MAKING A NEOLITHIC NON-MEGALITHIC MONUMENT

A TRB burial ground at Dalfsen (the Netherlands), c. 3000-2750 cal. BC

H.M. van der Velde, N. Bouma & D.C.M. Raemaekers (eds)

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Contents

Acknowledgements

This monograph is the scientific publication of the excavation that took place at Dalfsen (Netherlands) in 2015. The excavation started as a development-led project but after the chance find of several grave pits dating from the TRB period, an archaeological rescue project was organised in order to document and analyse a wealth of archaeological data concerning the Middle and Late Neolithic. After the fieldwork, archaeologists from ADC ArcheoProjecten and the Groningen Institute of Archaeology (GIA) designed a project plan to present and interpret the archaeological results to an international scientific public. This project design was funded by the Dutch Organisation for Scientific Research (NWO). Additional funding was granted by the Province of Overijssel and the municipality of Dalfsen. For this we owe gratitude to those organisations and people who helped us in this process, mr. Han Noten (former major of Dalfsen), mr. Klaas Agricola (former councilor of Dalfsen), mr. Jan Uitslag (current councilor of Dalfsen) and Suzanne Wentink (provincial archaeologist of Overijssel).

Some of the labour was done on voluntary basis. Most co-authors gave up a lot of their spare time. Some of them even worked on voluntary basis like Anna Brindley (GIA), Jan Lanting (GIA), Jaap Beuker (Drents Museum Assen) and Bertil van Os (Dutch State Service for Cultural Heritage, RCE). Their joint efforts were vital to the complex process of creating this monograph.

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Henk van der Velde, Niels Bouma and Daan Raemaekers

Chapter 1

Introduction

Henk van der Velde, Niels Bouma
and Daan Raemaekers

1.1 Introduction

This monograph is based on the results of the excavation of a burial ground dating to the TRB period in Oosterdalfsen, which is situated just east of the present-day village of Dalfsen, in the province of Overijssel, the Netherlands (Fig. 1.1). Because it was at the location of a planned new housing estate, the site had to be excavated. This was done in compliance with the Dutch Heritage Act (Erfgoedwet 2007), which is based on the treaty of Valletta. In the Netherlands, development-led archaeology has been organized by the establishment of a sector of professional archaeological companies.

In February 2015, ADC ArcheoProjecten started a rescue excavation at the site. In the course of March, the first burials dating to the TRB (Trichterbecher, also known as Funnel Beaker) period were found. As soon as the professional archaeologists realised the potential of the site, they contacted both of the universities (at Leiden and Goningen) in the Netherlands with active research programmes relating to the Neolithic period. The Groninger Institute of Archaeology (GIA, University of Groningen) has a long-standing research tradition concerning the Neolithic, and the Swifterbant and TRB periods in particular. The head of the institute, Daan Raemaekers, supported the excavation with his advice on archaeological matters and by his enthusiasm towards the team of students brought in to help the archaeologists. With this helping hand, the archaeological company was able to finish the excavation within the required quality standards, given the limited opportunities and constraints of a mitigative excavation (Chapter 3).

The Heritage Act demands a basic publication of the results of the excavation. From the start, however, it became clear that additional research would be essential to harvest the full potential of this particular site.[1] Therefore, ADC ArcheoProjecten and GIA designed an additional research proposal, which was subsequently funded by the Netherlands Organisation for Scientific Research (NWO). This publication is the result of the NWO-funded research, which started in the course of 2017.

In this chapter, we present the main objectives of this research project and their theoretical background. We also briefly highlight the way in which the municipality turned the burden of unexpected (and partly unwanted) archaeological research into an asset for their community and for their marketing program.

1 Bouma and Van der Velde 2017.

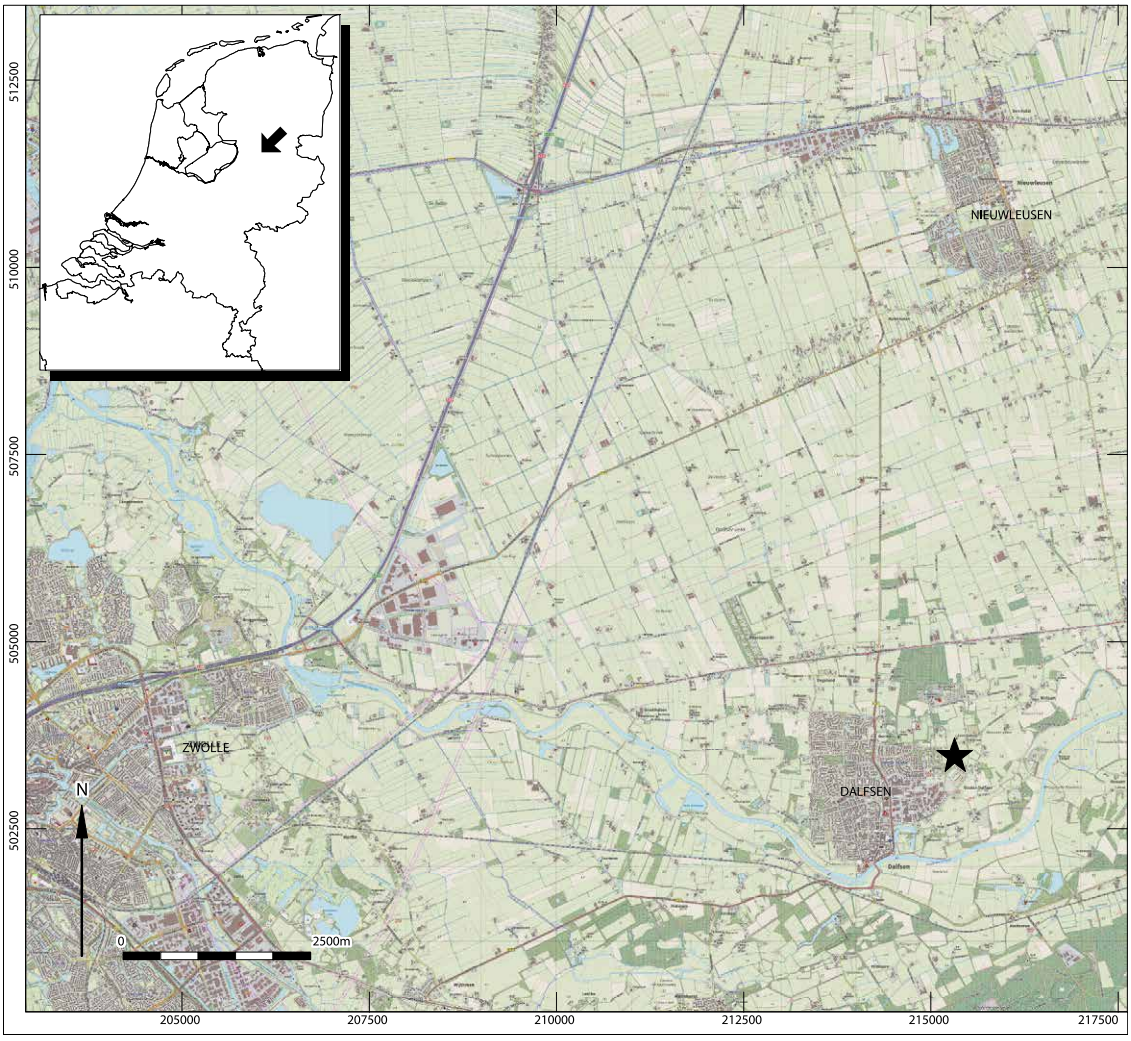


Figure 1.1 Dalfsen: location of the site.

1.2 The themes of the study

In this study, we will present a detailed catalogue of the burial pits and corresponding finds. The main body of this study (Chapters 3 to 7) concerns the interpretation of the data derived from the burial ground at Dalfsen. From there on, we will focus on three themes:

1. The burial ritual: What can the burial ritual tell us about diversity and norms?
2. Social networks and family ties: Can we reconstruct the local group buried here by studying their burial rituals?
3. The cultural biography of the burial ground: What is the long-term history of the burial ground?

Although burial sites from the TRB period belong to the best studied sites in the prehistory of northwestern Europe, we still know relatively little about the burial rituals of individuals. This is because the objects of study are usually the megalithic monuments. Although their architecture is relatively well known, a lot of these megalithic monuments have never been subjected to scientifically recorded excavations. Also, most megalithic burials bear traces of multiple burials (often within a timeframe of several hundred years), which makes it almost impossible to study individual burials. Although we know of the existence of non-megalithic graves, their number is relatively small, and they have only rarely been treated as an object of study (Chapter 2).[2] In contrast to the often impressive megalithic monuments, the remnants of the non-megalithic burials may look rather poor. They were likely often missed during earlier excavations, and undoubtedly a lot of them still await discovery under the modern-day ground surface We may assume that the

2 Kossian 2005.

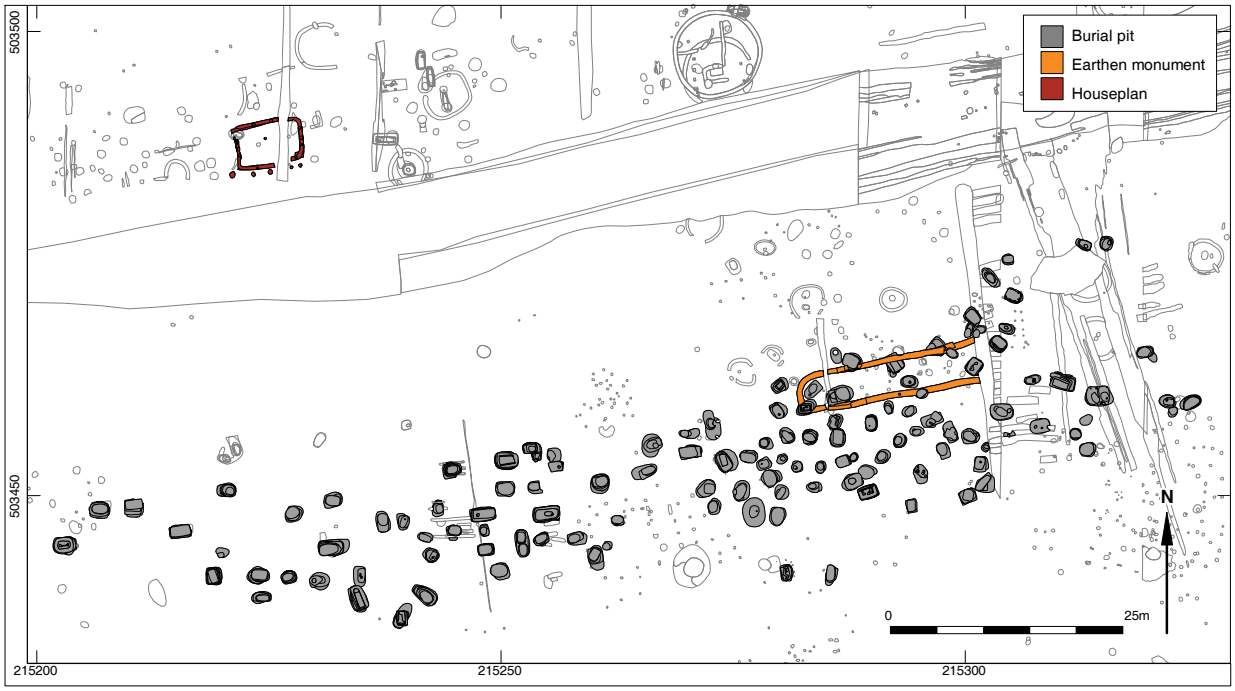


Figure 1.2 Dalfsen-Oosterdalfsen: overview of the burial ground dating from the TRB-period.

Figure 1.3 Dalfsen: features related to an earthen monument dating from the TRB-period.

number of non-megalithic graves was as high as (and probably much higher than) the number of megalithic monuments. With a few exceptions, most of these burials were found as single features or as part of a small group. Their dispersed presence in both time and place made a detailed study and comparison with megalithic burials somewhat problematic. In fact, compared with the burial ritual known from TRB megalithic graves, it is tempting to conclude that the burial ritual of the non-megalithic graves was different, creating a contrast that, in fact, may never have been present.[3]

The find of the large burial ground at Dalfsen creates, for the first time, the opportunity not only to study the burial ritual of the non-megalithic graves in more detail, but also to compare the different types of burials within the same TRB society. The burial ground at Dalfsen is thus a starting point in a search to establish a norm for this type of burial and to compare this norm with burials from megalithic monuments – our first theme. This comparison may help us to answer questions about the supposed differences between the burial rites of these groups, both in time and in place. We will return to this first theme in Chapter 2 and Chapter 8.

The second theme expands on the issue of norm and exception. Due to the large number of burials in the burial ground and its relatively short lifespan (roughly 250 years), we thought it might be possible to use the site as means to study the social structure of the local group that was buried there (Chapter 8). This may sound over-ambitious. First, one might question the possibility of reconstructing society by studying burial rites. Second, one might argue that the number of burials, being the largest number found in a single burial ground from the TRB period, is still not large enough to fully sustain these kinds of observations, especially since the number and variation in objects found with the burials is also rather small. Third, one might point out that, because only the inorganic objects are left, we are hampered in our study of cultural relations. And the absence of human bones makes it impossible to relate the burials to gender. In response to these objections, we note that for this period and this part of the world of the TRB, we have almost no alternative. The number of settlements, especially those with a significant amount of material culture, is small, and the megalithic sites cannot be studied from the perspective of individuality. These three valid theoretical and methodological objections will be dealt with further in the next paragraph. One additional objection, namely, that it is possible that not all the deceased members of the local group are represented in the burials found at Dalfsen, will be discussed in Chapter 8, because it has to be answered in the context of the study of burial ritual during the Middle Neolithic in the study area.

The third theme relates to the long-term history of the landscape, a research area also known as the cultural biography of landscape.[4] This kind of research focuses on the way people perceived the landscape by adding new meaning to it through to a constant interaction with and re-evaluation of its cultural elements through time. This study will be presented in Chapter 9.

The backbone of this volume however are the Chapters 3 to 7 in which the data derived from the excavation are described and interpreted. Chapter 3 deals with the features dating from the TRB-period of which most are grave pits. Chapter 4 Anna Brindley focuses on the pottery of which most is found in the grave pits. The latter makes it of special interest for the study of TRB-pottery from the West-group, since the majority of the pottery found comes from megalithic monuments which means that its context (in space and time) is less clear as in the case of Dalfsen. A selection of the pottery was sampled for geochemical analyses and in addition all pots were analysed through XRF-measurements. The results of this study are described in Chapter 5. Chapter 6 deals with the artifacts of flint, amber and the stone axes found from the grave pits. During the excavation, all graves were sampled for paleo-ecological and chemical analyses of the soil as where a selection of the pots in which residues were found. Chapter 7 deals with the results of these analyses. In addition to all this, a number of arable layers dating from the Late Neolithic/ Early Bronze Age until the Early Iron Age (1800-500 cal. BC) were found during excavation. The palynological analyses of these layers are also described in Chapter 7. Their results are of interest to the story of the long-term history of the site (the so called after-life of the TRB-period) which is described in Chapter 9.

3 Cf. Bakker 2010a, 11 ff.

4 Cf. Kolen 2005.

Chapter 2

The TRB West Group in the Netherlands and the archaeology of non-megalithic burials

Henk van der Velde and Daan Raemaekers

2.1 Introduction

The Netherlands are situated in the western part of the North European Plain, which was formed by the interplay of large Late Pleistocene coversand areas and several river valleys. A large part of the country consists of low-lying Holocene deposits that were deposited on these Late Pleistocene soils, creating a highly varied, mosaic-like landscape. Dalfsen is situated in the Pleistocene and hence relatively 'dry' parts of the country. This area is at the periphery of the so-called TRB West Group, which encompasses not only the northern and eastern parts of the Netherlands, but also parts of German Westphalia and Lower Saxony. Dalfsen is characterised by its location, namely, in a diversified natural environment, in a region bordering non-TRB groups (Fig. 2.1).

To the south, the TRB world bordered that of the Vlaardingen-Stein groups, an archaeological group that traditionally is defined in contrast to the TRB culture,[5] in that there are no megalithic monuments and there is a very limited scope in pottery forms. The raw material sources used in the flint industry are different as well. Moreover, whereas the TRB dataset is dominated by burial sites, that of Vlaardingen-Stein consists almost exclusively of settlement sites. Upon closer inspection, we see, however, that there are many arguments to soften this dichotomy, while maintaining the two concepts as different. There is one megalithic monument at the eponymous site of Stein,[6] albeit of a different type than the TRB passage graves. The absence of megalithic monuments may simply be the result of the absence of suitable stones due to geological circumstances: there are more megalithic monuments farther south (in the Seine-Oise-Marne culture of northern France) and to the east (in the Wartberg group of Westphalia), suggesting a cross-cultural incentive for building monumental tombs. Apart from the Stein tomb – which holds the cremated remains of at least 42 individuals[7] – we have little evidence of the burial rituals in this period. There is one formal burial of an adult male cremated in seated position in a pit. A group of 'isolated bones' in spatial association with a frame of six wooden posts is interpreted as an excarnation platform.[8] There are also ceramic finds that indicate close contacts between the TRB groups in the northern Netherlands and their southern neighbours. These contacts are evidenced by the presence of

5 Van Gijn and Bakker 2005; Verhart 2010, 184-199.
6 Modderman 1964; Verhart and Amkreutz 2017.
7 Verhart and Amkreutz 2017, 117.
8 Louwe Kooijmans 1985, 103; Verhart 2010, 170-171.

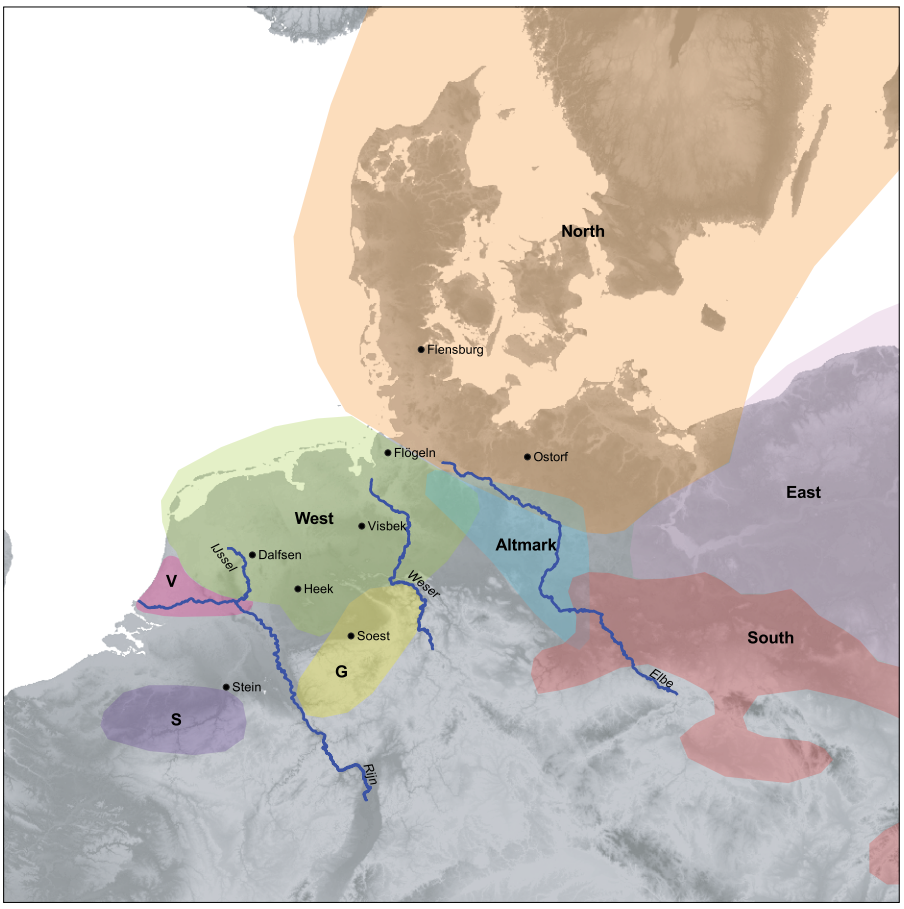


Figure 2.1 Map showing the geographic distribution of TRB (West, Altmark, South, East and North) and other contemporaneous Neolithic groups in northwestern Europe. S: Seine-Oise-Marne culture; V: Vlaardingen culture group; G: Gallery graves. After Bakker 2009.

some sherds with typical TRB *tiefstich* decoration in Vlaardingen-Stein settlement sites[9] and the occurrence of both collared flasks and clay discs across the entire area. Moreover, the undecorated pots from the TRB settlement site of Harderwijk-Beekhuizerzand[10] (some 45 km southwest of Dalfsen) fall within the morphological range of Vlaardingen-Stein ceramics.[11] The flint industry is indeed based on different sources – moraine flint in the TRB area in the north and riverine and mined flint in the Vlaardingen-Stein area in the south – but this may simply be a reflection of the regional availability. The flint technology and typology are again rather similar, with an *ad hoc* industry based on flakes and the production of transverse arrowheads as type fossils for the period, rather than for the specific cultural groups.[12]

Both circumstances – the combination of the two very different landscapes and the position of sites such as Dalfsen in a part of the world with mixed cultural influences – are important factors to bear in mind when studying the Dutch remains of TRB society, and the results of the excavation at Dalfsen in particular. In the past decades, a large amount of scientific literature concerning the core areas of the TRB world (northern Germany and Denmark) has been published.[13] It is worthwhile to combine the insights from the material from the Netherlands with insights about the developments of TRB societies in the core area into a framework in which the site of Dalfsen may be understood, even though the latter insights are partly based on a wealth of evidence that we cannot match in the TRB West Group, and in the Dutch parts of it in particular.

9 Hazendonk: Louwe Kooijmans 1976, Fig. 23; Hazerswoude: Diependaele and Drenth 2010, 123-124; Drenth and Geerts 2013.
10 Modderman *et al.* 1976.
11 Beckerman 2015, 110-112; Beckerman and Raemaekers 2009.
12 Van Gijn and Bakker 2005.
13 Cf. the Deutsche Forschungsgemeinschaft (DFG) priority program (University of Kiel), which resulted in numerous publications concerning the subject.

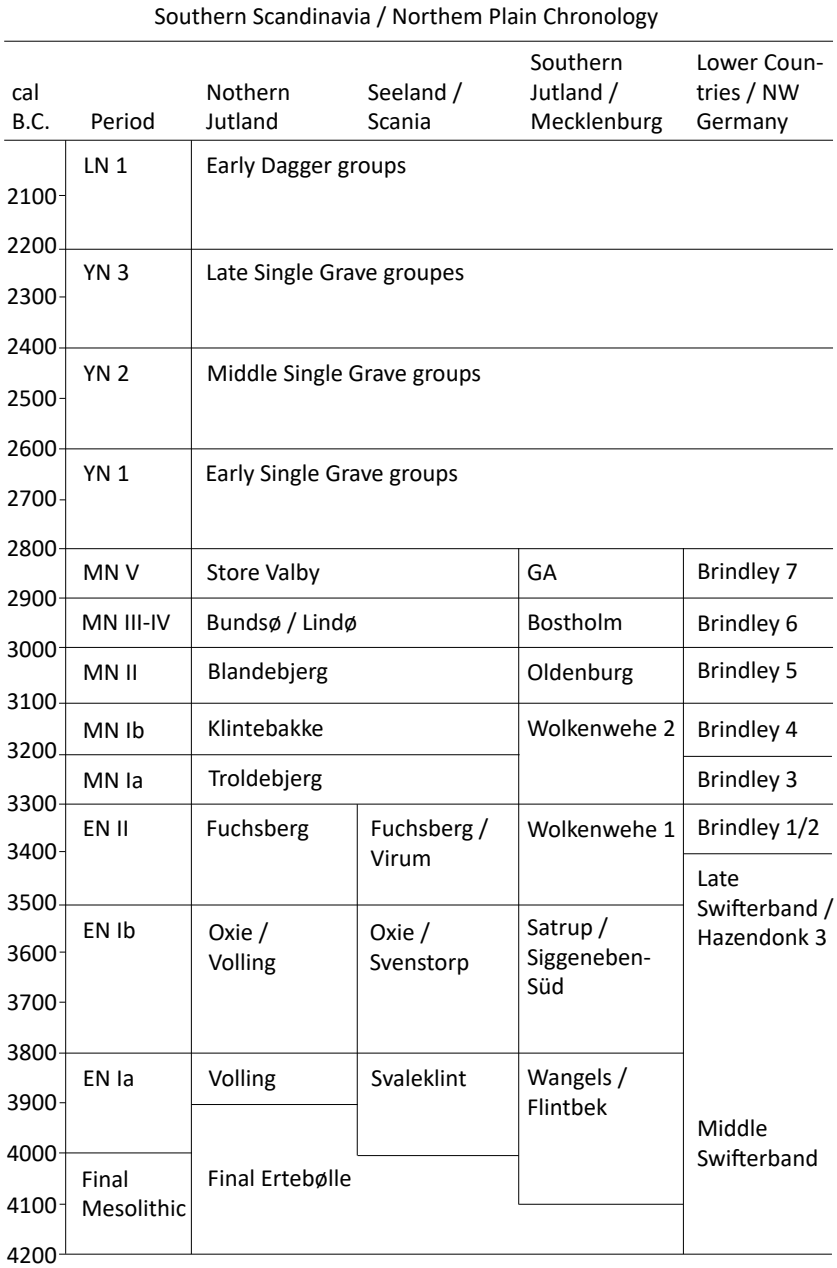


Figure 2.2 Dating of the Neolithic phases in southern Scandinavia and the North European Plain (reproduced with permission from Müller 2011).

2.2 The Neolithic sequence of the Netherlands

2.2.1 The Swifterbant culture (5000-4000/3400 cal. BC)

From the Dutch perspective, the Swifterbant culture is considered a regional phenomenon strongly rooted in the preceding Mesolithic cultures.[14] Its start coincides with the introduction of pottery, around 5000 cal. BC.[15] From around 4600 cal. BC, small numbers of bones from cattle, pig and sheep/goat are documented on various Swifterbant sites. While the bones from sheep/goat are easily interpreted as evidence of domestic animals (due to the absence of wild sheep and goat progenitors in this region), the situation is more problematic for cattle and pig. These finds are interpreted as domestic animals based solely on their relatively small size.[16] The results of the aDNA analysis of the Rosenhof cattle[17] serve as a

14 Deckers 1982; Raemaekers 1999, 190-192.

15 Hardinxveld-Giessendam Polderweg: Raemaekers 2001.

16 Çakirlar *et al.* 2020.

17 Scheu *et al.* 2008.

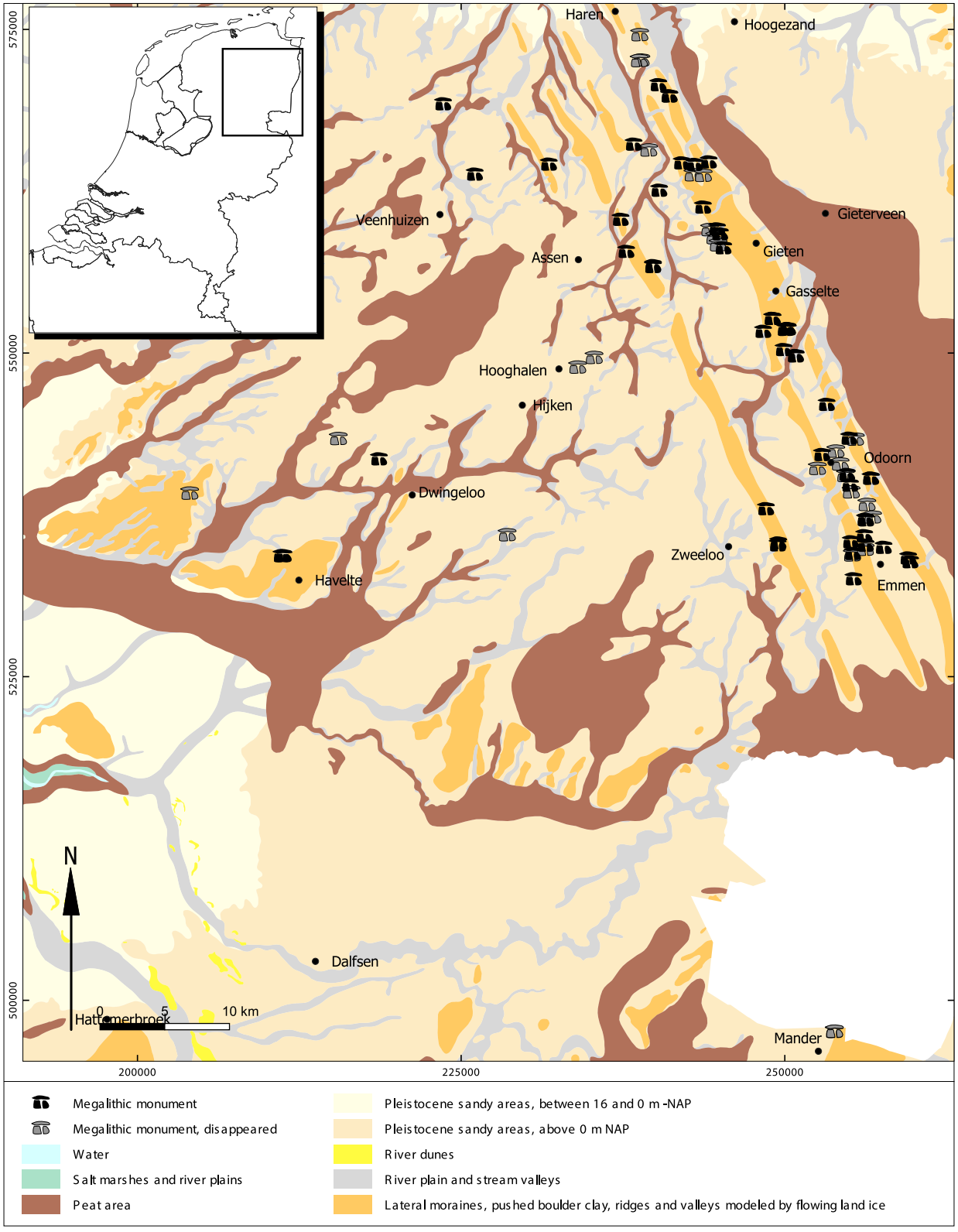


Figure 2.3 Overview of the megalithic monument in the (north of) the Netherlands.

warning that this relative size is an uncertain basis from which to determine the presence of animal husbandry in the Swifterbant culture before 4000 cal. BC. The earliest evidence for cultivation is stronger, and it dates to the 4300-4000 cal. BC plateau in the calibration curve. It is evidenced by the presence of cereal remains,[18] by evidence for small-scale deforestation in pollen diagrams[19] and even by the Pompeii-like preservation of cereal fields at three sites in the Swifterbant region.[20]

Because of the near absence of archaeological sites in the period 4000-3400 cal. BC, there are two competing models for the transition to the TRB culture.[21] The traditional hypothesis stresses the differences between the wetland Swifterbant groups, with their coarse pottery, and the megalithic monument builders of the TRB groups on the coversand plateaus, with their high-quality pottery,[22] starting in the Netherlands with the Drouwen phase. Over the past decades, this model has been challenged by an alternate model that stresses the cultural continuity between the two and proposes defining the period 4000-3400 cal. BC as a pre-Drouwen TRB phase,[23] with intermediate characteristics in terms of material culture and subsistence (indicated in Fig. 2.2. as Late Swifterbant). Arguments for this continuity model are to be found in the pre-4000 cal. BC Swifterbant culture, whose pots are very similar to Early Neolithic TRB pots from northern Germany[24] and whose subsistence base is also similar.[25] The Swifterbant site of Schokland-P14 (40 km west of Dalfsen, province of Flevoland) presents more arguments in favour of this model. In the pre-Drouwen period, typical TRB ceramics, such as collared flasks and clay discs, start to occur,[26] while a burial pit containing the remains from c. six individuals is evidence of a new burial ritual in which a dead person was added to an already existing grave – a tradition reminiscent of the burial ritual in the later megalithic monuments. The three more-complete individuals indicate that people were buried on their sides, in a flexed position.[27] An important site to extend our knowledge about burial rituals in this period is Ypenburg (some 141 km southwest of Dalfsen), a site that, on the basis of its ceramics, is attributed to the Hazendonk group.[28] Ypenburg provides us with a burial ground comprising 32 burial pits, with a total of 47 buried individuals. Most striking is the large number of buried children (n = 19). Almost all are buried in a flexed position. Burial goods are sparse and consist of personal ornaments only. There is no evidence of cross-cutting burial pits, which indicates that the graves must have remained visible above ground.[29]

2.2.2 The TRB culture (4000/3400-2750 cal. BC)

The first megalithic monuments appear in the Netherlands from 3400 BC onwards, a date based on ^{14}C dates from preserved organic material in the tombs.[30] The use of megalithic graves had started around 3600 BC in the neighbouring areas and seems to have reached the Netherlands rather late,[31] perhaps because of its location at the fringe of the TRB world. One could suggest that with the building of megalithic monuments, the Netherlands truly became part of the TRB world, but, as stated above, the pre-Drouwen phase already showed TRB developments.

Palynological analysis shows that from 3400 cal. BC onwards, early farming had a larger impact on the natural vegetation than in the previous period of the Swifterbant culture, again a similarity with the sequence in northern Germany.[32] Although foraging and hunting probably remained of considerable importance, the era around 3400 BC can be seen as the period when agriculture became the primary way of living for most of the local groups in the northeast and east of what is now the Netherlands.

The archaeological dataset of the TRB period is dominated by the megalithic monuments, and this is also where most of the research has been focused. The inventories of these megalithic monuments stand out by their huge number of finds, especially pots. For example, the inventory of megalithic monument D53-Havelte[33] comprises evidence for 1200 individual pots.[34] This is a major difference with the inventories of megalithic monuments northeast of the river Weser.[35] Apart from the tombs, the dataset comprises a number of non-megalithic graves, three palisaded sites (Anloo, Hattemerbroek and Uddelermeer, all situated in the Province of Gelderland) and several votive deposits.[36] Not all of the TRB burials in megalithic monuments were inhumations; we also have cremated bone from these tombs dating to the TRB period.[37] And there are inhumation-size flat graves and

18 Cappers and Raemaekers 2008; Out 2009, Table 9.2.
19 Bakker 2003.
20 Huisman *et al.* 2008; Huisman and Raemaekers 2014.
21 Raemaekers 2015.
22 *E.g.* Lanting and van der Plicht 1999/2000; Waterbolk 1985, 1999.
23 Ten Anscher 2012, 2015.
24 Raemaekers 2015.
25 Raemaekers 1999, 185-186.
26 Ten Anscher 2012, 63-129.
27 Ten Anscher 2012, 313-361.
28 Raemaekers 2008.
29 Baetsen 2008.
30 Lanting and Van der Plicht 1999/2000.
31 Midgley 2008; Müller 2011, 15.
32 Bakker 2003.
33 The Dutch megalithic monuments are referred to by their unique alpha-numeric codes, whereby the suffixes D, G and O denote the provinces of Drenthe, Groningen, and Overijssel, respectively.
34 Bakker 1992, 57.
35 Midgley 2008, 139.
36 Van der Sanden 1997.
37 Jöns *et al.* 2013.

cremation pits.[38] But apart from one excavated settlement (Bouwlust, province of North-Holland), we know almost nothing of TRB settlement sites and daily life.[39]

For this, we have to look to Niedersachsen (also part of the TRB West Group). There some progress has been made due to the Deutsche Forschungsgemeinschaft program Frühe Monumentalität und soziale Differzierung. Mennenga made an inventory of the known settlements from this period.[40] Although the number is rather small (compared with that from Denmark, for instance), the evidence forms a welcome addition to the small body of knowledge about aspects of the regional TRB groups in this part of the TRB world. From Mennenga's study, we know of several houseplans of different sizes (from 18 m to 19 m in length), of which the houses with foundation trenches (as found at Flögeln and Heek) seem to be the most common type. From the scarce evidence, it appears that settlements were rather small (two to three contemporaneous buildings). In some of the sites, flat graves also appear.[41]

2.2.3 The Corded Ware culture (2850-2500 cal. BC)

In the study of the Neolithic, the TRB culture stands out as a unique period, in which megalithic monuments were erected. As a result, it can be difficult to spot cultural continuity into the societies of the later Neolithic, apart from the role that those megalithic monuments continue to play, judging from the frequent presence of later material culture in the burial chambers.[42] In 1929, Childe introduced the term Single Grave culture (here: Corded Ware culture).[43] Throughout large parts of Europe, a new material culture accompanied changed customs in burial ritual, creating a society that seems to be at the start of a long cultural continuity into the Bronze Age. Later scholars discussed the origins of these changes in terms of migrations or diffusion of material culture.[44] Recently, results from aDNA research have provided strong new evidence in favour of the migration theory.[45] We must acknowledge that the archaeological data suitable for the study of (dis)continuity are scarce.[46] Due to the near absence of TRB settlement data, the discussion focuses on the burial data. Dalfsen, with its burials from the TRB period and the Corded Ware and Bell Beaker period, forms a crucial site to discuss the continuity in burial ritual between the TRB and Corded Ware periods, foremost due to the large TRB dataset. Moreover, many aspects of the burials seem to be a prelude to the 'typical' Corded Ware culture burials. These similarities include the position of the body, the use of standardised burial goods, the presence of coffin burials and the indirect evidence for burial mounds. In order to study the connections between TRB and Corded Ware culture burial rituals properly, our analysis will use the methodology proposed by Bourgeois and Kroon.[47] Two elements of their analysis need to be introduced here. First, they register not only the presence of specific categories of burial goods, but also their position within the grave in relation to the body (section 3.4.7). We will use the same scheme here. Second, they focus on the (spatial) correlation between these categories in burial goods to determine the degree of normative behaviour in the burial ritual.

2.3 Regionality, the concept of culture and the reconstruction of society through the study of burials

2.3.1 The archaeology of cultures in prehistory

The phasing of the Dutch Neolithic is characterised by the use of the concept of archaeological cultures. The north of the Netherlands during the 5th, 4th and early 3rd millennium BC is named after sites or characteristic elements, such as Swifterbant (5000-4000/3400 BC), TRB (4000/3400-2750 BC) and Corded Ware (2750-2500 BC).[48] These cultures are characterised by relatively homogeneous material culture across time and space. This is not the place to discuss the theoretical background of the concept of culture in depth. Since the introduction of this concept by Childe (1929), there has been much debate. This debate focusses on the role of material culture (ceramics, flint artefacts or houseplans) as definers of cultural groups or as indicators for the existence of cultural networks.[49] Without knowledge about shared customs and rituals as expressed in material remains, material culture patterns are material culture patterns, and nothing more. While we acknowledge the strong connection between material culture and the identity of groups, we also note the need to realise that the concept of archaeological culture is primarily relevant as a shorthand for archaeologists. Due to new types of research, such as aDNA and strontium isotope

38 Bakker and van der Waals 1973.

39 Raemaekers 2013; Peeters *et al.* 2017, 157.

40 Mennenga 2017.

41 Mennenga 2017.

42 The megalithic monuments with Corded Ware culture finds are D9 (De Groot 1988), D14 (unpublished; collection GIA), D28 (Van Giffen 1943), D20 (Brindley and Lanting 1992), D32a (Taayke 1985), D40 (Brindley and Lanting 1992), D42 (unpublished; collection GIA), D43a (Molema 1987) and D54a (unpublished; collection GIA).

43 Childe 1929.

44 Cf. Beckermann 2015.

45 Olade *et al.* 2017.

46 Beckermann 2015, 19.

47 Bourgeois and Kroon 2017.

48 Raemaekers 2017, 488; In this study, we chose to use the name Corded Ware culture instead of the term Single Grave culture (Dutch: Enkelgrafkultuur) usually used in the Dutch literature. Beckermann 2015.

49 Bradley 2007; Childe 1925; Hodder 2012.

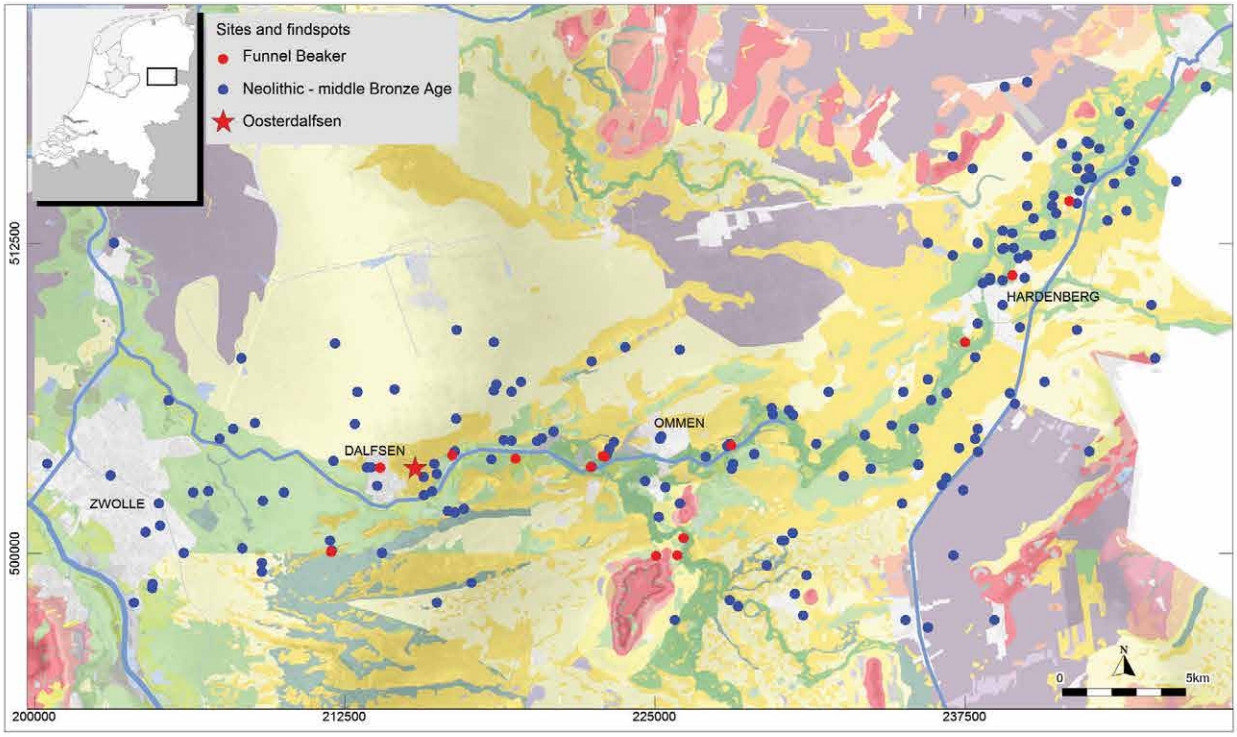


Figure 2.4 Overview of findspots dating from the Neolithic in the valley of the river Vecht (Netherlands).

analysis, the meaning of such concepts as TRB culture or Corded Ware culture is changing rapidly.[50]

To study the meaning of TRB material culture as an expression of personal and group identities, we identify three spatial levels of analysis to be discussed in the following chapters. These levels are:

1. The local community, probably consisting of several households, which interred its deceased in the burial ground;
2. The regional Vecht group, with its similar material culture and possibly similar customs and rituals; and
3. The interregional cultural network, as characterised by similarities in (parts of) the material culture – the TRB world.

The third spatial level is the area defined by the presence of TRB pottery and dominated by the archaeological remains of megalithic monuments and the set of rituals and beliefs presumed to relate to these monuments. Traditionally, this supra-region has been given a lot of attention. On the basis of differences in the material culture (more specifically stylistic difference in the ceramics), the TRB world is split into several regional groups, including the West Group, to which the Dutch archaeological record is attributed.[51] In recent years, smaller regional groups have been distinguished within these regional groups, and therefore the study of TRB societies is increasingly becoming more regional.[52] At the same time, archaeologists tend to use data from other TRB regions (however remote they may be geographically) to fill in the gaps in the regional datasets. A survey by Midgley on the rituals and burial customs in relation to the megaliths from the TRB culture offers us an intriguing glimpse of the enormous variation archaeologists encounter in the archaeological record.[53] We need to keep in mind not only that the data are unevenly spread throughout the TRB world, but also that the rituals and beliefs may have differed substantially across this world. It may even be that, although the Dutch passage graves are related in terms of form to the megalithic monuments in Denmark and the area bordering the Baltic Sea, regional groups perceived the burial rituals concerning these monuments differently. The large ceramic assemblages from the megalithic monuments in our area may be a first argument to underline the potentially different perceptions within the TRB world.

50 Olade *et al.* 2017.

51 Bakker 1979.

52 Furholt 2014.

53 Midgley 2008, 108 ff.

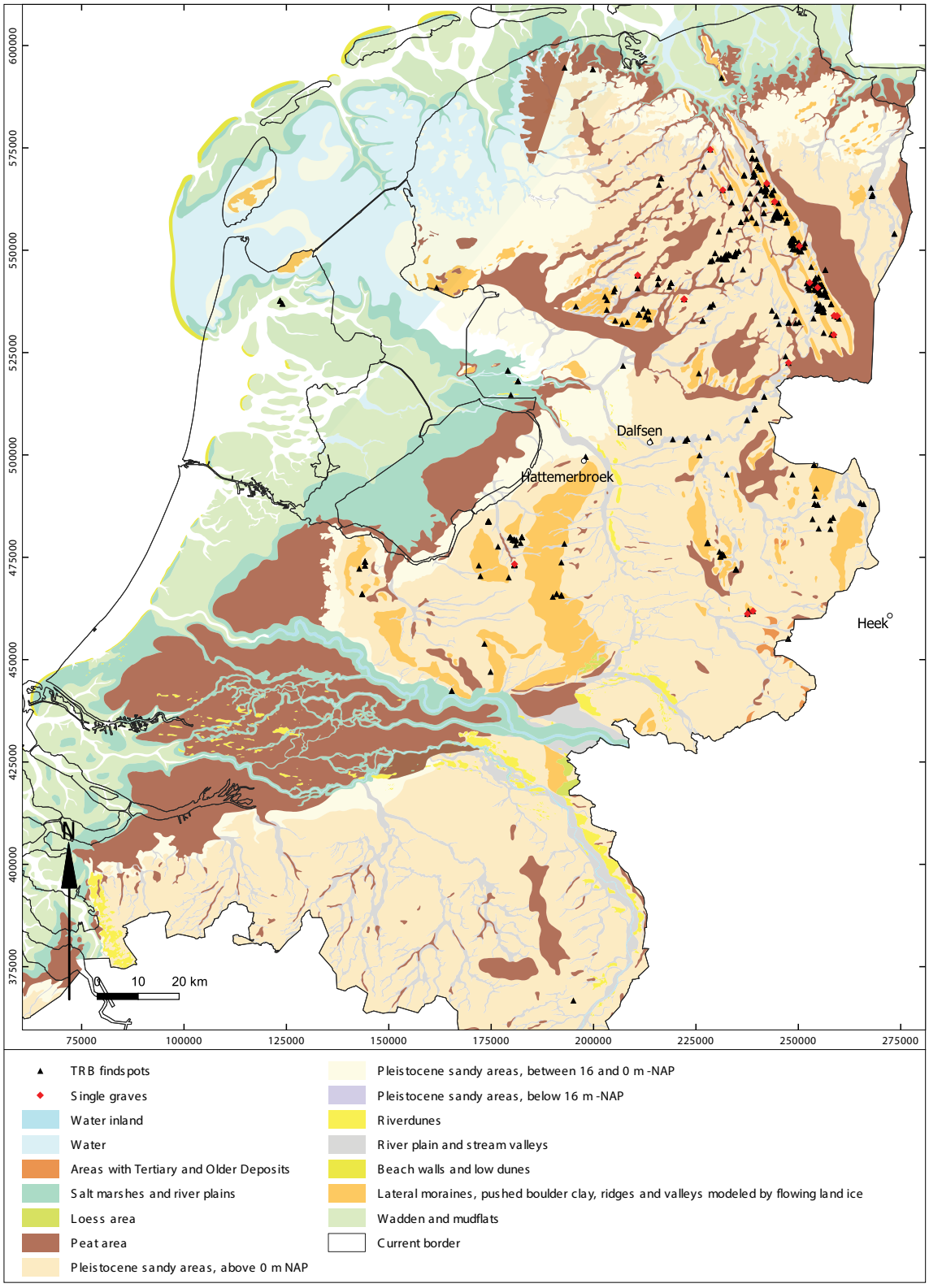


Figure 2.5 Overview of the single graves and principal findspots dating to the TRB-period in the Netherlands.

2.4 Non-megalithic burials

2.4.1 Megalithic versus non-megalithic burials

The study of TRB societies is largely based on evidence derived from megalithic monuments. First, excavation focussed on the burial chambers and the build-up of the burial mound. This has led to detailed knowledge about the building histories and inventories, but leaves us in the dark about the use of the landscape surrounding the megalithic monuments. Rare exceptions are the excavation near the twin megalithic monuments D35-Valthe and D36-Valthe, where a 1 ha area immediately south of the tombs was excavated.[54] This yielded a series of large features that were dug into the underlying Saalian deposits and that may well have been the source of (some of) the stone used to build the tombs. The finds collected as surface material stand apart both from typical tomb inventories and from surface scatters that we interpret as settlement sites, suggesting that TRB site variability is but little understood so far. A second example is the dolmen G5-Heveskesklooster.[55] During later prehistory, this site was covered with Holocene sediments, which preserved the Neolithic ground surface. The ceramic analysis made clear that the dolmen had been cleared out during TRB times: horizon 1 and 2 ceramics were found outside the chamber, while horizon 3 and 4 ceramics were found inside the chamber. The scatter of TRB finds continues far beyond the dolmen, which makes one wonder what function the site had in addition to that of burial monument. That large-scale excavation around the tombs may be essential to increase our understanding is best illustrated by the research conducted at Söderslätt, Sweden. It provides evidence of palisaded routes of several hundreds of metres, of trenches with standing stones, of zones covered with stones and of depositions in the neighbouring wetlands. Lack of excavations near the Dutch megalithic monuments means that we do not know if similar zones existed here as well.

Second, the focus on megalithic monuments has prevented us from doing any serious research on other aspects of TRB burial ritual. As a result, other features, such as burial mounds and flat graves, probably were and are overlooked in archaeological and non-archaeological projects. This makes it impossible to estimate the actual number of non-megalithic burials, although it is safe to say that they are heavily underrepresented in the archaeological record.

Third, we do not know if the TRB groups made the same differentiation between megalithic and non-megalithic monuments. Apart from the availability of stones being of importance to the choices made by local groups, it may well be that mounds above flat graves or earthen mounds looked as impressive as megalithic monuments, most of which were covered by earth anyway and would have looked very similar from the outside.[56] In his description of non-megalithic graves in Germany and the Netherlands, Kossian creates a special category for the stone cists, as being part of both the megalithic and the non-megalithic tradition,[57] indicating that the two categories are perhaps not to be interpreted as separate entities. This view is also expressed in the analysis of the Heveskesklooster stone cist, where the authors find it difficult to delimit this category, especially in comparison to 'simple non-megalithic graves'.[58]

2.4.2 The archaeological record of non-megalithic burials

The non-megalithic burials are understudied and underrepresented in the literature. Most burials were excavated in the early days of archaeology and did not receive much attention, whereas others have not even been published in full (for example, the small burial grounds at Heek).[59] The impressive synthesis by Kossian presents data derived from inventories and barely published data. In his inventory (spanning Poland, Germany, Denmark and the Netherlands), Kossian recorded 353 sites, with a total of 716 burials, of which most only contained 1 or 2 individuals. The first concern with this dataset is that we do not know if this small number of burials per site is due to burial practices or due to the find circumstances; most burial pits are hard to recognise for untrained researchers. Most probably, the actual number of non-megalithic graves was much higher, perhaps even as high as the total number of megalithic monuments we know about. The second concern with this dataset relates to the fact that Kossian brings together burial data from an enormous area. One may question whether it is possible to combine these data in a justifiable manner and whether we may end up neglecting potential regional differences in burial rituals and beliefs. This being said, there is no alternative if we intend to create a comparative context in order to achieve a better understanding of the Dalfsen burial ground.

Which sites are the most relevant for comparison? In the Netherlands, these are the few sites with somewhat larger groups of graves, namely, Uddel-Uddelermeer, Zeyen (D5) and Vledder (5 burials each), Mander O2 (9 burials), Angelslo and Zuidwolde (10 burials each). The burials at Angelslo seem to be all cremation graves. In the case of Mander and Zuidwolde, we presume that the actual number of graves may have been much higher, because only relatively small trial trenches were excavated, and

54 Fens and Arnoldussen 2015; Fens *et al.* 2016.

55 Kamstra, Peeters and Raemaekers 2016.

56 Midgley 2005.

57 Kossian 2005, 61.

58 Kamstra *et al.* 2015/16, 40.

59 Finke 1987; Kossian 2005, 35.

Figure 2.6 Dalfsen: The excavation lasted from March until June 2015. Both professional archaeologists and students were involved in unearthing the features.

these did not locate the boundaries of the burial ground. The last Dutch site of relevance is Hardenberg-Baalderes, where in 1937 a group of 36 TRB pots was collected during land reclamation works. Although no features were recognised, these finds are most probably the remnants of a larger burial ground dating to the TRB period.[60] Outside the Netherlands, important sites for comparison are the two sites from Heek (Ammert, with 20 burials, and Averbeck, with 26 burials, Nordrhein-Westfalen) and the sites of Flensburg (29 burials, Schleswig-Holstein) and Ostorf-Tannerwerder (50 burials, Mecklenburg-Vorpommern), although both Flensburg and Ostorf are situated quite a distance from Dalfsen (around 481 and 474 km, respectively).

60 Brouwer 2019.

Chapter 3

Dalfsen: Excavating a burial ground from the TRB period

Niels Bouma and Henk van der Velde

3.1 A brief overview of the site: From Mesolithic hunter-gatherers to medieval farmers

The location of the Dalfsen excavation forms part of a series of sand dunes situated on the northern bank of the river Vecht, east of the present-day village of Dalfsen (Fig. 3.1). These sand dunes are part of an extended assemblage of relatively high zones that follow the course of the Vecht valley from west to east. These zones were particularly popular for settlers in prehistoric times and later periods, judging from the large number of archaeological remains. Two developer-led projects in the municipality of Dalfsen have provided extensive evidence for the archaeological value of these landscape zones:

Figure 3.1 Dalfsen-Oosterdalfsen: Overview of the features excavated in 2015 and 2016.

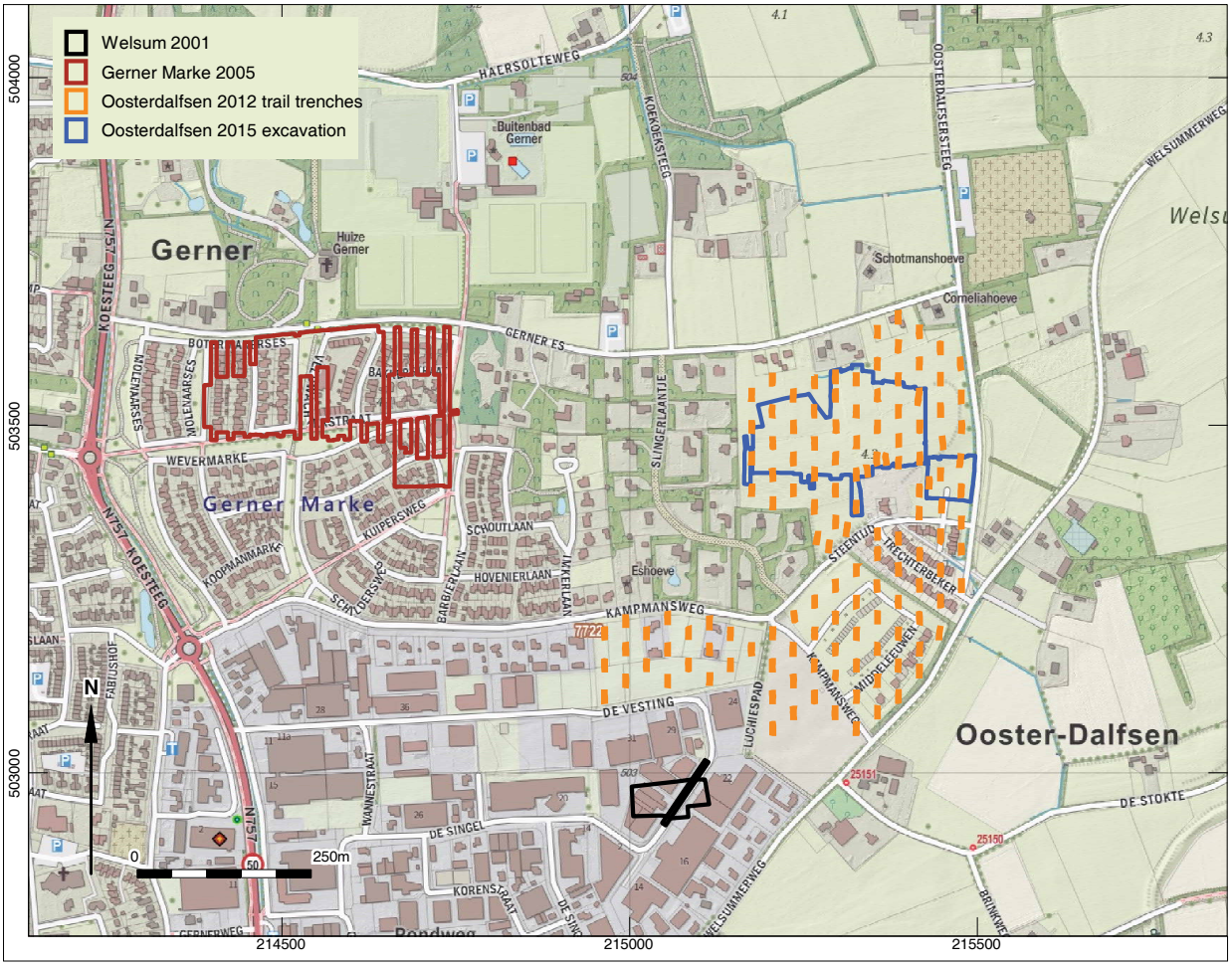


Figure 3.2 Excavations in the area east of the present day village of Dalfsen.

Gerner Marke and Dalfsen. The areas to be developed comprised 22 ha (Gerner Marke) and 20 ha (Dalfsen). In both projects, the first research stage comprised desktop research and a series of corings and trial trenches. All this resulted in excavations encompassing 4 ha at Gerner Marke and 3.5 ha at Dalfsen (Fig. 3.2).

The Gerner Marke excavation (2005-2007) concentrated on the northern edge of the Gerner Es.[61] The excavation produced remains of farms and outbuildings and many finds from the Late Iron Age, the Roman period, the Early Middle Ages and the High Middle Ages.[62] At the time, it was one of the larger excavations in the region, and although the results were not remarkable, the dig did have news value. For example, traces and discoveries from the Middle Ages were very relevant to the historical research into the origins of the village of Dalfsen, which was established in the 10th century. The results also made a significant contribution to the development of the habitation model describing the long-term history of the eastern Netherlands coversand landscape (Fig. 3.3).[63]

The Dalfsen excavation started in the winter of 2015 and provided more information for the existing model of proto-historic habitation.[64] The first weeks proceeded according to schedule. Traces of farms and outbuildings were found, dating from the Late Bronze Age, the Early Iron Age and the High Middle Ages (Fig. 3.1).[65] Over a period of 10 weeks, about 1.5 ha were excavated in an area where traces from the Iron Age and the Middle Ages were expected. The last week of the scheduled excavation,

61 In the coversand area of the Netherlands a lot of essen can be found. The toponym refers to the presence of arable land which was raised by using plaggen soils during the Late Middle Ages. Underneath these plaggen soils archaeological remains usually are well preserved.

62 Blom *et al.* 2006.

63 Van der Velde 2011.

64 Cf. Van Beek 2009; Van der Velde 2011.

65 Bouma and van der Velde 2017.

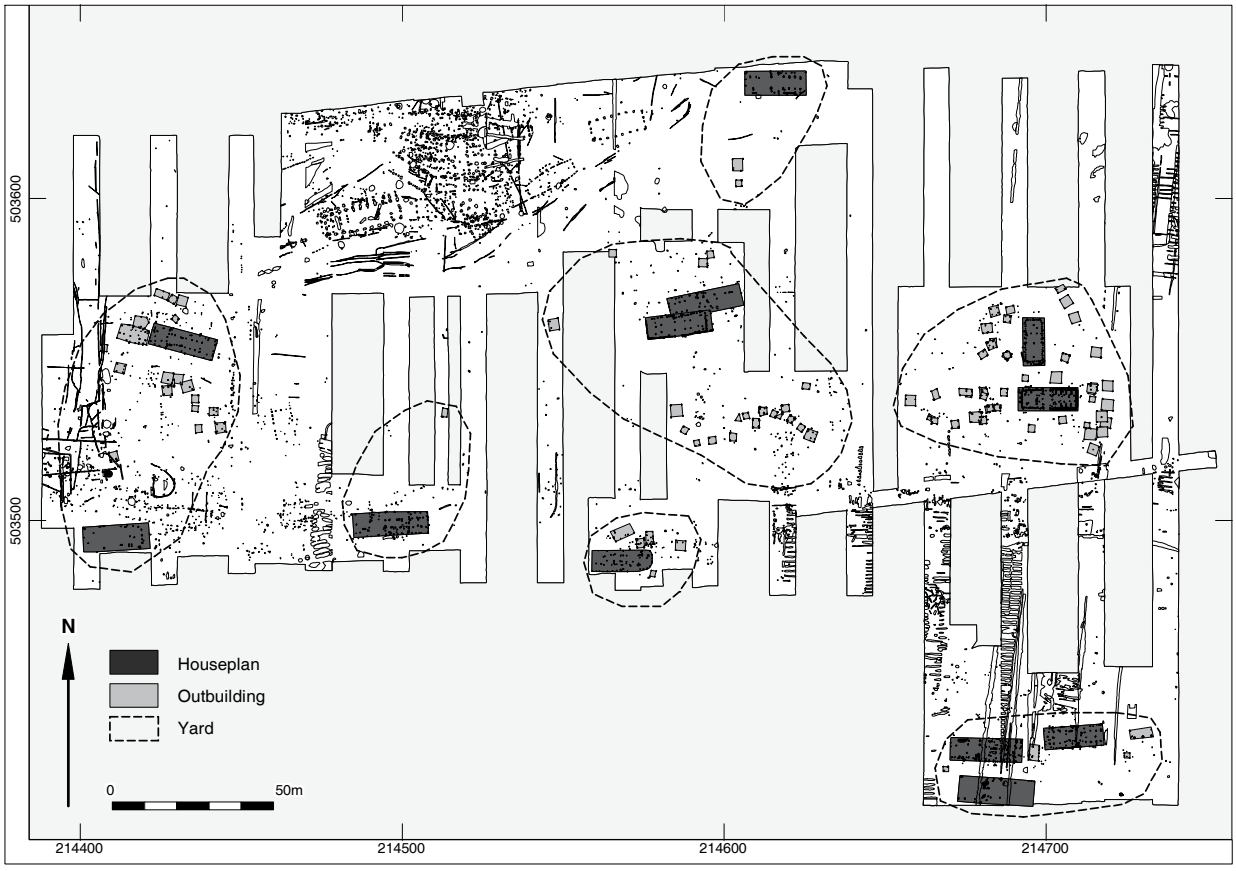


Figure 3.3 Dalfsen- Gernermarke:Features from the Iron Age and Roman period (100 BC – 300 AD).

however, turned out to be decisive for the course of the investigation. An isolated find had yet to be checked out: two complete funnel beakers (dating from the period *c.* 3200–2700 cal. BC) that had been found during the trial trench investigation.[66] The researchers initially thought they had found a single grave pit, maybe two (Fig. 3.4). But on further investigation, it turned out that the soil contained a large burial ground from the TRB culture and also several graves from the Corded Ware culture and the Bell Beaker culture.

The occupation history of the site area starts in the Mesolithic. Adjacent to the sand ridge with the graves, in the lower-lying area toward the river valley, some features and several flint artefacts represent a period during the Mesolithic in which hunter-gatherers exploited the area adjacent to the former branch of the river Vecht. The next phase of occupation and exploitation, the Neolithic, is at centre stage here, following which, we see human activity from the Middle Bronze Age onwards.

In a local depression directly northwest of the burial ground, several prehistoric arable layers have survived post-medieval ploughing activities. These layers date from the Early Bronze Age to the Early Iron Age (*c.* 1800–800 BC) (Chapter 7). Together with some plough marks, these are the oldest finds to attest the clearing of the landscape (Fig. 3.6). During excavation, 23 cremation graves were unearthed. They were all ^{14}C dated, and they yielded dates from the Middle Bronze Age to the Early Iron Age (1300–500 cal. BC). They appear to represent a clustering of graves along a prehistoric route. It is not certain that the agricultural activities (and related deforestation) were followed by the building of farmsteads, because the oldest traces of habitation date to the Late Bronze Age, whereas these features comprise (parts of) several farmsteads that date to the Early Iron Age. Apart from houseplans, several outbuildings were recognised. It appears that, apart from a short break in the 6th century AD, the site was uninhabited from the Middle Iron Age until the early 10th century AD. The long absence of habitation probably led to the regeneration of woodland during the Roman period. This is possibly also shown by the large number of features of tree falls, most

66 Bouma 2014.

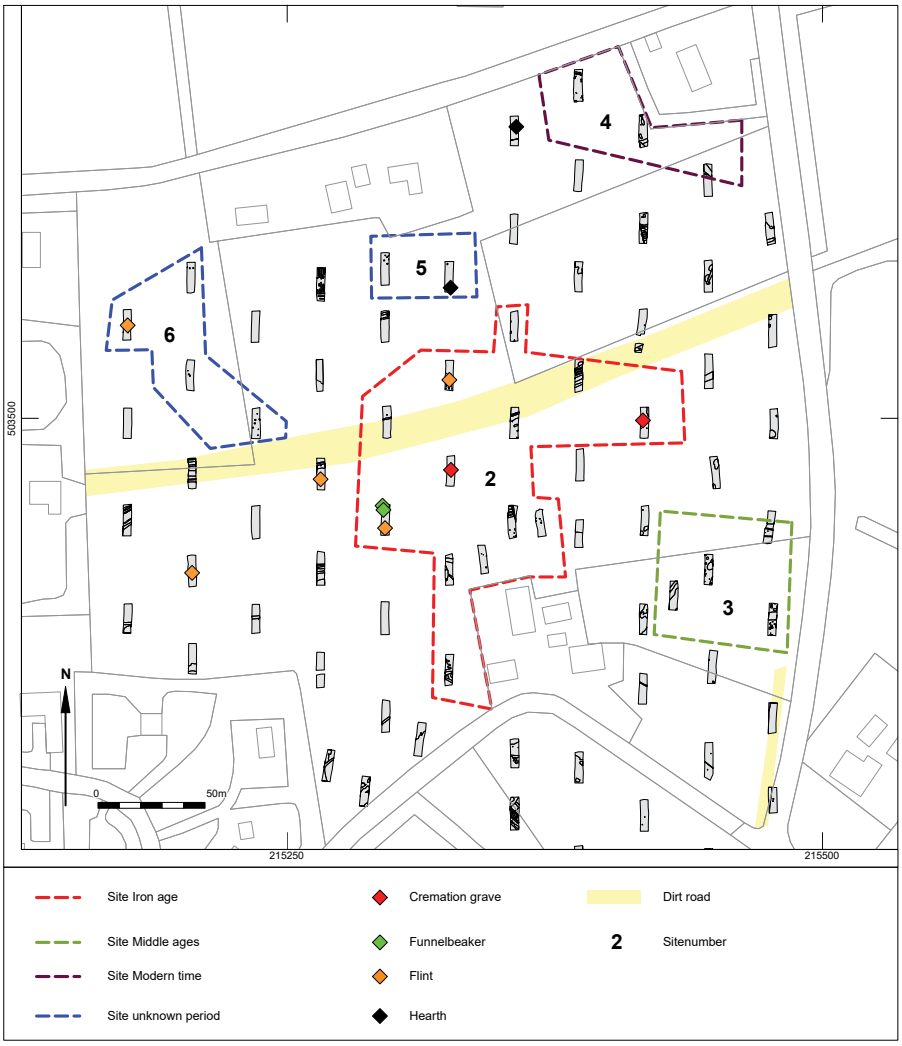


Figure 3.4 Dalfsen-Oosterdalfsen: Campaign of trial trenches in 2012.

probably dating from that period, and the large number of charcoal pits dating from the Carolingian period (750-900 AD) onwards. In the course of the 6th century AD, a small cemetery was founded near the older burial grounds (Fig. 3.7).[67] It comprised nine inhumation graves and two cremation graves. This burial ground probably comprised graves from one or two generations, based on the small number of graves. Two graves were relatively rich in finds. The choice of location of this cemetery close to the prehistoric burial grounds was probably a deliberate one, and the two rich graves (of a man and a woman) can be interpreted as founders' graves (Chapter 9). No habitation from this period was found nearby, but several contemporaneous houseplans were excavated at Gerner Marke, some 700 m away.[68] Finally, at least 25 charcoal pits were found, dating from the Carolingian period until the 11th century AD. They represent the process of charcoal production, an important step in the production of iron. In the southeastern part of the site, a medieval farmstead was founded during the 11th century.

3.2 The landscape at Dalfsen

The sand ridge on which the site was situated is part of a series of sand ridges oriented from west to east on the northern bank of the valley of the river Vecht (Fig. 3.1). The source of the current river Vecht is in Lower Saxony (Germany), and the river formed in the Late Pleistocene. Its course is directed by its flow in an older valley formed by a much larger predecessor, once a branch of the river Rhine system. This explains the relatively large dimensions of the current valley of the Vecht in relation to the relatively small stream. It also explains how sand dunes could have formed on the banks of the current valley: in the Late Pleistocene, wind was able to transport sand due to the sparse vegetation. During the Holocene, these sand ridge assemblages north and south of the river Vecht formed a dry and relatively accessible

67 Bouma and Van der Velde 2017.

68 Blom *et al*. 2006.

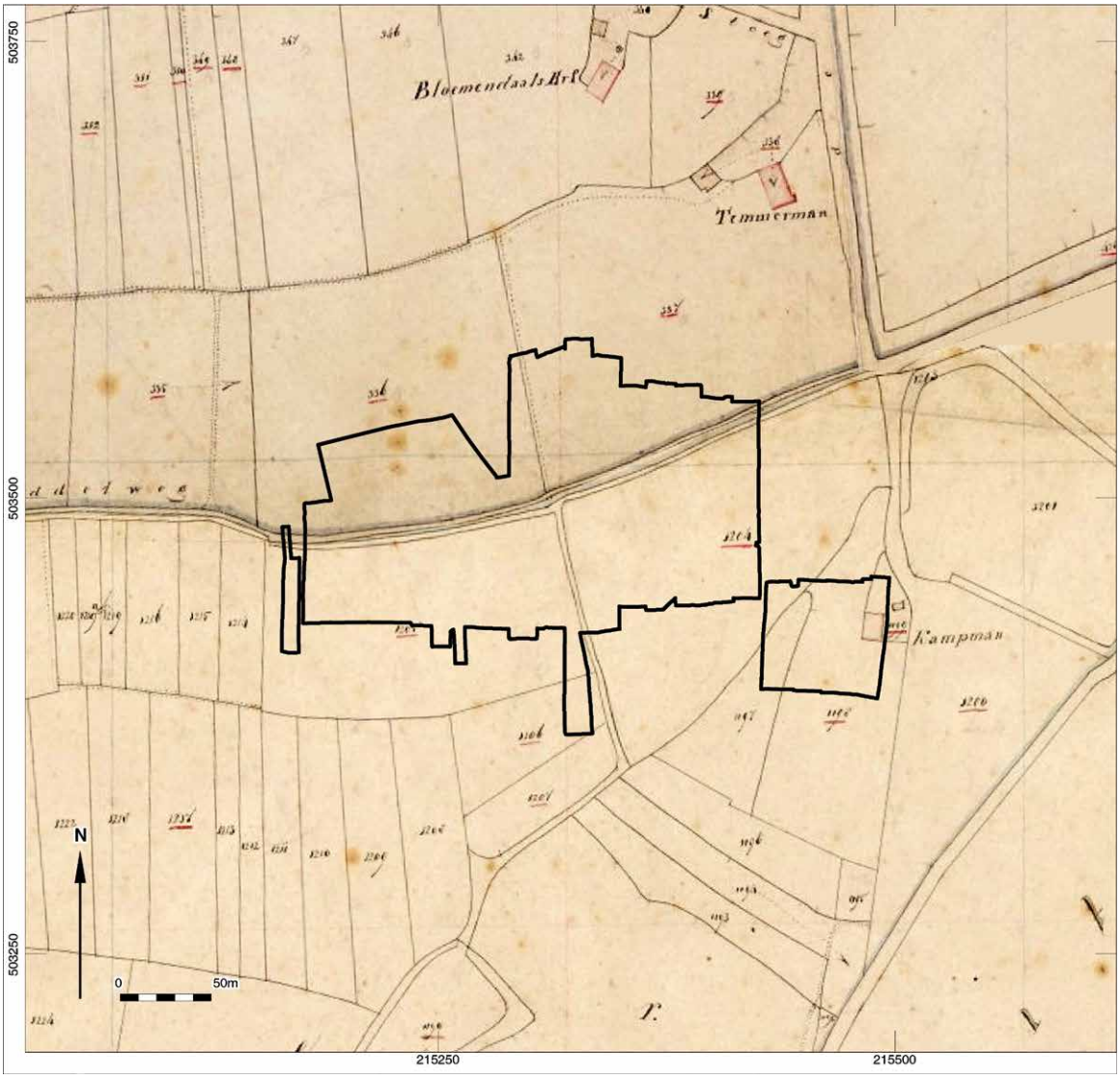


Figure 3.5 Dalfsen-Oosterdalfsen: the site plotted on a historical map with the pre-modern road.

Figure 3.6 Dalfsen-Oosterdalfsen: plough marks dating from the Early Bronze Age to the Early Iron Age.

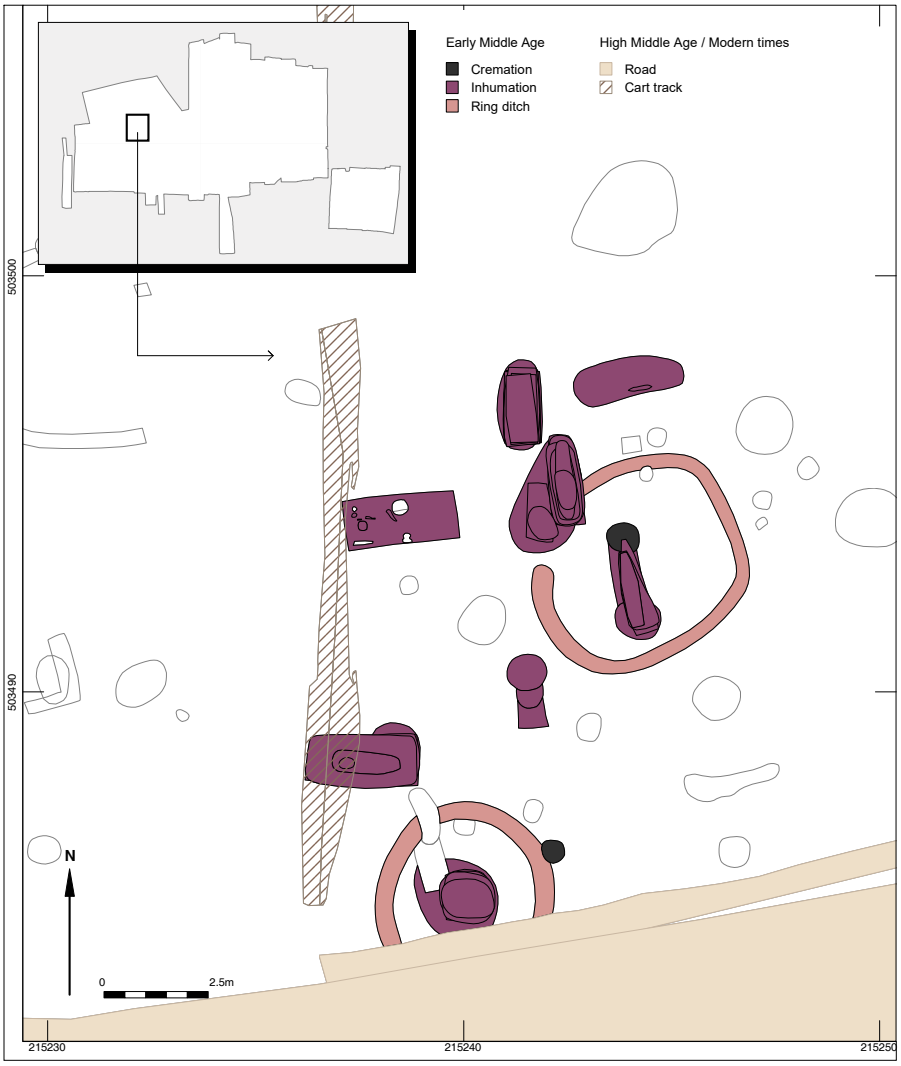


Figure 3.7 Dalfsen-Oosterdalfsen: Overview of the burial site dating from the Early Middle Ages.

area in an environment that, during a large part of the Holocene, was characterised by wet conditions and from time to time by difficult access.[69] Although the palaeo-landscape was far from static and many archaeological sites are located outside the stream valley of the Vecht, the accessibility of the sand ridges and the long-distance route from east to west (and vice versa) produced a rich archaeological record.

The Dalfsen sand ridge is some 3 km long and of variable width. It consists of drift-sands and is covered by a plaggen soil that formed during the 16th century (Fig. 3.8).[70] In general, plaggen soils reduced the pre-existing height differences in the landscape, which consisted of small ridges, heights and lower-lying areas, thus producing agricultural plots that are easier to work. The sand landscape is far from homogeneous: there are differences in the size of the sand particles (fractions) and the size distribution of the grains of sand, but the main differences are in the loam content of the sandy soils. As Spek pointed out, the content of loam in sandy soils is an important indicator not only of the susceptibility to podzolisation, but also of the period in which the area was reclaimed for agricultural activities.[71] Based on his study of soils and archaeological finds in the province of Drenthe, he concluded that areas containing soils with a low loam content were among the first to be reclaimed by Neolithic farmers.[72] One hypothesis is that most Neolithic sites are located on soils with little loam because these soils are easier to work with the relatively light plough then available.[73] When we look at the sand dune in the village of Dalfsen, it is noteworthy that the soils at Gerner

69 Neefjes *et al*. 2011.
70 Van Dinter 2017.
71 Spek 2004.
72 Spek 2004, 119.
73 Wiersma and Raemaekers 2011.

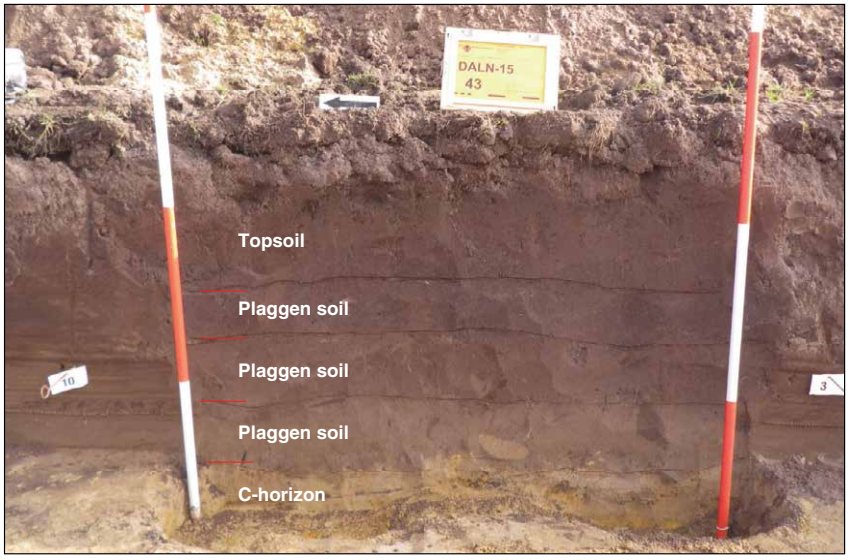
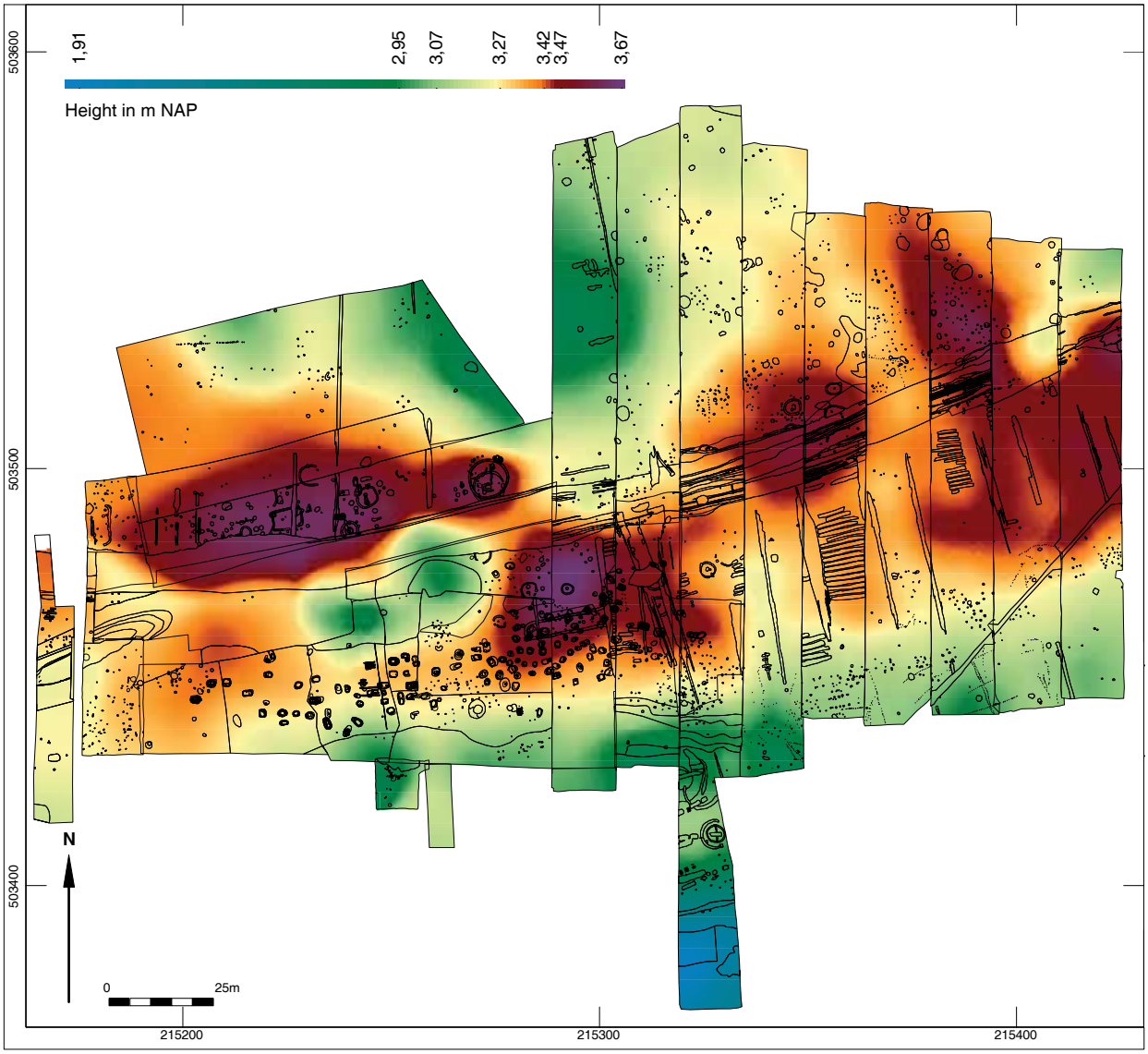


Figure 3.8 Dalfsen: Topsoil from the es of Oosterdalfsen.

Figure 3.9 Dalfsen: Paleogeographical height model of the excavation.



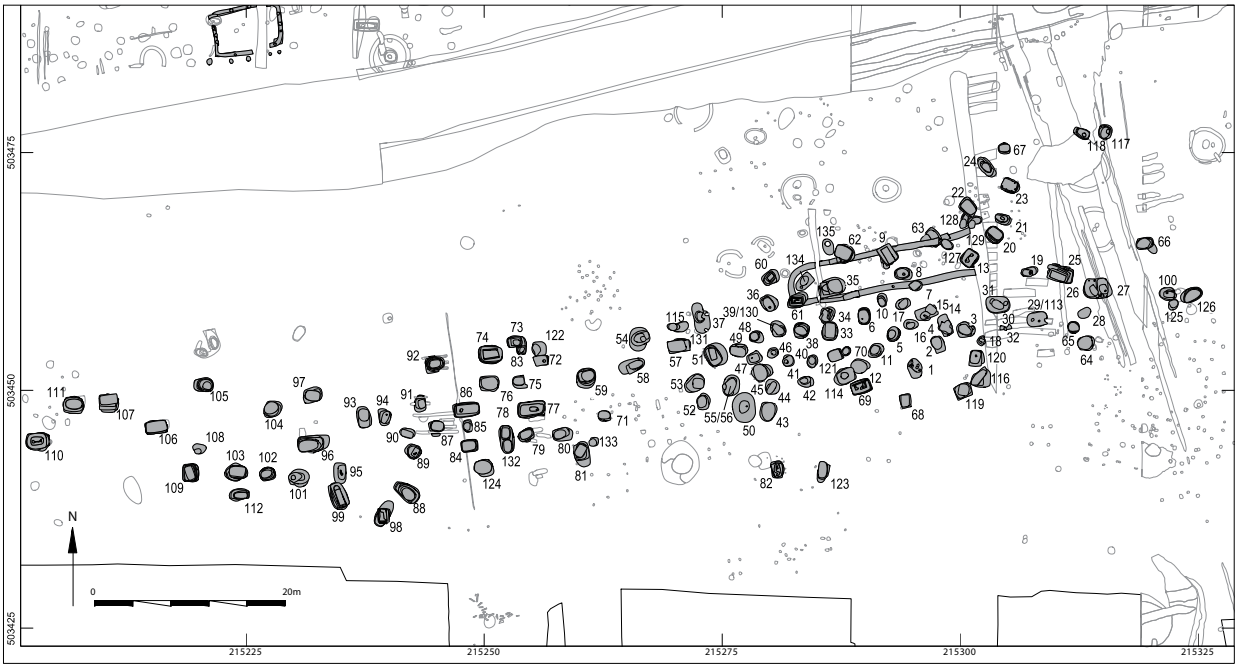


Figure 3.10 Overview of the TRB burial ground at Dalfsen.

Marke are relatively rich in loam and were occupied from the Iron Age onwards and that, in contrast, the soils at the site of Dalfsen are sands with a poor loam content and the archaeological record is dominated by features dating to the Neolithic and Bronze Age. These observations fit Spek's model well. We will return to this subject in Chapter 9.

At ground level, the modern-day landscape of the site at Dalfsen is dominated by a large ridge covered by a plaggen soil. Underneath this plaggen soil, the landscape consisted of two small sand ridges in the western part of the area and a larger ridge in the eastern part, with several natural depressions in between. The most prominent depression, found along the southern edge of the area, is interpreted as the remnant of a Late Pleistocene branch of the river Vecht (Fig. 3.9). The filling of this branch consisted mainly of sandy layers, but at 1.79 m below the present-day ground surface, a layer of peat dating to the Allerød period (14,000-11,000 BP) was found. We assume that this natural depression adjacent to the sand ridge containing the TRB burial ground can be characterised as an area that was at least seasonally wetland.

