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Wentink, K.; Gijn, A.L. van; C., Hamon B. Benedicte; Hamon, C.; Quillec, B.

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# Hoards from the Neolithic to the Metal Ages

Technical and codified practices

Session of the XIth Annual Meeting of the  
European Association of Archaeologists

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Benedicte Quilliec

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# NEOLITHIC DEPOSITIONS IN THE NORTHERN NETHERLANDS

Karsten WENTINK and Annelou van GIJN

## Abstract:

The aim of the present paper is to explore the nature of the Dutch Middle Neolithic flint axe depositions and interpret these on a cultural level. These axes associated with the Funnel Beaker Culture are often retrieved from waterlogged places either single or as part of multiple object hoards. By means of a metrical, micro-wear and spatial analysis it will be demonstrated that these objects are remnants of a highly structured phenomenon that was practiced throughout the research area.

## Samenvatting:

Het doel van het huidige artikel is een overzicht te geven van de Nederlandse midden-neolithische deposities en deze te interpreteren op een cultureel niveau. Deze bijlen, welke toegeschreven worden aan de Trechterbeker cultuur, zijn vooral gevonden in moerassige plekken, zowel alleen of als onderdeel van een meervoudig depot. Door middel van een metrische-, gebruikssporen-, en ruimtelijk-analyse zal worden aangetoond dat deze objecten onderdeel uitmaken van een uiterst gesstructureerd fenomeen dat ten uitvoer werd gebracht in het gehele onderzoeksgebied.

## Introduction

Already in the 19th century discoveries of groups of large axes puzzled those confronted with them. The fact that most were found in waterlogged places in particular formed the basis of speculation as to the nature of these objects. Surely people would not have been living in such inhospitable areas. Such axes were believed to represent hidden trade-goods, left there by merchants to be retrieved later. Or perhaps they were treasures hidden in times of trouble. A ritual explanation was only proposed, when all 'profane' explanations could be excluded. Presently such interpretations, so clearly devised by minds influenced by western capitalism, are widely dismissed (Fontijn 2002: 19). However until now, new studies focusing on the nature and interpretation of the Dutch Neolithic depositions remained absent.

The earliest intentional depositions known in the Netherlands were dated to the Late Mesolithic. These concerned pottery vessels that were buried in pits together with pieces of antler, bone and wood (Louwe Kooijmans 2001: 512). Although some other Early Neolithic finds are known that could be interpreted as intentional deposition, these are still a subject of debate (pottery vessel and red-deer antler from Bronneger (Louwe Kooijmans 2001: 112), three clusters of flint at Hoge Vaart (Hogestijn & Peeters 2001: 41).



Fig. 1. Research area (black square).

It was not until the Middle Neolithic that depositional practices became more structured and common. The focus of this paper will be the depositional practices associated with the Middle-Neolithic Funnel Beaker Culture (TRB - 3400-2850 cal. B.C.). The Dutch TRB (part of the TRB-Westgroup) has the advantage of a more or less restricted geographical distribution within the Netherlands, being mostly confined

to the northern half of the country. The most dense concentration of TRB finds however, are found on the Drenthe Plateau (fig. 1) located in the province of Drenthe (Bakker 1982). This till plateau was formed in the Saalian ice-age. In the Holocene period it was for the greater part surrounded by large peat areas of which the 'Bourtanger Bog' is one of the biggest in Europe. Although evidence of earlier TRB activity in Northern Germany concentrates in the wetlands formerly exploited by the Mesolithic predecessors (Midgley 1992: 311), the Dutch TRB finds from the large bogs are basically confined to peat track ways and finds of an alleged ritual character. As of yet no evidence is present to suggest that the bogs were actively exploited as part of the subsistence strategy by the TRB. Most settlements and megalithic tombs were located on the Drenthe Plateau. Although the till contains many large boulders that were used for the construction of the passage graves, it rarely contains good quality flint. This caused TRB people to be dependent on exchange contacts to acquire good quality flint axes, which were mainly produced in Northern Germany and Denmark. There is no evidence to suggest that high quality flint axes were locally produced (Beuker 2005: 277).

TRB flint axes share a very distinct technological feature; they are rectangular in cross-section, making them easily distinguishable from the oval axes made in the Atlantic tradition. The latter are predominantly found in the southern half of the Netherlands. Although some of these southern axes did reach the Plateau and were found in graves, they are completely absent from hoards (Bakker 1982: 95). The imported northern TRB axes, however, are found in numerous depositions containing either single or multiple objects that were retrieved from waterlogged places. It is the aim of the study to investigate and interpret this phenomenon of deposition on a cultural level. Do these remarkable finds from waterlogged places indeed reflect prehistoric ritual behaviour. If so, which patterns can be observed and how should these be interpreted? What was the life-history of these objects and how can these be linked to the lives of either individuals or groups? The present paper presents preliminary results of the Research Master thesis of the first author (Wentink 2006), and forms part of the second author's research project "The social significance of flint for Neolithic and Bronze Age communities" (Van Gijn *in prep.*). The compilation of the database, as well as the spatial and metrical analysis was performed by

the first author, whereas the microwear analysis was done in cooperation.

