37 - Dollerup	1901 (Thomsen)	Ebbesen 2006, 417-8 (fig. 359-60), 423 (fig. 367, 9), 424 (fig. 368, 11); Hübner 2005, 340, 528, 986
36	Høj 38 - Dollerup	1901 (Thomsen)	Ebbesen 2006, 418-21 (fig. 361-2), 424 (fig. 368, 14, 15), 425 (fig. 369, 5); Glob 1945, 34, 36; Hübner 2005, 104, 986
37	Høj 39 - Trehuse	1901 (Thomsen)	Ebbesen 2006, 420-1 (fig. 363-4)

Table 3.2 - The Underground graves at Trehuse-Sjørup-Dollerup.

Database number	Barrow	Burials	Burial type	Depth	Measurements	Orientation
2	Høj 2 - Sjørup	2	Grave B: primary, Underground; Grave A: secondary, Overground	Grave B: c. 50 cm	Grave B: c. 2.25 x 1.7 m; Grave A: 2.1 x 0.85 m	E-W
3	Høj 3 - Sjørup	1	Primary, Underground	85 cm	2 x 2.5 m	E-W
4	Høj 4 - Sjørup	1	Primary, Underground, ring ditch	62 cm	2.4 5 x1.2 m	E-W
5	Høj 5 - Sjørup	1	Primary, Underground	40 cm	2.5 x 1.6 m	E-W
6	Høj 6 - Sjørup	1	Primary, Underground, stone frame	15 cm	Inner 1.8 x 1.85 m, outer 2.4 x 1.2 m	NW-SE
7	Høj 7 - Sjørup	1	Primary, Underground, dark line (wooden coffin?)	30-42 - 83-89 cm	2.1 x 1.25 m	ENE-WSW
10	Høj 10 - Sjørup	1	Primary, Underground, stone base	20-30 cm	2.85 x 1.65 m	E-W
12	Høj 12 - Sjørup	3	Grave C: primary, Underground, stone frame and dark line (wooden coffin?); Grave B: secondary, Overground, covered by a stone; Grave A: secondary, Overground, covered by a stone	Grave A: 17 cm deep; Grave B: 20 cm under mound top; Grave C: 20-30 cm	Grave B: Ø 38 cm; Grave A: Ø 35 cm	Grave C: E-W
13	Høj 13 - Sjørup	1	Primary, Underground, stone frame	c.21-22 cm	Inner 2.4 x 1.1 m, outer 2.65 x 1.75 m	E-W
16	Høj 17 - Trehuse	3	Grave C: primary, Underground; Grave B: secondary, Overground; Grave A: secondary, urngrave	Grave C: c. 60 cm; Grave B: c. 75 cm under mound top	Grave C: 2.1 x 1.5 m; Grave B: c. 2.3 x 0.95 m	Grave C: NE-SW; Grave B: E-W
17	Høj 18 - Trehuse	2	Grave B: primary, Underground; Grave A: secondary, Underground	Grave B: c. 55 cm; Grave A: c. 10-20 cm	Grave B: 2 x 1.4 m; Grave A: 1.8 x 1.3 m	E-W
19	Høj 21 - Trehuse	1	Primary, Underground, ring-bank	45 cm	c. 2.2 x 1.4 m	E-W
20	Høj 22 - Trehuse	1	Primary, Underground	c. 15 cm	c. 2.4 x 1.2 m	
21	Høj 23 - Trehuse	1	Primary, Underground	35 cm	2.35 x 1.2 m	WSW-ENE
22	Høj 24 - Trehuse	1	Primary, Underground	c. 15 cm	c. 2.5 x 1.15 m	NE-SW
23	Høj 25 - Trehuse	1	Primary, Underground	c. 55 cm	c. 1.8 x 1 m	E-W
25	Høj 27 - Trehuse	1	Primary, Underground	60 cm	c. 1.9 x 1.4 m	NE-SW
26	Høj 28 -	3	Grave C: primary, Underground; Grave B: secondary,	Grave C: c. 60 cm ; Grave B: c.	Grave C: c. 2.5 x 1.4 m;	Grave C: WS-EN;

	Trehuse		Overground; Grave A: secondary, Overground, stone layer	1 m under mound top; Grave A: 10 cm under mound top	Grave B: c. 2.4 x 1.5 m; Grave A: c. 1.4 x 0.75 m	Grave A & B: E-W
29	Høj 31 - Trehuse	3	Grave C: primary, Underground, burnt rim; Grave B: secondary, stoneheap; Grave A: secondary, stone frame	Grave C: 23 cm; Grave B: 90 cm on surface; Grave A: c. 1.3 m on surface	Grave C: 1.85 x 0.85 m; Grave B: 1.85 x 1.1 m; Grave A: 2.9 x 1.1 m	Grave C: NE-SW; Grave B: N-S; Grave A: E-W
30	Høj 32 - Trehuse	7	Grave G: primary, Underground; Grave F: secondary, Overground; Grave E: secondary, stone cist; Grave D: secondary, stone cist; Grave C: secondary, stone cist; Grave B: secondary, urngrave; Grave A: secondary, stone cist	Grave G: c. 75 cm; Grave F: c. 1.5 m under mound top; Graves D & C: c. 1 m under mound top; Grave B: 2 m under mound top; Grave A: c. 1.3 m under stone layer's top	Grave G: c. 2 x 1 m; Grave F: 75 cm broad; Grave C: 20 x 35 cm; Grave B: 60 x 75 cm; Grave A: c. 2.5 x 1.1m	Grave G: NE-SW; Graves F & A: E-W
31	Høj 33	3	Grave A: primary, Underground; Grave B: primary?, Underground, almost circular; Grave 1: secondary, urngrave	Graves B & A: c. 50 cm; Grave 1: 5-10 cm on surface	Grave A: c. 2.25 x 1.6 m, Grave B: c.1.6x1.4m	Graves B & A: E-W
32	Høj 34 - Dollerup	1	Primary, Underground, stone frame	30 cm	c. 2.75 x 1 m	EN-WS
33	Høj 35 - Dollerup	2	Grave B: primary, Underground, stone frame; Grave A: secondary, Overground	Grave B: 55 cm; Grave A: c. 18 cm above surface	Grave B: 2.4 5x 1.35 m; Grave A: 2.5 x 2 m	E-W
34	Høj 36 - Dollerup	1 or 2	Primary, Underground, stone frame; possibly secondary Overground	95 cm; 40 cm above surface	1.5 x 0.5 m	E-W
35	Høj 37 - Dollerup	1	Primary, Underground, stone circle	40 cm	c. 2.2 x 1 m	E-W
36	Høj 38 - Dollerup	2 or 3	Grave C: primary, Underground; Grave B: secondary, Ground; Grave A: possibly another secondary grave	Grave C: 10-15 cm ; Grave B: 35 cm on surface; Grave A: c. 80 cm under mound top	Grave C: c. 2 x 1.1m; Grave B: 2.1 x 1.1 m	Graves C & B: NE-SW
37	Høj 39 - Trehuse	1	Primary, Underground, stone frame	50 cm	c. 2 x 1.3 m	ES-WN