3.3 The features dating to the TRB period

3.3.1 The excavation

In the Netherlands, almost every excavation starts with removing the modern topsoil and the ploughed arable land underneath it with a mechanical excavator. At Dalfsen, the layers of arable land, dating to the Late Middle Ages and early modern age, are between 0.6 and 1.2 m thick. Normally, any features dating from the Mesolithic to the Late Middle Ages should be visible at the top of the natural soil. But at this site, due to podzolisation, it was necessary to mechanically excavate into the subsoil to see these features, because at the 'normal' level (*i.e.* the top of the subsoil), most of the colour of the (Neolithic) features had been washed away due to soil processes and were therefore invisible.

The burial ground lies on the highest parts of the major sand ridge, at a depth of 0.6–0.7 m below the current ground surface. During the removal of the layers of arable land, the surface was continuously inspected for finds with the use of a metal detector. Metal finds and any other special objects were pinpointed and then 3D-documented with the use of a robotic Total Station (rTS). Other finds were collected and documented at a resolution of 2 × 2 m. Some 20–30 cm above the archaeological level, the excavator removed the arable land in very thin layers of no more than 5 cm until features began to show in the top of the natural soil. From this level on, the entire trench was skimmed by hand using flat-bladed shovels. All features received a unique number, and their outline was marked by means of a shallow incision. After the entire trench had been photographed, all features and layers were documented with the rTS and described. The rTS also documented the heights of the archaeological level and the current ground surface. Finds were subsequently collected separately by feature, fill and layer. Instead of being sectioned, all grave pits from the TRB period were carefully skimmed, layer

for layer. The graves were researched and documented to between 2 and 14 levels, depending on the preserved depth. During skimming, all finds were documented in 3D. The sediment was dry-sieved using a 4 mm sieve to retrieve the smaller finds, and these finds were also documented per level. After skimming, each new level was photographed and drawn digitally with the rTS. The depth of each level within the grave pit was measured with the rTS, as was the depth of each pot and feature within the grave pit.

3.3.2 Processing the features

During excavation, each grave pit was carefully examined and documented. It became clear during the initial skimming of the top of the subsoil that, due to the process of podzolisation, the colour of the features had faded diminished, especially in the upper levels. It also became clear during the skimming of the features that both their shape and their colour changed between different depths. Several features even became bigger in circumference as we skimmed down. The process of podzolisation made it impossible to distinguish layers in the grave pit: we were not able to see whether, at one stage, grave pits were filled in or reopened. It proved impossible to conduct micromorphological analysis to study this aspect due to the extreme mobility of the grains of sand. However, the position of the finds within the features showed variations in depth, with some objects coming from the lower part of the fill (presumably located at the bottom of the grave pit) and other objects coming from a higher position, suggesting that they were deposited either while the pit was still only partly filled in or after reopening of the grave pit at a later stage (see below). Also, several non-primary (especially older) finds were included in the filling (see also section 3.4.7). Similar observations were made at the excavations at Heek, where the excavator stated that the grave pits had mottled fillings, possibly due to ritual acts, such as the reopening of the graves. Because of these observations, the Heek Dalfsen research team decided to analyse the grave pits and finds in a 3D environment.[74]

The following analysis aims to reconstruct the so-called cultural biography of the individual graves and the burial ground. This approach was originally introduced to describe the changing meaning of objects during their life.[75] The approach was subsequently applied to the analysis of landscapes.[76] By combining both variations, the cultural biography approach can be applied to study, first, the rituals with reference to the primary grave; second, the rituals performed at a later stage, by which time the meaning of the primary grave may have changed; and, third, the correlation between the graves in the burial ground.

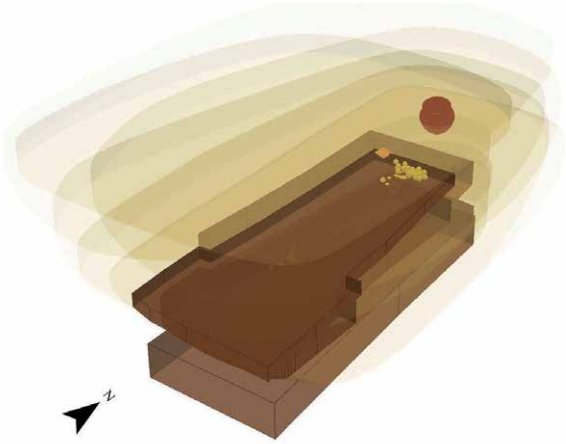


Figure 3.11 Dalfsen: 3D reconstruction of pit 99.

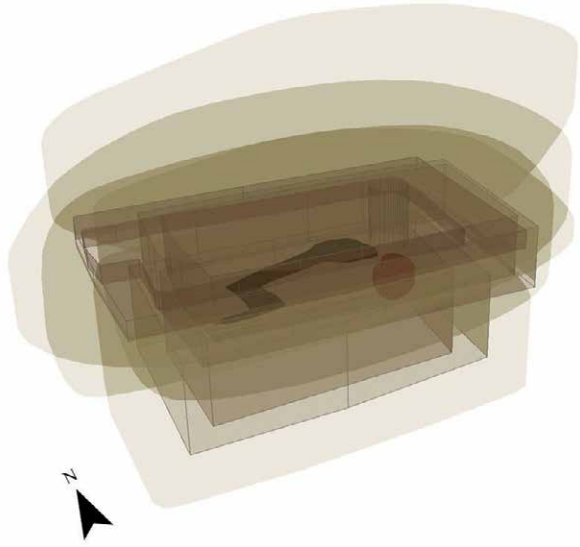


Figure 3.12 Dalfsen: 3D reconstruction of pit 61.

3.3.3 From 2D to 3D features: Building a GIS system

While excavating, archaeologists translate information into a 2D dataset.[77] This is part of an established tradition in recording the archaeological record. During the past decades, however, technical possibilities have grown explosively. This had led to several projects in which specialists tried to create a 3D image of excavated features in order to study them in their original context.[78]

74 Finke 1984; Kossian 2005, 113.

75 Kopytoff 1986.

76 Cf. Kolen 2005.

77 Emmitt *et al*. 2019; Verhoeven 2017.

78 Emmitt *et al*. 2019.

Figure 3.13 The burial ground of Dalfsen was situated on a narrow sand ridge.

As described in the previous section, the grave pits were excavated by carefully removing the filling through skimming. The advantage of this method is that the finds and the filling become visible gradually and can be documented in detail. The disadvantage is the lack of visible 3D information during fieldwork and the processing of the data. The way to overcome this is to bring 2D data into a 3D model, which is not easily done due to the way GIS programs are designed nowadays.[79]

Within each feature, the extent of each of the up to 14 layers was documented as a horizontal polygon and the location of each find was 3D measured. This resulted in complex overviews (Figs 3.11 and 3.12). In order to create a 3D model, it was necessary to combine the horizontal polygons with their lower-lying counterparts, a process that was hampered by the variations in shape and size. We first attempted to analyse the data using SketchUp Pro and Blender. However, only a few attributes can be included in this software. Attributes were sometimes adjusted during the analysis of the pottery and the excavation data. It was therefore decided to use ArcGIS Pro for the 3D display. By creating multiple nodes on the polygons and then combining these with the height in relation to the Amsterdam ordnance datum (normaal Amsterdams peil, or NAP) measurements, we were able to create rough models.

With the help of the NAP measurements of the polygons of the burial pits on multiple planes, the graves could be represented schematically in 3D. Here the flint finds, the beads of the amber necklace, and the two axes were included as point locations. Body silhouettes (*i.e.* the soil discolouration resulting from decomposition of the body) were displayed as being 2 cm thick and were also displayed at the correct height. The Z-value of the bottom of most funnel beakers was measured or could be reconstructed on the basis of other data. With the help of Photoshop, a 3D standard symbol for a funnel beaker was made. This symbol is used to indicate the location of the funnel beakers at the correct height. The Z-value was multiplied by a factor of 5 to make the 3D overview clearer.

As the results of these efforts show, studying the grave pits in a '3D environment' gave more insights and details about the grave contexts and opened the way to new research questions (sections 3.4.2 and 3.4.7). In fact, without this, we would have missed a lot of information, and we therefore strongly recommend researchers to follow this method in studying Neolithic grave contexts.

3.4 The grave pits

3.4.1 Introduction

The burial ground lies on the higher parts of a rather narrow sand ridge (Fig. 3.13). Extending over an area of 120 × 20 m, 134 grave pits were found. The number of grave pits was probably higher in the past: of some graves, only the lowermost few centimetres remain, and it therefore seems likely that some graves have disappeared entirely. And even the number of grave pits that remain is uncertain because during excavation some pits (graves 55, 66 and 86) appeared as two distinct, smaller pits at a lower level. Here, they are counted as one grave pit. The burial ground comprises 88 graves that can be dated to the TRB period due to the presence of typical TRB material culture and a further 46 graves

79 Jensen 2017.

without grave goods for which a similar date is assumed based on their spatial correlation to the graves with TRB grave goods and the strong similarities in terms of grave characteristics.

In this section, we focus on the analysis of the main characteristics of the graves separately. The correlation between these characteristics is studied in Chapter 8. All graves are described in detail in the catalogue. The finds from the graves will be discussed in Chapters 4 and 5 and are also incorporated in the catalogue.

One burial (grave 135) stands out from the other graves. Grave 135 is the only cremation burial (German: *Brandgrab*) found at Dalfsen. It was located 26 m west of grave 110, the most western flat grave of the burial ground. This grave lies on the same sand ridge as the burial ground. We obtained ^{14}C dates on two of the bone fragments, and they both fall in the period 2900–2700 cal. BC (Table 3.1). The cremation pit only yielded burnt bone: no charcoal or grave goods were found. The absence of charcoal suggests that the bone fragments were collected at the site of the cremation and buried in a different location from where the cremation took place.

Catalogue number	Laboratory number	Date in radiocarbon years	Calibrated date
DALN-15V3381	Poz-88040	4205 ± 35 BP	2900–2673 BC
DALN-15V3381	Poz-88702	4240 ± 35 BP	2917–2698 BC

Table 3.1 Dalfsen: ^{14}C dates for cremation grave 135. Calibration based on Bronk Ramsey *et al.* 2013.

	Frequency of grave pits	
Proportion of circularity	Number	Percentage
0.41–0.45	1	0.8
0.46–0.50	2	1.5
0.51–0.55	9	6.9
0.56–0.60	10	7.7
0.61–0.65	18	13.8
0.66–0.70	22	16.9
0.71–0.75	23	17.7
0.76–0.80	22	16.9
0.81–0.85	10	7.7
0.86–0.90	9	6.9
0.91–0.95	4	3.1
0.96–1.00	0	0

Table 3.2 Dalfsen: Frequency distribution of grave pits by proportion of circularity. Proportion = 1 signifies a perfectly circular burial pit.

3.4.2 The shape, size and profile of the grave pits

Analysis and interpretation of the data on the shape and size of the graves was not straightforward, because of two main problems. The first problem is that it is impossible to estimate how much of each grave was reworked into the overlying plaggen soil, because we have no way of calculating the original depth from the remaining depth. What we can say is that the graves cannot have been dug in from a height above the current surface height. This places a maximum on the missing depth of the graves of perhaps 60–70 cm. The second problem is that podzolisation has disturbed the outline of the graves to a major degree. There are several examples of this. In some cases, pits appeared as small ovals at level 1 but became much bigger and more rectangular at a lower level. Large, rectangular pits at level 1 sometimes split into two smaller rectangular pits lower down and appeared at this lower level as paired graves (see below). In yet other graves, the 'washing out' of the colour of the pits manifested itself, often at a lower level.

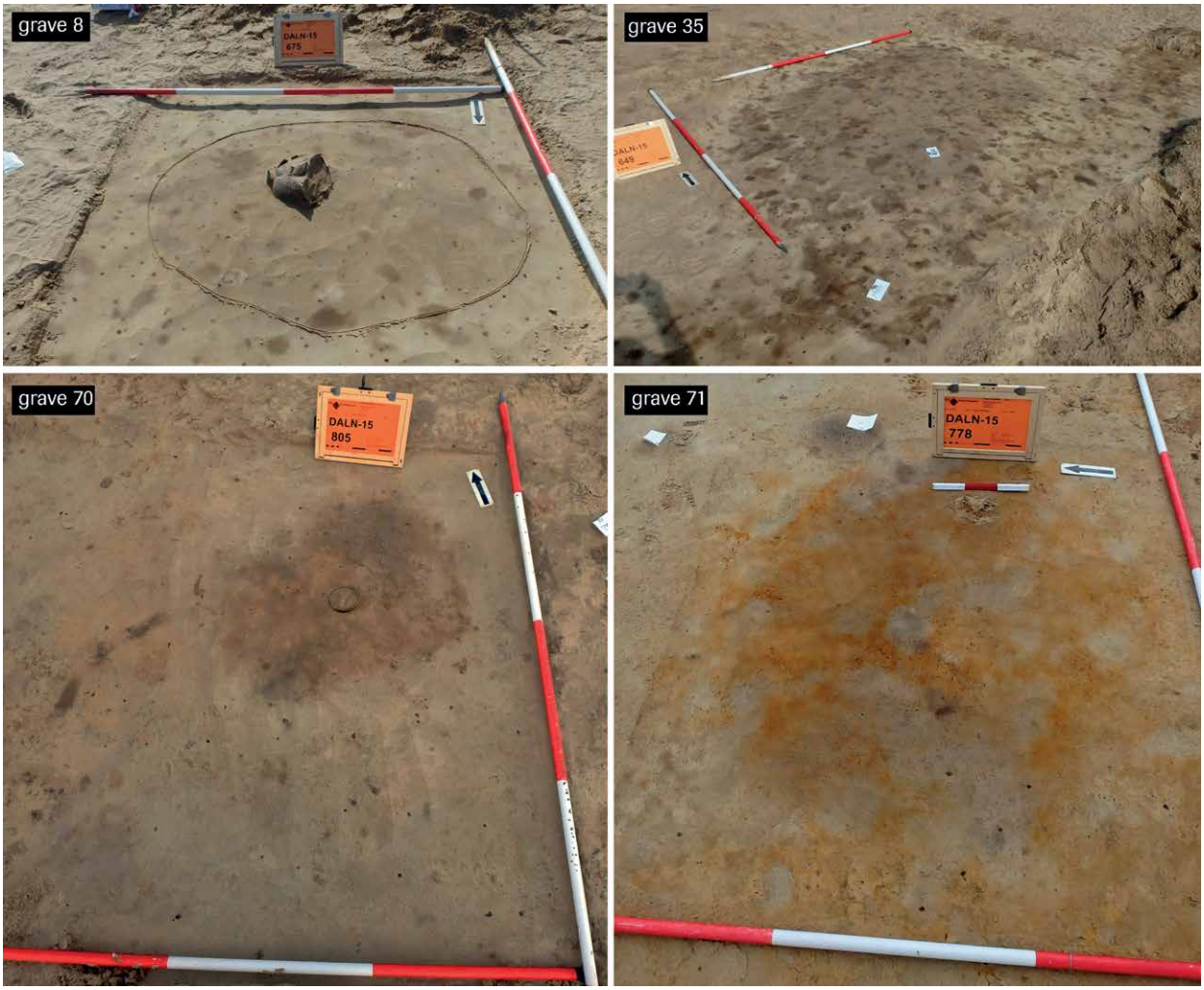
We addressed the first problem by assuming that there is no correlation between the degree of preservation of the depth of the graves and the other aspects of the shape of the grave pits. In other words, we assumed that the preserved shape variation mirrors the variation we might have analysed if all graves had been preserved from the original surface downward. Addressing the second problem was not as simple. There is clear variation in the horizontal outline of the graves, from circular to oval and rectangular. At what depth are we seeing the 'true' outline of the grave? We concluded that bioturbation will have affected the uppermost part of the grave more than the lower part and therefore decided to use the drawings from the lower part of the graves to determine the shape of the outline. In order to determine whether there truly are different types of outlines, rather than a continuum from circular to rectangular, further analysis was needed. To this end, for all graves, the width and a diagonal measurement were taken at the level where the outline is the most clear. The proportion between the two indicates the degree to which a grave is circular. For a circular grave, the proportion is 1, and for a more rectangular grave, the number will be less than 1. Table 3.2 presents an overview. This analysis makes clear that the circular, oval and rectangular burial pits constitute a continuum and that we need to be cautious about using the shape of the burial pit for interpretations of the burial ritual.

The burial pits have different shapes, of which rectangular and oval are the most common (Fig. 3.14). The rectangular pits can be divided into two groups based on their appearance: one group of perfectly rectangular pits and a second group of rectangular pits with rounded corners. It is assumed that some of the latter burial pits would have had straight corners originally, but due to podzolisation or poor preservation this could not always

	Frequency of grave pits	
Shape	**Number**	**Percentage**
Oval	66	49.3
Rectangular	26	19.4
Rectangular with rounded corners	40	29.9
Circular	1	0.7
Indeterminate (disturbed)	1	0.7
Total	134	100

Table 3.3 Dalfsen: Frequency distribution of grave pits by shape.

Figure 3.14 Dalfsen: Field photos of grave pits of different dimensions and shapes: grave 8, 35, 70 and 71.



be determined. Of the 134 flat grave pits, 66 are oval (49.3%), 26 are rectangular (19.4%), 40 are rectangular with rounded corners (29.4%), and 1 is circular (0.7%). The shape of one pit could not be determined because of later disturbance (0.7%). It therefore seems there was no preference for a particular shape of burial pit, and that circular burial pits form a relatively small group. Kossian's inventory lists 37 circular flat graves.[80] On a total of 434 burial pits, this is some 8.5%. The shape of the pit also seems to be an indication for the presence of complex wooden constructions. None of the oval pits showed traces of wooden planks covering the sides of the pit, so the oval pits were probably unlined. Indications for wooden planks covering the sides of the pit were only found in rectangular

80 Kossian 2005.

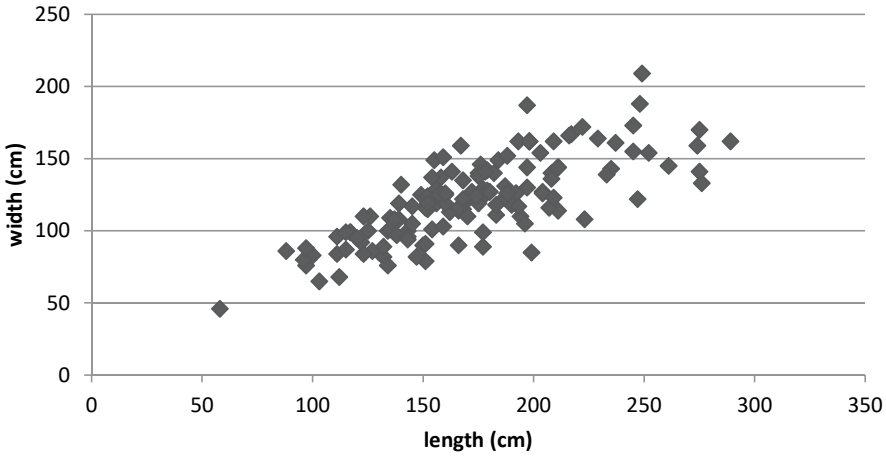


Figure 3.15 Dalfsen: Size distribution of the burial pits.

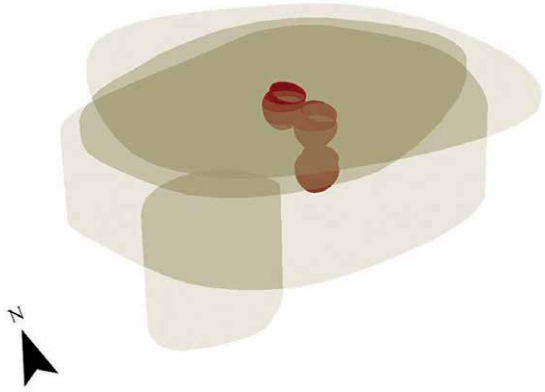


Figure 3.16 Dalfsen: 3D reconstruction of a grave shaft below burial pit 41.

pits. Traces of coffins were found in rectangular pits as well as oval pits.

Next step in the analysis was to determine the surface area of the graves. Here we made use of the digital level 1 data: the outline can tell us the size of the area it surrounds. The size of the grave pits generally varies from 0.58 × 0.46 m (0.27 m²), being the smallest, to 2.89 × 1.62 m (4.68 m²), being the largest (Fig. 3.15).[81] One grave pit is even larger in surface area (5.20 m²), measuring 2.49 × 2.09 m. Most of the grave pits are 1.50–1.90 m in length and 1.10–1.30 m in width. There is a small group of relatively large grave pits, with lengths greater than 2.5 m and widths greater than 1.5 m. There is also a small group of relatively small pits, with lengths of around 1 m and widths of 0.60–0.90 m. The exact length and/or width of four grave pits could not be established due to disturbance. This figure also makes clear that there is no correlation between the shape and the size of the grave pits, with the exception of the one circular grave pit. The 130 flat graves that could be measured have an average surface area of 2.22 m². It is difficult to compare the surface area of the grave pits at Dalfsen with that of the graves in Kossian's overview, because Kossian mentions different types of graves, such as *Brandgräber*, *Grubenhütte* (sunken huts), collective graves, stone cists and *Kulthäuser* (culthouses), which are not found at Dalfsen and are all very large. For instance, a collective grave found at Hameln measures 42 m² in surface area. Also, in his overview there are some very large grave pits that are probably not flat graves, but that are not accompanied by any remarks about the type of grave or about peculiarities. The 237 grave pits with a known surface area from Kossian's overview have an average surface of 2.16 m², and this does not differ much from the average surface area of the grave pits at Dalfsen. The surface area of the grave pits from presumed flat graves mentioned in Kossian's overview ranges from 0.18 m² (0.6 × 0.3 m) to 7.0 m² (3.5 × 2 m).

The preserved depth of the pits varies strongly, from just a few cm up to 66 cm. Some differences in depth relate to (and can be explained by) differences in the height of the natural landscape, which has been levelled by later agricultural activities. Other differences are harder to

81 See the appendix for the dimensions at the surface of each of the graves.

Burial	Dimensions of wooden coffin
9	1.72 × 0.75 m
25*	1.67 × 0.97 m
61*	1.21 × 0.71 m
62*	c. 1.50 × 0.60 m
63	1.01 × 0.47 m
69*	1.31 × 0.77 m
74*	1.56 × 1.09 m
79*	c. 1.05 × 0.78 m
89	0.94 × 0.60 m
92*	c. 1.00 × 0.69 m
98*	1.37 × 0.86 m
99	1.77 × 0.67 m
103	1.36 × 0.92 m

* Burnt or charred wood.

Table 3.4 Dalfsen: Dimensions of the wooden coffins.

Figure 3.17 Dalfsen: Compilation of photos from several graves showing signs of plank construction of the coffins.

Figure 3.18 Dalfsen: Bog iron ore covering grave 96.

explain. They may be due to variation in the decisions made by the relatives in digging the pit. An alternative explanation, which will be argued later on, is that some of the differences in depth can be explained as being the result of the decision to bury the deceased in already existing (small) grave mounds covering the pits, a custom also known from the Late Neolithic period.

Grave shafts were clearly visible below five of the burial pits (graves 18, 41, 77, 99 and 105; Fig. 3.16). The shafts below burials 18, 41 and 99 are almost equal in size, measuring 55 × 33 cm, 40 × 34 cm and 50 × 40 cm at the surface and having a depth of 28, 13 and 22 cm, respectively. The shafts below burials 77 and 105 are relatively large. They measure 86 × 43 cm and 90 × 79 cm and are 12 and 14 cm deep, respectively. Other graves also show possible pits or shafts below the burial pit, but those are less pronounced or less deep and therefore designated indeterminate. In burial pit 35, the eastern part of the pit was dug out twice as deep as the western half. As stated above, due to the recurrent presence of these pits in the 3D model, we presume they were the result of rituals related to the burial. Finds, such as pottery and objects made of flint, are missing from these shafts. Because we only noticed their existence when processing the data into a 3D model, we were not able to take samples from these pits (in search of possible organic residues). The most probable explanation for this phenomenon is the use of these shaft pits for ritual depositions of organic material, such as food, or of disarticulated human bones, including skulls.

The cross-section of the grave pits was reconstructed on the basis of the numerous plan views. We concluded that all pits have a very similar profile, with a horizontal bottom and straight or slightly sloping edges, whether they contained a coffin or wooden structure or not.

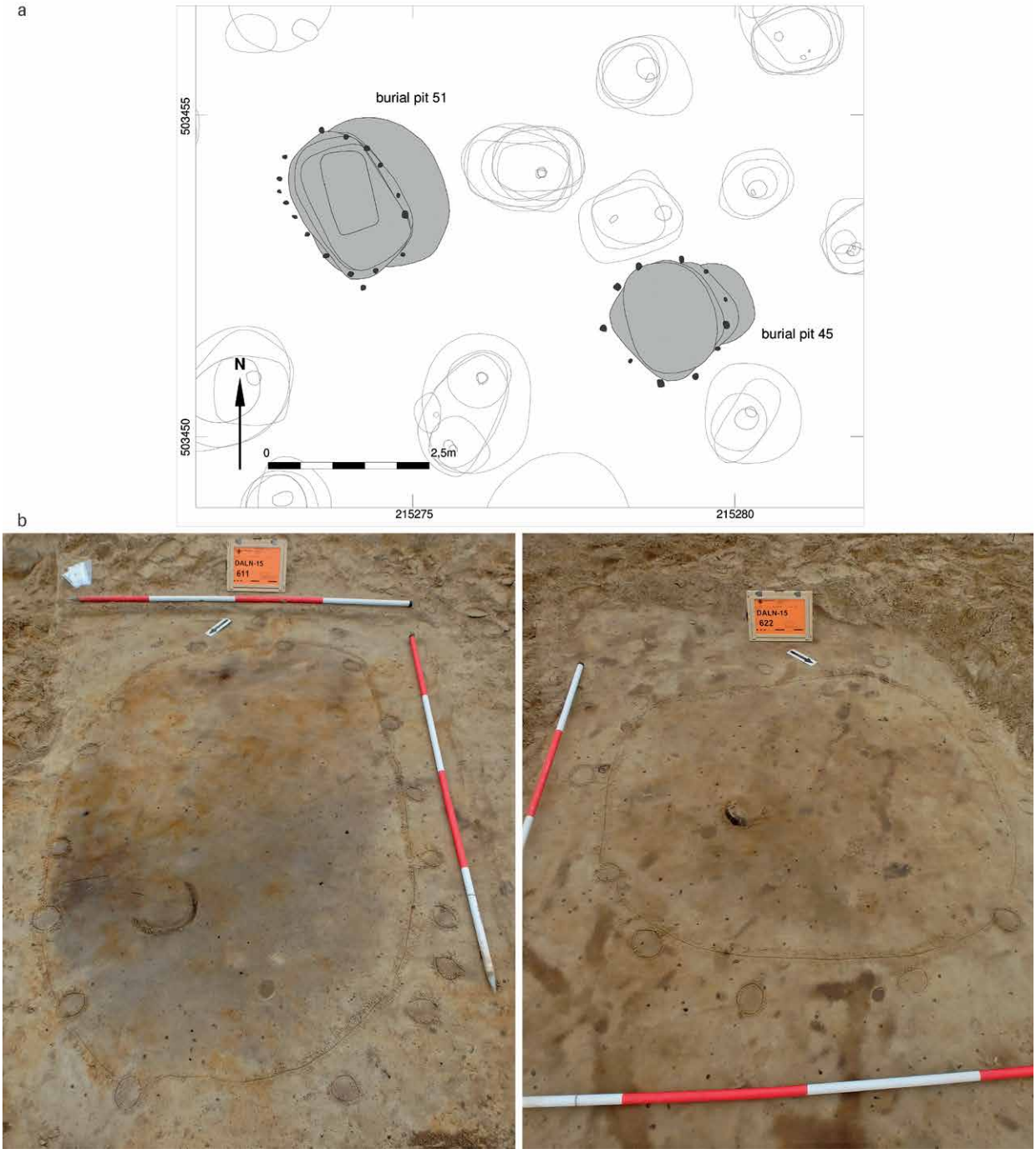


Figure 3.19 Dalfsen: Grave 45 and 51 showing features of postholes from post circles (a: field drawings; b: Field photo's).

3.4.3 Architectural remains of the graves

For most graves, the pit is the only architectural element that remains. There are nonetheless several graves that present evidence of other aspects of several stages in the burial ritual. First, there is evidence for the use of wooden coffins in some graves. There are 13 graves in which (charred) wood was found (Table 3.4). The rectangular outline of these remains is interpreted here as evidence of the use of wooden coffins in the grave ritual (Fig. 3.17). In eight examples, the coffin showed traces of burning, as the entire outline of the rectangular feature was made up of charred wood. In three examples, the long sides of the coffin projected beyond the ends of the short sides, indicating that not every coffin was neatly fabricated. The

wood was often preserved due to burning. Intriguingly enough, the fire that led to charring of the wood did not lead to the cremation of the interred person. There are two alternative interpretations offered here. The first is that the burning of the coffin wood did not provide enough fuel to lead to the cremation of the human body. The second is that the coffin was charred prior to the interment of the body. All coffin graves were found in grave pits with a rectangular outline. It is possible that all grave pits with a rectangular outline held wooden coffins. From this perspective, the preservation in 13 graves can then be seen as the result of the use of fire in the grave ritual (8 instances) and slightly better preservation (5 instances).

One exceptional grave contained evidence of the material used to cover the grave pit. Grave 96 yielded fragments of bog iron ore (Fig. 3.18). The bog iron ore had a slab-like appearance and was about 13 cm thick. The largest piece weighed almost 70 kg. In total, 120 kg was collected from this grave.

There is little evidence for what the graves looked like above ground. At the same time, the limited evidence for cross-cutting graves and the evidence for reopening of graves (see section 3.4.7) indicates that the graves were somehow visible above ground. One is tempted to think of the grave being marked by a small mound, a stone, a branch, or other perishable material. Two graves were marked by a post circle. Grave 45 had a post circle consisting of 11 posts (only recognised at level 3). The posts stood 40-60 cm apart and had a diameter of 6-11 cm. The post circle around grave 51 was also recognised at level 3. It comprised 16 postholes, of 6-11 cm diameter, placed 20-50 cm apart. These two graves should be considered chance finds, barely preserved: the remaining depth of the postholes was just a few centimetres. In other words, one possibility is that (many) other graves were marked with post circles.

	Frequency of grave pits	
Orientation (degrees)	Number	Percentage
0-10	6	4.6
11-20	5	3.8
21-30	2	1.5
31-40	3	2.3
41-50	3	2.3
51-60	7	5.3
61-70	10	7.6
71-80	11	8.4
81-90	26	19.8
91-100	9	6.9
101-110	5	3.8
111-120	4	3.1
121-130	4	3.1
131-140	5	3.8
141-150	4	3.1
151-160	4	3.1
161-170	11	8.4
171-180	12	9.2
Total	131	100

Table 3.5 Dalfsen: Frequency distribution of grave pits by orientation.

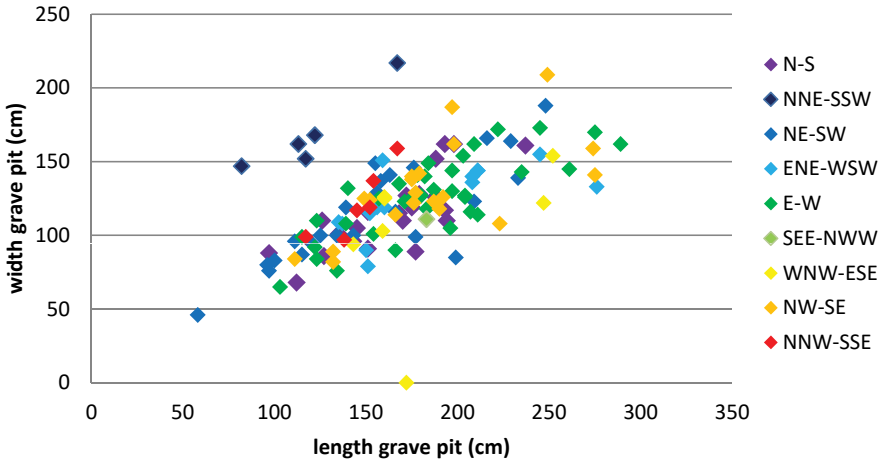


Figure 3.20 Dalfsen: Relationship between the length and width of the grave pits and their orientation.

3.4.4 The orientation of the grave pits

Many societies have cultural rules governing the orientation of graves. While the reason behind a preferred orientation may elude archaeologists, we can at least establish what the orientation was. To this end, the longest axis of each grave was measured in degrees and subsequently grouped in classes of 10 degrees. For most graves, the near absence of human remains makes it impossible to determine at what end of the grave the head was to be found. For this

Figure 3.21 Field photo of human body silhouette in burial pit 13.

reason, Table 3.5 does not distinguish between north-south and south-north graves, *etc*. In the section on the human remains (section 3.4.5), we will see whether the relatively small subset of graves with human remains can assist us further in understanding the orientation of the graves. It appears that there was no strong preference in the orientation for the Dalfsen graves; however, a more or less east-west orientation is the most frequent. That is the same orientation as the sand ridge and the burial ground as a whole.[82] Figure 3.20 makes clear that the orientation of the graves is not corelated with the dimensions of the grave pit.

The Dalfsen results were compared with those from the large body of TRB graves compiled by Kossian[83] and the somewhat older graves from Ypenburg[84] to determine whether the most common orientation of the graves is a cultural or temporal denominator or, instead, echoes the orientation of the landscape. Kossian mentions the orientation of 299 graves. Most have a northeast-southwest orientation (38.8%). Others have a northwest-southeast (29.8%), east-west (19.4%) or north-south orientation (12%). We therefore conclude that there is no broadly shared notion on the preferred orientation within the TRB West Group. The first notion, that it is a cultural or temporal denominator, is therefore rejected.

The second notion seems more likely: The local landscape setting is probably of importance in the orientation of the graves. At Flensburg, most graves (13 out of 23, of 56.5%) are oriented northeast-southwest. At Ostorf, the east-west orientation seems to dominate (16 out of 28 pits with known orientation, or 57.1%). For Ypenburg, there is no apparent orientation preference.[85] We therefore conclude that preferred orientation is a local aspect of the grave ritual, in which local topography may have played an important role. The Dalfsen sand ridge provided the spatial structure in which the graves were embedded.[86]

3.4.5 Human remains

Poor preservation of human remains, due to the acidic, sandy soils in which burial took place, is a characteristic that Dalfsen shares with all other TRB sites in the Netherlands. But Dalfsen is the first site in the Netherlands to yield human skeletal material from the TRB period, albeit a very

82 For two graves, the orientation of the body could not be determined. Grave 108 was poorly preserved, and grave 133 had a circular outline without traces of a coffin or body silhouette to indicate the orientation.

83 Kossian 2005.

84 Baetsen 2008.

85 Baetsen 2008.

86 A similar conclusion was drawn for the graves of the Swifterbant culture; see Raemaekers *et al.* 2009.

Figure 3.22 Field photo of two human body silhouettes in burial pit 110.

small amount. Grave 110 yielded very poorly preserved parts of the lower jaw, with the teeth still embedded, which when attempts were made to lift it, almost immediately fell apart or turned to dust. The physical anthropologist concluded that there was not enough preserved material for aDNA analysis and that any other specialised research on the bone fragments, including radiocarbon dating, would not yield usable results.[87]

Although human remains are almost totally absent at Dalfsen, there are several graves in which a silhouette of the deceased is visible as a feature in the sand, a so-called body silhouette (Figs 3.21 – 3.23). There are three ways in which body silhouettes were recognised at Dalfsen. The first group are clear body silhouettes recognised and documented in the field (n = 7). The second group are clear body silhouettes recognised during post-excavation analysis of the photographs (n = 6). The third group are less clear or partial body silhouettes recognised in the field as the location of the deceased in the grave pit but that even after post-excavation analysis of the photographs remained uncertain (n = 3). In total, 13 clear full body silhouettes were recognised. If the 3 uncertain ones are included, the total becomes 16 body silhouettes or parts thereof. All clear and vague silhouettes indicate that the deceased was buried

Figure 3.23 Field photo of human body silhouette in burial pit 61.

87 Pers. comm. E. Altena (Leiden University Medical Centre).

in a lateral position on their left side, with knees bent (*i.e.* in flexed [German: *hocker*] position). Only one uncertain body silhouette may represent a person laid on their right side. The width of the silhouette in grave 82 suggests that the body in that grave was wrapped in a shroud or something similar. The orientation of the body silhouettes differs widely and follows the orientation of the grave pits. Whereas the orientation of the grave pits favours an east-west position (Table 3.5), the body silhouettes can provide some more detail. The body silhouettes that are oriented northwest-southeast and west-east comprise 50% of the total, indicating that burial with the head position in the northwest or west was relatively popular, but not prescriptive. The body silhouettes are not detailed enough to say anything about the sex of the deceased, but it is possible to estimate the body length, which may be used to distinguish between adults and children. Most body silhouettes measured between 1.30 and 1.60 m in length, indicating the burial of adults and somewhat older children.

The graves with body silhouettes allow us to study the pit size in relation to the number of burials. In grave 61, a fairly small body silhouette was recognised, with a length of about 101 cm (Table 3.6). This small body silhouette was found in the burnt remains of a wooden coffin that measured about 0.86 m^2 at the surface (Fig. 3.23). This coffin was buried in a pit that measured 2.59 m^2 at the surface. Other grave pits with a single body silhouette have a surface area of between 1.81 m^2 and 4.68 m^2. The one with the largest surface area stands out because the other pits are no larger than 2.57 m^2. The surface area measurements show that most pits are a lot larger than would have been necessary for burying a single person, even more so because the person was buried in a flexed position. In grave 9, the body silhouette in the western part of the grave was ascertained in the field (group 1), whereas the one in the eastern part was recognised sometime later, from the field photos (group 2). This grave measures 3.21 m^2. Within this pit, a rectangular coffin was found. This coffin measures 1.29 m^2 in surface area and contains at least one and possibly two body silhouettes. Grave pit 22 (2.42 m^2) contains one clear body silhouette, but also other features of which it is uncertain whether they are part of a body silhouette or of something else that was buried here. For this grave, it remains uncertain whether there were more people buried in this pit. The presence of at least two body silhouettes is attested in two further graves (Fig. 3.22). Grave 107 measures 2.16 m^2 and grave 110 measures 3.36 m^2. What is interesting is that grave 107, with its two body silhouettes, has a smaller surface area than most of the grave pits with only one recognised body silhouette. This means that the size of the grave does not necessarily correlate with the number of people interred within it. In all, only 13 graves have body silhouettes (9.7%). This makes it very hard to estimate the number of people buried in the burial ground (Chapter 8).

Grave	Orientation	Position	Length	Timing of recognition
6	S-N	flexed on left side	unknown	post-excavation
9	NW-SE	flexed on left side	1.30 m	post-excavation
9	SE-NW	flexed on right side?	unknown	uncertain
13	NE-SW	flexed on left side	1.63 m	in the field
20	SE-NW	flexed on left side	1.66 m	in the field
22	NW-SE	flexed on left side	1.62 m	post-excavation
23	NW-SE	flexed on left side	1.60 m	in the field
61	E-W	flexed on left side	1.01 m	in the field
69	NE-SW	flexed on left side	1.30 m	in the field
82	NW-SE	flexed on left side	1.63 m	in the field
96	W-E	flexed on left side	unknown	uncertain
98	N-S	flexed on left side	unknown	uncertain
107	W-E	flexed on left side	unknown	post-excavation
107	W-E	flexed on left side	unknown	post-excavation
110	W-E	flexed on left side	1.57 m	in the field
110	W-E	flexed on left side	unknown	post-excavation

Table 3.6 Dalfsen: Orientation, position, length and timing of recognition of the body silhouettes.

3.4.6 Grave typology

Now that the basic characteristics of the Dalfsen graves have been described, we can move on to comparing these graves with graves from other sites. To this end, we again make use of the overview of TRB non-megalithic graves presented by Kossian.[88] Fortunately, he provided not only an overview of graves from a major part of the TRB world, but also a classification that allows us to study both the similarities and the dissimilarities.

Kossian's classification comprises many types, and the presence of stone and wood are defining characteristics of many of them. It is important to note that Dalfsen lies in a part of the Vecht valley that does not border areas with boulder clays and that therefore stones are absent in the landscape and in the grave record. Above, we concluded that the 11 grave pits containing evidence of a wooden coffin are a minimum number: the wood was preserved due to its charred nature, and many of the other (especially rectangular) grave pits may have contained a coffin as well. These two observations underline that in the case of Dalfsen the Kossian classification presented below is only useful in a descriptive way. We therefore do not attempt an interpretation of the grave types in terms of energy

88 Kossian 2005.

Figure 3.24 Dalfsen: Field photo of grave 87 with grave goods.

expenditure and underlying social stratification (or lack thereof; see also Chapter 8).

The Dalfsen burial ground comprises several grave types. The most numerous type consists of graves with circular to oval grave pits without any evidence of an internal structure (n = 66). The second-most numerous type consists of graves with a rectangular outline without any evidence of an internal structure. The third and least numerous type contains graves with a similar rectangular outline as group 2 graves but yielding the remains of wooden coffins. In Kossian's typology, our groups 1 and 2 are part of the same group of simple inhumation graves, known in German as *Erdgräber* (earthen graves) and in Dutch as *vlakgraven* (flat graves). Graves with a wooden coffin are also part of Kossian's *Erdgräber* group. Had they had more complex wooden constructions, these graves would have been labelled chamber graves. We conclude that our group 3 is also part of Kossian's *Erdgräber*. Simple graves with a cap stone are another subtype of Kossian's *Erdgräber*. We group our grave with the bog iron ore slab into this type as well. Kossian also presents a type of collective grave (*Kollektivgräber*): non-megalithic graves holding the remains of multiple individuals. Typical for the collective graves is their size (much larger than any Dalfsen grave pit) and the number of graves. For the collective gravesit is common to see earlier graves disturbed by later activities. The Dalfsen graves, with evidence for two articulated and intact examples, do not match the characteristics of *Kollektivgräber*, and we therefore prefer to consider them double graves of the *Erdgräber* type.

3.4.7 Grave goods

Now that the graves and the evidence for human remains have been described, it is time to turn to the grave goods. The detailed description of the different find categories can be found in Chapters 4-6. Here the focus lies on the relative frequency of the different grave goods, their position in the grave and the evidence they provide for the reopening of grave pits.

The grave goods from Dalfsen are rather varied, with complete ceramic vessels forming the biggest group. The 135 graves yielded a total of 124 pots. Although the ceramics from this period and culture are called funnel beakers, at Dalfsen only one true funnel beaker has been found. Most pots are amphoras, tureen-amphoras, bowls, cups, vessels and collared flasks (Table 3.9).[89] Other find categories are far less numerous. There are 2 polished stone axes, from

89 Brindley 1986a.

	Frequency of grave pits	
Number of grave goods	Number	Percentage
0	45	33.6
1	51	38.1
2	23	17.2
3	7	5.2
4	3	2.2
5	0	0.0
6	2	1.5
9	2	1.5
11	1	0.7
Total	134	100

Table 3.7 Dalfsen: Frequency distribution of grave pits by number of grave goods.

Figure 3.25 Dalfsen: Grave 25 was the richest grave of the site containing 5 beakers and a stone axe.

Figure 3.26 Dalfsen: Piece of marcasite with two blades and a strike-a-light from grave 13.

two different graves. Two other graves yielded amber. The poorly preserved grave pit 91 contained 2 amber beads. Grave 99 contained one large concentration of at least 59 amber beads and small remnants of even more beads, as well as a second small concentration of 7 amber beads (see Chapter 6). These were part of a necklace and possibly a small bracelet or anklet and as such are counted as one grave find each. Flint artefacts were found in the grave pits as well; here it is more difficult to decide whether they concern grave goods. First, the burial ground is located where there had also been a Mesolithic site. While typical Mesolithic flint artefacts from the infill of a grave pit can be explained away as backfill, many flint artefacts cannot be dated based on typological characteristics and we thus cannot tell whether or not they were part of the TRB repertoire. Here we include only those flint artefacts from the graves with typological connection to the TRB period. Some flint tools can confidently be dated in the TRB period and considered to be grave goods, such as the multiple strike-a-lights (two of which were found together with a piece of pyrite or marcasite) and the transverse arrowheads. For the latter, it should be kept in mind that these could also have been the cause of death, although no clear example of a transverse arrowhead in combination with a body silhouette has been found. That flakes were deposited as grave goods is proven by grave 13. Here, three flakes were found next to a strike-a-light with a piece of marcasite. Two of these flakes had corroded to the marcasite. Because they are physically attached to each other, we can be certain that the flakes were deposited at the same time as the strike-a-light and the marcasite. Moreover, all three flakes were suitable for making transverse arrowheads. On the basis of this observation, we decided that flakes from other graves with similar characteristics can be interpreted as grave goods as well. In total, 46 flint tools are interpreted as grave goods. In total, 129 other finds are also considered to be grave goods (with the amber bead necklace and bracelet or anklet each counted as one). In total, 175 finds are considered to be grave goods.

The high proportion of graves with grave goods (66.4%) sets the Dalfsen burial ground apart from other sites, such as Heek-Averbeck, where 57% of the graves yielded grave goods. The percentage may have been even higher, because a quarter of the 'empty' grave pits also yielded flint, but in those cases the interpretation as grave goods is uncertain.

The graves with the highest number of grave goods stand out, not only in terms of quantity, but also in terms of the nature of the finds. Grave 25 held a wooden coffin and contained five pots and one polished stone axe (Fig. 3.25). One large, decorated tureen-amphora with applied dimples had been placed in the southwest corner of the coffin. In the easternmost part of the coffin, a small, undecorated,

Figure 3.27 Dalfsen: a transverse arrowhead, a blade, six flakes and a flake fragment from grave 104.

shouldered bowl or cup with grip handle; an undecorated amphora; two undecorated, collared flasks; and one knob-butted hammer axe had been placed. Grave 13 was located within the earthen monument (see below) and contained an undecorated, slightly closed bowl; a strike-a-light with a piece of marcasite; and three flakes, two of which are corroded to the marcasite (Fig. 3.26). As noted above, all three flakes were suitable for making a transverse arrowhead. Due to the presence of a body silhouette, we were able to ascertain that grave 13 held the remains of a single burial. Grave 92 is a chamber grave. It contained a decorated bowl; a very small, undecorated anomalous bowl; a strike-a-light; one flake scraper; and five flakes that were suitable for making a transverse arrowhead. Grave 104 contained only flint grave goods: a transverse arrowhead; a blade; six flakes, of which five were suitable for making a transverse arrowhead; and a flake fragment (Fig. 3.27). Grave 1 contained two undecorated bowls with lugs; an extraordinarily large strike-a-light with a piece of marcasite;

Number of grave goods	Average surface area of grave pits
0	2.04 m²
1	2.17 m²
2	2.26 m²
3	2.77 m²
4	3.27 m²
6	3.23 m²
9	2.48 m²
11	2.42 m²

Table 3.8 Dalfsen: Number of grave goods per grave pit and average surface area of grave pits.

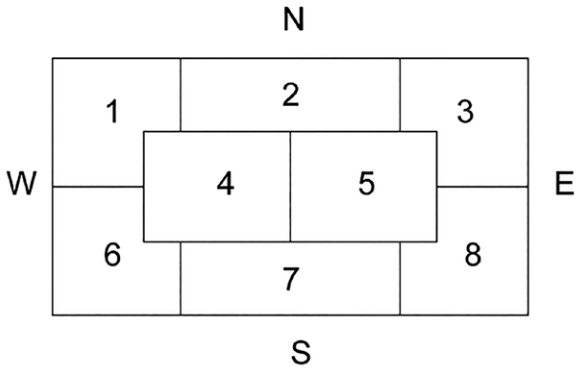


Figure 3.28 Schematic showing the zoning of a grave pit for recording the position of the different grave goods (Bourgeois and Kroon 2017: Fig. 2).

Zone	1	2	3	4	5	6	7	8
Amphora		1	1	7	4	2	1	6
Tureen-amphora	4	1	1	9	7	2		4
Bowl	3	1	6	13	10	1	1	14
Vessel		1	1	3	2	1	1	
Flask			2					
Funnel beaker	1				1			
Beaker				2				
Cup			1					1
Jar					1			1
Scoop					1			
Total	8	4	12	34	26	6	3	26
Percentage	6.7	3.4	10.1	28.6	21.8	5.0	2.5	21.8

Table 3.9 Dalfsen: Frequency of pots by type (Brindley 1986a) within zones of the grave pit.

Zone	1	2	3	4	5	6	7	8
Strike-a-light		1	1		2			1
Transverse arrowhead*	1	1		1		4		1
Blade				1				
Flake		3	5	10	3	1		
Flake scraper				1			1	
Flake fragment				1				
Total	1	5	6	14	5	5	1	2
Percentage	2.6	12.8	15.4	35.9	12.8	12.8	2.6	5.1

Table 3.10 Dalfsen: Frequency of flint artefacts by type within zones of the grave pit. * Two transverse arrowheads were found during sieving, and their exact original location within the burial pit is unknown.

Zone	1	2	3	4	5	6	7	8
Knob-butted hammer axe			1					
Stone battle axe								1
Total			1					1

Table 3.11 Dalfsen: Frequency of stone battle axes by type within zones of the grave pit.

Zone	1	2	3	4	5	6	7	8
Isolated amber bead					1			
Amber bead necklace	1							
Amber bead bracelet/anklet							1	
Total	1				1		1	

Table 3.12 Dalfsen: Frequency of amber beads by type of jewellery within zones of the grave pit.

two transverse arrowheads; and six flakes, of which five were suitable for making a transverse arrowhead. The larger number of grave goods in these graves corresponds with a wider variety of grave goods.

Pottery was the most popular grave good. It was found in 84 grave pits (62%). Most of these graves contained one or two pots. The highest number of pots found in one grave is five (grave 25). In grave 41, a small, decorated amphora was placed inside a larger, undecorated bowl. In graves 92 and 99, a pot was clearly placed outside the coffin, indicating that the grave ritual sometimes included aspects in which the spatial patterning of artefacts played a clear role (see below).

If we look at the number of grave goods in relation to the surface area of the grave pits (Table 3.8), we can see that, in general, the size of the pits increases with the number of grave goods, except for the three pits with the highest quantity of artefacts (graves 92 and 104, with 9 grave goods each, and grave 1, with 11 grave goods). The graves without grave goods are, on average, the smallest pits, and the ones with one or two grave goods are smaller in surface area than the ones with more than two grave goods. The graves with four to six grave goods are relatively large, but there are six graves with an even larger surface area. The largest grave pits contain one grave good (grave 51, with 5.2 m^2; grave 54, with 4.66 m^2; grave 96, with 4.68 m^2), two grave goods (grave 30, with 4.24 m^2), four grave goods (grave 99, with 4.36 m^2) or no grave goods at all (grave 77, with 4.68 m^2, and grave 88, with 3.88 m^2). It is possible that there would have been a correlation between the size of the grave and the richness of it. It could be that, if we had been able to add the organic grave goods to the grave good inventory, the observed mismatch between size and richness would have disappeared.

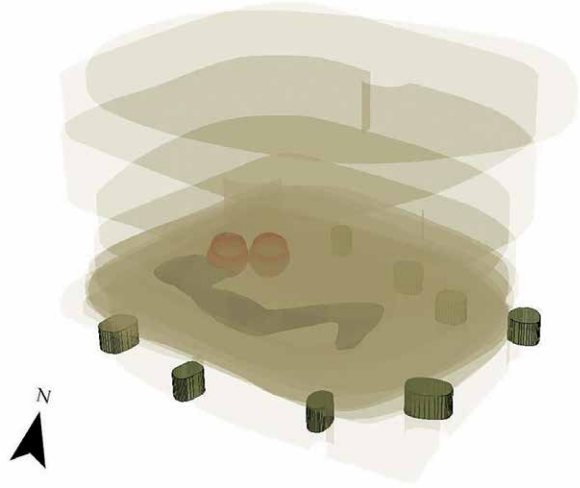


Figure 3.29 Dalfsen: 3D reconstruction of grave 23.

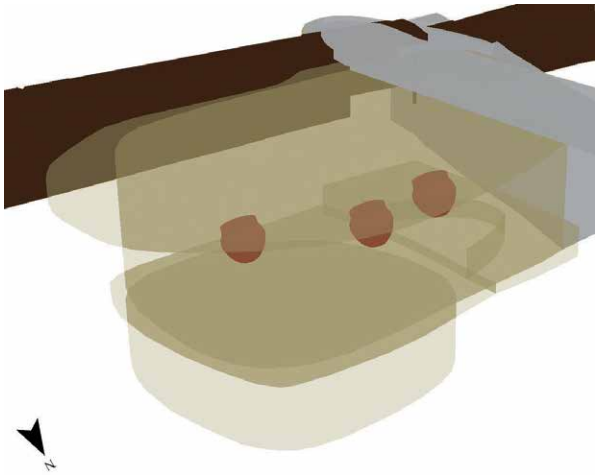


Figure 3.30 Dalfsen: 3D reconstruction of grave 35.

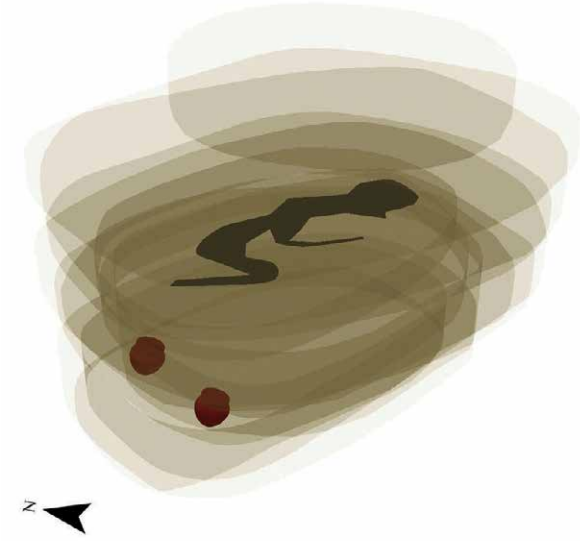


Figure 3.31 Dalfsen: 3D reconstruction of grave 20.

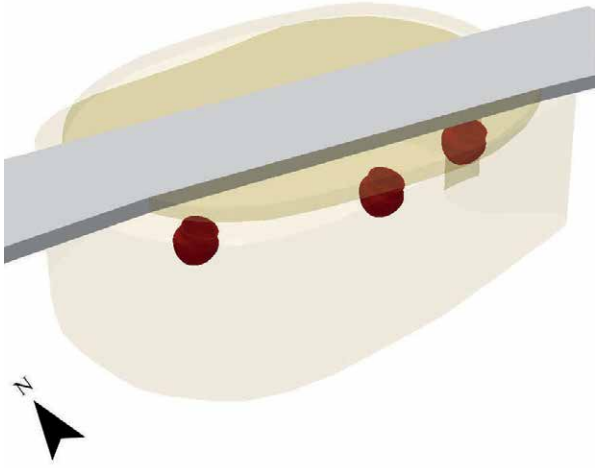


Figure 3.32 Dalfsen: 3D reconstruction of grave 29.

Due to the documentation strategy used on-site, we know the position of all the preserved grave goods within the grave pits. This allows us to study these patterns using the methodology developed for graves from the Corded Ware culture (Fig. 3.28; Tables 3.9 – 3.12).[90] Due to the near absence of body silhouettes, a generalisation of the approach was needed that acknowledges the uncertainty of the position of the head. We therefore conclude that zones 1, 3, 6 and 8 represent the corners of the grave pit; zones 2 and 7 border the long axis and zones 4 and 5 constitute the centre. Half of the ceramics were found in the centre of the grave pits (zones 4 and 5). Zones 2 and 7, along the long sides of the pits, contain the least finds (6% combined). The corner zones contain c. 44% of the ceramics, and there are remarkably more in the east corners (zones 3 and 8; 29% combined) than in the west corners (zones 1 and 6; 15% combined). If we look at specific find categories, the numbers involved decrease. We conclude that we cannot distinguish specific zones where only one type of grave good was deposited. Nevertheless, for pottery, there seems to be a preference for the central part of the grave pit or the southeast corner. The two stone axes were both found in the eastern part of the grave.

As a rule, the above analysis was carried out using the grave pit as the spatial context, but in the graves

90 Bourgeois and Kroon 2017.

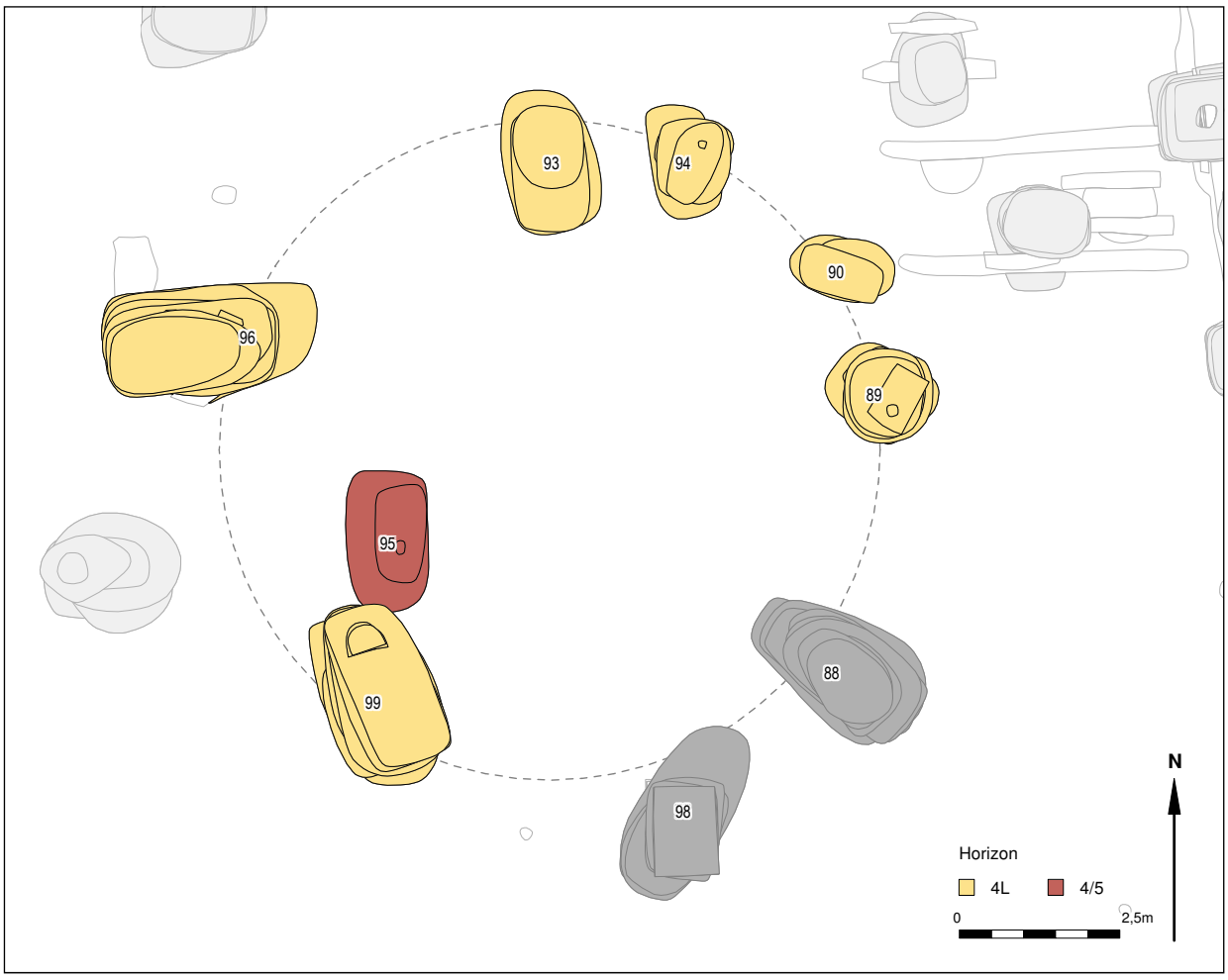


Figure 3.33 Dalfsen: Circular structure dating to Brindley horizon 4 indicating the location of a probable barrow mound.

with wooden coffins, the analysis pertains to this more restricted space. This allows us to employ a ninth zone: outside the coffin but inside the grave pit. This is not just a theoretical option for the deposition of grave goods: graves 92 and 99 each yielded a pot that was placed outside the coffin, in a separate, small pit.

The 3D recording allows to study the spatial setting of the grave goods, not only in the horizontal plane, but also in the vertical plane, showing us the depth of the grave goods within the fill of the pits. As a rule, the grave goods were found in the lowermost part of the pits, suggesting that they relate to the primary burial activity (Fig. 3.29). In seven graves, grave goods were found in a higher position, suggesting that the grave pits were reopened, either for a secondary burial or for ritual activities that pertained to the primary burial. Grave 35 is of special interest because its many finds give us detailed insight into the complexity of the burial ritual (Fig. 3.30). This grave pit is one of the largest known from Dalfsen and is situated inside the ditched structure discussed in section 3.6. During excavation of this feature, pottery sherds were found belonging to three almost complete pots. The presence of additional sherds that could not be cross-mended and the number of broken and complete grave goods suggests that the grave pit was reopened several times, either to inter another body or to remove body parts. The reopening of the grave and additional deposition of grave goods (and a body?) can also be attested by the relatively high position of the ceramic vessels within the pit. Reopening of the grave can also be proposed for graves 6 and 20. Here a body silhouette was found on a higher level than the one and two vessels in the grave (Fig. 3.31). Grave 29 contains pottery from horizons 6 and 7 (Fig. 3.32). These vessels were found on a much lower level than the horizon 6 pottery in grave 19, which is close to this grave. In graves 35, 41, 52, 67, 72, 103 and 111, the pottery was found relatively high up within the pit. In graves 29, 53, 90, 95, 96 and 108 the pottery was found relatively high compared to adjacent graves. Fig. 3.29.

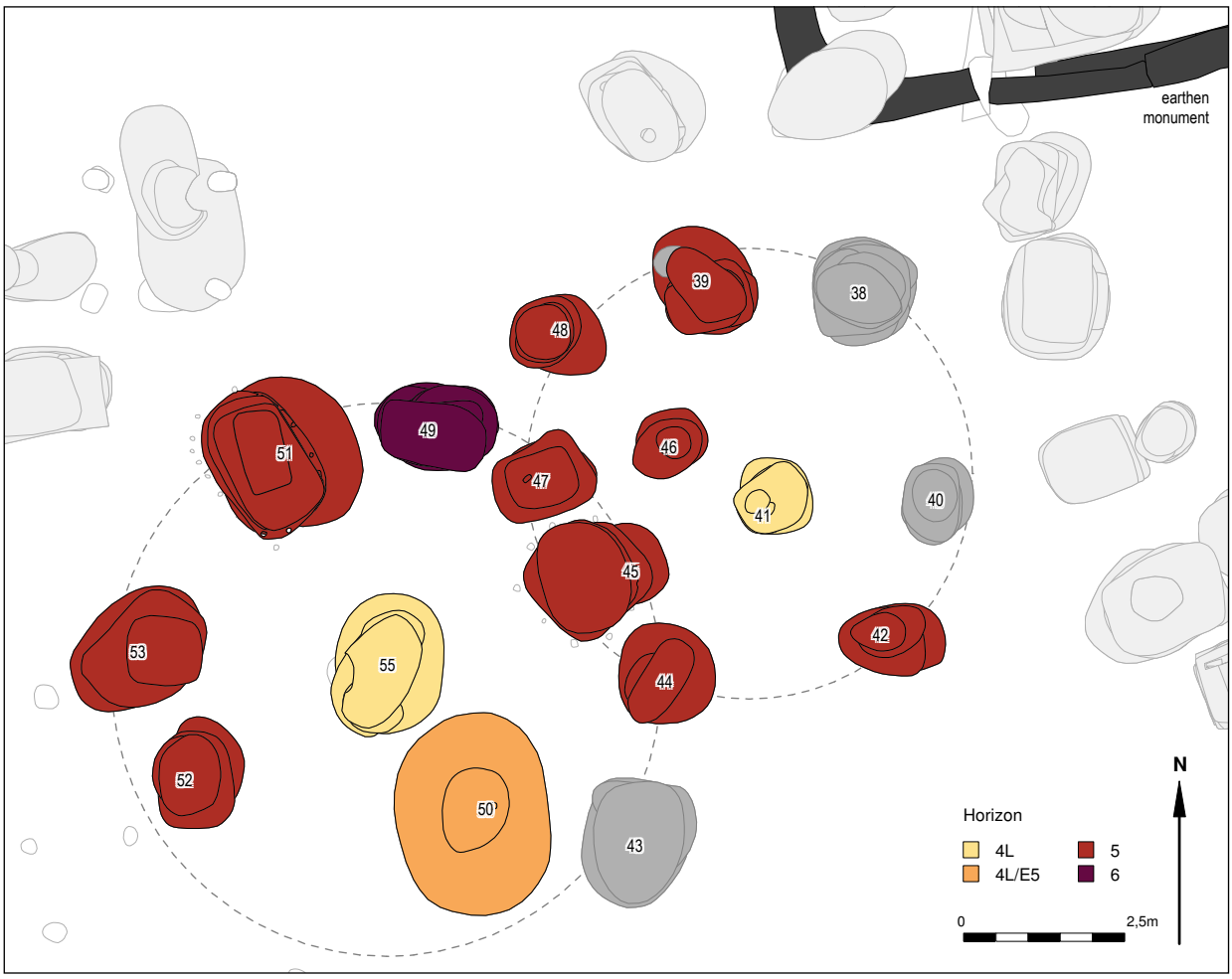


Figure 3.34 Dalfsen: Circular structures dating to Brindley horizon 4 or 5.

3.4.8 Spatial relations between the grave pits

On the basis of the plan of the burial ground, we can make some assumptions concerning the layout of, and spatial relations between, burial groups.

The first thing that catches one's attention is that none of the grave pits that are situated close to each other cut each other (Fig. 3.10). This suggests that the location of each grave was visible or recognisable by some sort of marker or (small) mound. Some of the constructions mentioned above (section 3.4.3) are probably related to the construction of mounds.

Several of the grave pits may have been covered by individual mounds, but there are also indications that larger mounds were created. These may have been the first appearance of a (incipient) tradition of raising primary mounds when recently deceased were buried there, a tradition well known from the Late Neolithic and the Early Bronze Age.[91]

The oldest graves from horizon 4 seem to lie in a circular configuration (Fig. 3.33). The oldest graves 93, 96 and 99 lie in a circle with graves 98, 88, 89, 90 and 94. Not only that, but each individual grave pit is also centred in this way, with the pits in the north and south lying north-south and the ones in the east and west lying east-west. Measured from the centre of the pits, they comprise a circular area of about 10.6 m in diameter. Based on their location, the configuration in a circle, and their orientation, burial pits 88 and 98 can possibly be dated to horizon 4 as well.

To the east, another two circular configurations of burial pits can be recognised southwest of the earthwork/monument (Fig. 3.34). The two circular configurations lie next to each other, and both

91 Cf. Bourgeois 2013.

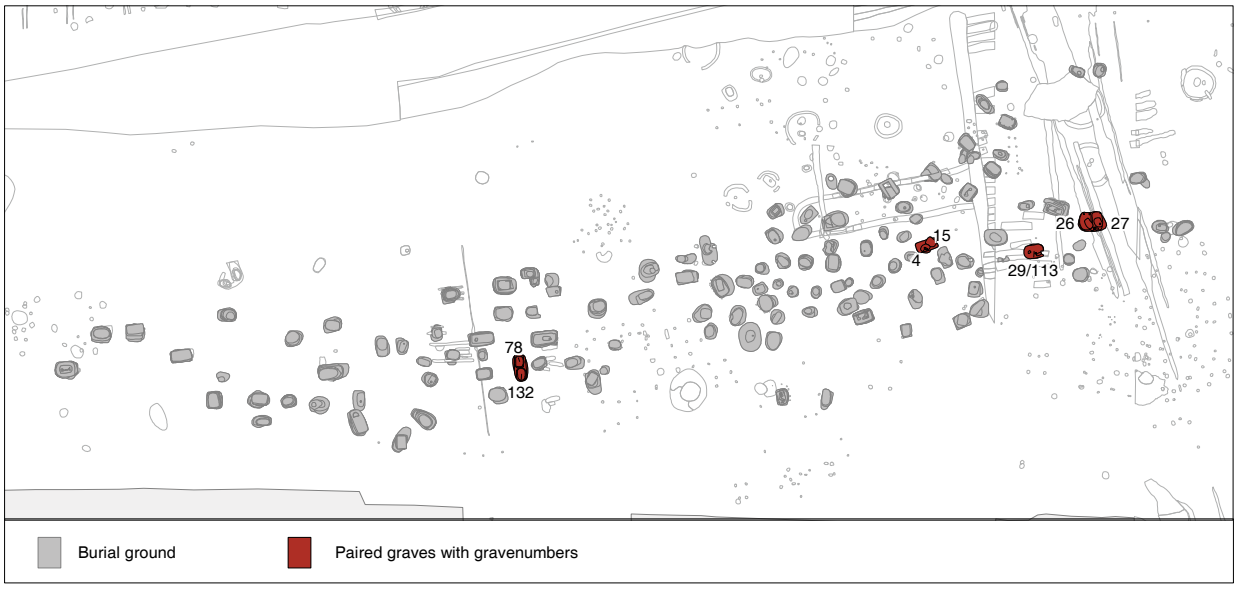


Figure 3.35 Dalfsen: Overview of paired graves (4 and 15, 26 and 27, 29 and 113 and 78 and 132).

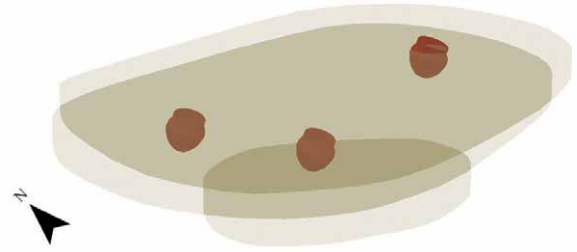


Figure 3.36 Dalfsen: 3D reconstruction of the superimposed graves 30 and 31.

	Grave number	Depth (cm)	Grave number	Depth (cm)	Horizon
Set 1	11	11	6	40	5
Set 2	12	8	69	37	5
Set 3	16	8	17	39	5
Set 4	21	15	20, 22, 23	61, 59, 66	5-6
Set 5	28	max. 5	25, 26, 27	44, 53, 28	5-6
Set 6	45	6	47, 49	25, 32	5-6
Set 9	46	13	39, 47	31, 25	5
Set 10	52	7	51	33	5
Set 11	73	23	72, 74, 122	37, 49, 55	4L-5
Set 12	93, 94	13, 21	98	40	4L

Table 3.13 Depths and horizon of adjacent burial pits with preserved depth.

measure 6-7 m in diameter (measured from the centre of the pits). In the middle of both circles, there seems to be a central burial pit. Both central pits (41 and 55) date to horizon 4 and are surrounded by horizon 5 burial pits. In addition to their central position and older date, these graves also stand out due to their large number of vessels. The horizon 4 burial pits each contain three vessels, while the surrounding graves from horizon 5 all contain one vessel, except for grave 42, with two vessels. Not only the number of vessels in grave 41, but also the way they were placed inside this grave is peculiar. A smaller pot, a small, decorated amphora, was placed inside an undecorated bowl. This is the only grave of the burial ground in which one ceramic vessel was placed inside another.

The aspect of later burials dug into older mounds is not easy to grasp when precise and absolute dating of individual grave pits is lacking. By studying the relative depths of the individual pits, we concluded that some of them were dug into the ground from a higher level, probably through an already existing mound. There are numerous examples where sets of adjacent grave pits consist of one grave pit preserved to a great depth and one preserved with a shallow depth (Table 3.13). For example, grave 11 lies adjacent to grave 6 and both date to horizon 5, but grave 11 has a depth of 11 cm and the adjacent grave 6 a depth of 40 cm.

Graves are considered paired graves for various reasons: (1) they are located in proximity and have a similar orientation; (2) they are similar in shape, size and fill; or (3) they come from large features that at a lower level separated into two distinct grave pits, with different

Figure 3.37 Dalfsen: The earthen monument.

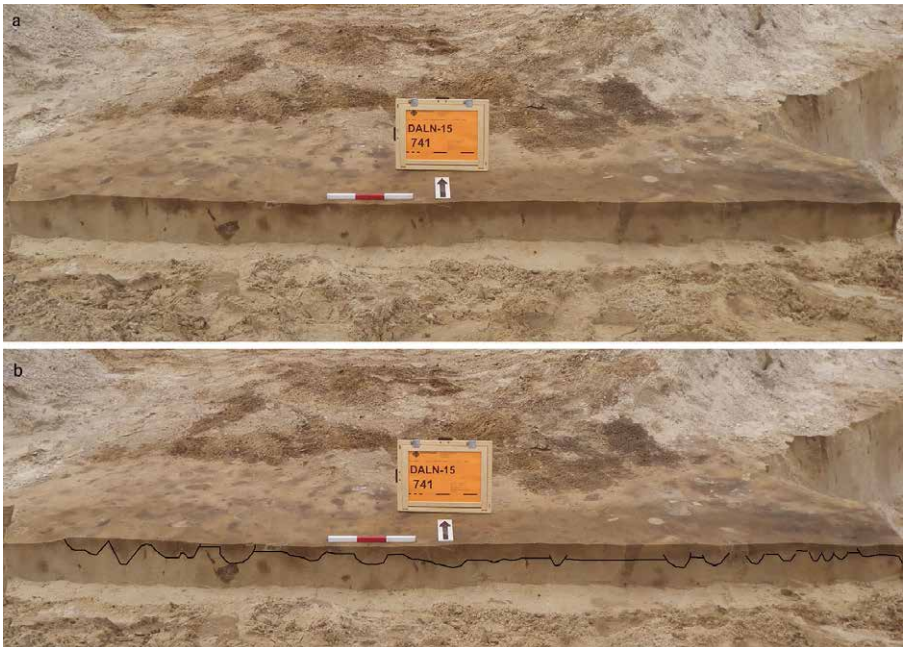


Figure 3.38 Dalfsen: cross section of a part of the ditch from the earthen monument (a). Probably features of a palisade are present (b).

fills. Graves are considered double graves when they show two clear silhouettes of the deceased lying next to each other in the same grave pit (graves 107 and 110). Figure 3.35 presents the paired graves identified.

Notwithstanding the general avoidance of existing burial locations when new burial pits were being dug, there are some examples where locations were re-used. There is one clear example of two grave pits that were dug in the exact same location, one grave lying on top of the other (graves 30 and 31; Fig. 3.36). The orientation of these two graves varies slightly, as does the fill of the pit. Both graves have their own grave goods. The pottery finds date the older grave in horizon 5 and the later grave in horizon 6, suggesting that the re-use of this location may have spanned some time. In grave 29, no separate pits were recognised, but this grave does contain pottery from two different horizons, horizons 6 and 7, suggesting that there was a horizon 7 grave that was missed in the field or, alternatively, that a horizon 6 'heirloom' was placed in a horizon 7 burial.

Figure 3.39 Dalfsen: The ditch is cutting through several graves.

Figure 3.40 Dalfsen: Overview of the pits inside the earthen monument and the ditch cutting through graves from an earlier phase.

3.5 Other TRB features

3.5.1 The earthen monument

One of the most surprising finds was a feature consisting of a ditch, of which the eastern boundary could not be established (Fig. 3.37). The surviving length of the structure was 20 m; the width was c. 4.2 m. In the west, the end of the ditch was rounded. We were not able to reconstruct the former length of the structure due to the poor observation conditions to the east of the documented part of the feature. On the basis of the spread of the TRB burials, we estimate that the feature must have been c. 25-30 m long. The structure has the same orientation as the sand ridge on which the burial ground is situated, slightly northeast-southwest. The structure was sectioned both in length and in width by carefully skimming. The ditch segment has a preserved depth up to 10 cm, underlining the fact that with slightly less favourable preservation conditions

Figure 3.41 Dalfsen: Phasing the site of earthen monument. During phase 1 several grave pits were situated. Phase 2 witnessed the digging of the ditch and postholes. During phase 3 the earthen monument was formed and grave pits were dug into it.

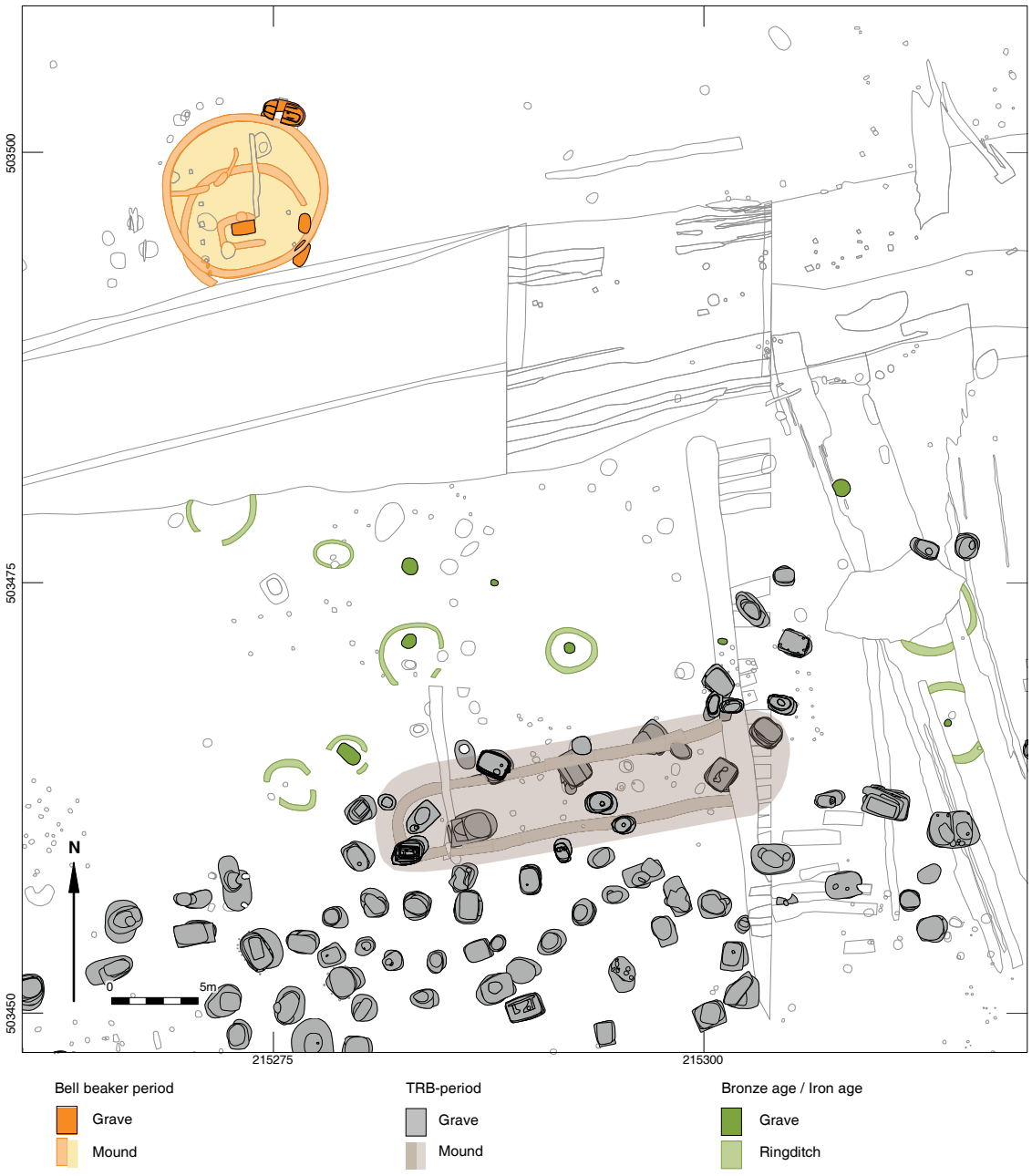


Figure 3.42 Dalfsen: Phase 4 of the earthen monument.

the feature would not have survived. The vertical cross-sections of the ditch suggest that the ditch was dug in sections, which may explain some of the noted differences in depth (Fig. 3.38a).

During excavation, we did not notice the presence of postholes in the ditches, but the photographs taken at that time do suggest that there was a post setting or possible palisade in the ditches. The distance between the posts was c. 10 cm, and the posts had a diameter of some 5 cm (Fig. 3.38b). There were no opportunities for direct dating of the feature, as the only finds that were collected are some flint flakes of uncertain age. Because of the dry and acidic conditions of the very tiny sand particles, we were not able to obtain suitable samples for palynological and soil micromorphological analysis; the grains proved to be very ambulant due to the small size of the particles, so the outcomes of these studied cannot be trusted.

Several other features show a spatial relationship to the ditched feature. The first group of features are the burial pits. The second group of features are 12 postholes, of

which the temporal relationship to the feature cannot be ascertained. More intriguing and relevant is the third group of features, a group of five small pits (Fig. 3.40) with a rather dark fill perhaps resulting from deposits rich in organic material, although they contain hardly any finds and no preserved organic material. There are two arguments to suggest a direct relationship to the ditched feature. First, the group of small pits fits perfectly within the area enclosed by the feature, and second, the pits share characteristics with the TRB grave pits in terms of the depth at which they were documented and their colour.

We propose to interpret the ditched feature as an earthen monument: an area originally demarcated by a segmented ditch in which a palisade was erected. Within the enclosed area, five pits were dug. Their purpose remains unknown. It is unclear where the soil from the ditch segments (and pits) was deposited, but there is an option that it was deposited in the area enclosed by the ditch segments. This alone may not have resulted in an earthwork. When we compare the potential soil volume of the ditch segments with the surface area enclosed by them, we can see that the enclosed area may have been raised by 45% of the original depth of the ditches. This means that if the ditch segments were originally dug to a depth of 50 cm, the enclosed area could have been raised by at most 22 cm. This suggests that in the first stage, the enclosed area may have been no more than a kind of platform.

The fact that the ditch segments yielded clean fill upon excavation suggest that shortly after they were dug, the enclosed area was filled with soil. This is also suggested by the variation in depth of the surrounding grave pits. By adding soil, a more visible earthen monument was created. We note that several burial pits have been preserved to a great depth and propose that these burials predate the earthen monument (burials 13, 20 and 35, with preserved depths of 49-61 cm). In contrast, burial pits 8 and 134, all located within the proposed earthen monument perimeter, have been preserved to a much more limited depth (7-28 cm). We propose that these were dug in from the surface of the earthen monument and had a similar original depth from the surface as the burials outside the monument proper. Because the surface of the monument was higher than the surrounding area and the top of the mound is now missing, their preservation depth is far less than that of the burial pits surrounding the monument. Turning this argument around, the difference in depth between the two groups indicates that the earthen monument perhaps had a height of c. 50- 80 cm. The creation of the earthen monument may also have involved filling in of the ditches, creating a focal point not only for more recent TRB burials in its immediate surroundings, but also for the location of the Late Neolithic burial mound (section 3.6) and even the location of several burials dating to the Middle/Late Bronze Age.

The date of the earthen monument can be established due to the presence of various cross-cuts between it and the grave pits dated in the TRB period. At least two grave pits (graves 9 and 63) are cut through by the ditches of the ditched feature, providing a *terminus post quem* in horizon 5 (Fig. 3.40). Three graves (graves 7, 61 and 62) cut through the ditch, proving a *terminus ante quem* in horizon 5 as well. The ditched feature can therefore be dated very precisely to horizon 5.

On the basis of all these observations, we suggest the following phasing of the earthen monument (Fig. 3.41):

- Phase 0: A burial ground is in use. The burials are archaeologically rather homogeneous (horizons 4 and 5).
- Phase 1: A segmented ditch is dug. In the ditch, posts are erected, and five pits are dug and used (horizon 5).
- Phase 2: The segmented ditch (or parts hereof) is filled in as part of the creation of an earthen monument (horizon 5). The five small pits may be part of this phase as well.
- Phase 3: More burial pits are added to the area surrounding the earthen monument and in the monument area proper (horizons 5-7).
- Phase 4: The earthen monument develops into a focal point for the later developments of a funeral landscape (Late Neolithic and Bronze Age; see section 3.6; Fig. 3.42).

Many aspects of the earthen monument merit further discussion (see Chapter 8). How should we interpret it? Is it analogous to a long barrow? The ditch with post setting is reminiscent of TRB long barrows,[92] but these all date to an earlier phase of the TRB and are unknown from the TRB West Group. Moreover, the Dalfsen earthen monument lacks the central grave typically found in a long barrow. The absence of central ('rich') graves leads us to believe that the monument was not erected to underline the position of a chief looking for a 'princely' grave location, but more as the result of deliberate choices of the local community. Or is it analogous to a megalithic monument? The Dalfsen earthen monument may also be interpreted as a central monument to which more recent individual inhumation graves are added – a situation strikingly similar to that of some megalithic monuments, such as O2-Mander, where a group of eight graves was found to the south of the megalithic monument.[93] The similarity is even stronger when one realises that the megalithic monuments were originally all covered with a mound, leaving only the kerb stones (if present) and the entrance stones visible as parts of the stone architecture: the visible part of the mound was thus largely an earthen construction. Or could it be a domestic structure? The occurrence of posts in ditches is also typical for TRB houseplans; an interpretation as domestic structure therefore needs to be considered as well (see section 3.6.2).[94]

92 Midgley 2005.
93 Lanting and Brindley 2003/04.
94 Midgley 2005; Pelisiak 2014.

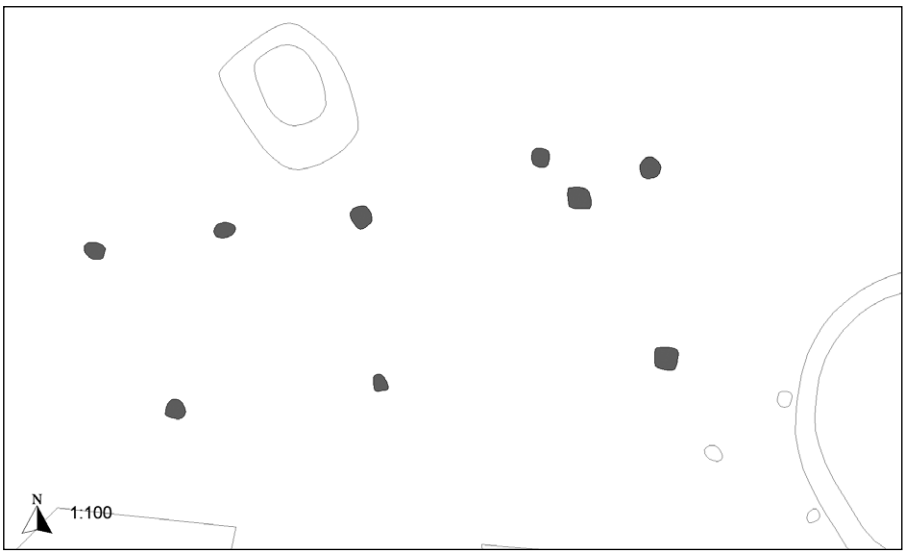


Figure 3.43 Dalfsen: structure 1.