## The Dutch hoards, general patterns and interpretational framework

At present 20 multiple object hoards are known from the Netherlands containing multiple axes, rough-outs, flint nodules and other tools (Achterop 1960; Ter Wal 1996). Ter Wal has convincingly argued for the existence of single object hoards containing only one large axe deliberately placed in the peat (Ter Wal 1996). Furthermore, several other types of objects were placed in the peat in Neolithic times, such as horns of cattle, pottery vessels (probably containing foodstuffs) and disc-wheels. Although the former occurred during the TRB period, the depositing of disc-wheels is exclusively dated to the Single Grave Culture (SGC) (Van der Waals 1964).

Although several multiple object hoards consist of only 2 axes (n=7) most contain 3-5 axes (n=9) with only a few containing more. The latter however don't only consist of axes but also of flint nodules, long blades or other flint tools. Nine hoards, based on typology, can be placed in the TRB period and eight can be attributed to the subsequent SGC, the remaining three were unfortunately not of a distinguishable character (Achterop 1960; Ter Wal 1996). Many of the hoards were discovered during peat-cutting activities at the end of the 19th and beginning of the 20th century. Although many axes ended up in museum collections, contextual information is often of poor quality or completely lacking. Several objects were left in the field, lost, stolen or destroyed, and on one occasion the complete hoard was lost and is only known from 19th century written sources (see Pleyte 1882: 52). The reclamation of peat began as early as the 17th century and continued well into the mid 20th century. The fact that all known hoards have been found during the last 50 years of this reclamation one can only imagine what has been lost.

One of the problems in dealing with depositions and rituals is determining when a find should be considered as such. For a long time, researchers distinguished between several different categories of finds. Finds could be interpreted as hidden treasure, unretrieved traders stock, votive hoards, workshop hoards, etc. (Schuhmacher 1914). However, interpretations like

these present us with a number of problems. How do we determine to which category our finds belong and more importantly, do these categories, which mainly reflect modern western logic, conform to prehistoric ones? The latter question in particular should be answered negatively. Before a find could be labeled as being 'ritual' one had first to dismiss any 'logical', profane interpretation. However, many anthropological sources have shown that profane and ritual are two things that are often intertwined and that no real distinction can be made between the two (Hermkens 2005; Hampton 1999; Stout 2002; Fontijn 2002).

When dealing with deposition Fontijn therefore proposes to abandon these outdated attempts to align prehistoric behaviour with our own categories and to look instead at patterns within aspects of the objects themselves and the context in which they are found (Fontijn 2002). Although Fontijn's research deals with Bronze Age depositions, this approach should be equally suitable for Neolithic depositions. If these finds reflect prehistoric ritual behaviour, there should be consistencies that are shared by all finds which are remnants of that ritual. These patterns might be reflected by the context in which the objects are found, namely deposition in a certain context and the lack thereof in others. Moreover, the use-life of these objects may display patterning such as originating from the same source, having had the same treatment before deposition or showing wear-traces of specific activities, or the lack thereof. In order to interpret selective deposition one should not just look at a single hoard or object, but at all the evidence and at the patterns this evidence brings to light. This applies not only to depots, but also for that matter, to any other type of archaeological data. Interpretation should therefore be based on these patterns and not on individual objects. The question whether or not a specific object is a ritual deposition therefore becomes less relevant and more dependent upon the entire material context from that place and period.

## Sources & Methodology

### Database

The main tool used to gain access to patterns and subsequent interpretations of depositional practices was the compilation of a database (MS Access) containing information on hoards, single finds and sites related to the TRB culture. The definition of a site here

being a location where multiple finds, not related to a single act, were recovered, thus excluding multiple object hoards. Numerous sources were used for the compilation of the database. Site information was retrieved from literary sources and the Dutch National Archaeological Database (Archis) and included amongst others all known megalithic monuments, stone cists, TRB flat-graves, peat trackways, excavated settlements and many find-scatters. Object information was partly retrieved from literary sources and partly from museum collections. From the latter, axes were examined and contextual and metrical information was recorded. Sites or objects from the above sources were only incorporated when the find-location could be pinpointed with at least 2 km. Many of the older finds, for which only a rather vague description of the find-location was available were therefore ignored. Presently the database contains 1645 records, 1038 of which describe individual axes.