Table 3.3 - The primary Ground graves at Trehuse-Sjørup-Dollerup.

Database number	Barrow	Burials	Burial type	Depth	Measurements	Orientation
8	Høj 8 - Sjørup	1 or 2	Primary (or secondary), Overground; possible primary, Ground grave (charcoal concentration)	c. 1 m under mound top	Ø 11 cm	E-W
15	Høj 15 - Trehuse	1 or 2	Primary, Ground, stone frame; possibly another primary Ground grave burial	c. 70 cm under mound top	2.4 x 0.8 m	E-W
18	Høj 20 - Trehuse	3	Grave C: primary, Ground; Grave B: secondary, stone chamber/possible urn; Grave A: secondary, stone cist	Grave A: c. 1.1 m under mound top; Grave B: c. 1.8 m	Grave C: 1.45 x 0.6 m; Grave A: 0.9 x 0.5 m; Grave B: 0.4 x 0.5 m	Grave C: E-W; Grave A: N-S
24	Høj 26 - Trehuse	3	Grave C: primary, Ground, stone base; Grave B: secondary, Overground; Grave A: secondary, Overground, stone frame	Grave C: 35 cm on surface; Grave B: c. 1 m above surface; Grave A: c. 1.5 m above surface	Grave C: 1.8 x 1.3 m; Grave B: 3.28 x 2.2 m; Grave A: c.2.85 x 1.4 m	Graves C & B: E-W; Grave A: NW-SE
28	Høj 30 - Trehuse	1	Primary, Ground	c. 20-30 cm on surface		

Table 3.4 - The primary Overground graves at Trehuse-Sjørup-Dollerup.

Database number	Barrow	Burials	Burial type	Depth	Measurements	Orientation
8	Høj 8 - Sjørup	1 or 2	Primary (or secondary), Overground; possible primary, Ground grave	80 cm under mound top	2.25 x 1.1 m	E-W
11	Høj 11 - Sjørup	1	Primary, Overground, dark line (wooden coffin?)	75 cm under mound top	2.5 x 1.07 m	ESE-WNW

Table 3.5 - Barrows with barrow and/or grave features at Trehuse-Sjørup-Dollerup.

Database number	Barrow	Burials	Barrow and/or grave feature
4	Høj 4 - Sjørup	1 (Underground)	Ring ditch
6	Høj 6 - Sjørup	1 (Underground)	Stone frame
7	Høj 7 - Sjørup	1 (Underground)	Dark line (wooden coffin?)
10	Høj 10 - Sjørup	1 (Underground)	Stone base
11	Høj 11 - Sjørup	1 (Underground)	Dark line (wooden coffin?)
12	Høj 12 - Sjørup	3 (primary: Underground)	Primary: stone rows and dark line (wooden coffin?); secondary: two graves covered by a stone
13	Høj 13 - Sjørup	1 (Underground)	Stone frame
15	Høj 15 - Trehuse	1 or 2 (Ground)	Primary?: stone frame
18	Høj 20 - Trehuse	3 (primary: Ground)	Secondary: stone chamber and stone cist
19	Høj 21 - Trehuse	1 (Underground)	Ring-bank
24	Høj 26 - Trehuse	3 (primary: Ground)	Primary: stone base; secondary: stone frame
26	Høj 28 - Trehuse	3 (primary: Underground)	Secondary: stone layer
29	Høj 31 - Trehuse	3 (primary: Underground)	Primary: burnt rim; secondary: stone heap and stone chamber
30	Høj 32 - Trehuse	7 (primary: Underground)	Secondary: four stone cists
32	Høj 34 - Dollerup	1 (Underground)	Stone frame
33	Høj 35 - Dollerup	2 (primary: Underground)	Primary: stone frame
34	Høj 36 - Dollerup	1 or 2 (primary: Underground)	Primary: stone frame
35	Høj 37 - Dollerup	1 (Underground)	Stone circle
37	Høj 39 - Trehuse	1 (Underground)	Stone frame

Table 3.6 - The orientations of the primary graves at Trehuse-Sjørup-Dollerup.