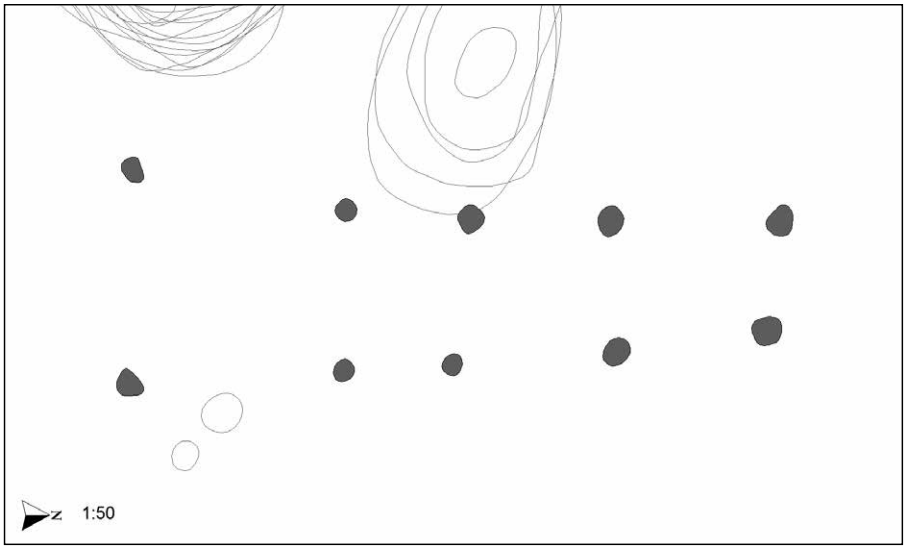


Figure 3.44 Dalfsen: structure 2.

3.5.2 Linear structures, cult buildings and houseplans

The burial ground and earthen monument are not the only TRB remains at Dalfsen.[95] The burial ground comprised a large number of postholes. Some were discussed above as part of the burials and the earthen monument. Here the focus is on the remaining postholes. None of these contained finds; their proposed TRB date is based on the colour of their fill and the fact that they appeared at a lower level than the later features. These are characteristics that these postholes share with the grave pits. An auxiliary argument is that these features share a space with the TRB graves. Apart from a number of single postholes, groups of postholes were found in two areas. Northwest of the earthen monument, 9 postholes probably form part of a structure (structure 1; Fig. 3.43). The posts were 8-10 cm in diameter and were preserved to a depth of up to 12 cm. They form two parallel east-west lines c. 2 m apart, over a distance of 6 m and 7 m, respectively. A second group, of 10 small posts, consists of two parallel lines comprising 5 posts each (structure 2; Fig. 3.44). These lines measure 4 m each and are oriented north-south. In the north, the lines are 0.8 m apart; in the south, the are 1.4 m apart. The posts have a diameter of 13-18 cm and are preserved to a depth of 12-22 cm.

Structure 3 was found 30 m to the northwest of the burial ground, located on a different sand ridge than the

95 A fragment of a TRB vessel was found in a posthole from a structure dated to the Iron Age some 90 m east of the burial ground (Chapter 4: AB12). It is unclear how this find should be interpreted within the Iron Age context, but the vessel must have come from a feature in which it was once deposited intact. One of the options is that it derived from a TRB grave pit disturbed in the Iron Age.

Figure 3.45 Dalfsen: Photographic overview of the constructions 3 and 4.

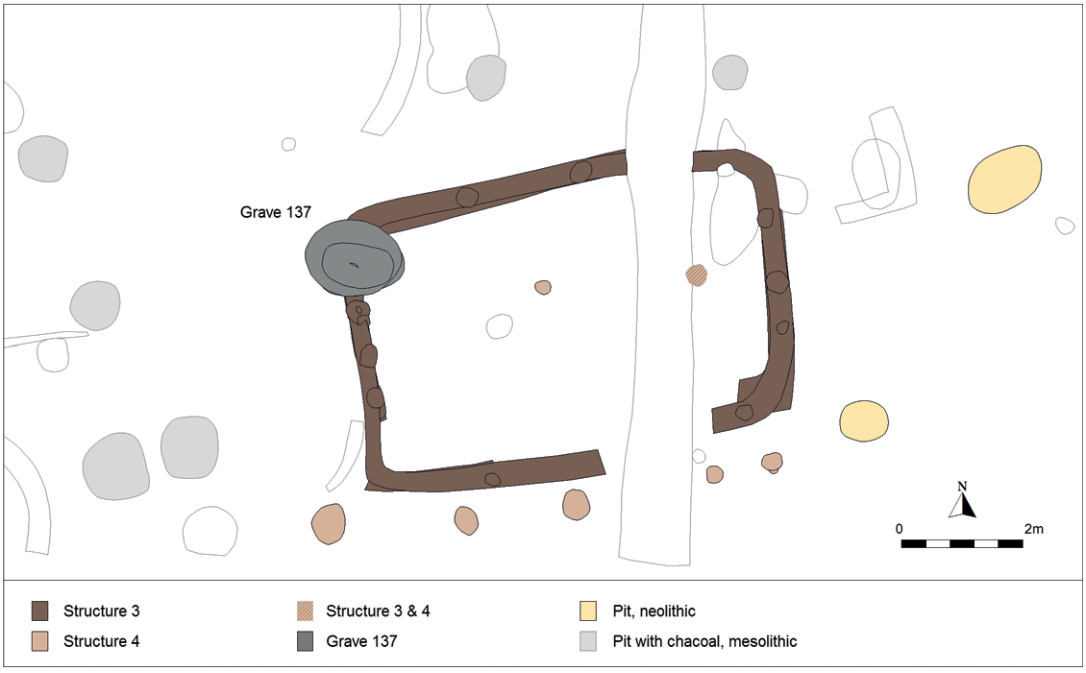


Figure 3.46 Dalfsen: Constructions 3 and 4.

burial ground. The barely visible ditches were recognised due to favourable weather conditions and the experience of the excavation team in recognising the faint remains of TRB features. The structure measures 7.0 × 4.8 m and is oriented southwest-northeast. The ditch was preserved to a depth of only a couple of cm. In the ditch, several postholes were documented (Fig. 3.45). The postholes were preserved to a depth of 8-24 cm and had a diameter of 8-24 cm. Two more postholes were found inside the structure. It is unclear whether they are part of this construction or should be interpreted as part of construction 4 (see below). The northwest corner of the structure is cross-cut by a burial pit (grave 137). The flint blade from this pit dates the burial pit to the Corded Ware culture (see section 3.6). The only absolute date available for construction 3 is one TRB sherd found in the ditch (feature 1968). A secondary argument for a TRB date is that the features are similar to the grave pits in terms of their preservation and colour.

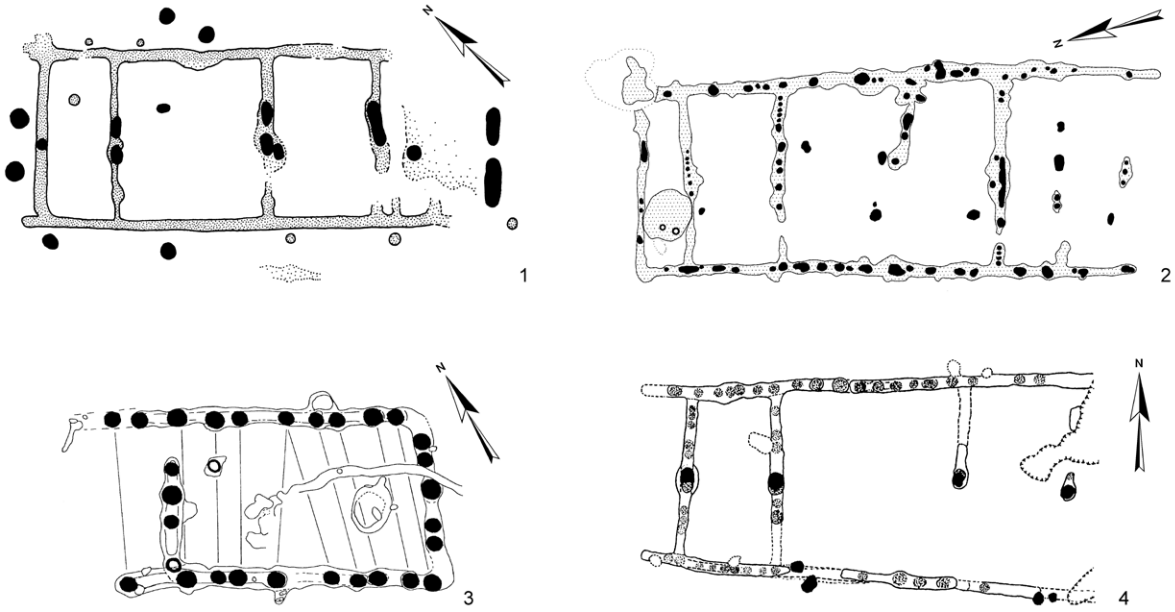


Figure 3.47 Overview of TRB West Group houses.

Figure 3.48 Dalfsen: grave 137.

To the south of structure 3, a west-east oriented line of postholes was found (structure 4; Fig. 3.46). These posts had a diameter of 13-50 cm and a preserved depth of 20-34 cm. There are no finds related to structure 4; the TRB date is again based on the similarities with other TRB features. This line of postholes may be related to structure 3. Another option is that it is the remnant of a rather similar rectangular construction, in which case the two postholes found inside structure 3 are part of the north wall of structure 4. If that is the case, structure 4 measures c. 7.5 × 3.8 m. In this scenario, structures 3 and 4 can be interpreted as a sequence. Based on the degree of preservation, we argue that structure 4 probably was the oldest and that, after demolition, it was replaced by structure 3.

In the vicinity of structures 3 and 4, three pits were found. Feature 1966 measured 75 cm in diameter and 14 cm in depth. Feature 1964 measured 1.25 × 0.8 m and was 26 cm in depth, and feature 1963 was an oval pit measuring c. 0.20 m in greatest diameter and 5 cm in depth. These pits did not provide any datable material but are considered to date to the TRB period on the basis of the colour of their fill.[96]

Interpreting the four constructions is difficult, not only due to their fragmented preservation, but also due to the small number of similar finds across the TRB West Group. Mennenga describes three groups of

96 The features without any finds but possibly dating to the TRB period are S900, S1582, S664, S1580, S1583, S653, S677, S1036, S902, S1584, S1028.

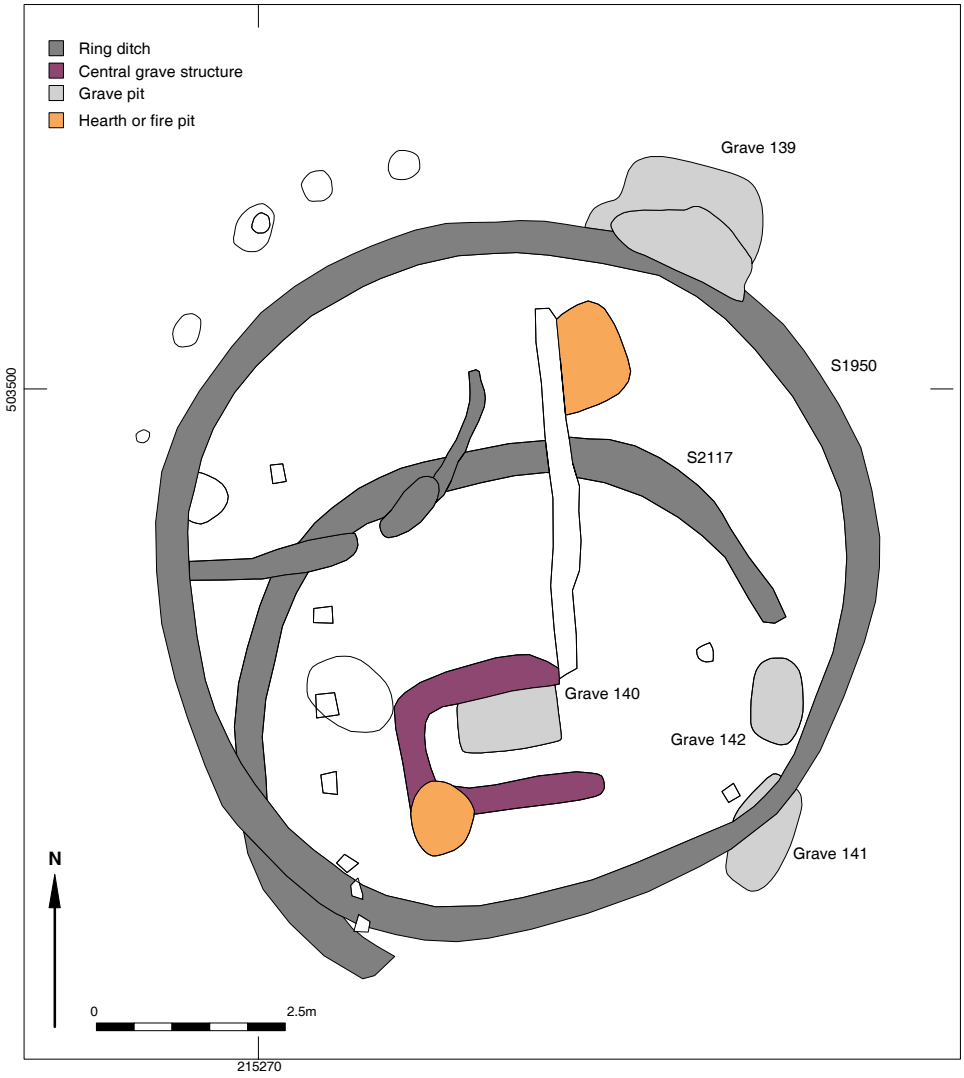


Figure 3.49 Dalfsen: Ring ditches of burial mounds and graves dating to the Bell Beaker period.

buildings in his overview of settlement structures from the TRB West Group.[97] His first group are 'longhouses', buildings consisting of multiple rooms. As a rule, these buildings had wall ditches in which postholes were set. They seem to be bi-partite. Several rooms seem to be of similar size. These constructions are known from the German states of Niedersachsen and Westfalen, at the sites of Flögeln, Penningbütel, Visbek and Heek. His second group, of small houses, consists of buildings with only one room. These buildings (found at Heek and Penningbüttel) are also constructed with wall ditches and posts. There are also smaller houses without ditches, at Hunte, Engter (Niedersachsen) and Bouwlust (province of Noord-Holland).[98]

Constructions 3 and 4 are interpreted as the remains of small houses (group 2), but because of their poor preservation we cannot completely rule out the possibility that these locations were the focus of activities typical for cult houses. This group of buildings is mainly known from TRB research in Denmark.[99] As with small houses, this type of building is also smaller in size. From some of them, features and finds were retrieved that may suggest that these buildings played a role in the TRB burial ritual.

We suggest, however, that the sand ridge on which these houseplans were found had a predominantly domestic nature. Most TRB West Group sites with houses show a combination of settlement structures and non-

97 Mennenga 2017, 272 ff.

98 Mennenga 2017, 265.

99 Kossian 2005, 79 ff.

Figure 3.50 Dalfsen: Several ring ditches from a Late Neolithic burial mound.

megalithic graves (Flögeln, Visbek and Heek), a list of sites to which Dalfsen can now be added.[100] In contrast, constructions 1 and 2 are located near the burial ground and share the same sand ridge. We propose that these constructions played a role in funerary rituals. The absence of finds hinders us in speculating on what form these rituals may have taken.

3.6 The Neolithic afterlife: Remains from the Corded Ware culture and the Bell Beaker culture

In the Dutch chronology of the Neolithic, the TRB culture is succeeded by the Corded Ware culture (c. 2750-2400 cal. BC), which is succeeded by the Bell Beaker culture (c. 2400-2000 cal. BC). Here, the excavation remains from these periods are presented in some detail because their characteristics and location may help us understand the perception of the TRB burial ground by later generations.

At Dalfsen, evidence of the Corded Ware culture is restricted. It concerns foremost the grave dug into the northwest corner of the ditch surrounding TRB construction 3 (see above). This grave 137 had an oval shape and was 28 cm deep. Parts of the body silhouette were recognised, and these suggest that the deceased was buried in a flexed position (Fig. 3.48). The pit yielded one flint blade, which dates this grave in the period of the Corded Ware culture. Apart from the find from this grave, two fragments of ceramics and a battle axe, also dating in the period of the Corded Ware culture, were found as stray finds. We interpret these finds as the remains of a disturbed grave because of the find location between the TRB burial ground and the Bell Beaker burial mound and because of the mint condition in which the battle axe was found.

Some 30-38 m north of the TRB burial ground, a group of four graves was found (Fig. 3.49). These are all part of a burial mound complex, of which only the graves and ditches have been preserved. The diameter of their ring ditches varied, from c. 6.8 m (first phase), to c. 4.4 m (second phase), to 8.5 m (third and final phase). The shifting position of the circular ring ditches suggests that the position of the mound altered through time and that probably for some time two mounds co-existed, until in the final phase, the mound, with a diameter of 8.5 m, covered both. No finds were retrieved from the ditches. Graves 138-141 are related to these ditches. Grave 139 is probably the oldest of these, since the pit is centred in the oldest ring ditch. Moreover, this grave pit (measuring 1.33 × 0.75 m) was situated inside a rectangular ditch of 2.20 × 1.15 m, making it the central grave of the burial mound. The rectangular ditch measured 30 cm in width and 18 cm in depth. Grave pit 139 was poorly preserved; only several cm of the ditch remained. A small fragment of Bell Beaker pottery was found in the fill of this pit, suggesting that not only this grave pit, but all of the different phases of the grave mound, date to the Bell Beaker period or later. Grave 138 was cut by the youngest phase of the ring ditch and measured 2.47 × 1.21 m.

100 Mennenga 2017.

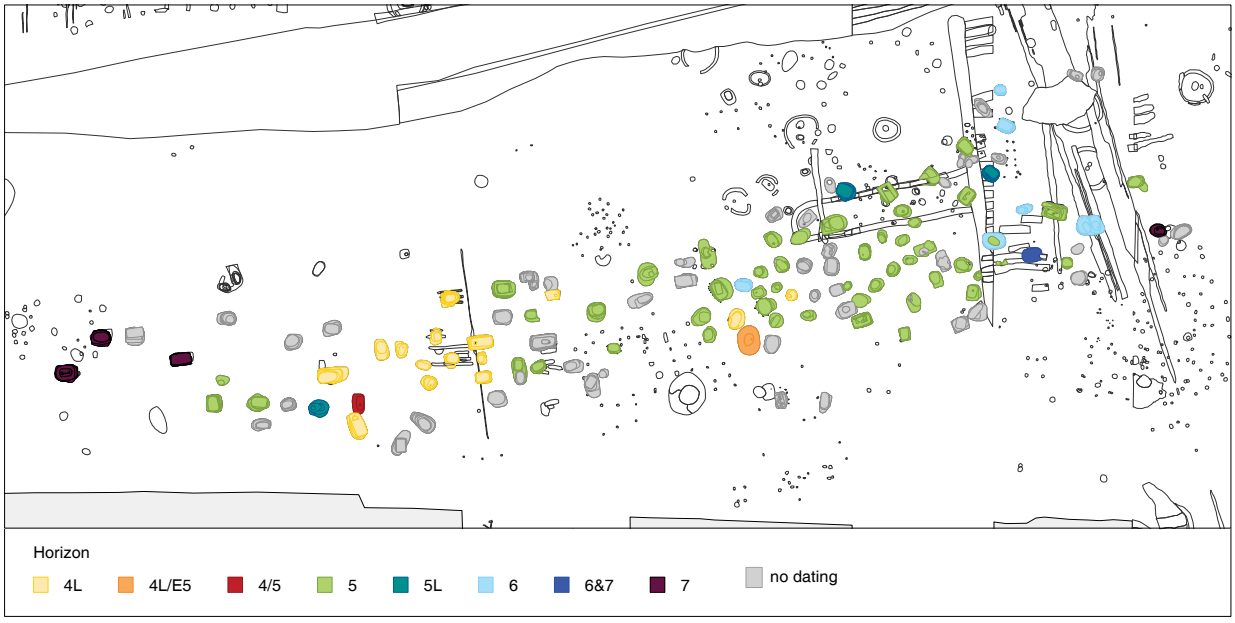


Figure 3.51 Dalfsen: Phasing of the burial ground. The numbers refer to the find horizons according to Brindley.

It was relatively well preserved. The grave pit had a remaining depth of 61 cm and contained remnants of a wooden coffin with traces of burning (measuring 2.25 × 0.65 m) and parts of a body silhouette, including some poorly preserved teeth. Both the size of the coffin and the position of the body silhouette suggest that the deceased was buried lying on their back, a practice that deviates from the customary flexed position of the Bell Beaker culture.[101] Graves 140 and 141 were only barely preserved: the remaining depth of the features was only a few cm. No finds came from these graves. These graves and ditches suggest the establishment of a grave mound during the Bell Beaker period and the reshaping of the monument during different phases of its existence. This is not uncommon for this type of grave monument.[102] Possibly the poor preservation of some of the graves is due to the custom of burying the dead in the mound itself, which leaves less traces of these features below surface level. The location of the grave mound is striking, namely, opposite the earthen monument erected during the TRB period. Both monuments seem to have become focal points for the later graves, dating from the Middle and Late Bronze Age (Chapter 9).

3.7 The phasing of the burial ground

On the basis of pottery found in the graves, the burial ground dates to TRB horizons 4-7 (Fig. 3.51), according to Brindley's typochronology of the TRB West Group pottery (see Chapter 4).[103] The other grave goods (stone axes, amber beads and flint tools) can be dated to the TRB period but not to specific horizons within it. The lack of grave goods means that 51 grave pits could not be dated by means of their finds. These can be dated to the TRB period on the basis of their spatial correlation and morphological similarities to the dated burials. The dimensions of the grave pits remain similar across the use history of the burial ground.

Based on their pottery, a total number of 28 burial pits can be dated to horizon 4. All burials from horizon 4 are centred around the west-centralpart of the burial ground, in an area measuring about 28 × 11 m. Of all the horizon 4 graves, two stand out in terms of appearance or grave goods. These are grave 96, with a covering of bog iron ore, and grave 99, with an amber necklace. If there was a founder's grave, it could have been one of these two. Most horizon 4 burials are found directly northeast of graves 96 and 99. Here at least 10 burial pits are found close together. They all differ in size, from small to large, and are oriented in various directions.

In horizon 5, the burial ground expands mostly to the east, but some new graves are found west of the older burials. In all, 47 graves can be dated to horizon 5. Because the horizon 5 burials lie directly east and west of the horizon 4 burials, it is impossible to assign the adjacent undated graves to one or other of these horizons. With the large expansion to the east, the focus of the burial ground also shifts to the east. This is best shown by the erection of an earthwork or monument during

101 Drenth and Lohof 2005, 435.

102 Bourgeois 2013, 30 ff.

103 Brindley 1986a.

this phase. At least two burial pits from horizon 5 are cut by the ditches of this earthwork or monument, while another three graves from horizon 5 cut through the ditch structure. The ditch structure can therefore be dated very precisely to horizon 5. Also, the burial pits found within the ditches of the earthwork/monument all date to horizon 5, and the same applies to the graves south of the monument. All burial pits related to the ditches of the earthwork/monument date to horizon 5. The same goes for all dated burial pits south and north of the ditches. No clear pattern was recognised in the distribution of the burial pits related to the ditches of the earthwork/monument.

In horizon 6, the cemetery again expands in the east, except for one grave (grave 49), which was found in the centre of the burial ground. There are seven graves that can be dated to horizon 6. Grave 29 contains vessels that date to horizons 6 and 7, where only one grave pit was recognised. This suggests that a horizon 7 grave may have been missed in the field or that people placed a horizon 6 'heirloom' in a horizon 7 burial.

All burial pits that date to horizon 7 were found along the edges of the burial ground. Four burials can be dated to horizon 7 based on the vessels found within these pits. One grave (grave 100) was found along the eastern edge, and the other three extend the cemetery to the west. Another 20 m to the west, one cremation burial was found, which is radiocarbon dated to the latest phases of the TRB period.[104]

The general idea is that cremation became the common burial ritual in the later TRB periods.[105] Dalfsen indicates that, at least on the site level, this idea does not hold up. Ten inhumation burials and one cremation date to horizons 6 and 7.

The number of dated horizon 6 graves is limited. Except for grave 49, they are found east of the preserved part of the ditch structure, but their distribution is diffuse. They do have in common that they are all oriented in an east-west direction. The same applies to the dated horizon 7 burials, which are all situated on the western edge of the cemetery. One undated grave (grave 107) that was also found here can possibly be dated to horizon 7 as well based on its location between the other three pits from horizon 7 and on its orientation.

Although an axe dating from the Corded Ware culture was found directly north of the earthen monument (section 6.3), there are no indications for burials from the Late Neolithic on the ridge on which the TRB burial pits were found. Still, we have to bear in mind that it is possible that some of the undated grave pits may date from later periods and that some graves (especially those dug into older burial mounds) may be missing due to later agricultural activities on site. The ridge directly north of the burial ground yielded several later Neolithic graves. During the (final phase of the) Middle Bronze Age, a small burial ground was added to the already existing burial landscape (Chapter 9).

3.8 The burial ground at Dalfsen in its spatial and cultural context

The burial ground at Dalfsen is for now a unique site due to the number of burials found. However, it is not the only known TRB burial ground, which indicates that in several instances these types of burials were part of a burial landscape, instead of being placed (seemingly) in a more random order. A thorough analysis of the choice of location is hampered by a lack of knowledge. First, most finds come from old excavations and are poorly documented.[106] In fact, it seems safe to assume that, in contrast to the highly visible megalithic monuments, non-megalithic burial pits are more likely to have been destroyed than discovered. Second, very few professional excavations have been undertaken adjacent to the megalithic burials, so it is difficult to establish a relationship between megalithic monuments and individual burial pits. Third, especially for the TRB West Group, houseplans are rare, so it is difficult to establish the relationship between settlement sites and burial sites. Finally, of the few known non-megalithic burial sites, only a minority have been fully documented and published. In this section, we will briefly explore the archaeological evidence regarding non-megalithic graves from the TRB period (the relationship between the Dalfsen burial site and megalithic monuments and burial sites outside but adjacent to the TRB group will be discussed in Chapter 8).

There are four groups to be considered:

- Single non-megalithic burials without any relationship to other burials or to contemporary settlement features;
- (Single) non-megalithic burials on or near settlement sites;
- (Groups of) non-megalithic burials spatially related to megalithic burials; and
- Groups of non-megalithic burials forming a burial ground.

The first group seems to be the most common, but this may be due to the above-mentioned state of research. Examples of this group have, for instance, been found at Denekamp (province of Overijssel).[107] Although this was an isolated find, there were no indications for other features dating to the TRB period. However, the existence of these single burials may also reflect a common practice (that is, more individual graves in the TRB period).

104 Poz-88040: 4205 ± 35 BP = 2900-2673 cal. BC; Poz-88702: 4240 ± 35 BP = 2917-2698 cal. BC.

105 Kossian 2005, 65; Van Gijn and Bakker 2005.

106 Kossian 2005, 35.

107 Hijszeler and Bakker 1965.

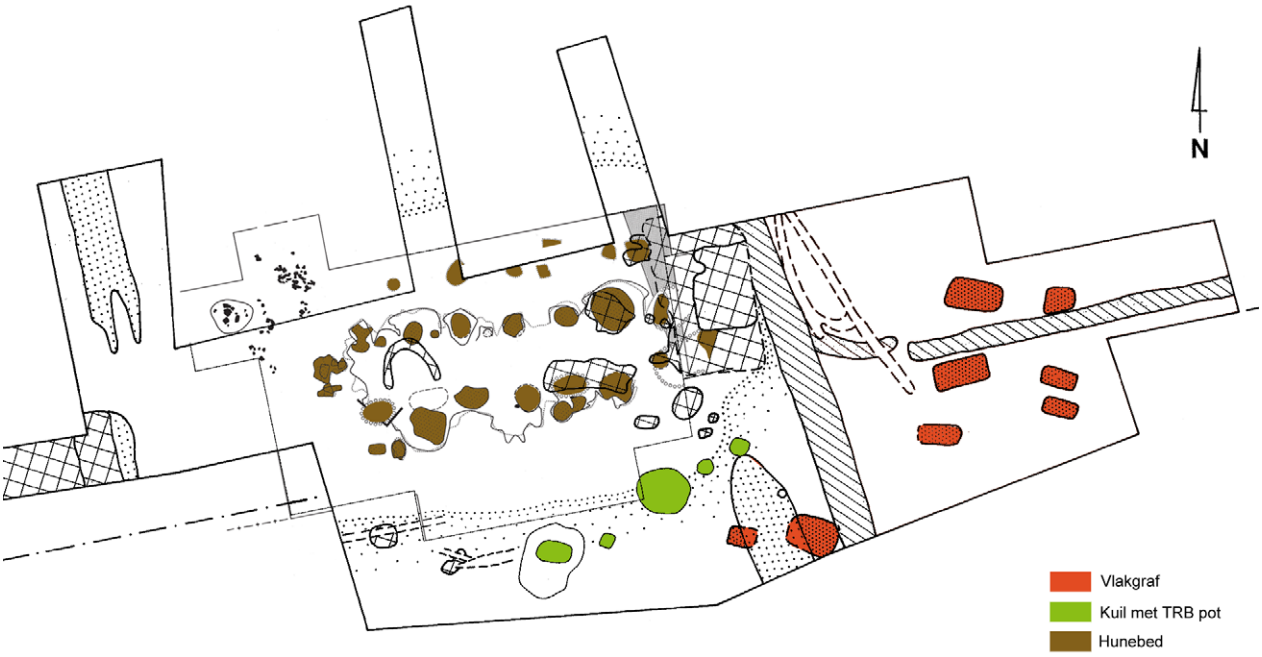


Figure 3.52 Overview of the megalithic monument and flatgraves of Mander (O2 – Overijssel), after Lanting and Brindley 2003/4.

The second group consists of several sites where both settlement traces and burials were found. The houseplan found at Dalfsen is one of only two known from the Netherlands, and it is the only one spatially related to burials. However, considering that it is separated from the majority of burials by a depression in the landscape, and considering the number of burials in contrast to the few settlement features, we would argue that the house was probably not the dominant factor of location choice for the cemetery. The spatial relationship between settlement and burial ritual can be observed in various sites in Niedersachsen.[108] At Flögeln, Visbek and Penningbüttel, both houseplans and burial pits were found.[109] At Flögeln, there were at least three structures, of which two are identified as houseplans. Adjacent to this settlement, eight burial pits were found. Four of these were spatially isolated, and the remaining four were found together. Most of the burials are spatially related.[110] Also at Penningbüttel, the spatial relationship between Haus A and two burials situated just south of the houseplan is evident.[111] At Visbek, at least two (possibly three) burials were found. In this case, too, there seems to be a spatial connection. Finally, at both of the sites in Heek, traces of houseplans and burials were found.[112] And at both sites, the relationship between the location of the burials and the settlement is evident, although it is not clear whether the burial ground and houseplans are contemporary.[113] Contrary to the sites mentioned above, at both sites in Heek, the burials were part of a burial ground consisting of 20 (Ammerter Mark) and 26 (Averbeck) graves.[114] We will return to this burial ground later. From the earlier period, we know of the occurance of graves near houseplans at Schokland-P14 (Swifterbant period) and the group of four burials found near one of the farmsteads in the settlement of Schipluiden (province of Zuid-Holland, Hazendonk period).

The third group may reflect a practice that was more common than was previously thought, as only a small number of sites with megalithic monuments have been researched systematically for the presence of non-megalithic burials. At Mander (province of Overijssel), not only the traces of a megalithic monument were uncovered, but also those of seven non-megalithic burials dating to Brindley horizons 4 and 5 (Fig. 3.52).[115] The burials seem to be complementary to the megalithic monument, and it is highly possible that more non-megalithic burials were present, since only part of the site was excavated. Similar find circumstances may have occurred at Uelsen-Steenberg (Niedersachsen), where a non-megalithic burial was found next to two megalithic monuments.[116] In the province of

108 Mennenga 2017.
109 Mennenga 2017, 69, 71, 84.
110 Mennenga 2017, 131.
111 Mennenga 2017, 133.
112 Finke 1990.
113 Finke 1990.
114 Kossian 2005, 376-7.
115 Lanting and Brindley 2003/04, 87.
116 Schlicht 1963, 1967; Lanting and Brindley 2003/04, 92.

Figure 3.53 Part of the pottery complex found at Hardenberg (1937) probably belonged to a burial ground.

Groningen, near megalithic monument G1-Noordlaren, two flat graves were found, and near megalithic monument G2-Glimmen, three non-megalithic burials were found.[117] Examples from the province of Drenthe are D47-Angelslo, with three non-megalithic burials; D21-Bronneger, with one non-megalithic burial; D20-Drouwen and D26-Drouwen, each with one non-megalithic burial; D43-Emmen, with several non-megalithic burials; D30-Exloo, with at least one non-megalithic burial; D32-Odoorn, with one non-megalithic burial; D54a-Spier, with two non-megalithic burials; D6a-Tynaarlo, with one grave; and D37a-Weerdinge, with one grave.[118] All these burials seem to have been isolated finds, most having been found during restoration and/or excavation of the nearby megalithic monument(s). The area surrounding megalithic monuments has only rarely been excavated systematically. A unique chance occurred at Valthe, where, in 2011, a large plot west of megalithic monuments D35-Valthe and D36-Valthe was excavated. Here, no indications for the presence of non-megalithic burials were found.[119]

The fourth group consists of several burial grounds comprising relatively small numbers of burials (Uddel-Uddelermeer (province of Gelderland), Zuidwolde-Ekelenberg, Angelsloo and Zeijen -all province of Drenthe-); three medium-sized burial grounds (Heek-Averbeck, Heek-Ammentermark and Hardenberg-Baalderes); and some larger burial grounds, situated farther away (Flensburg (Schleswig-Holstein) and Ostorf-Tannenwerder (Mecklenburg-Vorpommern). At Zuidwolde, a burial ground of which the documentation is far from complete, at least 10 graves were excavated.[120] All of these graves yielded finds, which, compared with the quality of the documentation and the percentage of graves with finds at Dalfsen (61%), seems a bit suspicious, as if the graves were only found because of the presence of these finds). With the exception of one containing five pots, all graves yielded only one to two finds. The burial ground dates to Brindley horizons 4 and 5. The burial ground at Angelslo comprised 13 cremation graves, almost all dating to Brindley horizon 7.[121] Because of this, it is quite difficult to compare the lay-out to Dalfsen, although it is interesting to note that Dalfsen yielded only a single cremation grave but several inhumation graves dating to horizon 7. The latter indicates that one cannot state that the burial ritual completely changed from inhumation to cremation during the final phase of the TRB period.[122] In fact, when we compare the physical

117 Brindley 1986a, 33.

118 Kossian 2005, 456 ff.

119 Fens and Arnoldussen 2013. Due to the difficult find circumstances prior to excavation, the level at which graves were to be expected may already have been disturbed (pers. comm., D. Raemaekers, University Groningen).

120 Bakker 2009, 186; Van Giffen 1943.

121 Bakker 2009; Huis in 't Veld 2001.

122 Cf. Van Gijn and Bakker 2005.

lay-out of the graves at Dalfsen to that in the Corded Ware culture, the parallels are striking. An interesting aspect of the cremation burials from Angelslo are the results of the research of the cremation contents.[123] One of the graves contained a woman and a child, suggesting, as we have seen also at Dalfsen, that multiple burials in a grave are possible. At Leer-Westerhammrich (Niedersachsen), several cremation burials dating to the TRB period were found, of which several also comprise evidence for multiple individuals.[124]

The discovery of the burial site at Dalfsen makes the preliminary conclusion regarding Hardenberg-Baalderes, that the 36 pots represent a (at least partly destroyed) burial ground, even more convincing (Fig. 3.53).[125] Considering the number of finds, we estimate that the burial ground at Hardenberg-Baalderes may have been the size of the burial grounds at Heek (which contained 20 to 30 burials each), considerably less than the number found from the burial ground at Dalfsen. The dating of this burial ground is horizons 4 and 5, so slightly earlier than Dalfsen. Finds from horizons 6 and 7 seem not to be present. The number of axes found at Hardenberg-Baalderes (n = 6) is striking compared with the number from Dalfsen (n = 2).[126]

The burial ground at Heek-Ammert is only partly published, and even then only the graves with multiple finds are discussed.[127] Kossian (2005) describes four of them, two of which are ^{14}C dated to the middle of the 4th millennium BC.[128] The published graves from this burial ground yielded rich inventories compared with the graves at Dalfsen. One of the graves contained 4 pots, 3 axes and 1 flint blade. Another one 4 pots, 2 axes and 1 fire-starting set (comprising a strike-a-light and some marcasite).[129] It is possible that the differences between the two sites are due to the earlier date of the graves at Heek-Ammert, but it is also a clue to the fact that we have to review questions about status and meaning on a local scale, within the burial ground itself.

Of particular interest is the site of Heek-Averbeck, also excavated by Finke. This burial ground yielded 26 graves, of which 11 did not yield any grave finds.[130] As with the graves at Dalfsen (of which 31% did not yield any inorganic finds), this suggests that the actual number of graves at different sites may have been much higher but that, due to the lack of finds, the barely visible graves may not have been recognised during excavation. The site is not published yet, but according to Kossian, the 15 graves contained 40 pieces of pottery, of which 15 were retrieved from only 3 graves. This means that the other 12 yielded 2 pots on average, a number slightly higher than at Dalfsen. Also comparable is the small number of graves with more objects. The richest one contained 7 vessels (F65), and two graves contained 4 vessels each (F32 and F39).[131] Most of the pits were of rectangular form, and some of them yielded traces of burned planks. Several of the burials were dated through ^{14}C.[132] Combining these results with the vessel forms indicates a dating of the burial ground during Brindley horizons 4 and 5, with possibly some earlier and some later graves.

The burial grounds of Flensburg (29 burials) and Ostorf-Tannenwerder (50 burials) are situated far away from Dalfsen and are therefore less suited for a direct comparison of features and grave goods. The burial ground at Flensburg is another indicator that these mid-sized burial grounds probably are more common than previously thought.[133] Just as with Heek-Ammert, this burial ground, too, was part of an ancestral landscape comprising graves from the Bronze Age and the Iron Age, something also noticed in the case of Dalfsen (Chapter 9). At Ostorf (Tannenwerder), on an island in a lake, graves containing (excellently preserved) inhumations were found, buried there over several centuries (3400-2900 BC). Due to its geographical position, this burial ground is argued to have had a special meaning.[134] Recent isotopic analyses relating to the diet of the deceased led to the conclusion that the population may have originated from the island and that their diet bore more parallels to that of hunter-gatherers than to that of early farmers.[135] Because of the number of the graves it seems unlikely that the entire community was buried there. The special interest of the burial ground at Ostorf lies not just in the excellent preservation of human bones, but also in the presence of organic materials, such as amulets made of animal bones. It is an indication of a part of the material culture likely once present in the burial ground at Dalfsen that is now completely lost.

123 Smits unpublished; Van der Sanden 2018, 137.
124 Bärenfänger 2004.
125 Brouwer 2019.
126 Brouwer 2019.
127 Finke 1987.
128 Kossian 2005; grave F32, 4700 BP ± 40 (GrN 16492, 3632-3472 BC), grave F1052, 4680 ± 60 BP (GrN 16494, 3634-3540 BC), using OxCal 13 (whereby GrN refers to Rijksuniversiteit Groningen lab number).
129 Kossian 2005, 376.
130 Finke 1984; Kossian 2005, 377.
131 Kossian 2005, 377-8.
132 grave F4 4520 ± 35 BP (GrN-9202, 3359-3098 BC), grave F5 5030 ± 70 (GrN 11762, 3965-3665 BC), grave F27 4400 ± 60 (GrN 11764, 3332-2902 BC), grave F34 4890 ± 80 (GrN 11765, 3943-3653 BC) and grave F38a 4480 ± 60 (GrN 11766, 3361-2938 BC), using OxCal 13.
133 Kossian 2005, 443.
134 Fernandes *et al.* 2015; Lübke *et al.* 2009.
135 Fernandes *et al.* 2015.

Chapter 4

Pottery

Anna Brindley

4.1 Introduction

This chapter concerns the pottery found in the graves of the TRB burial ground, of which 84 contained pottery. A total of 51 graves contained 1 pot each, 23 contained 2 pots each, 5 contained 3 pots each, and 1 contained 5 pots. The number of pots examined is 122 (including sherds of a vessel not found in a grave pit).

The pottery was in mixed condition, consisting of both intact and collapsed pots, and of complete and incomplete vessels. The fabric was also in mixed condition, ranging from unstable and crumbling to generally stable. Surfaces tended to be in good condition, with the original finish still preserved, although some had become obscured by a thin, sandy concretion or deposits of burnt material and soot. The typical white paste (consisting of ground burnt bone bonded with an adhesive) used to fill the impressed, grooved and incised decoration was preserved in places on some pots.

Initial work consisted of identifying and numbering the individual pots; classifying, identifying and checking of graves and associated groups of pottery; and reconstructing the form and decoration of individual pots. The pottery was numbered sequentially AB1-AB124 (subsequently AB9 and AB119 were excluded) as it was removed from its packing and was classified into one of nine categories: tureen, tureen-amphora, amphora, bowl, necked bowl, shouldered bowl, collared flask, miniature, and miscellaneous. Multiple pots from the same grave were kept together, but otherwise the pottery was organised by classification at this time. This allowed a direct visual analysis of each class as a whole. The individual pots were dated by typochronology, and a date for each grave was established based on the reviewed dating of the typochronology.[136] Identifying pottery to a typology is not an absolute science, as the development is a continuous one. The original choice of the term 'horizon' is meant to convey both the continuity of the sequence and the identifiable moments where pottery with a range of attributes was being made at the one time (a horizon is always dependant on the viewpoint of the observer). For Dalfsen, a sequence of pots was identified as accurately as possible, and pots and their graves were assigned to specific horizons and to the earlier/later or crossover portions of horizons. As this process is subjective, the identification of the precise horizon assignation of some pots changed marginally over the duration of the identification process. During this stage, the pottery (and with it, the graves) were reordered on the tables and laid out by horizon (horizons 4L to 7, whereby L stands for late and E stands for early). This allowed for the examination of the pottery as a temporal sequence. When a ground plan of the cemetery became available, as well as definitive numbers for each grave, the pottery was

136 Brindley 1986a; Lanting and Van der Plicht 2002.

reordered for a third time to examine as far as possible the distribution of the graves within the cemetery.

As the time available for examining this large assemblage was limited, the pottery was sketched to provide the main record for later use. These pencil sketches were made only as *aides-mémoires* for the present writer and not as definitive records of the pottery. They were made at high speed to record the general characteristics of each pot, including this author's considered opinion as to the original appearance of each vessel in so far as it is possible to reconstruct it. Normal conventions were not adhered to strictly, *i.e.* the drawings do not show the conventional broken lines for reconstruction, nor do they show the location of lugs. These drawings were made at a scale of 1:1.

4.2 Classification and features of the pottery

The identification of the pots is based on the categories of funnel beaker (Dutch: *trechterbeker*), bowl (*kom*, *schaal*), tureen (*terrine*), shouldered bowl (*schouderpot*), amphora (*amfoor*), and collared flask (*kraagflesje*). The terms 'tureen-amphora' and 'funnel beaker cup' were introduced by Brindley (1986a). The category 'necked bowl' is here used for comparatively deep bowls with a short, usually vertical neck, which occur during horizons 6 and 7. The term 'incipient ring base' is used to denote a very small, raised ring with a height of 1-2 mm on a flat base, which occurred in all horizons represented at Dalfsen and is widespread amongst the Dalfsen pots. It does not appear to be formed of added clay and is often irregularly shaped.

4.2.1 Decoration

This occurs most frequently on the neck and upper shoulder and, even on the earliest Dalfsen pottery, rarely covers the entire vessel. Excluding vessels with cut and notched bases (see below), there are only two examples of decoration around the edge of the base. Decoration occurs on some lugs (*e.g.* AB69 and AB70), especially in the earlier stages, and below lugs (*e.g.* AB89 and AB41). The chief elements used are straight lines, zigzag (either continuously executed zigzag, single strokes or crossed strokes), chevron (both horizontal, *e.g.* AB42, and vertical, *e.g.* AB70), individual stabbed impressions (*e.g.* AB57), and short lengths of lines (*e.g.* AB72). There is also one example of lozenge (AB109). The chief motifs (*i.e.* repeated combinations of elements) used consist of blocks of lines (*e.g.* AB87) spaced or with alternating vertical and horizontal directions (*e.g.* AB47, AB72, AB81 and AB88) and blocks of small zigzag (*e.g.* AB121). The chief edging (fringes) are lines of vertically impressed individual impressions, double impressions or short lines that occur at the base of blocks (*e.g.* AB97). This is sometimes replaced by a terminal line in a slightly different technique or by the deeper impression of the final point of a line (*e.g.* AB107). The first and last lines in vertical blocks are also occasionally emphasised by greater depth.

4.2.2 Applied features: Lugs and bosses

Lugs and bosses are generally small and low and are always pierced horizontally. On vessels with a neck and shoulder, they commonly straddle the neck-shoulder angle but may also occur on the shoulder (*e.g.* AB31). On simple bowls, they usually occur a short distance below the rim. They occur singly (*e.g.* AB74), as an opposed pair (*e.g.* AB24), as two usually fairly closely spaced opposed pairs (*e.g.* AB70), or as four equally spaced lugs. There is no discernible pattern to the choice of shape, size, position or number.

Lugs are pre-shaped rolls or straps (*e.g.* AB23), usually slightly larger than bosses, rectangular or D-shaped in cross-section, that are applied directly to the pot wall or with a mortise-and-tenon join. In some cases, a combination of the two is used. Larger roll or strap lugs may have been used for holding and handling, but even the larger Dalfsen lugs appear to be too small to provide sufficient purchase for use alone (*e.g.* AB13). The presence of four lugs is probably an indication that the lugs were used to attach a cover of some type. Morticed lugs may also have been strong enough to allow for suspension.

Horizontal long, or tunnel, lugs occur on two pots, both with slightly splayed openings (AB 101 and AB113).

Pierced bosses are circular and were perforated after being attached to the wall of the pot. The diminutive size of many bosses suggest they were used to keep covers in place. They may have been used for suspension on occasion, but as many are only fixed superficially to the pot surface, they would have been prone to detaching unless the cords or sinews also ran under the pot, which is unlikely as the vessels are flat-based. Few clay lids are known from TRB contexts, and covers of wood, leather, woven material or textile, all light weight but not likely to survive archaeologically, are a possibility.

Bosses without perforations vary in size and shape, from neat, small and circular, to larger, oval, irregular, and dimpled (*e.g.* AB57 and AB122). They usually occur close to the rim, and as many as seven occur on one vessel (*e.g.* AB19). They were attached directly to the surface of the pot while it was still wet. They may have been used to hold lids in place (*e.g.* AB64). The role and function of the irregularly placed and shaped lugs on bowls, such as AB40, may be to hold and tilt the vessel.

Low, lunate-shaped, elongated, pinched-up (or occasionally pinched-down) lugs occur on the shoulders of some tureen-amphoras (*e.g.* AB97 and AB120). These are applied directly to the vessel wall. Two large tureen-

amphoras (AB115 and AB133, both horizon 6) show an unusual arrangement of lines of three or four small, regular bosses. These may have been decorative rather than strictly functional and are possibly related to the cut cordons seen on horizon 7 shouldered bowls.

Short lengths of cordons with vertical cuts occur on two shouldered bowls and are typical of that type (AB27 and AB58). Although usually considered as decorative features of horizon 7 pottery, these may also have had a role in the handling of these vessels.

Tongue-shaped grips occur on a small number of vessels (*e.g.* AB1 and AB28). They are associated primarily with straight-sided open vessels, probably used for drinking. Grips of this type are affixed using mortise-and-tenon joins. They can occur singly or as two opposed grips.

4.2.3 Bases

Many of the bases have a very low raised edge that was not applied. These are here termed an incipient ring base. Although it has an accidental appearance, its widespread occurrence shows that it is a consciously executed feature. It is usually not more than 1-2 mm in height and not regularly shaped.

Well-defined foot rings are also represented, either straight or with a slightly protruding pedestal (*e.g.* AB69). These are usually less than 5 mm in height and are frequently notched. Bases described here as notched or gapped have a series of widely spaced, small, U-shaped openings in the ring (*e.g.* AB44 and AB74). These appear to have been made by rubbing a smooth stick or bone across the stand ring to form a smooth-sided gap, usually seven in number. These in turn define small, rudimentary, wide, low feet. The gaps are sometimes little more than cuts across the edge of the base.

Cut bases, a series of small cuts across the angle of the base, also occur (*e.g.* AB63). These are usually spaced, although there are some examples of multiple close-set cuts (*e.g.* AB58).

Separately applied feet (or legs) appear to occur on two vessels. In both cases, the shape of the base and the height of the legs suggests they were applied as separate elements (AB8 and AB87). A third vessel is incomplete and only the scars of several former feet indicate that these were originally applied individually (AB71). Applied ring bases were not observed, but the size and height of some ring bases makes it likely that additional clay was added to the base (*e.g.* AB19 and AB72). Exceptionally smooth, flat bases are rare, but the occurrence of several suggests that on occasion pots were balanced on a smooth board during manufacture (*e.g.* AB50).

4.2.4 Perforations

Both pre-firing perforations and post-firing perforations occur. Pre-firing perforations are intrinsic to the vessel as fired. They are cylindrical and have been noted on two vessels only (AB47 under rim, AB5 through base). Multiple small perforations (and 'imperforate' perforations) under the rim such as occasionally occur.[137] Post-firing perforations are modifications to the vessel, and these are dealt with extensively in section 4.6.

4.3 Description of the pottery

4.3.1 Introduction

The pottery found in the Dalfsen cemetery is treated here as an assemblage, and this catalogue has been arranged by type in order to aid the comparison of this large body of pottery with inventories from the Dutch megalithic monuments. Within each type, the pottery is described in general chronological order. Each vessel has been given a consecutive catalogue number (cat.), which is also used in the catalogue of figures. The types and their order are as follows: tureens (cat. nos. 1-7), tureen-amphoras (cat. nos. 8-31) amphoras (cat. nos. 32-54), bowls (cat. nos. 55-85), necked bowls (cat. nos. 86-88), shouldered bowls (cat. nos. 89-95), drinking vessels (cat. nos. 96-104), collared flasks (cat. nos. 105-106), miniature vessels (cat. nos. 107-113), and miscellaneous vessels (cat. nos. 114-122) (Tables 4.1 and 4.2). The description of the decoration reads from top to base. The detail of the descriptions of the pottery reflects the level of preservation. Preservation relates to several aspects: the completeness of the vessel, the fragmentation of the vessel, the surface condition of the sherds or pots, and the fragility of the fabric itself. (KS) indicates vessels sampled by Struckmeijer and Van Os (Chapter 5).

The catalogue should be read with the figures, as it clarifies aspects of the originally rapidly executed sketches. In the drawings, no distinction is made between pots with two opposed lugs or with four equally spaced lugs, or between pots with only one lug or with two lugs at right angles. The drawings accompany the catalogue are reproduced at a scale of 1:3 to allow for direct comparison with inventories from the Dutch megalithic monuments (for example, megalithic monuments G1-Noordlaren, G2-Glimmen, G3-Glimmen, D6a-Tynaarlo, D9-Annen, D30-Exloo, D40-Emmen) and the Dutch flat grave cemetery O2-Mander, as well as the large catalogue of pottery from flat graves compiled by Kossian (2005). Clarification of some aspects of the photographic catalogue is also given where necessary.

137 *E.g.* at Beekhuizer Zand; see Modderman *et al.* 1976, Fig. 9.

Cat. no.	AB	Gr.	Hor.	Cat. no.	AB	Gr.	Hor.	Cat. no.	AB	Gr.	Hor.
1	46	86	4L	42	68	6	5	83	92	19	6
2	89	55/56	4L	43	85	16	5	84	11	67	6
3	34	99	4L	44	41	95	4L	85	108	13	5
4	111	91	4L	45	17	47	5	86	115	29	6
5	114	96	4L	46	48	36	5	87	33	26	6
6	70	87	4L	47	15	70	5	88	103	30	6
7	109	93	4L	48	12	11	5	89	101	66	5
8	60	108	5	49	98	20	5	90	25	62	5
9	67	45	5	50	26	62	5	91	24	23	6
10	44	42	5	51	104	30	6	92	123	100	7
11	90	15	5	52	56	25	5	93	58	113	7
12	95	103	5	53	31	27	6	94	27	111	7
13	65	68	5	54	23	23	6	95	29	111	7
14	66	68	5	55	47	86	4L	96	39	89	4L
15	87	2	5	56	81	92	4L	97	20	74	5
16	121	63	5	57	72	59	5	98	18	50	5
17	49	35	5	58	88	55/56	4L	99	21	52	5
18	97	20	5	59	42	95	5	100	35	120	5
19	105	3	5	60	83	84	4L	101	55	25	5
20	113	8	5	61	37	72	4L	102	1	106	7
21	112	22	5	62	84	84	4L	103	28	111	7
22	110	109	5	63	14	53	5	104	10	110	7
23	107	32	5	64	6	78	5	105	53	25	5
24	106	31	5	65	2	65	5	106	54	25	5
25	99	9	5	66	5	37	5	107	38	72	4L
26	100	9	5	67	79	41	4L	108	7	55/56	4L
27	118	69	5	68	77	41	4L	109	82	92	4L
28	120	101	5	69	64	54	5	110	43	42	5
29	102	66	5	70	94	75	5	111	76	94	4L
30	57	25	5	71	63	79	5	112	96	103	5
31	30	26	4L	72	59	51	5	113	50	35	5
32	69	87	4L	73	3	48	5	114	117	29	6
33	45	85	4L	74	19	1	5	115	16	39	5
34	78	41	4L	75	122	1	5	116	62	10	5
35	75	94	4L	76	4	7	5	117	8	12	5
36	74	44	5	77	51	35	5	118	13	61	5
37	93	71	5	78	86	17	5	119	40	89	4L
38	52	90	4L	79	61	10	5	120	22	18	5
39	71	59	5	80	116	29	6	121	32	27	6
40	73	5	5	81	36	49	6	122	124	Pit 135	-
41	80	46	4L	82	91	19	6				

Table 4.1 Catalogue of the ceramic finds from Dalfsen. Cat. no. = catalogue number; AB = Anna Brindley concordance list catalogue number; Gr. = grave number; Hor. = Brindley horizon. The numbers AB9 and AB119 were not used.

AB	Cat. no.	AB	Cat. no.	AB	Cat. no.
1	102	43	110	84	62
2	65	44	10	85	43
3	73	45	33	86	78
4	76	46	1	87	15
5	66	47	55	88	58
6	64	48	46	89	2
7	108	49	17	90	11
8	117	50	113	91	82
10	104	51	77	92	83
11	84	52	38	93	37
12	48	53	105	94	70
13	118	54	106	95	12
14	63	55	101	96	112
15	47	56	52	97	18
16	115	57	30	98	49
17	45	58	93	99	25
18	98	59	72	100	26
19	74	60	8	101	89
20	97	61	79	102	29
21	99	62	116	103	88
22	120	63	71	104	51
23	54	64	69	105	91
24	91	65	13	106	24
25	90	66	14	107	23
26	50	67	9	108	85
27	94	68	42	109	7
28	103	69	32	110	22
29	95	70	6	111	4
30	31	71	39	112	21
31	53	72	57	113	20
32	121	73	40	114	5
33	86	74	36	115	86
34	3	75	35	116	80
35	100	76	111	117	114
36	81	77	68	118	27
37	61	78	34	120	28
38	107	79	67	121	16
39	96	80	41	122	75
40	11	81	56	123	92
41	44	82	109	124	122
42	59	83	60		

Table 4.2 Concordance list. AB = Anna Brindley concordance list catalogue number; Cat. no. = catalogue number.

4.3.2 Tureens (cat. nos. 1-7)

Tureens (Fig. 4.1) are characteristic vessels of horizons 2-4 (Brindley 1986a). They are wider than they are tall, have a distinct, generally vertical neck (although slightly conical or flared necks also occur), with a separate although not necessarily large shoulder and a deep, or long, body. They are most commonly single-lugged, although two and four lugs also occur, the latter especially at the end of the development. The earlier lugs or handles tend to be larger than the later examples, which typically are small and straddle a small shoulder.

The Dalfsen tureens belong to the end stage of the development of the type, at the end of horizon 4. Both the general shape and decoration of these tureens originate in previous horizons of development. The prevalence of a strongly marked horizontal band of three or four lines under the rim, combined with a band of either zigzags of blocks on five of the vessels; small lugs, occasionally forming two pairs (found on six tureens); and, occasionally, *tvaerstik* distinguish these vessels from the tureen-amphora series.[138] Cat. no. 4 has, unusually, two lugs at right angles to each other. The occurrence of vertical chevrons below the lugs on at least four of the vessels is also consistent with a horizon 4 Late date and sets these vessels apart from horizon 5 tureen-amphoras. The band of lozenges on cat. 7 is also a distinctive feature of horizon 4 pottery. For instance, there are numerous examples at megalithic monument D14-Eexterhalte on horizon 4 pottery[139], but it occurs only once in the Dalfsen assemblage, suggesting that its popularity had waned. Seven tureens occur in this assemblage. All are decorated.

138 J.A. Bakker uses the Danish term *tvaerstik* in his book, The TRB West Group (Bakker 1979, 179). Also known as *dwarstempel* in Dutch, it refers to decoration consisting of a horizontal line with vertical cuts or impressions.

139 Unpublished data.

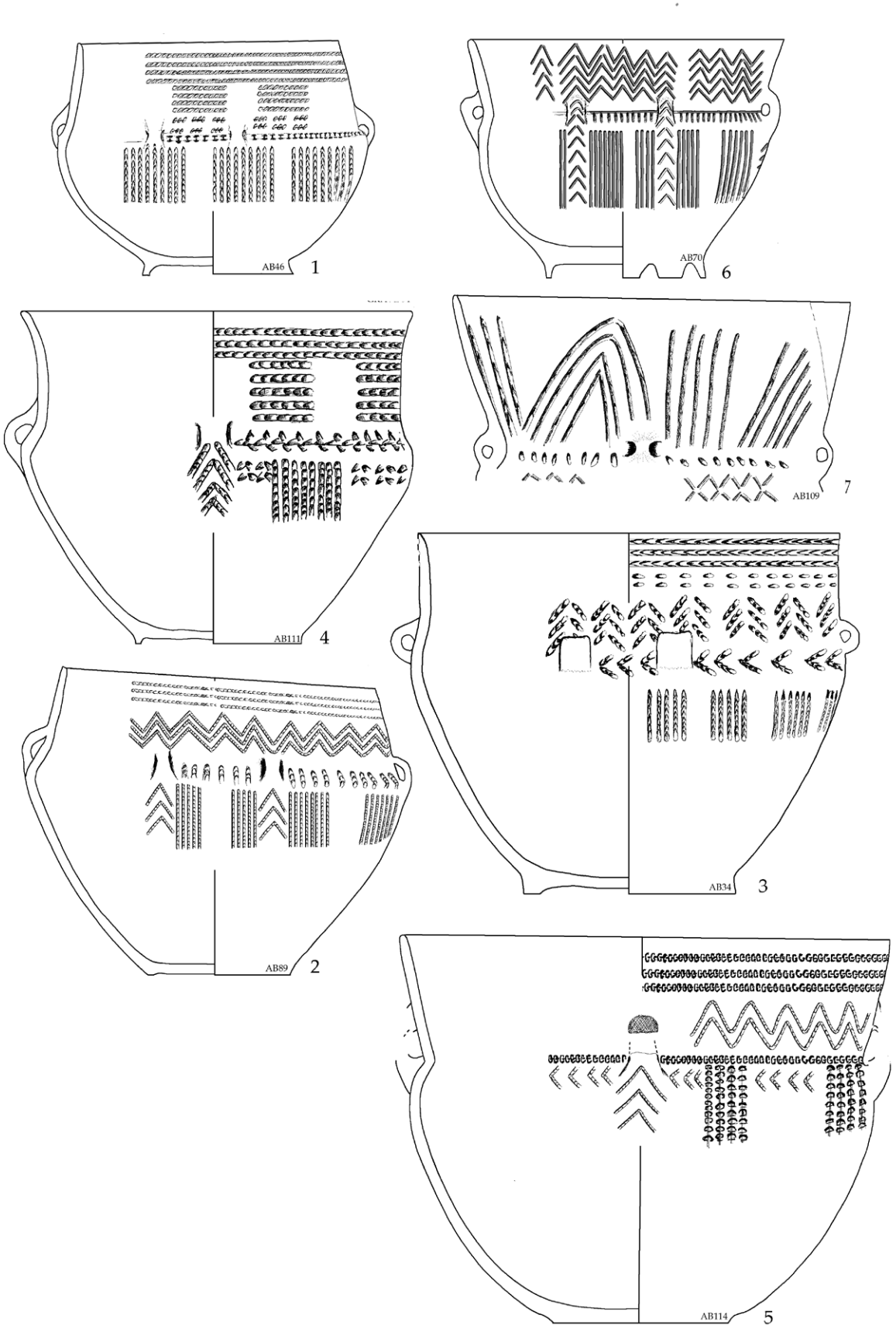


Figure 4.1 Dalfsen: Overview of the tureens catalogue nos 1-7.

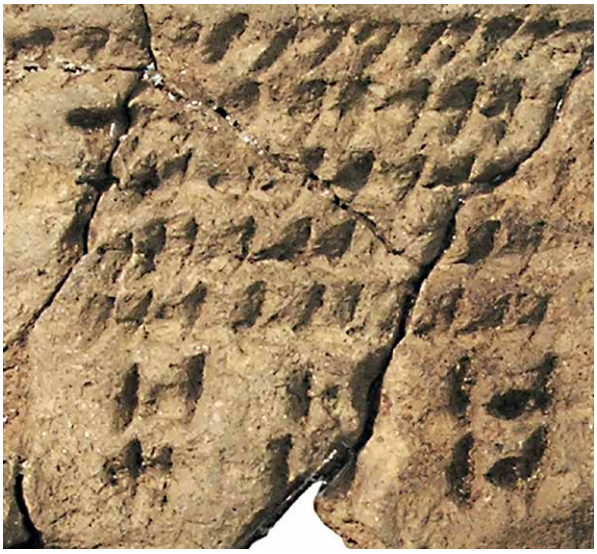


Figure 4.2 Dalfsen: Tvaerstik on neck (AB46).

Figure 4.3 Dalfsen: Tvaerstik on body of vessel shown in Figure 4.2 (AB46).

Figure 4.4 Dalfsen: Small foot ring (AB34).

CAT. NO. 1

- **AB46** (grave 86). Complete profile, ring base and one pair of originally two pairs of small, undecorated lugs (low, D-shaped section) on small shoulder. Tiefstich and tvaerstik combination consisting of primary tiefstich line crossed by oblique cuts. Four horizontal lines below rim, blocks of four horizontal lines with two hyphenated horizontal lines below. Vertical decoration on shoulder. Blocks of vertical lines to approximately halfway down body. Fairly regular walls, very smooth to the touch (thickness 4 mm). Fine quartz visible on surface, but it does not seem to have been heavily gritted paste. Beige-brown with pale interior.
- Found with a straight-sided open bowl (AB47/cat. no. 55). V1374, found in filling of grave, probably incidental.
- Horizon 4L
- Comments: One of only four vessels with a combination of tiefstich and tvaerstik decoration. The tvaerstik consists of primary tiefstich line crossed by oblique cuts. The addition of these cuts must have added significantly to the time taken to complete the decoration, which could have been considered complete with only tiefstich lines. On the neck, the tiefstich line appears as a regular groove largely containing the oblique cuts (Fig. 4.2). On the body, the vertical tiefstich lines are clearly visible because the oblique lines are very shallow in places and the pot surface is worn (Fig. 4.3).

CAT. NO. 2

- **AB89** (grave 55/56). Reconstructed from sherds. Slightly conical neck, two spaced pairs of lugs on shoulder, and incipient ring base (wall thickness generally 4-5 mm and locally 3-6 mm). Tiefstich. Three lines under rim, band of three zigzag lines, vertical lines on shoulder and blocks of verticals on upper body. Three vertical chevrons below each lug. Not in good condition. Worn external surface. Better preserved inside shows smoothing marks. Beige greyish with some fine grit visible (also some red-coloured grit visible). Found with a bowl (AB88/cat. no. 58) and a fragmented, undecorated miniature bowl (AB7/cat. no. 108).
- Horizon 4L

CAT. NO. 3

- **AB34** (grave 99). Vertical neck and slight shoulder (wall thickness 5-6 mm), two pairs of opposed lugs (rectangular cross-section), low ring base (Fig. 4.4.). Pointed tiefstich. Three regular lines below rim, above two lines of spaced, horizontal stabs followed by band of zigzag consisting of blocks of three oblique lines. Line of horizontal chevrons on shoulder; blocks of three to eight vertical lines on upper body. Originally complete but in pieces when examined. Upper part

still glossy. Mottled beige-brown-grey paste with fine and occasionally small white quartz. Regular, very well smoothed outside and inside.
- Found with amber beads of one or two necklaces.
- Horizon 4L
- Comments: This association is important for the dating of the amber necklaces in the graves. No upcast from decoration suggests pot fairly dry when decorated.

CAT. NO. 4

- **AB111** (grave 91). Reconstructed. Two lugs (thick, rectangular cross-section) at right angles to each other at junction of neck and shoulder, base with incipient ring base. Regular, fairly thin-walled (thickness 4 mm) with smooth, burnished surface. Broad, round-tipped tiefstich. Three lines below rim, well-spaced blocks of five horizontal lines, composite line at base of neck (horizontal tiefstich with stabs above and below). Blocks of verticals (8-11) separated by stabbed line of rough zigzag, block of standing chevrons below lug. Brownish paste with white quartz and possibly some feldspar grit, visible especially on the inside.
- V2039 (small, decorated shoulder sherd) found in filling of grave, probably incidental.
- Horizon 4L
- Comments: The arrangement of two lugs set at right angles is only rarely recognisable, but it may have been more common than currently appears (*NB* the drawn profile accompanying the photograph suggests incorrectly that this vessel has two opposed lugs).

CAT. NO. 5

- **AB114** (grave 96). Reconstruction (incomplete, full profile); slightly open neck; small, rounded shoulder; and flat base. One lug base survives, possibly one of a pair (neck thickness 4 mm, body thickness 5 mm). Tiefstich and tvaerstik. Three lines of tvaerstik (rounded head, close-set, but guideline visible) below rim, two lines tiefstich zigzag on neck, line of tvaerstik at base of neck. Blocks of vertical tvaerstik on body, interrupted by line of horizontal chevron. Panel of three vertical chevron below lug. Not well preserved. Brown-beige paste. Smoothly polished, with fine quartz grit visible. (KS).
- Horizon 4L

CAT. NO. 6

- **AB70** (grave 87). Slightly open neck, small shoulder, two not quite opposed pairs of horizontal lugs, and base with seven feet (or gaps). Fine pointed tiefstich. Large band of four to five zigzag lines, horizontal line at base of neck with pendant fringe on shoulder. Panels of vertical lines, some with vertical strip of chevrons. Decoration is not symmetric; see comment. Surfaces are well preserved. The exterior has not been highly smoothed and has a slightly rough texture (thickness 5 mm). Mottled brown with fine and small quartz and possibly feldspar grit visible. Some white paste still present.
- Found with an amphora (AB69/cat. no. 32).
- Horizon 4L
- Comment: The lower part of the pot is very asymmetrical. It appears to be due to irregular manufacture, rather than slumping due to soft clay, which would also have been reflected in the neck and rim. It occurred during the shaping process, as the neck and rim are symmetric. This may indicate an inexperienced potter. The vessel has two different decorative schemes. On one side, the two lugs are decorated and there is a panel of five zigzags between the two lugs with a gap outside each lug and chevron decoration on the top of the lugs. On the other side, the two tops of the two lugs are not decorated and there are two panels of four lines of zigzag between the lugs but no gap outside the lugs. The panels are irregular, with four to nine vertical lines. The two vessels found in this grave are not a pair, but they do have some stylistic similarities, including the fringe at the top of the shoulder, itself not uncommon.

CAT. NO. 7

- **AB109** (grave 93). Large sherd of neck of a tureen. Thick-walled vessel, represented by approximately one third of neck and rim; top of shoulder; and very small, undecorated lug. Small size of lug suggests originally four arranged in two pairs, similar in shape to AB70 (see cat. no. 6, above). Deeply incised, carelessly executed tiefstich decoration, including line of lozenges on shoulder. Slightly irregular walls (thickness 5-7 mm), smoothed only on outside, brown paste with fine mica and fine and small white quartz visible in places. (KS)
- Horizon 4L
- Comments: The deeply incised tiefstich technique of decoration is unique in this assemblage, as is the lozenge line on the shoulder, although it is common in other horizon 4 assemblages, *e.g.* megalithic monument D14-Eexterhalte (*NB* the sketched reconstruction incorrectly shows four regularly spaced lugs).

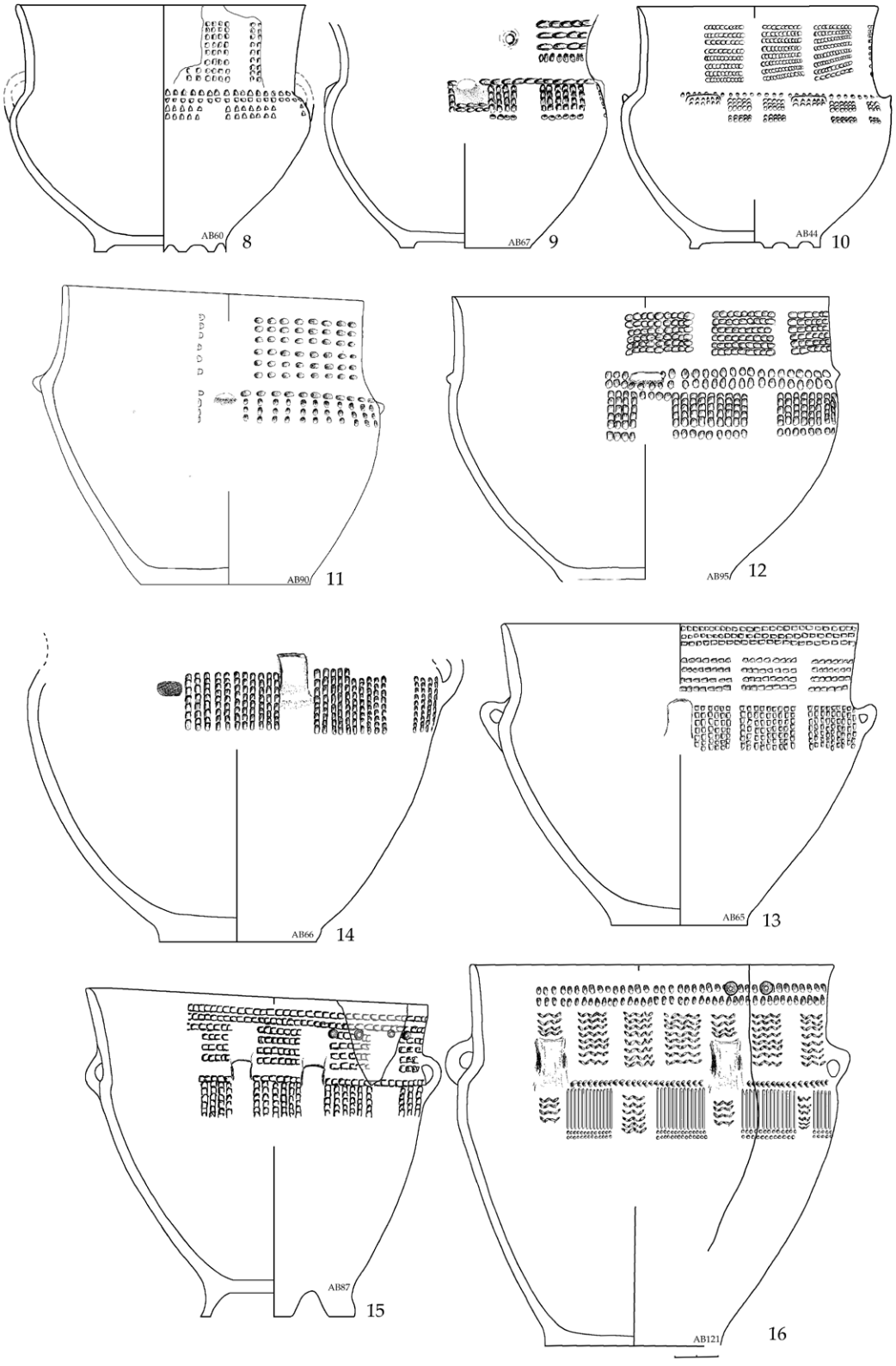


Figure 4.5 Dalfsen: Overview of the tureen amphoras catalogue nos 8-16.

4.3.3 Tureen-amphoras (cat. nos. 8-31)

Tureen-amphoras evolved towards the end of horizon 4 from tureens and are characteristic of horizon 5.[140] They are associated with blocks of tiefstich decoration, some large zigzags and horizontal lines, with vertical lines (sometimes in blocks), terminating in a fringe, being the preferred decoration on the shoulder and upper body. Decoration on the shoulder does not extend far down the body of the vessel. Lugs; bosses; and horizontal, narrow lugs occur at the base of the neck and where preserved are four in number. They are usually small, occur in two pairs or are positioned equidistant and are undecorated, although a decorative panel occurs occasionally below (cat. nos. 12, 16, 20, 21, 24, 28 and 31). At Dalfsen, there is some evidence that larger vessels were more frequently placed in graves towards the end of the horizon. Twenty-three tureen-amphora occur in this assemblage. All are decorated.

CAT. NO. 8

- **AB60** (grave 108). Incomplete, well-represented body and base, but only one small neck-and-rim sherd survives. One lug base preserved on shoulder. Base with nine irregular-sized, notched feet on incipient ring base. Lines of close-set, small, discrete stabs executed both vertically and horizontally. Tall blocks on neck interspersed with fairly narrow gaps. Line of close-set vertical stabs at neck base. Almost immediately below, line of horizontally executed stabs with pendant short blocks of two rows of vertically executed stabs separated by small gaps. Bright brown, mottled colour; regular walls (wall thickness 3-4 mm, narrowing to less than 2 mm at tip); fine and some small quartz. Smoothing marks on inside of neck. Burnished.
- Horizon 5
- Comments: The neck blocks consist of vertical stabs aligned horizontally, except for the top and bottom rows, where the stabs have been executed horizontally. The combination of vertical and horizontal stabs is evidence of the care taken in the decoration of this vessel. It is not clear if the gaps on neck and shoulder coincide. The smoothing was carried out when the surface was still quite soft, and some grit is visible lying smooth with the surface. Well-executed pot.

CAT. NO. 9

- **AB67** (grave 45). Incomplete, large parts of body and most of neck absent. Intact, complete base with very low, neat ring base. Tiefstich executed with a single implement with rectangular tip. Three horizontal lines below rim, with line of vertical stabs; at least two of the lines in blocks apparently aligned with shoulder blocks. Horizontal line at neck base, blocks of vertical lines with final line of dots. Surviving upper part includes part of one post-firing perforation and a small, damaged lug or boss. Very regular and smooth walls (thickness 3 mm on neck, 4 mm on body). Smoothed as burnish lower down. Sporadic quartz. Orangey brown.
- Horizon 5
- Comments: Exceptional vessel.

CAT. NO. 10

- **AB44** (grave 42). Incomplete, full profile with two of probably originally four very small, low, slightly turned-up, horizontal bosses and a notched incipient ring base with eight notches. Decoration of circular, close-set impressions. Horizontal blocks (8 lines) on neck; line of vertical, small stabs at neck base; short blocks of vertical, close-set lines with a double line of dots on body. Regular and smooth, carefully rubbed walls (thickness 2 mm at rim, 4 mm on lower body). Beige-brown colours. Fine and small quartz grit.
- Found with a miniature straight-sided vessel (AB43/ cat. no. 110).
- Horizon 5
- Comments: Irregularities in decoration (blocks and gaps on shoulder and neck do not coincide and are of irregular length) make this a good but not an excellent pot.

CAT. NO. 11

- **AB90** (grave 15). Complete (reassembled), four small, equally spaced, turned-up bosses. Damaged base, probably flat. Tiefstich, executed as horizontal stabs on neck and vertical stabs on shoulder. Blocks (5-6 lines) on neck, tiefstich line at neck base, with gaps coinciding only roughly with three lugs (runs over fourth). Impressions of different sizes and shapes, not in regular lines. Surfaces smoothed and rubbed (wall thickness 3-4 mm).
- Undecorated sherds (V560 and V569) found in filling of grave, probably incidental.
- Horizon 5
- Comments: Some smoothing visible around panels of decoration on neck.

CAT. NO. 12

- **AB95** (grave 103). Four equally spaced, low horizontal bosses and very small/incipient foot ring. Tiefstich, not fully consistent, uneven decoration. Blocks of horizontal, tightly spaced lines on neck, double stabbed line at base of neck, blocks of tightly spaced verticals on shoulder, with single line of stabs below. Regular but not completely smooth (thickness 2 mm at rim, 4 mm elsewhere). Break on rim shows black with some fine and small white quartz. Possibly burnished.

140 Brindley 1986a, 56.

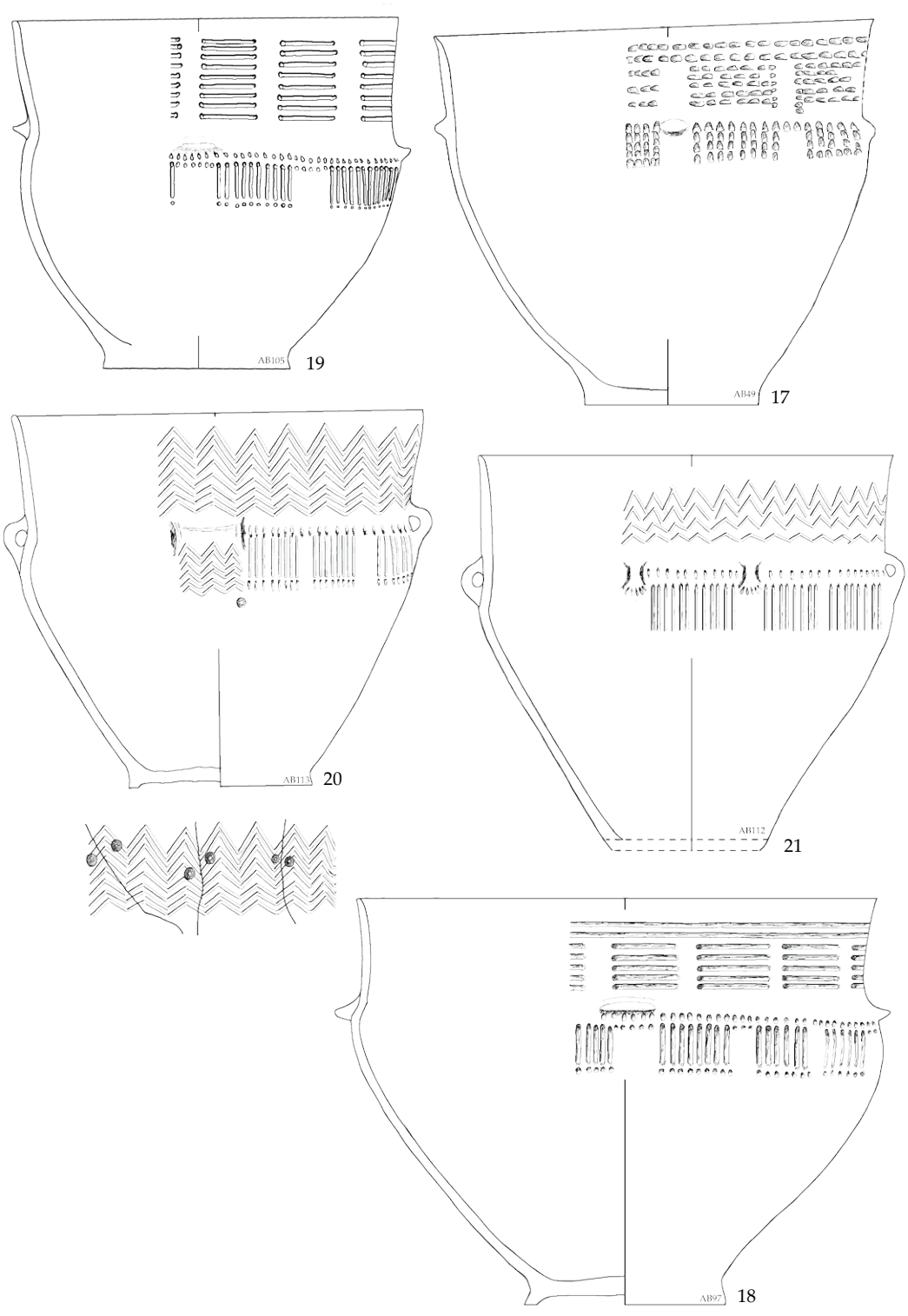


Figure 4.6 Dalfsen: overview of the tureen amphoras catalogue nos 17-21.

- Found with a small anomalous vessel (AB96/cat. no. 112).
- Horizon 5
- Comments: Blocks not aligned.

CAT. NO. 13

- **AB65** (grave 68). Incomplete, with full profile in one area. Two opposed, horizontally perforated, prominent lugs on shoulder and incipient ring base. Tiefstich. Horizontal band of three continuous lines executed from left to right below rim. Blocks of four horizontal lines executed from right to left on neck. No line at neck base. Shoulder and upper body, blocks of 7-11 vertical lines, varying in length and width. Neck and shoulder blocks aligned generally. Fine and scattered small white quartz visible, as well as irregular-sized orange-coloured fragments (iron?). Very smooth walls (thickness 5 mm at rim, 6 mm on body). External surfaces obscured largely by sandy, rust-coloured deposit.
- Found with a second amphora-tureen (AB66/cat. no. 14).
- Horizon 5
- Comments: This pot was probably decorated by a right-handed person who turned the vessel on its side and supported it from the inside with the left hand while executing the blocks on the neck. The thickness of the walls, the firing (broad orange core), the little grit, and the irregularities in the decoration suggest a learner, whereas the smooth finish, regular walls and general shaping suggest greater skill. Fabric appears similar to that of bowl AB79/cat. no. 67.

CAT. NO. 14

- **AB66** (grave 68). Body of decorated vessel, evidence for two pairs of opposed, prominent, horizontally perforated lugs on the shoulder and low ring base. Tiefstich. Small piece of horizontal decoration at neck base preserved. Blocks of verticals on shoulder (slightly irregular in shape and alignment). Regular walls (thickness 5-6 mm). Interior is less smooth and shows voids, possibly due to loss of inclusions.
- Found with a second amphora (AB67/cat. no. 9), both truncated.
- Horizon 5
- Comments: Grit similar to associated vessel (AB65/cat. no. 13), although more orange-coloured grit (iron?) visible. It is likely that these two vessels were made on the same occasion. Decoration is executed with a similar but slightly larger implement than AB65, and the vessel also has a smooth and soft to the touch finish on the outside. Fabric appears similar to that of bowl AB79/cat. no. 67.

CAT. NO. 15

- **AB87** (grave 2). Asymmetric, with two opposed pairs of neatly shaped, horizontally perforated lugs (rectangular cross-section) and five comparatively tall feet defined by large, rounded notches. Two dunts (fig 4.5) in neck reinforced close to rim. Broad, square tiefstich. Three continuous horizontals below rim (two over lugs) above broad blocks of three horizontals. One continuous horizontal line at neck base, with blocks of vertical lines and fringe line. Blocks on neck and shoulder neatly aligned. Regular (thickness 3-4 mm) and smooth walls (inside and outside). Beige colour. Small quartz visible.
- Horizon 5

CAT. NO. 16

- **AB121** (grave 63). Tall, with two pairs of opposed, slightly depressed lugs and smooth, flat base. Flat rim tip. Lugs slightly depressed. Stabs and tiefstich. Two lines of vertical stabs below rim, blocks of small stab zigzag on neck, line of vertical stabs on shoulder tip, blocks of vertical tiefstich with double stab fringe interspersed by small blocks of stab zigzag. Regular walls (thickness 3 mm). Dark grey paste with possibly feldspar and quartz grit (no fresh break). Post-firing perforations associated with a reinforced crack (dunt) and a repaired, crescent-shaped rim break.
- Horizon 5
- Comments: Well made and well finished, neat decoration. Smoothed vertically on outside. A coil break is visible at the rim (Fig. 4.5).

CAT. NO. 17

- **AB49** (grave 35). Three of originally four approximately equally spaced, small, elongated, up-turned lugs, and flat base. Broad tiefstich. Two continuous lines below rim, with irregular blocks of three to five horizontal lines of different widths and interspersed with gaps of different sizes. Continuous line on shoulder (except at lugs) with blocks of vertically arranged stabs, in some places executed vertically and in others, horizontally. Gaps between neck blocks and shoulder blocks coincide, but overall decoration is very irregular (Fig. 4.74). Regular walls but with abundant smoothing marks inside and outside (thickness 3 mm at rim, increasing to 5 mm on lower body). Mottled beige with some black patches and slight polish in places. Little grit apart from some pink feldspar? and a dark grey fragment visible.
- Found with two other vessels: a small anomalous vessel (AB50/cat. no. 113) and an asymmetric, open, lugged bowl [AB51/cat. no. 77]).
- Horizon 5

CAT. NO. 18

- **AB97** (grave 20). Four equally spaced, narrow, applied lugs, slightly pinched-up to a thin tip. Low ring base. Grooved decoration on neck, combination of grooves and tiefstich on shoulder, with small, circular impressions (dots) at base of decoration. Two continuous lines below rim, horizontal blocks (5-6 lines) on neck. Line of dots at shoulder, with double line in some gaps and vertical blocks (6-11 lines), ending in fringe of dots. Gaps on neck and shoulder do not coincide. Wall thickness 3 mm at rim widening slightly to 4 mm elsewhere. Final smoothing while fairly hard, not burnished. Black inside, grey outside. Fine and small quartz, abundantly visible on inside. Occasional flecks of pyrite. Traces of lustre in places.
- Found with an undecorated amphora (AB98/cat. no. 49). Sherds (V913, V943 and V945) and crumb (V863) found in filling of grave, probably incidental.
- Horizon 5L
- Comments: Fairly similar to AB105/cat. no. 19, but different paste and implement. The inclusion of larger pots seems to be a characteristic of late horizon 5 and horizon 6 graves, especially at the eastern end of the cemetery. AB97 is one of the largest tureen-amphora in the assemblage.

CAT. NO. 19

- **AB105** (grave 3). Two of probably originally four equally spaced, narrow, horizontal, applied, slightly pushed-up lugs and incipient ring base (*NB* not shown in sketches; Fig. 4.7). Grooves (with slight upcasts) and small, circular impressions made with the same implement. Horizontal blocks (7-9 lines) on neck, two lines of dots at neck base, with vertical blocks forming shoulder decoration. Gaps on neck and shoulder not aligned. Thin wall (thickness 2-3 mm), smooth but not completely regular. Smoothing marks visible on inside. Grey-beige exterior, darker on the inside. Generally fine grit, but small white quartz and occasional larger pieces on inside. Patches of gloss in places.
- Small sherds (V562, V572 andV584) found in filling of grave, probably incidental.
- Horizon 5
- Comments: Grooves with slight upcasts indicate that decoration was probably the last stage of manufacture.