### Micro-wear analysis

From the recorded objects 69 axes were selected for micro-wear and residue analysis. The axes of several multiple object hoards in the collection of the Drents Museum were part of a travelling exhibition and were therefore not available for this research. Axes from a variety of contexts were examined, among which objects from multiple object hoards, supposedly single object hoards, finds from megalithic tombs and a collection of stray finds. Two excavated TRB settlements were included; they contained no complete flint axes, only some axe fragments (Van Gijn, *in prep.*).

The selected sample has been subjected to residue and use-wear analysis at the Laboratory for Artefact Studies, Leiden University. For the analysis a stereo-microscope (magnifications 10-160x) and an incident light microscope (magnifications 100-500x) were used. The incident light microscope used was attached to an adjustable stand, thus enabling high-power functional analysis on large objects. Photographs were taken with a Nikon DXM1200 digital camera. With the aid of the stereo-microscope a general survey of the object was carried out and obvious traces of residue located. For examination with the incident light microscope some objects were partially cleaned with alcohol to remove finger grease after the absence of potential residue was attested using both microscopes. Phenomena such as edge-removals, rounding, polish, striations and residues were recorded (Van Gijn 1990). Comparison of recorded

phenomena with experimentally used tools led to the interpretation of the object's functional life. The aim of the residue and micro-wear analysis was to obtain information on the use of flint axes in general and also to gain information on the use-life of individual axes.

### **Spatial analysis**

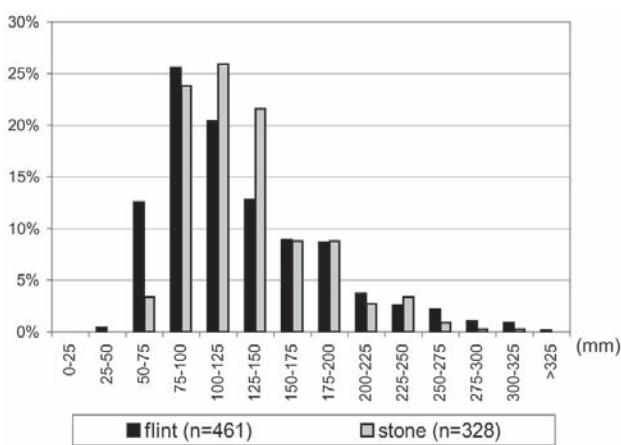
For each object or site in the database coordinates (Netherlands National System) were recorded, making it possible to plot them onto a series of maps using the GIS software MapInfo (Version 7.0). The records were combined with cartographical information including geological maps, soil maps, historical maps, land-use maps and a detailed digital elevation model of the province of Drenthe (AHN). Of many of the objects in the database only an approximate find location was known. For this reason an additional variable was added to each set of coordinates, describing the accuracy of the record. This could vary from an accuracy in the range of 1-10 m, 10-100 m, 100-1000 m or more than 1 km. The latter could only be used to give an approximate overview of find distributions. The aim of the analysis was to obtain information on the relation between sites and finds and also to investigate their relation to the landscape.

### **Metrical analysis**

#### **General observations**

The most conventional way of studying stone or flint axes is by means of a metrical analysis. Ter Wal carried out an extensive metrical analysis on a sample of 433 axes from the Drents Museum in Assen and concluded that it appears that axes from a wet context are generally much larger than those from a dry context (Ter Wal 1996). Although the current dataset is much larger, the patterns are similar to Ter Wal's observations. At present the database contains records of 1038 axes, these however cannot all be used in a metrical analysis. The older find descriptions in particular do not contain detailed metrical information about the axe, and in the light of the nature of this research it would take too much time to measure all available axes manually. Also a number of axes had to be dismissed from the analysis due to their being incomplete. For the variable 'length' 789 axes could be used in the analysis which is 76% of the total number of axes in the database and can therefore be seen as a representative number.

As can be seen in table 1, both stone and flint axes are similar in terms of length, although stone axes tend to be a bit larger with the exception of a few extremely large flint axes. However axes of different lengths they are not evenly distributed over the landscape. Axes from dry contexts are generally smaller than the average 128 mm, while axes from wet or border contexts are larger than average. Flint axes from border contexts (i.e. transition zones from dry to wet places) are almost double the length of the average. It is precisely this context from where most multiple object hoards seem to originate. The problem here is that many older finds are often only described as coming from the peat whereas their vertical position relative to the underlying sand is not mentioned. This vertical position is of interest as the peat gradually grew over time, making the contemporary land-peat border unrepresentative of the Neolithic situation. Depositing an object at the edge of the peat would mean that the axes would be positioned near the underlying sand, which would subsequently be covered by a layer of peat up to several meters thick. In the cases where the vertical position is mentioned, it is clear that these axes are often found in, on or near the underlying sand. This suggests that at the time they were deposited at the edge of the peat, something that is also observed in Denmark (Tilley 1996: 101).