Database number	Barrow	Burials	Orientation
2	Høj 2 - Sjørup	2 (primary: Underground)	E-W
3	Høj 3 - Sjørup	1 (Underground)	E-W
4	Høj 4 - Sjørup	1 (Underground)	E-W
5	Høj 5 - Sjørup	1 (Underground)	E-W
6	Høj 6 - Sjørup	1 (Underground)	NW-SE
7	Høj 7 - Sjørup	1 (Underground)	ENE-WSW
8	Høj 8 - Sjørup	1 or 2 (Overground or Ground)	E-W
10	Høj 10 - Sjørup	1 (Underground)	E-W
11	Høj 11 - Sjørup	1 (Overground)	WNW-ESE
12	Høj 12 - Sjørup	3 (primary: Underground)	E-W
13	Høj 13 - Sjørup	1 (Underground)	E-W
15	Høj 15 - Trehuse	1 or 2 (Ground)	E-W
16	Høj 17 - Trehuse	3 (primary: Underground)	NE-SW
17	Høj 18 - Trehuse	2 (primary: Underground)	E-W
18	Høj 20 - Trehuse	3 (primary: Ground)	E-W
19	Høj 21 - Trehuse	1 (Underground)	E-W
21	Høj 23 - Trehuse	1 (Underground)	ENE-WSW
22	Høj 24 - Trehuse	1 (Underground)	NE-SW
23	Høj 25 - Trehuse	1 (Underground)	E-W
24	Høj 26 - Trehuse	3 (primary: Ground)	E-W
25	Høj 27 - Trehuse	1 (Underground)	NE-SW
26	Høj 28 - Trehuse	3 (primary: Underground)	NE-SW
29	Høj 31 - Trehuse	3 (primary: Underground)	NE-SW
30	Høj 32 - Trehuse	7 (primary: Underground)	NE-SW
31	Høj 33	3 (two primary?: Underground)	E-W
32	Høj 34 - Dollerup	1 (Underground)	NE-SW
33	Høj 35 - Dollerup	2 (primary: Underground)	E-W
34	Høj 36 - Dollerup	1 or 2 (primary: Underground)	E-W
35	Høj 37 - Dollerup	1 (Underground)	E-W
36	Høj 38 - Dollerup	2 or 3 (primary: Underground)	NE-SW
37	Høj 39 - Trehuse	1 (Underground)	NW-SE

Table 3.7 - The presence of human remains at Trehuse-Sjørup-Dollerup.

Database number	Barrow	Burials	Human remains	MNI	Position of body

13	Høj 13 - Sjørup	1 (Underground)	Soil silhouette of head, tooth enamel of two teeth	1	Head in W
16	Høj 17 - Trehuse	3 (primary: Underground)	Primary: soil silhouette; secondary: soil silhouette and cremation	3	Both: lateral, crouched, head in W, facing S (right side)
17	Høj 18 - Trehuse	2 (Underground)	Soil silhouettes	2	Both: lateral, crouched, head in W, facing S (right side)
19	Høj 21 - Trehuse	1 (Underground)	Soil silhouette	1	Supine, head in W, drawn legs that fell sideways due to pressure of the fill
21	Høj 23 - Trehuse	1 (Underground)	Soil silhouette	1	Lateral, crouched, head in SW, facing S (right side)
24	Høj 26 - Trehuse	3 (primary: Ground)	Primary: weak traces of soil silhouette; secondary: soil silhouette	2	Secondary: supine, head in W, arms straight next to body
25	Høj 27 - Trehuse	1 (Underground)	Soil silhouette	1	Lateral, crouched, head to SW, facing SE (right side)
26	Høj 28 - Trehuse	3 (primary: Underground)	Primary: soil silhouette	1	Lateral, crouched, head in W, facing S (right side)
28	Høj 30 - Trehuse	1 (Ground)	Soil silhouette (only feet clearly visible)	1	Lateral, crouched, head in W, facing S (right side)
29	Høj 31 - Trehuse	3 (primary: Underground)	Primary: soil silhouette; secondary: cremation and dissolved remains of thigh and lower leg	3	Primary: lateral, crouched, head in W, facing S (right side); secondary: supine, head in E
32	Høj 34 - Dollerup	1 (Underground)	Tooth enamel	1	Indet.
34	Høj 36 - Dollerup	1 or 2 (primary: Underground)	Remnants of teeth	1	Head in W

Table 3.8 - The barrows with grave goods at Trehuse-Sjørup-Dollerup.

Database number	Barrow	Burials	Grave goods (primary / secondary)	Ceramics	Axe	Other finds
1	Høj 1 - Sjørup	0	1		Thick-butted flint axe, type 1, Senon flint	
2	Høj 2 - Sjørup	2 (primary: Underground)	2 / 0			Primary: flint blade variant B (Ebbesen: A-blade), an amber disc variant B (Ebbesen: type 2a), pieces of wood
3	Høj 3 - Sjørup	1 (Underground)	1		Thick-butted flint axe, type 1	
5	Høj 5 - Sjørup	1 (Underground)	35			35 amber beads and discs, four of variant A (two amber discs Ebbesen type 2b)
7	Høj 7 - Sjørup	1 (Underground)	1			Flint blade variant B (Ebbesen: A-blade)
8	Høj 8 - Sjørup	1 or 2 (Overground or Ground)	0-1		Primary/secondary?: battle axe D1	Flint blade scraper loose in fill
11	Høj 11 - Sjørup	1 (Overgrond)	1		Thick-butted flint axe, type 1, Danien flint	
12	Høj 12 - Sjørup	3 (primary: Underground)	0-1 / 1	Secondary: potsherds	Flint axe (loose in fill)	Primary: flint blade variant C (Ebbesen: A-blade) 20 cm above grave?
13	Høj 13 - Sjørup	1 (Underground)	1		Thick-butted flint axe, type 1, Danien flint	
15	Høj 15 - Trehuse	1 or 2 (Ground)	1		Thick-butted flint axe, type 1, Danien flint	
16	Høj 17 - Trehuse	3 (primary: Underground)	0 / 9	Secondary: potsherds		Secondary: eight amber beads; flint blade (A-blade) loose in fill
17	Høj 18 - Trehuse	2 (Underground)	1			Primary: flint knife of blade variant B, at the body's waist
18	Høj 20 - Trehuse	3 (primary: Ground)	10 / 1			Primary: ten amber beads; secondary: bronze ring
19	Høj 21 - Trehuse	1 (Underground)	1			Flint blade variant C, at pelvis on right side, in S
21	Høj 23 - Trehuse	1 (Underground)	1			Flint blade; flint blade drill loose in fill
23	Høj 25 - Trehuse	1 (Underground)	2		Battle axe A1	Flint knife of blade variant B
24	Høj 26 -	3 (primary:	0 /2	Secondary: C1c/Glob I6, B6/Glob P6?		