CAT. NO. 20

- **AB113** (grave 8). Incomplete. Single pair of opposed, horizontal, tunnel-shaped lugs and neatly finished incipient ring base. Fine pointed tiefstich forming narrow, deep, groove-like impressions without upcasts. Wide band of medium-sized zigzag (9 continuous lines) covering neck and block of similar zigzag on underside of distinctive tunnel lugs. Well made, with regular, fairly thin walls (thickness 2 mm at rim, 5-6 mm in places elsewhere). Three reinforced cracks (dunts) in neck. Post-firing perforation below one of lugs indicating further reinforcement or repair. Dark grey, with patches of black paste, well smoothed, with occasional quartz visible on inside. Some gloss still preserved on inside of neck. Exterior rubbed but not burnished, as scratch marks and smoothing marks are visible. Fairly neat but not perfect decoration. (KS)
- Horizon 5
- Comments: Four of the six perforations on the neck have been drilled from both sides, indicating that this piece had separated from the rest of the pot.

Figure 4.7 Dalfsen: Slightly pushed-up horizontal lug and slight upcasts by horizontal lines (AB105).

CAT. NO. 21

- **AB112** (grave 22) Long neck and slight shoulder narrowing originally to comparatively small base (base missing; inside base angle preserved in one place). Two spaced pairs of horizontally perforated lugs (narrow, with D-shaped section) with few stabs on underside but otherwise plain. Wall thickness 4 mm. Incised decoration made with a fine, pointed stylus on neck, and as tiefstich on shoulder (same implement). Four lines of large zigzag on neck, continuous line of stabs at neck base, blocks of vertical tiefstich lines on shoulder. Crescent-shaped mend or reinforcement,

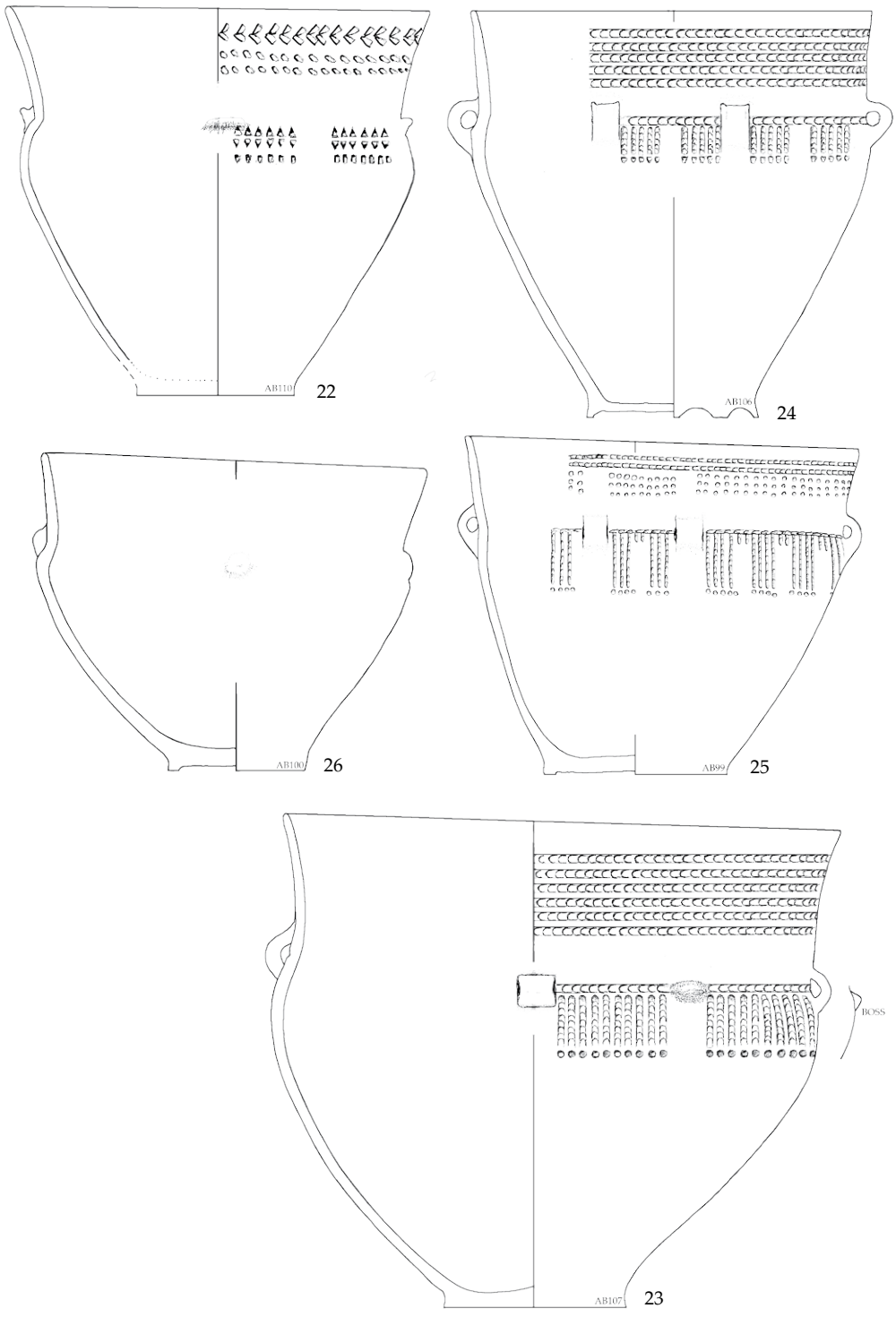


Figure 4.8 Dalfsen: overview of the tureen amphoras catalogue nos 22-26.

represented by three post-firing perforations along neck break. Mottled grey with white quartz visible in places. No fresh breaks. (KS)
- Thick sherd (V779) found in filling of grave, probably incidental.
- Horizon 5
- Comments: The vessel is quite well formed and smoothly finished. The decoration is irregularly incised and executed, especially the zigzag.

CAT. NO. 22

- **AB110** (grave 109). Comparatively narrow and tall, with long, horizontal, pinched-up, applied lugs at neck base (probably originally four) and flat base. Three surviving lugs are of different lengths and shapes. Worn inside base. Irregularly executed decoration starts some distance below rim. Upper line of crossed stabs, followed by two lines of smaller stabs. Blocks of three lines, upper two being triangular-shaped and paired, and lower consisting of smaller stabs similar to those on neck. Fairly well made, with thin wall (thickness 3-4 mm) that does not thicken towards base. Surfaces have been rubbed smooth. Neatly finished on inside. Greyish beige mottled coloured surfaces. Quartz and possibly feldspar visible where surface is worn. (KS)
- Horizon 5
- Comments: Vessel in large pieces but almost complete. The neck appears to have been smoothed while damper than the lower body, to judge from the type of smear marks. Impressions (probably of grain) on the inside. The pairing of triangular stabs on the shoulder is unusual (Fig. 4.9).

CAT. NO. 23

- **AB107** (grave 32). Full profile but incomplete. Slightly asymmetric, possibly due to slumping rather than irregular shaping (wider than shown in sketch). Surviving portion includes both horizontal, neatly made lugs (narrow rectangular section) and small, horizontal bosses. Tiefstich (two types of tools). Band of six very regular horizontal lines of C-shaped impressions (possibly made with an obliquely cut, hollow implement). Line at neck base interrupted by lugs and bosses. Band of verticals (except below lugs and bosses) ending in dots on shoulder. Very regularly made, finished and decorated. Walls are exceptionally regular (thickness 4 mm) and smooth both inside and outside, and on the base outside. Fine and occasionally small white grit visible. Flat base. (KS)
- Horizon 5
- Comments: Exceptional manufacture. Unusual combination of lugs and bosses.

Figure 4.9 Dalfsen: Paired triangular stabs (AB110).

CAT. NO. 24

- **AB106** (grave 31). Full profile, two opposed pairs of short, tunnel-shaped lugs, eight gaps on neat, flat base (incomplete, c. two-thirds of original vessel). Broad tiefstich, rounded tip for horizontal neck decoration, square tip for vertical shoulder decoration. Neatly shaped lugs (narrow, rectangular section) and thin rim tip (thickness 2 mm, widening to 4 mm on body). Grey fabric with irregularly dispersed, small quartz grit visible. Regular walls. Although carefully finished to level of rubbing at late stage, grits are visible in surface. Slight gloss visible on exterior.
- Horizon 5
- Comments: The neck appears to have been decorated with an obliquely cut implement, giving C-shaped indentations. Although this pot is quite similar in quality and decoration to AB107/cat. no. 23, it is not as expertly made. The slightly large inclusions play a role in the final quality of the surface.

CAT. NO. 25

- **AB99** (grave 9). Complete. Two opposed pairs of fairly closely spaced, small, horizontally perforated, thick, neatly shaped lugs and incipient ring base. Lugs (rectangular cross-section) and broken example show that at least upper part was plugged into neck wall. Some white paste remains in places. Tiefstich executed apparently with quill on neck and possibly with same instrument on remainder of vessel. Two continuous lines below rim, with long blocks of three rows of dots. Line of tiefstich at base of neck overlain by vertical stabs continuing as vertical lines in small blocks of three to four lines, terminating (with one exception) in line of dots. Regular, fairly smooth walls (thickness 3 mm at rim, widening to estimated 4-5 mm lower down), with

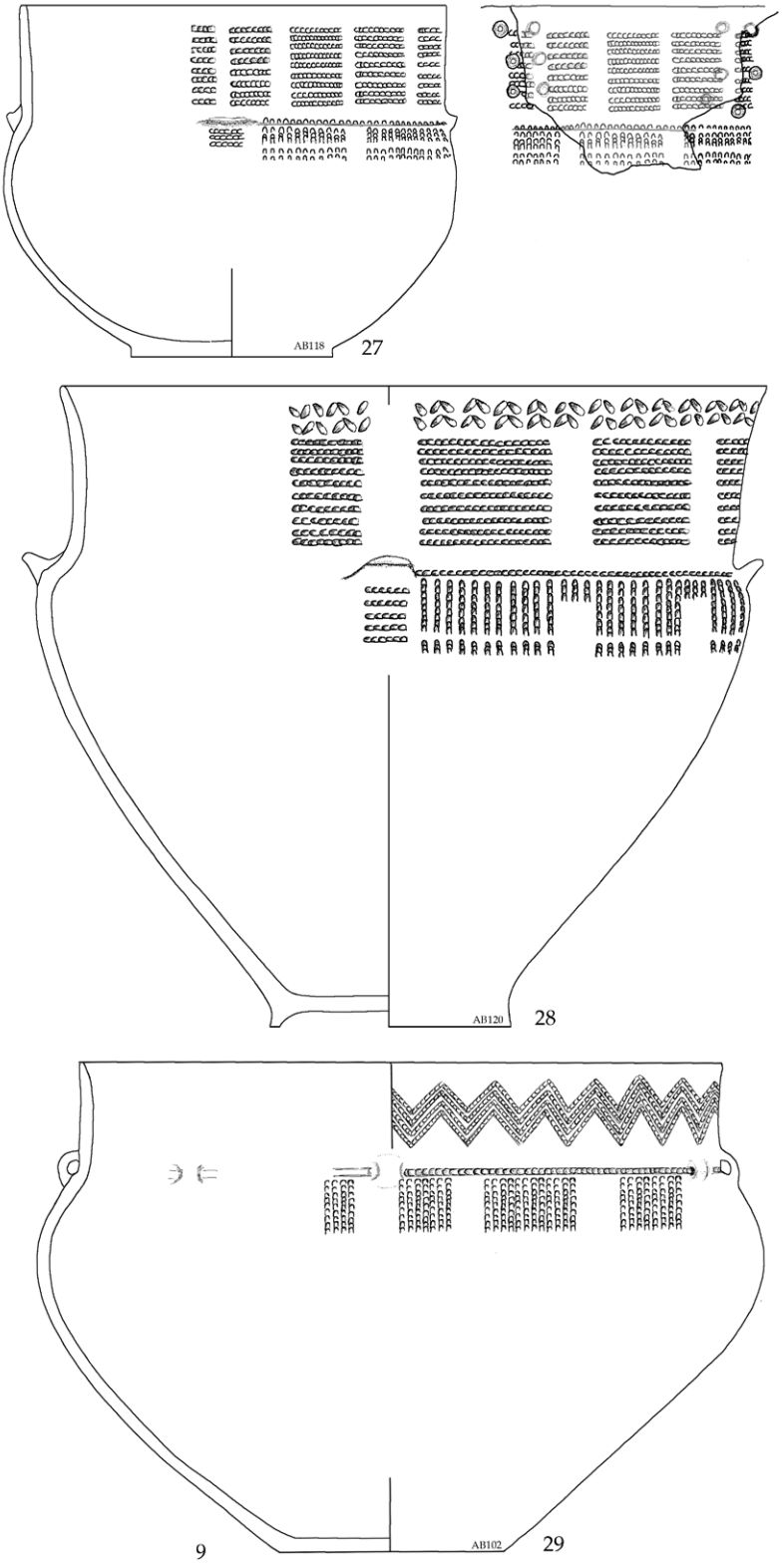


Figure 4.10 Dalfsen: Overview of the tureen amphoras catalogue nos 27-29.

smoothing marks visible. Lightly rubbed on exterior. Dull surfaces. Greyish beige-coloured fabric with small patches of thin, charred material (firing?). Fine and occasional small white quartz and mica visible in surface.
- Found with a second complete, undecorated tureen amphora (AB100/cat. no. 26). Sherds V307, V308, V967, V986, V960, V904, V961, V998, V970, V958, V926, V903 and V1216 found in filling of grave, probably incidental.
- Horizon 5
- Comments: Well made, but not top quality. This grave is within the ditch feature and appears to cut two pits that seem to be cut by the ditch.

CAT. NO. 26

- **AB100** (grave 9). Undecorated tureen-amphora with two pairs of widely spaced, circular bosses on shoulder and smooth, flat base. Fairly regular, smooth walls, inside and outside (thickness 3-4 mm). Slightly asymmetric shape. Dark, almost black, shiny exterior and black interior. Quartz and possibly feldspar visible in surfaces; no fresh breaks.
- Found with a decorated tureen-amphora (AB99/cat. no. 25). Incidental small sherds V307, V308, V903, V904, V926, V958, V960, V961, V967, V970, V986, V998 and V1216 found in grave fill.
- Horizon 5

CAT. NO. 27

- **AB118** (grave 69). Four equally spaced, small, pinched-up horizontal lugs and flat base. Tiefstich, rounded point. On neck, narrow blocks of nine closely packed horizontals. Below this are very short, wide blocks of vertical lines (8-15) with a double line of dots below. Although lugs are described as equally spaced, they occur in two pairs, with the intervening area having a more regular arrangement of blocks relative to those on the shoulder (four neck blocks, each paired to one of two shoulder blocks). Slightly longer side (of which only one survives completely), consists of five neck blocks and three shoulder blocks, the latter being uneven in width. Three horizontal lines below each lug. Regular, thin walls (thickness 4 mm where measured, but seems consistent) with fairly smooth, probably rubbed exterior. Fairly neat decoration, but not completely regular. Well smoothed and rubbed. Greyish paste with fine, small and medium white quartz visible. Distinctive upcasts (Fig. 4.11) at the edge of the impressions, especially on the neck, show that the pot was still soft at the time it was decorated. Large piece missing from the neck, with three post-firing perforations on each side, representing six pairs of perforations.
- Horizon 5

Figure 4.11 Dalfsen: Distinctive upcast (AB118).

- Comments: The neck has a primary line of tiefstich and a secondary line of small stabs which overlie it in places (due to carelessness).

CAT. NO. 28

- **AB120** (grave101). Large, well-made vessel, with four equally spaced, narrow, horizontal, pinched-up lugs and foot ring. Tiefstich (small, rectangular stylus) and stabs. Two lines of continuous stab zigzag from left to right (gap in one place), tall blocks of horizontal lines (10), separated by narrow gaps. Horizontal line at base of neck broken by smallish lugs with short horizontal block (4 lines). Wide blocks of verticals terminating in horizontal line of irregular, short lines of two stabs, separated by narrow gaps with fringe of three lines. Fairly regular walls (thickness 7 mm on body, 3 mm in places on neck), with smooth surfaces. Parallel smoothing marks on inside, well rubbed on outside. Mottled dark and paler orange-brown with fine, small and medium quartz. Multiple post-firing perforations, including a crescent-shaped mend to rim and neck (six perforations), a vertical dunt (one pair of perforations) and one perforation adjacent to site of missing lug. (KS)
- Horizon 5L
- Comments: Well made and neatly finished; decoration is not fully regular.

CAT. NO. 29

- **AB102** (grave 66). Very large, well-made, smoothly finished, broad, amphora-shaped vessel with five small lugs and flat base. Tiefstich. Three to four continuous lines of large zigzag. Horizontal line at base of

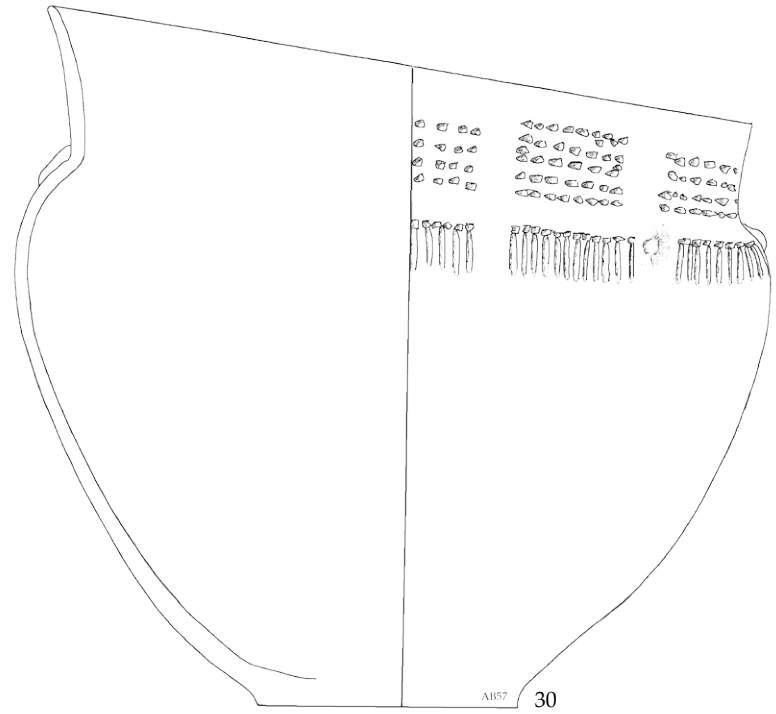


Figure 4.12 Dalfsen: Overview tureen amphoras catalogue nos 30-31.

Figure 4.13 Dalfsen: Irregular decoration (AB57).

neck and blocks of vertical lines on shoulder. Regular, thin walls (thickness 4 mm). Mottled brown-black, with black interior. Mainly fine and small quartz.

- Found with a tall, undecorated, shouldered vessel (AB101/cat. no. 89) and a flint axe. (KS)
- Horizon 5L
- Comments: Very regular decoration. Occurrence of five lugs is unusual.

CAT. NO. 30

- **AB57** (grave 25). Large tureen-amphora with comparatively short neck, deep body and flat base. Three of possibly originally four circular, dimpled bosses on shoulder. Irregularly executed stabs and grooved lines. Widely spaced small stab lines in blocks of four on the neck, line on shoulder with pendant short blocks of grooved lines. Bosses probably represent two spaced opposed pairs. Thin, regular walls (thickness 4-5 mm). Surfaces show abundant traces of smoothing, visible as horizontal, parallel, small facets. Pale grey-coloured

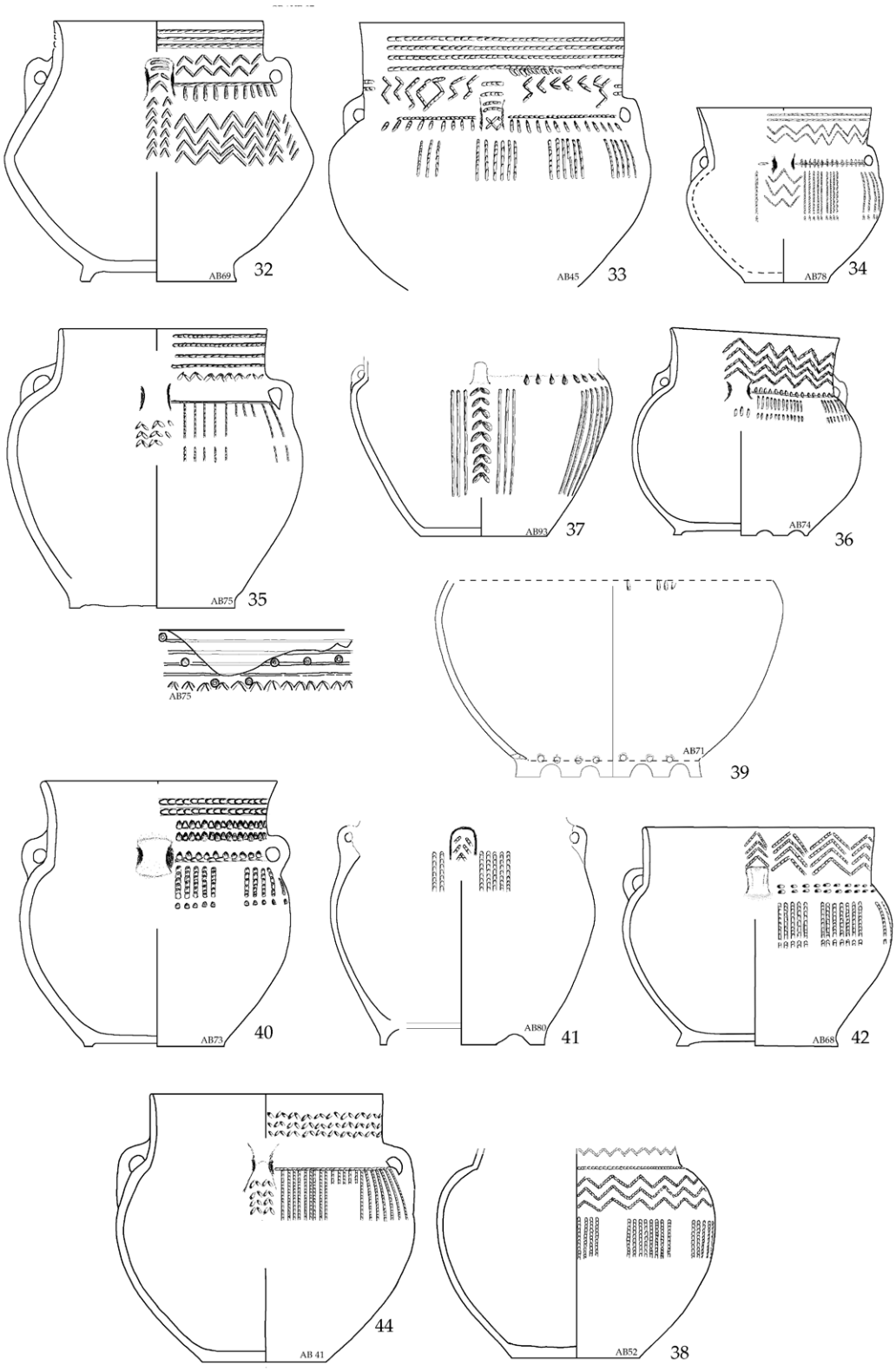


Figure 4.14 Dalfsen: overview amphoras AB 32-42.

paste with mainly fine white quartz grit. Extensively polished; lustre survives in many places. Traces of white paste in some grooves. (KS)
- Found with four other vessels – a shouldered cup (AB55/cat. no. 101), a small, undecorated amphora (AB56/cat. no. 52), and two undecorated collared flasks (AB53/cat. no. 195, AB54/cat. no. 106) – and a high-quality battle axe.
- Horizon 5L
- Comments: Lots of shallow smoothing marks visible on neck; on body slight plastic smear, *i.e.* still soft when smoothed. The bosses were applied before the grooving on the shoulder was executed. Although the vessel is large and shows traces of extensive work, neither decoration nor finish are regular (Fig. 4.13). The decoration shows traits of horizon 5, but the large size of the vessel points to the end of the horizon or possibly within horizon 6. The two collared flasks and the lugged cup are types that occur in horizons 6 and 7. In terms of grave goods, grave 25 is the richest grave in the cemetery.

CAT. NO. 31
- **AB30** (grave 26). Asymmetric, small tureen-amphora/shouldered bowl. Base with seven notches on irregular incipient ring base. Two opposed, narrow, horizontal lugs covering shoulder. Irregularly executed and inconsistent decoration of horizontal marks below rim and at neck base, and irregular, short blocks of 8-11 lines of tiefstich with pendant small, stab-like dots. Greyish with dark grey inside and irregularly dispersed medium quartz grits. Rim not in good condition, possibly truncated.
- Found with a large, short-necked, decorated bowl (AB33/cat. no. 87).
- Horizon 6
- Comments: The profile has more in common with a shouldered bowl; the two opposed lugs and the decoration suggest identification as a late amphora. See AB117/cat. no. 114 for similar vessel.

4.3.4 Amphoras (cat. nos. 32-54)

Amphoras (Figs 4.14 and 4.22) were used from at least horizon 2 until at least horizon 6. They usually have proportions that are tall rather than short, with straight necks and a distinct junction between neck and shoulder. The shoulders can be rounded or straight, and either long or short. These vessels usually have two or four small lugs, set across the junction of the neck and shoulder. Bases are usually flat (three examples here have small feet or gapped bases, cat. nos. 36, 39 and 41).

Amphora occur during horizons 4-6 at Dalfsen. There are a large number of undecorated examples. Amphora are often very well made, with thin, highly finished walls and even, regularly impressed decoration. They are usually smaller than tureens and tureen-amphora. Three amphoras have small feet or gapped bases (cat. nos. 36, 39 and 41). A total of 23 amphora have been identified, of which 13 are decorated.

CAT. NO. 32
- **AB69** (grave 87). Vertical neck (thickness 4 mm) and angular body with long shoulder, two opposed, prominent, horizontally perforated lugs, and small ring base. Perforation is unusual in being very neat on inside (Fig. 4.15). Fine pointed tiefstich, very closely impressed. Shoulder decoration varies from four to five zigzags. Only one lug is decorated (Figs 4.16 and 4.17). Large sherd missing from lower body, with post-firing perforation preserved between missing piece and base. No grits visible. Greyish beige paste, smoothed and retaining high gloss in many places.
- Found with tureen-amphora AB70/cat. no. 6.
- Horizon 4L
- Comments: Quite nicely made. It does not seem to be the same paste as AB70/cat. no. 6. The two pots are not a pair, but they do have some similarities, such as the fringe at the top of the shoulder.
- Cat. no. 33
- **AB45** (grave 85). Vertical neck, fairly high shoulder, two opposed, decorated lugs, base missing. Irregular decoration includes fine tiefstich and small amount of tvaerstik (Figs 4.18 and 4.19). Decoration irregularly executed, with upcasts. Thin, regular wall with slightly undulating surface (thickness 3 mm). Brown externally, black inside, with fine, white grit visible.
- Horizon 4L

CAT. NO. 34
- **AB78** (grave 41). Small, nearly complete (missing part of neck), with two opposed lugs and flat base (wall thickness 3 mm, but narrowing to less than 2 mm at rim tip). Tiefstich, very narrow, pointed stylus. Two continuous lines under rim, two zigzag lines on neck, tiefstich line at neck-shoulder junction, with small, vertical lines above and below and executed separately (*i.e.* not crossing horizontal line). Blocks of vertical lines on shoulder ending in fringe of fine stabs. Lugs not decorated, small panel of three Ws below each lug. Execution of decoration and walls not fully regular, and final smoothing has contributed to loss of surface at widest part of pot. Bright brown, mottled. Traces of white paste in some places.
- Found with two undecorated, thick, robust bowls (AB77/cat. no. 68 and AB79/cat. no. 67).
- Horizon 4L

Figure 4.15 Dalfsen: Neatly finished perforation on the inside (AB69).

Figure 4.16 Dalfsen: Decorated lug (AB69).

Figure 4.17 Dalfsen: Undecorated lug (AB69).

Figure 4.18 Dalfsen: Carelessly executed and finished decoration (AB45).

Figure 4.19 Dalfsen: Inserted short section of tvaerstik (AB45).

CAT. NO. 35

- **AB75** (grave 94). Vertical neck, rounded body, two opposed, thick lugs with rectangular cross-section, and incipient ring base. Fine pointed tiefstich. Four lines below rim, small stab zigzag line below, with small gap to base of neck. Horizontal line at base of neck, with vertical, short lines running into vertical blocks (4-7 lines) ending in short lines. Three lines of stab zigzag below undecorated lugs. Slightly burnished after decoration. Large, crescent-shaped repair with at least seven post-firing perforations made from outside. Bright brown with mottled black patches. Slightly burnished after decoration (clay pressed into incised decoration).
- Found with a small drinking vessel (AB76/cat. no. 111).
- Horizon 4L
- Comments: An unusual aspect of this pot is that one side of the neck is comparatively neatly decorated while the other, damaged side of the pot is more irregular and less neatly decorated (this applies not only to the outside of the neck, but also to the inside of the neck). The lines are not straight, the tiefstich runs in the opposite direction at one point, and the zigzag is also irregular. The rim is damaged on this side, and there is a line of seven perforations of the type normally used for repair. The absent sherd along the rim is narrow and was bound into place, as there was insufficient room for twin perforations. The vessel is complete except for the damaged part of the neck. The decoration appears to have been executed by two people, one skilled, the other unskilled.

CAT. NO. 36

- **AB74** (grave 44). Incomplete, but with complete profile. Small, with rounded body and base with seven low, broad feet separated by similar-sized gaps. One lug preserved. Very fine tiefstich (*NB* finer than shown in sketch). Broad notches creating similar-sized feet. Inside, grey with medium grit similar to AB30/cat. no. 31. Beige-grey. Very neatly finished and smoothed.
- Horizon 5
- Comments: This vessel may have originally had only one lug rather than two opposed lugs. Exceptionally well-made pot. Probably originally complete, now missing part of neck and shoulder and upper body.

CAT. NO. 37

- **AB93** (grave 71). Incomplete, with lugs and irregular, flat base, represented only by part of body and lowest part of one lug (Fig. 4.20). Short and high shoulder. Deeply incised decoration (unusual in this assemblage) with slight upcasts, which have been pressed down (Fig. 4.20, on the left). Strip of vertical chevrons below lug. Fairly thin, regular and neatly finished walls (thickness 3 mm), final smoothing when nearly dry. Fine quartz and mica visible only on inside surface. Bright beige with black mottling and patches of lustre and pale grey interior.
- Horizon 5
- Comments: Similar colour, workmanship and paste to AB21/cat. no. 99 in nearby grave, which suggests same date. Quite high quality.

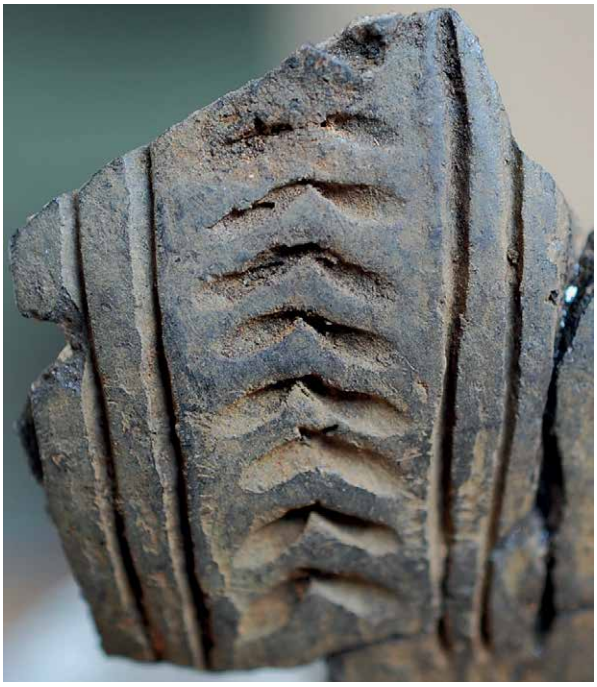


Figure 4.20 Dalfsen: Base of lug at top of sherd (AB93).

CAT. NO. 38

- **AB52** (grave 90). Incomplete, represented by parts of rounded body and smooth, flat base. No evidence preserved for lugs. Tiefstich (small with square tip), fairly regularly impressed. Evidence for zigzag line on neck, horizontal line at base of neck, band of three zigzag lines on shoulder and blocks (6-8 lines) on upper body. Very regularly finished, smoothed and decorated (thickness 2-4 mm). Brown-orange colour. Fine and fine to small quartz grit visible in places where surface has been pushed down during burnishing. Inside has been very regularly smoothed. Smeared when nearly dry. Traces of white paste.
- Horizon 4L
- Comments: Very high quality; one of the best-made vessels in this assemblage.

CAT. NO. 39

- **AB71** (grave 59). Represented by part of lower body. Well made, with regular, fairly thin, smooth walls (thickness 3 mm). Traces of lowest part of tiefstich decoration visible at what was vessel's widest point. Base entirely missing, but originally had feet separated by distinct notches; the locations of three are still visible (Fig. 4.21). At some point, the base became detached along the manufacturing line and was 'sewn back' with post-firing perforations, 16 of which can be identified. These vary in size from small to large. Bright beige-brown with fine, white grit.
- Found with a bowl (AB72/cat. no. 57). (KS)
- Horizon 5
- Comments: The separation of the base from the rest of the pot probably occurred when the vessel was cooling after firing. The quality of the finish and the care taken to replace the base suggest that the vessel was well made and decorated originally.

CAT. NO. 40

- **AB73** (grave 5). Complete, except for part of neck and some damage to rim. Rounded body, two opposed lugs and very neat incipient ring base. Neatly shaped strap lugs (one pair only) with rectangular cross-section. Tiefstich and stabs, all decoration executed with one implement. Two horizontal, continuous lines, two lines of dot-like stabs. At base of neck, double line consisting of primary line similar to those below rim and super-impressed second line of individual, dot-like stabs which partially overlay it. On shoulder, short blocks of verticals (usually seven, but six or eight also occur) ending in a fringe of dots. Very neatly made, finished and decorated. Thickness 2-4 mm. Surfaces exceptionally smooth, thoroughly rubbed and lightly burnished, probably repeatedly. Grey-beige inside, patchy grey and beige outside. Very little grit visible but includes white quartz grit. Smoothing marks are visible on the inside. Some white paste.
- Sherds V561, V567, V570, V574, V585, V589, V599, V618 found in filling of grave, probably incidental.
- Horizon 5

CAT. NO. 41

- **AB80** (grave 46). Represented by portion of lower body and base and part of one lug. Very regular, well-smoothed walls (orange colour). Irregular-sized feet, probably five originally, gapped (not notched). Small portion of one decorated lug is preserved, as well as decoration on the upper body. Thin walled and well finished (thickness 3-4 mm), with fine quartz. Wiped when fairly dry. Orange-brown.
- Horizon 5
- Comments: High quality.

Figure 4.21 Dalfsen: Perforations seen from the inside (AB71).

CAT. NO. 42

- **AB68** (grave 6). Complete. Rounded body, single small, undecorated lug (rectangular cross-section and slightly protruding incipient ring base; see AB15). Neatly finished flat rim tip. Fine pointed tiefstich. Band of zigzag consisting of blocks of four oblique lines in opposing directions. Two lines of stabs (left to right) at neck-shoulder junction, neat blocks of fine vertical tiefstich terminating in line of stabs on shoulder. Darker and lighter mottled greys with some fine white quartz grit visible on inside surfaces (no breaks). Regular walls (thickness 2 mm at rim tip) with very slightly undulating (smoothing pressure of tool) although otherwise smooth surfaces. Some white paste. Vessel is very well made, decoration well executed, but has minor irregularities.
- Sherds V624, V634 found in filling of grave, probably incidental.
- Horizon 5
- Comments: Although amphoras are usually associated with two lugs, single lugs are occasionally identified. They can usually be identified only on complete vessels and are therefore probably under-represented in the record. Nearly top quality.

CAT. NO. 43

- **AB85** (grave 16). Rounded body, two opposed lugs (D-shaped section) on shoulder and small, distinct ring base. Almost all neck missing but otherwise vessel intact. Tiefstich, rounded head with impressions set close together. Neck decoration includes blocks of horizontal lines with gaps coinciding with gaps on shoulder. Horizontal line at base of neck with vertical blocks (usually 9 lines but varying from 8 to 11), ending in line of vertical stabs. Three horizontal lines below

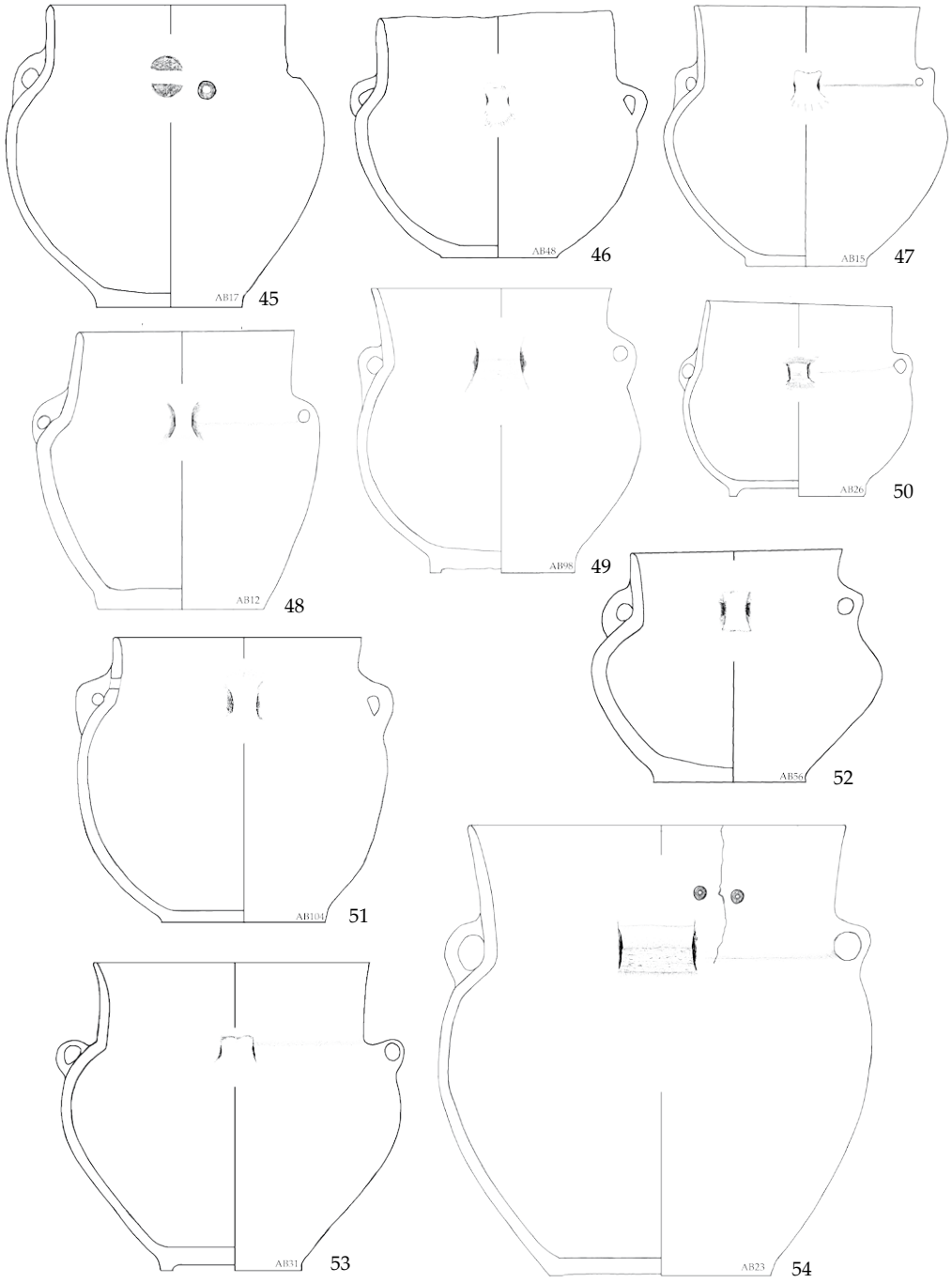


Figure 4.22 Dalfsen: overview amphoras catalogue nos 45-53.

each lug. Very regular, well-smoothed walls (thickness 3 mm). Smoothing marks are visible between blocks of decoration on shoulder. High gloss still preserved. Small quantity of fine quartz and one piece of iron visible but no fresh breaks.
- Horizon 5
- Comments: The decoration is slightly uneven in execution, but the finish is exceptional. The vessel has been extensively smoothed as well as burnished on the outside.

CAT. NO. 44
- **AB41** (grave 95). Rounded body, two opposed lugs and smooth, flat base. Tiefstich, neatly executed. Three lines small stab zigzag (executed L-R) not directly below rim. Similar decoration in small panel below lugs. Horizontal line at base of neck with pendant blocks of vertical lines interspersed with blocks of short fringe. Very well made and finished with very regular, smooth walls (thickness 3-4 mm). Orangey brown colour with small quantity of quartz. High quality.
- Found with a bowl (AB42/cat. no. 59).
- Horizon 4L
- Comments: On the neck, small, parallel smoothing marks of something hard are visible below the decoration. Shoulder is exceptionally smooth, probably a final smoothing after the shoulder decoration was executed. The lower body is very smooth but slightly undulating from coils. Probably burnished.

CAT. NO. 45
- **AB17** (grave 47). Near complete, undecorated, two opposed, horizontal lugs and flat base (missing half of neck and rim and both lugs but otherwise in good condition). One post-firing perforation survives on shoulder close to one of lugs. Neatly formed and finished (thickness 2 mm at rim, c. 4 mm elsewhere). Smoothed with something hard and then wiped with something that left thin scratches? Surface has slightly undulating feel. Some lustre especially where dark or black coloured. Largely dark grey to black with some lighter bright brown mottling. Fine and small white grit visible on interior. Very thin, hard, possibly burnt deposit on parts of interior.
- Horizon 5

CAT. NO. 46
- **AB48** (grave 36). Reassembled (complete profile), undecorated, with two opposed lugs (D-shaped section, morticed), and base with incipient ring base. Fairly regular walls (thickness 3-4 mm). Lower body is more thoroughly smoothed and burnished than neck, where smoothing marks are still visible. Black and grey with gloss where black. Fine and small quartz grit visible. (KS)
- grave 36. Small fragments of pottery (V853 and V857) found in filling of grave, probably incidental.
- Horizon 5
- Comments: Quite similar in terms of finish to bowl AB4/cat. no. 76.

CAT. NO. 47
- **AB15** (grave 70). Undecorated, with two opposed, small lugs and flat base. Regular, smooth, thin walls (thickness 2-3 mm), neatly finished.
- Horizon 5
- Comments: Lugs are fairly similar to those on AB68/cat. no. 42.

CAT. NO. 48
- **AB12** (grave 11). Complete except for slight damage to the rim. Undecorated, asymmetric vessel with neck and shortish shoulder, two opposed lugs and flat but not completely smooth base. Walls slightly irregular (thickness 2-3 mm at rim). Smoothed and lightly rubbed with lots of marks from this process visible. Generally dull surface or very slight gleam seems to be original. Dark brown with patches of black. Some white quartz visible where rim is damaged.
- Sherds V568, V578, V974 found in filling of grave, probably incidental.
- Horizon 5
- Comments: The location within the cemetery indicates a date in horizon 5.

CAT. NO. 49
- **AB98** (grave 20)**.** Complete, undecorated, with slightly open neck, two opposed, applied, horizontally perforated lugs at neck-shoulder junction, and long shoulder. Very slight incipient ring base. Wall thickness 4 mm where measured but probably thicker elsewhere. Smoothing marks visible, some gloss. Some damage to rim and neck but otherwise intact. Dark and light grey mottled with light grey on inside. Fine, small and medium white grit, visible especially on inside.
- Found with a large tureen-amphora (AB97/cat. no. 18). Incidental sherds V943, V913, V945, V863 (crumb) found in fill of grave.
- Horizon 5
- Comments: This pot has been squashed slightly while still malleable. The inclusion of large tureen-amphora (AB97/cat. no. 18) and the position of this grave towards the eastern end of the cemetery suggest a late stage within horizon 5 for this undecorated vessel.

CAT. NO. 50
- **AB26** (grave 62). Vertical neck and smallish shoulder with two opposed lugs (low, D-shaped section) and an incipient ring base. Very thin, regular walls (thickness

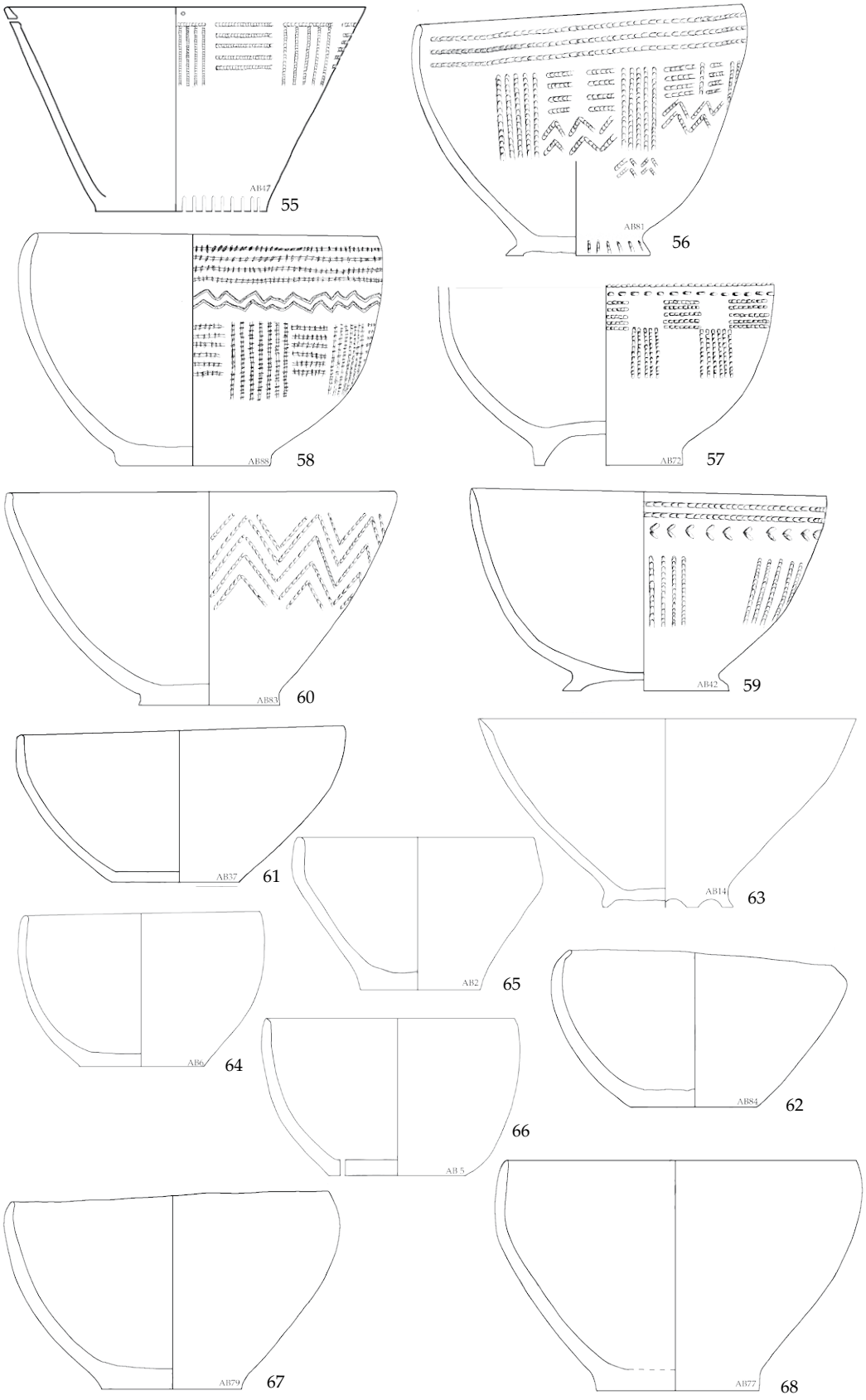


Figure 4.23 Dalfsen: overview of bowls catalogue nos 55-68.

2 mm). Grey with darker patches. Some fine quartz visible but no fresh breaks. Very worn surface with traces of slightly gleaming rubbed surface where sufficiently well preserved. Reassembled, nearly complete.
- Found with a tall, shouldered bowl (AB25/cat. no. 90).
- Horizon 5
- Comments: This association of pots is important because grave 62 overlies the 'ditch' and must date to at least horizon 5L.

CAT. NO. 51
- **AB104** (grave 30). Complete, undecorated amphora with two opposed lugs (D-shaped, one now missing) and flat base. Well-smoothed and rubbed walls with now dull surfaces (thickness 3-4 mm). Fine and small white quartz. Mottled beige and grey. Black deposit on outside and inside. Neck was squashed while the clay was still malleable but after it had been given its final smoothing.
- Found with a short-necked bowl (AB103/cat. no. 88).
- Horizon 6

CAT. NO. 52
- **AB56** (grave 25). Vertical neck, large, pronounced shoulder, two opposed lugs (with shallow, vertical indentation) at junction of neck and shoulder, and flat base. Undulating walls are fairly regular and smooth (thickness c. 4 mm). Traces of shaping and smoothing on exterior have not been eradicated by burnishing process, which has revealed some small grit. Slight lustre visible in places. Mottled beige, grey. Fine and small and medium white grit.
- Found with four other vessels, large tureen-amphora (AB57/cat. no. 30), shouldered cup (AB55/cat. no. 101), and two collared flasks (AB53/cat. no. 105 and AB54/cat. no. 106).
- Horizon 5L/6
- Comments: This vessel belongs to the richest grave in the cemetery, with five vessels and an exceptional battle axe. The type of amphora (straight neck and angular body) shows that angular-profiled vessels were not confined to horizons 2 and 3. The paste, finish and fabric are similar to that of the collared flasks, indicating that AB56 is not an accidental inclusion in the grave.

CAT. NO. 53
- **AB31** (grave 27). Vertical, comparatively long neck, two opposed lugs (thin, rectangular section, one now missing but represented by mortice) on a fairly shoulder and slight ring base. Fairly regular, slightly undulating, smooth walls (thickness 3-4 mm). Interior shows parallel horizontal smoothing marks; also faintly visible on outside. Slight gleam in places on outside where well preserved. Very dark grey paste with fine and small quartz visible. Some white grit visible on inside. Black on inside, light beige in patches on outside. Burnt seed impression near rim.
- Found with the lower body and base (AB32/cat. no. 121) of a second vessel that is possibly similar to AB24/cat. no. 91 and AB98/cat. no. 49.
- Horizon 6

CAT. NO. 54
- **AB23** (grave 23). Tall neck and rounded body, two opposed, undecorated tunnel lugs and very slight incipient ring base. Smooth, regular and well-finished surfaces. Some grit visible in smoothed surface. Vertical dunt in neck, with two post-firing perforations.
- Found with a shouldered vase (AB24/cat. no. 91).
- Horizon 6
- Comments: The location of grave 23, at the eastern end of the cemetery, suggests a late date, horizon 6 or possibly horizon 7. The former is more likely based on the taller proportions and more cylindrical form of the necks of the two pots.

4.3.5 Bowls (cat. nos. 55-85)

The bowls have curved walls and range in shape from neutral (*e.g.* cat. no. 64), to open (*e.g.* cat. no. 63) and closed (*e.g.* cat. no. 85), and include both tall (*e.g.* cat. no. 76) and wide and shallow forms (*e.g.* cat. no. 83). There is one example of a straight-sided bowl (*e.g.* cat. no. 55). Bases include flat, pedestalled, protruding, gapped and footed. Two bases have decoration around the edge. Of particular interest are fairly robust, thick-walled vessels in a late horizon 4/early horizon 5 contexts and a series of multi-bossed bowls in horizon 5, as these are types not hitherto closely datable. This series shows the changes in bowl types common at particular times. Two vessels have unusual pre-firing perforations (cat. no. 55 below the rim, cat. no. 66 in the base). Only one bowl (cat. no. 84) has been repaired. Bowls occur during every stage of TRB pottery manufacture. A total of 31 bowls are represented in this assemblage, only 12 of which are decorated.

CAT. NO. 55
- **AB47** (grave 86). Straight-sided, open, decorated bowl with flat base (*NB* not raised as suggested in profile drawing accompanying photographs of pot). About half of vessel is preserved. One small, pre-firing perforation (diameter 2 mm; Fig. 4.81) close to the rim, not two as suggested in photograph of pot. No evidence for lugs or bosses. Tiefstich (square-tipped) decoration on upper part and on edge of base. Vertical and

horizontal blocks (5-6 lines) alternate (vertical lines pendant from a single horizontal line). Short, vertical lines around base. Regular, fairly smooth walls (thickness 5-6 mm). Mottled darkish brown. Mixed grits, including large to medium pieces? Black stain on inside upper half. (KS)

- Found with a tureen (AB46/cat. no. 1). Small base fragment (V1374) of another pot found in fill of grave, probably incidental inclusion.
- Horizon 4L
- Comments: Perforated before firing, from the outside. All three pots in this group show different levels of skills. They are unlikely to have been made at the same time or by the same person (*NB* catalogue photograph suggests incorrectly that there are two pre-firing perforations).

CAT. NO. 56

- **AB81** (grave 92). Complete. Protruding, decorated base with incipient ring. Tiefstich. Decoration not symmetric. Vertical blocks (5-6 vertical lines) separating panels of two horizontal blocks (4 lines) above zigzag decoration. Vertical lines on part of base only. Not highly finished, decoration somewhat irregular. Walls fairly regular (thickness 3 mm at rim, thicker farther down, probably 4 mm) but are not smooth to touch. Surfaces appear to have been wet wiped (fine smear marks visible with aid of hand lens). Mottled greys and beige with some small white quartz visible.
- Associated with second bowl (AB82/cat. no. 109).
- Horizon 4L
- Comments: This vessel has a 'front' and a 'back', the latter with pairs of inverted Vs below the block of vertical lines and no decoration on the base. The horizontal blocks are split into two in three cases by smudging a vertical path through the lines. The other three panels consist of two separately executed blocks.

CAT. NO. 57

- **AB72** (grave 59). Incomplete, thick-walled (thickness 6 mm), decorated bowl with unusually distinctive hollow base, slightly raised on interior. Rim and uppermost part missing. Tiefstich (fine rectangular). Horizontal lines below rim terminating in hyphenated line (*NB* the hyphenated parts are closer together than shown in sketch). Band of blocks of five horizontals above band of blocks of six verticals. Mottled beige and brown. No fresh breaks but some fine quartz and a small, rounded pebble (4 × 4 mm) visible. Neatly made and finished.
- Found with an amphora (AB70/cat. no. 6). V763 found in filling of grave, probably incidental.
- Horizon 5

Figure 4.24 Dalfsen: Tvaerstik (AB88).

CAT. NO. 58

- **AB88** (grave 55/57). Incipient ring base and no lugs. Combination of tiefstich and tvaerstik (Fig. 4.24). Four horizontal lines, two lines of zigzag, alternating vertical and horizontal blocks. Regular, fairly smooth but with smoothing marks visible. Brownish orange (thickness 2 mm at rim, 5-6 mm elsewhere). Black and white grit.
- Found with two other vessels: a tureen (AB89/cat. no. 2) and a small, straight-sided open vessel (AB7/cat. no. 108).
- Horizon 4L
- Comments: Some of the tiefstich appears to have been executed either by a left-handed person or with the bowl held upside down. One of only four vessels with tvaerstik decoration.

CAT. NO. 59

- **AB42** (grave 95). Gently protruding foot and incipient ring base. Tiefstich, rectangular. Two horizontal lines below rim, line of horizontal, stabbed chevrons with blocks of seven to eight vertical lines below. Walls regular and fairly smooth (thickness 2 mm at rim, 5-6 mm lower down). Beige-brown, with some quartz visible but no clean breaks. Medium quality. Slight upcast on chevron. Some paste survives.
- Associated with amphora (AB41/cat. no. 44).
- Horizon 5

CAT. NO. 60

- **AB83** (grave 84). Complete except for small area of damage to rim. Open, with flat base. Tiefstich, narrow, circular impressions. Decoration irregularly executed. Broad band of five large zigzags consisting of three continuous lines infilled with standing and

inverted large Vs. Regular but slightly undulating walls (thickness 5 mm), not highly smoothed. Seems to have been generally rubbed, possibly with leather, but not burnished. Slightly mottled dark grey to beige. Fine and some medium and larger white grit.
- Associated with second, undecorated bowl (AB84/cat. no. 62).
- Horizon 4L

CAT. NO. 61
- **AB37** (grave 72). Almost complete, undecorated, wide, shallow, slightly asymmetric bowl with flat base. Fairly smooth but not regular (thickness 3 mm at rim, thickening to 4 mm). Irregular smoothing marks on inside. Possible seed impression on base. Mottled brown and dark grey. Fine and small white grit visible.
- Associated with miniature vessel with late horizon 4 decoration (AB38/cat. no. 107).
- Horizon 4L

CAT. NO. 62
- **AB84** (grave 84). Undecorated, asymmetric, well smoothed, with in-turned rim and thick walls, and flat base. Fairly regular but slightly undulating walls, smooth on outside (thickness 5 mm). Pale beige, some mica visible. Fine, small and medium grits irregularly dispersed. Missing piece towards base but otherwise intact. Not highly finished, rather crude.
- Associated with second, decorated bowl (AB83/cat. no. 60).
- Horizon 4L

CAT. NO. 63
- **AB14** (grave 53). Incomplete, open bowl with notched base, represented by full profile and most of base. Probably without bosses or lugs. Slight bevel to rim. Base includes four wide, shallow notches or feet, may originally have had five. Regular wall with slight polish but not highly smoothed (thickness 3 mm), has not been burnished. Brown mottled black and beige. Fine quartz grit.
- Horizon 5

CAT. NO. 64
- **AB6** (grave 78). Complete, small, undecorated, with thin, regular walls narrowing to rim, and flat base. Well shaped and regular but not highly smoothed (thickness 2 mm; thickness 1 mm at rim tip). Beige-brown paste. Some small quartz visible on inside. Some wiping marks visible.
- Horizon 5
- Comments: Identified as horizon 5 on basis of the shape, fabric and location within cemetery of the grave.

CAT. NO. 65
- **AB2** (grave 65). Complete. Small, thick-walled (thickness 4 mm at rim), slightly angular bowl with flat base. Undecorated. Robust but not highly finished. Scrape marks on inside, slight wet finish. Mottled beige and grey. No fresh breaks but some fine quartz and possibly feldspar visible. Dull surfaces.
- Horizon 5
- Comments: Dated to horizon 5 on basis of greyish colour, soot patches and location of grave at eastern end of cemetery. Nearby graves belong to horizons 6 and 7.

CAT. NO. 66
- **AB5** (grave 37). Thick-walled, with neutral profile and flat base, which rises on the inside. Small, cylindrical perforation (diameter 3 mm) made before firing in base close to the wall (Fig. 4.79). Carefully but not fully smoothed, thick walls inside and out (thickness 3-5 mm, base thickness 7 mm). Fine and small quartz visible; looks like a well-sorted clay rather than one to which grit has been added.
- Horizon 5, probably early
- Comments: Random, pre-firing perforations, either single or multiple, occur occasionally in the bases of TRB vessels. Their function is unknown. This one is unusually large and regular.

CAT. NO. 67
- **AB79** (grave 41). Reassembled and nearly complete, undecorated, thick-walled, robust bowl (thickness 4-6 mm) and probably flat base. Asymmetrical (height 8.5-9.5 cm) but very well-smoothed, regular walls with no visible grit either inside or outside. Base is damaged. Dull surfaces. No fresh breaks and only sparse fine quartz grit noted. (KS)
- Found with a second thick and robust bowl (AB77/cat. no. 68) and a small, decorated amphora (AB78/cat. no. 34).
- Horizon 4L
- Comments: Very similar to AB77/cat. no. 68. Paste and finish appear to be similar to two tureen-amphoras (AB65/cat. no. 13 and AB66/cat. no. 14) found in grave 68.

CAT. NO. 68
- **AB77** (grave 41). Undecorated, thick-walled bowl. Reassembled full profile but not complete. Very regular wall (thickness 5-6 mm), smooth surfaces (almost no smoothing marks visible anywhere except on base). Dull surfaces. Orangey brown colour. Little visible grit but bright orange inclusions and small quartz noted.
- Found with a second thick and robust bowl (AB79/cat. no. 67) and a small, decorated amphora (AB78/cat. no. 34).
- Horizon 4L
- Comments: Very similar to AB79.

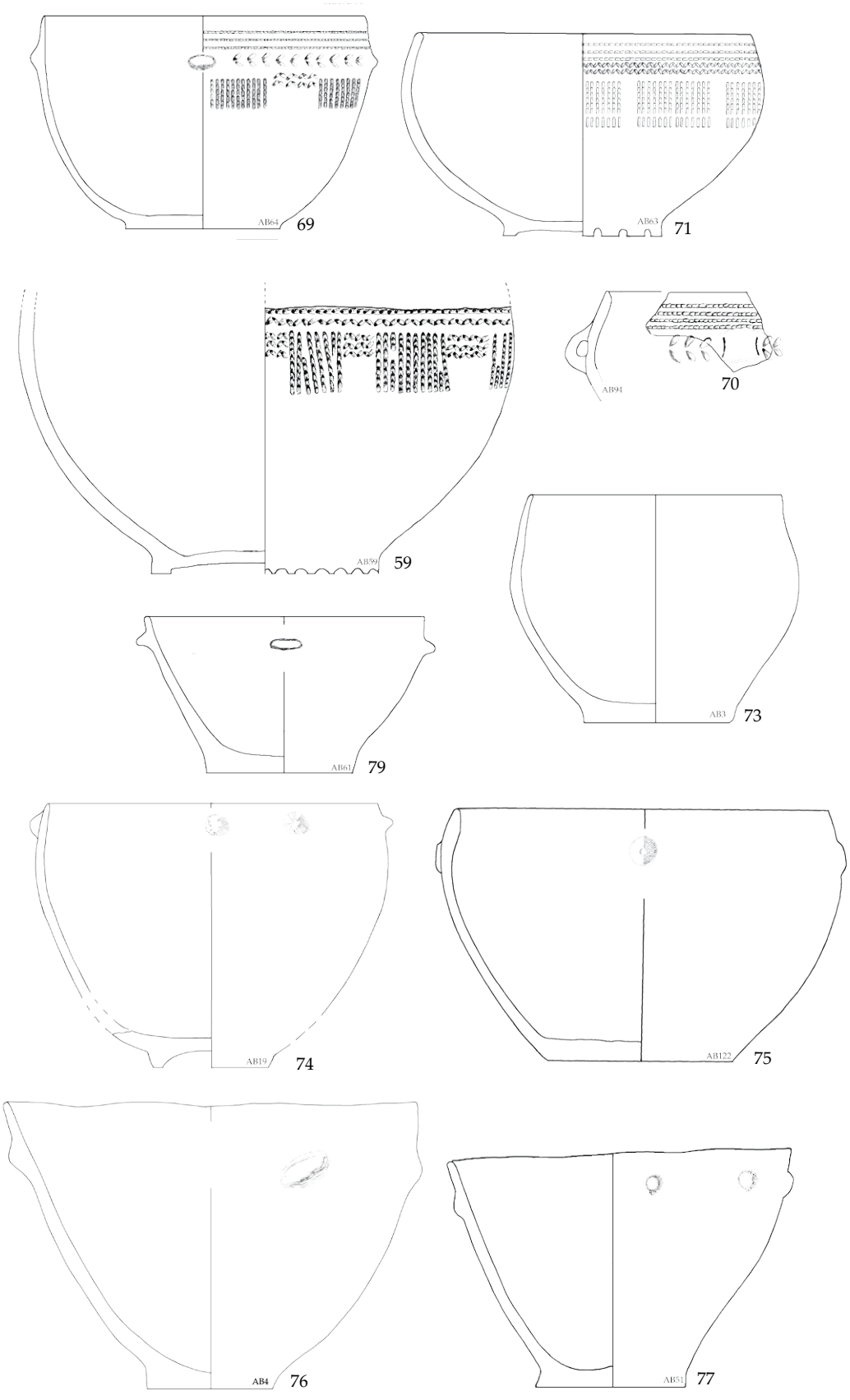


Figure 4.25 Dalfsen: overview bowls catalogue nos 69-77, 79.

CAT. NO. 69

- **AB64** (grave 54). Incomplete, with two of probably originally four very small, horizontal bosses (probably originally equally spaced) and incipient ring base. Tiefstich. Three continuous lines under rim, line of chevrons (opposed stabs from right to left) below this broken by the small, applied bosses. Blocks of verticals interspersed with pairs of zigzag lines. No decoration under bosses. Relatively well-finished, regular, fairly smooth surface, not burnished, smoothing marks visible. Brown with no fresh breaks. Fine and some small quartz grit (thickness 2 mm at rim, 4 mm elsewhere).
- Horizon 5, probably early

CAT. NO. 70

- **AB94** (grave 75). Rim and lug sherd of decorated bowl with horizontally perforated, small lug. Tiefstich, pointed. Traces of line of horizontal stabbed chevron. Neatly smoothed after decoration, no visible casts. Beige-grey to small white quartz and pink feldspar (?).
- Horizon 5, probably early
- Comments: No other sherds of this pot were recovered.

CAT. NO. 71

- **AB63** (grave 79). Incomplete, missing large piece on one side. Slightly closed mouth, base with 15 distinctive cuts on incipient ring. Tiefstich, narrow pointed (one implement). Three horizontal lines below rim, two narrow stabbed zigzags (continuous left to right). Wide blocks of fairly short lines interspersed by small gaps. Line of vertical stabs below blocks. Well-smoothed and rubbed exterior surface, neatly finished, with regular decoration (thickness 2 mm at rim tip, 5-6 mm on wall). Mottled grey brown. Fine and small white grit visible. Some white paste still present.
- Horizon 5, probably early

CAT. NO. 72

- **AB59** (grave 51). Large, decorated bowl, missing rim and uppermost part. No visible evidence for lugs. Flat base with 20 small notches. Tiefstich. Horizontal lines below the rim, one line of small, continuously stabbed zigzag, blocks of vertical lines interspersed with short blocks of three small zigzag lines. Most blocks include one or more extra lines towards base of block. Brown-coloured, densely gritted quartz paste, very friable. Regular, well-smoothed walls. Burnishing has revealed grits.
- Horizon 5, probably early
- Comments: The coils have been added to the outside, which is not common.

CAT. NO. 73

- **AB3** (grave 48). Slightly biconical bowl with flat base (wall thickness *c.* 2 mm at rim). Complete except for some chipping along rim. Smoothed but still slightly irregular walls. Interior black, exterior dark brown mottled. Black paste with small and medium white quartz.
- Horizon 5

CAT. NO. 74

- **AB19** (grave 1). Incomplete with slightly closed mouth and distinctive hollow base. Small, applied bosses 4 mm below rim attached directly to wall (possibly up to seven originally). Regular, well-smoothed, thick walls (thickness 4-5 mm). Mottled brown and black grey. Fine white quartz. (KS)
- Found with a second bowl (AB122/cat. no. 75). Incidental sherds V330 found in grave fill.
- Horizon 5
- Comments: These bowls have been assigned to horizon 5 on the basis of the location of the grave within the cemetery. The association of a similar bowl (AB51/cat. no. 77) with a decorated tureen-amphora (AB49/cat. no. 17) in grave 35 provides support for this date.

CAT. NO. 75

- **AB122** (grave 1). Incomplete (paper reconstruction) with slightly bevelled rim and slightly closed mouth, four dimpled bosses 2 cm below rim (possibly the original number), and flat base. Surfaces now worn but well smoothed and regular (wall thickness 5 mm-6 mm). Grey paste with large amount of small and medium white quartz. (KS)
- Found with a second bowl (AB19/cat. no. 74). Sherds V330 found in filling of grave, probably incidental.
- Horizon 5
- Comments: See cat. no. 74 for comment.

CAT. NO. 76

- **AB4** (grave 7). Asymmetric open bowl with five horizontal, irregular ovoid-shaped bosses approximately 3 cm below rim, and flat base. Walls not regular although relatively smooth and glossy in places (thickness 5-6 mm where measured). Rim tip varies from narrow rounded to thicker and flatter. Beige-grey patches of back. Very little grit visible (no clean breaks) except for sporadic fine white quartz.
- Horizon 5
- Comments: This pot was made by an inexperienced potter. The asymmetry is not due to slumping but to pushing out the walls. The bosses are of different shapes and sizes and are at different distances below the rim. Grave 7 overlies the 'ditch' which means that grave 7 and AB4 must date to late horizon 5 at the

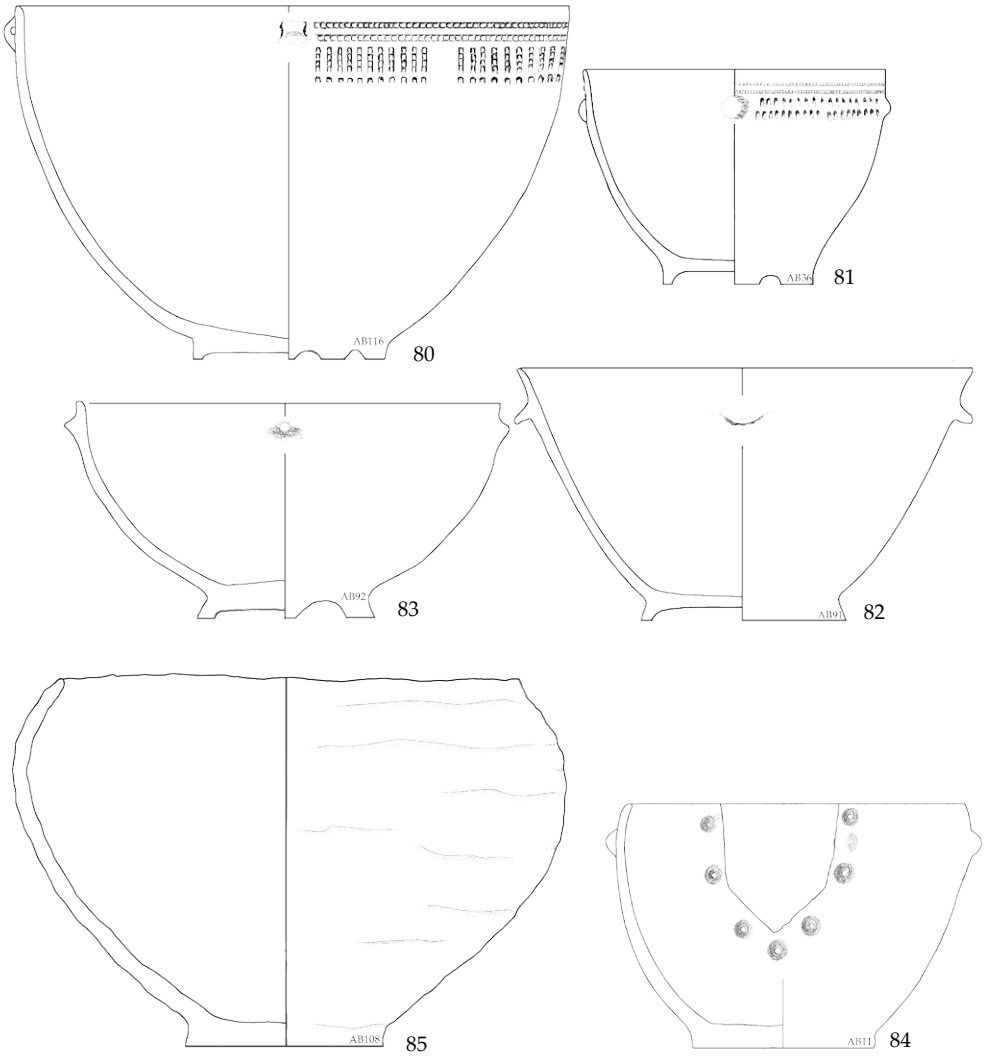


Figure 4.26 Dalfsen: overview bowls catalogue nos 80-85.

earliest. The bowl is similar to AB51/cat. no. 77, which is associated with a tureen-amphora (AB49/cat. no. 17) with horizon 5 decoration.

CAT. NO. 77

- **AB51** (grave 35). Asymmetric, open bowl with five small, irregularly shaped bosses and flat base. Regular walls (thickness 4-5 mm) with a fairly smooth, dull finish. Little grit is visible, but it includes possibly feldspar and white quartz.
- Found with a decorated tureen-amphora (AB49/cat. no. 17) and an undecorated, miniature lugged vessel (AB50/cat. no. 113).
- Horizon 5
- Comments: Similar bowls were also found in graves 7 and 17. AB51 is important because of its association with a decorated tureen-amphora of horizon 5.

CAT. NO. 78

- **AB86** (grave 17). Undecorated, open bowl with four small bosses in two pairs and flat base. Walls not fully regular but smooth (thickness 5 mm at rim). Dark brown mottled black with black interior. No fresh breaks, small white quartz visible. The vessel is not highly finished.
- Horizon 5

CAT. NO. 79

- **AB61** (grave 10). Open, slightly curved, asymmetric bowl with two small, opposed, horizontal lugs and flat

base. Intact but missing part of upper body. Regular but not quite smooth walls (thickness 6 mm). Greyish brown with patches of black on outside. Thin layer of charred black material in patches on upper inside and outer. Fairly abundant fine and small feldspar (?) and quartz grit. Exterior seems to have been finished by wiping when slightly soft.
- Found with a miscellaneous biconical vessel (AB62/cat. no. 116). Sherds of other pots (V605) found in filling of grave, probably incidental.
- Horizon 5
- Comments: Both vessels have smooth, flat bases (similar to vessels AB50/cat. no. 113, AB52/cat. no. 38 and AB10/cat. no. 104). They have not been made from the same paste.

CAT. NO. 80

- **AB116** (grave 29). Smooth-profiled with three equally spaced, small, horizontally pierced, neatly cylindrical lugs with thin, rectangular section, and low ring base with five notches. Double impressed tiefstich, irregularly executed (Fig. 4.27). Two horizontal lines below rim, blocks of short verticals (12-16) with small gaps. One side fairly regularly decorated, other less regular. Fairly Regular walls (thickness 4-5 mm). Brown-beige paste with fairly abundant fine and small quartz grit. (KS)
- Also included two other vessels, a short necked bowl (AB115/cat. no. 86) and a miscellaneous sinuous-profiled vessel (AB117/cat. no. 114).
- Horizon 6

CAT. NO. 81

- **AB36** (grave 49). Complete, small, thin-walled bowl (thickness 2 mm at rim tip) with four small, widely spaced bosses (very large gap between two bosses suggesting originally five bosses intended), and base with five feet separated by rounded notches. Slight damage to rim. Tiefstich. Two horizontal, continuous lines and two narrow bands of close-set vertical stabs made with same implement. Fairly regularly made except for spacing of bosses. Patchy orange-beige. Rubbed smooth but some quartz grit visible on inside of base.
- Horizon 6
- Comments: This grave is located within the distribution of horizon 5 graves.

CAT. NO. 82

- **AB91** (grave 19). Incomplete, but full profile and base. Open profile, slightly curving, thin walls (thickness 2 mm at rim, widening to 4 mm at base), delicate, outturned rim, low ring base, and horizontal, slightly downward-projecting, pinched-out lugs. Two lugs survive, may represent original number. Very regular

Figure 4.27 Dalfsen: Double tiefstich impressions (AB116).

walls with very smooth surfaces inside and out. Slight smoothing marks visible inside, rubbed smooth on outside. Grey with fine quartz grit.
- Found with a second bowl (AB92/cat. no. 83), both neatly finished, undecorated and incomplete.
- Horizon 6
- Comments: See comment for cat. no. 83.

CAT. NO. 83

- **AB92** (grave 19). Incomplete, full profile preserved. Wider and more rounded, with thicker walls than AB91, and small lip at rim. One small knob or rounded lug, possibly of single pair, survives. Incipient ring base, four broad notches preserved (probably 6 originally). Very well finished, with regular, smooth walls (thickness 4 mm). Abundant fine quartz and possibly feldspar grit in grey-beige body.
- Found with a second bowl (AB91/cat. no. 82); both neatly finished, undecorated and incomplete.
- Horizon 6
- Comments: The comparatively open profile, careful finish and neatly shaped lugs, slight out-turned lips and the foot base distinguish these vessels from the other, undecorated, lugged bowls on this site, that appear to date to horizon 5. These characteristics, together with the location of the grave within the cemetery, are interpreted as suggesting a slightly later date. This may be a significant indicator for dating undecorated bowls on other sites.

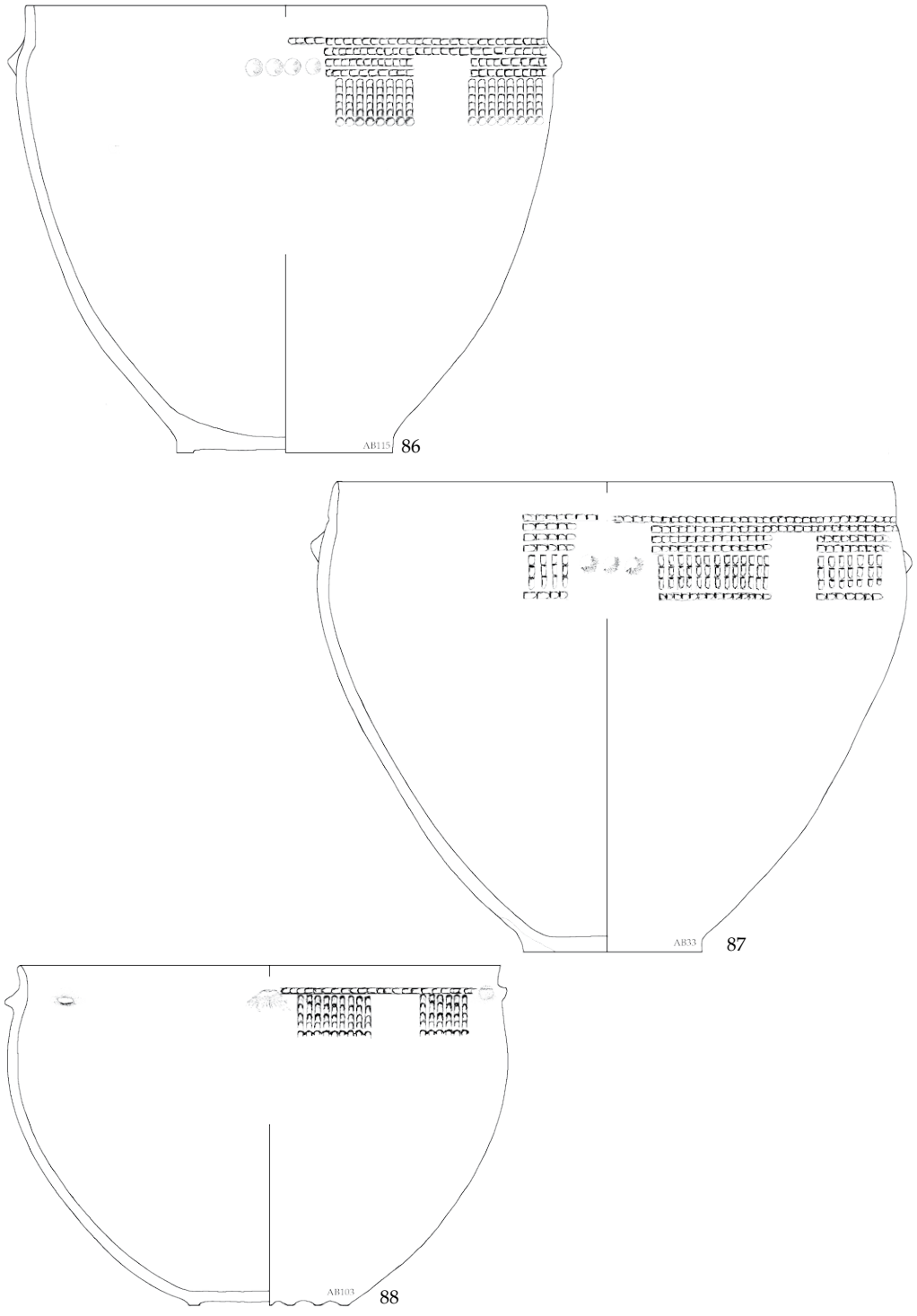


Figure 4.28 Dalfsen: overview necked bowls catalogue nos 86-88.

CAT. NO. 84

- **AB11** (grave 67). Undecorated bowl with lugs and flat base, now incomplete. Two widely spaced, small bosses (probably 4 or 5 originally) approximately 10 mm below rim. Large, approximately D-shaped break surrounded by crescent of seven perforations. Very well smoothed with regular walls (thickness 2 mm at rim, up to 5 mm elsewhere). Mottled brown-black, slightly paler on the inside. Fine but with some larger grit also visible.
- Horizon 6

CAT. NO. 85

- **AB108** (grave 13). Complete but in very poor condition. Slightly closed mouth and flat, slightly pedestalled base. Undecorated, without lugs. Wall very irregular and not well smoothed. Large white quartz grits are visible in a greyish paste, both inside and out.
- Incidental sherd V957 found in fill of grave.
- Horizon 5, possibly late, based on location within cemetery
- Comments: This grave lies between the two ditches. The pot is very poorly constructed in terms of paste, forming method and finishing, all of which point to a novice potter.

4.3.6 Necked bowls (cat. nos. 86-88)

These are bowls with a very short neck and a very slight shoulder, and pinched-out lugs or bosses (Fig. 4.28). Three bowls have been catalogued as necked bowls. All three date to horizon 6.

CAT. NO. 86

- **AB115** (grave 29). Short necked, with four equally spaced strips of four small, conical bosses, and a small ring base. Tiefstich with broad, rounded tip, regular and evenly impressed. Single continuous line at base of neck, blocks of three horizontal lines and short vertical lines on shoulder, terminating in a horizontal line of vertical impressions. Bosses occur in every second gap. Regular, smooth wall (thickness 3-4 mm where measured). Outside very evenly burnished. Lustre still preserved. Smooth inside (slight smoothing marks visible in places). Mottled grey paste, similar to AB110/cat. no. 84. Apart from some white quartz, few grits visible.
- Found with two other decorated vessels: a bowl (AB116/cat. no. 80) and a miscellaneous sinuous-profiled vessel (AB117/cat. no. 114).
- Horizon 6
- Comments: this is a high-quality vessel. Four equally spaced strips of four small, conical bosses (rather similar to the cut cordons that occur on horizon 7 vessels). Vessel complete but wrapped in clingfilm when examined.

CAT. NO. 87

- **AB33** (grave 26). Large, with short neck, bosses on slight shoulder and small, flat base. Four equally spaced groups of three small, applied, rather conical bosses short distance below neck base. Decoration executed with broad stylus, neatly executed, continuous, horizontally executed line of separate marks, with second parallel line, and series of blocks consisting of another two horizontal lines and 11-13 vertical lines of four impressions, ending in separate horizontal line of vertical impressions. Regular walls (thickness 3 mm at rim tip, 4-5 mm where measured on body) with smooth surfaces both inside and outside. Sharply oblique coil joins. Three groups of post-firing perforations: large, crescent-shaped arrangement of at least 16 conical, post-firing perforations formerly used to re-attach D-shaped part of neck and shoulder; reinforcement of vertical dunt; and single perforation. Grey paste with fine white quartz and occasional pieces possibly of feldspar. Much lustre still survives on burnished exterior. Inside very smooth, but very fine striations visible in places indicate that it was not burnished.
- Found with one other vessel, a small, decorated tureen-amphora (AB30/cat. no. 31).
- Horizon 6
- Comments: High quality. The paste appears to be similar to the large, decorated pot in found in grave 25.

CAT. NO. 88

- **AB103** (grave 30). Short neck, deep body, five small, equally spaced pinched bosses on shoulder, and gapped, very low ring. Broad, rounded tiefstich, tightly impressed. Line on neck base, with wide blocks of short verticals on shoulder, terminating in horizontal line of vertical impressions (double or treble stabs). Regular walls (thickness 5 mm, but narrowing to 3 mm at neck). Parallel smoothing marks faintly visible on inside of neck. Surface further smoothed after decoration, but faintly visible smoothing marks suggest it was lightly rubbed rather than deeply burnished. Base has nine small feet separated by small, rounded gaps. Neatly finished and decorated. Mottled grey-beige with fine and some small white quartz.
- Found with a complete, undecorated amphora (AB104/cat. no. 51).
- Horizon 6
- Comments: High quality.

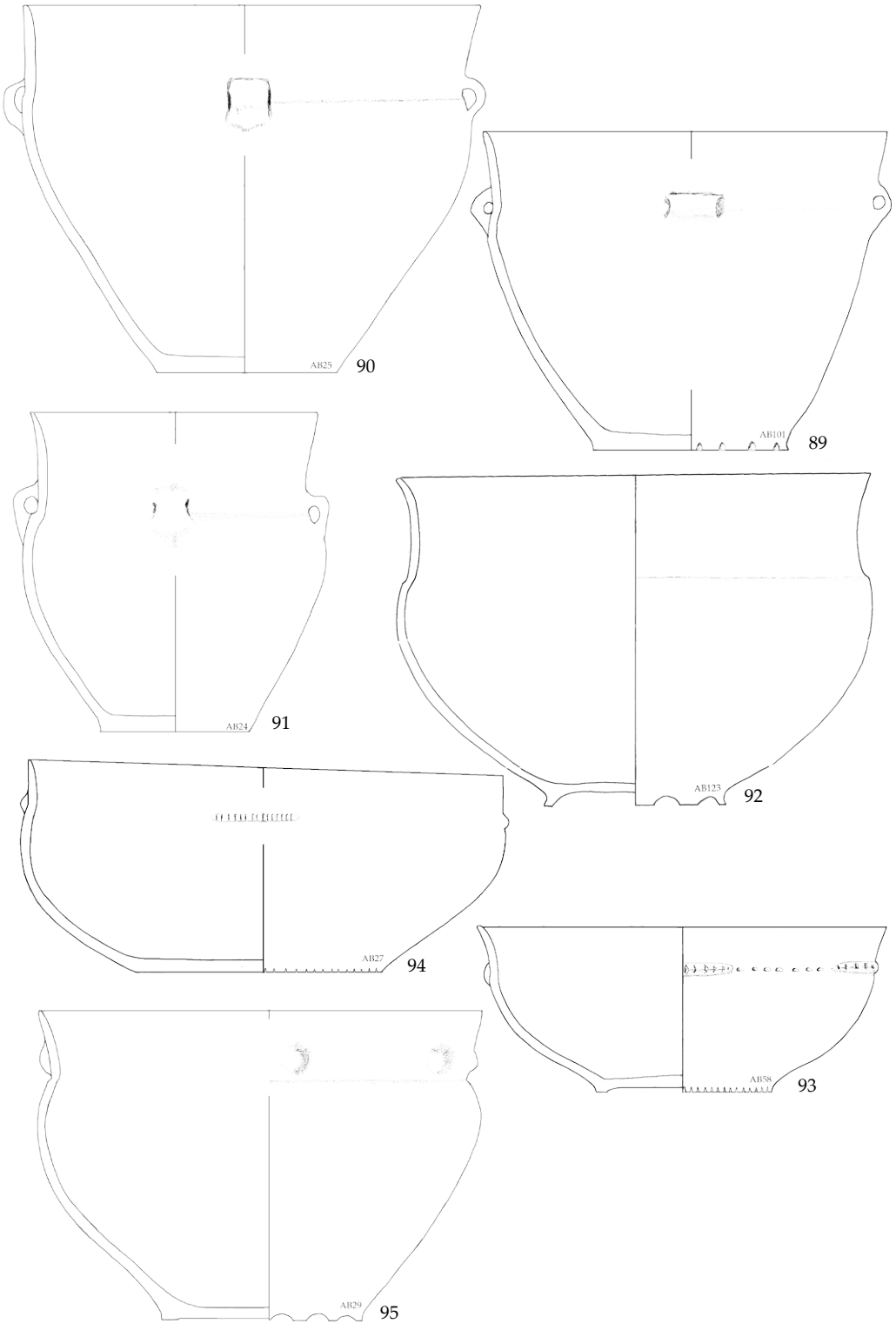


Figure 4.29 Dalfsen: overview shouldered bowls catalogue nos 89-95.