**Fig. 2.** Frequencies of length relative to raw material.

It should be noted that the observed length of the axes represents the end-stage of the 'life' of each individual axe (marginalizing lost axes). The number of discarded flint axes, as can be seen in figure 2, shows a gradual increase as length decreases, with a peak in the 75-100 mm range. Stone axes however show a more extreme pattern of discarding which already starts in the 125-150 mm range, to peak at the 100-

context material	n	dry Av.length	n	wet Av.length	n	border Av.length	n	total Av.length
stone	19	115	27	142	19	143	328	130
flint	51	102	57	153	25	229	461	127
total	70	105	84	149	44	192	789	128

**Table 1:** Number and average length of stone and flint axes from varying geological contexts.

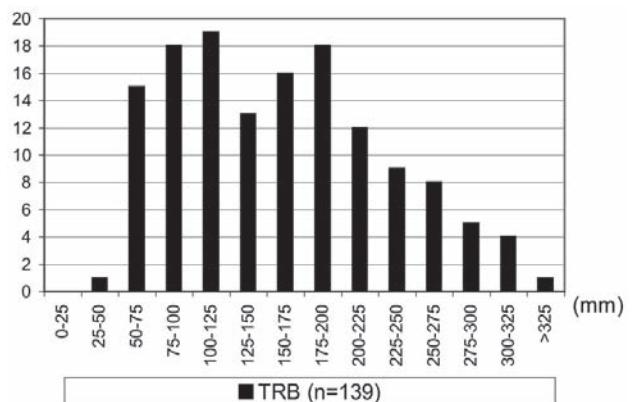
125 mm range. While a fair number of flint axes are still used into the 50-75 mm range, stone axes in that range are virtually absent. It seems that stone axes are discarded slightly bigger than flint axes. For this pattern a functional explanation can be offered.

Olausson showed, with the aid of experiments, that the main difference in usage between flint and stone axes lies in the configuration of their edges and inherent qualities of the raw material (Olausson 1983). A flint axe blade is generally sharper and thinner resulting in a deeper penetration with each blow, making it more suitable for fine carpentry. Stone axes have a blunter edge, but their raw material is less susceptible to damage. This, together with the total weight of the tool makes it more suitable for heavy work. Reduced length and therefore weight of the stone axe has a negative effect upon its effectiveness as a tool. With flint axes it is predominantly the sharp edge which makes the tool functional, resulting in an overall pattern of slightly bigger discarded stone axes relative to the flint axes whose effectiveness is less linked with tool length or weight.

### TRB axes

The dataset used above reflects a palimpsest situation as no distinction has been made between axes belonging to different cultures or periods. In fact this is quite difficult to do since many axes cannot be attributed to a specific Neolithic culture apart from the larger axes - the imported objects - which can often be assigned to either the TRB or SGC. The smaller - locally produced - axes do not have any defining characteristics. As they were produced from poor quality flint, the raw material defined to a greater degree the eventual shape of the artefact. This local flint was moreover transported by the Saalian glaciers from Denmark and Northern Germany to the Netherlands. Therefore the local raw material itself, although of poor quality, is indistinguishable from the raw material used for the production of the imported axes. Based on the nature of the local raw material, Bakker has suggested 150

mm being the maximum length of locally produced axes (Bakker 1979). If we only consider axes attributed to the TRB, we find they are predominantly large (>150 mm), imported axes (52,5%) while these form only 26,9% of the total dataset. From the axes smaller than 150 mm 25,9% come from a grave context, while from the total database only 9,5% of the axes smaller than 150 mm come from graves. This means that among the axes attributed to the TRB culture both axes from graves and the large imported axes are over-represented. This is reflected in figure 3 displaying two distinct peaks. There are however clear patterns within this dataset that are not influenced by the over-representation of these groups.

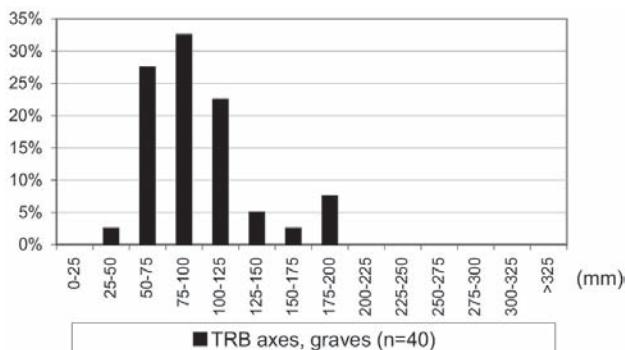


**Fig. 3.** Frequencies of TRB dated axes per length group.

### - Grave context

Ter Wal noted that TRB axes from graves are much smaller than those derived from wet contexts (Ter Wal 1996). When plotting the relative distribution of axes from grave contexts per length group this becomes particularly clear as can be seen in figure 4.