	Trehuse	Ground)				
25	Høj 27 - Trehuse	1 (Underground)	1			Amber bead
26	Høj 28 - Trehuse	3 (primary: Underground)	2 / 1		Primary: thick-butted flint axe, type 1, Danien flint	Primary: flint knife variant B (Ebbesen: A-blade); secondary: amber bead
27	Høj 29 - Trehuse	1 (urngrave)	0? / 1			Primary/secondary: iron nail; flint blade variant B (Ebbesen: A-blade) loose in fill
28	Høj 30 - Trehuse	1 (Ground)	6	Two fragments of an uncharacteristic storage vessel with stripey surface; undecorated potsherd	Battle axe E3	Grindstone, fire flint (B-blade) and fragment of a flint dagger (possible spearhead) loose in fill
29	Høj 31 - Trehuse	3 (primary: Underground)	2 / 3		Primary: thick-butted flint axe, type 1A	Primary: flint blade variant B (Ebbesen: A-blade); secondary: bronze awl, bronze dagger, possible bronze button
30	Høj 32 - Trehuse	7 (primary: Underground)	1 / 14	Secondary: B2a2 (Ebbesen: Glob L8); urn with lid		Primary: flint blade variant B or C (A-blade); secondary: potsherd, ten amber beads, bronze piece, razor and awl
32	Høj 34 - Dollerup	1 (Underground)	1	Fragment of a small A-type beaker with fishbone decoration (Ebbesen: I-C?)		3 undecorated potsherds and flint blade loose in fill
33	Høj 35 - Dollerup	2 (primary: Underground)	0-1 / 1		Secondary: battle axe F/G (Ebbesen: Glob G)	Primary: flint knife c. 20 cm above grave?
34	Høj 36 - Dollerup	1 or 2 (primary: Underground)	1 / 8	Secondary: potsherds of at least six pots	Secondary: weathered battle axe (Ebbesen: Glob G?), thick-butted flint axe, type 1, Damien-flint	Primary: flint knife of blade variant C (Ebbesen: A-blade)
35	Høj 37 - Dollerup	1 (Underground)	2		Thin-butted flint axe, type 2	Fragment of a fire flint (in fill?)
36	Høj 38 - Dollerup	2 or 3 (primary: Underground)	0 / 1		Secondary: battle axe F2 (Ebbesen: Glob G)	Two flint blades loose in fill

Table 3.9 - The dates of the barrows at Trehuse-Sjørup-Dollerup.

Database number	Barrow	Burials	Phase	Date	Lifespan in years	Source of date
1	Høj 1 - Sjørup	0	From Phase 1b onwards	2800-2250 cal BC	550	Flint axe type 1 (Hübner 2005, 728-37)
2	Høj 2 - Sjørup	2 (primary: Underground)	Phase 1b; reuse in Phase 3	2800-2700 cal BC; 2450-2250 cal BC	100; 200	Grave type, amber var. B, flint blade var. B (Hübner 2005, 660, 728)
3	Høj 3 - Sjørup	1 (Underground)	Phase 1b-c	2800-2600 cal BC	200	Grave type, flint axe type 1 (Hübner 2005, 660, 728-9)
4	Høj 4 - Sjørup	1 (Underground)	Phase 1a-c	2850-2600 cal BC	250	Grave type (Hübner 2005, 660)
5	Høj 5 - Sjørup	1 (Underground)	Phase 2	2600-2450 cal BC	150	Amber var. A (Hübner 2005, 732-3)
6	Høj 6 - Sjørup	1 (Underground)	Phase 1a-c	2850-2600 cal BC	250	Grave type (Hübner 2005, 660)
7	Høj 7 - Sjørup	1 (Underground)	Phase 1b	2800-2700 cal BC	100	Flint blade var. B (Hübner 2005, 728)
8	Høj 8 - Sjørup	1 or 2 (Overground or Ground)	Phase 3	2450-2250 cal BC	200	Grave type (Hübner 2005, 660)
9	Høj 9(a-b) - Sjørup	0	Indet.	Indet.	Indet.	N/A
10	Høj 10 - Sjørup	1 (Underground)	Phase 1a-c	2850-2600 cal BC	250	Grave type (Hübner 2005, 660)
11	Høj 11 - Sjørup	1 (Overground)	Phase 3	2450-2250 cal BC	200	Grave type, flint axe type 1 (Hübner 2005, 660, 737)
12	Høj 12 - Sjørup	3 (primary: Underground)	Phase 1b; reuse in Phase 3	2800-2700 cal BC; 2450-2250 cal BC	100; 200	Grave type, grave feature (stone rows with possible wooden frame), flint blade var. C (Hübner 2005, 521-2, 660, 726-7)
13	Høj 13 - Sjørup	1 (Underground)	Phase 1b-c	2800-2600 cal BC	200	Grave type, flint axe 1 (Hübner 2005, 660, 728-9)
14	Høj 14 - Trehuse	0	Indet.	Indet.	Indet.	N/A
15	Høj 15 - Trehuse	1 or 2 (Ground)	Phase 2	2600-2450 cal BC	150	Grave type, flint axe 1 (Hübner 2005, 660, 731-2)
16	Høj 17 - Trehuse	3 (primary: Underground)	Phase 1a-c; reuse in Phase 3 or later	2850-2600 cal BC; 2450-2250 cal BC	250; 200	Grave type, urngrave (Hübner 2005, 597, 660)
17	Høj 18 - Trehuse	2 (both: Underground)	Phase 1a-c/ 1b	2850-2600 cal BC	250	Grave type, flint blade var. B (Hübner 2005, 660, 728)
18	Høj 20 - Trehuse	3 (primary: Ground)	Phase 2; reuse BA	2600-2450 cal BC	150	Grave type, bronze ring (Ebbesen 2006, 393; Hübner 2005, 660)
19	Høj 21 - Trehuse	1 (Underground)	Phase 1a-b	2850-2700 cal BC	150	Flint blade var. C (Hübner 2005, 726-7)
20	Høj 22 - Trehuse	1 (Underground)	Phase 1a-c	2850-2600 cal BC	250	Grave type (Hübner 2005, 660)
21	Høj 23 - Trehuse	1 (Underground)	Phase 1a-c	2850-2600 cal BC	250	Grave type (Hübner 2005, 660)
22	Høj 24 - Trehuse	1 (Underground)	Phase 1a-c	2850-2600 cal BC	250	Grave type (Hübner 2005, 660)
23	Høj 25 - Trehuse	1 (Underground)	Phase 1b	2800-2700 cal BC	100	Battle axe A1, flint blade var. B (Hübner 2005, 727-9)
24	Høj 26 - Trehuse	3 (primary: Ground)	Phase 2; reuse Phase 3	2600-2450 cal BC; 2450-2250 cal BC	150; 200	Grave type, C1c-e and B6 beakers (Hübner 2005, 287, 660, 734-6)
25	Høj 27 - Trehuse	1 (Underground)	Phase 1a-c	2850-2600 cal BC	250	Grave type (Hübner 2005, 660)
26	Høj 28 - Trehuse	3 (primary: Underground)	Phase 1b; reuse in Phase 3	2800-2700 cal BC; 2450-2250 cal BC	100; 200	Grave type, flint axe type 1, flint blade var. B (Hübner 2005, 660, 728)
27	Høj 29 -	1 (urngrave)	Indet.; reuse in IA	Indet.	Indet.	Iron nail (Ebbesen 2006,