4.3.7 Shouldered bowls (cat. nos. 89-95)

Shouldered bowls are deep, tall or shallow, depending on their proportions. These vessels have a slight but distinct junction at the neck, with the shoulder and body distinction similarly subtle. Bosses, cordons and fine, turned-up lugs occur. Lines of stabs and cordons may be present on the apex of the shoulder, and the cordons and edge of the base are sometimes cut with fine, vertical lines. Wide, shallow examples are dated to horizon 7; examples with proportionately longer necks may be slightly earlier. Seven vessels have been identified as shouldered bowls (Fig. 4.29).

CAT. NO. 89

- **AB101** (grave 66). Tall, with two opposed tunnel lugs (thin, rectangular section) and notched, flat base with 14 small notches. Mottled brown exterior, darker on the inside. Very well-smoothed, rubbed surfaces (rim tip thickness 3 mm, wall thickness 5 mm). Dull. Originally complete; modern damage reveals black body with fairly abundant fine grit, including quartz.
- Found with a very large tureen-amphora (AB102/cat. no. 29).
- Horizon 5, probably late (or even horizon 6 early)
- Comments: Notched, flat base with 14 small notches moving in the direction of the bases with multiple small cuts that occur in horizon 7.

CAT. NO. 90

- **AB25** (grave 62). Complete (reassembled). Tall, undecorated, shouldered vessel with two opposed, horizontal lugs (with depressed profile) on slight shoulder and incipient ring base. Regular walls (thickness at rim 3 mm, thicker farther down), but surface slightly undulating on outside where it has been finally smoothed (horizontal marks) and rubbed up to a polish. Low gloss in places. Quite a lot of burnt stuff in thin deposit both inside and outside. Bright beige with black patches.
- Found with a small, undecorated amphora (AB26/cat. no. 50).
- Horizon 5
- Comments: grave 62 overlies the 'ditch' and is at the eastern end of the cemetery.

CAT. NO. 91

- **AB24** (grave 23). Complete shouldered vase with two opposed, horizontally perforated lugs. Smooth, regular, well-finished surfaces (*e.g.* no grits visible). Charred deposit on parts of the outside and inside.
- Found with an amphora (AB23/cat. no. 54).
- Horizon 6
- Comments: The location of grave 23, at the eastern end of the cemetery, is consistent with the dating of this vessel to horizon 6.

CAT. NO. 92

- **AB123** (grave 100). Reconstruction. Deep bowl with slightly concave neck, slight shoulder, and ring base with seven gaps or feet. Base, neck or rim and shoulder represented. Well smoothed and finished, very smooth on inside, with parallel marks, burnished smooth on outside. Brown with fine and medium grits, including quartz. (KS)
- Horizon 7
- Comments: Identified as horizon 7 on the basis of fabric, finish and location at extreme eastern end of cemetery.

CAT. NO. 93

- **AB58** (grave 113). Shallow, with short neck and slight incipient base with multiple cuts. Line of small dots interspersed by three short cordons marked by dots or vertical cuts at base of neck. Regular walls (thickness 3-4 mm). Very well-smoothed and -finished surfaces. Mica visible in paste, which also includes some quartz (no fresh breaks, difficult to see). Dull appearance probably due to preservation. Paste similar to AB27/cat. no. 94, with quartz and possibly feldspar.
- Horizon 7

CAT. NO. 94

- **AB27** (grave 111). Shallow, with three equally spaced long, narrow, vertically cut cordons and flat, cut base. One of the cordons is now missing, but the vessel is otherwise complete. Regular walls, smooth surfaces and well finished, probably burnished. Fine mica in paste. Worn surfaces. Paste similar to AB58/cat. no. 93.
- Found with two other vessels: a cup with a wide grip lug (AB28/cat. no. 103) and a shouldered bowl with a slightly open neck and bosses (AB29/cat. no. 95).
- Horizon 7

CAT. NO. 95

- **AB29** (grave 111). Fairly short, very slightly open, straight neck (*NB* neck more vertical than shown in sketch), four small, neatly shaped, circular bosses close to neck base, deep body and flat base with 11 notched feet. Regular walls (thickness 4 mm; 3 mm at rim), very smooth surfaces both outside. Horizontal smoothing marks visible on inside of neck, very smooth lower down inside, outside has been very carefully rubbed and smoothed, and some lustre is still visible. Small pieces of rust-coloured damage occur on surface and fine quartz is visible in a few places.
- grave 111. Found with two other vessels: a cup with a wide grip lug (AB28/cat. no. 103) and a shallow, shouldered bowl with sections of a cut cordon (AB27/cat. no. 95).
- Horizon 7
- Comments: Highly finished.

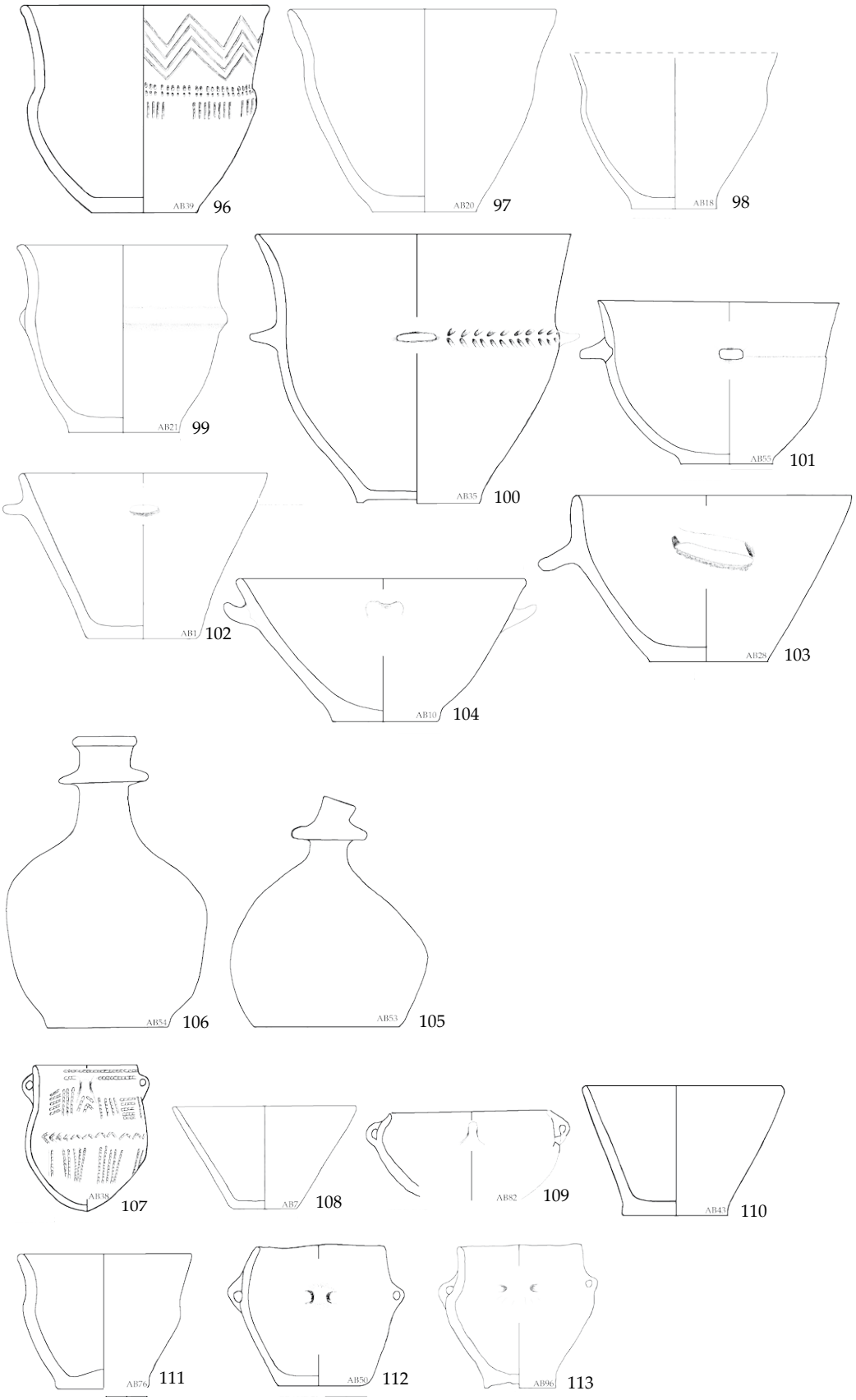


Figure 4.30 Dalfsen: other categories catalogue nos 96-113.

Figure 4.31 Dalfsen: Incipient ring base (AB39).

4.3.8 Funnel beakers, cups and other drinking vessels (cat. nos. 96-104)

Nine vessels are included.

CAT. NO. 96

- **AB39** (grave 89). Thick-walled, robust funnel beaker with incipient ring base (Fig. 4.31). Tiefstich, small with rounded tip, irregularly impressed. Four lines large zigzag on neck, two stab lines at base of neck and short, irregular blocks of between five and nine verticals. Fairly regular walls (thickness *c.* 5 mm) but not well smoothed and slightly undulating. Brown-beige. Neck too dirty to see but smoothed downwards on body. Some charred deposit. Traces of white paste present.
- Found with a small scoop (AB40/cat. no. 119).
- Horizon 4L

CAT. NO. 97

- **AB20** (grave 74). Funnel beaker cup with open mouth, slight shoulder and smooth, flat base. Thick-walled (thickness 4-5 mm) with heavy carbonised deposit on outside. No breaks; quartz and possibly feldspar visible.
- Horizon 5

CAT. NO. 98

- **AB18** (grave 50). Complete base and lower body. Open neck and slight shoulder (thickness 2-3 mm) and flat, very smooth base. Very well smoothed, with very regular walls. Mottled black and brown. Fine, white grits visible on inside. Inside is very smooth. Outside has been burnished. Very thin black deposit on upper part of interior.
- Horizon 5E
- Comments: Very like AB10/cat. no. 104. For similar bases, see AB50/cat. no. 113, AB52/cat. no. 38 and AB10/cat. no. 104.

CAT. NO. 99

- **AB21** (grave 52). Full profile but less than half present. Gently out-turned lip, low, applied cordon at shoulder, and flat, very smooth base (see AB50/cat. no. 113, AB52/cat. no. 38 and AB10/cat. no. 104). Regular, smooth walls, with smoothing facets at rim, with some slight traces of burnt matter visible with hand lens. Dark colour. Fine, sandy, white grit, including quartz, visible on inside. Similar paste to AB93 (which also has a similar flat base). (KS)
- Two incidental sherds (V710 and V732) found in grave fill.
- Horizon 5
- Comments: Smoothing is horizontal on the neck and vertical on the body. Cordons are rare on vessels of this type and date, but another example occurs on a vessel found at Ekelenberg (Drenhe, Netherlands).[141]

CAT. NO. 100

- **AB35** (grave 120). Incomplete (about half present), with full profile, with one pinched-up lug on the shoulder and base (the area opposite the existing lug is missing, and the original number cannot be established). Double line of opposed stabs on shoulder. Fine, small and medium grits, including possibly feldspar, visible only in fresh breaks. Very small, neat ring base. Very regular walls (thickness 5 mm) on inside and smooth but very slightly undulating on the outside. Dull surfaces. Pale grey interior, patchy grey and orangey beige exterior.
- Horizon 5
- Comments: The surfaces are in very good condition.

CAT. NO. 101

- **AB55** (grave 25). Shouldered cup, smooth black-grey-beige surfaces, flat base, and projecting, small grip in socket. Regular wall (thickness 5 mm) with smooth, burnished exterior. Fine and small white grit. Irregularly grooved line at shoulder. Charred deposit.
- grave 25. Found with four other pots (AB 53, 54, 56, 57).
- Comments: This grave is the richest grave in the cemetery. The associations in this grave date to the end of horizon 5 or the beginning of horizon 6.

141 Knöll 1939, Table 39, no. 7.

CAT. NO. 102

- **AB1** (grave 106). Open, straight-sided, robust, small bowl or cup with single large grip lug and flat base. Complete (slight rim damage). Regular walls (thickness 6 mm), with smooth surfaces and very little grit (white quartz) exposed anywhere. Dark to lighter grey both inside and outside. Thick charred deposit, especially on rim and outside, opposite lug.
- Horizon 7
- Comments: The location of the grave, at the western end of the cemetery, supports a horizon 7 date.

CAT. NO. 103

- **AB28** (grave 111). Complete, handled cup with slightly curved walls, large, wide grip lug, and flat base. Some soot on outside, possibly from firing.
- Found with two other vessels: a shallow, shouldered bowl with sections of cut cordon (AB27/cat. no. 94) and a shouldered bowl with a slightly open neck and bosses (AB29/cat. no. 95).
- Horizon 7
- Comments: Not as well finished and well made as the other two similar vessels, AB1/cat. no. 102 and AB10/cat. no. 104.

CAT. NO. 104

- **AB10** (grave 110). Open bowl with grip lug and flat base (incomplete). Gritty paste (thickness 7 mm) with distinctive, pink-coloured grit (probably granite).
- Horizon 7
- Comments: Grip lug is larger than that on AB25/cat. no. 90 but smaller than that on AB28/cat. no. 103. The location of the grave, at the extreme western end of the cemetery, points to a horizon 7 date.

4.3.9 Collared flasks (cat. nos. 105-106)

Collared flasks occur during all horizons. The Dalfsen assemblages holds two collared flasks, which were found in grave 25 (Fig. 4.30).

CAT. NO. 105

- **AB53** (grave 25). The smaller of two undecorated collared flasks. Asymmetrical. Mottled beige and grey. Fine and small and medium white grit. Burnishing process has revealed some small grit. Slight lustre visible in places.
- Horizon 5, probably late
- Found with a second collared flask (AB54/cat. no. 106) and three other vessels: a large, decorated tureen-amphora (AB57/cat. no. 30), a lugged cup (AB55/cat. no. 101) and an angular-profiled, small amphora (AB56/cat. no. 52), as well as a finely made battle axe.

Figure 4.32 Dalfsen: Rounded base (AB38).

CAT. NO. 106

- **AB54** (grave 25). Less asymmetrical than AB53/cat. no.105, with a longer neck and more regular upper part, but otherwise similar to AB53.
- grave 25
- Horizon 5, probably late
- Comment: Both undecorated collared flasks from this grave have a similar paste, colour and finish to the small, undecorated, complete amphora (AB56/cat. no. 52) that was also found in this grave. These two vessels were found in the richest grave in this cemetery. Angular-profiled collared flasks occur in late graves, as do lugged cups.

4.3.10 Miniature vessels (cat. nos. 107-113)

Seven very small vessels were found (Fig. 4.30), in each case in graves that included other, larger vessels. Four have very small lugs, and one is decorated. Four can be dated to horizon 4L on the basis of association or decoration, and three to horizon 5. It is possible that they disappeared in the course of horizon 5.

CAT. NO. 107

- **AB38** (grave 72). Small, decorated, asymmetric vessel with fairly short neck above long shoulder, two opposed, small lugs close to rim and small, rounded base (Fig. 4.32). Irregular, unevenly executed, fine tiefstich decoration. One lug is decorated; the second has decoration below it. Brown-coloured paste. Fine and small quartz.
- Found with an undecorated bowl (AB37/cat. no. 61).
- Horizon 4L

- Comments: The decoration on this vessel is important for the dating of the associated undecorated bowl. Appears to have been made in a hurry. Several spalls detached from the body during firing. This vessel cannot stand upright without support.

CAT. NO. 108

- **AB7** (grave 55/56). Fragmented, small, undecorated, straight-sided, open pail vessel (thickness 3-4 mm) with flat base. No evidence for lugs. Smooth but not highly finished. Brown with some slight soot?
- Found with a bowl (AB88/cat. no. 58) and a tureen (AB89/cat. no. 2).
- Horizon 4L
- Comments: Small drinking vessel?

CAT. NO. 109

- **AB82** (grave 92). Reconstructed, incomplete. Small, poorly made and irregularly shaped, thin-walled bowl (thickness 2-3 mm) with in-turned rim and at least two but probably originally four small, horizontally pierced lugs at point of inflection. Lower end of lugs plugged into small holes. None of the base survives. Fairly crudely made. Fine and small white grit. Beige and dark grey mottled.
- Found with a bowl (AB81/cat. no. 56).
- Horizon 4L

CAT. NO. 110

- **AB43** (grave 42). Complete, small, straight-sided, open pail vessel with flat base. Mottled orangey beige and grey. Fine and small white quartz. Not highly finished.
- Found with a tureen-amphora (AB44/cat. no. 10).
- Horizon 5
- Comments: Possibly a drinking beaker.

CAT. NO. 111

- **AB76** (grave 94). Small, thick-walled, undecorated funnel beaker cup (thickness 3-4 mm, base thickness 5 mm). Smoothed but not highly finished.
- Found with an amphora (AB75/cat. no. 35).
- Horizon 4L
- Comments: Drinking vessel.

CAT. NO. 112

- **AB96** (grave 103). Small, thick-walled vessel with neck and distinct shoulder, two opposed, horizontally perforated lugs and very low foot ring. Surface has not been smoothed and is rough and uneven.
- Found with a tureen-amphora (AB95/cat. no. 12).
- Horizon 5

CAT. NO. 113

- **AB50** (grave 35). Small, slightly biconical, tall bowl with slight groove or shoulder associated with two opposed, horizontally perforated, small lugs, and flat base. Shiny black polished surfaces, similar to AB48/cat. no. 46.
- Found with a tureen-amphora (AB49/cat. no. 17) and an undecorated bowl (AB51/cat. no. 77).
- Horizon 5

4.3.11 Miscellaneous vessels (cat. nos. 114-122)

Nine vessels are included under this heading (Fig. 4.33).

CAT. NO. 114

- **AB117** (grave 29). Incomplete, sinuous-profiled vessel with neck and shoulder. One tunnel lug preserved. Tiefstich. In poor condition. No base preserved. Smooth, regular walls, but decoration is irregularly executed and varies from front to back although the pattern remains the same. There are several groups of post-firing perforations; two groups at least relate to vertical cracks and were probably for reinforcement. Greyish colour (thickness 4-5 mm), fine and occasionally medium grit visible. Similar to AB30/cat. no. 31.
- Found with two other vessels: a necked bowl (AB115/cat. no. 86) and a simple bowl (AB116/cat. no. 80), both decorated.
- Horizon 6

CAT. NO. 115

- **AB16** (grave 39). Complete, asymmetric, no lugs. Fairly short, vertical neck and distinct rounded shoulder. Rim tip narrows to 2-3 mm. Smooth-surfaced but not fully regular walls, dull even where in good condition. Mottled grey and beige. Unusually no grit is visible on both inside and outside because the surface is in very good condition. Thin, charred deposit in patches on outside.
- Horizon 5

CAT. NO. 116

- **AB62** (grave 10). Incomplete, full profile but only about three quarters of vessel present. Biconical vessel consisting of neck and shoulder without sharp break, flat base, and no lugs (thickness 1.5 mm at rim, widening to 4.5 mm). Exterior largely black, inside paler, with grit visible. Abundant fine, small and occasionally larger quartz grit. Smoothed.
- Found with an undecorated bowl (AB61/cat. no. 79). Incidental sherds (V605) of other pots found in fill of grave.
- Comments: Found right beside the 'ditch'. AB61/cat. no. 79 and AB62/cat. no. 116 have smooth, flat bases similar to vessels AB50/cat. no. 113, AB52/cat. no. 38 and AB10/cat. no. 104. They have not been made from the same paste. Horizon 5, on basis of location within cemetery, and associated straight-sided bowl.

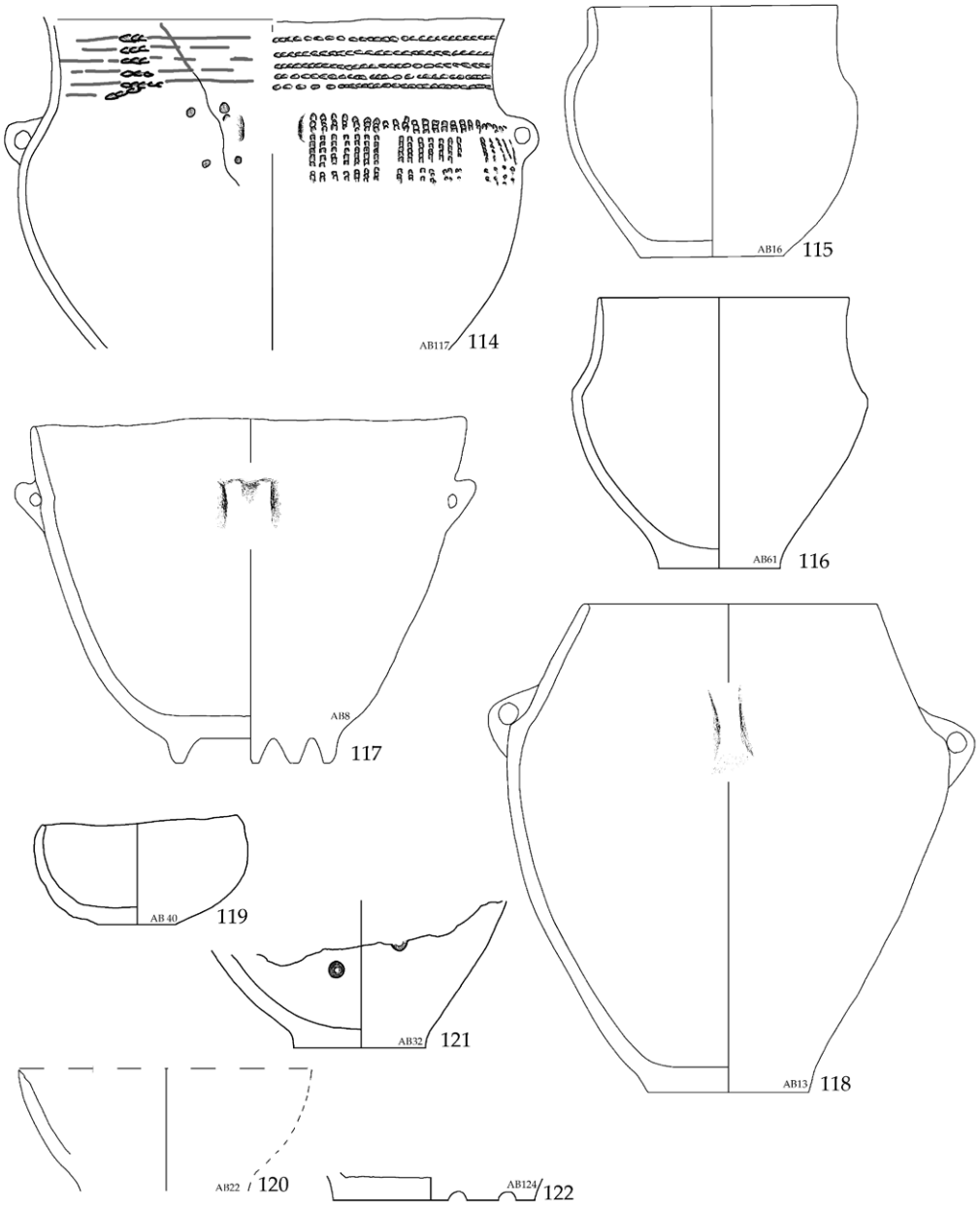


Figure 4.33 Dalfsen: miscellaneous pots catalogue nos 114-124.

CAT. NO. 117

- **AB8** (grave 12). Slightly open, slightly shouldered vessel with two opposed lugs (one lug damaged) and footed base with seven distinct, small, rounded feet, probably applied. Reassembled and largely complete. Regular walls (thickness 3-5 mm) and fairly smooth surfaces; this vessel may have been rubbed with leather (no striations) when it was fairly dry. Dull surfaces. Mottled surfaces, orange, beige and darker patches and abundant small grey quartz.
- Two incidental sherds (V577) in filling of grave.
- Horizon 5

CAT. NO. 118

- **AB13** (grave 61). Tall, undecorated, biconical vessel with two opposed, prominent horizontal lugs or handles (one now missing) on shoulder, and flat base. Lugs socketed above and applied to wall below. Fairly smooth surface (thickness 3-5 mm). Mottled grey-beige with some darker patches. Small base. Quite like AB112/cat. no. 21.
- Horizon 5
- Comments: This vessel is important. It was found in a grave cut into the fill of the 'ditch'. This means that

grave 61 and AB13/cat. no. 118 must date to the later part of horizon 5. The vessel itself is very similar to Urnfield pottery and would have been identified as such had it been found without a definite TRB context. The vessel seems to have warped while it was drying or during the attachment of the lug, at least while the paste was still soft and pliable.

CAT. NO. 119

- **AB40** (grave 89). Undecorated, probably pinched-out, shallow, scoop-sized, open bowl with small, flat base (thickness c. 5 mm).
- Found with a decorated funnel beaker (AB39/cat. no. 96).
- Horizon 4L

CAT. NO. 120

- **AB22** (grave 18). Flat base of fairly thick-walled vessel. Surfaces are neatly smoothed. Thick fabric and general colour and finish similar to undecorated amphora and other shouldered or necked vessels found in graves from horizon 5 onwards. (KS)
- Incidental sherd (V539) found in fill of grave.
- Horizon 5 or later
- Comments: Location of grave 18 within the cemetery points to a late stage within horizon 5.

CAT. NO. 121

- **AB32** (grave 27). Lower body and base, possibly of undecorated amphora similar to vessels AB24/cat. no. 91 and AB98/cat. no. 49. Regular walls (thickness 4-5 mm), slightly undulating exterior, flat base with pedestal. Two post-firing perforations (one incomplete), not forming a pair. Profile, comparatively small inside base and fabric suggest lower part of undecorated amphora. Parts of broken edge appear to have been ground down, suggesting secondary use as small bowl. Quartz visible in surface of base inside. Paste is mottled grey black. The type and degree of finish is similar to AB31/cat. no. 53 (the interior being smoothed but still rough to touch, *i.e.* fairly regular but not thoroughly smoothed, especially at the base). Patch of low gloss.
- Found with one other vessel, an undecorated amphora (AB31).
- Horizon 6

CAT. NO. 122

- **AB124** (pit 135). Incomplete. Notched base (diameter 16 cm) with a small part of side wall (thickness 5 mm). Beige exterior, dark grey interior with mixed fine and small white quartz visible. The base is flat, with eight small notches. Wall appears to have been regular and well smoothed. No rim or shoulder sherds. Form unidentified. Probably from a grave originally as it appears to have been a complete vessel. All breaks are fresh.

4.4 Dating and chronology

4.4.1 Dating and typochronology

Dating of TRB West Group pottery is based on the typochronology identified and supported by radiocarbon dates,[142] adjusted by Lanting and Van der Plicht (1999/2000) and Brindley (2013) to take into account additional dates[143] (Fig. 4.34). A typochronology is a sequence of development supported by closed finds,[144] and in this case (namely, Brindley's horizon typochronology), bolstered by radiocarbon dating. In the absence of deep stratigraphical deposits, typochronology becomes a strong dating tool, especially when based on complete vessels forming a range of types. These conditions are fulfilled by the TRB West Group pottery. One of the most important contributions of the Dalfsen cemetery to studies of the West Group has been the discovery of a large number of closed associations of different types of pots in graves.

The radiocarbon dating of the proposed sequence of horizons is adversely affected by two factors:

Well-associated radiocarbon dates for TRB West Group graves and pottery are scarce and likely to remain so because of the poor preservation of both unburnt bone and cremated bone in, especially, Dutch context. The Dalfsen cemetery, with its very large number of graves, illustrates this difficulty particularly well.

The irregular, wiggling form of the calibration curve during this period simply does not allow for the precise dating of a tight sequence of developmental stages without ancillary information from stratigraphy or a typochronology. The relevant part of the curve is shown in figure 4.34. While it is possible to separate dates for early pottery from dates for later pottery, dates falling in the middle part of the curve, even with small standard deviations, will touch on at least two overlapping wiggles in the curve.

This means that future radiocarbon samples are unlikely to advance the dating of the internal stages of the typology significantly. Fortunately, three aspects of TRB West Group pottery help ameliorate this situation:

The complex decorated and undecorated pottery is ideal for typological analysis (*i.e.* the combined use of pot profile, layout of decoration, decorative elements, motif combinations, and techniques).

The large numbers of semi-complete and reconstructible pots is a significant aspect to the analysis of the different types and their development.

There are sufficient examples of associated pots from single-event depositions (graves) to date the undecorated

142 Brindley 1986a.
143 Brindley 2013, 13; Lanting and Van der Plicht 1999/2000, 62-68.
144 Bakker 1979, 53.

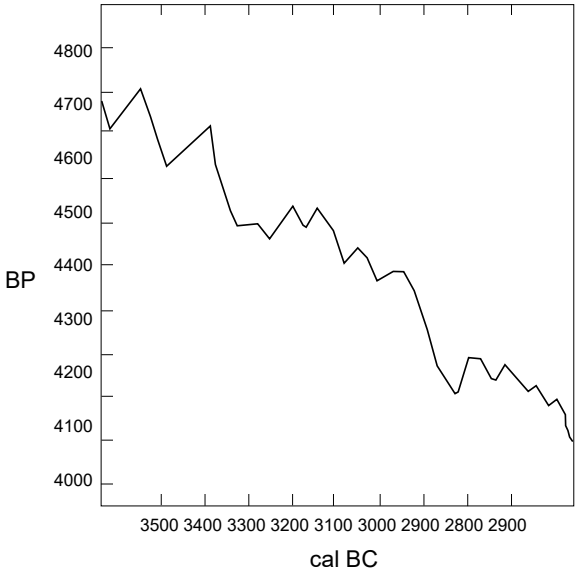


Figure 4.34 Calibration curve of ^{14}C from the TRB-period.

pottery (this number has increased significantly with the discovery of the Dalfsen cemetery).

These aspects are used to support the tight dating proposed by Brindley for the typochronology used here, including horizons 2-6.[145] The dating bands proposed for the sequence of horizons is based on fairly well-established start and end dates for horizon 1 (c. 3350-3400 BC) and horizon 7 (2800-2750 BC). The period covered by the intervening horizons (2, 3, 4, 5 and 6) is marked by the irregular section of the calibration curve, and therefore dates have been proposed on the complexity of the typological developments and the relative quantities of pottery deposited in megalithic monument contexts. This has resulted in varying lengths of time for horizons 2 (50 years), 3 (125 years), 4 (150 years), 5 (125 years), and 6 (50 years). It is anticipated that new evidence will help refine the internal dating of horizons 3, 4 and 5, but such information is likely to be based on newly discovered repeated associations of specific types rather than on stratigraphic deposits (which unlikely in a Dutch context) or dendro-chronological, or tree-ring, samples, the only source of absolute dating available for this period.

4.4.2 Dating and typochronology at Dalfsen

All the pottery (122 vessels) found in the cemetery can be identified and dated to a well-defined bracket identified in stylistic terms between the end of horizon 4 and sometime during horizon 7 (Table 4.3).

The pottery has been analysed in terms of Brindley's horizons and is illustrated in Figures 4.35 to 4.37. The version published by Brindley in 1986 is based on pottery from the entirety of the area of the TRB West Group. The typochronology of the Dalfsen pottery presented here is based on the additional closed associations from a limited area and therefore includes additional information on undecorated pottery, thus constituting a regional subset of the Brindley 1986 typochronology. An illustrated typochronological analysis of the pottery from Ostenwalde 1, a megalithic monument in the Hümmling ground moraine landscape in Germany, using the same system of Brindley horizons, is in preparation.[146] This is based on an intensive, new reconstruction of the pottery from that megalithic monument and will illustrate the regional typochronology east of the Ems, from an area showing influences from Westphalia. The Dalfsen pottery analysis forms a valuable counterpart from the western part of the TRB West Group.

A relatively small number of the Dalfsen graves with pottery (15 graves) are dated to the end of horizon 4. The associated pottery shows traits characteristic of the end of that horizon. This first phase of activity has been identified on the basis that the pottery, which in some respects is similar to horizon 5 pottery, includes a number of characteristics that do not occur in horizon 5 proper (Fig. 4.35). Horizon 4L at Dalfsen has been defined by the occurrence of a small number of tureens, the presence of only one funnel beaker, and the occasional use of tvaerstik. These are three features which are associated with pottery of horizons 3 and 4 and disappear entirely in horizon 5. This suggests that the use of this cemetery began a decade or two before 2975 BC, the end date proposed for horizon 4. For this reason, late horizon 4 material is dated here to 2990-2975 BC.

The majority of the Dalfsen pottery can be identified as belonging to horizon 5 (Fig 4.36). This includes a large number of graves with associated decorated and undecorated pottery, as well as graves with only undecorated pottery that, on the basis of the graves' location within the cemetery, can be assigned to this

Brindley horizon	Date (BC)	Duration in years	Number of pots
Late 4	c. 2990-2975	*c.* 15	29
5	2975-2850	125	71
6	2850-2800	50	14
7	2800-2750	max. 50	7

Table 4.3 Number of pots by Brindley Horizon.

145 See discussion in Mennenga 2017, 91-96, 294.

146 Brindley in prep.

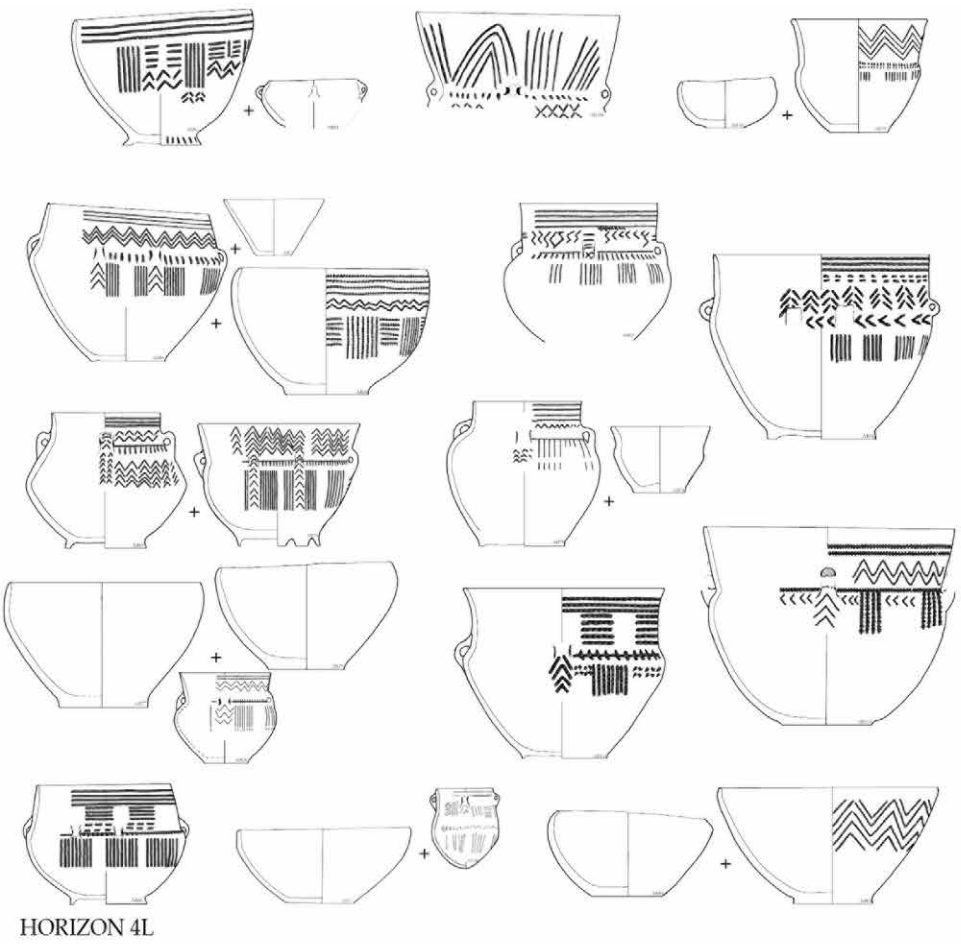


Figure 4.35 Dalfsen: horizon 4 and 5E pottery.

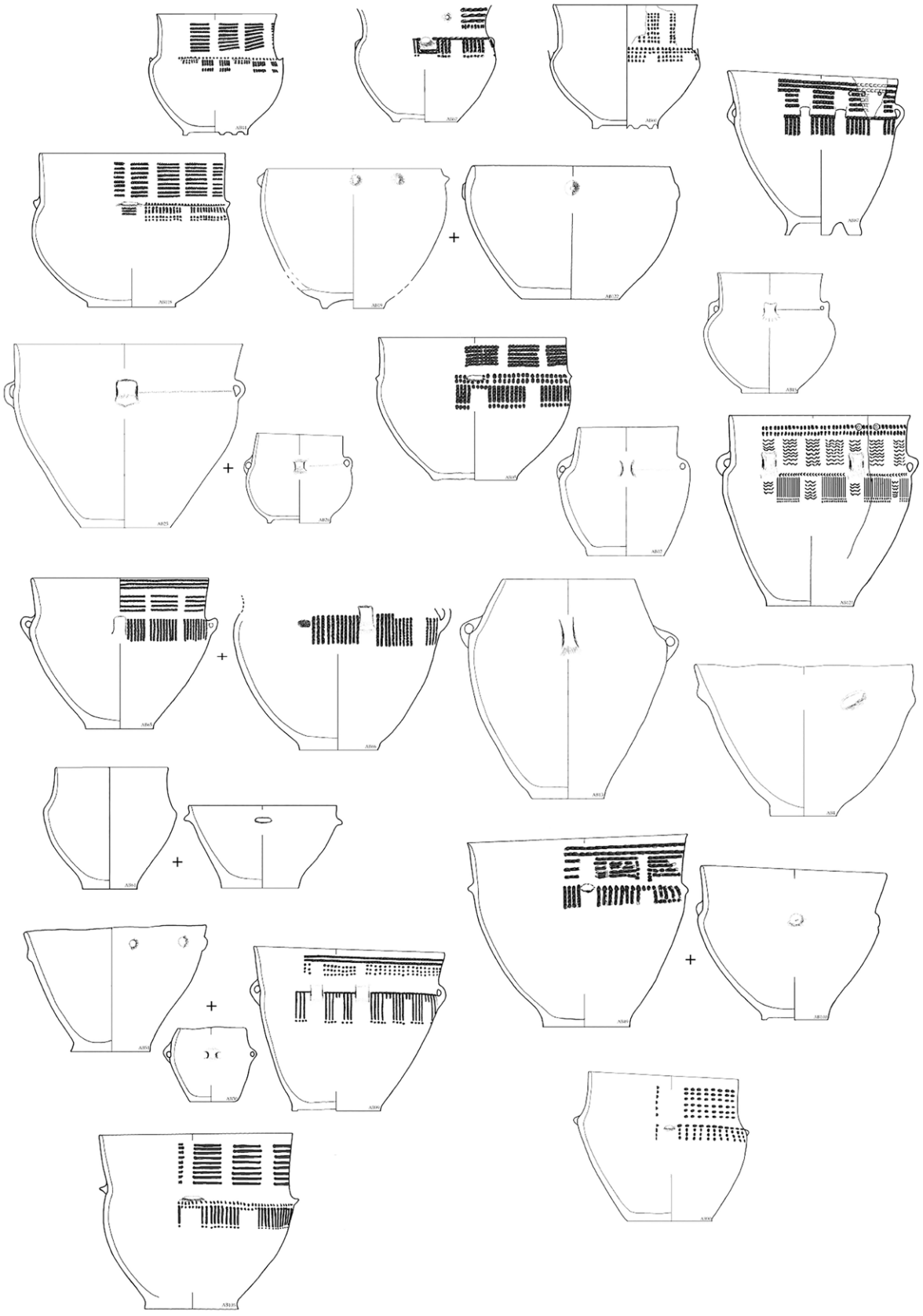
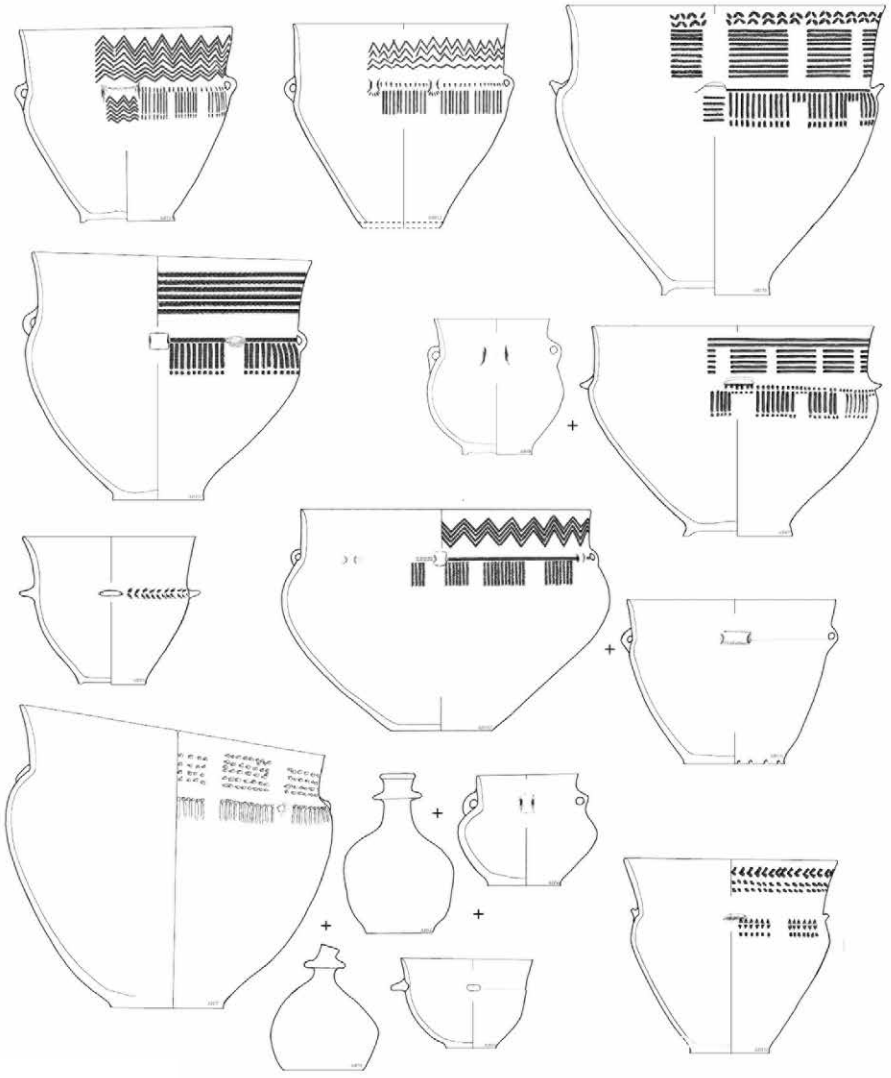


Figure 4.36 Dalfsen: horizon 5 (a) and 5L (b) pottery (following page).



horizon. This undecorated material includes bowls with four or more bosses below the rim, which were previously well known from megalithic monuments but could not be closely dated, and biconical lugged vessels, such as AB13, the miniature AB50, the tureen-amphora AB100, and the shouldered bowl with tunnel lug AB101. None of this undecorated material was included in the figures illustrating horizon 5 pottery in the 1986 publication because of the absence of closed associations with these types.[147] The horizon 5 pottery at Dalfsen also shows a developing preference for vessels with a larger capacity than heretofore. This tendency continues into horizon 6.

Figure 4.37 (upper) shows the 12 pots assigned here to horizon 6 based on the decoration and shape of the vessel, the association of an undecorated vessel with a decorated horizon 6 vessel, or the location of the grave containing the pottery within the area of the cemetery deemed to have been used at this time. The pottery includes a pair of fairly open bowls with lugs and short foot rings, as well as a number of tall amphora. No miniature vessels appear to occur in this horizon. In general, horizon 6 pottery is not well represented in TRB assemblages, and until now, only pottery with decoration could be assigned to this stage. Eight of the 12 vessels assigned to horizon 6 at Dalfsen are undecorated, representing a significant extension of the definition of this horizon, which will add to the possibility of identifying contemporary material at other sites, including megalithic monuments.

Seven pots are identified to horizon 7 (Fig. 4.37 lower). The small number of pots suggests that activity at Dalfsen tapered off during this horizon. All the types present are represented at other sites, in dated or associated contexts. A date sometime between 2800 BC and 2750 BC is suggested for this material,

147 Brindley 1986b.

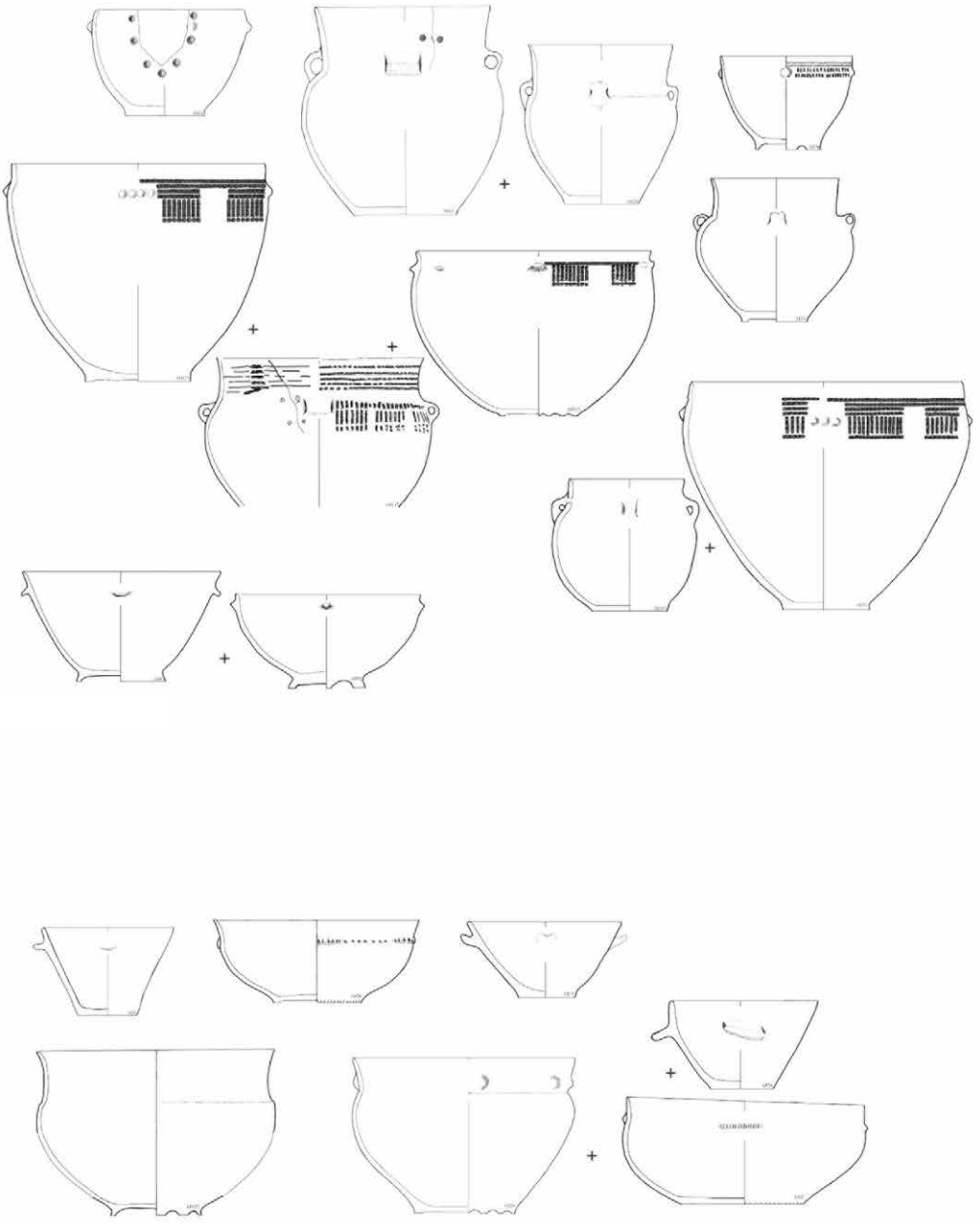


Figure 4.37 Dalfsen: horizon 6 and 7 pottery.

but the end date is less precisely fixed because of the limited quantity and type of pottery and its peripheral distribution at Dalfsen (unlike the more numerous and clustered distribution of the earliest pottery in the cemetery). Based on this, it would appear that the cemetery was in use for TRB burial for *c*. 240-230 years (*c*. 2990-*c*. 2750 BC).

4.4.3 Funeral ritual reflected by the pottery

The pottery deposited at Dalfsen does not appear to follow rigid rules as to what pottery, how many vessels (Table 4.5), and the various combinations of pots (most commonly bowls and amphoras) could be deposited in a grave. Much of the pottery can be identified as designed to hold either a liquid (especially the amphora, which

are vessels with a neck and small mouth from which the contents must be poured and with evidence, in the form of small lugs, for the attachment of a lid or a cover) or a dry or semi-liquid substance (bowls with wide, open mouths providing access for a hand or scoop to remove contents). The collared flasks, with their very narrow, elongated necks and wide, shouldered bodies are likely to have been used for something that (i) needed to be protected either from spillage or from contamination or both; (ii) was inherently valuable or scarce; or (iii) was concentrated and used in small quantities only (*e.g.* salt or some type of bitter essence). The contents of a collared flask need to be shaken out (the neck is too narrow for pouring). Large amphora may have been used for storage, smaller amphora for individual or immediate use.

This pottery may have contained food and drink deposited in the grave either as offerings or to provide sustenance for the dead in an afterlife. In these circumstances, what was contained may have been more important than the container *per se*. Alternatively, the pottery deposited in the grave may have held food and drink consumed during the funeral activities. Comparison of Figures 4.4.1-4.4.4 shows that the overall capacity of the vessels deposited generally increased, from the earliest pottery of horizon 4L to the pottery of the end of horizon 5 and into horizon 6. This may point to larger numbers of people taking part in later funeral activities.

There is some support for the idea that larger vessels were used in 'richer' graves. Two of the largest tureens of horizon 4L came from graves that may be considered as 'rich'. Grave 99 included a large tureen (AB34), as well as a large number of amber beads. Grave 96 was covered with a layer of bog iron ore (which had to be specially sourced and was heavy to transport) and also included a large tureen (AB114). A third large tureen was found in grave 91, which included an amber bead, perhaps the remnant of a necklace of amber and perishable beads, while a fourth large tureen (AB109) came from a poorly preserved grave (grave 93) and is represented only by a large sherd. Grave 25, from the end of horizon 5, included an exceptional battle axe as well as the only two collared flasks found at Dalfsen. Grave 51 was also a distinctive grave: the grave pit was surrounded by a ring of 16 postholes, while the grave included the largest simple bowl (AB59). However, another grave pit (grave 45) with a ring of postholes did not include any pottery.

The variation in the quality of the pots deposited together in individual graves does not suggest that pots were made at the same time for a shared purpose; no 'sets' of pots with the same decoration and finishing characteristics occur at Dalfsen. What appear to be close similarities between individual vessels are due to the limited decorative repertoire at any one time; the use of similar, probably casually obtained, informal tools (pointed bone and sticks); and a common ideal of workmanship.

4.4.4 Frequency of burial activity

Burial appears to have taken place on a fairly regular basis (Table 4.4).

Brindley horizon	Duration in years	Number of generations (each lasting *c.* 30 years)	Number of graves with pottery
4 (end of)	c. 15	1	15
5	125	4	55
6	50	1-2	9
7	50	1-2	5

Table 4.4 Frequency of burial activity.

If one accepts that Table 4.4 does not take into account graves without pottery, that the figures are approximations, and that the boundaries between horizons are informed guesses, it appears that burial in the cemetery took place at regular intervals, without either abrupt peaks or breaks, tapering off gradually after 2900 BC, during horizons 6 and 7.

4.4.5 The distribution of activity dated by the presence of pottery

The distribution of datable activity within the cemetery shows a more or less consistent pattern. The linear shape of the cemetery is predicated on the fact that it is situated on the summit of a fairly narrow east-west ridge (Fig. 4.38). A cluster of 13 graves (72, 84-87, 89, 90, 92-94, 96 and 99) seems to have formed the initial focus of activity during the end part of horizon 4, with a further two graves (41 and 55/56) occurring relatively close together some distance to the east. Most of the horizon 5 activity occurs east of the initial focus, with a small number of horizon 5 graves occurring on the west side. With one exception, all the horizon 6 graves occur outside the main core of horizon 5 activity but within the easternmost part of the distribution of horizon 5 graves. No horizon 6 pottery was discovered west of the horizon 4 primary nucleus. The horizon 7 pottery occurs at both the western and the eastern end of the distribution. The main movement of the distribution is in an easterly direction from the initial core, but the activity west of this area suggests that if the topography of the site had allowed it, the cemetery would have developed an approximately circular form, radiating out from the core. Dalfsen is unique among TRB cemeteries in having a sufficient number of graves with datable pottery to show the spatial development of the cemetery. Other TRB cemeteries include only a small number of graves with pottery of one horizon.

The large number of graves with pottery and the extended period of use represented also sheds some light on the numbers of pots deposited in graves. Of the 137 graves identified as probably TRB in date, 84 include

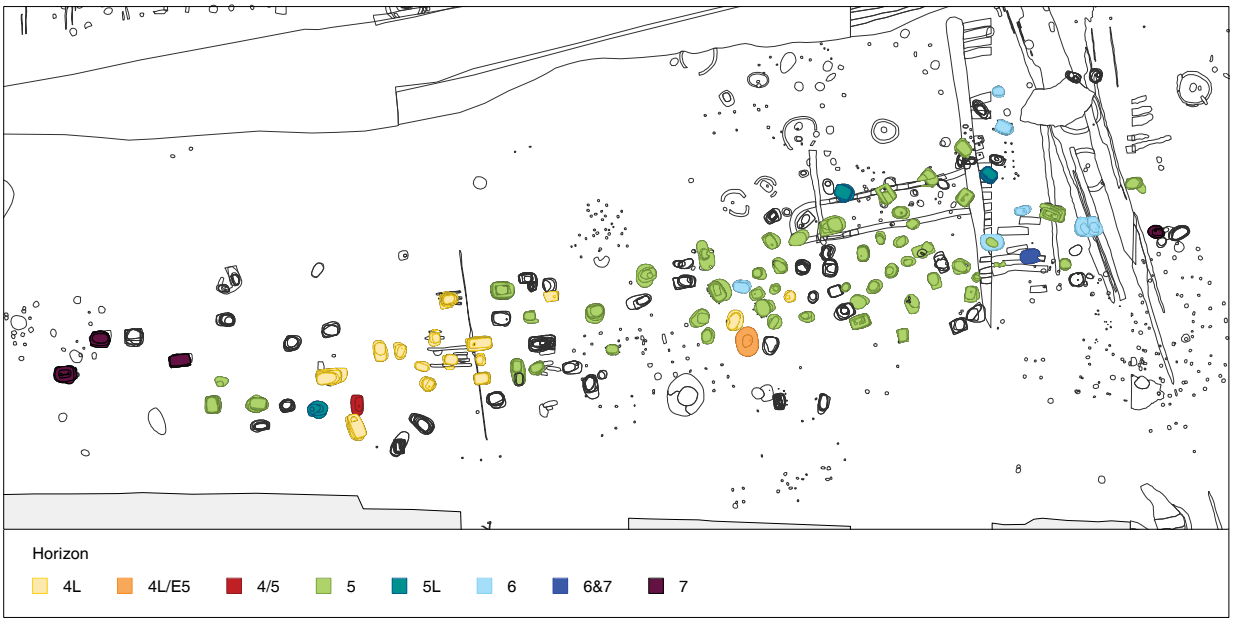


Figure 4.38 Dalfsen: distribution of the pottery in the burial ground.

	Number of graves				
Number of pots per grave	horizon 4L	horizon 5	horizon 6	horizon 7	Total
1	6	42	3	4	55
2	7	11	5	0	23
3	2	1	1	1	5
4	0	0	0	0	0
5	0	1	0	0	1
Total	15	55	9	5	84

Table 4.5 Number of pots per grave per horizon.

pottery (approximately 60%). A single pot in a grave is the most common, with almost two thirds of all the graves with pottery having just one pot. The exceptional nature of grave 25 (horizon 5), which has five pots, is underlined by there being only a handful of graves with three pots (two in the earliest phase of activity and one in each of the subsequent horizons) and none with four pots. There is no significant combination of pots, with the exception of the observation that miniature vessels only -cooccur with larger pots. The comparatively large number of miniature pots is surprising, but it may be related to the good preservation and full excavation of the cemetery rather than to local factors. Fragmented small pots have probably been under-recognised in megalithic monument inventories.

No other details relevant to the pottery have been recognised from the spatial distribution of the graves. Nor is it possible to identify the earliest grave in the cemetery on the basis of the pottery, because stylistically, the pottery identified as horizon 4L forms a coherent group. At any stage in the development of a style, a range of elements are employed. This, combined with the possible use of 'old-fashioned' elements or even the use of pots that were several years old, makes such conclusions impossible when burials take place at close intervals of time. It is an unfortunate effect of the richness of this cemetery; had burials taken place less frequently, a sequence might be identifiable on the basis of changes in style. However, given the extended period of use of the cemetery, evidence is available of the progressive use of the cemetery. This may suggest that areas were not reserved for particular groups of people (elites, family members). It is also possible that new graves were dug at the existing edge of the cemetery. In general, the horizon 4L graves appear to be less densely concentrated than those of horizon 5. The two most distinctive burials within the horizon 4L part of the cemetery can be identified as grave 99, on the basis of the large size of the grave pit and the presence of amber ornaments, an arrowhead and a tureen (AB34), and grave 96, also a large grave pit, which was associated with a thick cover of bog iron and included a tureen (AB114). These two graves occur at the western end of the distribution of graves with horizon 4L pottery. Several undatable graves occur immediately west of these two graves, as do several graves of horizons 5 and 7.

There is a trend within the horizon 5 use of the cemetery of a general move from smaller to larger vessels from west to east, and for larger vessels to occur towards the north and south sides of the cemetery, with many of the smaller amphoras occurring along the axis

of the distribution. An area of disturbance associated with a much later house site makes the relevance of these observations difficult to assess.

4.4.6 Pottery, dating and the ditch structure

A unique feature of the Dalfsen cemetery is the presence of the remains of a long, narrow, ditched feature associated directly with graves containing pottery (see section 3.5.1). It can be closely dated because the ditch cuts two graves with decorated and undecorated pottery (graves 9 and 63) and is in turn cut by three graves with undecorated pottery (graves 7, 61 and 62). All five can be dated to horizon 5, which is therefore both the *terminus ante quem* and the *terminus post quem*. Undecorated tureen-amphoras in grave 9 (pre-dating the ditch) and grave 62 (post-dating the ditch) are similar in shape. As three graves cut through the ditch, it would appear that the ditch was backfilled fairly quickly, probably negating it as a feature of visual significance. Graves 8, 13 and 35 occur in the area between the ditches. Of these, graves 8 and 35 include decorated tureen-amphoras, which could be contemporary with the decorated tureen-amphoras in graves 9 and 63 and could therefore could have already been buried before the digging of the ditch or, alternatively, shortly after. Grave 35 also includes two undecorated vessels, namely, a miniature vessel resembling the pot in grave 61 and a bowl closely resembling the bowl in grave 7. Both these graves cut through the ditch. Taken together, the pottery from all these graves forms a consistent group, which suggests that the ditch was relatively short-lived.

4.5 Pottery making

4.5.1 The ethnographic basis of analysis

Many reconstructions of primitive pottery making are inspired by descriptions of pottery production in such places as equatorial Africa, Afghanistan, and the southwestern states of the USA.[148] These studies reflect two features: environment and economy. Climate has a strong influence on the way pottery vessels can be made, and the hot, dry conditions of these areas bear no relationship to the damp and seasonal conditions of western Europe, including the Netherlands. While suitable clay and a reliable fuel resource are essential, climate plays a sometimes underestimated but influential role in aspects of pottery manufacture. For this reason, the description of the *Jydepotte* industry is an important source of information for this part of Europe.[149] In the 19th and early 20th century, handmade pottery using locally sourced material was made in Jutland. This was a cottage industry that, although it produced pottery for markets all over Europe, existed in the same temperate region of Europe as Dalfsen, and that, like the TRB culture in general, was based on locally sourced clay for pottery made without a wheel and fired in primitive conditions. In this context, locally sourced clay presumes the use of clay from the nearest possible source, rather than clay that was selected because of advantageous characteristics and sourced from farther afield.

Regarding the aspect of economy, household production, *i.e.* the production of pottery on a household basis for its own use only, is widely considered the probable context in which TRB pottery was made and used. However, in the places where pottery is handmade today, none of the potters make pottery purely for their own consumption. In most areas, pottery is also made for trade or, nowadays, for the tourist market, and it is usually a seasonal source of income. Handmade Jydepotte were made for export, to provide income outside the agricultural season in an area without other possible sources of income. Household production is broadly thought of as pottery made of local materials, in the home, for home use. But there seems to be little historical information about the organisation of this activity.[150] By whom was it made? When was it made? How often was it made? How much was made? Why are some pieces highly finished and others not? Was it made only in large households, with different individuals involved in the several stages necessary for the production of any vessel? What of the sourcing of clay and fuel; the cleaning and preparation of the clay; the teaching of methodology, shaping, finishing, drying, decoration, firing and ultimately use of the product; and the choice of the vessel form, its function, its role? A large household could have accommodated specialisation within household production. A small household production must have looked very different.

One area where household production and use have been identified is the Maghreb of Northern Africa, where it was documented in the mid-20th century among the Berbers.[151] Amongst the Berbers, the female head of the household organised the manufacture of utensils for her own household on an annual basis to replace vessels damaged or lost over the year. The pottery was handmade using local material and fired in an open firing. The potters were the female members of the household. North African environmental conditions bear little resemblance to those of temperate western Europe, but the organisation of this activity may help us to understand something of the situation pertaining in western Europe, in particular the pride taken by the female head of the household in their products and its significance in forming their social confidence.

148 *E.g.* Rye 1981; Shepard 1956.
149 Steensberg 1939, 1940.
150 Peacock 1982.
151 Balfet 1965, 161-177.

Peacock (1982) has provided a survey of ethnographic accounts of primitive pottery making in a domestic context for own household consumption. In these accounts, the pottery is made by the women of the house in the vicinity of the house, without the use of a potting wheel, and fired in open firings. These circumstances are likely to have pertained to TRB pottery making and can arguably be considered the most likely context for the making of the Dalfsen pottery.

4.5.2 Pottery making at Dalfsen

Fuel and clay

Two commodities are essential to the production of pottery: fuel and clay. In the possibly thinly populated landscape of the Vecht valley, wood would have been abundantly available and could have been collected and stored incidentally by old and young. An alternative source of fuel still widely used for firing pottery is dried dung. Although usually thought of as a fuel of hot, dry climates, this material was certainly a possible fuel in western Europe; drying dung for use as fuel occurred on the Île de Brehat in Brittany in the 19th and early 20th century (Fig. 4.39). This was an area where wood was not immediately available, and drying dung for use as fuel would have been a necessity. In the fourth millennium BC, woodland is likely to have existed in the neighbourhood of Dalfsen, and the use of dried dung as a fuel is unlikely.

The second essential is clay. In general, clay is widely available, although it generally requires preparation of one type or another. Clay is a heavy resource and is therefore usually sourced as close as possible to the place where it will be used, especially when means of transport are limited. On the basis of a survey of ethnographic sources, Arnold concluded that the 'preferred territory of exploitation' was within 1 km of a settlement (29% of the communities surveyed), and up to 7 km (82% of the sample). According to him, 7 km was probably the maximum distance travelled that is considered economic in the search for clay, although distances of 25-50 km were travelled when necessary.[152] In Jutland, the clay used for the Jydepotte was dug out by the farmers from their own fields. It was collected during the winter months, between the harvesting of one crop and the sowing of the next.[153] Balfet reported that the women in a part of the massif of Grande Kabylie in the Maghreb made their pottery on an annual basis, starting with the collection of clay locally, in the early summer, when they were not involved in other household tasks.[154]

Clay may not have been available in the neighbourhood of Dalfsen (between 1 and 7 km distant, as suggested by Arnold, above). The ridge on which the cemetery and presumably the associated settlement were located is a blown sand ridge standing on a base of glacial sand. The nearby river Vecht was probably too fast flowing to have deposited clay at this point. It is likely that the nearest locations where clay would have been deposited are downstream, in the neighbourhood of Zwolle, or farther west, in the former IJsselmeer, as TRB pottery is known from Hattemerbroek, near Zwolle.[155] The nearest boulder clay deposits are also at some distance (Fig. 4.40; see also Chapter 8). The *Atlas van Nederland in het Holoceen* (2011) includes the distribution of the main boulder clay deposits that would have been accessible at 3850 BC and at 2750 BC.[156] The nearest probably accessible boulder clay deposits to Dalfsen are to the northeast, in the vicinity of Vollenhove, just south of Zuidwolde, where stone would also have been available; south of the Vecht, in the neighbourhood of Wezepe-Hattem, at the northern end of the Veluwse push moraine (*stuwwal*); and upstream, to the southeast, at the Lemelerberg, where the Vecht is joined by a northward-flowing tributary, the Regge. This last appears to have been the most likely source of clay from the point of view of accessibility and transport; a boat would have been an advantage in transporting this heavy commodity, and a laden boat would have benefitted from the downward flow of the river. It is now impossible to establish how long a logboat would have taken to travel from Dalfsen to the Lemelerberg, considering various factors, such as number [157]of paddlers, size of the logboat and speed and flow of the river. Information regarding a logboat speed is difficult to find, but a fisherman on Lake Malawi reported a normal speed of about 7 km/hour in lake conditions, which suggests at least a couple of hours' travel upstream to the Lemelerberg. Struckmeyer and Van Os found that several of the pots sampled were made of a fluvial clay (*e.g.* AB77 and AB79) and that another vessel (AB110) was probably made of a clay of fluvial or marine origin (Chapter 5). This suggests that this pottery could have been imported. The majority of the analysed pottery was made of clay for which no source was identified. However, any pottery made in the neighbourhood of Dalfsen is likely to have been made of imported raw materials, making the identification of imported pots difficult.

Assuming that it was made in the neighbourhood of Dalfsen, pottery must have been made of clay that had to be sourced in a time-consuming manner. It is unlikely

152 Arnold 1981, 35-36, Fig. 2.1.

153 Steensberg 1940.

154 Balfet 1981, 257.

155 Lohof *et al.* 2011.

156 This conclusion seems to conflict with conclusions drawn by Struckmeyer and Van Os (Chapter 5); see also Chapter 8.

157 https://www.facebook.com/notes/answerscom/whats-the-average-speed-of-a-dugout-canoe-on-lake-malawi/50978149408

Figure 4.39 Preparing dung for use as fuel in northwestern France (source: https://commons.wikimedia.org/wiki/File:Brittanydung.jpg).

to have been something that could have been fitted in around household chores, and clay may therefore have been collected on a seasonal basis, probably by men not involved in daily household tasks. Clay may also have been sourced from different places occasionally.

Preparing the clay

The collecting and processing of clay have been well documented in hot climates but more rarely in cool ones.[158] Although production of the Jydepotte in Jutland was for commercial markets, the preliminary stages are likely to have been similar to those at Dalfsen because they were affected by similar local environmental and technological constraints. In Jutland, pottery making was a seasonal activity carried out by a husband and wife team, each with complimentary roles, during the winter, when agriculture was at a low ebb. The clay was dug up by the husband from his own land in November and prepared by him. It was exposed to freezing conditions to dry and break up in the fields where it had been dug. It was then further crushed by beating and stamping, and the larger inclusions, debris, vegetation and stones, were removed by hand.[159] In hot climates, freshly dug damp clay is left to dry in the sun before being crushed to remove the larger inclusions. It can then be sieved using textile or woven sieves, or shaken to sort in shallow containers.[160] After this, the cleaned clay must be rehydrated carefully, a process known as slacking. It is then ready for use.

TRB communities probably also sourced their clay between late summer harvesting and spring sowing. At Dalfsen, in view of the distances to clay sources, sourcing clay was probably carried out as soon as the harvest was completed, in order to avoid long journeys in the winter, when daylight was limited and river transport more difficult. As in Jutland, the clay may have been allowed to dry or freeze as a first step to processing, during the same winter. Breaking up clay could have involved mallets or hammer axes, or handheld rocks. Wicker baskets and sieves must have been everyday household items and would probably have been used to sort and

158 Rye 1981.

159 Steensberg 1940.

160 *E.g.* Vidyani and ManiBabu 2017, Fig. 9c.

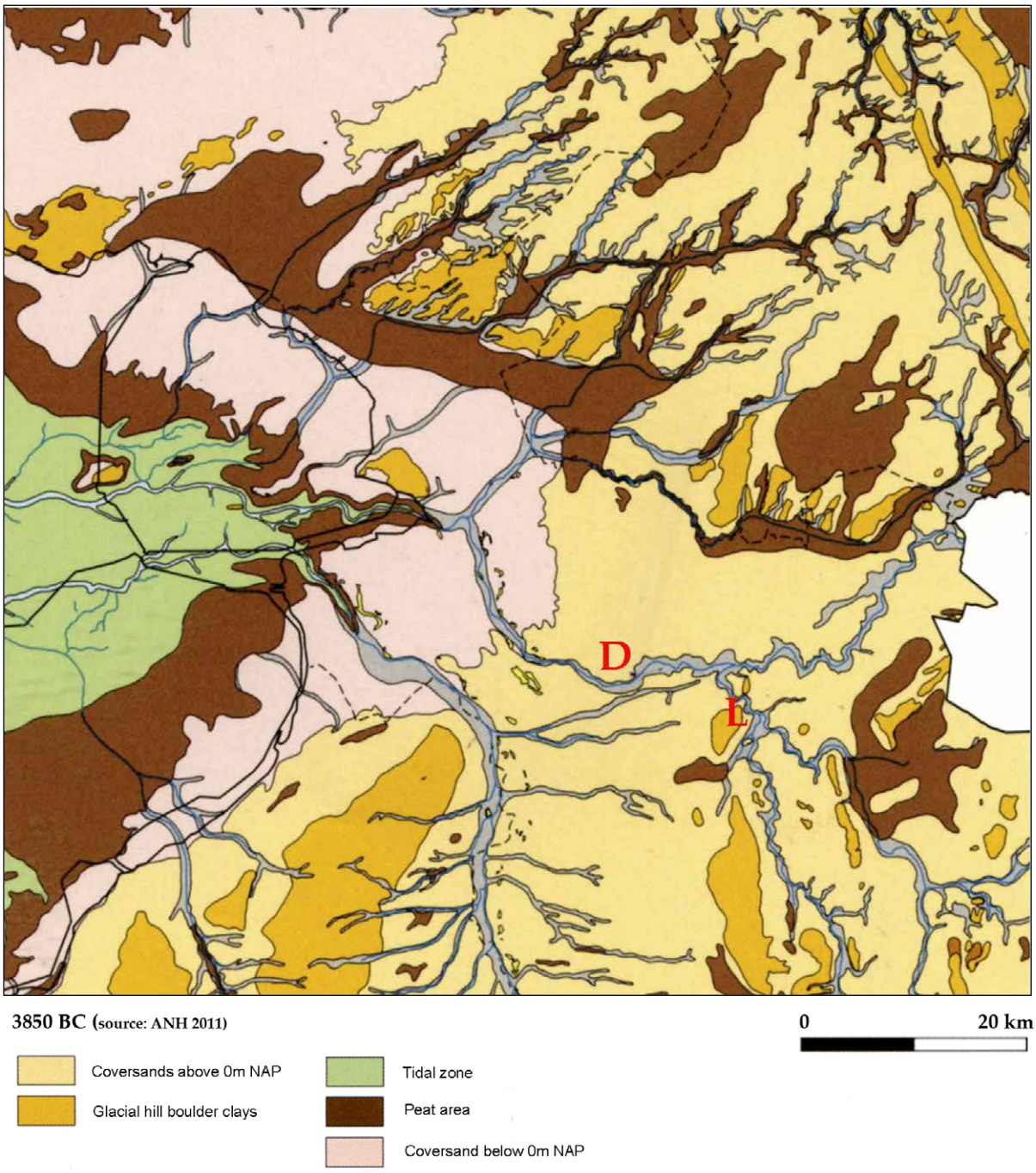


Figure 4.40 Map of clay sources probably available for the making of the pottery at Dalfsen (D = Dalfsen; L = Lemelerberg; source: Atlas Netherlands in the Holocene 2011).

clean the dry clay. As transporting a heavy commodity some distance to Dalfsen was a consideration, these initial processes may have been carried out where the clay was extracted, so that a fairly dry and at least partly clean product could be transported. It is possible that more than one journey was required, the first to dig the clay and leave it to dry and break up, and a second to clean and sort the clay and transport it back to the settlement.

Rehydrating or slaking of the clay is more likely to have been carried out in the direct neighbourhood of the household. This could have been done in pits, re-used dug-out canoes or troughs. Troughs, pits or possibly wood-lined sunken structures would not leave easily recognisable traces on settlement sites except in exceptional circumstances, but they are likely to have been part of the original settlement makeup. Slaking is a slow process as the clay must take up moisture evenly until the correct consistency is reached. Rye described water being poured carefully into a hollow made in the centre of a pile of clay and the clay being drawn down from the sides of the hollow and gradually incorporated with the water.[161] Another method, used by women working together in the village of Changki, in Nagaland, involves one woman carefully sprinkling water on dry clay that is continuously pounded by her companions.[162]

After the clay has been rehydrated and kneaded, temper is added. Stone temper was used for the Dalfsen pottery, either sand (quartz) or granite. Sand was locally available. It required little preparation and is generally easy to sieve and sort to size. Granite is not locally available in this area. It may have been available as cobbles in the boulder clay, and would have been available in the neighbourhood of Zuidwolde. Discarded quernstones, which are made of granite, are another possible source. Pieces of granite require preparation in the form of crushing and sorting to the required size. The temper is incorporated by further kneading.

In 19th-century Jutland, the preparation of the clay was the responsibility of the husband, who handed over the prepared clay to his wife. In other places, female potters prepare their own clay. It is possible that at Dalfsen, dry, cleaned clay was transported to the settlement, at which point it became the responsibility of the household potters, who saw to its rehydration, tempering and kneading in the vicinity of the home. Kneading is an essential aspect of the preparation of good potting clay. It disperses the temper equally, mixes the water evenly throughout the mass and gets rid of air. Various descriptions of this process describe it being carried out on a board, on a mat, or directly on a clay floor with the use of a parting agent, such as sand. At this stage of the Neolithic, it was possibly done on a mat or directly on the floor, with the feet, at least in the initial stage. Descriptions of this process indicate that it can be done several times. Although it is not essential, many potters leave prepared clay to mature, sometimes for several years. It is claimed that this improves the workability of the clay. A maturing heap or deposit of prepared clay is likely to have been another now invisible attribute of the home site.

Balfet has described how the mistress of a Berber household divided out the various tasks in the making of pottery in such a way as to maintain daily household tasks and the care of children, while allowing younger women and girls to learn the various techniques.[163] Aspects of the Dalfsen pottery suggest a similar organisation may have been practised. One of the characteristics of TRB pottery found in megalithic monuments and in cemeteries is the great variability in terms of skill and proficiency, and in this respect, the pottery from Dalfsen is no exception.[164] Because of the large number of well-preserved vessels, this is particularly noticeable. The making of a pot consists of a number of stages, which must be carried out in sequence and may require periods of drying in between. It is neither necessary nor always possible to complete a pot to final drying stage in one session. The Dalfsen pottery includes vessels that may have been completed to drying stage in one session, but other vessels display evidence for multiple sessions, and in some cases, it is clear that the expertise displayed at one stage was not equalled during a subsequent stage. This suggests strongly that different potters' hands were involved in the making of at least some of the pottery. There is also evidence to suggest that some pots were decorated by two people. Balfet's account of tasks being shared out by the female head amongst the women of the household allows for the possibility that separate stages were completed by different individuals.

In Jutland, the wife worked alone to produce the Jydepotte, which was handmade without the use of a wheel. The wife placed pre-formed cylinders of clay on a board balanced on her knees and formed her pottery using a combination of hand shaping, coiling, squeezing, pressing and brute force, with the vessel turned as necessary on the board with silty water as a lubricant. Features such as necks, rims and handles were made separately and added one by one.

161 Rye 1982, Fig. 22.

162 https://nagafolkfilms.com/Traditional%20Pottery%20Making%20Changki.php

163 Balfet 1965, 163.

164 Brindley 2003, 47-49.

Figure 4.41 Dalfsen: Lowest coil pinched onto surface of basal plate (AB46).

Figure 4.42 Dalfsen: Plastic flow on the surface of a bowl wiped when damp (AB6).

Figure 4.44 Dalfsen: Fire cloud (AB85).

Shaping, finishing and firing the pottery

Like the Jydepotte and the Berber pottery, TRB pottery was hand-made without the use of a potter's wheel. As in Jutland, a smooth board may well have been used, because the pottery is flat-based and in some cases has very smooth bases. With the exception of baking plates, *biberons* (A small bowl with a drinking spout); small, scoop-sized bowls; and some small, collared flasks, TRB pottery was always coil-built above the flat base. The initial stages were the making of a disc for the base and the preparation of the clay rolls which were to be coiled. The quality of the final vessel depended on the care given to the making of these coils, which had to be regular and consistent. I have found no evidence of extensive paring and scraping to make walls thinner, or of beating out walls, stretching walls, or squeezing to shape walls. Several of the finer Dalfsen amphora have walls of 3-4 mm width. These vessels must have required thin coils, presumably made either from a good-quality clay or from a well-processed one. Shepard notes that 'the more plastic the clay, the more slender the coil that can be formed'[165]. The thickness of the basal disc depended on several factors, one of which is whether the pot would have feet made by cutting out excess basal material. With TRB pottery, the lowest coil was added usually to the surface of the disc (Fig. 4.41), but occasionally it was added to the edge.

The walls were built up by coiling, with each row pressed firmly onto the previous one, usually obliquely working the inside downwards and the outside upwards (what Shepard terms internal overlap). The walls were built upwards in either conical or cylindrical manner, or curved inwards. It was essential that the bonding was tight. A simple but fully functional vessel could be

165 Shepard 1956, 58.

Figure 4.43 Dalfsen: Spalling (AB38).

Figure 4.45 Lustre that has survived firing, indicating low firing temperature (AB102).

considered completed after rubbing down at this stage. And after drying, it could be fired. At Dalfsen, and in other reconstructed assemblages of TRB pottery, only simple bowls and scoops were finished in one session. Most pots required several sessions of working, with the pot allowed to dry out to the leather-hard stage, *i.e.* the stage at which the surface of the clay could be manipulated without the risk of deforming the wall.

Subsequent work by the potter consisted of the adding of lugs, handles, bosses and cordons to the body, as well as rings and feet to the base, and of additional surface treatments (smoothing, polishing, burnishing) and decoration.

Pottery must be completely dry for firing. In Jutland, the pottery was smoked before being fired, possibly because the entire process took place during the winter months, when drying conditions would not have been optimal. At Dalfsen, and in general for the TRB culture, as the pottery was for household use and not for sale at market, it would not have been necessary to fire pottery during the winter months.

Figure 4.46 Dunt in the rim of a decorated tureen-amphora (AB121).

Household pottery that is handmade by women is normally fired in open firings, and not in kilns.[166] This involves carefully placing the fully dried vessels together with the fuel in a hearth, either directly on the ground surface or in a hollow. Under these circumstances, temperatures easily rise above the 600°C needed for firing. Some of the characteristics of this type of firing occur on the Dalfsen pottery, including smoke clouds, which occur when pots are in direct contact with

166 Peacock 1982.

burning fuel; irregular colour; and spalling, whereby pieces of the surface spring off due to too rapid heating during the firing (Figs 4.43 and 4.44).[167]

An indication that the firings were at a low temperature is the presence of a lustre, which was probably created before firing (Fig. 4.45). At temperatures higher than about 620°C, shrinkage of the surface of the vessel leads to the disappearance of lustre.

Another noticeable feature of the Dalfsen pottery is the presence of dunts, which result from faulty firing. Dunts are splits which occur when pots are cooled too rapidly when removed from the heat of the firing. They occur as radial splits in the rim and neck or as concentric splits or breaks in the body of the pot.[168]

Although dunts are only easily recognisable where pots are well preserved, as at Dalfsen, it is possible that the apparently comparatively high number of dunts in the Dalfsen pottery is a reflection of poor firing practises or the necessity of curating all pottery because of the difficulties in procuring raw materials (Fig. 4.46).

Once fired, Berber pottery entered the household for its exclusive use.[169] This is probably what happened to the pottery made at Dalfsen. It was made for household use, including use in funeral activities.

Other aspects of manufacture

It is widely believed that pottery was always finished to the same level by one person, but careful examination of TRB pottery shows that this was not the case. Although a vessel could be considered finished and ready for firing after shaping and rubbing (*e.g.* AB6; Fig. 4.42), as described above, this level of finish only seems to occur regularly for some undecorated bowls. TRB pottery was often finished to a much higher level. The variations that affect assemblages of TRB pottery are the result of this and are not always due to the relative experience and skill on the part of someone who had made the pot from start to finish (as previously suggested by Brindley 2003).

This is why the Dalfsen pottery shows great variety. It was not finished to a consistent final step, nor was each step carried out to a consistent level. The interior of a vessel is sometimes not as highly finished as the exterior, and in some instances, the upper part of a vessel has a different level of finish to the lower body (Figs 4.60 and 4.61). Techniques that were used for smoothing include rubbing and wiping as a preliminary (and sometimes only) treatment, but Dalfsen potters also scraped, smoothed and burnished surfaces to improve the appearance of their pottery.

Figure 4.47 Dalfsen: Coils visible inside the neck of an amphora (AB75).

An intrinsic aspect of pottery making is that each step taken is sequential, and the result is cumulative (shaping the plastic clay and rubbing the surface must precede scraping and smoothing when the pottery has firmed up, which in turn must precede burnishing and polishing at a firm, leather-hard stage; the process cannot be reversed).

Coil joining

During the initial forming of the pot, coils are superimposed in continuous layers and the consistent bonding of the coils is important to the strength of the pot. Bowl AB108 is an example of poor bonding and has an undulating surface, which has not been smoothed or regularised (Figs 4.48 and 4.49).

In TRB pottery, the joins are normally oblique, to allow for the greatest amount of joining surface, and the joins generally have an internal overlap. AB108 has examples of both types of joins. The joining on the lower body to the widest part of the bowl has internal overlap, but from the widest point to the rim the joins have an exterior overlap. Figure 4.49 shows a section of the widest part of this bowl with the two different joins on either side of the middle coil indicated with arrows. Had these joins been efficiently bonded, this evidence would not have been visible. It also shows evidence that the coils were laid down row by row rather than in a continuous spiral. The undulating surface is the result of the irregular pressing together of the coils. After forming, this bowl was wiped over before being allowed to dry and then be fired. On the basis of these observations, it is proposed that this vessel was made by a novice potter. It was found in grave 13, at the eastern end of the distribution of the horizon 5 pottery, within

167 Rye 1981, 114, Figs 91, 102, 115.
168 Rye 1981, 114, Fig. 101.
169 Balfet 1965.

Figure 4.48 Dalfsen: Internal and external overlapping coils at widest point of a bowl (AB108).

the 'ditch feature', associated with a *bikkel* [170]and two flakes of flint. The body silhouette appears to be that of an adult.

Asymmetrical vessels are a common occurrence and are the result of poor shaping techniques, of slumping due to the weight of the clay itself, or of the working of a pot before it has been allowed to dry sufficiently and the walls were still soft and malleable (see Fig. 4.50).

Although finished to the same stage, compared with bowl AB108 (see Figs 4.2 and 4.3), more care has been taken in the making of bowl AB6 (Fig. 4.42). The walls are regular and thin, and the surface, although not fully smooth, does not undulate. The bowl has remained intact despite a large crack, showing that the horizontal bonding was effective. Continuous rubbing with a damp hand using circular movements evened out the surface at this stage.

All forming and shaping, including of shoulders and necks, was achieved through coil building. Several amphoras (AB52, AB71, AB80 and AB93) have broken at the junction of the neck and shoulder. This is not because the body and the neck were made separately and later joined. The pot wall was thin at this point, additionally so because of the habit of incising a line at the base of the neck; the breaks are not the result of poor bonding. It appears that the forming of necked vessels (amphoras, tureens, *etc.*) was generally the responsibility of more experienced potters, whose bonding techniques were more efficient. Vessels with necks and shoulders are usually given a further level of finish (one or more of the following: scraping, smoothing, burnishing), even when not decorated.

170 A term introduced by A.E. van Giffen during his excavations at the flint mines of Rijckholt to describe the smaller versions of picks used in the mine (pers. comm. J.N. Lanting). They are a common find in hunebeds and were used in, a.o., fire-making.

Figure 4.49 Dalfsen: Deep cracks and undulating surface (AB108).

Figure 4.50 Dalfsen: Undecorated amphora that was smoothed when the wall was still plastic (AB12).

Figure 4.51 Dalfsen: Amphora viewed from above, showing squeezed neck between the two lugs (AB98).

Figure 4.52 Dalfsen: Small, conical boss attached directly to the surface (AB86).

Figure 4.53 Lug attached with a mortise-and-tenon join (AB45).

Figure 4.54 Broken lug and exposed circular mortise (AB82).

Figure 4.55 Intact lug on vessel depicted in Figure 4.54 (AB82).

Figure 4.56 Dalfsen: Scar of originally attached foot (AB71).

Applied features

Applied features were added after smoothing of the surface. These include bosses, handles, lugs, grips, basal rings and feet. Several vessels with shoulders show that at least some of the pottery was still plastic when these extra features were pressed onto the walls of the pot. Figure 4.51 shows the neck of AB98, deformed when the two opposing lugs were applied. Most features were simply applied directly to the surface of the pot. These are prone to dislodgement (Fig. 4.52).

Occasionally, a lug or grip has a mortise-and-tenon join made by cutting a hole in the wall of the pot and inserting the end of the lug into this (AB45; Fig. 4.53). The small lugs on the miniature vessel AB82 were also applied in this way (Figs 4.54 and 4.55).

Foot rings and individual feet (such as occur on AB8) would also have been applied at this stage. Scars on AB71 show that this amphora originally had a series of applied feet, now all missing (Fig. 4.56).

Surface treatments

Improving the surface of a pot makes an essential contribution to the appearance of a pot (in low-fired pottery it has less effect on the efficiency of a pot, including its porosity, although well-smoothed surfaces presumably were easier to keep clean). Shephard considered surface improvements, carried out when a pot was leather-hard, to be largely aesthetic.[171]

Smoothing

This took place when the pot had dried somewhat and firmed up, but while the surfaces were still plastic and malleable. Smoothing was achieved in one of two ways, or a combination of both: with a sharp-edged tool, which dragged temper and grits out of the surface and levelled higher parts, or with a rounded-edge tool, which left raised trails known as plastic flow. Examples are shown in Figures 4.57 and 4.58. The pot in the former figure had a harder, drier surface than that in the latter figure at the time of working. If both techniques were used, scraping preceded smoothing.