It is evident that we can speak of a very selective distribution. Virtually all axes are below the 150 mm line which according to Bakker separates imported axes from locally produced axes (Bakker 1979). When examining the individual axes from grave contexts, it



**Fig. 4.** Relative distribution of TRB axes from grave contexts per length group.

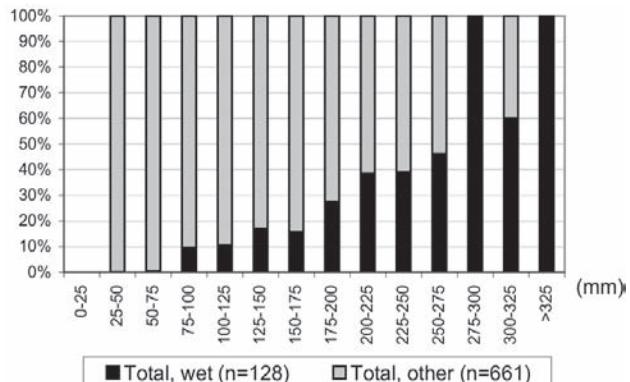
can be seen that many were indeed locally produced, however a number may have been worn-down remnants of imported axes. These imported axes often radically changed shape, as they were resharpened and repaired (Bradley & Edmonds 1993: 48). It is however virtually impossible to distinguish between these two groups. The overall character of this find-group suggests that predominantly, if not exclusively, used, worn axes accompanied the dead in their graves, something that will be elaborated upon below in the section dealing with the results of the micro-wear analysis.

#### - Wet context

According to the explanation presented above in section 4.1, the majority of the axes was discarded when their decreased length/weight-ratio began to counter tool effectiveness. However, a number of axes also entered the archaeological record while being still long enough to be effective (ca. 26% of the total number of axes were longer than 150 mm). This can partly be explained by people losing axes, something that would undoubtedly have occurred every now and then and which is also witnessed in anthropological contexts (White & Modjeska 1978). This, however, does not explain the presence of the more extreme cases. With the extremely large axes there is the question of functionality. Especially with flint axes the risk of breakage (due to end-shock) increases when the axe blade is longer. A hypothesis therefore might be that many flint axes exceeding the length of 200 mm were not functional, due to the imminent risk of end-shock, but also because of practical reasons related to hafting. The fact that most axes found in hoards are of extreme length (>250 mm) and in mint condition might indicate that they never served as functional tools (as usage would cause an axe to wear down). This can also be substantiated by the

results of the use-wear analysis, the detailed results of which are presented below, showing that none of the axes examined longer than 218 mm displayed traces of use. Further evidence as to the non-functional role of these large axes can be found when examining the find context from which they were derived.

In figure 5 it can be seen that although a number of smaller axes was also retrieved from waterlogged places, these form only a very small proportion of the total number of axes. It is striking however that the largest axes are found almost exclusively in wet contexts (finds from border contexts are included here). This would suggest that more practical reasons generally pertain to the discard of small flint axes. The extremely large axes, however, are only found deposited in wet contexts suggesting the need for a ritual rather than a secular explanation for discard.



**Fig. 5.** Distribution of all axes from wet contexts relative to axes from other or unknown contexts.

The production of tools of extreme sizes meant for non-functional purposes is a phenomenon that is also encountered in ethnographical context. In the Kimberley region of northwestern Australia, so-called Kimberly points were manufactured. Some points were specially produced for exchange purposes. These points could be recognized as such by their being much larger than the normal, functional points (Akerman, Fullagar & Van Gijn 2002: 18). Another example comes from Malinowski (Malinowski 1961: 88) who reports the following concerning arm-shells associated with the Kula-exchange:

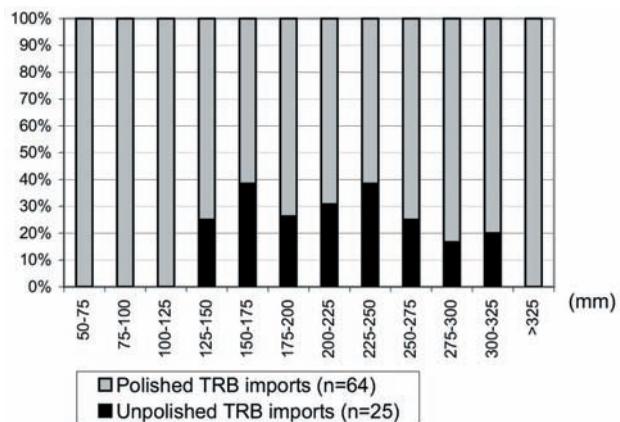
«[...] by far the greater number of the arm-shells, easily ninety per cent, are of too small a size to be worn even by young boys and girls. A few are so big and valuable that they would not be worn at all, except once in a decade by a very important man on a very festive day.»

Manipulation of size can thus be regarded as a powerful strategy to emphasize the special status of an object, and by doing so it is placed apart from conventional, profane tools.