	Trehuse					403)
28	Høj 30 - Trehuse	1 (Ground)	(End of) Phase 1c	2700-2600 cal BC	100	Grave type, battle axe E3 (Hübner 2005, 660, 729-30)
29	Høj 31 - Trehuse	3 (primary: Underground)	Phase 1b; reuse in BA	2800-2700 cal BC	100	Flint axe 1A, flint blade var. B, bronze objects (Ebbesen 2006, 407; Hübner 2005, 728)
30	Høj 32 - Trehuse	7 (primary: Underground)	Phase 1a-b; reuse in Phase 3 or later; reuse in BA	2850-2700 cal BC; 2450-2250 cal BC	150; 200	Grave type, flint blade var. B-C, B2a2 beaker, stone cists, bronze (Ebbesen 2006, 410; Hübner 2005, 574, 660, 726-8, 734-6);
31	Høj 33	3 (primary: Underground)	Phase 1a-c; reuse in Phase 3 or later	2850-2600 cal BC	250	Grave type, urngrave (Hübner 2005, 597, 660)
32	Høj 34 - Dollerup	1 (Underground)	Phase 1a-c	2850-2600 cal BC	250	Grave type, A-type beaker (Hübner 2005, 660, 726-30)
33	Høj 35 - Dollerup	2 (primary Underground)	Phase 1a-c; reuse in Phase 2-3	2850-2600 cal BC; 2600-2250 cal BC	250; 350	Grave type, battle axe F/G (Hübner 2005, 660, 732);
34	Høj 36 - Dollerup	1 or 2 (primary Underground)	Phase 1a-b; reuse in Phase 2	2850-2700 cal BC; 2600-2450 cal BC	150; 150	Flint blade var. C, battle axe Glob G, flint axe type 1 (Hübner 2005, 726-7, 732)
35	Høj 37 - Dollerup	1 (Underground)	Phase 1b-c	2800-2600 cal BC	200	Grave type, feature (stone circle), flint axe type 2 (Hübner 2005, 529, 660, 728-30)
36	Høj 38 - Dollerup	2 or 3 (primary: Underground)	Phase 1a-c; reuse in Phase 1c-2a; reuse in Phase 3?	2850-2600 cal BC; 2700-2525 cal BC; 2450-2250 cal BC?	250; 175; 200?	Grave type, battle axe F2 (Hübner 2005, 660, 730)
37	Høj 39 - Trehuse	1 (Underground)	Phase 1a-c	2850-2600 cal BC	250	Grave type (Hübner 2005, 660)

4 Angelslo-Emmerhout

Table 4.1 - The excavation dates of the graves at Angelslo-Emmerhout and the consulted sources for my analysis.

Database number	Grave	Excavation date	Reference
1	Tum. VIII - Angelslo	1965	Arnoldussen/Scheele 2012, 155, 157-9; Van der Waals 1967, 211; Bakker/Van der Waals 1973, 25; Lanting 1969, 178; Lohof 1991, 38; Drenth 2005, 349; Lanting/Van der Plicht 2002, 76; Van der Waals/Glasbergen 1955, 8, 11-2
2	Tum. X - Angelslo	1965	Arnoldussen/Scheele 2012, 155, 158; Van der Waals 1967, 211; Bakker/Van der Waals 1973, 25; Struve 1955, tab. 1; Glob 1945, 22, 24; Lohof 1991, 41; Drenth 2005, 349
3	Grave C/15 - Angelslo	1965	Arnoldussen/Scheele 2012, 155, 158; Van der Waals 1967, 211; Bakker/Van der Waals 1973, 19; Drenth 2005, 349; Van der Waals/Glasbergen 1955, 8, 11-2
4	Grave D/16 - Angelslo	1965	Arnoldussen/Scheele 2012, 155, 157-9; Van der Waals 1967, 211; Bakker/Van der Waals 1973, 19; Struve 1955, tab. 1; Drenth 2005, 349
5	Grave G/18 - Angelslo		Arnoldussen/Scheele 2012, 155, 157-9; Bakker/Van der Waals 1973, 19; Drenth 2005, 349
6	Grave I/20 - Angelslo	1965	Arnoldussen/Scheele 2012, 155, 158-9; Van der Waals 1967, 211; Bakker/Van der Waals 1973, 19; Lanting 1969, 177; Drenth 2005, 349
7	Grave M - Emmerhout		Arnoldussen/Scheele 2012, 155, 157-9
8	Grave O - Emmerhout		Arnoldussen/Scheele 2012, 155, 157-9; Drenth 2005, 349
9	Grave R - Emmerhout		Arnoldussen/Scheele 2012, 155, 158; Bourgeois 2013, 30
10	Grave 7 - Emmerdennen-S	1961	Bakker/Van der Waals 1973, 18, 20; Van der Waals 1963, 251-2; Drenth 2005, 349; Lohof 1991, 35; Beckerman 2015, 193; Van der Waals/Glasbergen 1955, 8-9
11	Grave 10 - Emmerdennen-S	1961	Bakker/Van der Waals 1973, 18, 20; Van der Waals 1963, 251-2; Drenth 2005, 349; Van der Waals/Glasbergen 1955, 8, 12
12	Grave 6 - Emmerdennen-S	1961	Bakker/Van der Waals 1973, 18, 20, 24; Van der Waals 1963, 251-2; Drenth 2005, 349; Beckerman 2015, 193; Van der Waals/Glasbergen 1955, 8, 11-2
13	Tum. I - Emmerdennen-S	1931	Lohof 1991, 48; Bursch 1936, 56-7; Drenth 2005, 349
14	Tum. III - Emmerdennen-S	1931	Lohof 1991, 43; Bursch 1936, 57-8; Drenth 2005, 349
15	Tum. VII - Emmerdennen-S	1932	Lohof 1991, 47; Bursch 1936, 61-3; Drenth 2005, 337, 349; Beckerman 2015, 193
16	Tum. X - Emmerdennen-S	1932	Lohof 1991, 48; Bursch 1936, 64