The same level of finish was not always applied consistently to the entire surface; for instance, only the lower body of AB59, a bowl, was burnished (Figs 4.59 and 4.60).

Vessels with a consistently high level of finish were decorated only when the entire outer surface had been thoroughly smoothed. Amphora AB41 (Figs 4.62 and 4.63) has been made of a less gritty paste than bowl AB59 (Fig. 4.64), which probably played a role in the choice to smooth the outer surface so thoroughly. Both pots were fairly dry when the decoration was cut into the surface. There is almost no plastic upcast beside the incisions.

171 *Ibid.*, 65.

Figure 4.57 Dalfsen: Scraping on the inside of a vessel (AB64).

Figure 4.58 Dalfsen: Plastic flow on the interior of a tureen amphora (AB64).

Figure 4.59 Dalfsen: Plastic flow on the interior of a tureen amphora (AB38).

Figure 4.60 Dalfsen: Surface rubbed with a damp hand before decoration. The plastic surface masked the quartz temper (AB59).

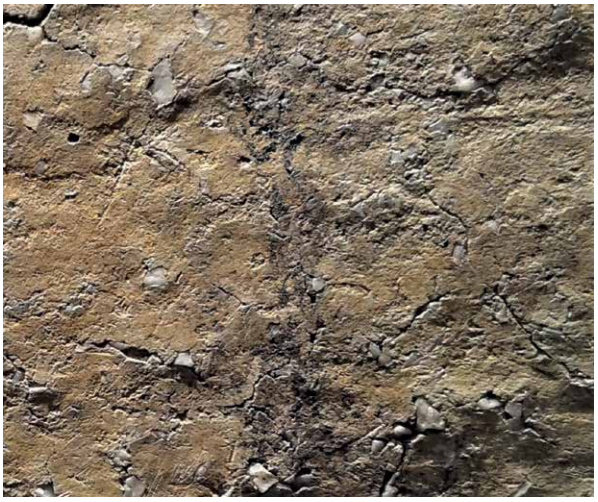


Figure 4.61 Dalfsen: Lower down on the vessel shown in Figure 4.60, the surface has been burnished when leather-hard, revealing the quartz temper (AB59).

Figure 4.62 Dalfsen: Thoroughly smoothed surface and lightly burnished surface of amphora AB41.

Figure 4.63 Dalfsen: Decoration on the amphora shown in Figure 4.62 (AB41), which was executed after the surface had been fully smoothed. The impressions are clean edged with no upcast, indicating that the surface was firm.

Burnishing

Burnishing involves compressing the surface while it is still slightly plastic but when the wall (*i.e.* not the surface) is dry enough not to deform, and is the final finishing technique used on this pottery.

Figures 4.64 and 4.65 show examples of burnishing. These pots retain some lustre.

4.5.3 Decoration

The use of decoration on TRB pottery is most extensive during horizons 2, 3 and 4, after which it declines in extent, with a larger proportion of undecorated pottery being used, as well as the growing restriction of the decorated areas

Figure 4.64 Dalfsen: Distinct burnishing troughs (AB102).

Figure 4.65 Dalfsen: Pot on which burnishing troughs have not developed because it was harder (drier) (AB52).

on the pots themselves. The undecorated pottery is highly finished in many cases. This trend is visible in the Dalfsen assemblage, with the horizon 7 pottery having minimal decoration and with pots with decoration extending below the widest part of the pot confined to horizon 4L and the earliest part of horizon 5.

Almost all the decorated pottery in the Dalfsen burial ground is decorated in the characteristic TRB manner, *i.e.* tiefstich, whereby a stylus was repeatedly stabbed into

Figure 4.66 Dalfsen: Vessel showing traces of white fill in decoration but not in cut base (AB63).

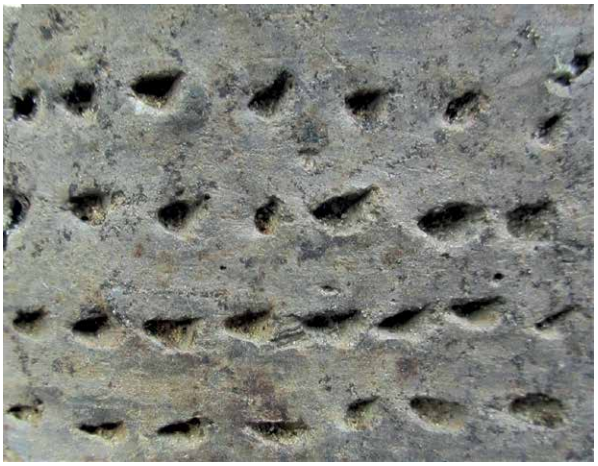


Figure 4.67 Dalfsen: Stabs arranged in horizontal lines (AB57).

Figure 4.68 Dalfsen: Grooved lines on an amphora (AB93); note pressed-down upcast.

the surface and dragged out to form a continuous line. This technique had several advantages. It was possible to create straight and regular lines in pastes that were gritty or unevenly tempered, there was little upcast, and the irregular bed of the groove provided more adhesion for the filler paste than a smooth-surfaced groove would have. This paste, a mixture of finely crushed burnt bone and some form of adhesive,[172] was used to fill the impressed decoration. It is now largely missing but would originally have masked the impressions within the grooves, which now appear as the dominant visual aspect of the decoration (Fig. 4.66). Short cuts across a raised feature (cordon, edge of base) were probably not filled with paste.

Tvaerstik technique was used sparingly, on four vessels only (AB45, AB46, AB88 and AB114). In no case is this the 'classic' tvaerstik, which consists of a horizontal line cut by short vertical lines. Tvaerstik was used widely on pottery of horizon 4, and its absence from Dalfsen is one of the arguments for dating the cemetery to the very end of that horizon (Fig. 4.67). Jabs and stabs, either individually or forming lines and panels, occur on some

172 Brindley 1986a, 50.

Figure 4.69 Dalfsen: C-shaped horizontal tiefstich combined with squared-ended vertical tiefstich (AB106).

Figure 4.70 Deep, irregularly executed incised lines with extensive upcast, which has not been removed (AB97). The pointed shape of the stylus is clearly visible at the top of each line.

vessels. True grooved lines were used on one small amphora (Fig. 4.68). Examples of different techniques are shown in Figures 4.67-4.69.

Variation in tiefstich lines was produced by the use of squared, rounded or pointed tips; the size of the tip; the angle at which it was inserted and removed; and the frequency of the stabbing action. Pointed tips produced a deeper fine line than rounded tips. Evidence of hollow tools (of reed or bone), vertically impressed, is found regularly on horizon 5 pottery but not at Dalfsen. However, C-shaped impressions noted on the large tureen-amphora AB10 were probably made with a hollow instrument with an obliquely cut head (Fig. 4.70). As is usual with assemblages of TRB decorated pottery, the decoration itself was executed with varying degrees of accomplishment.

4.5.4 Tidying up, mistakes and corrections

Perhaps the easiest way that most of us identify with others is in the small details of how we try to correct our mistakes. 'Tidying up', *i.e.* smoothing around decoration, reflects the interest individual potters took in the final appearance of pots they made. Smoothing over incised or impressed decoration is shown by overlapping edges, as can be seen on AB64 (Fig. 4.71). Careful vertical smoothing between the shoulder panels avoided this, as seen on AB85 (Fig. 4.72). Both vertical and horizontal smoothing marks are visible on the neck of AB90 (Fig. 4.73). AB49 appears to have been decorated when the pot was fairly hard and dry. There is little upcast, and the pot has not been smoothed again after decoration (Figs 4.74 and 4.75).

'Mistakes' in the execution of patterns are common on pottery with less well-executed decoration. Tureen amphora AB49 shows a large number of errors in the execution of a fairly simple pattern.

Multiple mistakes on a smooth-surfaced tureen-amphora (AB49) suggest either that the potter was more experienced in smoothing than in decoration or that two individuals were responsible for the production of this pot. Five 'errors' are shown in Figures 4.75 and 4.76.

Occasionally an effort was made to correct an error (Figs 4.77-4.79).

Figure 4.71 Dalfsen: The surface has been smoothed over the edges of the impressions (AB64).

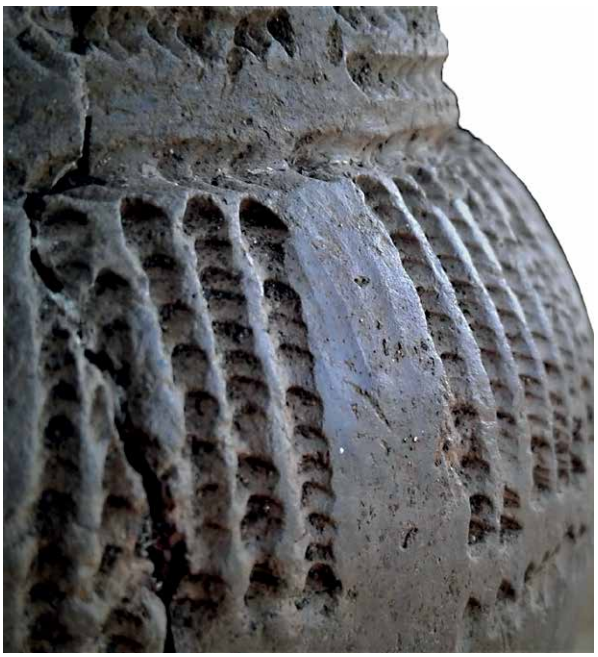


Figure 4.72 Dalfsen: Vertical facets are visible between two panels of vertical lines (AB85).

Figure 4.73 Dalfsen: Vertical marks between the panels and horizontal marks below the two panels show smoothing after decoration (AB90).

Figure 4.74 Dalfsen: Very irregularly executed zigzag lines on a tureen-amphora neck (AB112). The band has four zigzags on the left, and five on the right. Arrows indicate perforations made after firing.

Figure 4.75 Dalfsen: 'Errors' in the decoration of AB49: (i) on the neck, the upper horizontal paired line swoops downwards at this point; (ii) the gap in the neck decoration is not aligned correctly with the pinched-up lug; (iii) there is a horizontal line missing at the base of the decoration on the right side of the gap; and (iv) the panels on the upper body are not of the same length.

Figure 4.76 Dalfsen: A further 'error' in the upper body decoration of AB49. The decoration on the left side of the gap appears to have been lengthened with three extra rows of stabs and is longer than the decoration on the right side of the gap.

Figure 4.77 Dalfsen: Corrections to vertical panel on AB59.

Figure 4.78 Dalfsen: Corrections to vertical panel on AB42.

Figure 4.79 Dalfsen: Corrections to vertical panel on AB78.

Figure 4.80 Dalfsen: Perforations on exterior of base (AB5).

Figure 4.81 Dalfsen: Perforations on interior of rim (AB47). Note the upcast.

Two hands

Careful examination of the different stages in the fabrication of individual pots throws surprising light on how the making of the Dalfsen pottery was organised. One amphora in particular highlights how complex this process could be. Amphora AB75 is symmetrical, with no sign of slumping. It has a well-smoothed exterior, one that involved rubbing, scraping and smoothing before it was decorated. The interior of the neck, however, was not smoothed after the coils were bonded, and these are clearly visible as horizontal depressions (Figs 4.47 and 4.89). This is unusual, as the inside of the neck is easily accessible at all times during manufacture. The vessel has two neatly applied and shaped lugs. The decoration shows evidence that it was executed by two people. Potter A was responsible for the regular, even decoration executed on one side, and this side is complete. The other side, decorated by potter B, probably broke during firing and was repaired involving multiple drilled holes, which have obscured the decoration. However, close examination shows that the decoration on this side is irregularly executed. The straight lines are not neatly horizontal, nor are they continuous, and the tiefstich is not continually executed in one direction but changes direction, suggesting that potter B either turned the pot upside down from time to time, or changed hands. All of the decoration on the body of the pot was executed by potter A. Balfet's description of the female head of a Berber household allotting different stages of manufacture according to who was available or needed experience in a particular aspect of the process[173] can be used to suggest that a TRB household included an extended family, with one woman who apportioned tasks in a similar fashion. The contrast between the smooth finish given to tureen AB49 and the many mistakes made in the decoration added later (Figs 4.75 and 4.76) also suggests two different people were responsible for this pot.

4.6 Perforations and maintenance

4.6.1 Introduction

Perforations occur on 19 vessels and are a significant aspect of this inventory. Two types of perforation occur: cylindrical perforations made before firing, which occur on two vessels, and conical and hourglass-shaped drilled perforations made after firing, which occur on 16 vessels. Perforations occur on pots of all horizons except horizon 7, which is represented by the least number of pots in the assemblage. Cylindrical perforations occur on two bowls of horizons 4L and 5. Drilled perforations occur mainly on decorated vessels (13 decorated as opposed to 4 undecorated vessels) and on complex-profiled vessels (8 tureen-amphoras, 6 amphoras and 1 necked bowl) as opposed to one simple-profiled bowl. A total of 2 vessels date to horizon 4L, 10 to horizon 5, 1 to the cross-over horizons 5/6 and 4 to horizon 6. The occurrence of so many perforations on well-preserved pots from a contemporary group has meant that it is possible to look in depth at this phenomenon.

4.6.2 Cylindrical perforations

These were made before firing, while the pottery was still plastic. They are therefore intrinsic primary features of the vessel. They are not very common on TRB pottery, but they do occur sporadically: close to the rim, in the base, and on the so-called baking plates. They are usually small and without obvious function.

Two examples of cylindrical perforations occur in this assemblage (Figs 4.80 and 4.81). One is a comparatively large example (diameter 3 mm) in the base of undecorated

173 Balfet 1965.

Figure 4.82 Dalfsen: Broken surface surrounding perforations on the inside of the pot (AB121).

bowl AB5. It is very neatly made, without any traces of upcast on either side. The second example, which is about 1 mm across, has distinct upcasts on both sides. This example occurs close to the rim of decorated bowl AB47. On the inside of the rim, the upcast from pushing through the perforator has not been removed. This bowl is not complete, but approximately half of the rim is preserved, showing that the perforation was not one of a series.

4.6.3 Conical and hourglass-shaped perforations

These are made after firing and are drilled through the wall of the pot. In most cases, this is from one side only, and the result is a conical-shaped perforation. When the drill breaks through the wall of the pot, it usually takes away the adjacent surface on the inside (Figs 4.21 and 4.82). In some cases, the hole is widened to create a neater and larger perforation. Drilling normally occurs from the outside of the pot because of the difficulty of accessing the interior. Where the perforation is obviously drilled from the inside wall, it is safe to assume that this occurred on a sherd that had become detached.

Rotary drills with fine points were used for this task, which must have required patience and skill; the walls of some of these pots are only 3 mm in width, and the pottery itself is gritty and friable, although it is relatively soft because it was fired at low temperatures. Probably a bow drill with a bone awl or point was used, together with sinew. The photo below (Fig. 4.83) shows an Inuit man using his mouth to hold the drill, thus allowing him to use both hands. Fragile pottery was probably drilled in this way, with the pottery held in one hand and cushioned on the leg and with the drill worked with the second hand. The many perforations on the Dalfsen pottery suggest that the use of fine drills was a common activity on TRB settlements.

Figure 4.83 Inuit man using a bow drill (source: Canadian Museum of History).

4.6.4 The function of perforations

The function of the cylindrical perforations is unclear, although they were evidently intrinsic to the use of the pot. Drilled perforations were used for mending and reinforcement and usually occur in pairs or groups as pairs of perforations used to reinforce pots that had split at the rim (dunts) during firing but were otherwise serviceable (*e.g.* AB23, AB87 and AB120); pairs of perforations used to mend broken pots (*e.g.* AB113); or multiple perforations used to 'sew' pieces of pots back into place (*e.g.* AB112 and AB121). These are referred to here as crescents of perforations because characteristically the multiple pairs surround a D-shaped broken-off part including part of the rim. There are seven vessels with this type of repair Two other types of repairs, involving multiple perforations for the reattachment of a base and the repair of a rim edge, are also represented.

Figure 4.84 Dalfsen: Reinforced dunt in a decorated pot (AB121).

Figure 4.85 Dalfsen: Multiple perforations used to reattach base (AB71), exterior view.

Pairs of perforations may co-occur with crescents of perforations on a single pot (*e.g.* AB120 and AB121). Multiple dunts on a single pot have also been discovered (*e.g.* AB120 and AB121). Because of the fairly complete condition of much of the Dalfsen pottery, it has been possible to distinguish these different types of activity.

The simplest manner of repairing a break is to drill holes on either side of the break and use sinew or fibre to bind the loose sherd back into place. The slightly different reinforcement, as opposed to repair, of a crack is interesting because of what it reveals about the manufacture of pottery in the neighbourhood of Dalfsen. Because the pottery is quite well preserved, it is possible

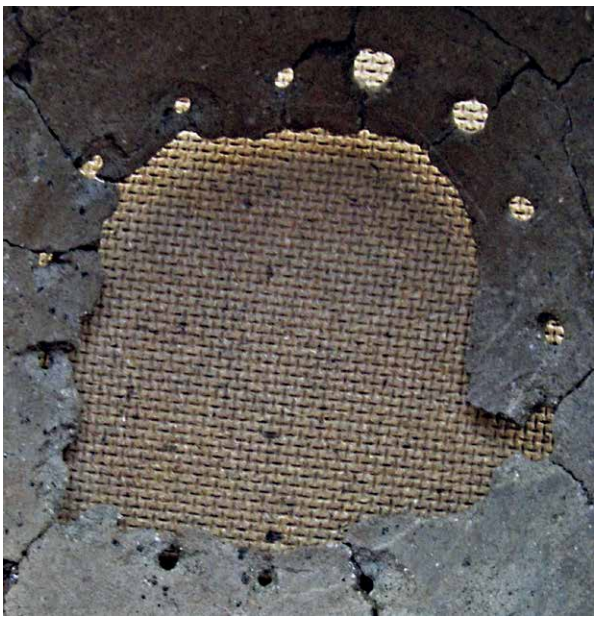


Figure 4.86 Dalfsen: Multiple perforations used to reattach base on the vessel shown in Figure 4.87 (AB71), interior view.

to identify cracks or splits that are not breaks. They are found usually in the neck of the vessel, running down from the rim, and can be recognised as dunts, the technical term for cracks and splits that occur when a pot cools too rapidly after firing. They can also occur on the body of the pot, usually along a weak join. If the pot is otherwise complete, dunts could be, and were, reinforced by drilling a pair of holes, one on either side of the crack, and binding up the crack (Fig. 4.84). Up till now, repaired pots were considered to be ones that were damaged during use, but the Dalfsen pottery shows that this is not so in many cases. Although misfired pottery can be a total disaster, minor damage caused during firing does not always render a pot unusable. Dunts were probably a common occurrence and did not necessarily prevent the use of the pot.

Neck dunts occur on at least seven vessels, and more than one can occur on a single pot. All the dunts are on vessels with a separate neck, such as tureen amphoras and amphoras. A particularly extensive body dunt occurs on AB71, where multiple perforations were used to reattach a footed base to the body of an amphora (Figs 4.86 and 4.87).

Multiple pairs of perforations arranged in a crescent represent loose sherds that have been sewn back into place. These generally D-shaped replaced pieces do occur on undecorated pottery (AB5), but are associated more often with decorated pots. The perforation is drilled through the decoration when necessary. This type of repair was used for both large and small pieces. The largest repair consisted of at least 16 pairs of perforations

Figure 4.87 Dalfsen: Crescent of perforations (AB5).

Figure 4.88 Dalfsen: Detail of 16-pair crescent (AB33).

(*i.e.* in excess of 32 separate holes were drilled to repair the break). This vessel, AB33, also had a reinforced dunt. It is one of the largest vessels in this assemblage and is well finished and neatly decorated. The repairs were extensive but were evidently considered economically worth doing.

Another type of repair involving multiple perforations, this time not in pairs, was used to reattach a narrow section of rim (AB75; Fig. 4.89). The latter repair was to a damaged rim top, the repair consisting of an irregular line of seven perforations drilled close to the rim so that the missing part could be bound back into place. The missing piece is too narrow to have accommodated drilled pairs.

Some pots have multiple repairs and reinforcements, using both pairs for the dunts and crescents for loose pieces (AB41 and AB121).

Drilled post-firing perforations can be either conical or hourglass-shaped. Most of the perforations at Dalfsen are conical and have been drilled from the outside because there is insufficient space to work a drill inside

Figure 4.89 Dalfsen: Detail of neck showing missing rim from the inside (AB75), with the area immediately above the perforations indicated with red dots. Note also the irregular horizontal grooves, which are evidence of coil building that has not been smoothed over.

Figure 4.90 Dalfsen: Perforations drilled from the inside (AB113).

these pots. However, one decorated tureen-amphora (AB113) includes four hourglass-shaped perforations and three of an original four conical perforations. This vessel has unusually deeply cut incised zigzags on the neck, resulting in a weak vessel which developed a long dunt when it was fired. During the drilling of perforations to reinforce the dunt, a large, triangular piece of the neck, including part of the dunt, broke off. Rather than discarding this already weakened and damaged vessel, both the perforations to reinforce the dunt and those now required to reattach the loose sherd were drilled from both sides and are hourglass-shaped. However, the partner perforations on the vessel could only be repaired from the outside and are conical in form.

AB	Type of perforation	Arrangement	Brindley horizon	Decoration
5	cylindrical	single?	5	no
11	conical	crescent	5L/6	no
17	conical	below shoulder	5	no
23	conical	dunt	6	no
32	conical	below shoulder	6	no
33	conical	dunt and crescent	6	yes
47	cylindrical	single	4L	yes
67	conical	dunt?	5	yes
69	conical	below shoulder	4L	yes
71	conical	crescent	5	yes
75	conical	line	4L	yes
87	conical	dunts	5	yes
97	conical	crescent	5	yes
112	conical	probably crescent	5	yes
113	conical	dunt and below shoulder	5	yes
117	conical	crescent?	6	yes
118	conical	dunt and crescent	5	yes
120	conical	dunt and crescent	5	yes
121	Conical	dunt and crescent	5	yes

Table 4.6 Summary of information on perforations.

4.6.5 Significance and discussion

The occurrence and frequency of perforations at Dalfsen has some significance. It is unusual for so many perforations to be found on such well-preserved and complete or semi-complete vessels. Excluding the poorly preserved, fragmented settlement pottery, TRB pottery has, until now, been found in two types of context, either as small numbers of well-preserved pots from small cemeteries of flat graves, or as sherds of hundreds of pots in megalithic monuments. Perforations have been found on pottery from both types of context, but their significance could not be assessed because small cemeteries do not provide sufficient numbers of pottery, while the reconstruction of well-preserved assemblages from megalithic monuments is considered too time-consuming to be worthwhile. The Dalfsen assemblage includes a large number of complete or semi-complete vessels with abundant evidence for repair and reinforcement of the pottery (Table 4.6). As a result, it has been possible to identify different types of consolidation and to appreciate the extensive efforts made to conserve pottery when necessary. Repairs and reinforcements tend to occur on shouldered vessels, such as amphora and tureen amphora, and on decorated pottery. This may be because complex-profiled vessels were more difficult to make and therefore more fragile and because decorated vessels were considered more valuable because of the extra time expended in their manufacture.

The different types of repair and consolidation, as well as the sometimes extensive nature of the work involved, are also apparent because of the good preservation of the pottery as a whole. The occurrence of dunts and their frequency is clear, as is the degree to which they were considered as something that had to dealt with pragmatically rather than as a reason for the discarding of a pot. A further consideration is that the absence of a nearby source of potting clay played a role in the curation of pottery. Once fired, pots had to be conserved as long as possible, and the extensive occurrence of perforations reflects this.

The significance of the distinction between the conical and the hourglass perforation is also apparent. Pairs of conical perforations discovered on reconstructed pots do not signify a repaired break but a reinforced dunt. Hourglass perforations signify a sherd which could be drilled from both sides and therefore must have been a sherd separated from the body of the pot.

Finally, the abundance of drilled perforations provides evidence for the use of the bow drill.

4.7 Discussion

Pots cannot be taken as a substitute for people, even in places where the former occurs abundantly, as at Dalfsen and in the megalithic monuments of the TRB West Group, where environmental factors have destroyed almost all traces of the deceased. The pottery found at Dalfsen, fully excavated, in a good state of preservation, from a

Catalogue of perforated pots

- AB5 Small, very regular, cylindrical perforation (diameter 3 mm) in base close to side wall. No traces of upcast. Undecorated bowl. Horizon 4L. Grave 37. Cat. no. 66
- AB11 Seven conical perforations (seven pairs) arranged in large crescent. Undecorated, smoothly finished bowl. Horizon 5L or 6. Grave 67. Cat. no. 84
- AB17 Incomplete vessel with one conical perforation below shoulder close to lug. Undecorated, smoothly finished amphora. Horizon 5. Grave 47. Cat. no. 45
- AB23 Pair of conical perforations straddling dunt in neck of undecorated, smoothly finished amphora. Horizon 6. Grave 23. Cat. no. 54
- AB32 Part of lower body of vessel with one conical perforation below widest point of body. Appears to have been an undecorated amphora. Horizon 6. Grave 26. Cat. no. 121
- AB33 Large crescent of at least 16 pairs of conical perforations, surrounding large, D-shaped piece. Also, one conical perforation of original pair spanning dunt. Decorated necked bowl. Horizon 6. Grave 26. Cat. no. 87
- AB47 Small, cylindrical perforation close to rim tip. Distinct upcast on both sides. Incomplete, decorated bowl, possibly a single perforation. Horizon 4L. Grave 86. Cat. no. 55
- AB67. Cylindrical perforation in small neck sherd of incomplete decorated tureen amphora. Horizon 5. Grave 45. Cat. no. 9
- AB69 Conical perforation in lower body of decorated amphora. Probably one of pair. Horizon 4L. Grave 87. Cat. no. 32
- AB71 Circle of conical perforations surrounding now missing footed base. Decorated, well-made amphora. Horizon 4L. Grave 59. Cat. no.39
- AB75 Line of conical perforations below rim. As there does not appear to be sufficient room to accommodate pairs on the now missing rim sherd, it is suggested that the missing piece was held in place using whipping stitch (*i.e.* binding thread carried over the rim and back through the perforation). Decorated amphora. Horizon 4L. Grave 94. Cat. no. 35
- AB87 Two dunts, each with a pair of conical perforations. Decorated tureen-amphora. Horizon 5. Grave 2. Cat. no. 15
- AB97 Crescent of seven pairs of conical perforations. Decorated tureen-amphora. Horizon 5. Grave 20. cat. no. no. 18
- AB112 Crescent. Three conical perforations of incomplete crescent. Decorated tureen-amphora. Horizon 5. Grave 22. Cat. no. 21
- AB113 Complex repair now represented by seven of probably eight perforations on a decorated tureen-amphora. Three pairs of perforations occur on the neck and one adjacent to the lug (a missing sherd at this point probably included the partner of this last perforation). An initial attempt to reinforce a long dunt with two pairs of perforations resulted in the breaking off of a part of the neck, which was reattached with a further two pairs of perforations. Horizon 5. Grave 8. Cat. no. 20
- AB117 Series of conical perforations on poorly preserved sherds. Possibly reinforced dunt(s). Incomplete decorated tureen-amphora. Horizon 6. Grave 29. Cat. no. 114
- AB118. Evidence for a crescent of conical perforations in the form of six perforations or parts thereof, representing a large, D-shaped break. Decorated tureen-amphora. Horizon 5. Grave 69. Cat. no. 27
- AB120 Multiple reinforcement and repairs. Dunt straddled by pair of conical perforations, small, D-shaped area with crescent of six perforations representing six pairs and single perforation adjacent to lug and missing part of pot. Large, well-made, decorated tureen-amphora. Horizon 5. Grave 101. Cat. no. 28
- AB121 Dunt and crescent. One pair of conical perforations straddles a long dunt. On the opposite side of the vessel, a D-shaped area is marked by a crescent of four conical perforations. This break may have originated in a dunt. Decorated tureen-amphora. Horizon 5. Grave 63. Cat. no. 16

defined period of time, is an assemblage offering unique opportunities, but it was only one category in a world furnished with objects of treen (worked wood), wicker, stone, textile, skin and leather. Ceramic pots have many advantages, especially for cooking, but containers can be made of many materials. The pottery at settlement sites was not usually abandoned in a complete state but discarded when damaged, and it has not been protected by large stone constructions or by being buried in pits, which are characteristics of funeral pottery. In comparison, the quantity of preserved pottery found at many megalithic monuments and at Dalfsen therefore

seems large and impressive in its completeness, but it represents only a fraction of the actual pottery made and used by the local community.

The Dalfsen pottery forms a large, fairly well-preserved group, with the vast majority of pots capable of full paper reconstruction, and identifiable to a type and horizon. In all, 122 pots were examined from 84 graves. These have been classified and dated by the horizon typology. The classification is as follows: tureens (7), tureen amphoras (24), amphoras (23), bowls (31), necked bowls (3), shouldered bowls (7), collared flasks (2), drinking vessels (9), small or miniature vessels (7) and miscellaneous vessels (9). Of these 122 vessels, 24 were identified to horizon 4L, 72 to horizon 5, 12 to horizon 6 and 7 to horizon 7, and 5 of the remaining 6 can also be assigned a horizon on the basis of location in the cemetery. The chronology of the pottery permits analysis of the distribution of graves in the cemetery (used progressively rather than with areas reserved for kin or class or sex), the length of time the cemetery was in use for (about two and a half centuries), and the general intensity of that activity (approximately once every three to four years). The site is located in a sandy area probably lacking local (*i.e.* within 7 km) sources of potting clay. It is suggested that boulder clay from the Lemelerberg (upstream) may have been used as a source for much of the clay used. Three of 22 sherds examined by Struckmeijer were made of clay that included diatoms (AB77, AB79 and AB110) suggesting other sources of clay were also exploited. Details of manufacture (shaping, finishing, decoration and firing) are visible on many pots. A range of ability and experience in the production not just of individual pots but also at different stages in the production of individual vessels is evident. Some pots (especially complex-profiled pots) were not made and decorated in a single session by one person, as is usually assumed. This suggests household production, with different people responsible for separate stages in the production of individual pots under the direction of the female head of household (based on accounts of the production of household pottery by North African Berber communities) and not the production by single potters responsible for all stages of productions within small nuclear households. Multiple post-firing conical perforations were used to reinforce pots in many cases weakened or split by dunts that occurred as the pot cooled. It has been possible to examine these complex borings in detail because of the completeness of the pottery assemblage.

Details of the pottery suggest that this was not specially made 'funeral pottery' but in all probability general household pottery and that its selection was not governed rigidly by type, quality, or apparently, maker.[174] It appears to have been selected on the basis of what was available within a household at a given moment. In the case of Dalfsen, the number of graves with pottery (84) and the length of time the cemetery seems to have been in use (c. 240-230 years) allow a crude calculation that several pots were extracted from the pottery available in the settlement once every few years. Whatever the size of the local community, this very small percentage will limit the effective search for products made by one hand or for products made in one household.

Identifying regional groups on the basis of pottery is dependent on being able to recognise related material within a greater region than the local community. For the West Group, dense clusters of megalithic monuments in certain areas provide sufficient evidence to do this. Megalithic monuments with large quantities of pottery from several centuries of use show minor but recognisable differences, for instance from the northwestern end of the Hondsrug, represented by G2-Glimmen and G1-Noordlaren, to the southeastern end, represented by the pottery from megalithic monuments in the neighbourhood of Emmen. Differences between these areas and the cluster of excavated megalithic monuments and flat graves near Oldenburg are also recognisable.[175] On a local scale, several of these differences have been recognised by Menne within a small region of the Emsland.[176] Differences are limited, and they usually consist of the use of a particular motif in one area rather than another. Dalfsen, however, is not located in an area of dense contemporary activity and, as a single assemblage, does not provide sufficient evidence on which to identify preferences at the local level. Despite its quantity and diversity, much TRB pottery is remarkable for its standardisation. At the level of the individual potter, it may show considerable variation in terms of quality, but the aspirations of these same individuals appear to have been remarkably standard. Furthermore, regional diversification within the West Group is most noticeable in horizons 3 and 4. Dalfsen, unfortunately, from the point of view of examining regional style, mostly falls within the later horizons. Horizon 5 pottery everywhere in the West Group includes, on the neck, bands of lines below the rim, as well as bands of zigzags or patterns of blocks of horizontal and vertical lines. Horizon 7 pottery, although associated with the use of slashed or cut cordons, is largely undecorated everywhere.

Despite the longevity of the cemetery's use, the decorative range of the Dalfsen pottery is limited and shows no specific local traits, apart from the use of a hyphenated line, which occurs on pottery from Mander and is not found in the Hondsrug assemblages.[177] The nearest large assemblage of contemporary pottery occurs in megalithic monument D53-Havelte, 30 km north

174 Striking examples are AB108 (Figs 4.48 and Fig 4.49), AB2 and AB84 (Fig. 4.25).

175 Fansa 1982.

176 Menne 2018.

177 Brindley and Lanting 2003/04, Fig. 18.

of Dalfsen. Cemeteries used for short periods of time between horizons 4L and 7 are known from Zuidwolde, Harderwijk, Uddelermeer, Ugchelen, Denekamp, Neede (1 amphora), Dalen and Mander. Settlement pottery is known from Beekhuizerzand. Viewed within the context of other non-megalithic cemeteries, Dalfsen is (at present) a unique site in that it was used for several centuries. Although there are problems when dealing with the study of these cemeteries (relating to visibility, ease of recognition and scientific recording), it remains true that up till now flat cemeteries have never produced ceramic evidence for more than a few decades of use.

The large number of graves at Dalfsen provides an opportunity to examine the occurrence of, and associations between, types of pots in graves. There does not appear to have been a prescribed combination of either types of vessels or common function. Only one repeated association stands out, namely, that of pairs of bowls, which occurs four times. Pairs occur in graves 84 (and 92) dating to H4L, and in graves 1, 19 and 41 (also a small amphora), dating to H5. The smaller amphoras tend to occur by themselves, as in graves 5, 6, 11, 16, 36, 44, 46, 47 and 70 (all horizon 5) and 90 (horizon 4L). The small vessels described as miniatures only occur in graves that include other pottery. There is a general trend towards larger vessels and multiple vessels from the end of horizon 5 onwards.

Pottery is the most common category of artefact found in graves of any date, where it can have played a wide range of roles and functions. Vessels are interpreted as drinking vessels, and they are variously interpreted as a personal possession, a grave gift from the community, or a symbol of status. But a pot deposited in a grave itself also may have had a number of possible roles. For instance, it may have had a function in the funeral ritual, such as a funeral meal, it may have been a container for something required by the dead person in an afterlife, or it could be a gift taken by the dead in order to gain access to an afterlife. Most of the Dalfsen pottery can be interpreted broadly as having held a liquid (the amphora), a dry or solid foodstuff (the bowls), or have been used for drinking from. The collared flasks may have held a particularly rare or concentrated substance. As a whole, the pottery does not suggest a rigid funeral formula, at most limited consumption of a liquid or foodstuff by a small group during the burial, or the provision of food or drink or both for the deceased. As already mentioned, it does not appear to have been made specifically for inclusion in a grave. Where multiple pots occur in a single grave, variations in skill suggest that the vessels were not made by one person, suggesting that they were not possessions of the deceased. It is also possible that pots originated from more than one household.

The extended use of the Dalfsen cemetery, with its large number of discrete graves, including those without pottery, provides a valuable parallel for the use contemporary megalithic monuments, with their disturbed contents and lack of evidence for individual burials. The quantity of pottery deposited at Dalfsen during horizon 5 is comparable to that found in megalithic monuments of the TRB West Group. The occurrence of this pottery in the graves suggests that the presence of the pottery is integral to the burial in some way. Brindley's suggestion of large gatherings for feasting and subsequent discarding of pottery during the burial of one individual of higher status at megalithic monuments at intervals of 10 to 15 years is not sustained by the picture of more frequent, smaller-scale activity at Dalfsen, with probably more equal treatment being given to all or most members of the local community.[178]

Finally, the large number of discrete associations provides useful information to refine the typology originally outlined by Brindley in 1986 on the basis of the total mass of TRB West Group pottery. In particular, it provides a good illustration of the pottery of the end stage of horizon 4 (Fig. 4.35), as well as evidence for the use of undecorated pottery of various types, especially in horizon 5 (Figs 4.36). Until now, many undecorated amphoras and bowls, especially those with bosses, were usually not dated more closely than to horizons 5-7. It also illustrates the practice of including small vessels in graves (Fig. 4.30). These vessels occur in megalithic monuments but have attracted little attention, probably because without a systematic search, they are often difficult to recognise.

178 Brindley 2003, 47.

Chapter 5

Geochemical analyses of the ceramics

Katrin Struckmeyer and Bertil van Os

5.1 Introduction

As part of the pottery investigations, the vessels from Dalfsen were additionally analysed by using various microscopic and elemental analytical methods. The main purpose of these analyses was to establish whether the pottery was locally produced or imported. This has particular relevance if the imported pottery does not differ in its shape and decoration from the typical regional range. In this case, investigation of the raw materials used is the only way to detect imports or, in case of a different typology, to provide an additional argument for import. An additional purpose of this study was to clarify if there are differences between the vessels of individual burials. Pottery involving different technology or raw materials could point to different families or groups buried in the cemetery. These analyses can give additional information about the identification of networks and mobility within a community. A final purpose of this study was to find out whether the ceramics from the burials show chronological breaks or, instead, chronological continuity in the pottery tradition.

5.2 Methodology of the pottery analyses

In order to investigate the fabric and technology of the pottery from Dalfsen, several archaeometric analyses were applied, namely, portable X-ray fluorescence (pXRF), inductively coupled plasma-atomic emission spectrometry (ICP-AES) and thin-section analysis. These different methods make it possible to obtain information about various aspects of pottery production.

To determine the raw materials used and their geochemical composition, the pottery was analysed by pXRF. These investigations were carried out by one of us (BO, Rijksdienst voor het Cultureel Erfgoed, Amersfoort, the Netherlands). The method offers great advantages compared with conventional laboratory analyses. It is well suited to classifying the raw material, by detecting differences and similarities in the chemical composition. And in this case in particular, the possibility of a non-destructive analysis of the pottery was crucial, because it meant that the mostly completely preserved vessels at Dalfsen did not have to be damaged. This method has the additional advantages that it is portable and that the elemental composition of the pottery can be detected very quickly, without elaborate sample preparation. Therefore, a large number of samples can be analysed, on-site, within a short period of time. But the method also has some disadvantages, especially the inaccuracy of measuring the lighter elements only at the surface of the pottery, but also the limited number of trace elements that it can trace. These important limitations make it necessary to use additional methods to verify and supplement the results of the pXRF analysis. In total, 119 vessels from Dalfsen were analysed with pXRF. The measurements were carried out almost exclusively on the outer face of the vessels. The measuring

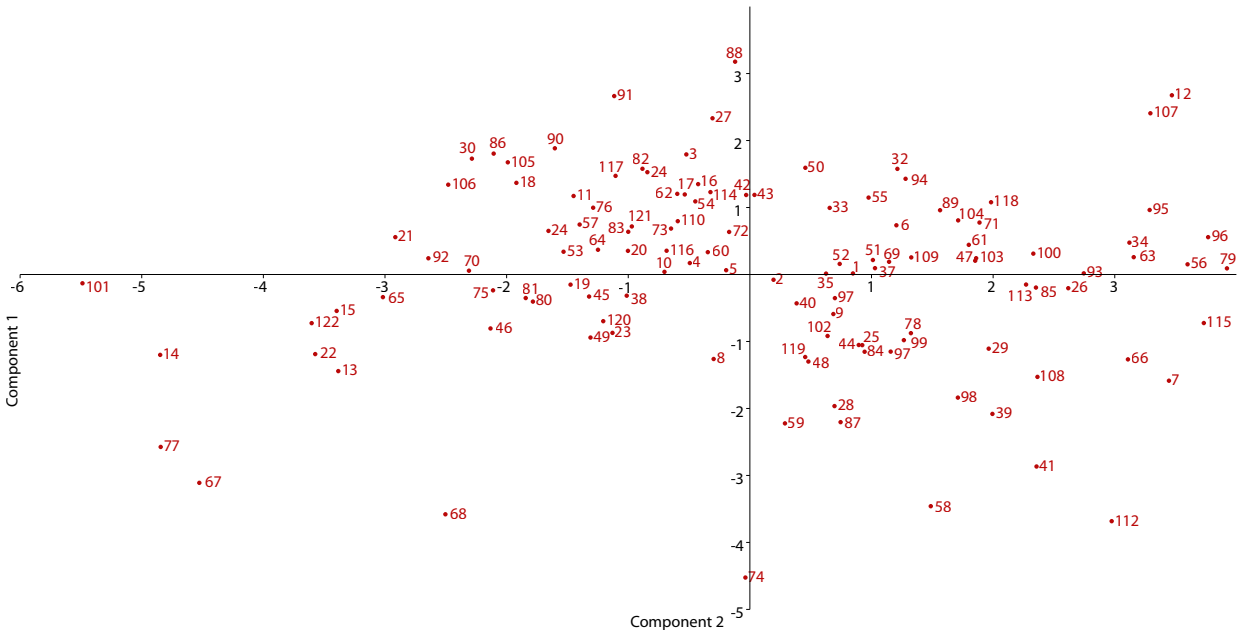


Figure 5.1 Dalfsen: Results of the pXRF analysis. The main components shown in the PCA plot were calculated based on the correlations between the measured values of the individual chemical elements (Tab. 5.1). Component 1 is determined by elements associated with clay minerals (Rb, Al203,K20). Component 2 is determined by elements associated with the burial environment (CaO, Fe203, Sr).

time of each sample was 110 seconds. Further analysis of the obtained data was performed on 12 elements (SiO2, CaO, K2O, Al2O3, TiO2, Fe2O3, Zn, Zr, Sr, Rb, V, Nb). The remaining measured elements, which did not provide sufficiently precise data or are not suitable for characterising provenance, were not further analysed.

Within the scope of the archaeometric analyses, 25 pottery sherds were selected for further analytical methods, which involve destruction of a small portion of the sherd.[179] Because the method is destructive, all of the selected fragments are undecorated body sherds. In making this selection, it was crucial that the sherds could be assigned to securely typed vessels, so that the dating is known. The only exception is a decorated rim sherd that can probably be dated to the Bronze Age. This sherd was selected as a reference.

In addition to the pXRF analyses, 22 of the selected 25 sherds were subjected to ICP-AES. These investigations were carried out by OMAC Laboratories Ltd. (Loughrea, Galway, Ireland). A small fragment of each sherd (minimum 1 g) was ground into a fine powder and dissolved in a four-acid solution, which was then injected into excited argon plasma. The analysis of the data was done in close cooperation with T. Brorsson (Ceramic Studies, Nyhamnsläge, Sweden). Of the 44 elements detected, 17 were used as basis for determination (Al, Ca, Ce, Fe, K, La, Mg, Mn, Na, Ni, Rb, Sr, Ti, V, Y, Zn, Zr). Elements that are very susceptible to post-depositional processes, such as phosphorus, were rejected.

In order to identify different clusters of pottery based on its chemical composition, multivariate statistical analyses (principal component analysis [PCA] and cluster analysis), were performed on the pXRF and ICP-AES datasets. This approach allows researchers to arrange the large amounts of data and to detect differences and similarities among the different variables. In addition, bivariate scatterplots were created comparing the frequency of two different elements.

For the petrographic investigations, thin-sections were prepared from 24 of the 25 sherds and viewed using a polarising microscope. The analysis of ceramic thin-sections makes it possible to obtain detailed information about the mineralogical composition of the clay matrix and about the techniqual recipes employed in the production of the pot the sherd came from. The minerals in the clay can be identified by their optical characteristics, such as colour, habit and relief. For example, quartz can be identified by its grey or white interference colours under crossed polarisers.[180] The clay matrix can be classified as fine, medium-coarse or coarse depending on the natural silt and sand content in the clay. The components of the temper, their sizes, quantities and distribution can be precisely determined, so that it is possible to record the tempering technique and clay recipe used for the pot.

179 Complete pots were omitted from the selection due to the destructive nature of the method of analysis.

180 MacKenzie and Adams 1995, 48.

Cat. nos	SiO_2 %	CaO %	K_2O %	Al_2O_3 %	TiO_2 %	Fe_2O_3 %	Zn ppm	Zr ppm	Sr ppm	Rb ppm	V ppm	Nb ppm
1	55	0.201	1.79	15	0.890	5.94	84	245	55	126	124	21
2	59	0.209	1.84	17	0.902	6.02	115	275	53	97	103	19
3	64	0.161	1.90	19	0.930	3.79	67	278	46	82	108	20
4	62	0.202	2.12	15	0.886	4.64	82	302	67	115	102	18
5	49	0.207	1.85	15	0.831	5.16	71	250	51	100	89	20
6	43	0.056	1.78	20	0.951	4.96	77	161	35	78	96	15
7	44	0.327	3.98	22	0.808	5.95	105	210	105	136	117	15
8	52	0.208	2.17	15	0.811	3.61	76	262	84	111	113	12
9	55	0.094	2.31	15	0.768	5.42	66	159	30	100	118	14
10	60	0.110	2.24	16	0.776	3.15	89	248	50	91	102	14
11	59	0.182	1.89	17	0.814	3.21	97	332	57	80	81	21
12	44	0.060	1.93	25	0.995	6.18	112	230	27	136	113	25
13	65	0.216	1.53	15	0.603	4.52	127	428	81	48	82	15
14	70	0.248	1.06	14	0.618	3.29	127	384	91	45	36	16
15	69	0.118	1.36	9,16	0.544	3.24	70	277	66	120	59	19
16	67	0.207	1.81	19	0.939	3.47	76	260	51	94	116	19
17	66	0.143	1.85	19	0.918	3.24	121	290	52	90	102	18
18	66	0.133	1.77	16	0.922	2.67	60	313	53	89	87	16
19	51	0.100	1.60	13	0.734	3.92	59	287	47	78	104	16
20	60	0.134	1.71	15	0.791	2.75	85	219	50	105	92	17
21	73	0.084	1.37	15	0.771	2.33	66	230	36	68	80	13
22	63	0.218	1.06	15	0.658	3.48	82	366	77	56	87	13
23	64	0.147	2.01	16	0.764	3.22	76	198	104	93	92	13
24	63	0.158	1.63	18	0.891	3.19	103	293	49	86	101	21
24	60	0.130	1.65	17	0.855	2.83	58	225	43	54	93	14
25	58	0.135	1.69	18	0.734	4.32	126	191	39	136	127	13
26	56	0.116	2.67	20	0.900	4.37	132	199	79	154	130	15
27	63	0.233	1.75	20	1.16	1.66	87	247	53	73	115	19
28	52	0.113	1.66	15	0.736	6.63	107	164	32	94	122	12
29	51	0.080	2.38	19	0.815	6.15	87	175	68	98	142	12
30	71	0.146	1.69	17	0.939	3.03	64	331	44	66	90	17
32	64	0.169	2.21	21	1.08	4.53	97	277	57	117	124	18
33	52	0.066	1.91	17	0.824	5.82	84	342	31	111	129	20
34	51	0.117	2.27	20	0.907	5.86	122	246	46	128	172	20
35	56	0.154	1.88	21	0.837	5.72	53	225	56	109	108	14
37	45	0.262	1.79	20	1.01	4.76	95	223	78	95	99	18
38	49	0.093	1.06	16	0.809	3.89	86	198	21	51	105	13
39	42	0.137	1.72	13	0.821	8.89	71	207	51	98	166	16
40	50	0.161	1.62	15	0.923	4.40	125	245	59	95	119	17
41	50	0.196	2.45	16	0.756	8.64	97	152	62	133	126	12
42	63	0.154	1.97	19	0.899	3.16	113	274	44	117	99	18
43	57	0.145	2.07	20	0.931	4.09	83	248	48	92	85	17
44	52	0.145	1.75	16	0.841	8.23	77	235	45	97	119	16
45	62	0.175	2.00	18	0.740	4.01	85	280	66	85	83	14
46	61	0.151	1.63	15	0.723	2.51	120	300	71	81	85	13
47	61	0.096	1.99	20	0.903	5.13	144	231	73	132	131	18
48	53	0.204	1.79	18	0.892	4.72	97	174	89	74	123	13
49	67	0.183	1.56	17	0.787	3.21	137	228	69	86	91	13
50	64	0.160	1.91	19	0.986	3.52	112	269	59	106	121	21
51	48	0.170	2.56	19	0.910	4.11	97	269	119	98	105	19
52	59	0.064	2.32	17	0.896	5.27	77	182	29	91	115	13
53	64	0.094	1.51	17	0.835	3.05	68	208	34	63	101	12

Table 5.1 Dalfsen: Results of the pXRF measurements.

Cat. nos	SiO_2 %	CaO %	K_2O %	Al_2O_3 %	TiO_2 %	Fe_2O_3 %	Zn ppm	Zr ppm	Sr ppm	Rb ppm	V ppm	Nb ppm
54	66	0.193	1.94	18	0.926	3.05	85	244	54	103	105	18
55	57	0.098	2.11	18	0.904	3.97	108	261	56	115	124	20
56	45	0.110	2.22	24	0.907	6.50	135	189	36	102	152	17
57	65	0.136	1.66	17	0.935	4.37	57	332	110	72	110	18
58	54	0.534	1.99	16	1.04	7.27	199	207	86	87	123	16
59	44	0.425	1.52	16	0.905	6.87	105	300	94	87	120	18
60	60	0.106	1.83	19	0.917	3.74	84	243	86	89	99	14
61	59	0.101	2.43	21	0.975	4.36	111	173	99	127	102	16
62	66	0.160	2.50	19	0.815	2.88	88	276	48	117	78	17
63	43	0.037	2.40	16	0.937	5.59	85	202	58	154	152	18
64	65	0.121	1.48	16	0.852	3.70	86	227	35	81	99	15
65	66	0.219	1.73	14	0.720	2.83	74	321	51	80	74	14
65	66	0.219	1.73	14	0.720	2.83	74	321	51	80	74	14
66	46	0.057	3.41	20	0.725	6.33	160	213	38	120	117	12
67	70	0.264	0.924	11	0.475	4.41	102	340	57	66	77	10
68	61	0.286	1.02	13	0.520	5.72	184	332	69	70	88	14
69	48	0.093	1.56	18	0.894	5.69	69	246	32	122	127	15
70	64	0.173	1.75	14	0.753	3.26	64	286	59	90	77	16
71	56	0.089	2.69	21	0.985	4.63	99	196	64	101	117	15
72	64	0.034	1.89	18	0.891	3.08	99	199	25	62	133	12
73	61	0.080	1.70	15	0.890	3.76	71	220	37	76	119	16
73	61	0.080	1.70	15	0.890	3.76	71	220	37	76	119	16
74	56	0.382	1.43	18	0.941	5.84	119	201	272	56	136	12
75	65	0.078	1.40	14	0.743	3.07	66	223	39	80	96	12
76	63	0.070	2.09	18	0.806	2.50	95	245	28	61	88	14
76	63	0.070	2.09	18	0.806	2.50	95	245	28	61	88	14
77	65	0.305	1.02	13	0.533	3.27	113	396	74	40	71	11
78	50	0.158	2.54	17	0.927	5.07	123	198	58	96	107	13
79	34	0.171	2.84	22	0.833	5.24	150	154	27	167	83	19
80	65	0.144	1.79	17	0.694	2.47	78	202	101	80	81	15
81	62	0.296	1.91	16	0.737	3.19	78	312	82	91	91	18
82	63	0.172	1.95	17	0.917	2.96	73	308	60	104	99	20
83	65	0.198	1.89	19	0.884	3.45	77	275	67	81	101	16
84	49	0.180	1.92	19	0.797	4.39	98	175	85	95	121	14
85	42	0.082	1.92	22	0.816	4.43	127	149	32	104	124	14
86	68	0.236	1.85	18	0.933	3.17	65	385	63	85	82	20
87	50	0.143	1.40	14	0.784	5.12	190	240	51	106	132	14
88	57	0.110	1.79	21	1.07	1.44	70	272	42	77	113	20
89	54	0.034	2.19	20	0.817	4.59	95	195	31	125	111	17
90	52	0.100	1.72	20	0.939	2.11	90	366	41	69	67	15
91	69	0.104	2.04	17	1.06	2.69	80	324	50	84	97	20
92	62	0.109	1.39	13	0.750	2.54	97	262	49	65	73	17
93	47	0.141	2.34	20	0.874	4.58	123	155	44	141	122	17
94	59	0.109	1.77	19	0.996	4.94	115	253	47	116	124	21
95	52	0.069	2.90	22	0.993	4.72	118	210	83	117	149	18
96	42	0.032	2.15	26	0.869	7.12	112	204	45	99	150	17
97	51	0.116	2.27	16	0.822	5.19	87	189	77	128	112	13
97	50	0.120	1.72	16	0.826	4.80	92	218	58	101	129	17
98	48	0.156	2.25	15	0.690	5.48	79	160	52	162	125	13
99	53	0.105	2.93	17	0.823	6.51	78	189	57	99	100	12
100	39	0.120	1.78	21	0.904	6.05	88	234	45	92	146	18
101	77	0.090	0.925	14	0.414	2.25	63	370	59	75	44	15

Table 5.1 (continued).

Cat. nos	SiO_2 %	CaO %	K_2O %	Al_2O_3 %	TiO_2 %	Fe_2O_3 %	Zn ppm	Zr ppm	Sr ppm	Rb ppm	V ppm	Nb ppm
102	53	0.189	2.60	16	0.781	5.71	96	244	48	108	102	15
102	53	0.189	2.60	16	0.781	5.71	96	244	48	108	102	15
103	47	0.117	1.94	21	0.926	5.48	109	184	39	87	120	16
104	57	0.029	2.53	18	0.811	3.89	98	194	46	154	113	17
105	63	0.155	2.16	16	0.867	2.54	63	367	61	86	81	19
106	69	0.198	2.07	17	0.917	2.21	53	343	61	81	76	15
107	46	0.094	3.00	23	1.22	4.64	93	249	101	109	122	21
108	55	0.102	2.07	16	0.808	7.49	90	153	48	134	154	14
109	56	0.170	2.95	19	0.949	4.82	102	240	57	104	106	15
110	66	0.175	1.66	18	0.882	3.41	83	263	56	125	99	17
112	53	0.238	2.06	16	0.627	10	118	145	89	147	157	17
113	55	0.078	2.29	19	1.02	4.55	198	202	69	98	126	16
114	67	0.188	1.99	17	0.995	3.71	101	325	57	106	120	19
115	49	0.162	3.63	19	0.788	4.94	161	175	31	190	103	15
116	58	0.150	1.77	17	0.875	3.57	95	257	38	83	101	15
117	47	0.170	1.65	20	0.922	2.96	89	333	52	68	67	18
118	54	0.027	2.39	20	0.958	4.18	122	229	50	131	115	16
119	52	0.289	2.01	17	0.885	5.46	96	267	72	100	121	15
120	53	0.155	1.45	13	0.701	4.69	53	273	60	99	110	17
121	60	0.150	1.92	17	0.837	3.29	98	321	53	106	89	17
122	73	0.116	1.52	13	0.637	2.17	63	195	35	54	74	10

Table 5.1 (continued).

5.3 Results of the pXRF analysis

The PCA plot based on the results of the pXRF analysis shows that most of the pottery plots in one large cluster, even though some of the sherds slightly deviate from this group (Fig. 5.1). The first component is determined by the elements associated with clay minerals (Rb, Al2O3, K2O), while the second component is determined by the elements associated with the burial environment (CaO, Fe2O3, Sr). The measurements of the elemental compositions prove that the pots are quite similar to each other (Table 5.1).

This homogeneity can also be seen in the cluster analysis, where almost all vessels have a very small distance to each other. Although there is variation in the elemental composition, it is not possible to distinguish any discrete groups that could represent different sources of raw material. The pottery appears to have been locally produced. Moreover, no concentrations of vessels that date in the same horizon could be detected in the plots.

It would also be of interest to know whether pots placed together in the same burial are quite similar in their raw materials, so that they can be assumed to have been produced on the same occasion. And it would be of interest to be able to clarify whether burial pits positioned near or adjacent to one another include pottery made of very similar clays, implying a relationship between these graves. As mentioned previously, the pottery is highly homogeneous. It is important to emphasize that many more vessels, whose pXRF data do not show a close relationship, were probably made of the same raw material and may have been produced by the same persons.

One example of a burial with two quite similar pots, a tureen-amphora (cat. no. 10) and a miniature straight-sided vessel (cat. no. 110), is grave 42. Another example is the decorated bowl (cat. no. 60) and the undecorated bowl (cat. no. 62) from grave 84, the two undecorated bowls (cat. nos. 67 and 68) from grave 41, as well as to the two undecorated bowls with lugs (cat. nos. 82 and 83) from grave 19. The typological study of two decorated tureen-amphoras (cat. nos. 13 and 14) from grave 68 proved that these pots were probably made by the same person on the same occasion. This can also be seen in the pXRF data.

In another case, of a tureen-amphora (cat. no. 6) found together with an amphora (cat. no. 32) in grave 87, the typological study disputes a common production of the pottery, but the chemical analysis proves the use of very similar raw materials. Moreover, a few burials located close to one another in the cemetery contained vessels whose elemental components are very similar. It appears that there is a relationship between graves 85, 86 and 87, dating to late horizon 4. In the PCA plot, the decorated amphora (cat. no. 33) from grave 85, the straight-sided open decorated bowl (cat. no. 55) from grave 86 and the decorated amphora (cat. no. 32) from grave 87 are close together. Another example are the adjacent graves 18

and 32 of horizon 5. A thick-walled vessel (cat. no. 120) and a tureen-amphora (cat. no. 23) were probably made of very similar raw materials.

One of the richest burials of the cemetery is of special interest. Three of the five vessels found in grave 25 have elemental components that are very homogenous (Fig. 5.1). Among these pots of late horizon 5 are two undecorated collared flasks (cat. nos. 105 and 106) and a large tureen-amphora (cat. no. 30). Only the clays of an undecorated amphora (cat. no. 52) and of a shouldered cup (cat. no. 101) deviate more from the others, although the paste and finish of the vessels suggest a greater similarity. Moreover, it is noteworthy that the three similar vessels differ slightly from the majority of the pottery in the PCA plot, but not enough to indicate a different clay source. Instead, it could be an indication that these vessels were produced separately, in one batch, maybe by a different group. It could be assumed that this pottery was made especially for this burial. One necked bowl (cat. no. 86) from grave 29, which is also a rich burial, including four vessels, shows a similar use of raw material as the vessels from grave 25, as was also noted in the typological study.

The plots of the PCA as well as of the cluster analysis show that there are a few more vessels that deviate from the main trends (Fig. 5.1). One of these is a bowl found in grave 1 (cat. no. 74) displaying higher concentrations of strontium, slightly elevated calcium and higher phosphorous than the rest of the material, while the other values of this pot fall within the normal range. Most likely this pot was also decorated with bone fragments, as was the pot with cat. no. 22. The unfavourable preservation conditions for bone and carbonate of the Dalfsen soil may have caused dissolution of the bone. The strontium and phosphorous, liberated from the bone, may subsequently have been absorbed by the red, ironhydroxide-rich coating of the pot, thus also explaining the second factor of the PCA analyses. In particular, due to the fact that the measurements were taken on the outside of the vessels, there is always the risk that post-depositional adherences and alterations distort the measurement results. The same probably applies to another small vessel from grave 103 (cat. no. 112). Here the iron content is very high. This may be due to iron deposits that have obscured the surface of this pot. Also, this pot may have contained organic material that, after deposition, caused reducing conditions inside pot, triggering dissolution of iron, which subsequently was transported to outside of the pot and then oxidised during dry conditions.

In addition, there are three pots that also deviate from the others, displaying remarkably low levels of rubidium, indicating lower clay content. One of these vessels is a bowl of horizon 5 from grave 35 (cat. no. 77).

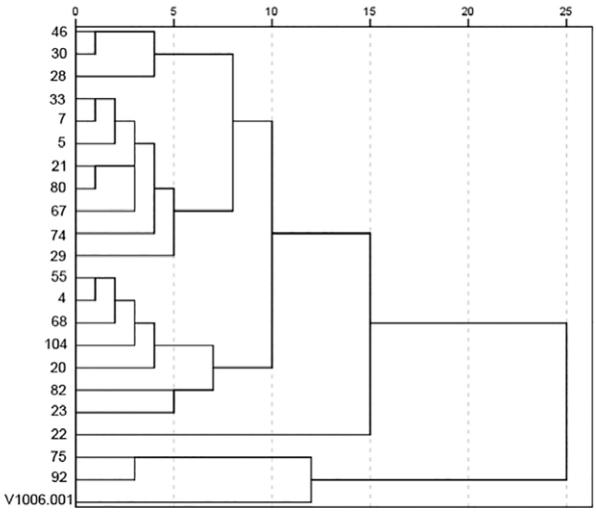


Figure 5.2 Dalfsen: Hierarchical cluster analysis (average linkage method) of the elements detected by ICP-AES (catalogue nos).

The other two are the previously mentioned tureen-amphoras found together in grave 68 (cat. nos. 13 and 14). Especially on the basis of the cluster analyses, the raw material of these tureen-amphoras is also quite similar to the clays of two undecorated, thick-walled bowls of late horizon 4 found together in grave 41 (cat. nos. 67 and 68). The paste and finish of these bowls are also very similar to those of the two pots from grave 68. Although all of the mentioned vessels are more scattered in the PCA plot than the rest of the pottery material, it appears that they were locally produced. If these grave goods had derived from more distant areas, a greater differentiation within the PCA would have been expected. Moreover, the ICP analysis, which was also performed on some of these vessels (cat. nos. 67, 68 and 74), also indicates a local provenance.

5.4 Results of the ICP-AES and thin-section analyses

Of the 25 sherds selected for destructive analysis, 22 sherds were additionally subjected to ICP-AES analyses (Table 5.2). In order to identify pots that were made of clay from the same raw material source, the measurements were investigated by a cluster analysis based on 17 chemical elements (Fig. 5.2). Since thin-sections are also available for the pottery sherds measured by ICP analyses (Fig. 5.3; Table 5.3), the petrographic results of these thin-sections are used for the interpretation of the geochemical data.

The cluster diagram of the ICP analyses shows that most of the samples are very close to each other (Fig. 5.2). This high similarity can also be seen in the aforementioned pXRF data and is also reflected in the

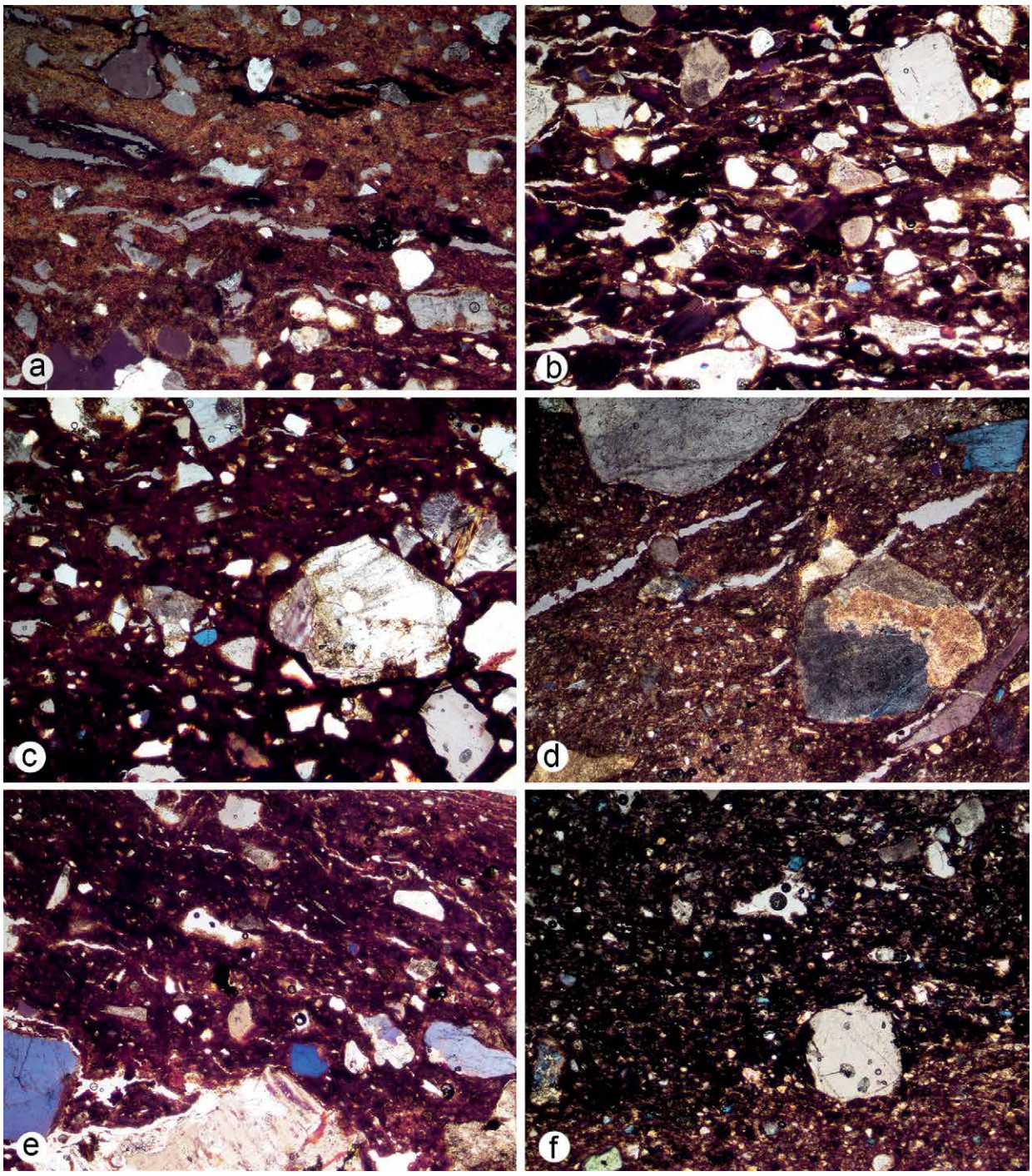


Figure 5.3 Dalfsen: Thin sections of the pottery: (a) catalogue no. 28; (b) catalogue no. 74; (c) catalogue no. 7; (d) catalogue no. 80; (e) catalogue no. 104; (f) catalogue no. 22. Cross-polarized light. Width of individual images = 3.1 mm.

Cat. nos	Al %	Ca %	Ce ppm	Fe %	K %	La ppm	Mg %	Mn ppm	Na %	Ni ppm	Rb ppm	Sr ppm	Ti %	V ppm	Y ppm	Zn ppm	Zr ppm
4	7.71	0.31	53.8	5.36	2.19	21.4	0.55	234	0.6	34.3	125	58.9	0.436	104	14.8	79	102.5
5	6.51	0.14	38.5	3.33	1.16	17.2	0.36	117	0.25	19.8	67.5	42.4	0.385	95	9.5	52	75.6
7	7.71	0.2	41.7	2.35	1.37	20	0.41	94	0.25	16.9	96.3	51.8	0.398	94	8.9	69	100.5
20	7.12	0.15	31.7	4.87	1.52	13.8	0.62	323	0.18	30.3	95.3	37.6	0.33	105	10.1	98	76.7
21	6.5	0.18	80.1	2.27	1.28	32.6	0.34	182	0.29	23.4	70.9	43.4	0.377	85	25.5	57	83.7
22	9.1	0.3	149	2.41	2.2	78.5	0.5	202	0.57	25.1	140	76.6	0.418	103	19.8	98	110
23	7.09	0.37	73.3	4.86	2.19	31.1	0.5	550	0.81	24	135	77.7	0.409	81	26.3	93	141
28	5.77	0.4	73.8	5.42	1.02	29	0.27	114	0.7	11.2	59.1	67.8	0.258	88	19	95	80.8
29	6.08	0.35	55.3	1.69	1.15	23.3	0.16	196	0.83	10.5	59	88.1	0.322	69	15.5	59	73.8
30	4.89	0.33	57.3	3.2	0.87	24.5	0.31	484	0.65	20.1	57.8	65.3	0.251	57	13.4	106	58.6
33	7.05	0.17	42.7	2.46	1.37	19.7	0.33	94	0.33	19.6	83.5	50.7	0.415	89	10.7	63	95.3
46	5.09	0.36	60.8	3.42	0.94	25.8	0.32	490	0.68	20.3	57.3	69.7	0.26	60	14.1	105	59.7
55	7.25	0.22	50.3	6.48	1.91	18.5	0.67	224	0.51	32.6	114.5	78.2	0.413	110	10.9	83	102.5
67	7.56	0.23	70.2	2.47	1.83	25.8	0.33	282	0.61	24.7	89.3	110.5	0.384	92	16.4	65	84.2
68	8.18	0.32	47.9	4.27	1.96	18.5	0.64	173	0.63	35.4	109.5	101	0.351	105	11.1	93	89.5
74	6.63	0.36	43.6	1.85	1.69	19.2	0.35	618	0.55	17.9	95.3	83.3	0.346	73	11.8	88	105
75	8.14	1.79	140	3.89	2.65	68.9	0.77	948	1.2	29.8	133.5	197.5	0.384	80	32.5	95	117
80	6.62	0.23	87.8	2.69	1.36	38	0.36	152	0.34	22.1	82.4	66	0.384	85	26.5	76	86.9
82	7.72	0.61	59.6	5.44	2.95	22.6	0.85	727	0.81	34	137	125.5	0.316	77	15.5	96	114
92	7.89	1.32	108.5	3.55	2.92	47.9	0.87	805	1.24	40	146.5	185	0.34	70	28.2	79	111.5
104	8.4	0.18	67.2	2.9	1.8	26.8	0.65	231	0.61	46	117	55.6	0.452	112	14.7	89	86.3
V1006.001	8.57	2	123	5.41	3.03	53.6	1.28	1350	1.1	38.6	149.5	216	0.531	123	37	135	133

Table 5.2 Dalfsen: Results of the ICP-AES measurements.

results of the thin-section analyses. We subsequently tried to distinguish different groups of sherds from each other on the basis of the cluster diagram, which includes several clusters. But since these groups are not very different from each other, they do not represent different clay deposits, as the analysis of the thin-sections proves. For example, the thin-sections of the two undecorated, thick-walled bowls of late horizon 4 found together in grave 41 (cat. nos. 67 and 68) show that the clays used resemble each other to a high degree, so that the same clay deposit can be assumed. This is also confirmed by the pXRF data. The pots were made of sorted coarse clays with a very large proportion of silt and sand. Especially noticeable is that the clay from both pots include diatoms, which do not occur regularly in the examined pottery from Dalfsen. In contrast to these petrographic results, in the ICP results, the vessels are arranged in different clusters (Fig. 5.2).

The first group of the cluster diagram contains two pottery sherds (cat. nos. 46 and 30). They are very similar in their chemical and mineralogical composition (Fig. 5.2; Table 5.3). Medium-coarse clays with a very high proportion of silt and some sand grains were used for the pots. One of the sherds belongs to an undecorated amphora of horizon 5 found in grave 36 (cat. no. 46). The other sherd is a fragment of a large tureen-amphora from the rich grave 25, which can be dated in late horizon 5 (cat. no. 30).

A further sherd deviates only slightly in its chemical components from the previously mentioned clays (cat. no. 28; Figs 5.2 and 5.3a). But the thin-section of this tureen-amphora from grave 101 shares more similarities with two samples of the next cluster, consisting of a tureen-amphora from grave 66 (cat. no. 29) and a bowl from grave 1 (cat. no. 74; Fig. 5.3b). All three vessels, dating to horizon 5, were made of very fine-grained, ferruginous clays. It is noteworthy that there is a high percentage of organic components in the clays. Since the plant material was destroyed during the firing process of the pottery, only characteristic cavities remain. But in some of these cavities burnt remains are still present. In addition, one clay contains few accessory minerals, including biotite (cat. no. 74). Moreover, a large number of cracks in the matrix could be detected.

Cat. nos	Sorting	Coarseness	Silt	Sand	Iron	Mica	Diatoms	Organic material	Calcium carbonate	Accessory minerals	Tempering material	Average max. grain size (mm)	Temper amount (%)	Thickness of the sherd (mm)
4	s	m	++	°	+	+	°	-	°	°	g	1.9	17	5
5	s	f	+	°	+	+	°	+	°	°	g	1.0	12	7
7	s	f	-	°	-	°	°	+	°	°	g	1.4	17	6
20	s	m	+	°	°	+	°	+	°	°	g	1.5	17	5
21	s	m	+	°	-	-	°	-	°	°	g	1.1	14	5
22	s	c	++	+	-	-	++	-	°	°	g	1.3	8	5
23	s	m	+	°	°	+	°	-	°	°	g	1.1	14	5
28	s	f	-	°	+	-	°	++	°	°	g, s	1.3	17	8
29	s	f	°	°	-	-	°	+	°	°	g, s	1.6	26	5
30	s	m	++	-	-	+	°	-	°	°	g	1.4	10	6
33	s	m	+	°	+	+	°	+	°	°	g	1.3	13	4
46	u	m	++	+	-	+	°	-	°	°	g	1.8	9	6
55	s	m	++	°	-	+	°	+	°	°	g	2.0	16	6
67	s	c	++	+	-	-	-	-	°	°	g	1.0	3	7
68	s	c	++	++	+	-	+	++	°	-	g	0.8	3	7
74	s	f	°	°	-	°	°	+	°	-	g, s	1.2	23	6
75	s	f	+	°	-	+	°	-	°	°	g	1.2	9	6
80	s	m	++	°	-	+	°	-	°	°	g	1.8	12	5
82	s	m	++	-	+	++	°	-	°	-	g	1.2	17	5
88	s	m	++	°	-	++	°	++	°	-	g	1.1	7	5
92	s	c	++	-	-	++	°	++	°	-	g	1.8	14	5
99	s	m	+	°	+	-	°	+	°	°	g	1.1	18	6
104	s	m	+	°	°	+	°	++	°	°	g	1.6	20	7
120	s	m	++	°	-	++	°	+	°	-	g	1.1	11	5

Table 5.3 Dalfsen: Microscopy results of the thin-section analyses. Abbreviations: s = sorted, u = unsorted, f = fine, m = medium-coarse, c = coarse; ++ = very large amount, + = large amount, – = small amount, ° = not present; g = granite, s = sand.

In this second cluster, there are further three pottery fragments (cat. nos. 33, 7 and 5; Figs 5.2 and 5.3c). For the production of the vessels, fine and medium-coarse clays with a lot of silt were used. Only one clay contains a lower proportion of silt (cat. no. 7; Fig. 5.3c). The proportion of ferruginous minerals varies among the analysed thin-sections. Again, a lot of organic remains could be detected in the clays. The sherds belong to an amphora (cat. no. 33) and to two tureens of late horizon 4 (cat. nos. 5 and 7). The vessels were found in graves 85 (cat. no. 33), 93 (cat. no. 7) and 96 (cat. no. 5), which were close to each other, in the western part of the cemetery. Moreover, two further sherds in this group are very close in the cluster diagram (cat. nos. 21, 80; Fig. 5.3d). They were made of sorted, medium-coarse clays with a lot of silt and some ferruginous minerals. One of these clays includes some large, round concretions of clay with ring-shaped cavities around them (cat. no. 21). These inclusions show that the person preparing the clay omitted to accurately knead the clay during the preparation process. The sherds come from a tureen-amphora of horizon 5 found in grave 22 (cat. no. 21) and a bowl of horizon 6 from grave 29 (cat. no. 80).

The next cluster of the diagram comprises several sherds made of sorted, medium-coarse clays with very large proportions of silt (cat. nos. 4, 23, 55, 82 and 104; Figs 5.2 and 5.3e). The chemical data indicate that especially two of these vessels, an open bowl with straight sides from grave 86 (cat. no. 55) and a tureen from grave 91 (cat. no. 4), are very similar, which is also confirmed by the thin-section analysis. Both graves, which were located close to each other, can be dated to late horizon 4. In addition, an open bowl of horizon 7 from grave 110 (cat. no. 104), two

tureen-amphoras of horizon 5 found in grave 8 (cat. no. 20) and grave 32 (cat. no. 23) and a bowl of horizon 6 from grave 19 (cat. no. 82) are part of this group.

There are two vessels that were not chemically analysed by ICP (cat. nos. 88 and 120). But the thin-section analysis proved a common raw material source. The clays are medium-coarse, with a very high proportion of silt and a large proportion of plant remains. In addition, a few ferruginous minerals and accessory minerals could be detected. Some round concretions of clay show that the preparation of the raw material was not executed very carefully. One of the vessels is a necked bowl of horizon 6 from grave 30 (cat. no. 88). The other vessel, found in grave 18, can be dated to horizon 5 or later (cat. no. 120). Both graves were close to each other in the cemetery.

Although it seems that the majority of the pottery from Dalfsen was made of very similar raw materials, the ICP analysis points out four sherds that deviate from the others (Fig. 5.2). Among this pottery is one tureen-amphora of horizon 5, which was excavated from grave 109 (cat. no. 22). The chemical analysis proved that a few elements, namely, cerium, lanthanum and rubidium, have significantly higher levels than the rest of the analysed sherds, which indicates a very high content of clay as part of the raw material. The vessel consists of a sorted, coarse clay with a very high proportion of silt and a lot of sand. Ferruginous minerals and organic remains are available in small quantities (Fig. 5.3f). It is striking that the clay contains an exceptionally high proportion of diatoms, which points to clay pits with lots of nutrients caused by stagnant water.

Two other vessels also show a somewhat higher clay content (cat. nos. 75 and 92; Fig. 5.2). In total, 10 elements (Ca, Ce, K, La, Mg, Mn, Na, Rb, Sr and Y) associated with clay minerals have higher concentrations compared with the other samples. It should be noted that the pXRF analysis shows no deviating data for these vessels. The reason for this lies in the sample preparation. XRF is a total method, but it only measures the surface of the samples, in this case the outer, most weathered part of the pots. With ICP-AES, the clay minerals are more easily dissolved than the quartz and the heavy minerals, causing a bias towards clay-rich samples. One of these pots is an undecorated bowl from grave 1 dating to horizon 5 that was made of a fine clay with a lot of silt and some ferruginous minerals (cat. no. 75). The other is a shouldered bowl of horizon 7 from grave 100, at the eastern end of the cemetery (cat. no. 92). The clay of this bowl consists of a coarse clay with a very large proportion of silt and some sand grains. The clay is slightly ferruginous and includes some accessory minerals. Most likely, clays from other local extraction pits, with slightly different grains sizes, containing more silt and clay particles, were used for the production of this pottery.[181]

Apart from proving answers to questions about the mineralogical composition and the provenance of the clays used, microscopical analyses can also provide a lot of details about the tempering of the pottery. All of the analysed sherds from Dalfsen were tempered with crushed granite and quartz. The maximum average grain size of these fragments was determined, *i.e.* the average size of the five largest granite particles in each sherd. The values range between 0.8 and 2 mm, and the average is 1.3 mm. No large variability in the grain size was detected. In contrast, there are some differences in the quantity of temper. The measured values range between 3% and 26%, and the average is 14%. Moreover, there are no indications of a chronological change in the tempering techniques within the different horizons. However, it is possible to determine a relationship between the tempering technique and the clays used. Fine-grained clays, which include a very small proportion of non-plastic particles, were tempered with sand as well as granite (cat. nos. 28, 29 and 74). It seems that the addition of sand was necessary to improve the qualities of these fine clays so that they were usable for the pottery production. Due to this additional tempering with sand, these clays have higher proportions of temper. In contrast, two vessels made of very coarse clays with a lot of silt and sand, which are natural ingredients of the raw material, were tempered with a remarkably small quantity of crushed granite (cat. nos. 67 and 68). The high proportion of natural silt and sand is probably the reason why only a small artificial addition of non-plastic material was required. This relationship between the clays used and the tempering technique shows that detailed knowledge about the composition and the qualities of the different clays was available. Thus, the potters adapted their production process in accordance with the quality of the raw material. The limited compositional variation concurs with the similarities in shape and decoration of the pottery.

181 A further pottery fragment that has a different composition is a rim sherd that can probably be dated to the Bronze Age (V 1006.001). The sherd, found north of the historical path, has a line of vertical incisions below its rim. No thin-section or pXRF analysis were done on this sherd. The ICP data show the greatest deviation from all of the analysed sherds (Fig. 5.2). The concentrations of 14 elements (Ca, Ce, K, La, Mg, Mn, Na, Rb, Sr, Ti, V, Y, Zn, Zr) associated with clay and heavy, silt-related minerals are exceptionally high, differing significantly from those of the other sherds. This is most likely caused by a higher clay:temper material ratio (sand, rock fragments and quartz) compared with the very coarse TRB pots, indicating a different production process.

5.5 Conclusions

The results of the archaeometric pottery study support the assumption that the cemetery was used by a local community. All three of the methods applied proved that almost all vessels are quite homogenous with respect to their raw material and production technique. Different traditions in the manufacture of the pottery could not be detected. If the cemetery was used by several local groups or families, then it is to be assumed that they all made their pottery of clays from the same clay deposits. Although it was possible to identify a few adjacent graves in the cemetery whose grave goods consist of very similar raw materials, discrete areas within the cemetery could not be distinguished on the basis of the pottery.

There are many burials with two or more vessels. The studies proved that the raw material of some of these vessels found in the same graves is similar to a very high degree. On the basis of the similarity in the raw material, it seems likely that this pottery was made on the same occasion at the same time. This applies, for example, to the two undecorated bowls from grave 41 (cat. nos. 67 and 68). The typological study has also shown a close relationship between these bowls. Grave 25 is a rich burial, with five pots and one polished stone axe. Three of the five vessels of this burial were made of very similar clay. Although there are no indications that the pottery was imported, the results of the pXRF analysis show that the vessels deviate slightly from the others in terms of their raw material. Thus, it is possible that the pottery was produced separately because this burial played a special role within the community.

The different methods of the archaeometric study proved that several local clay deposits were used for the production of the pottery. The geochemical similarity of most of the vessels indicates that the different deposits probably were located close to each other. Because their elemental composition differs only slightly, it is very difficult to separate out discrete groups. In addition, it must be taken into account that very heterogeneous deposits were used for the manufacture; this could also be the reason for the variation between the raw materials. Since the cemetery was located on a sand ridge, it was probably difficult to obtain suitable raw material in the environs of Dalfsen. One possible source may have been a natural depression of a former branch of the river Vecht, which was located close to the sand ridge and probably consisted of wetland at this time. Maybe the presence of diatoms in three of the analysed thin-sections (cat. nos. 22, 67 and 68) can be taken as an indication that clay was extracted from pits with non-flowing, nutrient-rich water, such as an abandoned meander or oxbow lake of the river Vecht. In addition, we also have to consider the possibility that clay obtained locally itself originally came from a distant area where suitable clay deposits were sufficiently available. Since it was not possible to analyse soil samples from the vicinity of Dalfsen we cannot exclude the possibility of raw materials imported for pottery production. Moreover, there are no reference samples available which derive from nearby settlements as potential users of the cemetery. Thus, the raw material source(s) used cannot be located.

It seems that the local raw material sources were used continuously during the time of occupancy. Vessels of different dates were made of quite similar clays. The reason for this continuity could have been the rare presence of suitable deposits for pottery production.[182]

182 The only significant change that can be accepted for the site is between the pottery of the Funnel Beaker culture and that of the Bronze Age. The greatest deviation in the cluster diagram of the ICP analysis is shown by a sherd from the Bronze Age. Although there is no evidence for the use of a different clay source, there is evidence for the use of a finer clay, with far less granite and sand temper material. This clearly indicates a different production method and selection of raw materials, pointing to a different pottery tradition and culture.

Chapter 6

Flint, stone and amber

Jaap Beuker, Jan Lanting and Henk van der Velde

6.1 Introduction

The burials at Dalfsen produced an impressive inventory of ceramics, as detailed in Chapter 4. But in addition, a large number of the burials yielded objects of flint, and two burials yielded stone axes. Two other burial inventories contained amber beads. All these non-ceramic finds will be described and discussed in this chapter. Although this has been mentioned above, it is important to stress once more that not only human skeletal and palaeoecological remains related to the construction of the burial pits may have been lost, but also a lot of burial goods. In Chapter 3, some pits underneath the actual burial pits were mentioned. We will never know what these pits contained (offerings, personal possessions?), and we can only hypothesise about their meaning. Several of the better preserved burials at Ostorf (Tannerwedde) contained non-human bone objects (necklaces and teeth of wild animals), suggesting the custom of placing personal belongings in with the deceased.[183] In the absence of evidence at Dalfsen, we have to stick to the finds that were retrieved, but we have to remember we are seeing only part of the original inventories.

6.2 Flint

This subsection was written by Jaap Beuker.

6.2.1 Introduction

Establishing which flint artefacts can be considered grave goods is not straight-forward. Because of the presence of flint artefacts dating to the Late Palaeolithic and Mesolithic in the general area of the burial ground, it is conceivable that at least some of the flint artefacts found in the grave pits ended up in the pit fill by accident.[184] In addition, we cannot assume that grave goods occurred only in the basal layer of the graves. In this regard, Kossian states: 'Diesbezüglich auswertbare Komplexe zeigen jedoch, dass sich die Beigaben in der Regel auf Höhe der Grabsohle befunden haben und dieser wohl auch ursprünglich dort deponiert wurden'. [*tr.* Complexes that can be evaluated in terms of this aspect show, however, that the additions were generally at the level of the grave bed and that these were probably originally deposited there.] His wording 'In der Regel' implies that this is not always the case, and indeed, Kossian also says: 'In mehreren Fällen deuten die Fundposition aber auch darauf hin, dass sich 'Beigaben' bzw. Gefässfragmente und sonstige Begleitfunde oberhalb der Grabsohle, in unterschiedlichen Höhenlagen der Verfüllung und gelegentlich

183 Kossian 2005, 280 ff.

184 Flint artefacts were also found outside the grave cuts: 3 Late Palaeolithic (Federmesser), 2 possible Late Palaeolithic, 53 Mesolithic, 12 Neolithic, 1 possible Neolithic, and 258 undatable. These finds are not further discussed here.

auch deutlich über dem eigentlichen Grabraum befunden haben'.[185] [*tr.* In several cases, however, the find position also suggests that 'grave goods' or vessel fragments and other accompanying finds were located above the grave bed, at different levels of the backfill and occasionally well above the actual grave area.] Kossian gives a number of examples, among which especially several graves in the burial ground of Heek-Averbeck are informative: 'Der Verfüllvorgang der Grabgruben liess sich folgendermassen rekonstruieren. Zunächst wurde der Leichnam zusammen mit Keramikgefässen und Steingeräten etc. auf der Grabsohle niedergelegt und mit einer etwa 20-30 cm starken Sandschicht bedeckt. In mehreren Fällen wurden dann auf dieser Sandschicht weitere Gefässe deponiert. Es folgte eine zweite Sandschicht, auf die in einzelnen Fällen wiederum Gefässe gestellt wurden'.[186] [tr. The process of filling the grave pits could be reconstructed as follows. First, the corpse was placed on the grave floor, together with ceramic vessels and stone tools, *etc.*, and covered with a layer of sand about 20-30 cm thick. In several cases, further vessels were then deposited at this layer of sand. This was followed by a second layer of sand, on which, in a few cases, vessels were placed.] It is therefore possible that not only primary, but also secondary grave goods are present in levels above the bottom level of the grave. This makes differentiating between contamination and grave goods complex.

In the analysis that follows, we distinguish among three categories of find:

Definitely not a grave gift. This concerns flint found outside the grave cut (n = 329); artefacts found in the grave pit that can be securely dated to periods prior to the start of the TRB culture (n = 58); and artefacts found in the grave pit with a weight of < 0.5 g (n = 135), which are too small to be considered grave gifts.