For any Neolithic person, who would have been intimately familiar with the use of flint axes, it would have been clear-cut that the extremely large axes would shatter upon impact, when put to functional use. Their size placed them apart from functional life, an assumption which is being substantiated by the lack of use-wear traces and the almost exclusiveness of these objects having been deposited in wet places. We must also keep in mind the fact that these axes were not locally produced, but would have traveled 200-400 km before reaching the Netherlands. The lack of use-wear would therefore also prove that during the 'life' of the axe, which would undoubtedly have involved exchange and transport, at no time was the axe put to a functional use. It also suggests that the flint-knapper who created the axe, knew upon producing it that the axe had no functional purpose, a characteristic that was also recognized and respected by all people (owners?) that stood between the flint-knapper and the person/group depositing the axe 200-400 km down-the-line. Apparently some axes were solely produced for non-functional purposes and ended their lives being deposited in waterlogged places. We may therefore conclude that these axes were produced for ceremonial rather than functional purposes and also circulated in this sphere. Something that would further substantiate this interpretation, but which is not mentioned so far, is the presence of unpolished axes in the Netherlands.

Among the imported axes there are 27 specimens which can be dated to the TRB period that are either completely unpolished or partly polished, leaving the cutting edge unpolished. These unpolished axes form a well-known part of many multiple object hoards known from The Netherlands and are also often found in wet contexts with no accompanying finds. When inspected for the presence of use-wear, no traces of use were found on any of these objects. The lack of micro-wear traces, together with the find context indicates that they should be seen in the same light as the extremely large axes.

As can be seen in figure 6 the unpolished axes represent about 30-40% of the imported axes. Besides extreme length a way to clearly distinguish them from



**Fig. 6.** Relative distribution of unpolished TRB imported axes compared to polished imported axes.

functional tools, would have been by not polishing them. This is further emphasized by some axes which are partially polished with exception of the cutting edge. The fact that all of the unpolished axes came from wet locations, lacked traces of use and were often of extreme lengths all indicate that these represent a group of axes that has never been meant for usage but were specially produced of ceremonial rather than functional-related activities. They further illustrate the fact that these ceremonial axes were not tempered with. After production their physical form was not altered.

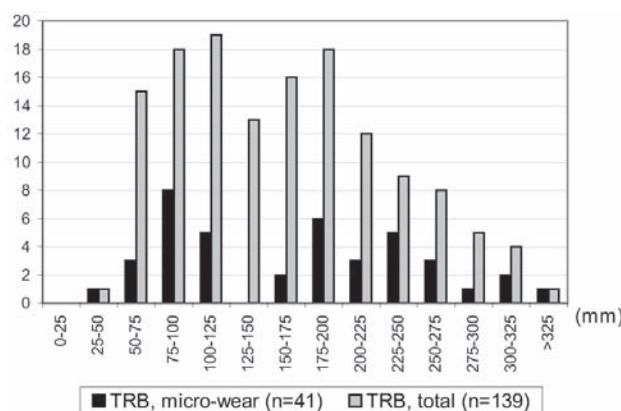
At the production centers in Northern Germany or Denmark axes were produced specially for ceremonial (exchange) purposes. There were different ways in which it could be made visually apparent that these axes should be placed apart from the functional axes. Axes could be made to such a size they would be totally unpractical, or they could be circulated in unfinished form. Often the latter would have been partially polished with the exception of the cutting edge emphasizing the fact that they weren't meant for functional use. These axes traveled vast distances to reach the Netherlands without ever having been put to use. Moreover these axes ended their lives of exchange in waterlogged places, where they were deposited either as a single object or as part of a multiple object hoard.

## Microwear and residue analysis

### Introduction

The 69 objects selected came from different collections and included finds from the National Museum

of Antiquities in Leiden, The Groninger Museum in Groningen, the Drents Museum in Assen and objects currently in private ownership. The sample mostly contained flint objects and predominantly axes (59 axes, 2 chisels, 7 blades and one scraper) from several different contexts. Of the 69 objects 19 were grave finds coming from megalithic tombs, 13 were single finds (including both 'stray finds' and objects generally interpreted as single object hoards) and 37 objects were part of multiple object hoards. The axes were of differing taphonomical quality. Some axes showed signs of patination, which could to some extent influence micro-wear analysis. Moreover, many axes had been part of museum collections, sometimes for over a hundred years. The mere handling of these objects could have obscured old traces and possibly caused new traces to develop. Also a variety of recent residues were encountered including such things as white paint, ink, nail polish, and glue. Sometimes the total lack of dirt residues indicated that the objects had been well cleaned, possibly also leading to the removal of potentially present prehistoric residues.



**Fig. 7.** Numbers of TRB flint axes selected for micro-wear analysis and to total number of TRB flint axes per length group.