Table 4.2 - The graves at Angelslo-Emmerhout and Emmerdennen-South.

Database number	Grave	Grave type	Burials	Burial type	Depth	Measurements	Orientation
38	Tum. VIII - Angelslo	Barrow	9	Primary, beehive grave; Secondary, 8 tangential graves			
39	Tum. X - Angelslo	Barrow	4	Primary; secondary, 3 tangential, wide-set post circle	> c. 80cm	c. 1.7 x 1.4 m	E-W
40	Grave C/15 - Angelslo	Flat-grave	1	Primary, tree-trunk coffin	c. 190 cm		
41	Grave D/16 - Angelslo	Possibly small mound	1	Primary, palisade ditch			
42	Grave G/18 - Angelslo	Flat-grave	1	Primary	> c. 80 cm	c. 1.7 x 1.4 m	
43	Grave I/20 - Angelslo	Flat-grave	1	Primary	> c. 80 cm	c. 1.7 x 1.4 m	
44	Grave M - Emmerhout	Flat-grave	1	Primary	> c. 80 cm	c. 1.7 x 1.4 m	
45	Grave O - Emmerhout	Flat-grave	1	Primary	> c. 80 cm	c. 1.7 x 1.4 m	
46	Grave R - Emmerhout	Flat-grave	1	Primary, beehive grave			
47	Grave 7 - Emmerdennen-S	Flat-grave	1	Primary			
48	Grave 10 - Emmerdennen-S	Flat-grave	1	Primary			
49	Grave 6 - Emmerdennen-S	Flat-grave	1	Primary			
50	Tum. I - Emmerdennen-S	Barrow	3	Primary, wooden coffin; secondary, 2 tangential graves, tree-trunk coffins, widely spaced post circle		2.6 x 1.85 m	E-W
51	Tum. III - Emmerdennen-S	Barrow	7	Primary (dug away by secondary burial), palisade ditch; secondary, wooden coffin; secondary, 5 tangential graves; secondary, urngrave			
52	Tum. VII - Emmerdennen-S	Barrow	4	Primary, tree-trunk coffin, ring-ditch, 5 posts; secondary, cremation grave, double closely set post circle; secondary, 2 tangential graves			E-W
53	Tum. X - Emmerdennen-S	Barrow	2	Primary, stone construction, ring ditch; secondary, cremation grave	65 cm	2.35 x 1.3 m	E-W

Table 4.3 - The primary graves at Angelslo-Emmerhout with a soil silhouette.

Database number	Grave	Presence of human remains	Position of body
39	Tum. X - Angelslo	Soil silhouette	Lateral, crouched, head in W, faced to S
41	Grave D/16 - Angelslo	Soil silhouette	Indet.
43	Grave I/20 - Angelslo	Soil silhouette	Lateral, crouched (head in W, facing S?)
53	Tum. X - Emmerdennen-S	Weak soil silhouette	Head in E

Table 4.4 - The graves at Angelslo-Emmerhout that contain grave goods.

Database number	Grave	Grave goods (primary / secondary)	Ceramics	Axe	Other finds
38	Tum. VIII - Angelslo	1	Glasbergen 1d/1e		
39	Tum. X - Angelslo	4		Battle axe Struve C2 or C5/ intermediate between Glob B-C; flint axe	Flint blade, grindstone
40	Grave C/15 - Angelslo	1	(late) Glasbergen type 1d		
41	Grave D/16 - Angelslo	6		Battle axe Struve B3	Flint arrowhead, flint blade, three flint flakes
42	Grave G/18 - Angelslo	2		Greenstone axe	Flint blade
43	Grave I/20 - Angelslo	2		Greenstone axe	Flint blade
44	Grave M - Emmerhout	3	Protuding Foot Beaker		Two flint flakes
45	Grave O - Emmerhout	2	Protuding Foot Beaker with herringbone pattern decoration	Battle axe fragment	
47	Grave 7 - Emmerdennen-S	3	Glasbergen 1a		Flint blade, flint bladelet
48	Grave 10 - Emmerdennen-S	3	Glasbergen 1f	Greenstone axe	Flint blade
49	Grave 6 - Emmerdennen-S	2	Glasbergen 1d		Pseudo Grand-Pressigny dagger
51	Tum. III - Emmerdennen-S	1 / 12	(Bell) beaker sherds (possibly secondary)		Primary: Grand-Pressigny dagger (c.30 cm under old surface); secondary: two bronze rings, at least ten amber beads
52	Tum. VII - Emmerdennen-S	2	Zig-Zag beaker		Flint bladelet
53	Tum. X - Emmerdennen-S	0 / 1			Secondary: burnt fibula

Table 4.5 - The dates of the primary graves at Angelslo-Emmerhout.