Possibly a grave gift. This concerns flint artefacts weighing > 5 g that cannot be dated based on typological characteristics and therefore cannot be assigned to either the TRB period or previous periods (n = 22) (contra Kossian[187]).

Definitely a grave gift. This concerns flint artefacts that can be placed in the TRB period typologically: strike-a-lights (n = 5) and transverse points (n = 10).

Mesolithic artefacts were found in 27 of the graves.[188] The number of undatable flint artefacts in the grave pits (category 2) is five times higher than the number of flint artefacts datable to the Mesolithic. This leads to the assumption that a large number of the flint artefacts found in the graves were not purposefully buried with the deceased.

6.2.2 Description

Transverse points

The burial ground at Dalfsen yielded a total of 10 transverse points, from 6 grave pits (see Table 6.1). The low average number of projectile points per grave pit initially seems surprising. For grave gifts, one would expect a complete set of armour, with a larger number of points. But a comparison with other flat graves of the TRB West Group and from Schleswig-Holstein indicates that there, too, the number of projectile points per grave pit is, as a rule, low – Dalfsen fits in well with this pattern.

Small numbers of projectile points can thus show up in graves. But are they always grave gifts? An alternate explanation would be that points, in some cases, were present in the body of the deceased and possibly even resulted in that person's death. The location of the projectile points within the grave, as well as any damage to the points, can give indications for this explanation, but of course the only conclusive evidence would be human skeletal material pierced by a point. None of the transverse points from the graves at Dalfsen show clear damage resulting from their use. In addition, the positioning of the points is such that there is no question of them piercing the body/bones. One transverse point from Dalfsen shows bipolar retouching (Fig. 6.1: 1345.01),[189] a technique of working that is regularly seen in transverse points.[190] It is noteworthy that a number of these points have been thinned by means of shallow

185 Kossian 2005, 112.

186 Kossian 2005, 113.

187 Kossian (2005, 105) states, 'Auffällig ist, dass Klingen im Bereich der Westgruppe eher selten, Abschläge und Trümmer dagegen recht häufig in sicheren nicht megalithischen Grabzusammenhängen der Horizonte Brindley 1 bis 5 vorkommen'. [*tr.* It is striking that in the area of the West Group blades are rather rare, but flakes and debris occur quite often in securely dated, non-megalithic grave contexts of Brindley horizons 1 to 5.] The excavation at Dalfsen has taught us that this interpretation is questionable. We need to take account of the possibility that all Neolithic graves can contain non-recognisable contamination. Worked flint that was present in the vicinity of the grave could easily have ended up in the grave fill. Isolated flakes, bits of flint, *etc.*, therefore cannot be automatically considered grave goods.

188 The following Mesolithic artefacts were found in the TRB graves: grave 5, 2 percussion scrapers; grave 6, 2 cores, 2 scrapers; grave 7, 1 scraper; grave 9, 1 scraper; grave 22, 2 cores; grave 24, 1 fragment of an obliquely retouched flake; grave 29, 1 flake; grave 30, 1 flake with striking platform; grave 31, 1 fragment of a flake or trapezoid; grave 32, 1 obliquely retouched flake; grave 33, 2 flakes, 2 scrapers; grave 38, 1 retouched medial flake fragment; grave 43, 1 flake fragment with striking platform; grave 45, 1 flake fragment; grave 47, 2 flakes, 1 flake fragment; grave 48 1 point fragment (lance point?); grave 61, 1 flake; grave 62, 1 obliquely retouched flake, 1 core; grave 64, 1 flake; grave 66, 1 symmetrical trapezoid; grave 70, 1 core; grave 74, 1 obliquely retouched flake; grave 82, 2 flakes; grave 98, 1 flake; grave 110, 1 flake, 1 flake fragment; grave 111, 2 flake fragments, 1 core; grave 119, 1 core.

189 The 1.8 cm long, transverse arrowhead from grave 76.

190 Beuker 2010, 89.

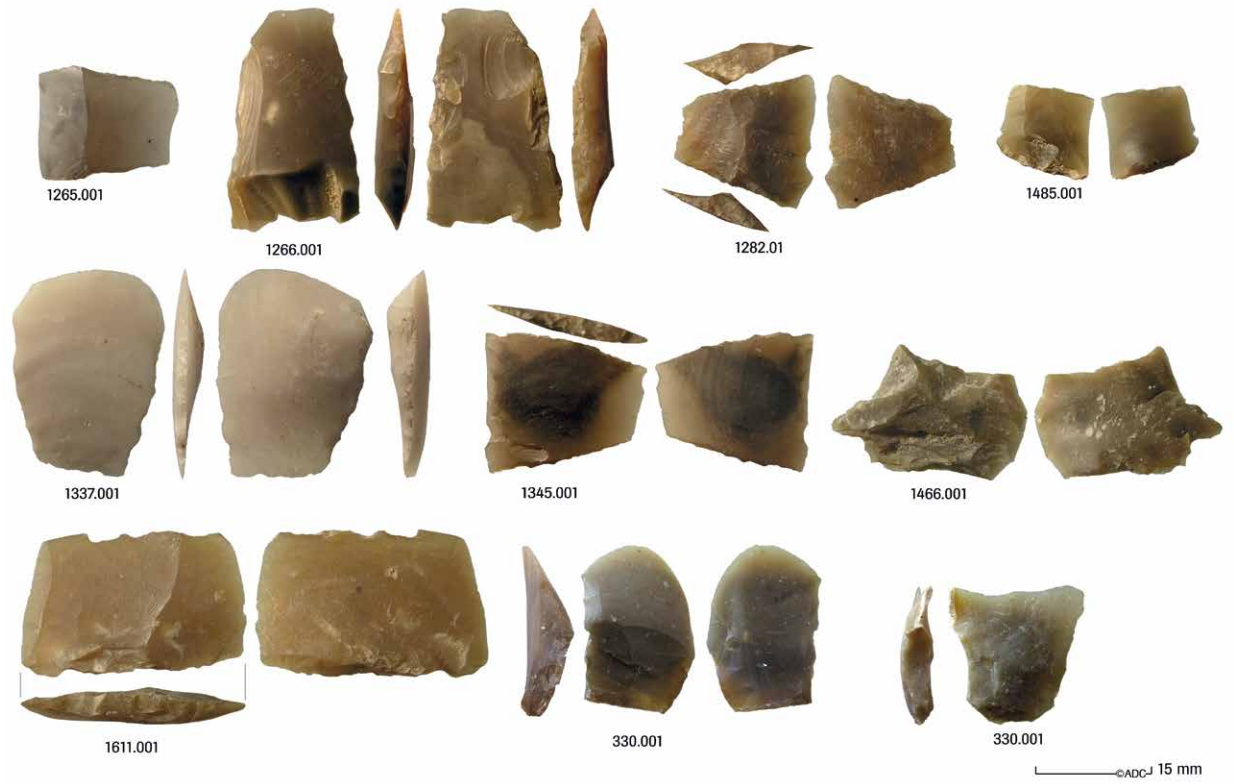


Figure 6.1 Overview of the transverse points from Dalfsen.

Table 6.1 Number of transverse points from TRB flat graves, following Kossian (2005) for sites other than Dalfsen.

Find location	Number of transverse points	Kossian code
Netherlands		
Dalfsen – grave 1	2	n.a.
Dalfsen – grave 64	3	n.a.
Dalfsen – grave 76	2	n.a.
Dalfsen – grave 98	1	n.a.
Dalfsen – grave 99	1	n.a.
Dalfsen – grave 104	1	n.a.
Diever	3	297
Zeijen II	1	329
D13a-Eext	1	300
Angelslo II	1	292
Sleen	3	322
Niedersachsen, Germany		
Gudendorf	4	97
Warstade-Wedelsforth	4	111
Granstedt	3	159
Bavendorf	3	131
Düste	2	113
Nordrhein-Westfalen, Germany		
Schöppingen Ramsberg 50	2	197
Heek Ammert	15	191
Schleswig-Holstein, Germany		
Flintbeck – long barrow grave A	5	272
Flintbeck – long barrow grave D	8	272
Flintbeck – long barrow grave E	5	272
Ostenfeld Fernhau	1	241

retouching in certain locations. This method of retouching is somewhat reminiscent of the retouching of transverse points seen in the Single grave culture.

The length:width index of the points from the graves was determined.[191] If we compare the values with the graph published by Niekus, we see that all of the points from Dalfsen fall within the range for the TRB.[192]

Niekus does not state whether the TRB saw any change in shape in the transverse points. He notes that the number of transverse points known from the early part of the TRB and from the Corded Ware culture is very low, and the inventory from the megalithic monuments almost always consists of a mix of material from different Brindley horizons. And according to him, we cannot exclude the possibility that there may be a size difference between transverse points from settlement sites and those from (megalithic) graves. The number of transverse points from Dalfsen is too small to pronounce on this aspect.

191 Respectively 1.0; 0.68; 0.82; 0.59; 0.94; 0.91; 0.86; 0.92; 0.68; and 0.63.

192 Niekes 2008, 63.

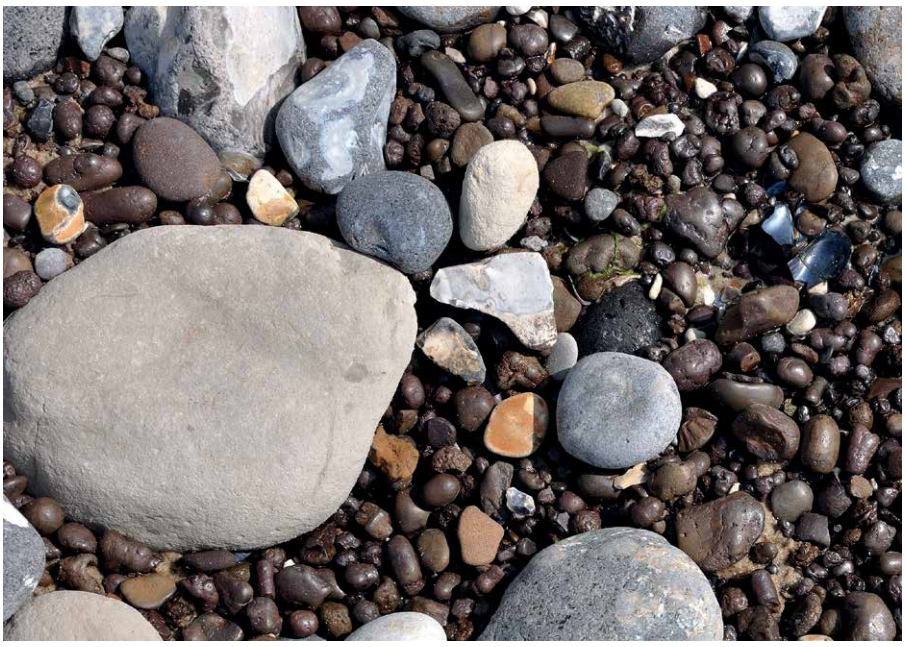


Figure 6.2 Marcasite balls on the beach at Cap Blanc-Nez, Pas-de-Calais, France. (Photo: J.R. Beuker).

Figure 6.3 Marcasite ball from the stone cist burial at Diever, Drenthe, the Netherlands. (Photo J.R. Beuker).

Marcasite and strike-a-lights

Marcasite (also known as pyrite), in combination with flint, functioned as a way to create fire. By hitting or vigorously rubbing the marcasite with a piece of flint (the so-called strike-a-light), sparks were generated that could be caught using an easily flammable material. After a period of use, the strike-a-light starts to show a characteristic rounding.[193]

Marcasite does not occur locally in the northern part of the Netherlands and therefore had to be imported. The geology literature mentions numerous sources, but it is highly questionable whether these sources would have been accessible to prehistoric humans. Marcasite balls strongly resembling the archaeological finds are readily available at the foot of the cliffs of Cap Blanc-Nez, south of Calais, France (Fig. 6.2).

Marcasite is chemically unstable and can eventually decay into dust. Sometimes the inside of the ball decays first, leaving a hollow, rusty 'bullet'. Marcasite 'balls' from the TRB period are known from the following Dutch sites: the stone cist burial at Diever (Fig. 6.3)[194] and the megalithic monuments D13-Eext,[195] D42-Westenes-Noord[196] and D19-Drouwen-West.[197]

The strike-a-lights of the TRB culture are more or less rod-shaped, with rounding at one or both ends. Bakker says the following about them: 'Pick-like strike-a-lights are normal objects in megalithic graves and settlements.[198] These were also found in individual graves like Diever and Zeijen. These objects, which can have a length of 8 cm or more, were made of discarded, sharpened flint axes, old hammer stones or other pieces of flint. The wear-gloss which they sometimes show near the point might indicate another use than that of striking sparks. From use wear analysis, experimentation, and new finds, we now know that this last suggestion of Bakker's is incorrect.

193 Stapert and Johansen 1999, 148.

194 Van Giffen 1943.
195 Van Lier 1760.
196 Beuker 2008.
197 Rijksmuseum van Oudheden, Leiden, C1912/12.16i.
198 Bakker 1979, 77.

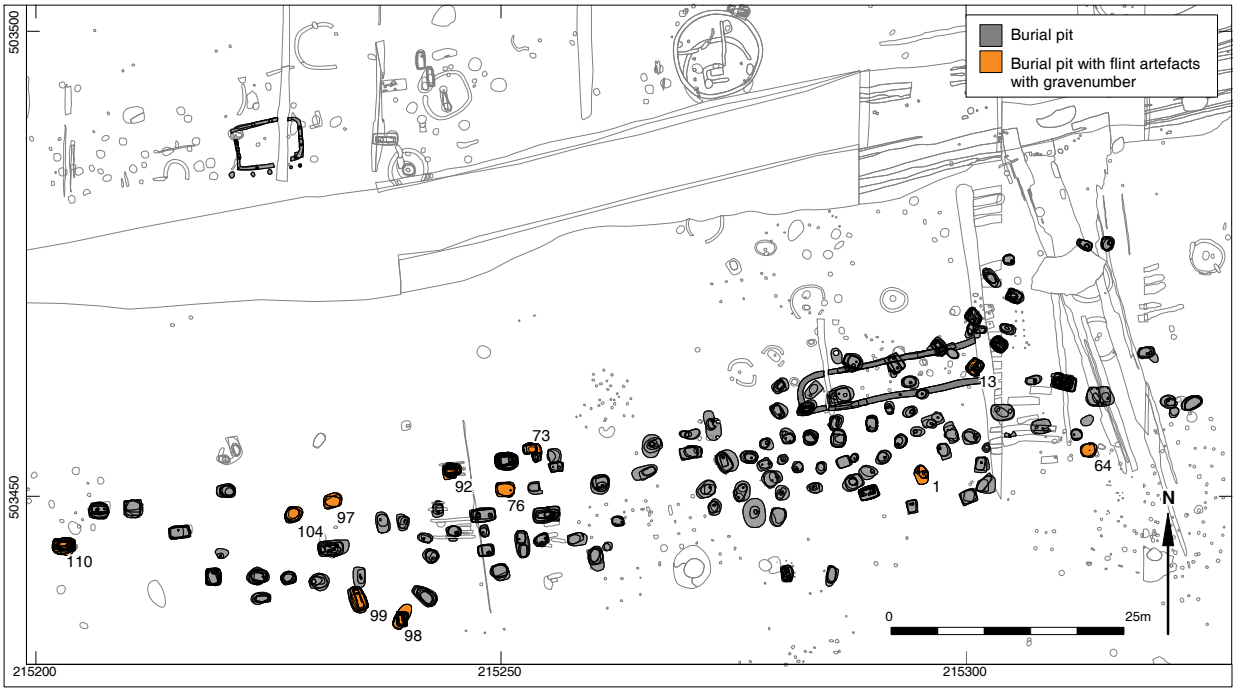


Figure 6.4 Dalfsen: Plan of the burial site showing the graves containing definite and possible flint grave gifts.

With the exception of the find from the stone cist at Diever, the combinations of strike-a-lights and marcasite balls recovered at Dalfsen are unique for the Netherlands.[199] Kossian (2005) provides just two examples, one from Nordrhein-Westfalen (Heek) and one from Schleswig-Holstein (Flintbek).[200] It is clear from ethnographic data that creating fire was primarily a male domain. There are indications that the same held true in Dutch prehistory. Strike-a-lights and marcasite are mostly found in male graves. One of the nicest examples was found in the excavation at Schipluiden. In his right hand, the deceased held three flint strike-a-lights and a piece of marcasite.[201] The excavation of a tumulus near Lunteren revealed a grave containing a coper dagger, seven projectile points, a wrist guard, a strike-a-light, and a piece of marcasite.[202] The exceptionally obvious male inventory is typical of the Bell Beaker culture.

6.2.3 Combinations of artefacts

Several of the graves contained combinations of artefacts. Unless they were associated with other finds, flakes, splinters and small pieces of flint have been omitted from consideration as grave fits. Noteworthy are the combined finds of transverse points and flakes suitable for making transverse points on. Grave 1 contained two transverse points and six flakes, of which five would have been suitable for turning into a transverse point, on the basis of shape and dimensions. Grave 64 yielded three transverse points and a single flake. This flake also would have been suitable for turning into a transverse point. Grave 104 contained a transverse point, a core, six flakes and a flake fragment. Five of the six flakes would have been suitable for making a transverse point, and possibly the flake represented by the flake fragment would have been too. It is interesting that the pits within the burial ground also yielded a combined find of two transverse points and nine flakes (cat. no. V1272.001). At least six of the seven flakes would have been suitable for the creation of a transverse point. The raw material, possibly including the two points, appears to originate from a single piece of flint. Only one small flake differs. This find comes from a small, oval pit measuring 57 × 38 cm located directly east of grave 64. East of this pit were two similar pits. Considering the combination of flakes and transverse points, we may ask ourselves whether these relate to a specific type of grave.

Another noticeable connection between finds was seen in graves 1 and 3 and possibly grave 92. It concerns a combination of marcasite and a strike-a-light[203] That all three combinations of finds are grave gifts is beyond dispute. In any event, it makes sense that strike-a-lights and marcasite would be placed with the deceased.

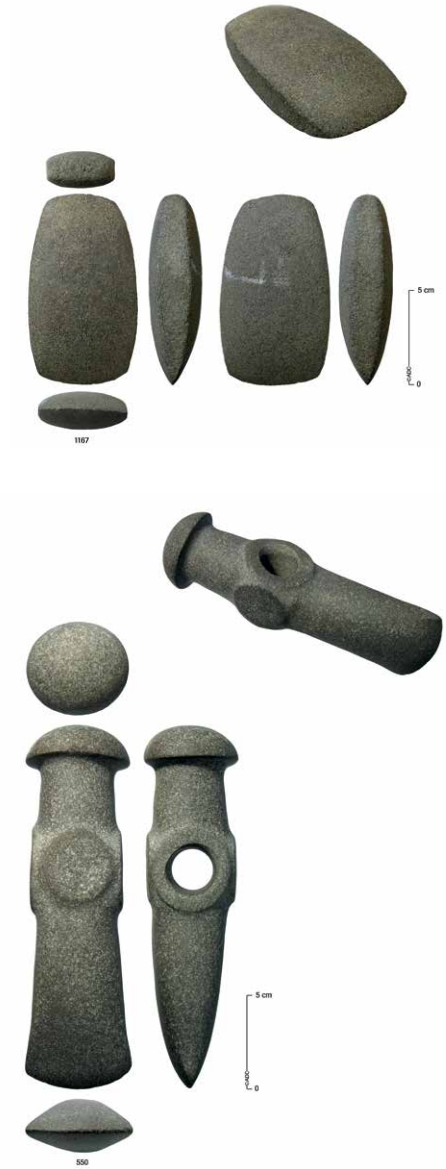
199 It concerns graves 1 and 13 and possibly grave 92.

200 Flintbek (Kossian findspot 276) and Heek-Ammert (Kossian findspot 191).

201 Van Gijn and Houkes 2006, 185.

202 Bloemers *et al.* 1981, 49.

203 Marcasite and pyrite are chemically identical (chemical formula FeS_2) but differ in their crystalline structure.



Strike-a-lights and flakes are another combination, found, for example, in grave 13 (one bikkel and three flakes), grave 92 (one strike-a-light and two flakes), and grave 97 (one strike-a-lightbikkel and two flakes). The flakes would have served no purpose for lighting a fire and therefore must have had a different function. The three flakes from grave 13 would have been suitable for making transverse points, as would one of the flakes from grave 92. But whether the other flake from grave 92 would have been suitable is not certain. And both of the flakes from grave 97 would have been less suitable for creating projectile points.

Figure 6.5 Stone axes found in the Dalfsen burial ground

6.2.4 Spatial distribution of the flint grave goods within the burial ground

Using the notions above as a guide, the presence of flint grave goods was studied from a spatial perspective. The number of graves with combinations of artefacts or characteristic objects among the grave goods is relatively small. The distribution map of graves with flint grave goods shows a blank area in the middle of the burial ground (Fig. 6.4). A number of graves that are in close proximity to each other (98 and 99 and 97 and 104 and to a lesser extent 76 and 92) have been compared in terms of contents. Only graves 98 and 99 show similarities in their contents. Both contained a single transverse point, but it is unclear whether this tells us anything about the nature of the point (grave gift or not).

6.3 Stone axes

This section was written by Henk van der Velde.

Three axes were found during the excavation at Dalfsen. Two of them (cat. nos. 550 and 1167) are related to burials and date to the TRB period. The first (cat. no. 1167; Fig. 6.5a) is one of the more common types in use during this period in the Netherlands and adjacent areas of Germany. It is a so-called *Felsrechteckbeil* (axe with rectangular cross-section) according to Brandt.[204] It is most probably of type B1 (a/b) based on the lightly rounded sides and the relatively thick top segment of the axe. Due to the find circumstances (as part of the inventory

204 Brandt 1967, 140-142.

of a burial pit within the TRB burial ground), this object is dated in the TRB period, but this type is also known from contexts dating to the Corded Ware culture.

The second TRB axe (cat. no. 550; Fig. 6.5b) was found in burial 25. This grave also yielded five pots, making it the richest burial of the site. The axe is described as a knob-butted hammer axe of the Dutch type.[205] It is made of diabase. The cutting edge is oval. Around the shaft-hole, concentric rings are visible, and flattened knobs were created through polishing. The shaft is cylindrical and mounts into a mushroom-shaped knob, making it a slender object. This axe is the only one of this type that can be dated precisely (late in horizon 5). Lanting recently wrote an article on the Dutch Middle Neolithic hammer axes and proposed a refined typochronology.[206] He sketches the development (in four groups) of this type from a more squat axe with a not fully developed knob (as found at Donkerveld) towards slender and fully developed knob-butted hammer axes, as found at Wapenveld, as the end phase. The hammer axe from Dalfsen is part of the latest group. This typology makes clear that this type of axe is found throughout the entire period of the TRB culture in the Netherlands and adjacent regions of German.[207] The context of the find and the observation that this axe (despite the enormous amount of time the makers must have put in it) was barely used, suggests that this object may have had a kind of symbolic function (or was an object of status). This suggestion is underlined not only by the small number of axes found in this burial ground (only two), which suggests they were not part of a basic inventory, but also by the combination with the other finds, which makes this interpretation of interest for the study of social organisation of the TRB burial group. With the exception of the burial ground at Heek-Ammerter Mark, no other findspots are known where we can test such a hypothesis. At Heek, a similar axe form was found in combination with several pots dating to Brindley horizon 4. Apart from that axe being of a different (but related) type (Lanting's Ammerter Mark type), this burial does not stand out as being the richest within the burial ground.[208]

The third axe (cat. no. 432; Fig. 6.5c) was found just north of the burial ground and dates from the period of the Corded Ware culture. It may have derived from a (since disappeared) burial dating from the Corded Ware culture period, since we know of several burials from this period from this excavation (see section 3.6). Another option is that the axe was deposited in the depression situated between the area of the burial ground from the TRB period and the area on which the TRB houseplan and later burials were situated (see sections 3.1 and 3.2). It is a stone battle axe of type C-3 (in the Glob/Struve typology).[209] These axes are found in the northeastern Netherlands; in northwestern Germany, including Schleswig-Holstein; and in Denmark, but the axes coming from the latter area show a sharper edging on both long margins of the object.

6.4 Amber objects

This section was written by Henk van der Velde.

Two burials contained finds of amber in the form of beads (graves 91 and 99). Burial 91 yielded one thin, disc-shaped bead. The total number of beads from grave 99 is at least 66. Additional but very poorly preserved parts of beads were not included in this count of 66. Fragments of two more beads (probably dating to the TRB period) were found during sieving of the soil recovered from the depression adjacent to the burial ground. These finds suggest that the number of amber finds at the site would have been higher originally. At the same time, it is clear that amber beads were not part of the standard inventory of grave goods, whereas ceramics were.

None of the beads and bead fragments are in good condition, because the sandy soil in which they were found has caused them to deteriorate over time. Therefore, much of the shininess and colour are now gone, and their conservation after excavation has merely stabilised them. Some of the beads could not be reconstructed. Because of these preservational issues, it is not possible to determine whether decorations (such as lines) were present.

The amber beads of burial 99 were found in two concentrations. All of these finds were measured in 3D, and due to the 3D reconstruction of the burial pit, we were able to establish that concentration 1 was situated at the bottom of the pit, in the northern part of the plank-lined burial chamber (Fig. 6.6). It comprises 59 beads. The 3D mapping gives us some indications for the reconstruction of the composite object they were once part of, although we have to acknowledge that in the absence of the material that would have held all the beads together, we cannot exclude that this concentration comprises more than one composite object.

The 59 beads can be categorised into three groups. The beads in the first and largest group (n = 36) are disc-shaped, and the majority seem to have sharp edges at the rim. The diameter varies from 6 to 11 mm. The thickness varies from 2 to 5 mm. The beads of this type (mostly of Woltermann type 1A, and at least one of Woltermann type 7A) fall into two subcategories based on size (Fig. 6.7). Group 1 also comprises one object that stands out by its size. This bead, which is disc-shaped with a rounded outer margin, is 23 mm in diameter and 10 mm thick. The bead has a central perforation 4 mm in width.

205 Bakker 1979; Lanting 2018.

206 Lanting 2018.

207 Lanting 2018, 113 ff.

208 Lanting 2018, 116.

209 Another parallel was found by Brandt (1967, 53).

Figure 6.6 Dalfsen: In situ photo of bead concentration 1 in grave 99.

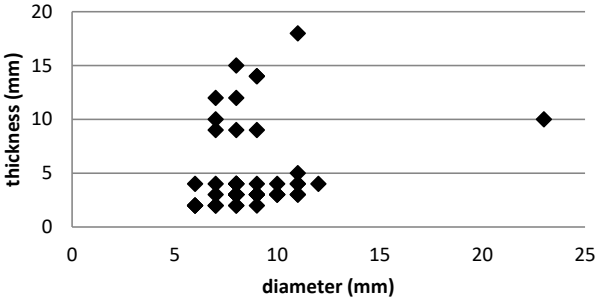


Figure 6.7 Measurements of 48 of the beads in bead concentration 1 in grave 99. For the remaining 11 beads, the dimensions could not be established.

The beads in the second group (n = 10) are tubular (Woltermann type 7B), varying from 9 mm (measured on a fragmented bead) to 18 mm (length) in length and from 7 to 11 mm in width. Some of them stand out by their absolute size, and it seems that, based on that criterium, there also within this group there are two subcategories based on size. The shape within this group of tubular beads also varies, from slightly oval to flat and from circular tubes to more flattened ones.

The third group consists of 11 beads, which are so deteriorated that it is no longer possible to establish their exact type. It is only possible to determine that they are not cylindrical but, rather, disc-shaped or flattened. The circular perforations of the beads vary from 3 mm (for the smaller beads) up to 6 mm (for the larger ones). The size, form and position of concentration 1 suggests that the deposition was part of the funerary ritual, but it seems unlikely that the object was positioned around the neck of the deceased. A possible parallel is a burial found at Swifterbant, dating to the Swifterbant period. There, a 'necklace' was positioned on the head.[210]

Concentration 2 was found some 80 cm south of concentration 1 and consisted of 7 flat, circular beads measuring 10 mm in diameter (Fig. 6.8). Their thickness varies from 3 mm to 6 mm. A circular hole of roughly 3 mm diameter was drilled in the centre of each bead.[211] The thin beads can be typed as disc-shaped (*scheibenförmig*) with sharp edging (Woltermann type 1a) and the thicker ones as short, cylindrical (*kurzzylindrisch*) with sharp edging (Woltermann type 7a). The location of the individual beads in concentration 2 suggests that all of these beads are part of a single object, most probable a bracelet or anklet. Because it was not possible to establish the exact position of the corpse (because no silhouette remained), we cannot establish whether it was around the ankle or the wrist of the deceased.

The number of beads is large compared with other known sites. The above-mentioned burials from Swifterbant contained 5 and 11 amber objects, respectively. Several Dutch megalithic monuments yielded amber beads, but we are not certain whether all these beads are part of a single piece of jewellery or whether they represent different pieces.[212] The biggest assemblages come from G2-Glimmen (71 beads), D26-Drouwen (48 beads) and G5-Heveskesklooster (30 beads).[213] In the neighbouring German areas that are also part of the

210 Devriendt 2014, Fig. 4.2.
211 Woltermann 2013.
212 Drenth 2014, Table 1.
213 Verschoof 2013.

Figure 6.8 In situ photo of bead concentration 2 in grave 99.

TRB West Group distribution area, we know of assemblages numbering up to six beads from a non-megalithic burial (Heek-Ammerter Mark) The biggest number of beads from megalithic monuments in the TRB West Group – hundreds of them – seem to be come from the northeastern distribution area of the TRB West Group.[214] Their proximity to rich findspots of amber raw material may account for differences in the number and use of amber by local groups. Notwithstanding possible differences in the state of preservation, the proportion of burials with finds of amber from the burial site of Flensburg (6 out of 29 burials) is rather high compared with those of Heek-Ammerter-Mark (1 out of 20 burials) and Dalfsen (2 out of 134 burials).[215]

Previous research into the provenance of the Dutch prehistoric amber finds has stated that the majority of the raw material was retrieved in the Waddenzee area.[216] An additional source has been proposed for the amber finds from Swifterbant: the Pleistocene boulder outcrops on the former islands of Urk and Schokland, in the former Zuiderzee (now province of Flevoland).[217] These two outcrops are located downstream along the river Vecht and should be considered as a source area relevant for the Dalfsen beads as well. In geological terms, it needs to be emphasised that the amber from the Waddenzee area also originates from eroded Pleistocene outcrops and therefore may not be distinguishable from amber collected on Urk or Schokland. At this stage, we need to be careful not to draw hasty conclusions about its source and associated social status of amber finds. They may have been high-status objects deriving from long-distance trade relations, but they may also have been collected by the local TRB group at a nearby location (Urk or Schokland) or while visiting the Waddenzee region.[218]

At this moment, both the small number of finds and the uncertainty surrounding their provenance make it difficult to interpret the beads in terms of the social status of the deceased. Looking at the craftsmanship of the beads found in burial 99, not only the quality of the objects but also the standardisation of the beads seems pertinent. This standardisation (combinations of mainly disc-shaped beads and tubular ones) is also witnessed in the beads from Glimmen, Drouwen and some German TRB contexts, and is in contrast to the amber objects dating to the Swifterbant period.[219] Due to the 3D measuring of the individual beads, it was possible to reconstruct parts of the design of the necklace of concentration 1 (Fig. 6.9). There seems to be a pattern of several disc-shaped beads alternating with a tubular bead. The biggest spherical amber bead is the central piece in the necklace, and the beads either side of it are a mirror image, involving combinations of four thin, disc-shaped beads and a tubular one, repeated five times on each side. Within these combinations, there seems to be a tendency for one of the four disc-shaped beads to be bigger in diameter than the others.

214 Woltermann 2013.
215 Woltermann 2013, 176.
216 Kars and Boon 1992/93.
217 Devriendt 2014; Kars and Boon 1992/93.
218 Verschoof (2013) suggests that amber finds in the Dutch megalithic monuments may represent a social connection of the local groups with the coastal area, where, he assumes, some of the families may have stayed seasonally in special extraction camps.
219 Devriendt 2014.

Figure 6.9 Reconstruction of the amber bead necklace from grave 99.

Also, the differences in size within the group of tubular beads indicate that there are several pairs of similarly shaped beads and that they were placed opposite each other.

The inventory of burial 99 comprises not just beads, but also a pot, dating to Brindley horizon 4 (AB34). This pot was positioned just outside the actual grave chamber, but given the level at which it was found (on the bottom of the burial pit), we assume that it was deposited either as part of the original inventory or shortly after the burial of the corpse. Although it is hard to date individual pots with accuracy, Brindley has stated that this pot is most probably the oldest of all the ceramics retrieved from this burial ground (Chapter 4). This would make this burial the first one of the burial ground (the founder's grave). Although we have to be cautious in our analysis of the status of amber in TRB society, we have to acknowledge the correlation between this burial's position at the start of the chronological sequence and the presence of the highest proportion of amber beads. Seemingly, this amber necklace and bracelet/anklet merited a special deposition or the deceased merited special grave goods, suggesting that there is a causal relation between the amount of amber and the status of the deceased.

Do the data suggest any correlations between amber and the gender of the deceased? We do not know the gender of person buried in grave 99, who, we argue, was the founder of the burial ground. Similarly, we do not know the gender of the person buried in grave 91. Therefore, in the case of Dalfsen, the data are silent. What about other sites? Due to a lack of contexts in which a connection can be made between gender (and age) of the deceased and items provided for the last journey, we (again) have to be careful in drawing far-reaching conclusions. From the TRB period, we know of a female and two males in which graves amber object were found, from the burial ground of Ostorf.[220] From the remainder of the Dutch Neolithic, finds of amber in burials are known from graves of the Swifterbant period (where a child, man and woman were buried with amber objects), the Hazendonk group (amber beads used as amulets mainly for children) and from the Corded Ware and Bell beaker cultures.[221] In none of these cases could a connection between amber and a specific gender be ascertained.

220 Woltermann 2013, 177.
221 Drenth 2014.

Chapter 7

The Palaeoecological evidence

Hanneke Bos, Marlon Dijkshoorn,
Cornelie Moolhuizen and Tania Oudemans

7.1 Introduction

In this chapter, the results of the various palaeoecological analyses relating to the burial ground at Dalfsen are discussed. During excavation, samples were taken in order to answer different questions concerning the palaeoecological environment of the site. The first objective of the study was to examine this data in search of possible remnants of ritual behaviour concerning the burials, including in the form of food provided for the deceased during or after the burial rites. Palynological and macrofossil analysis was carried out on samples from the content of the ceramic vessels, as well as from the sediment around the pots. The second objective of the study was to search for evidence of the former existence of burial mounds, through micromorphological study of sandy layers. The third objective of the study was to obtain palaeoecological evidence for the development of the cultural landscape during and after the TRB period in order to study the cultural biography of the site (see Chapter 9). For this part of the study, palynological samples from agricultural layers dating from the Late Neolithic/Early Bronze Age through to the Iron Age proved to be of interest (section 7.2.3).

As part of the first objective, during excavation, all (complete) funnel beakers were collected with their contents still intact. The sandy soil was carefully removed in the laboratory in two layers (an upper layer and a lower layer, being the layer at the bottom of the vessel). The pottery was brushed clean, and possible remnants of the contents were sampled for chemical analyses. The last parts of this chapter are devoted to the chemical analyses of the remains found inside six of these vessels (section 7.3).

Also as part of the first objective, we tried to filter out pollen from the sandy contents of the beakers (section 7.2.7). A sample of the sandy soil was taken from each burial pit during excavation for geochemical analyses of the soil, specifically for trying to find traces of organic finds related to the burials. These analyses relied on comparison with reference samples taken.

As part of the second objective, several soil samples were taken for thin sectioning During the processing of the samples, we met with serious difficulties relating to the tiny fraction of the grains of sand. Due to the low loam content and the small size of the grains of sand, we perceived a considerable risk of internal transport of sand. In the end, we found that the samples were so unstable that it was not possible to create thin sections from them.

The same problem may have affected our ability to get reliable results from of the pollen samples and the samples taken for geo-chemical analyses and meet our first objective. Due to the high portability of the grains (something we also witnessed in the podzolisation of the soil), we had to stop the experiment. In order to create a closed context for research on the pollen, we sampled only those complete pots that were not found in an upright position (section 7.2).

We encountered no such problems with sampling when studying the palynological samples taken from the agricultural layers, relating to our third objective. Here, the mingling of the sands with organic residues and charcoal created a soil layer in which vertical transport of pollen was less likely to occur.

7.2 Palynological analysis of pot contents and agricultural layers

This section was written by M. Dijkshoorn and J.A.A. Bos

In order to get insight into what the landscape and vegetation surrounding the site looked like during its occupation, botanical analysis was carried out. There are only a few datasets concerning the development of the landscape in the stream valley of the Vecht prior to the Middle Bronze Age. From these datasets, we know that during the Neolithic period, the climax wood of oak was opening up due to human impact from the middle of the 4th millennium onwards. And we know that the Late Neolithic was a dynamic period in which settlements shifted through the half-open spaces in the landscape.

From the Bronze Age, the wider trends in the vegetation development in the Netherlands, or more specifically the province of Overijssel, are known from a number of palynological studies.[222] However, many of these studies lack detail or only deal with short, specific time intervals. A site that was relatively close to Dalfsen and situated in a similar coversand landscape, close to the stream valley of the Regge, is Nijverdal.[223] Here, pollen samples from natural peat deposits and soils dating from the Bronze Age and Iron Age were analysed. Analysis of the pollen samples from the excavation near Dalfsen could add to the relatively scarce knowledge on the vegetation development in Overijssel during the Neolithic and Bronze Age. Moreover, the analysis could give more insight into how the residents of the area used and impacted on the landscape.

In total, 21 samples were collected from the site of Dalfsen for analyses of pollen, spores and non-pollen palynomorphs. Of the 21 samples, 12 were taken from the sediment inside the funnel beakers, 1 from the sediment around the funnel beakers 1 from the sediment that was stuck to the outside of a pot, and 7 from a nearby profile. In the pollen profile, 11 different agricultural layers were present (Figs 7.1, 7.2 and 7.3). Two metal box samples were taken from these layers, with, an overlap (5856, top, and 5857, bottom) (Fig. 7.3b). A third metal box sample (5858; Figs 7.2 and 7.3b) was taken in the lowermost part of the profile, below these agricultural layers, where a darker soil was visible.

Pollen samples were collected with a small corer (volume: 3 cc) from the sediment in the pots, the sediment around the pots and the seven agricultural layers. After collection, the samples were processed at the Sediment Laboratory at the Free University of Amsterdam. Samples were prepared using the standard methods published by Faegri and Iversen and Moore *et al*., with the addition of treatment in warm (80°C) 40% HF and sieving over 150 µm mesh.[224] Residues were mounted in glycerine jelly and sealed. This method allows rotation of the pollen grains during analysis, leading to a more accurate identification of the palynomorphs. All samples were scanned first to check if they were suitable for palynological analysis. A light microscope (magnification 400× and 1000×) was used for both scanning and analysis. Pollen and spore types were identified by comparison with modern reference material and the identification keys of Moore *et al*. (1991), Beug (2004) and Punt (1976-2003).[225] When a specific pollen type or group name is based on any of these identification keys, this is indicated with an M, B or P after the type or group name, depending on the source. Identification of non-pollen palynomorphs (NPP) was based on the type classification of van Geel and colleagues.[226] The different types are referred to using different type numbers: HdV-[nr.]. If no specific name has yet been assigned to a non-pollen palynomorph, only its type number is be used, for reference. Microfossil taxa were divided into regional and (extra-)local components following Janssen (1973).[227] Combined arboreal pollen (AP) and non-arboreal pollen (NAP) totals were employed for percentage calculations. The pollen sum (>600) includes trees; shrubs; heather; upland herbs; and grassland, swamp and marsh species. Pollen and spores of the local aquatic vegetation were excluded, since these would potentially cause an overrepresentation of the local wet vegetation in the diagram. Once enough pollen, spores and NPPs had been counted (>600) to constitute a statistical reliable pollen sum, the entire slide was scanned to check whether some species present in the sample had not been detected during the analysis. These additional species are indicated with a '+' in the pollen diagram.

The results of the pollen analysis of the three agricultural layers are shown in a pollen diagram constructed using the computer program TILIA.[228] In the pollen diagram, the pollen types are divided into different ecological groups. These groups are indicated with different colours and comprise trees and shrubs (green),

222 Van Beek *et al.* 2015a, 2015b, 2019.

223 Bos and Zuidhoff 2012.

224 Faegri and Iversen 1989; Moore *et al.* 1991.

225 Beug 2004; Moore *et al.* 1991; Punt 1976-2003.

226 Miola 2012; Pals *et al.* 1980; Van Geel 1978, 2001; Van Geel and Aptroot 2006; Van Geel *et al.* 1981, 1989, 2003.

227 Janssen 1973.

228 Grimm 1992-2004.

Figure 7.1 Field photo showing the agricultural layers in the investigated pollen profile, with the darker brown plaggen soil on top.

Figure 7.2 Field photo showing the placement of the metal boxes containing samples 5856 (top) and 5857 (bottom) in the pollen profile. Metal box sample 5858 was collected below the other two (see red star and Figure 7.3a).

Figure 7.3 Field photos showing (a) how metal box sample 5858 was collected from a lower level than metal box samples 5856 and 5857 and (b) the different layers captured by metal box samples 5856 and 5857 (see Table 7.1b).

swamp forest (dark blue), heather (purple), upland herbs (yellow), cereals (red), grassland (light green) and swamp and marsh (light blue). To the right of this main diagram, the curves of the pollen percentages are plotted per pollen type in black, grouped by ecological group. These percentages are relative to the total pollen sum. The black line exaggerates the percentage curve by 5%, in order to clearly visualise the lowest pollen percentages as well.

To obtain an accurate chronostratigraphical framework for the agricultural layers in the pollen profile, a series of three radiocarbon samples was selected for AMS ^{14}C dating. Macroremains were recovered by washing the subsamples with water over a 125 µm mesh sieve. The macroremains were then handpicked from the residue and stored in Eppendorf vials. Due to the absence of sufficient datable 'terrestrial' material (macroremains, such as fruits or seeds), only three samples of charcoal were appropriate for AMS ^{14}C dating. The AMS ^{14}C samples were pre-treated and dated by the Poznan Radiocarbon Laboratory in Poznan, Poland.

7.2.1 Results of scanning the pollen from the agricultural layers

The scanning of the samples from the profile gave varied results. The sample from box 5858 yielded no pollen (Table 7.1). The samples from the different layers in 5856 and 5857 contained pollen of variable quality. The pollen concentration was reasonable to good, but preservation was often poor or insufficient, as many pollen grains were corroded or bleached or both. Due to the low concentration and poor preservation of the pollen and spores in the samples, the age of the samples was often difficult to estimate. However, based on their pollen content, most samples probably could be relatively dated to the Atlantic and Subboreal, *i.e.* the Neolithic and the Bronze Age. This was also suggested by the presence of cereal (Cerealia) and the absence of *Fagus sylvatica* (beech) and *Carpinus betulus* (hornbeam) pollen. If pollen of the latter two trees had been present, this could have indicated that the samples dated in the Late Bronze Age or the Iron Age, respectively.

Sample number	Depth (cm below metal box)	Height (cm above sea level)	Layer	State of preservation	Concentration	Charcoal content	Pollen content	Antropogenic indicators	Age
DALN-15-5856-21	21	322	2	reasonable	reasonable/ good	xxxx	Pinus, Corylus x, Alnus xx, Cerealia, Poaceae xxx, Spergula-type, Aster-type, Asteraceae liguliflorae, Hornungia type, Calluna x, Cyperaceae, Sphagnum	Cerealia, Spergula, Asteraceae spp.	Atlantic/ Subboreal (Neolithic to Bronze Age)
DALN-15-5856-32	32	322	4	insufficient	reasonable/ good	xxx	Quercus, Alnus xxx, Calluna x, Campanula, Poaceae x, Cyperaceae, Dryopteris-type, Phaeoceros laevis, HdV-128		Atlantic?
DALN-15-5857-15	15	283	6	bad	reasonable/ good	xxx	Quercus, Corylus, Alnus xxx, Calluna xx, Poaceae xx, Caryophyllaceae, Plantago lanceolata, Anthemis-type, Asteraceae liguliflorae, Cerealia x, Cyperaceae, Polypodium, Sphagnum, HdV-128	Cerealia, Plantago lanceola-ta, Asteraceae	Atlantic/ Subboreal (Neolithic to Bronze Age)
DALN-15-5857-21	21	277	7	insufficient	good	xx, charred Cyperaceae/ Poaceae epidermis	Quercus, Corylus x, Alnus xxx, Calluna x, Poaceae x, Cerealia-type, Anthemis-type, Asteraceae liguliflorae, Sinapis-type, Phaeoceros laevis, Humulus, Polypodium	Cerealia, Asteraceae	Atlantic (Neolithic)
DALN-15-5857-27	27	271	9	insufficient	good	xxx	Quercus x, Corylus, Ulmus, Tilia x, Alnus xxx, Poaceae x, Calluna x, Cyperaceae, Cerealia	Cerealia	Atlantic (Neolithic)
DALN-15-5857-38	38	260	11	reasonable	good	x	Pinus, Quercus xxx, Corylus xx, Tilia x, Ulmus, Alnus x, Fraxinus, Polypodium, Hedera, Anthemis-type, Aster-type, Asteraceae liguliflorae, Artemisia, Calluna x, Amaranthaceae, Poaceae, Dryopteris-type, Phaeoceros laevis, HdV-128	Cerealia, AsteraceaeAmarantha-ceae	Atlantic (Neolithic)
DALN-15-5858-28	28	unknown		insufficient	insufficient	x	no pollen		

Table 7.1 Description and charcoal and pollen content of the pollen samples from the profile. Charcoal: x = present, xx = often present, xxx = abundant.

Figure 7.4 Field photo showing the placement of metal box samples 5856 and 5857. The three Bronze Age agricultural layers from which pollen samples were analysed are indicated with red dots. From top to bottom, these are layers 2, 6 and 11.

Because of the likelihood that the pollen samples were contemporaneous with the TRB period and therefore may reflect the surrounding vegetation in the landscape during that period, it was decided to analyse the three best preserved pollen samples from this profile, one from the base of the agricultural layer, one from the middle and one from the top (DALN-15-5857-38, DALN-5857-15 and DALN-5856-21; see also Fig. 7.4). The results will be discussed below.

7.2.2 Pollen analysis of the agricultural layers

The pollen diagram from the analysis of the three agricultural layers is shown in Figure 7.5. The lowermost agricultural layer (layer 11) is characterised by a high arboreal pollen percentage (87% of the total pollen sum). In total, 55% of the pollen sum originates from trees and shrubs that grow on dry to moist soils. Oak (*Quercus robur*-group), hazel (*Corylus avellana*) and lime (*Tilia cordata/T. platyphyllos*) are the most dominant tree taxa. Other tree taxa from which pollen was found in this lowermost layer include pine (*Pinus sylvestris*), elm (*Ulmus glabra*-type) and birch (*Betula pubescens*-type). Furthermore, pollen and spores from taxa that grow in the undergrowth, such as ivy (*Hedera helix*) and oak fern (*Polypodium vulgare*-type), are present in the lowest layer. Of the total AP percentage, 33% consists of pollen from the alder-type (*Alnus glutinosa*-type), a species which can be found in swamp forests on wet soils.

The AP percentage decreases markedly from layer 11 to layer 6, from 83% to 25%. This is mainly caused by a marked decline of pollen of all tree and shrub taxa from dry to wet soils, but especially of lime, oak, elm, hazel and alder. Pollen of oak, elm, ash, birch and pine reach very low values in layers 6 and 2, while pollen of lime even completely disappears in the top layer analysed (layer 2). The values of hazel and alder pollen slightly increase again in layer 2, from 3 to 4.5% and 20 to 43%, respectively.

In the lowest layer analysed (layer 11), the proportion of pollen of common heather (*Calluna vulgaris*) is relatively low (3%). The same applies for the upland herbs (3%), which includes pollen of mugwort-type (*Artemisia vulgaris*-type), composites (*Aster tripolium*-type, *Asteraceae liguliflorae* and *Anthemis arvensis*-type) and ribwort plantain (*Plantago lanceolata*) is present. Furthermore, spores from the liverwort species *Anthoceros punctata* and *Phaeoceros laevis* were found. Towards the top layer (layer 2), the upland herb pollen percentage increases slightly, to 5%. While the percentage of liverwort spores decreases, other types appear, such as the spurry-type (*Spergula arvensis*-type), sorrel-type (*Rumex acetosa*-type) and pollen from the mustard family (*Hornungia*-type).

The pollen percentage of cereals nearly doubles from layer 11 to layer 2, from 1% to 1.8%. Pollen from grassland species, such as the white clover-type (*Trifolium repens*-type), bedstraw-type (*Galium*-type) and grasses (Poaceae) are present in all three layers. The percentage of grass pollen is markedly higher in the upper two layers (6 and 2) compared with the lowest layer (11). In these upper two layers, pollen of the bellflower-type (*Campanula*-type) and meadow buttercup-type (*Ranunculus acris*-type) were also found.

In the uppermost agricultural layer analysed (layer 2), a few pollen grains and spores of swamp and marsh species are present. Most of these are from sedges (Cyperaceae).

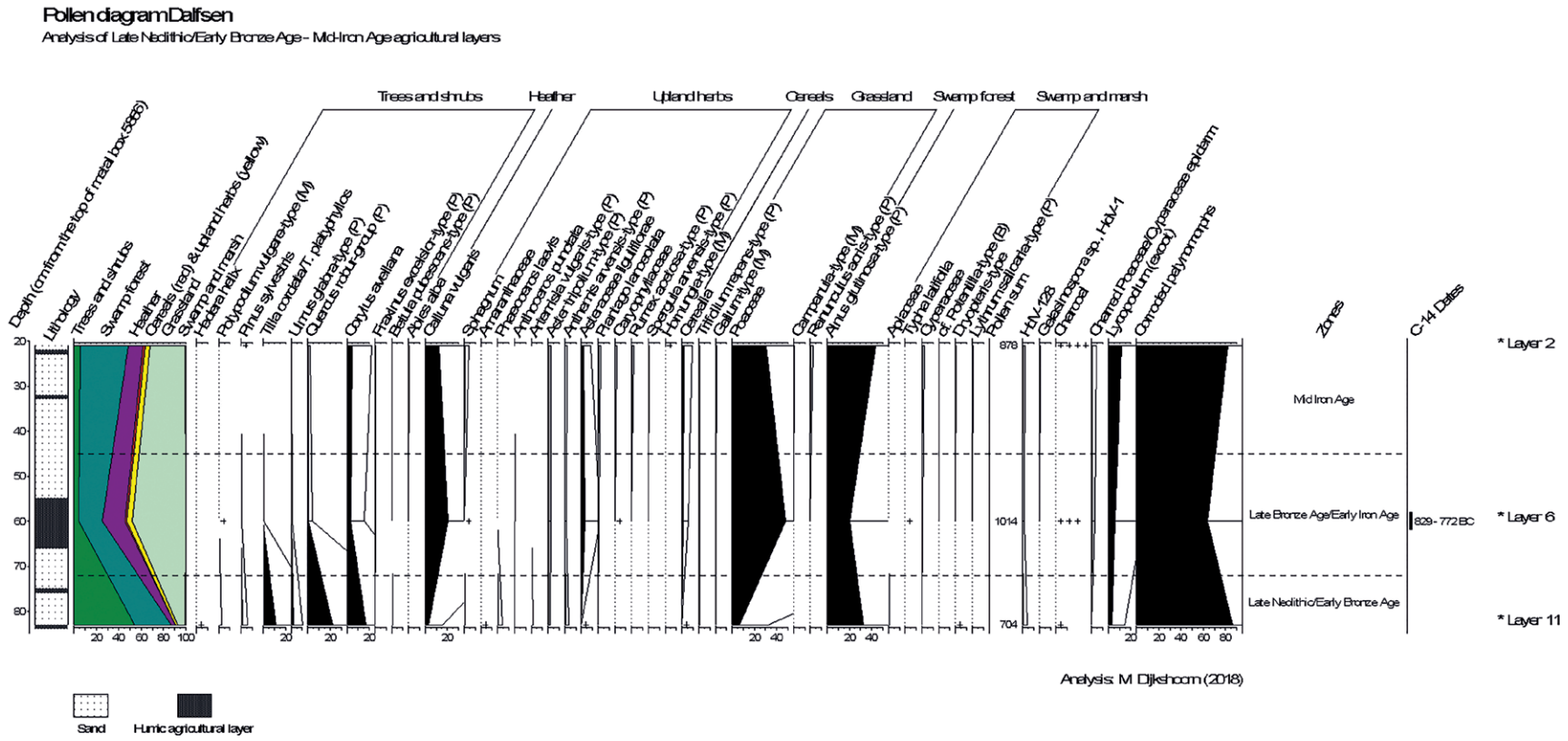


Figure 7.5 Pollen diagram of the Bronze Age agricultural layers.

Only a few pollen and spores from other types were found, including the purple loosestrife-type (*Lythrum salicaria*-type), the cinquefoil-type (*Potentilla*-type) and the wood ferns (*Dryopteris*-type).

All three samples yielded the microfossil HdV-128, an algal type that is related to shallow, open water. Other non-pollen palynomorphs include Gelasinospora (HdV-1). This carbonicolous ascospore was found in the top layer (2), where a relatively high abundance of microscopic charcoal was recorded. The amount of microscopic charcoal increases from bottom to top and is very abundantly present in layer 2. In addition, the abundance of charred Poaceae/Cyperaceae epiderm also increases from the lowest to the top-most layer.

7.2.3 Discussion: Absolute and relative dating

It is hard to determine exactly the number of agricultural layers which have survived due to their position in the depression. It is also not possible to date them accurately by means of find material, since the number of sherds is small, as is their size. AMS ^{14}C dating was carried out on one sample from each of the agricultural layers 11, 6 and 2 (Table 7.2). The amount of charcoal material in layer 11 was not sufficient to be used for AMS ^{14}C dating. AMS ^{14}C dating of the samples from layer 6 and layer 2 resulted in Late Bronze Age or Early Iron Age and Late Iron Age or Roman period calendar ages, respectively.

Layer 11 could not be dated by ^{14}C dating. We therefore rely on the pollen spectrum to provide a date. The pollen assemblage has high values of such trees as oak, lime and hazel, which allows us to date layer 11 in relative terms, by comparison with other pollen diagrams in similar regions in the provinces of Overijssel and Drenthe[229], to the Late Neolithic and Early Bronze Age.

Although the number and quality of the pollen from agricultural layers 7 and 9, which lie between layers 11 and 6, was not sufficient for analysis, in those layers human impact is also visible in the pollen record. These layers may be dated somewhere in the Early to Middle Bronze Age on the basis of their intermediate position.

The pollen sample from layer 6 reflects an increase in the human impact on the area and shows a strong decrease in the tree pollen values, indicating a phase of deforestation, expansion of heathlands and crop cultivation. Based on biostratigraphical correlation with pollen diagrams from similar landscapes,[230] the pollen assemblage likely reflects the Bronze Age. Radiocarbon dating of the charcoal in layer 6 resulted in an age of 829-772 cal. BC, which dates the sample in the Late Bronze Age or Early Iron Age. This means that the biostratigraphical and ^{14}C date are concurrent. This concurrence suggests that the charcoal that was deposited during this period in layer 6 was found in situ.

Find number	Layer	Dated material	Lab number	Lab result in ^{14}C years BP	Calibrated age in yrs. (2σ)
DALN-15-5856	2	charcoal fragments	Poz-106479	955 ± 30	45 BC-80 AD
DALN-15-5857	6	charcoal fragments	Poz-106544	995 ± 35	829- 772 BC
DALN-15-5857	11	charcoal fragments		No result	

Table 7.2 Radiocarbon dates from agricultural layers at Dalfsen. The radiocarbon ages of the samples were converted into calendar ages using Oxcal version 4.2. (Poz = Poznan Radiocarbon Laboratory, Poznan, Poland).

The age of 45 cal. BC-80 cal AD for the charcoal from layer 2 dates this sample in the Late Iron Age or Early Roman period. This is rather young when compared with the content of the pollen assemblage. No pollen of beech or hornbeam was found, while in pollen samples dating to the Late Iron Age or Early Roman period, pollen of beech and hornbeam are usually present.[231] The charcoal that was dated from layer 2 therefore presumably originated from younger, washed-in material. On that basis, the ^{14}C date is dismissed. The excavation provides extra arguments to dismiss the ^{14}C date. First, the excavation did not yield any evidence of habitation or use of the landscape for the period between 500 BC and 800 AD. The presence of an agricultural layer that dates in the middle of this period is not consistent with these data. Second, directly above layer 2 is a thick drift-sand layer. This may suggest that the agricultural soil was lying exposed for several or even many years. It is plausible that with the inflow of drift-sand on top of the agricultural layer, foreign charcoal from the Roman period was deposited on this site. The sandy soil is very loose, and charcoal particles could easily have been transported downwards into deeper layers. This process of vertical transport is further supported by finds of rye, maize and buckwheat pollen – all much later introduced to the area – in samples from the sediment in and around the funnel beakers (see below), indicating the presence of sediment from distinctly younger ages as well. Third, the poor and fine-grained sandy soil on which these agricultural layers were present is not suited for prolonged crop cultivation, due to depletion of the soil and the risk of sand drift.[232] Therefore, a time interval of approximately 700 years between layers 6 and layer 2 is

229 Bos and Zuidhoff 2012; Van Beek *et al.* 2015a, 2015b, 2019; Van Geel *et al.* 1981.

230 Bos and Zuidhoff 2012; Van Beek *et al.* 2015a, 2015b, 2019; Van Geel *et al.* 1981.

231 Bos and Zuidhoff 2012; Van Beek *et al.* 2015a, 2015b, 2019; Van Geel *et al.* 1981.

232 Koster 1978.

unlikely. Since the pollen sample from layer 2 is consistent with human impact in the area, and since archaeological evidence shows that human impact decreased from 500 BC onward, layer 2 most likely dates from the Middle Iron Age (c. 600 BC). Finally, the increase in wetness that is reflected in the pollen sample from layer 2 (see below) is also typical for the Iron Age, when groundwater levels were probably higher due to both changes in climate (it became cooler and wetter) and an increase in human impact, which led to an increase in erosion and run-off.[233]

The pollen analysis and ^{14}C analysis have provided us with a general notion about the age of the various agricultural layers. These seem to span a period between the Late Neolithic/Early Bronze Age and the Middle Iron Age. The pollen record of the oldest agricultural layer (layer 11) suggests that the build-up of the agricultural layers post-dates the TRB occupation at Dalfsen.

7.2.4 Vegetation reconstruction

The results of the palynological analysis indicate that during the deposition of the lowest agricultural layer (layer 11), in the Late Neolithic period or Early Bronze Age, the area around Dalfsen was forested. A mixed oak forest dominated the higher, dry, sandy soils, while alder swamps were present in the lower, more humid areas of the region. The mixed oak forest mainly consisted of oak and lime, although some elm and remnants of open pine forest were present on the sandy coversand ridges, which were at higher elevations.[234] Hazel was present in shrubs on the slopes of the coversand ridges, on forest edges and in the undergrowth of forests, together with oak ferns and ivy. Both hazel and oak ferns are photophilous and thrive in relatively open areas in the landscape or in areas where the open canopy of surrounding trees, such as oak or birch, allowed sunlight to penetrate to the forest floor.[235] Hazel requires a relatively high light penetration in order to grow optimally.[236] In periods after deforestation, hazel can become one of the first pioneer species to colonise new parts of the land. It therefore is also often found on forest edges. Oak ferns are often present in areas where organic material slowly decays, such as in the slits of decaying tree trunks on the forest floor.[237] In the vicinity of the sample location and possibly in the scattered open spaces in the forest, some herbaceous and grass vegetation was present.

At some distance from the sample location, on humid soils, such as the Vecht stream valley or next to streams and rivers, alder swamps were present. Alder is a tree species that requires moist and nutrient-rich soil for optimal growth. Furthermore, due to the wet environment in which it grows, its roots need little oxygen.[238] In the alder swamps, sedges, wood ferns and peat mosses were also present. These species are all indicative for humid and nutrient-rich environments, just like alder.

In the Late Neolithic period or Early Bronze age, humans created small openings within the mixed oak forests for agricultural plots and settlements. Small-scale cereal cultivation probably took place in small openings in the forest on the soils at higher elevations. The presence of cereal pollen indicates local cultivation of cereals, since cereal pollen is relatively large and is therefore not dispersed over large distances.[239] It is also possible that these pollen grains originate from threshing activities near the sample location, because cereal pollen grains are only particularly released from their husks during this process. This applies specifically to barley and wheat.[240] Nevertheless, even if the cereal pollen grains were derived from threshing, it is likely that the crops were cultivated regionally. Moreover, the agricultural layers testify to these agricultural activities. Due to depletion of the soils, people probably had to shift from one plot to another from time to time. Cultivation of crops is also supported by the presence of liverwort species, *Anthoceros punctata* and *Phaeoceros laevis*, which are generally found on fallow land on loamy soil.[241] This could be a confirmation that somewhere in the region, crops were cultivated on a small scale on loamy soils, which are more nutrient-rich and moist in comparison with the fine-grained sandy soils. In some of the former agricultural plots in the forest that had been deserted due to depletion of the soils, heather could develop. Heather grows on poor soils that are low in nitrogen and phosphorous.[242]

Both the regional and the local landscape around Dalfsen changed markedly from the Late Neolithic/Early Bronze Age to the Late Bronze Age/Early Iron Age. Forest cover experienced a significant reduction. While the extent of the alder swamps in the lower-lying areas in the region decreased slightly, the most significant forest reduction took place on the higher, sandy soils on the coversand ridge. Here, the forest almost completely disappeared. However, some scattered oak, lime and elm trees and hazel shrubs remained present. Simultaneously with this deforestation, the abundance of heath- and grassland increased and crop cultivation intensified. These vegetation changes are related to the increase in human impact accompanying the occupation of the area. Forest cover was reduced in favour of cereal cultivation and habitation. Arable

233 Van Geel *et al.* 1996, 1998.
234 Bos and Zuidhoff 2012; Doorenbosch 2013, 17.
235 Weeda *et al.* 1985, 88.
236 Weeda *et al.* 1985, 100.
237 Weeda *et al.* 1985, 49.
238 Weeda *et al.* 1985, 68.
239 Behre and Kučan 1986.
240 Joosten and van den Brink 1992.
241 Koelbloed and Kroeze 1965.
242 Weeda *et al.* 1988, 38.

weeds, such as different types of composites (Asteraceae liguliflorae, *Anthemis*-type, *Aster tripolium*-type) grew on these cereal fields as arable weeds. However, the nutrient content of the sandy soils was low, and when the land was left fallow after harvesting, the absence of a vegetation cover led to an increased risk of sand drift. Therefore, crop cultivation was not sustainable and led to an even lower nutrient content of the soil, causing an increase in heather. The high values of heather in the pollen sample of layer 6 indicate that the species was growing in the proximity of or at the sample location. The latter may have occurred when heather expanded after the agricultural field was abandoned. On the more nutrient-rich, moist to wetter soils in the region, such as near the alder swamps in the stream valleys, grassland with white clover and bedstraw expanded.

The analysis of the uppermost agricultural layer (2) reflects the local and regional vegetation during the Middle Iron Age (c. 600 BC). During this period, the forest cover remained reduced, with some hazel shrubs and single stands of oak and elm trees on the higher, dry, sandy soils. Lime appears to be absent from the forests in the region. Pollen diagrams in similar areas in Overijssel and Drenthe reflecting this period show that during this period the importance of lime in the forests decreases.[243] Usually this is caused by the expansion of shade-tolerant trees, such as beech (*Fagus sylvatica*) and, later, also hornbeam (*Carpinus betulus*). Another theory is that the decrease in lime was related to the increase in human impact, because the branches of deciduous trees, such as lime, were often used as cattle fodder.[244] The absence of lime therefore also could relate to the increase in human impact in the region. Furthermore, beech pollen was not found at this location. As with lime, this is likely the result of the open landscape on the coversand ridge. Beech is very sensitive to direct sunlight on its bark and leaves, and it is usually present in areas of the forest with a lot of shade.[245] At Dalfsen, the deforestation of the higher soils had probably already progressed to the point that shady forests with lime and beech were absent from the area.

Crop cultivation continued to expand in the region during the Iron Age. Common sorrel, spurry and different types of composites (Asteraceae liguliflorae, *Aster tripolium*-type, *Anthemis arvensis*-type) grew on cereal fields as arable weeds. The absence of liverwort species could indicate that the nutrient availability of the soil had decreased, since spores of these taxa were absent in this agricultural layer too. Liverworts are usually present on more nutrient-rich, loamy soils. However, the absence of these liverwort species also could relate to the high corrosion and poor quality of the pollen in the sample. Due to a relatively quick nutrient depletion of the sandy soils, humans shifted from one agricultural plot to another. On abandoned agricultural fields, heather was growing.

The taxa of moist to wet environments show a trend towards wetter conditions. Groundwater levels were probably higher due to wetter conditions caused by a change from a relatively warm and continental climate during the Bronze Age to cooler and wetter conditions during the Iron Age.[246] The increase in deforestation and human agriculture during this period may also have caused instability of the soils and an increase in surface erosion. In the stream valleys, the abundance of alder swamps increased, and more marsh vegetation developed in the undergrowth, in the form of sedges, cinquefoil, purple loosestrife, wood fern and peat moss. In the vicinity of these alder swamps, wet grasslands expanded, with bedstraw and bellflower. All these taxa require nutrient-rich and wet soils.[247] Peat moss, however, could also have been present in wet parts of heath areas.

The abundance of microscopic charcoal, the fungus type *Gelasinospora* cf. *reticulispora* (HdV-1), and charred epiderm of sedges and/or grasses indicate that during the Middle Iron Age there was high fire activity in the area. *Gelasinospora* cf. *reticulispora* commonly reaches high frequencies in layers containing charcoal.[248] These fires could have been induced naturally due to lightning and drought. However, when found in combination, this spore type, the high levels of microscopic and macroscopic charcoal and the charred grass or sedge epiderm are more likely related to human-induced fire activity, for example by the use of hearths, stoves to prepare food, but probably also deliberate burning of vegetation as a means to increase the fertility of the land.

7.2.5 Conclusions

The local and regional vegetation in the area around Dalfsen changed markedly from the Late Neolithic/Early Bronze Age to the Iron Age. In the Late Neolithic/Early Bronze Age, the coversand ridge as well as the lower and moist-to-wet valleys were densely forested. On the coversand ridge, an open oak-lime forest was present, while in the stream valleys, alder swamps dominated. Cereal cultivation occurred on a small scale, in open places in the forest, on the higher soils. The residents in the area started to affect the vegetation in the landscape from the Bronze Age onwards. Forest cover decreased markedly in the Late Bronze Age/Early Iron Age. During this period, the vegetation on the coversand ridge changed from a dense forest with shady parts

243 Bos and Zuidhoff 2012; Van Beek *et al.* 2015a, 2015b, 2019; Van Geel *et al.* 1981.

244 Van Zeist 1959.

245 Weeda *et al.* 1985, 118.

246 Van Geel *et al.* 1996, 1998.

247 Weeda 1987, 215.

248 Van Geel *et al.* 1978.

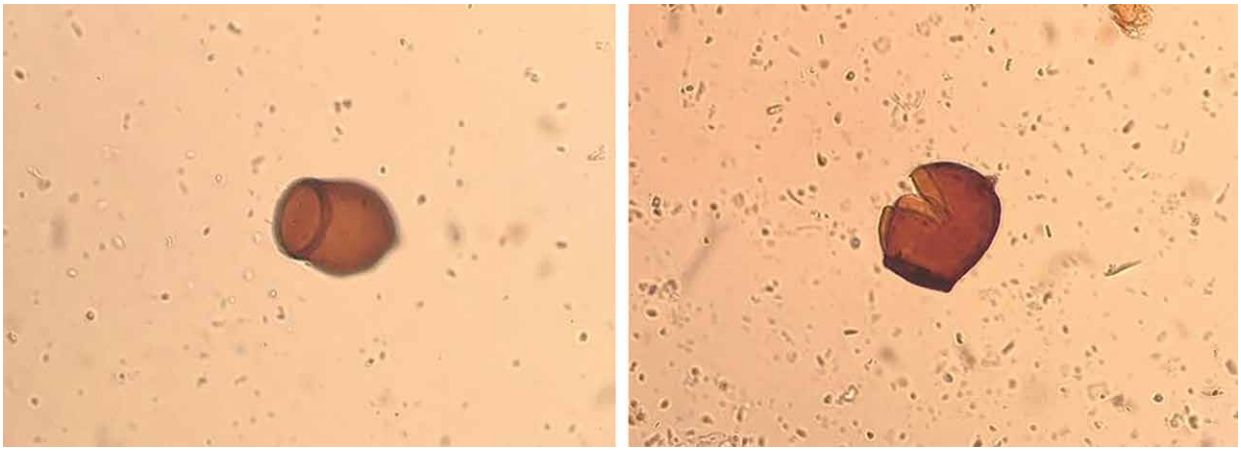


Figure 7.6 Photo of an example of the fungal 'spore' (400 times magnified) that was found in many of the funnel beakers.

into an open landscape covered by heather, grassland, some arable fields and hazel shrubs. Increased crop cultivation presumably led to depletion of the soils; therefore, people had to shift from one plot to another from time to time. On deserted fields, heather could expand. The combination of deforestation and crop cultivation led to sand drift in the area, due to the removal of the protecting vegetation cover. During the Iron Age, the residents of the area also continued to strongly influence the vegetation in the area. Crop cultivation expanded, and human-induced fires may have been used as a means to increase the fertility of the nutrient-poor soil. In the stream valleys, groundwater levels increased as result of a cooler and wetter climate and increased surface erosion due to deforestation. As a result, the stream valleys became wetter and alder swamps expanded. Wet grasslands also developed in close proximity of the alder swamps.

7.2.6 Results of the pollen analysis of the TRB vessel contents

The pollen from the funnel beakers were very poor quality and very low density. Neither the preservation nor the concentration of the pollen and spores were sufficient for statistical analysis. Due to the low pollen concentration, it was often difficult to relatively date the samples accurately based on their pollen content. Eight pollen samples from the vessels showed a more or less similar species content that suggested an age from the Atlantic onwards (see Table 7.3). Four other samples indicated distinctly younger ages because they contained quite some rye (*Secale cereale*), indicating that these date to the medieval period or even later. It is therefore suggested that the material in many pots was probably not contemporaneous with the age of the pots itself and that many pots contained material from younger periods. Furthermore, some samples contained so few pollen that we felt it was better to directly analyse them to get an overview of the number of pollen types. Other samples, with a higher pollen concentration, were only scanned, to establish the taxa and species present. The only sample from the vessels that contained enough pollen to make statistical analysis possible was sample DALN-15-2047. However, during the analysis (Table 7.3), many pollen grains of rye and typical agricultural herbs were found, which date the pollen sample in the medieval period and which indicated that here, too, the pollen sample did not reflect the TRB period. Therefore, pollen analysis was discontinued.

In several pots, a very typical c. 45 µm long fungal 'spore' was found (Fig. 7.6). It resembles the ascospores of the coprophilous fungus *Apiosordaria verruculosa*[249] (formerly known as Tripterospora-type[250]), as it has the same truncated base, but it is much larger in size. Furthermore, it lacks the somewhat eccentrically placed germ pore at the apex. Instead, it has a pointed apex. We checked the 'spore' with Bas van Geel University of Amsterdam), but he could not identify it; therefore, the type still remains unknown.

In addition, one soil sample (DALN-15-1210) was collected from around the funnel beakers. The pollen concentration and preservation in this sample was better than in the pots themselves. However, this sample contained pollen of *Fagopyrum esculentum* (buckwheat) and *Zea mays* (maize). The presence of buckwheat dates this sample in the medieval period or later (from the 12th-13th century onwards based on the finds listed in the Dutch Relational Archaeobotanical Database for Advanced Research [RADAR][251]), while maize is from a

249 Van Haaster and Brinkkemper 1995.
250 Cugny *et al.* 2010.
251 Van Geel *et al.* 2003.

Sample number	Context	Research conducted	Sample origin	State of preservation	Pollen concentration	Charcoal concentration	Content	Antropogenic indicators	NPP's	Age
DALN-15-848	grave 23	scanning	pelvis area	reasonable	reasonable	xxx	Alnus 20, Polypodium 2, Spergula 1, Dryopteris-type 4, Secale cereale 2, Quercus 1, Poaceae 11, Plantago lanceolata 1, Corylus 12, Cerealia 2, Cyperaceae 2, indet. 11	Cerealia, Secale cereale, Plantago lanceolata		Subatlantic (medieval period)
DALN-15-1234	grave 13	analysis	pelvis area	insufficient	insufficient	x	Alnus 2, Corylus 2, Rumex acetosella 1, Poaceae 4		'spore'	From Atlantic (Neolithic) onwards
DALN-15-1796	grave 110	analysis	pelvis area	insufficient	reasonable	x	Poaceae 27, Salix 4, Calluna 1, Corylus 3, Alnus 12, Pinus 3, Aster type 1, Quercus 1, Caryophyllaceae 1, Galium 1, Betula 1, Dryopteris-type 18, Cerealia 3, Asteraceae liguliflorae 3, Potentilla 1	Cerealia		From Atlantic (Neolithic) onwards
DALN-15-2306	AB55	analysis	content pot	insufficient	insufficient	xxx	Cerealia 7, Corylus 4, Poaceae 8, Alnus 12, Pinus 2, Artemisia 1, Dryopteris-type 1, Betula 2, Asteraceae liguliflorae 2, Quercus 1, Apiaceae 1	Cerealia	Tilletia sphagnii	From Atlantic (Neolithic) onwards
DALN-15-2046	AB23	scanning	content pot	insufficient	insufficient	xx	Alnus, Corylus, Betula, Asteraceae liguliflorae, Dryopteris-type		'spore'	From Atlantic (Neolithic) onwards
DALN-15-2047	AB99	scanning	content pot	reasonable	reasonable	xxx	Corylus 5, Quercus 1, Betula, Calluna 8, Myrica 3, Alnus 10, Rumex acetosella 18, Plantago lanceolata 1, Ranunculus acris -type 1, Sphagnum, Dryopteris-type 4, Cerealia 16, Hordeum/Triticum-type 13, Secale cereale 85, Papaver rhoeas-type 1, Persicaria maculosa-type 1, Asteraceae tubuliflorae 1, Brassicaceae, Matricaria-type, Polygonum aviculare-type, Scleranthus 4, Spergula arvensis 2, Galium-type, Poaceae 49, Cyperaceae 3, Sparganium 1, Sphagnum, HdV-128	Many Cerealia, Secale cereale	'spore'	Subatlantic (medieval period)
DALN-15-2055	AB20	analysis	content pot	reasonable	insufficient	xxx	Poaceae 4, Cyperaceae 1, Sphagnum 4, Dryopteris-type 5, Corylus 3, Alnus 3, Pinus 2, Campanula 1, Polypodium 2			From Atlantic (Neolithic) onwards
DALN-15-2058	B13	scanning	content pot	reasonable	insufficient	xxxx	Corylus, Alnus x, Cerealia, Artemisia, Calluna, Dryopteris-type, Poaceae	Cerealia, Artemisia	'spore'	From Atlantic (Neolithic) onwards
DALN-15-2068	AB121	scanning	content pot	reasonable	insufficient	xx	Quercus, Corylus, Alnus xxx, Calluna, Cerealia x, Artemisia, Asteraceae liguliflorae, Plantago major-type, Polygonum aviculare, Poaceae, Dryopteris-type	Cerealia, Plantago major, Polygonum aviculare		From Atlantic (Neolithic) onwards
DALN-15-2071	AB68	analysis	content pot	insufficient	insufficient	xxx	Alnus 12, Poaceae 9, Dryopteris-type 2, Zygnema 1, Galium 1, Cerealia 1, Secale cereale 5, Sphagnum 3, Quercus 1, Calluna 3, Corylus 1, Debarya 1	Cerealia, Secale cereale	'spore'	Subatlantic (medieval period)
DALN-15-2083	AB98	scanning	content pot	insufficient	insufficient	x	Quercus, Corylus corr, Alnus corr., Tilia corr, Poaceae corr., Cerastium fontanum-type corr. Dryopteris-type corr., Zygnema-type		'spore'	From Atlantic (Neolithic) onwards
DALN-15-2303	AB78	analysis	content pot	insufficient	insufficient	xxxx	Alnus 1, Calluna 2, Poaceae 3, Cerealia 4, Betula 3, Secale cereale, Scabiosa columbaria 1, Quercus 2, Corylus 2, Dryopteris-type 1	Cerealia, Secale cereale		Subatlantic (medieval period)
DALN-15-1210	grave 7	scanning	dark fill of burial pit	reasonable	reasonable	xxxx	Quercus, Corylus, Acer, Alnus, Cerealia x, Fagopyrum, Zea mays, Poaceae xx, Cyperaceae x, Calluna, sphagnum, Polygonum aviculare, Rumex acetosella xx, Plantago lanceolata, Aster type, Asteraceae liguliflorae, Artemisia, Ranunculus acris type, Lychnis flos-cuculi, Dryopteris-type	Plantago lanceolata Cerealia, Fagopyrum Zea mays, Spergula-type, Rumex acetosella	Sordaria-type	Subatlantic (medieval period from 12th-13th century)
DALN-15-AB-20	AB20	scanning	surface residue	insufficient	insufficient		no pollen			Indet

Table 7.3 Overview of the pollen samples from the funnel beaker pot contents. Charcoal: x = present, xx = often present, xxx = abundant, xxxx = very abundant.

Find number	grave number	Brindley horizon	Vessel number	Vessel shape	Sample number	Location of sample origin	Residue description
1646	106	7	AB01	bowl/cup	DA01	rim, interior	black, <1
					DA02	rim/wall, exterior	dark brown, 1
1295	67	5L/6	AB11	bowl	DA03	rim, interior	dark brown, <1
					DA04	wall, exterior	black, <1
1443	74	4L	AB20	cup	DA05	rim, interior	black, <1
					DA06	rim/wall, exterior	brown, 2
1698	111	7	AB28	cup	DA07	wall, interior	dark brown, <1
					DA08	rim/wall, exterior	dark brown, 1
642	10	5L/6	AB62	biconical	DA09	rim, interior	black, <1
					DA10	rim/wall, exterior	black, 1
510	30	6	AB104	amphora	DA11	wall, interior	black, <1
					DA12	rim, exterior	dark brown, 1

Table 7.4 Overview of samples taken from TRB vessels from Dalfsen. The description of the residue indicates the colour, followed by the thickness in mm.

much more recent time still. The latter was probably blown in from a maize field nearby. A sample from the sediment that was stuck on the outside of a pot (DALN-15-AB-20) was also analysed. However, this did not contain any pollen.

7.3 Six TRB vessels and their function: Chemical analysis of organic surface residues

This section was written by Tania F.M. Oudemans (Kenaz Consult and Laboratories)

7.3.1 Introduction

This contribution presents the results of the chemical analysis of surface residues on six TRB vessels excavated from the burial ground of Dalfsen. Since one of the main objectives of the research presented in this monograph was to gain a better understanding of the individual burial rituals during the TRB period in the West Group, it was thought that organic residue analysis might offer new insights into the use and/or function of specific vessels used in burial rituals.

The ultimate goals of this chemical study were to (i) detect any remaining organic compounds; (ii) identify their natural origin; and (iii) explain their presence in terms of human behaviour in the past. What could the residues tell us about the last use-phase of the vessel? Could this information help us understand the burial rituals that had taken place in individual graves?

7.3.2 Choice of vessels

A total of 12 vessels were presented as potential objects for organic residue analysis by specialists from ADC ArcheoProjecten. These covered a broad range of grave type, orientation and chronological period.[252] Different types of vessels were presented, varying from small cups and bowls, to biconical vessels, to an undecorated amphora. This choice of vessels has the advantage that it offers the possibility of gaining a broad first impression of the nature of the available residues, but it has the disadvantage that it limits the scope of possible interpretation because it is not possible to compare the residue of two or more similar vessels.

After visual inspection, six vessels were selected from different graves (see Table 7.4). Residues were taken from both the inside and the outside of the vessel, in order to identify both the original vessel contents and the organic materials (*e.g.* fuels, oils, foods) that may have come in contact with the outside of the vessel during the burial ritual, for a total of 12 samples. We chose to use surface residues rather than residues that had absorbed into the ceramic itself because the nature of the vessels used in the TRB burial rituals was not clear. Had these vessels seen prior use or was their function as grave good their primary function? In other words, had they been used for cooking or storage prior to the ritual or were they pristine? It was crucial to study only the remains of the last use-phase and not residue that could have accumulated inside the ceramic over multiple use-phases.

7.3.3 Methods

First, a small amount of sample material (*c.* 10 µg) was applied to the diamond window and flattened with the screw arm of the ATR unit in order to maximise the contact between sample and diamond surface. The FTIR analysis was performed with a Fourier Transform

252 This pre-selection was based on the presence of surface residues.

Infrared Spectrometer (Thermo Fischer IS05) equipped with an iD7 ATR unit. The FTIR analysis was performed in ATR modus (whereby the light reaches *c*. 2-3 µm into the sample). The spectral resolution is 4 cm −1, and the spectral range is 4000-550 cm −1. A total of 64 scans was collected per measurement and stored using OMNIS software.

Fourier-transform infrared spectroscopy (FTIR) is a rapid analytical technique that is extremely useful for a first estimation of the general chemical composition of a material. The ATR unit enables the analysis of solid samples without any further chemical or mechanical preparation and is optimal for the analysis of small, unknown, mixed materials, such as organic residues from archaeological contexts. FTIR makes it possible to determine the absence or presence of particular functional groups and structural elements in the solid material (including the presence of some inorganic compounds or minerals). This gives information about the nature of a material, its homogeneity and its state of preservation.

Based on the FTIR results, samples can subsequently be selected for further detailed chemical analysis. Direct temperature-resolved mass spectrometry (DTMS) is a powerful tool in the analysis of very small samples of complex solid organic materials. DTMS makes it possible to characterise the complete composition of the material, including both volatile, extractable compounds and solid, non-extractable compounds. The chemical DTMS 'fingerprint' gives information about a broad range of compounds, such as lipids, waxes, terpenoids, polycyclic aromatic hydrocarbons (PAHs), saccharides, small peptides and protein fragments, and a broad range of thermally stable, more or less condensed polymeric components (commonly called 'charred', or 'carbonised'). Within archaeological research, DTMS is commonly applied in the study of complex organic solids, such as food residues[253] paints, glues, tars or lamp oils.

7.3.4 ATR-FTIR results and discussion

All 12 samples were measured multiple times in order to estimate the extent of the variation within the material. The respective measurements of one sample showed little or no variation in FTIR spectra, indicating good homogeneity. The results of the FTIR analyses are illustrated by selected FTIR spectra (Figs 7.7 and 7.8) and summarised in Table 7.5.

The most striking result of the FTIR analysis is the lack of significant organic peaks in most samples, indicating that there is a limited amount of organic material present in the residues. In addition, the peaks that do occur are mostly of little or no indicative value about the original material, indicating an extensive degradation of organic compounds in the residues.

This is clearly illustrated in the spectrum of the best-preserved residue, DA05 (Fig. 7.7). No peaks indicative of the presence of proteins or polysaccharides of any kind could be detected. Nor could charred remains of these compounds be seen. No intact lipids or waxes were present. Only a few markers for degraded lipids were visible (see also Table 7.5), in the form of salts of lipids (peaks 1610-1590 cm-1 and 1400-1390 cm-1 and some minor peaks, such as 1695 and 1161 cm-1, for various vibrations of C = O) and some relatively low resonances for aliphatic compounds (2926 and 2853 cm-1 and 2962 and 2872 cm-1). All other FTIR transmission peaks were either unspecific organic signals (such as the broad OH and NH stretching band 3600-3200 cm-1) or evidence of contaminating compounds, such as carbonates, silicates and clay components.

The least well-preserved residues (DA03 and DA07) show almost no indication of anything but clay and/or silicates from the soil (*e.g.* sand), as can be seen in Figure 7.8 and Table 7.5.

This lack of organic compounds adhering to the inside and the outside of the six TRB vessels can be due to a number of processes that may have taken place either prior to or after deposition. If the vessels were been exposed to heating to high temperatures (over 350°C) for longer periods of time (for several hours) during the burial ritual, this may have caused the loss of all recognisable organic compounds. However, even such extreme thermal degradation processes would have created some sort of carbonised deposit on the ceramic. The lack of FTIR markers for any carbonised compounds indicates that we are most likely dealing with a post-depositional degradation effect. If organic material was originally present in or on these six TRB vessels, it was obviously not highly carbonised and therefore more easily and completely degraded by bacteria and fungi present in the soil. This conclusion seems to agree with the lack of other organic materials from Dalfsen. The environmental circumstances must have been extremely unfavourable for the overall preservation of organic materials. Based on these results, it was decided to not continue further analysis using DTMS or other analytical methods.

7.3.5 Archaeological interpretation and conclusions

The FTIR analysis has resulted in the disappointing conclusion that little or no organic material was present in the residues on the six vessels from Dalfsen-Dalfsen. Only a few degraded fats could be detected, and that only in the best-preserved residues. If we assume that there

253 Kubiak-Martens *et al.* 2015; Oudemans and Kubiak-Martens 2014; Oudemans *et al.* 2007a, 2007b; Raemaekers *et al.* 2013.

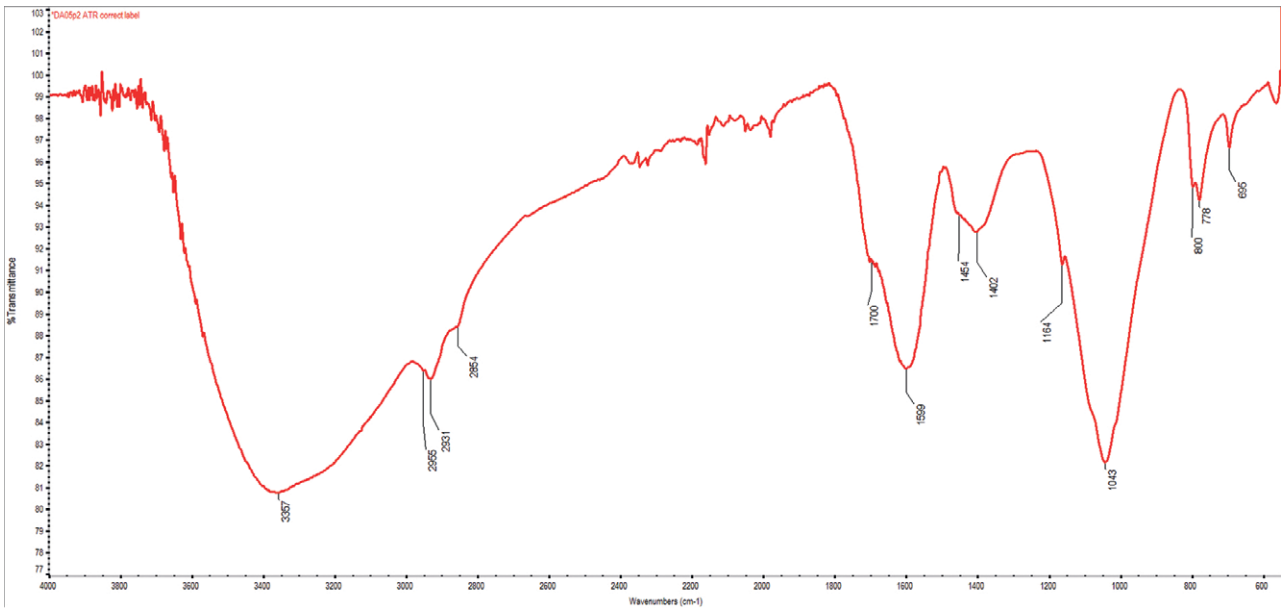


Figure 7.7 Dalfsen: FTIR spectrum of sample DA05 (particle 2).