The micro-wear analysis embraced axes from both TRB and SGC context. In the light of the present paper only results of the TRB axes (n=41) will be reported. The results of the analysis concerning SGC axes and their relation to the TRB axes are reported elsewhere (Wentink 2006). When plotting the length of the TRB axes selected for micro-wear analysis relative to the total number of TRB flint axes in each length group, it can be seen in figure 7 that axes from nearly each group were present in the analysis. Although the focus of the research lay with the large axes coming from supposed ritual contexts (single finds from waterlogged places, multiple object hoards

and unpolished pieces), the sample also contained some of the smaller axes that were analyzed for comparative purposes.

### General patterns

Use-traces were not equally present on all examined length groups. No TRB axe larger than 215 mm appeared to have traces of use. It is posited that a functional cut-off point lies around this mark. The fact that the largest SGC axe with use traces is 218mm long appears to substantiate this assumption. Many of the axes with use-traces showed clearly developed use polish which overlies the traces of grinding. Moreover rounding and micro-retouch were present indicating usage. Although on some occasions a clear polish was present which indicated wood working, often exact interpretation on contact-material level was not possible. This is most probably related to the fact that axes were used for all kinds of activities and not solely for the working of one contact-material. On occasion an axe showed traces of resharpening prior to deposition, especially in grave contexts. With the aid of the microscope differences within the grinding-traces could be observed as indicative of the use of different grindstones. These differences were often accompanied by slight differences in the grinding angle and thus interpreted as being the result of secondary resharpening of the axe. Traces of hafting could be observed in the form of friction gloss, and on occasion black residue (possibly remnants of birch-tar) could be identified.

### Grave context

As was already mentioned the overall character of axes coming from grave contexts could be typified as small and seemingly worn down. This is corroborated by the results of the use-wear analysis. In total the database contains records of 54 TRB axes coming from grave contexts. Of these, eighteen objects were examined for the presence of use-traces, which is 33.3% of the complete sample. The axes came from three different passage graves (D19 Drouwen, D5 Zeyen, and G2 Glimmen). Of the eighteen axes, sixteen could be positively described as having been used, as can be seen in table 2. The remaining two were classified as unsure, since it appeared that post depositional processes had obscured possible traces of use, not definitely excluding the possibility that they in fact were used.

contexts	use			used			resharpened			
	yes	unsure	total	yes	no	unsure	total			
D19	12	1	13	8	4	1	13			
D5	1	-	1	1	-	-	1			
G2	3	1	4	1	3	-	4			
total (n)	16	2	18	10	7	1	18			
total (%)	88.9	10.1	100	55.6	38.9	5.6	100			

**Table 2:** Micro-wear traces per context.

Although the majority of the axes appear to have been used, also a fair number of these were resharpened before deposition. In these cases, the cutting-edge predominantly displayed only very fresh-looking traces of polishing. However inside deeper negatives (caused by use) that remained untouched by the grindstone, use-polish could still be seen. Also on some occasions the angle used for resharpening had left the extreme edge of the axe intact including use-traces in the form of use-polish, rounding and edge-damage. Besides actual use-traces the majority of these axes (72,2%) also displayed traces of hafting. The axe from tomb D5 showed minor traces of red ochre on its cutting-edge, something that will be elaborated upon below.

It can be concluded that used axes predominantly accompanied the dead in the graves. This is also supported by the overall worn character and minimal length of axes from grave context. The resharpening of the axes seems to indicate that many were prepared for use to make sure that the deceased was accompanied by a sharp axe that was ready for use. These axes could very well have belonged to the deceased in life, therefore being intimately linked to the person who owned them. They would have been used during the clearing of fields and the construction of houses. Moreover these small axes would have often started out as being much larger, however each time the axe was resharpened their length decreased. It is therefore not improbable that axes like these were the possessions of specific people for many years.

## Depositions

In an attempt to isolate finds of a potential ritual character fourteen axes coming from multiple object hoards were examined for the presence of use traces. Moreover nine single finds of large axes were

selected solely upon the appearance of the axe, being either unpolished or much larger than average. For two of these axes it was known that they came from wet contexts, of the remaining seven no detailed contextual information was known, making it as yet impossible to determine whether or not these could have been deposited axes. However a very homogeneous image emerged while performing the analysis. With the exception of three single find axes, all artefacts appeared to show no traces of use. Some other quite interesting traces were found instead.

On 13 of the 20 remaining axes very clear wear-traces were found. They appeared to be caused by friction with a rather soft material, possibly hide or bark, perhaps a combination of the two. Interesting however was the overall presence of this polish. All ridges, cutting-edge and higher ribs (of the unpolished axes) displayed this gloss. Due to the overall presence of the gloss it was interpreted as having been caused by a material in which the object was wrapped in an as yet not identified material. This is not unthinkable since the axes originated some 200-400 km from Drenthe making it highly plausible that during transport the axe was wrapped in a soft material to protect it from damage. Another explanation is that since these unused axes were deposited in wet contexts, they also played a ceremonial role prior to deposition. This could have involved the object being wrapped in a certain material and being unwrapped on special occasions for display purposes, an activity that is also witnessed in ethnographic context in the New Guinea Highlands (Hampton 1999) and in Northern Australia (Akerman, Fullagar and Van Gijn 2002). Although it is impossible to tell exactly what happened, both explanations seem plausible, given the context and origin of these axes. Axes for which contextual information was available and which displayed these traces, came exclusively from wet contexts.