Database number	Grave	Primary date	Timespan in years	Source
38	Tum. VIII - Angelslo	2800-2630 cal BC (4160 ± 30 BP)	170	Radiocarbon dating (Lanting and Van der Plicht 2002, 76)
39	Tum. X - Angelslo	2750-2650 BC (Phase 2)	100	Battle axe Struve C2 or C5 / Glob B-C (Drenth 2005, 349)
40	Grave C/15 - Angelslo	(2866)2568-2299 cal BC (2δ)	269	Glasbergen 1d Beaker (Beckerman 2015, 193)
41	Grave D/16 - Angelslo	2750-2650 BC (Phase 2)	100	Battle axe Struve B3 (Drenth 2005, 349)
42	Grave G/18 - Angelslo	2700-2400 BC (Late Phase 2, 3 or 4)	300	Greenstone axe (Drenth 2005, 349)
43	Grave I/20 - Angelslo	2700-2400 BC (Late Phase 2, 3 or 4)	300	Greenstone axe (Drenth 2005, 349)
44	Grave M - Emmerhout	(3091)2890-2299(2204) cal BC (2δ)	591	Protruding Foot Beaker (Beckerman 2015, 193)
45	Grave O - Emmerhout	(3091)2890-2299(2204) cal BC (2δ)	591	Protruding Foot Beaker (Beckerman 2015, 193)
46	Grave R - Emmerhout	2875-2525 cal BC	350	Beehive grave (Bourgeois 2013, 30)
47	Grave 7 - Emmerdennen-S	(3091)2890-2296 cal BC (2δ)	594	Glasbergen 1a Beaker (Beckerman 2015, 193)
48	Grave 10 - Emmerdennen-S	(3091)2890-2299(2204) cal BC (2δ)	591	Glasbergen 1f Beaker (Beckerman 2015, 193)
49	Grave 6 - Emmerdennen-S	(2866)2568-2299 cal BC (2δ)	269	Glasbergen 1d Beaker (Beckerman 2015, 193)
50	Tum. I - Emmerdennen-S	Indet. (LN or EBA)	Indet.	Absence of finds (Lohof 1991, 48)
51	Tum. III - Emmerdennen-S	2650-2400 BC (Phase 3 or 4)	250	Grand-Pressigny dagger (Drenth 2005, 349)
52	Tum. VII - Emmerdennen-S	(2881)-(2204) cal BC (2δ)	(677)	Zig-Zag beaker (Beckerman 2015, 193)
53	Tum. X - Emmerdennen-S	1800-1400(1250) cal BC (BA)	400/550	Ring-ditch (Bourgeois 2013, 30)

5 Lilla Beddinge

Table 5.1 - The excavation dates of the graves at Lilla Beddinge and the consulted sources for my analysis.

Database number	Grave	Excavation date	Reference
54	Grave 41 / I	1913 (Hansen)	Malmer 1962, 153-4, 180, 918; Hansen 1917, 70, 68-9 (fig. 4-6); Malmer 2002, 138
55	Grave 42 / II	1915 (Hansen)	Malmer 1962, 153-4, 180, 918; Hansen 1917, 70-1, 68-9 (fig. 4, 7-12); Malmer 2002, 138
56	Grave 43 / III	1915 (Hansen)	Malmer 1962, 153-5, 180, 918; Hansen 1917, 71-2, 68-9 (fig. 4, 13-9); Malmer 2002, 138
57	Grave 44 / IV	1915 (Frödin)	Malmer 1962, 153, 155-6, 180, 918; Hansen 1917, 69 (fig. 4); Malmer 2002, 138
58	Grave 45 / V	1934 (Hansen)	Malmer 1962, 153, 156-7 (fig. 37), 180, 918; Malmer 2002, 138
59	Grave 46 / VI	1934 (Hansen)	Malmer 1962, 153, 156, 158, 180, 918; Malmer 2002, 138
60	Grave 47 / VII	1951 (Malmer)	Malmer 1962, 153, 158-62 (fig. 38-43), 180, 918-9; Malmer 2002, 138, 141, 163; Olausson 2015, 104
61	Grave 48 / VIII	1933 (Hansen)	Malmer 1962, 153, 162, 180, 919; Malmer 2002, 138
62	Grave 49 / IX	1934 (Hansen)	Malmer 1962, 153, 162-3 (fig. 44), 180, 919; Malmer 2002, 138, 141; Olausson 2015, 101
63	Grave 50 / X	1939 (Hansen)	Malmer 1962, 153, 163, 180, 919; Malmer 2002, 138
64	Grave 51 / XI	1950 (Malmer)	Malmer 1962, 153, 164-8 (fig. 45-50), 180, 919; Malmer 2002, 138, 163; Larsson 2009, 71
65	Grave 52 / XII	1950 (Malmer)	Malmer 1962, 153, 168-76 (fig. 51-60), 180, 919; Malmer 2002, 138-40, 158-9, 163
66	Grave 53 / XIII	1951 (Malmer)	Malmer 1962, 153, 176-81 (fig. 61-6), 919; Malmer 2002, 138, 160; Furholt 2003, 110, 112, 244, tab. 266; Olausson 2015, 101-2

Table 5.2 - The graves at Lilla Beddinge.

Database number	Grave	Burials	Burial type	Depth	Measurements	Orientation
54	Grave 41 / I	1	Primary, stone construction	c. 100 cm		NNW-SSE
55	Grave 42 / II	1	Primary, stone construction			NNW-SSE
56	Grave 43 / III	1	Primary, funnel-shaped stone construction	140 cm	2.01 x 1.23 m	NNW-SSE
57	Grave 44 / IV	1	Primary, stone construction			NNW-SSE
58	Grave 45 / V	1	Primary, stone frame	85 cm	3 x 2 m	NNW-SSE
59	Grave 46 / VI	2	Primary, stone construction; secondary, cremation grave	35 cm	2 x 0.5 m	NE-SW
60	Grave 47 / VII	3	Primary, boat-like funnel-shaped stone construction; secondary?, heap of bones, oval boat-reel like stone frame; secondary, cremation grave, stone construction	Primary: 80 cm; bone heap: 40 cm	2.5 x 1 m	NNE-SSW
61	Grave 48 / VIII	1	Primary			
62	Grave 49 / IX	1	Primary, stone chamber, possibly with wooden coffin/base	130 cm	2.6 x 0.6 m; stone structure: 4.5 x 2 m	NE-SW
63	Grave 50 / X	1	Primary, stone frame	130 cm		ENE-WSW
64	Grave 51 / XI	1	Primary, stone frame and wooden coffin	100 cm	1.75 x 0.75 m	NE-SW
65	Grave 52 / XII	1	Primary, stone frame and wooden coffin	105 cm	coffin: c. 2.90 x 0.75 m; SW chamber: 1.7 x 0.8 m; NE chamber: possibly c. 1.3 x 0.8 m	NE-SW
66	Grave 53 / XIII	1	Primary, funnel-shaped stone construction and wooden coffin	115 cm	1.5 x 1 m	NNW-SSE

Table 5.3 - The presence of human remains in the primary graves at Lilla Beddinge.