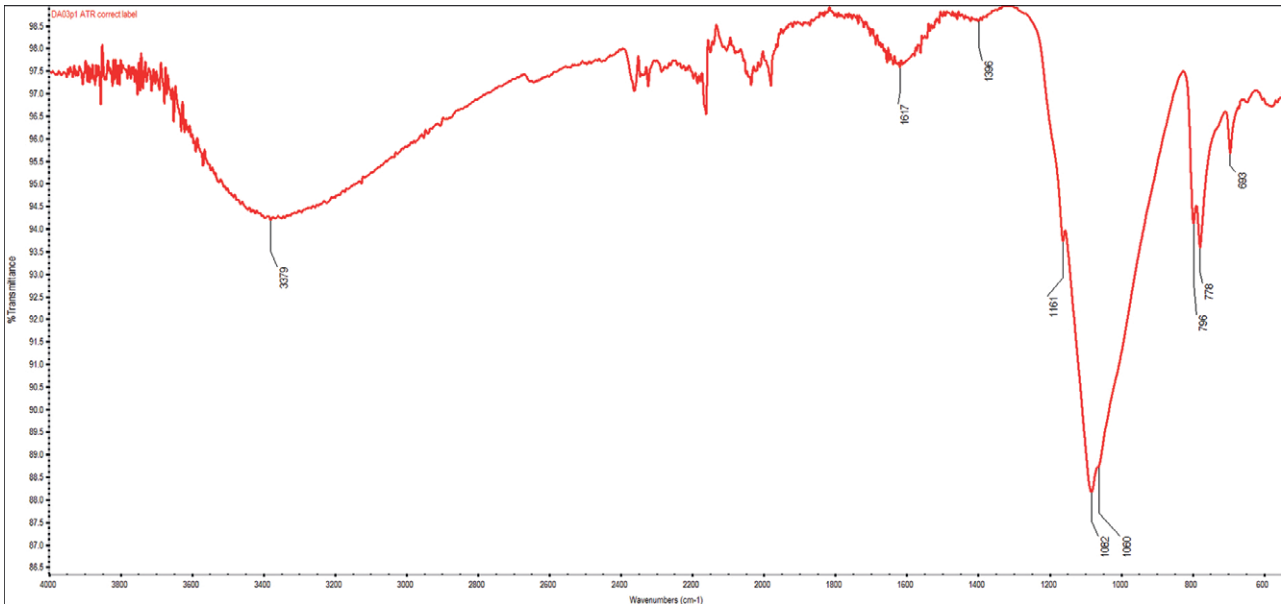


Figure 7.8 Dalfsen: FTIR spectrum of sample DA03 (particle 1).

was some kind of organic material in the vessels during the burial ritual, these findings suggest that the vessels and their organic contents were not part of a cremation fire, but were, instead, deposited into the ground in a relatively fresh or mildly heated condition. Naturally, the other explanation would be that the vessels were set in the soil without any organic contents. Based on the chemical analysis, it is not possible to prove or disprove either of these two possibilities.

7.4 Conclusions

Due to the poor loam content of the sandy soils, several of the palaeoecological analyses ran into serious difficulties. The vertical transport of diverse elements (grains, charcoal and pollen) must have been highly dynamic. This led to poor preservation of macrobotanical remains, pollen, and organic residues, and it caused us to mistrust some of the outcomes of the analyses (especially relating to the contents of the vessels).

Transmission peaks	Regions (cm-1)	DA01 (int.)	DA02 (ext.)	DA03 (int.)	DA04 (ext.)	DA05 (int.)	DA06 (ext.)	DA07 (int.)	DA08 (ext.)	DA09 (int.)	DA10 (ext.)	DA11 (int.)	DA12 (ext.)
OH (s)	3620-3600 (3616)	-	-	±	-	-	-	-	-	-	-	-	-
OH (s), N-H (s)	3600-3200 (3400-3350)	+++	+++	+	+++	+++	++	+	+++	+++	+++	+++	+++
C = CH2 (s)	3060	-	-	-	-	-	-	-	-	-	-	-	-
C-H3 (s) aliphatic	2962, 2872	-	-	-	-	±	-	-	-	-	-	-	
C-H2 (s) aliphatic	2926, 2853	±	±	-	+	+	±	±	-	±	±	±	±
RHC = O aldehydes	2650	-	-	+	±	±	±	±	-	-	-	-	-
C = O (s)	1700-1695	-	±	-	-	±	-	-	-	-	-	-	-
[O = C-O]- (s) in salts of fats	1610-1590 -1600	++	+	+	++	++	++	+	++	++	++	++	++
CO32-	1450-1400	±	±	-	-	±	-	-	-	-	-	-	-
[O = C-O]- (s) in salts of fats	1400-1390	+	+	+	+	+	+	±	+	+	+	+	+
C-O-H (s)	1280-1230 (1245-1275)	-	-	-	-	-	-	-	-	-	-	-	-
C = O	1167-1161	±	±	±	±	+	±	±	+	+	±	±	-
Si-O(-Si) (s) Si-O-Si (s) Si-O (s)	1100-1000 (1074-1020) -1080	++	+	+++	++	++	++	+++	++	++	+	+	++
Si-OH (s)	950 and 915	±	-	-	-	-	-	-	-	-	-	-	-
Si-C (s) in clay	796 and 779	±	-	+++	++	++	++	+++	±	+	±	±	±
OH in clay	696	±	-	+	+	+	+	+	-	+	±	±	±

Table 7.5 Dalfsen: FITR results of interior (int.) and exterior(ext) samples. Depicted are the relative intensities of the FTIR transmission peaks (s = stretching; b = bending; v = vibration; def. v = deformation vibration; skel. v = skeletal vibration; r = rock) in four categories (±: little; +: average; ++: strong; +++: very strong).

The most interesting results came from the pollen analyses of agricultural layers found in a depression just west of the TRB burial ground. Although the dating (which also proved to be difficult) shows that these layers are not contemporary to the period that the site was used as a burial ground, the results give valuable insights into the environment in the centuries after the burial ground was in use. Although we have evidence for a couple of burials during the period of the Corded Ware and Bell Beaker (the latter maybe being contemporary with the environment described through the pollen analysis), the effect of these burials on the physical landscape was minimal. This seems contrary to some of the insights derived from studies in Late Neolithic barrow landscapes in the Netherlands, which were deliberately kept open.[254] Looking at the sand ridge of Dalfsen, it becomes clear that human presence has led to open spaces and a less dense forestation than elsewhere, but this change to the landscape seems no more than the remnants of shifting arable fields and probably some farmsteads (of which hardly any traces were found during the excavation). Although the data from the pollen record are sparse and the dating not as solid as we had hoped, they sketch an environment in which the human impact was relatively modest.

254 Doornbosch 2013, 239.

Chapter 8

The Dalfsen burial ground as a means of reconstructing TRB local social organisation

Daan Raemaekers and Henk van der Velde

8.1 Introduction

In this chapter, we investigate the data retrieved from the burials and the grave goods with the aim to reconstruct the TRB community that made use of the burial ground at Dalfsen. First, we will focus on the possibilities of reconstructing the social organisation of the group buried here (sections 8.2 and 8.3). To this end, we will discuss various anthropological key concepts, as well as the theoretical uncertainties in burial archaeology. Second, we will discuss the earthen monument (section 8.4) and compare the Dalfsen burial ritual to that of the megalithic monuments in the neighbouring area (section 8.5). Third, because of the position of Dalfsen at the western outer limit of the TRB West Group, we will compare the burial evidence from Dalfsen with the burial evidence from neighbouring groups outside the TRB world (section 8.6).

In Chapter 3, we discussed the burials in detail and classified them by looking at different sorts of data concerning the form of the grave pit, the surface area of the pit, its orientation, the number of finds and the spatial patterning of the graves. We concluded that while there are – in general terms – oval and rectangular grave pits, these are part of a continuous distribution. We cannot distinguish distinct types. The size of the grave pits varies between 1.50 and 1.90 m^2. The small group with larger surface areas stands out. The grave pit size and shape are not related, while the size of the grave pits did not alter during the use history of the burial ground. The orientation of the grave pits is quite varied, although an east-west orientation – following the local topography – was preferred. We conclude that the orientation was not related to the grave pit shape. Grave goods are rather sparse. Only half of the graves yielded any at all, most graves with grave goods have fewer than five. The graves with the largest numbers of grave goods all are relatively large. The spatial analysis indicated the presence of double graves and three groups of graves arranged in a circle – interpreted as multi-person burial mounds of which the mound itself was not preserved. In two of these burial mounds, the central grave dates to horizon 4 Late, while the surrounding graves date to horizon 5. The anticipated central grave of the third circular group was not found. If it was originally present, the date of the surrounding graves in horizon 4 Late would imply a start of this third burial mountain in horizon 4 Late as well. The final spatial pattern is the group of graves dug down into the earthen monument.

The analysis of the grave goods (Chapters 5 and 6) has made clear that many grave goods had a prior use history and were not produced for the burial ritual. A large number of pots show signs of everyday use, such as repair holes and/or are incomplete. In some graves, we found flint strike-a-lights and pieces of marcasite, a set of items for everyday

use in creating fire, or flint arrowheads, the everyday tools used for hunting. These observations suggest that personal items were kept with the deceased. The chemical analyses of the pottery made clear that the majority of the pots was made locally (section 5.5). Some pots contain clay from a different clay source. This may have been another clay source found nearby. Or it may have been a source from far away, in which case perhaps these vessels should be interpreted as evidence of long-distance contact.

8.2 From burial ground to living community: Burial archaeology

All human societies can be defined on the basis of a number of key concepts from cultural anthropology. With this claim, we do not mean to suggest that societies are in essence similar, but that all societies can be characterised by the fact that they comprise individuals with social relations with marriage partners and with biological parents. From these three unavoidable facts, three relevant fields of enquiry follow.

The first relevant field of enquiry is that, because societies consist of individuals, we may study in which ways individuals relate to one another. Four aspect are of relevance here: gender roles, special roles, social status, and life stage. We can analyse to what extent gender roles were of importance in a specific society. Whereas in present-day Western societies the gendered division of roles is often seen as inappropriate, in many other past and present societies gender roles are well defined. We can also analyse a person's role. In many societies there are persons who play a special role in a community. The literature tends to emphasise shamans, but also a midwife or a craftsperson may hold a position that places the individual somewhat apart from their local community. And we can analyse the degree to which persons are seen as having a similar or different social status in a community, *i.e.* the degree of hierarchy in a society. Finally, we can analyse the role of children in society. One might suppose that children (from a certain age?) were full yet not full-grown members of a community or that children (up to a certain age?) were a different kind of member of a community.

The second relevant field of enquiry for any human society is that people have marriage partners.[255] This observation holds two aspects of relevance. The first is the type of marriage. This may be a two-person marriage (in all three possible combinations of males and females) or a multi-person marriage (in which one female marries a group of males, termed polyandry, or one male marries a group of females, termed polygyny. The second aspect of relevance is the significance of the specific role as spouse as part of the *social personae* of an individual.

The third relevant fields of enquiry is that of the translation of the social relations with parents, grandparents, siblings and other family member into a kinship system. In this system, the social relations between family members may be expressed in terms of matrilinear or patrilinear descent (or absence thereof) and matrilocal or patrilocal residence (or absence thereof). One specific kinship system is that of moieties: a marriage system in which a community is divided into two halves and in which a marriage partnership is only allowed with a partner from the other kin group.

In theory, burial archaeology might address all these issues. In practice, both theoretical and methodological problems make this a rather complicated effort. First, it is clear that the community of the dead is not a reflection of the community of the living.[256] The relatives give shape to the burial ritual within a strict framework of rituals set by the larger community. Within such a framework, there is little freedom to give individualised shape to the burial ritual of a deceased, resulting in a distortion of the reflection of the community of the living in the burial ritual. This distortion cannot be solved on the basis of the analysis of one burial ground: it would require a comparison of these results to other aspects of society that shed light on similar aspects of society. The second problem is that of limited preservation. Not only do we lack skeletons, which means that we have no evidence of the sex and age of the deceased, but we also lack any organic grave goods and have little evidence of the above-ground appearance of the graves. That means that we can only base our analysis on the preserved elements of the burial ritual, hoping that they are representative for the burial ritual as a whole.

We propose to study the aspects mentioned above using the following strategies. Because skeletons are missing, studying gender is rather difficult. One might follow the strategy used by Van de Velde for his classic study on LBK burials from the site of Elsloo (province of Limburg). He found that certain grave goods were never found together. He interpreted these two different subsets of grave goods as typical male and female grave goods, allowing him to interpret many graves in terms of gender (as distinct from sex).[257] The difficulty with this assumption is that the same pattern might also result from other mutually exclusive processes. One such process that readily comes to mind is a descent system with moieties. We would need to insert data from other sites into our analysis, preferably data on burials with both skeletons and grave goods preserved, to determine which interpretation we find more valid.

255 Of course, in some present-day societies, marriage no longer holds the status described here, and many additional, less formal forms of partner relations are socially accepted.

256 *E.g.* Parker Pearson 2004.

257 Van de Velde 1979.

The analysis of possible gender roles requires a detailed analysis of the correlation of all available aspects of the burial ritual. This will allow us to determine what normative burial behaviour looked like and make clear which burials deviate from this norm. The burials will be analysed individually to see if we can define the special role a deceased may have played in the community of the living. The same analysis will also indicate whether there are graves that can be considered rich and containing the remains of a person who, while alive, may have had a high status in the community.

Special attention will also be given to the burial of children. These will be identified on the basis of the size of the grave pit and the size of the body silhouette, if present. When these aspects are part of the definition, it leaves only the characteristics of the grave pit and grave goods as parameters to study the status of children in this community.

The remaining aspects of the social organisation will not be studied on the level of the individual burial, but at the level of the burial ground, by means of the spatial patterns observed within the burial ground. The identification of gender roles will be difficult, and the study of the marriage patterns will be equally difficult. If we cannot determine the sex and gender of the deceased, one might suppose that if partnership was an important aspect of one's *social personae* this might be expressed in the burial ritual by the close proximity of the burial of marriage partners. Further, one might suppose that this aspect was expressed in the presence of two burials in one grave pit, either simultaneously, side by side, or separated in time, following re-opening of the grave, as attested by the presence of grave goods at a higher level in the grave pit. Or one might suppose that it was expressed in the form of two (or more) grave pits grouped together and having a similar orientation.

The final aspect is that of the kinship system. This might be expressed in the spatial patterning of characteristics of the burial ritual. Here Van de Velde's study is again an inspiration.[258] He found that in graves that he interpreted as male on the basis of the grave goods, two decorative schemes were used on pottery (curvilinear and rectilinear decoration). The female graves only yielded pottery with one of these schemes. He concluded that men married into their spouse's family, leaving them with connections in both their wife's and their mother's family. He interpreted this pattern as evidence of a matrilocal kinship system.[259] A moiety system might be detected if the burial ground is divided into two spatially distinct halves (if descent was expressed in the decisions made on the location of a new burial) or, in contrast, if the burial ground contains spatially defined subgroups with rather similar numbers of individuals (if social ties at the time of death were expressed in the decisions made on the location of a new burial).

258 Van de Velde 1979.

259 Van de Velde 1979, 133.

8.3 The Dalfsen burial ground as social group

8.3.1 The dating of the burial ground

The dating of the Dalfsen burial ground relies on the observations Anna Brindley made about the chronology of the pottery (Chapter 4) and on the dating of the graves (Chapter 3). Due to the poor preservation of organic material, we were not able to produce any ^{14}C results. Only in a minority of the graves was it possible to create a relative chronology, by making use of one feature cutting another.

The Dutch chronology of the TRB period is based on only a small number of ^{14}C dates.[260] The available ceramic typochronologies, by Van Giffen, Bakker and Brindley, are based upon the huge assemblages from megalithic monuments, most of which were was found outside their primary context.[261] From a relative point of view, these typochronologies (especially Brindley's sequencing into horizons 1 to 7) is beyond dispute. From an absolute point of view, however, we still have to be cautious when using these typochronologies for dating a site, for several reasons. First, there are no direct dates on the TRB ceramics. The dates derived from organic material that was found in spatial association with TRB ceramics. Second, the available ^{14}C dates have a plus/minus of 40–50 uncalibrated years. With calibration, their margin of error is substantial. Third, the TRB period has a plateau in the calibration curve corresponding to the Drouwen phase (horizons 1–4). When these restrictions are taken into account, it becomes clear that the absolute chronology is able to distinguish between the Drouwen phase (horizons 1–4) and the Havelte phase (horizons 5–7) but that it cannot provide arguments for the duration of the specific horizons.

In Chapter 4, Brindley defines the timespan of the burial ground of Dalfsen from 2975 BC (late horizon 4) to 2750 BC (the end of horizon 7). We are less certain. We consider the founding of the burial site to have happened somewhere in the period 3050-2950 cal. BC. The end of the TRB ceramic tradition may indeed have occurred around 2750 BC. This gives the burial ground a lifespan of c. 200-300 years, or 8-12 generations of 25 years. We consider the number of grave pits the minimal number of interred, because there are graves with evidence for re-opening (section 3.4.8), there are graves with more than one body silhouette, there is one cremation burial, and there are very shallow grave pits suggesting that graves that were dug in less deep are now missing. Perhaps the Dalfsen burial ground originally held the remains of 200 individuals. On the basis of the proposed time

260 Lanting and van der Plicht 1999/2000.

261 Bakker 1979; Brindley 1986a.

depth and the duration of a generation and 200 interred individuals, we conclude that c. 17-25 individuals were interred in each generation, the equivalent of perhaps three to six extended families.

8.3.2 Who was buried at Dalfsen?

Central to this research is the assumption that the burial ground of Dalfsen holds (almost) everybody of the local group and we are thus able to study the social organisation of the local group. With a local group we mean a couple of families. An alternative explanation may be that the burial ground was of special regional importance and that people came to Dalfsen from a wide area to bury some of their deceased, based on selection criteria unknown to us. This alternative is proposed for later periods in the Neolithic, where it is assumed that only a (small) number of the population were buried in a manner which archaeologists may find and recognise.[262] This alternative hypothesis is dismissed on the basis of the results of the chemical analyses of the ceramics (Chapter 5). Apart from a couple of outliers, the pXRF analysis shows a remarkably uniform group, which most probably means that almost all pots were made within a small region. We therefore conclude that the burial ground was used by a local group that buried their deceased relatives here. This makes this burial ground a suitable object of study for the social organisation of a local group during the (later) TRB period.

8.4 The anthropology of the Dalfsen burial ground

All graves in the burial ground are of the same type, namely, grave pits (*Ergräber*) as described by Kossian (2005). This description does not take into the account the variation that can be observed in many aspects of the burial architecture and grave goods (Chapter 3). It is this variation that we will look into here, with the intention to address the anthropology of the burial ground, in line with the concepts described above (section 8.2).

8.4.1 Individuals

Any society is built up of individuals as raw material. The articulation of the roles these individuals play typifies a society. The first aspect considered here is that of gender. Is there evidence in the Dalfsen burial ground that gender played a role in the burial ritual? The lack of skeletal remains constrains this analysis to one based on grave characteristics and burial goods. In a rich burial ground, it might be concluded that certain goods are never found together and might be interpreted as gender-specific grave goods.[263] This is not the case at Dalfsen: if one excludes the singular finds from the analysis, all grave goods are found in combination with all other categories of grave goods.

As an alternative starting point, we return to the conclusion that strike-a-lights were a male item in both preceding and succeeding groups (see section 6.2). If we then add the co-occurrence of these strike-a-lights with transverse arrowheads, we end up with 11 burials. Can we interpret these as gender-specific burials? Of these burials, five also have a ceramic grave good. Four of these are a bowl (80%), while bowls only comprise 33% of the ceramic grave goods overall. These figures suggest that perhaps bowls may be considered a gendered object as well. A similar correlation is found with the shape of the grave pit. Eight of the 11 burials (73%) have a rectangular plan or a rectangular plan with rounded corners, whereas this figure for the entire burial ground is 50%. Is this more evidence of gendered burial ritual? If so, one would expect the presence of bowls and rectangular grave pits to also be correlated. This is not the case: of the burials with bowls, only 57% have a rectangular or rectangular with rounded corners plan, slightly more than the expected 50%. We conclude that there is no evidence for the expression of gender roles in the Dalfsen burial.

We also address special roles that some individuals may have played in society – and that were expressed in their interment. For this analysis, we focus on burials with singular aspects. We will discuss three if these burials. Grave 99 (dated to horizon 4 Late) stands out due to its large number of amber beads, more specifically a bracelet/anklet and necklace. This is a relatively large grave (the fifth-largest). The other grave goods (one transverse arrowhead and one tureen-amphora) do not indicate a special status of the deceased. The ceramic analysis suggests that this vessel may have been the oldest of the burial ground (see section 4.4) which would make this grave the founder's grave. The individual interred here would have had a special status that justified the start of the Dalfsen burial ground. Grave 66 (dated to horizon 4 Late) is singular because it was covered by large pieces of a slab from iron ore. The burial also stands out due to its size: it is the third-largest burial pit. One might expect the special nature of this grave to be mirrored in its grave goods, but this is not the case. Grave 66 held one tureen amphora. The absence of singular grave goods makes it impossible to interpret the special role that may have been expressed using the iron ore slabs as covering material. Grave 25 (dated to horizon 5) is singular due to the number of pots (n = 5), including two collared flasks, and the presence of one hammer axe. Both artefact types are only found in this grave. The grave is the seventh-largest grave. It is unclear whether a special role is expressed through the presence of these singular grave goods. In all, there are few graves that stand out due to their singular characteristics. Moreover, the special role that the interred may have played in society remains hidden for us.

262 Bourgeois 2013, 12 ff.

263 Cf. Van de Velde 1979.

On the basis of their relative richness, one might suppose that the person's social status, rather than their specific role, was being expressed.

This brings us to the third individual aspect that we will consider, that of social status. We must realise that we study status differences within a burial ground that according to Kossian (2015) holds only one burial type. This already indicates that within the wider framework of TRB burial rituals, the Dalfsen burial ground does not display major differences. In other words, we consider the Dalfsen burial ground to be evidence of local communities that did not express major status differences in their burial ritual. We have tried to identify status differences by looking at the number of grave goods. There are only five burials with more than four grave goods. These are grave 25 (discussed above), grave 13 (with 1 strike-a-light, some marcasite and 5 flakes), grave 104 (with 1 transverse arrowhead, 1 blade and 7 flakes), grave 92 (with 1 strike-a-light, 5 flakes, 1 scraper and 2 bowls) and grave 1 (1 strike-a-light, some marcasite, 1 flake and 2 bowls). The rich graves do not stand out in any other way (but see discussion on grave 25). As a group they are no bigger than the other groups, they do not hold a central place in the burial ground, and they have no deviant architectural characteristics. We conclude that there is no evidence found for the presence of any status differences, apart from the three graves with singular features mentioned above.

The fourth and final aspect to consider is the social role of children. The lack of skeletal remains means we can focus on two burial characteristics. First, there are three body silhouettes of small and hence likely non-adult individuals (see Table 3.6). These have an estimated length of c. 1.0, 1.3 and 1.3 m. These graves also stand out because they are coffin burials (= 100%), a characteristic only found in 13 of the 134 grave pits (= 10%). It is impossible to determine whether coffin burials may indicate burials with non-adult individuals or whether the preservation of the body silhouette was improved due to the presence of the coffin. The architecture and grave goods of these three graves do not stand out from the other graves. We conclude that the youngsters seem to have been treated in similar ways as their adult kin. A second route to study the social status of children are the smallest graves. The smallest is grave 130, with a surface area of 0.27 m^2. On the basis of size, this grave stands out from all other graves. Graves 131, 4, 133 and 141 have a surface area of 0.67-0.76 m^2 and are basically the start of the continuum in surface area of all graves (see Fig. 3.16). None of these five graves hold grave goods. We propose that, with the exception of grave 130, the smallest graves mentioned here may have held sub-adult individuals. Grave 130 may have held a younger deceased. In conclusion, it appears that, whereas child mortality must have been predominantly high for young children, these seem to be absent in the burial record and may have been treated differently (perhaps with the exception of the individual in grave 130). Youngsters were interred at Dalfsen and seem to have received a ritual identical to their adult kin, suggesting that they may have played social roles comparable to adults.

Due to the assumed high child mortality in pre- and protohistoric societies, several researchers claim a percentage of child mortality up to the age 15 of roughly 50%.[264] Recent research, however, points out that this percentage must have been much lower (around 20%).[265] At Dalfsen, some 6% of the graves are attributed to sub-adults. This leads to the question how representative the Dalfsen sub-adult burials are for the deceased of the age group. Due to the poor preservation of human bones at Dalfsen, it is not possible to establish the number of people buried in one grave. The presence of several double burials (see section 3.4.5) at Dalfsen and the observation of double burials including children at other prehistoric burial grounds, suggests that (some of) 'missing' sub-adult burials may be 'hiding' in the larger grave pits. Of course, we cannot exclude the possibility that some sub-adults received a death ritual that left no archaeological remains.

8.4.2 Marriage patterns

At first glance, the burial ground provides an impression of a random pattern of individual burials, indicating that deceased were interred as individuals, not as partners in a marriage or kinship relation with one or more other deceased. Yet there are four graves that were located so close together that it was only during the deepening of the feature that they were discovered to be two separate burials (see section 3.4.8). Another grave holds grave goods both at the bottom of the grave and at a level much higher in the grave. Here one might suppose a second burial in the same grave. These examples might be interpreted as the remnant of burials where the social relation (partnership?) with a previously deceased was expressed. However, we conclude that, as a rule, this social relation was not expressed.

8.4.3 Other social patterns

Whereas it was not possible to identify marriage patterns beyond the incidental double burial, there are other patterns in the burial ground that may have had social significance. Most striking are the circular arrangements already described in section 3.4.8 (Fig. 8.1). The two circles in which graves 41 and 55 are centrally positioned suggest a burial ritual in which

264 Smits 2006, 143 ff.

265 Gurven *et al.* 2007; Schierhold 2018.

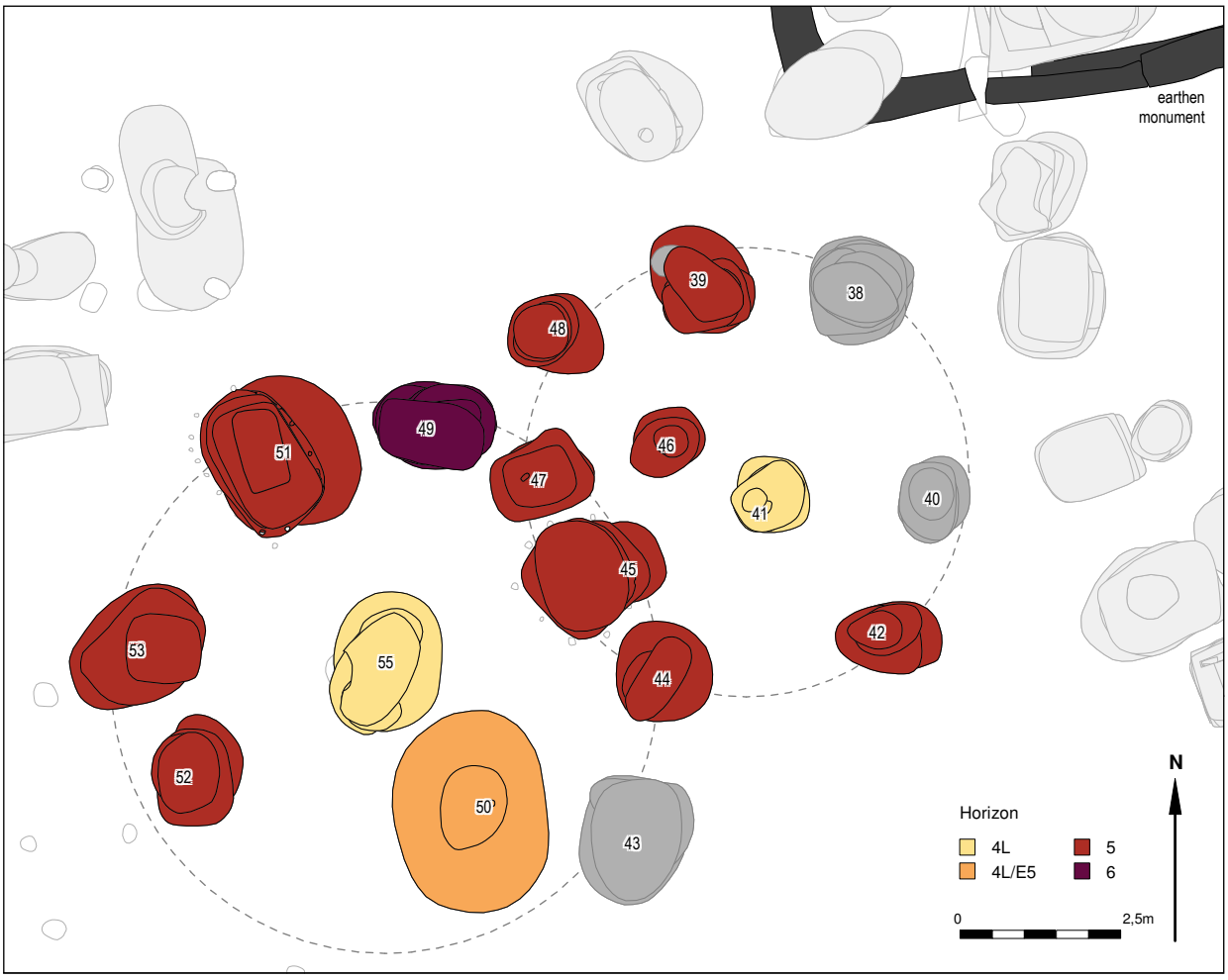


Figure 8.1 Circular structures dating to Brindley horizon 4 or 5.

later interments were placed in a circular pattern around these central graves. This interpretation is strengthened by the fact that the central graves are the oldest in the groups. A third circular pattern lacks a central grave. We propose that these circles embody kinship groups, perhaps descent groups. The central burial may have been covered with a relatively large mound to allow the subsequent burials to be positioned in the rim zone of the mound – a pattern reminiscent of Bronze Age family burial mounds.

The final spatial pattern of relevance here is the structuring effect of the earthen monument (see below). The construction was a singular event, with lasting effects. Many of the younger graves were found in its vicinity, and the monument delimited the burial ground. With the interpretation of the circular patterns as kinship groups in mind, one might suppose a similar interpretation for the earthen monument and its vicinity. We would like to conclude that the single social structuring aspect that we may see in the Dalfsen in the burial ground is that of kin, not gender nor individual status.

8.5 The earthen monument as singular event

The analysis above has defined how normative the burial ritual was and pointed out several burials that defied the norm. The most deviant element of the burial ground is without doubt the earthen monument. While it is far from certain that the activities that gave shape to the earthen monument are part of a burial ritual, it does constitute an important element of the burial ground and should be discussed here.

The earthen monument comprises a series of activities, of which the segmented ditches with post settings constitute the earliest phase (section 3.5.1). In the second phase, the ditch was filled up and probably covered by an earthen mound. The time depth of these two phases of activities is relatively short, judging from the age of the underlying and overlying burials (all horizon 5). There is no evidence of a central grave within the boundaries of the monument, leaving the opportunity open to consider a not very deep, dug-in central grave or a platform on which

rituals were carried out related to the burials outside the monument proper. The occurrence of five pits could have been the remnant of these activities.

Notwithstanding the uncertain interpretation of the earthen monument, it did play the role as focus point for later burials, a role very similar to that of central graves in the burial mounds of the later part of the Neolithic (see further Chapter 9) and the Bronze Age.[266] The earthen monument not only became the focus point for younger burials, it also delimited the burial ground, again very similar to groups of burial mounds, where younger mounds sometimes filled in the space delimited by the oldest mounds.

The construction of the earthen monument is a singular event in the biography of the Dalfsen burial ground. Its importance is not only in its singularity, but also in its place in the chronology of the burial ground. The oldest burials are found in the central part of the burial ground, where horizon 5 burials are added both to the west and the east of this earliest phase. The developments in the western part in horizons 5, 6 and 7 are interpreted as a continuation of the traditional practice. In contrast, the eastern development changes from the moment of the construction of the earthen monument. The density of burials is much higher than before, and the largest and richest graves are found here. We suggest that the construction of the earthen monument is a tipping point in the social organisation of the burial community. Where part of the community continued as before, the construction of the earthen monument is evidence of a restructuring of the burial ritual for another part of the community. In this part, there is more evidence of variation between graves and, as such, more evidence of social differentiation (see further section 8.7).

8.6 The Dalfsen burial ground as stoneless megalithic monument

The megalithic monuments of the TRB West Group have a biography that is difficult to unravel. Due to the lack of preserved bone, the massive spread of TRB cultural debris in the burial chambers cannot be connected to individual burial rituals. Stylistic analysis of the ceramics led to the conclusion that these assemblages consist of relatively large sets of stylistically very similar pottery, which implied that an individual assemblage results from a restricted number of burials.[267] Of course this also means that most deceased were not visible in the TRB burial record at all and that only distinguished deceased found their final resting place in a megalithic monument.

We propose here that the Dalfsen burial ground may help in the process of deconstructing burial activities in the megalithic monuments, due to the many similarities with these tombs and the presence of many single burials with grave goods that can be connected to individual deceased. How can the megalithic monuments in the TRB West Group be described in terms that we can relate to the Dalfsen burial ground? It concerns a burial chamber that, in general, is oriented east-west, with the entrance facing south. The chamber was buried by a mound, which left only the entrance open. Some mounds were demarcated by the use of kerb stones. The burial chamber yielded a large amount of find material (see below), while skeletons were not preserved. Individual burials (where documented) were found in the proximity of the megalithic monument. The largest set of individual burials near a megalithic monument comes from O2-Mander (Fig. 8.2). Here the east-west oriented tomb was accompanied by a group of graves located to the south and southeast of the entrance. A final characteristic to mention here is that the use of megalithic monuments continued after the TRB period, as attested by the finds of ceramics from later phases in prehistory, especially from the Corded Ware culture.[268]

The Dalfsen burial ground can be described in very similar terms, in which we make comparisons on different spatial scales: the earthen monument, the burial ground and the site. The earthen monument was probably covered by a mound c. 50-100 cm high and was oriented east-west. Individual burials were located near the earthen monument, to the south and southwest. The burial ground yielded a large number of grave goods (especially pottery) that are related to a large number of individual burials. The area of the burial ground remained important in later phases of prehistory, especially in the period of the Corded Ware culture when a couple of graves were added to a zone some 30 m north of the burial ground.

Before we try to interpret the proposed similarities, it is important we mention two important differences. First, the Dalfsen burial ground lacks the use of megalithic stones or even small stones. We interpret this absence of stone architecture primarily as a result of the absence of such stones in the vicinity. On the basis of the soil map 1:50,000, the nearest source of megalithic stones is c. 40 km away, while the spatial analysis of the megalithic monuments in the Netherlands has made clear that all tombs are built within a short distance km from a stone source.[269] The second difference is that megalithic monument building in the TRB West Group is restricted to the period of horizons 1-4,[270] while the Dalfsen burial ground starts in the late horizon 4, with the earthen monument being built in horizon 5. Notwithstanding the different date, in both

266 See section 3.2 and Bouma and Van der Velde 2017.

267 Brindley 1986a.

268 See note 42 in Chapter 2.

269 Bakker and Groenman-van Waateringe 1988, 153; 78% are located within 350 m of a stone source.

270 Bakker 1992, Table 3.

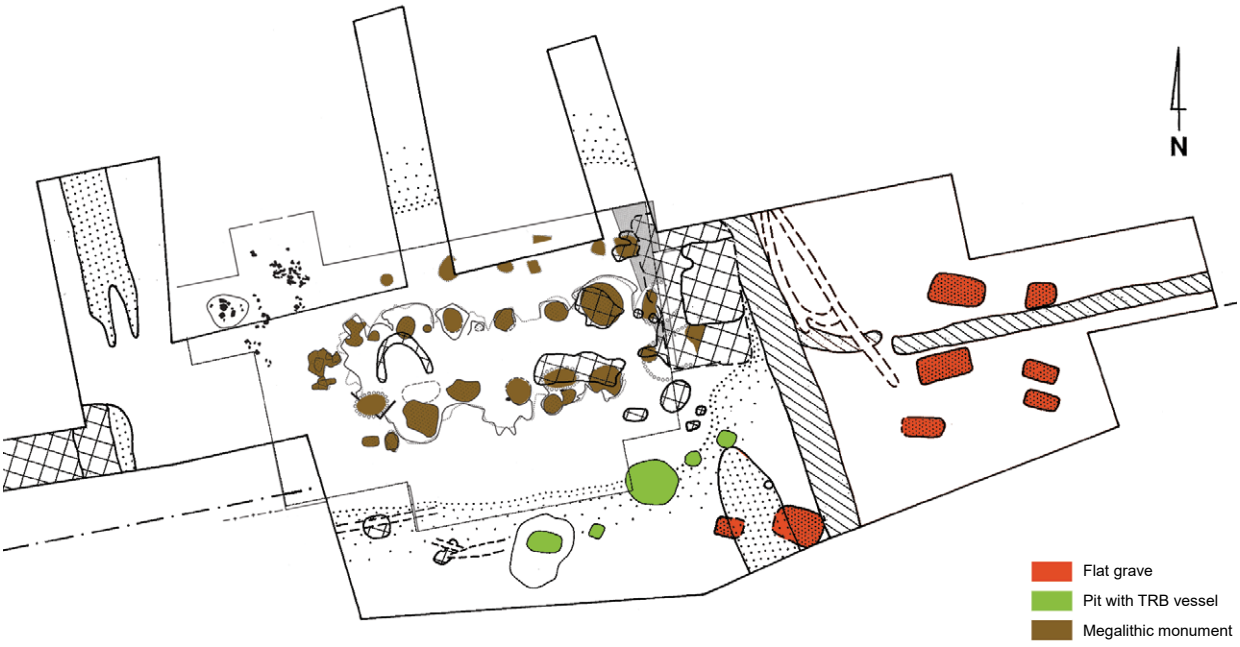


Figure 8.2 Overview of the megalithic monument and flatgraves of Mander (O2 – Overijssel) after Lanting and Brindley 2003/4.

Site	Horizon	Duration of use (years)	Number of pots	Number of pots per year	References
Dalfsen	4-7	250	124	0.5	
G2-Glimmeres	2-5, 7	400	366	0.9	Brindley 1986b
D6a-Tinaarlo	2-7	400	200	0.5	Brindley et al. 2001/2002
D40-Emmen	3	80	100	0.8	Brindley and Lanting 1991/1992
D32a-Odoorn	3-4	160	250	0.6	Brindley and Lanting 1991/1992
D9-Noordlo	3-5 / 4	400 /150	101 / 150	0.3 / 10	De Groot 1988 / Brindley and Lanting 1991/1992
G1-Noordlaren	3, 7	150	300	0.5	Brindley and Lanting 1991/1992
D53-Havelte	3-7	660	400	1.7	Brindley and Lanting 1991/1992
D30-Exloo Noord	1-4	300	80	0.27	Brindley and Lanting 1991/1992
D26-Drouwenerveld	2-5	250	160	0.66	Bakker in press
G2-Glimmeres	2-5, 7	400	366	0.92	Brindley 1986b
D6a-Tinaarlo	2-7	400	200	0.50	Brindley et al. 2001/2002
D40-Emmerveld ZO	3	125	60-80	0.56	Brindley and Lanting 1991/1992
O2-Mander	3-6	300	267	0.89	Ufkes 1993; Lanting and Brindley 2003/2004

Table 8.1 Use history of Dalfsen compared with that of several megalithic monuments in the Netherlands. Note that for D9-Noordlo, two different calculations have been published.

instances, the monuments are built relatively shortly after the onset of the TRB occupation in the region and may relate to creating a mark in a newly occupied area.

We came to three conclusions relating to this comparison. Our first conclusion is there are striking similarities in the quantities of grave goods found in the Dalfsen burial ground and the megalithic monuments (see Table 8.1). While for the megalithic monuments it was proposed that a selected group of people was buried with a large set of grave goods, the grave goods from the megalithic monuments do not stand out in either quality or quantity from the Dalfsen grave goods. This leads us to reconsider the limited number of interments in the megalithic monuments and the status of the interred. Perhaps we should re-interpret the megalithic monuments as communal monuments where large parts of the community found their resting place.

Petrographic analysis of the ceramics from the megalithic monuments might provide evidence independent from the stylistic argument about how homogeneous the ceramics are. On the basis of the similarities in the number of finds per year, one might suppose that the persons interred in the megalithic monuments perhaps did not have a special status and that the tombs served a communal practice of interring most if not all of the deceased. We conclude that the term collective burial may need redefining in this context: the use of a megalithic monument as a multi-person burial monument is not different from a burial ground where the individual graves and burial mounds comprising several individual graves constitute a collective effort. Moreover, if the megalithic monuments are to be reinterpreted as communal burial areas, the attention should shift to interpreting the individual burials that are found near the tombs. What social processes led to the exclusion of these deceased from the communal practice? The communal basis for the use of a megalithic monument can be underlined by the notion that local groups constructed the tombs.[271]

Notwithstanding the qualitative similarities between the use history of Dalfsen and the selected megalithic monuments from the Netherlands, there are substantial differences in the pottery types found at the two categories of sites (Tables 8.3 and 8.4). Dalfsen stands out from all megalithic monuments because of its low proportion of funnel beakers and its high proportion of amphoras. While this may indicate different notions about the suitability of specific ceramic types in the burial ritual, it is important to note that variation is also large among the megalithic monument assemblages. The variation may therefore relate to local preferences. Another option is that this variation is the result of the difference in the age of the various assemblages.[272]

Our second conclusion is that the Dalfsen burial ground provides ample evidence of the re-opening of graves (section 3.4.7). This is a practice undocumented from other TRB West Group flat graves, due to the absence of human bones. But the fact that in megalithic monuments sherds that can be refitted are found scattered through the chamber indicates that post-interment activities that interfered with the deceased can be assumed there as well.[273] In other parts of the TRB culture where human bones are preserved, we see several indications for rearranging body parts (especially the skulls).[274] In this context, Dalfsen adds

	Bowls		Funnel beakers		Amphoras		Tureens		Collared flasks		Tureen-amphoras		Vases		Cups		Miniature vessels		Jugs		Shouldered bowl		Dishes		Pail		Necked bowls		Other, indet	
	n	%	n	%	n	%	n	%	n	%	n	%	n	%	n	%	n	%	n	%	n	%	n	%	n	%	n	%	n	%
Dalfsen	31	25.4	2	1.6	23	18.9	7	5.7	2	1.6	24	19.7			4	3.3	7	5.7			7	5.7					3	2.5	12	9.8
D30-Exloo Noord	11	18.3	15	25.0			6	10.0	5	8.3							3	5	4	6.7			6	10.0	6	10			4	6.7
G2-Glimmeres	120	32.8	102	27.9	44	12.0	40	10.9	11	3.0			23	6.3	8	2.2			4	1.1					5	1.4			9	2.5
D6a-Tinaarlo	56	28.0	31	15.5	26	13	12	6.0	5	2.5	31	15.5			10	5.0			2	1.0			2	1.0	10	5.0			15	7.5
D40-Emmerveld ZO	7	18.4	18	47.4			6	15.8																	5	13.2			2	5.3
D9-Noordlo	25	28.4	41	46.6	6	6.8	10		5	5.7															1	1.1				
O2-Mander	83	26.4	60	19.1	10	3.2	74	23.6	20	6.4	26	8.3													27	8.6			14	4.5

Table 8.2 The various pottery types documented at Dalfsen and selected Dutch megalithic monuments.

271 Van Gijn and Bakker 2005, 291; Sanchéz-Quinto *et al.* 2019.

272 Cf. Brindley 2003.

273 A possible exception concerns the burial ground of Heel-Averbeck, of which Finke (1990) states that there are indications that grave pits were left open for some time, indicating that several rituals may have been conducted there, too.

274 Midgley 2008, 110 ff.

	Dalfsen	Early 4th millennium	Vlaardingen-Stein-Wartberg
grave	simple	simple	megalithic
	with wooden coffin	group burial	excarnation
Inhumation	yes, but also cremation	yes	yes, but also cremation
Posture	flexed	mostly flexed	unknown
grave goods	personal ornaments	primarily ceramics	few
	fire kit	fire kit	
Gender	not expressed	not expressed	not expressed

Table 8.3 Comparison of burial characteristics from Dalfsen, from the first half of the fourth millennium and from Vlaardingen-Stein-Wartberg.

arguments to the interpretation that re-opening burials was normal practice in the TRB West Group as well.

Our third conclusion is that the physical appearance of the Dalfsen burial ground after the construction of the earthen monument would be rather similar to that of the megalithic monuments. In both settings, the view would be dominated by an earthen monument. At several megalithic monuments, this monumental view would be enhanced by the presence of smaller visible monuments, namely, the individual graves. At Dalfsen, some of these were delimited by a series of posts, and we present arguments (section 3.4.8) that the individual graves had small, individual mounds. Some individual graves were re-opened for secondary burials. The two or three larger circular burial mounds, with a primary burial and a series of secondary burials, would have added to the monumental nature of the site. The physical and conceptual bond between the local group involved in the construction and use of the tomb (and individual burials) would have stressed the sense of belonging or even ownership of the area.

8.7 The western edge of the TRB world: A region between cultures

In the preceding sections, we focussed on the TRB material culture, more specifically that of the West Group. There are differences in the typology of pottery, dating of megalithic monuments and settlements structures between the West Group and other TRB groups. But also within the TRB West Group one can note regional trends. One of them, the wealth of material culture found in megalithic monuments west of the river Weser, has already been mentioned (section 2.2.2). It is customary to interpret TRB finds within the framework of the TRB culture, within its geographical span, stretching from Sweden (north), to the Netherlands (west), to Poland (east). This means that notions on burial practice, ritual behaviour and depositions of pottery outside megaliths from Denmark and Sweden are used not only to discuss the material remains found in Dutch TRB contexts, but also to provide interpretations. Due to the poor preservation of human material and the almost total absence of settlement sites in the Dutch TRB area, this is not only tempting, but also sensible, as it may lead to valuable insights.

We propose that this traditional perspective has also framed the material evidence from a specific culture-historical perspective. In this section, we instead position the 'Dutch' part of the TRB world as a regional phenomenon also – potentially – closely tied and influenced by its non-TRB neighbouring groups. In order to interpret the data from Dalfsen in a regional context, in this section we focus on the material evidence from the preceding period and the neighbouring regions. This means we have to look to the evidence from the pre-Drouwen TRB and Hazendonk cultures (first half of the fourth millennium cal. BC) and the contemporaneous Vlaardingen/Stein-group and the Wartberg group (here shortened to VSW) (Table 8.3).

8.8 Looking back in time

The burial evidence from the first half of the fourth millennium cal. BC derives from a small number of sites, with luckily a relatively large number of burials. It concerns two sites near the Hague, Schipluiden (N = 7)[275] and Ypenburg (N = 42),[276] and one site in Flevoland, Schokland-P14 (N = 18).[277] We can use these sites for comparison of various burial aspects.[278] First, the burial architecture is very similar. Without exception, it concerns pits without further evidence of architecture elements, such as stones or wooden coffins. Most graves contain flexed burials, but a small minority of the interred were buried in a supine position. Grave goods are sparse, with the exception of personal ornaments (jet and amber beads). Ceramics are not encountered in the burials. In these three burial grounds, skeletal remains have been preserved, which potentially would make an analysis of gender roles much easier. With the exception of two males buried with pyrite, of whom one with a strike-a-light, there is no evidence for clear gender roles. We acknowledge that this interpretation may be obscured due to the small number of grave goods. The small number of grave goods is again not helpful in identifying individuals with a special status. At

275 Smits and Louwe Kooimans 2006.
276 Baetsen 2008.
277 Ten Anscher 2012.
278 A general overview of these burials is presented in Raemaekers 2018.

Ypenburg, children, including babies, constitute 50% of the interred. The spatial patterning of the burial grounds does not provide any clues on marriage patterns or other social patterning.

This comparison allows us to distinguish between burial aspects that are shared across the fourth millennium cal. BC and burial aspects that can be seen as innovations in the regional context. The general lay-out of the burial ground did not change much over time: it concerns groups of relatively simple graves with some surface marking, judging from the lack of cutting. The deceased were buried in a flexed position. The wooden coffins seen at Dalfsen are an aspect unknown from the earlier burial grounds. The grave goods show a major shift, from primarily personal ornaments to primarily ceramics, but there are continuities as well, judging from the strike-a-lights. A further similarity is that we are unable to define gender or individuals with a special status on the basis of the grave goods or architecture. The proportion of sub-adult burials is very similar for Schipluiden, Schokland-P14 and Dalfsen – here Ypenburg stands out due to its high number of child burials. We propose that the changes observed (introduction of wooden coffins and ceramics, decrease in personal ornaments) are innovations in the Dalfsen regional context.

8.9 Non-TRB neighbours: Vlaardingen-Stein-Wartberg

The area to the south of that occupied by the TRB West Group has a relatively sparse burial record. Vlaardingen and Stein ceramics are so similar that one might propose we should instead talk about Vlaardingen-Stein ceramics.[279] In contrast, burial rituals in this area may have been quite varied. Of the settlements in the western part of this area (Vlaardingen group), Hekelingen yielded a pit containing burnt bones from an adult and a rectangular area delimited by five oak posts containing burnt bones from an individual aged 30-40 years. The latter is interpreted as probable evidence for the custom of excarnation.[280] The burials found at the site of Stein reflect a chamber grave in which at least 42 cremation burials were found.[281] The monumental burial chamber was probably in use for roughly 100 years. This burial chamber is the only evidence for burial from the Stein area.[282] It is unclear whether all members of the local community were buried in the chamber. From the assumed total weight of the cremation remains, only a small percentage was recovered.[283] We concluded that selective storage of cremation remains took place, because the cremated remains from the chamber comprised a relatively high percentage of skull fragments. Out of the 42 individuals, 36 were adults.

More to the southeast, we move into the territory of the Wartberg gallery graves in Westphalia, Germany.[284] While we know something about the gallery graves, we know very little about the few single graves.[285] Most of the attention has gone to the remains of a dozen megalithic burial structures covered by a mound and interpreted as passage graves.[286] Due to favourable soil conditions, several of these graves yielded well-preserved inhumations, numbering up to 250 individuals. They are interpreted as the remains of a local community of which all members were buried in a collective burial monument.[287] The gallery graves in the district of Soest yielded a small number of finds that were interpreted as personal items. They consisted of personal ornaments, such as bone, tooth and amber beads, but also arrowheads and sets of strike-a lights and marcasite.[288] Noteworthy is also the near absence of pottery in the gallery graves. Recent excavations at two burial monuments at Ermitte-Schmerlecke resulted in a dataset of 162 individuals.[289] Of these 162 individuals, 31 were under 15 years of age (c. 20%), 41 between 20 and 40 years, 7 between 40 and 60 years, and 83 older than 20 years. On the basis of the number of individuals and the proposed time depth it was concluded that some 20-30 persons were interred every generation. It is interesting that there are not only regular burials, but also rituals performed with parts of bodies of the deceased. In some instances, only parts of the skeletons were found in articulation; other parts were rearranged, and especially skulls were found separated from the rest of the skeleton.[290]

At a first glance, the burial record of the Dalfsen burial ground is strikingly different from the burial record from its non-TRB neighbours. We would like to stress that this apparent contrast requires some rethinking. When one takes into account that stone architecture is absent at Dalfsen and that the burial ground is the result of a large series of interments of a local community, one can see conceptual similarities to both the burial chamber at Stein and the Westphalian gallery graves.

A striking difference, however, is the near absence of pottery in gallery graves. The similarities between the Westphalian gallery graves and the TRB megalithic monuments from the area west of the Weser as the resting

279 Beckerman and Raemaekers 2009.
280 Verhart 2010, 170-1.
281 Drenth 2019; Verhart and Amkreutz 2017.
282 Verhart and Amkreutz 2017.
283 Vaselka, in Verhart and Amkreutz 2017, 115 ff.
284 Schierhold 2014.
285 Günther 1991.
286 Schierhold 2012.
287 Schierhold 2018.
288 Schierhold 2018.
289 Schierhold 2018, 150 ff.
290 Schierhold 2018, 152 ff.

place of entire local communities is in sharp contrast to traditions noticed in the TRB world in northern Germany and Denmark, where megalithic graves most probably contained few inhumations. We conclude that the notion of a communal burial place is the one similarity, and it is a similarity of a very general nature. The individual burials, the flexed positions, the role of ceramics, the wooden coffins – all are evidence of a TRB cultural tradition not shared with the non-TRB neighbours.

8.10 Conclusions

The time depth of the Dalfsen burial group has been determined to be c. 200-300 years on the basis of the ceramic typochronology. Over this period, some 11-17 individuals per generation were buried, the equivalent of three to five extended families. We conclude that the Dalfsen burial ground was used by a local community (based on the homogeneity of the clay used in the ceramics) and propose that the burial ground incorporated (almost) all of the deceased from the age of sub-adult onwards.

The analysis of the burial ground focussed on the anthropological key concepts that define every human society. It allowed us to study which of these concepts was articulated in the burial ritual. It seems that gender roles and marriage relations were not expressed, suggesting that the individual status of the deceased as a member of the local group was considered of greater importance. The burials of individuals of sub-adult length (youngsters) did not deviate from the general characteristics, suggesting that these persons did not have a different status in society than their adult family members. There is more evidence of the expression of kinship relations. We based this conclusion on the presence of two (three?) circular patterns of graves, in which the oldest grave was positioned in the centre of the circle and younger graves were added to the burial mound. Whereas this interpretation is based on the spatial pattern and the relative age of the burials, it finds a further external argument in aDNA analysis on burials in megalithic monuments in northern Europe,[291] which led the researchers to conclude that the people in megalithic monuments were kin groups from patrilocal communities. This kinship pattern is based on the continuity of the Y-chromosome haplotypes across time. A similar interpretation may explain the Dalfsen burial pattern – which suggests that patrilocality may have characterised several, many or all of the regional TRB groups.

The earthen monument is the material reflection of a singular event, which provides intriguing insights into a pre-monument and post-monument burial ground. The pre-monument burial ground (horizons 4 Late-horizon 5) can be characterised as a burial ground, homogenous in nature, that slowly expanded both to the west and the east and in which the two (three?) larger burial mounds with the central graves provided spatial and kinship structure. In the post-monument stage (horizons 5-7), the western part of the burial ground continued much as before, whereas the eastern part developed a higher density of graves and yielded more relatively large and rich graves. What social processes lay behind the construction of the monument remain hidden, but the effects on the burial community are quite clear and may be interpreted as a schism. We hypothesise that new notions on burial ritual were developed while the traditional notions continued as well.

We conclude that the Dalfsen burial ground has much in common with the megalithic monuments of the TRB West Group, where the general appearance of the earthen monument and the megalithic monuments was very similar (an earthen mound), as was its role in the creation of spatial structure. Moreover, the number of pots interred at Dalfsen per year is very similar to that of the published assemblages from the megalithic monuments in the Netherlands. This leads us to question the selective nature of interment in the megalithic monument. Might these have held a larger proportion of the deceased than has thus far been imagined?

The Dalfsen burial ground has also been analysed in its regional setting to gain more insight in the TRB nature of the site. To this end, the burial ground was compared with the burial record of the first half of the fourth millennium cal. BC and that of Vlaardingen-Stein-Wartberg communities. We conclude that the use of wooden coffins and ceramics, the decrease in personal ornaments, and the presence of large burial mounds and an earthen monument are all characteristics without roots in the area. The supine position and the existence of burial groups are shared characteristics. Dalfsen is also quite different from its non-TRB neighbours. The individual burials, the flexed positions, the role of ceramics, the wooden coffins – all are evidence of a TRB cultural tradition not shared with the non-TRB neighbours. If one accepts our interpretation of the Dalfsen burial ground as a site where a local community found its resting place, the number of interments is reminiscent of the number of burials in the Wartberg graves.

291 Sanchéz-Quinto *et al.* 2019.

Chapter 9

The cultural biography of the burial ground: The long-term history of the site

Henk van der Velde

9.1 Introduction

The Dalfsen archaeological record starts with one piece of flint, which is dated to the Late Palaeolithic period. This is probably the proverbial tip of the iceberg, because we suppose that the small sand ridges along the (former) branches of the Vecht were attractive areas for small groups of hunter-gatherers. We know little about the visibility or collective memory of these activities, as the next stage of the archaeological record available to us is the TRB burial ground. This chapter presents the landscape setting of the TRB period, which may have been formative in shaping the function and meaning of various parts of the landscape incorporating the Dalfsen site. After this, we will turn to the cultural biography of the site – the continuous adding and rewriting of the function and meaning of the location.

9.2 The concept of the cultural biography of landscape

The concept of cultural biography is now more than 30 years old. It was first proposed by Appadurai and Kopytoff.[292] Both authors focused on the multilayered meaning of objects due to the different attitudes to those objects changing through time, depending on the way they were perceived by users. As such, it was used in archaeology to describe the life cycle of objects, from their conception to their destruction or deposition.[293] Landscape archaeologists subsequently realised that this concept also created interesting possibilities for describing the long-term history of landscapes from an interdisciplinary point of view.[294] By creating different interpretative layers, some of which witness dynamic change and others of which seem to be more static through time, it becomes possible to study the interaction between landscape and human presence through time. An important aspect of this historical presence is the continuous reshaping of the environment, in which the meaning (or symbolic value) of diverse elements changed or, rather, achieved a more layered meaning.[295] The latter may be studied both from a micro level (that is, a limited period of time) and a macro level (that is, the *longue durée*). In this study, we will use this approach to address the perception of local groups of the visible evidence of their predecessors.

292 Appadurai 1986; Koppytoff 1986.
293 Koppytoff 1986.
294 Kolen 2005; Kolen and Renes 2015, 25.
295 Kolen and Renes 2015, 31.

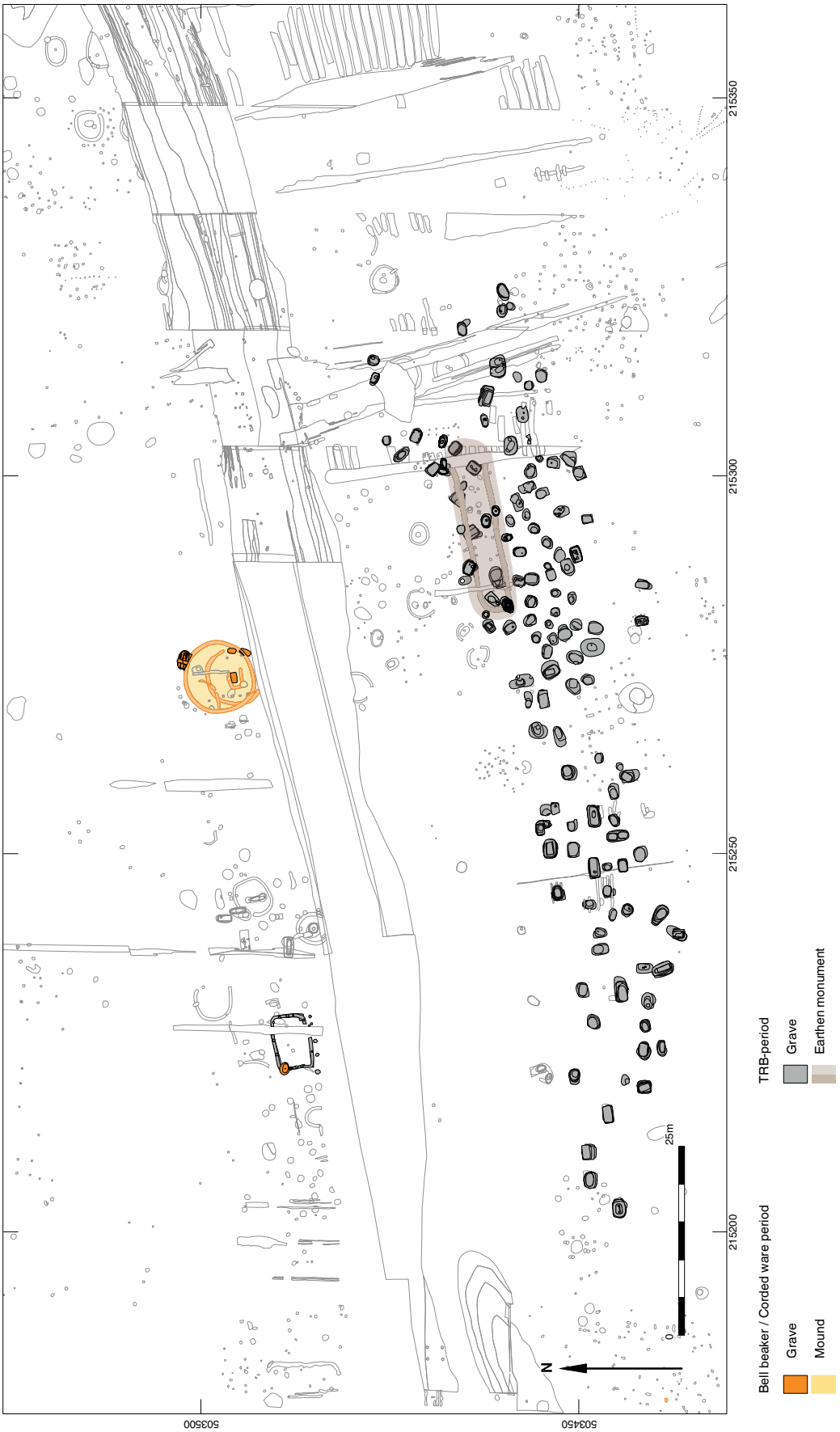


Figure 9.1 Dalfsen: overview of the monumental landscape during the Middle and Late Neolithicum.

9.3 Tabula rasa?

The site of Dalfsen did not yield any finds from the 4th millennium BC. This raises a question: Is it possible that the TRB people were the first inhabitants not only of the site, but also of the region? We conclude that there is little evidence of occupation or even exploitation in the region before c. 3000 BC (horizon 4). Cultural remains from earlier TRB horizons are absent, while horizon 4 finds are known from Baalderes (at c. 30 km distance to the east) and Hanzelijn-Oude Land (also at c. 30 km distance, to the west). These sparse data suggest that TRB in this area was a relatively late development. The archaeological record of the period immediately preceding the TRB period, namely, the Swifterbant culture, is also absent. This may partly be the result of poor preservation (which would have affected the preservation of ceramics) and the absence of unique diagnostic flint artefacts for this period (both the Late Mesolithic and the Swifterbant culture are characterised by trapezes).[296] One might expect that human activities would have registered in pollen diagrams and thus would provide evidence for human presence in the region. Small-scale clearances from around 4000 cal. BC are known from the province of Drenthe,[297] but unfortunately no pollen diagrams exist for the Dalfsen region. While the absence of evidence is never the evidence of absence, we conclude that at this moment it is a strong possibility that the TRB Dalfsen inhabitants were the first to occupy the region after a long period without human occupation.

9.4 The shaping and rearranging of a monumental landscape during the TRB period

Around 3000 BC (horizon 4), people started using the Dalfsen area not only for burying their dead, but also for other purposes. The region just north and east of the present village of Dalfsen consisted of a series of sand ridges forming a high and dry landscape with an east-west orientation. To the south and north, low-lying areas with clay and peat were present. Several now-relict branches of the river Vecht ran through these areas, adding to a diverse, mosaic landscape. It was on one of the small ridges in the present-day hamlet of Dalfsen, opposite a former branch of the river Vecht, that the people chose to bury their deceased.

The absence of finds pre-dating the burial ground leads us to assume that the choice of location for the first burial (the founder's grave) was not based on traces of earlier human presence. It is more likely that the small sand ridge on the fringe of a low-lying (wet) area was considered to fulfil the requirements of a physically demarcated landscape zone. We will never know if the local group who chose to bury their first dead in the soil of this ridge intended to reserve the entire area as a future monumental landscape of the dead. But we do know that as a result of this first burial, a burial ground was created. The Dalfsen TRB people must have interfered with the natural vegetation (probably a dense forest) to create an open space for their burials. Even during the earliest period of use, horizon 4, the burial ground grew to encompass at least 15 burials. This burial ground subsequently changed in appearance by the creation of more and more individual burials, which were probably visibly marked, and with the singular event of the construction of an earthen monument.

The starting date of this burial ground is intriguing because it is just after the period that TRB groups across northern Europe ceased to erect megalithic monuments.[298] In Chapter 8, it was concluded that in many ways the Dalfsen earthen monument functioned as a megalithic monument. This is also true from a chronological perspective: While the construction of megalithic monuments stopped, their use continued throughout the TRB period. In the TRB chronology from southern Scandinavia, the construction of megalithic monuments is dated c. three centuries later than the start of the use of TRB pottery. At Dalfsen, the horizon 4 burials predate the horizon 5 earthen monument, but this is a much shorter delay.[299]

Within a few generations, the burial zone developed from a small group of burials to a burial ground containing 135 graves, some of them or perhaps even most of them covered by mounds. The creation of the earthen monument was a singular event in this process. This earthen monument not only became the focus point of the burial ground, as its northern delimiter, it also became a burial monument itself due to a number of graves having been dug into it. The earthen monument was located over several older burials, and this leads us to hypothesise that the creation of this monument may have been so important that the TRB group involved decided to break its tradition of non-violation of already existing burials. By the end of the TRB period, a large part of the sand ridge, stretching over 120 m, had become a burial landscape in which not only small burial mounds and an earthen monument were present, but also wooden constructions related to burial rituals.

Other TRB traces were found on an adjacent sand ridge, separated from the burial area by a depression. On this second sand ridge, features are evident of several wooden structures; we assume these to be the remains of a settlement. As an assemblage, the TRB finds suggest that different landscape zones may have had distinct functions and meaning. It was not possible to fully excavate the

296 Niekus 2009; Raemaekers 2013.
297 Bakker 2003.
298 Midgley 2005; Müller 2012.
299 Midgley 2005.

depression of the former branch of the river Vecht, which means that we do not know what role this low-lying zone played in the life of the TRB group. In Drenthe, there are several find spots of (ritual) depositions of objects in wetland areas dating from the TRB period.[300] These finds from elsewhere suggest that the low-lying area south of the burial ground may have had a similar role in the landscape.

9.5 Creating new ancestors during the Neolithic, the Bronze Age and the Early Iron Age

During the Late Neolithic, several graves were added to the site. They date from the Corded Ware culture (2750-2400 cal. BC) and the Bell Beaker period (2400-1900 BC). A single sherd dates from the Early Bronze Age (1900-1600 cal. BC), but most features (both cremation graves and traces of settlement) are attributed to the (later period of the) Middle Bronze Age, Late Bronze Age and Early Iron Age (1300 – cal 500 BC). In this section, we will focus on the way local groups dealt with or were inspired by the remnants of earlier periods in the landscape.

In the Netherlands, there are few sites yielding features from the (late) TRB period and features from the Corded Ware culture. At Dalfsen, both were present. One of the focus points of research of the beginning of the Late Neolithic is the supposed continuity (or not) from the TRB to the Corded Ware culture. As is stated in Chapter 3, indications for cultural continuity prevail at Dalfsen. As is the case with some other sites dating from the TRB period, there are also indications for the presence of material from the Corded Ware culture. The objects found (or even the cremation burials) do not necessarily imply that local groups during the period of the Corded Ware culture had the same perception of the landscape as did people from the TRB period. The dataset from the graves at Dalfsen, just like that of some other flat graves from the TRB period and the Corded Ware culture, primarily suggest continuity in the burial ritual. However, from a spatial point of view, the Dalfsen dataset does display some discontinuities. In addition to the find of a single axe dated to the Corded Ware culture, just north of the burial ground from the TRB period (was it a stray find or was it formerly part of a Corded Ware grave?), there are no indications of the existence of graves from that period on the southern sand ridge. Although we have to take into account that some of the graves without finds actually may date from the Corded Ware culture, we think that these probably are also of TRB origin. This means that people from the Corded Ware culture decided to leave the burial ground as it was and to not alter its appearance. In contrast, they added to it, by creating more graves on the sand ridge just north of the burial ground. One of these graves is positioned in the northeastern corner of the TRB houseplan. In a recent study, Mennenga concluded that this particular corner in the architecture of the TRB house may have had a special religious significance.[301] The location of the grave suggests that this knowledge may have continued into Corded ware times and that the location of the house was still recognisable.

The people of the Bell Beaker period added one new burial mound to the northern ridge opposite the earthen monument. All of the graves (especially the visible elements related to them) would have added to the already existing fabric of the burial landscape, a phenomenon that has been noted in other studies of Late Neolithic burial traditions.[302] However, there are also some differences between the graves from the TRB period and those from the subsequent periods. Whereas we assume that during the TRB period (almost) everybody was buried, during the periods that followed, this aspect of the burial ritual changed. Those aspects of the burial ritual that left archaeological traces turned to specific, individual rituals and special occasions, since only a small minority of members of the local groups were buried in the vicinity of the old burial ground.[303]

We do not know what the landscape looked like during the TRB period. It is possible that the local group cleared huge parts of the sand ridge to create a burial ground, farmsteads and arable fields, or, alternatively, that it just created a few open spots in the forest. With the uncertainties about the dating of the agricultural layers, at least we established that until the end of the Neolithic, the landscape around the burial ground was densely forested and that trees were prominent on the higher ground as well (Chapter 7). This sketches an image of burial mounds in the midst of trees, but still recognisable as belonging to a ritual world, a place for communicating with the ancestors. This image is in contrast to landscapes around Late Neolithic burial mounds as described by Doorenbosch, since that author states that the durable visibility of these monuments was an important factor in managing the cultural landscape.[304]

It is difficult to establish the way local groups arranged the landscape during the Late Neolithic. Due to the scarcity of settlement remains, we know relatively little of the landscape setting of settlements in this period.[305] At Dalfsen, the settlements are also missing, although some stray finds may be the lone remnants of disappeared farmsteads, but that should not surprise us very much, since the depression in which the agricultural layers and drift-sands were found counted more agricultural layers than the three which have been analysed (Chapter 7). Due

300 Bradley 2000; Van der Sanden 1997.

301 Mennenga 2017, 292.
302 Bourgeois 2013.
303 Bourgeois 2013, 12.
304 Doorenbosch 2013.
305 Fokkens *et al.* 2016, 303.

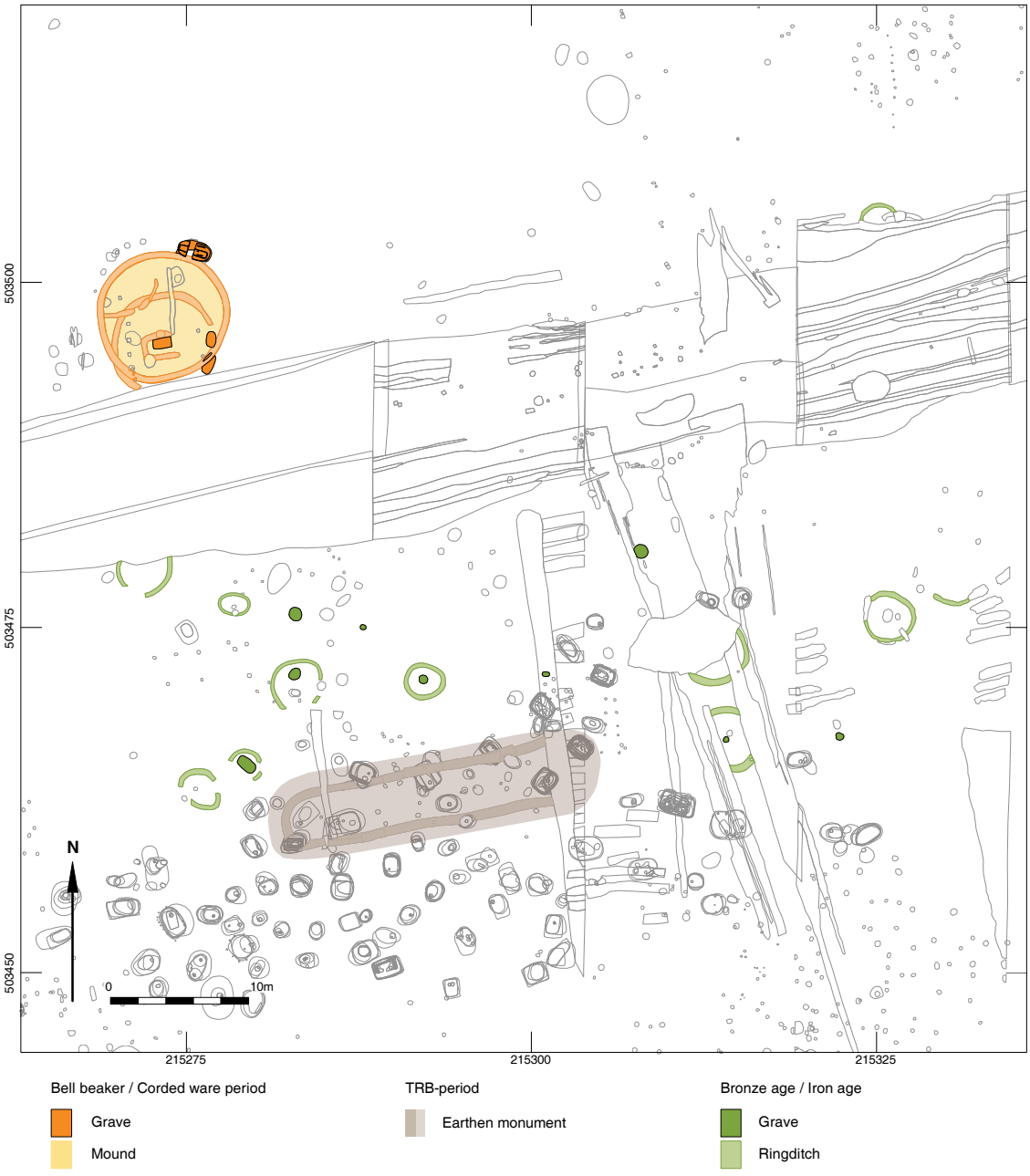


Figure 9.2 Dalfsen: the location of the graves dating from the Bronze and Iron Age in relation to the former TRB-burial ground.

to a lack of material that could be dated by ^{14}C, it is not possible to relatively date the agricultural layers found between the layer (presumably) dating from the Late Neolithic and the layer dated around 1000 BC.

A single sherd dated from the Early Bronze Age suggests the presence of people in the environs, but the first signs of permanent activity date from the later phase of the Middle Bronze Age. Around that time, the first cremation grave was dug in the direct vicinity of the Neolithic grave monuments. Within a couple of centuries, a cremation grave field had formed alongside a prehistoric route. The spatial relationship between Middle Bronze Age graves and older burial monuments has also been pointed out by other researchers. It is explained as an act of demonstrating a claim on the landscape by incorporating (and thereby creating new) ancestors in the burial ground.[306] As such, it is a reprise of the burial acts that took place during the Late Neolithic.

306 Bradley 2002, 2007; Roymans *et al.* 2009.

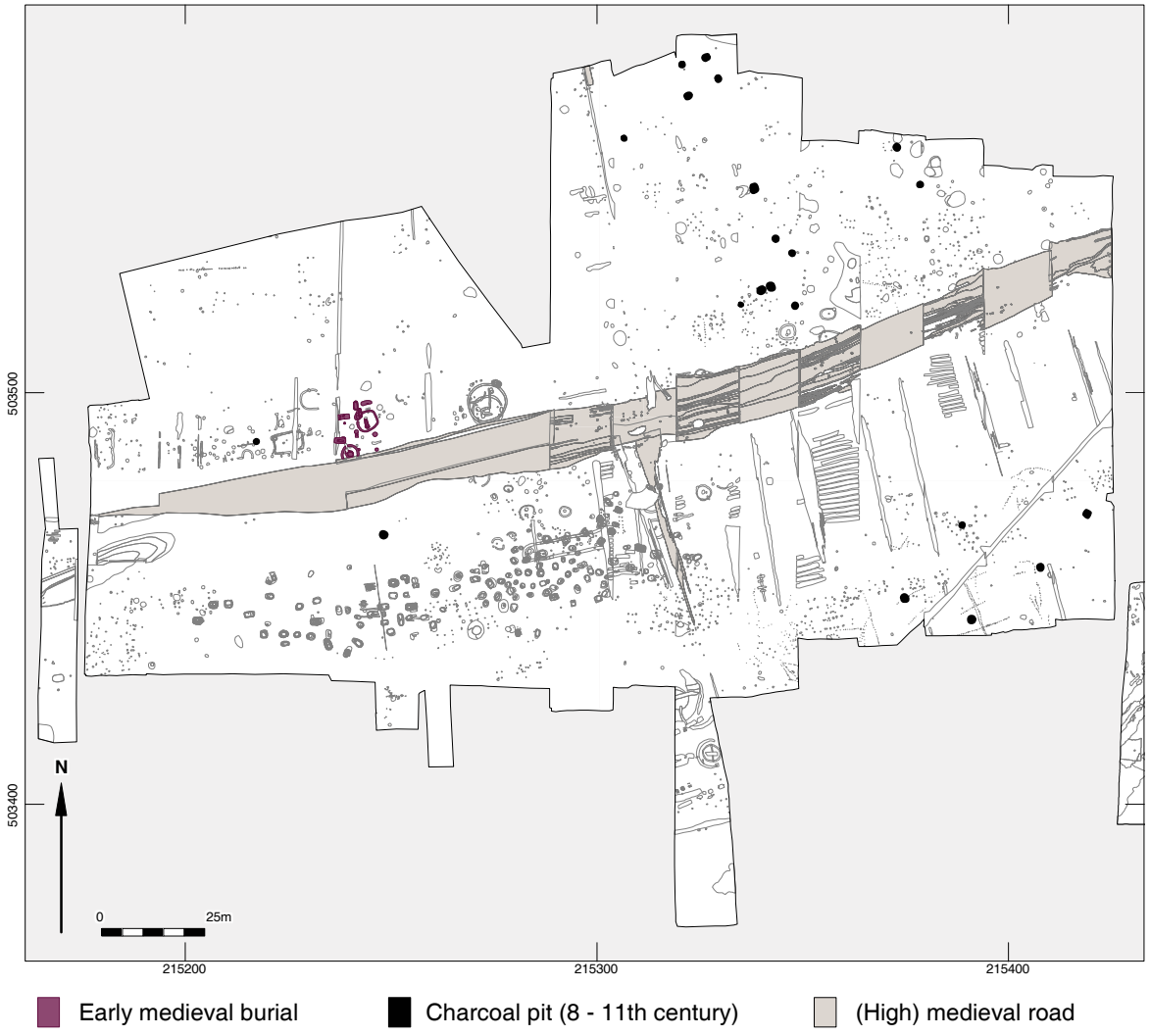


Figure 9.3 Dalfsen: charcoal pits dating from the Early Middle Ages.

It is interesting that most graves apparently were placed in a complementary position with respect to the already existing Neolithic graves, although at least a couple of the Neolithic graves presumably were no longer visible by then. This changed in the Iron Age, when a farmstead was built in the central part of the TRB burial ground. It is most likely that the builders dug up finds (or even human remains) when building their farmstead, judging from the presence of several TRB sherds in an Iron Age pit some 300 m east of the burial ground.

The alignment of Bronze Age cremation burials makes it highly probable that a Bronze Age prehistoric route preceded the medieval road (see below). The orientation of the burials, both from the TRB and from the following prehistoric periods, may suggest that this route dates to the Neolithic. These observations underline the functional interpretation of the landscape, where the orientation of the sand ridges predisposes people to locate routes, both in prehistory and in historical periods.

9.6 A maintained woodland: The absence of features from the Middle Iron Age until the Early Middle Ages

We lack settlement features and traces of burials for a period of roughly 1000 years (c. 500 BC-c. 550 AD). Around 500 BC, evidence of occupation or exploitation ends and apparently people settled elsewhere. This re-location is part of a pattern documented across the sandy areas in the region. While the farmers of the Neolithic and Bronze Age seem to have preferred sandy soils without loam, during those from the Iron Age located their settlements in sandy area rich in loam.[307] The presence of drift-sand material dating from the Bronze Age and the Iron Age at Dalfsen is also evidence of the decreased value of these soils for agriculture.[308]

307 Roymans and Gerritsen 2002; Spek 2004.
308 Blom *et al.* 2006.

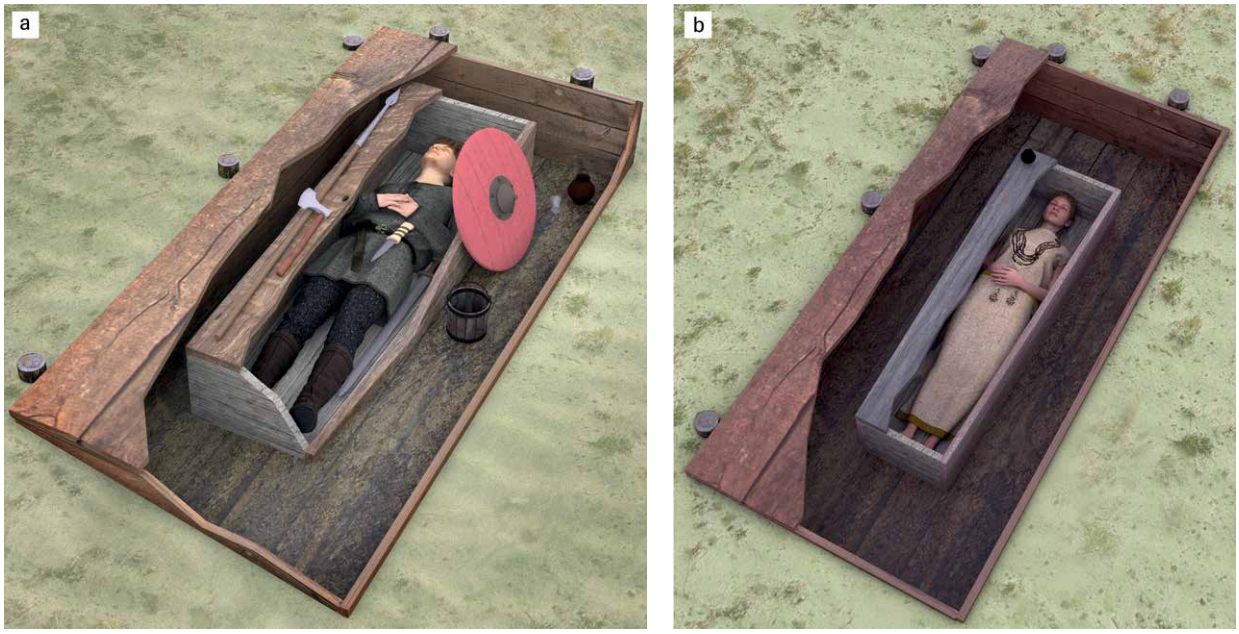


Figure 9.4 Dalfsen: reconstruction of the two richly furnished graves dating from the 6th century AD.

We do not know what happened at Dalfsen in the period between the burial ground of the Middle Iron Age and the 6th century AD, as we have no features or finds from this period. Human presence can again be picked up in the mid-6th century AD, when, near the TRB burial ground, new graves were dug and at least nine persons were interred.

While we lack direct evidence for human interference with the site for this period of 1000 years, we can reconstruct the development of the landscape during this period. First, we may expect the regeneration of the natural vegetation, especially trees, since the area was left untouched. This hypothesis is supported by the presence of numerous charcoal pits dating to the 8th to 11th century AD. They are interpreted as the remnants of forest-clearance activities related to the production of charcoal, which implies that the area had by then turned back into woodland. During the excavation of these pits, several treefalls were documented. Although it was not possible to date them using ^{14}C, their location and stratigraphy in relation to several features dating from the Iron Age suggests that the majority date from the period between the Middle Iron Age and the Early Middle Ages. Second, we assume that during this period the route was still in use. This would mean that people actively had to clear parts of the area in order to keep it accessible for voyagers. We do not know how these people interpreted the prehistoric burial monuments, but the decision by a group of newcomers during the middle of the 6th century AD to bury their dead in the midst of the prehistoric burial landscape suggests that the burial mounds were still visible and recognisable.

From the Middle Iron Age until the Late Roman period, numerous settlements were present within a short distance of the research area, so we assume that the Dalfsen forest became part of a larger agricultural landscape. From a practical point of view, it must have been a source of wood and may even have been managed. It must also have been necessary to manage the route, since it was one of the long-distance routes along the northern bank of the river Vecht. Travelling this route, visitors may have seen the burial mounds dating to various periods. We cannot know whether the communities living in the area actively managed the burial ground (for example, by not letting the trees encroach on the burials). However, the decision of these 6th century AD people to bury two important members of their group (out of the 9 graves) next to this burial ground suggests that it was still seen as an important (ritual) focus point, even when it had been out of use for a period of at least 1000 years.[309]

From excavations in the vicinity of the site, we know that the area was continuously inhabited until the Late Roman period (when it was densely populated).[310] Although we cannot be certain that the 5th century AD was a period without habitation, we know that the number of inhabitants diminished dramatically.[311] Many settlements and arable lands must have been deserted. When in the course of the 6th century the region witnessed a phase of recovery, this was due to both the remaining population

309 Van der Velde and Williams 2019.
310 Cf. Van Beek and Groenewoudt 2015; Van der Velde 2011.
311 Van der Velde 2011, 138.

and newcomers. In the case of Dalfsen, we interpret the small group buried there as 'new people'. It is interesting to note not only that a small group was buried (probably just one generation), but also that this group chose not to settle in the vicinity of this burial ground. No traces of settlement (or finds) dating from the Merovingian period have been found. In the neighbouring excavation of Gerner Marke, traces of at least three houseplans (dating between the late 6th and early 8th century) were found.[312] The new settlers chose to strengthen the *genius loci* of the Dalfsen site and incorporated the ancestors into their own history. The wealth of the two burials must have been a strong statement that this group was here to stay. This phenomenon is not new. We know of several burials dating from the Late Roman period and Early Middle Ages that can be interpreted as founders' graves for new communities in the eastern and central areas of the Netherlands, and there are plenty of comparable sites where older burial (mounds) were incorporated.[313]

From the Carolingian period onwards, the nature of the area changed yet again. Large numbers of trees were chopped for the production of charcoal, and in the course of the 10th century, the first 'Christian' farmer reclaimed the area for agriculture. From that period onward, arable plots were created beside the road, the terrain was levelled and the burial ground was no longer part of the communal history.

9.7 New meaning for new people

In 1963, the historic route (a small, sandy path) ceased to exist and the area was turned into arable land. The final layer of meaning of this landscape came into being as a result of the building developments that led to the excavation. Due to the great public interest in not only the burial ground, but also the deep history of the local road, the spatial planners sought inspiration in the history of the area for their design.[314] The local government commissioned a new spatial design in which new stories about old finds were integrated. In addition, a focal point, in the form of a reconstructed burial mound accompanied by information panels about the history of the place, was added to the design to become a symbol for the new settlers in a modern world.

312 Blom *et al.* 2006, 75 ff.

313 Delaruelle *et al.* 2012; Mees 2015; Van der Velde and Williams 2019.

314 Van der Velde and Bouma 2018.

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