Database number	Grave	Human remains	MNI	Position of body
54	Grave 41 / I	Inhumation	1	Head in NNW
55	Grave 42 / II	Inhumation	1	Lateral, crouched, head in NNW, facing E
56	Grave 43 / III	Inhumation	1	Lateral, crouched, head in NNW, facing E
57	Grave 44 / IV	Inhumation	1	Lateral, crouched, head probably in NNW, faced E
58	Grave 45 / V	Inhumation	1	Crouched, head in NNW, knees in E, upper body laid on back, head faced upwards
59	Grave 46 / VI	Inhumation	1	Head in SW
60	Grave 47 / VII	Inhumation (female, c. 19 years old), skeletal parts (three parts of skull, wisdom tooth); skeletal parts (mainly long bones and five skulls without mandibles	9	Supine, head in SSW; heap of bones on top of skulls in NE of grave
61	Grave 48 / VIII	Inhumation (young individual)	1	
62	Grave 49 / IX	Inhumations	5	Three adults, half-sitting, crouched, in a row, turned to SE; two infants in between the most SW adult and the middle adult
63	Grave 50 / X	Inhumation	1	Supine, head in WSW
64	Grave 51 / XI	Inhumation (young individual)	1	Lateral, crouched, head in SW, facing SE
65	Grave 52 / XII	Inhumations (young individual; male, c. 14-15 years old)	2	Both lateral, crouched, facing SE; SW body (male) on right side, head to SW; NE body (undetermined) on left side, head to NE
66	Grave 53 / XIII	Inhumation (male adult)	1	Lateral, crouched, head in NNW, facing E

Table 5.4 - The graves with grave goods at Lilla Beddinge.

Database number	Grave	Grave goods (primary / secondary)	Ceramics	Axe	Other finds
54	Grave 41 / I	7	Malmer J3	Thick-butted, hollow-edged flint axe V1	Four flint blades, small flint splinter
55	Grave 42 / II	5	Malmer ad K	Battle axe Malmer E1; thick-butted, hollow-edged flint axe V1	Two flint blades
56	Grave 43 / III	5	Malmer ad J	Battle axe Malmer E1; thick-butted, hollow-edged flint axe V1	Flint scraper, flint blade
57	Grave 44 / IV	7		Battle axe Malmer E1; thick-butted, hollow-edged flint axe V2	Granite grindstone, three flint blades, a bone awl; five pieces of flint in filling of grave
58	Grave 45 / V	6	Malmer N	Thick-butted, hollow-edged flint axe V1	Two pierced boar tusks type A3, two flint blades
59	Grave 46 / VI	0 / 2			Secondary: tweezer and razor
60	Grave 47 / VII	1 / 1	Sherd of Malmer J; secondary: undecorated sherds		Primary: small bone awl 10cm W of head; secondary: reddishbrown clayey lump under skulls (body paint?); fragment of grindstone in construction
62	Grave 49 / IX	1			Fragmentary bone needle
64	Grave 51 / XI	63	Two Malmer G2; undecorated BAC sherds (Malmer N?), probably not a grave good; sherds in fill	Thick-butted, hollow-edged flint axe V1 (Larsson: adze)	Two flint blades, bone awl, two decorated disc-shaped bone beads, 54 amber beads, reddish brown clayey lump (body paint?); fragments of burnt stone and flint in fill of grave
65	Grave 52 / XII	122	Two Malmer H2; Malmer H1; Malmer G3	Two thick-butted, hollow-edged flint axes, both V1	Four flint blades, three bone awls, row of animal bones (remains of a meal?), 106 amber pearls, bone comb, small fragmented 'basket-shaped' sheet of copper, 'basket-shaped' (earring?)
66	Grave 53 / XIII	8	Undecorated sherds in fill	Thick-butted, hollow-edged flint axe V6	Long chopping weapon made of deer antler with a transverse perforation, heap of three flint blades, a bone awl and two animal bones (sheep and King's eagle); burnt flint in fill

Table 5.5 - The dates of the primary graves at Lilla Beddinge.

Database number	Grave	Phase	Date	Source
54	Grave 41 / I	BAC Period 5		Malmer J3 (Malmer 1962, 180)
55	Grave 42 / II	BAC Period 4-5		Malmer ad K (Malmer 1962, 180)
56	Grave 43 / III	BAC Period 5		Malmer ad J (Malmer 1962, 180)
57	Grave 44 / IV	BAC Period 5		Battle axe E1 (Malmer 1962, 180; Malmer 2002, 138)
58	Grave 45 / V	BAC Period 3-4		Malmer N (Malmer 1962, 180)
59	Grave 46 / VI	LN		Absence of finds (Malmer 1962, 180; Malmer 2002, 138)
60	Grave 47 / VII	BAC Period 5 or LN		Sherd of Malmer J, similar graves in region (Malmer 2002, 141)
61	Grave 48 / VIII	LN or later		Absence of finds (Malmer 1962, 180; Malmer 2002, 138)
62	Grave 49 / IX	BAC Period 4		Grave feature, bone needle (Malmer 2002, 141)
63	Grave 50 / X	LN or later		Absence of finds (Malmer 1962, 180; Malmer 2002, 138)
64	Grave 51 / XI	BAC Period 3		Malmer G2 (Malmer 1962, 180)
65	Grave 52 / XII	BAC Period 4		Malmer H2, Malmer H1, Malmer G3 (Malmer 1962, 180)
66	Grave 53 / XIII	BAC Period 3-4?/Period 5	3350-2880 cal BC (4375±120 bp)	Radiocarbon date (Furholt 2003, 110, 112, 244); grave feature (Malmer 1962, 180, 196; Malmer 2002, 138, 160)