These traces were also witnessed on some single find axes, for which no contextual information was recorded. This might indicate that they could very well have had the same biography as those for which contextual information was present, suggesting that they would also have been deposited in wet contexts.

Another interesting phenomenon encountered while examining these axes was the presence of a red residue on over 65% of the axes (table 3), identified as being red ochre by means of X-ray powder diffraction (Dik, in Wentink 2006). The ochre seems predominantly located on the cutting-edge of the axes and was especially well preserved on the unpolished axes, probably due to taphonomic reasons. On some occasions only small fragments of red residue were encountered, however, on most axes clear traces of ochre were present all along the cutting edge. The residue was not accompanied by use-traces, which would have been the case if these axes were involved in some sort of contact with unprocessed ochre. It can thus be concluded that the ochre most probably was applied as a pigment paste.

In the preceding section it has already been argued that some axes were produced solely for ceremonial purposes. This is substantiated by the fact that the axes do not show traces of use and moreover, often do show traces of being wrapped in a soft material. Another feature that distinguished these 'ceremonial' axes was the presence of a red pigment on the cutting edge, further emphasizing the fact that these axes were not meant for usage.

## Spatial analysis

### Introduction

For the spatial analysis relatively few data could be used, as often objects cannot be dated to a specific

culture. As mentioned before, Late-Neolithic axes are virtually indistinguishable from TRB axes, especially when it comes to the locally produced specimens. Plotting all Neolithic axes on a map would therefore result in a palimpsest in which all potential patterns would be obscured. However, when we only plot TRB dated axes, we will inevitably only see either axes coming from secure TRB contexts (mostly graves) or the large imported flint axes, which are predominantly interpreted as being ritual in character. Although we can look for patterns within the distribution of these large TRB axes, it is hardly possible to compare this with the distribution of the small, used axes, found outside graves. We know for a fact that at least a proportion of these small used axes were retrieved from wet contexts. This could indicate intentional deposition, however, since we do not know the dates of these axes, they cannot be used for interpretational purposes as to TRB cultural behaviour.

Based on the observations described above, the following characteristics can be presented to identify objects that are likely candidates of selective deposition:

- Specimens longer than 218 mm (this being the largest used flint axe from the sample selected for micro-wear analysis).
- Unpolished specimens longer than 150 mm.
- Presence of red ochre residue on cutting edge.
- Lack of use traces, but presence of traces of packing/transport.
- Found together in a hoard with other objects that conform to either of the above stated characteristics.

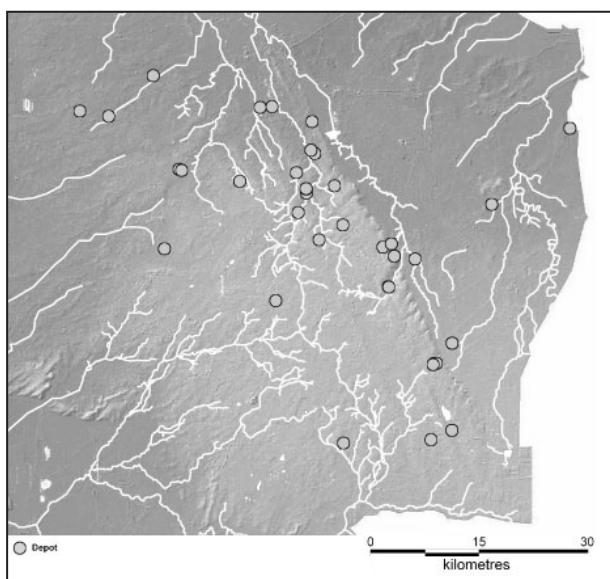
All objects in the database have been reviewed with the above characteristics in mind. Objects were individually evaluated, to decide whether or not they should be interpreted as an intentional deposition. Most objects labeled as intentionally deposited

find type	treatment				packing/transport				context	
	polished		ochre		used				wet	unknown
	yes	no	yes	no	yes	no	yes	no		
hoard (n=14)	8	6	7	7	1	13	8	6	12	2
single (n=9)	4	5	8	1	3	6	5	4	2	7
total (n)	12	11	15	8	4	19	13	10	14	9
total (%)	52.2	47.8	65.2	34.8	17.4	82.6	56.5	53.5	60.9	39.1

Table 3. Different treatments per find type.

conformed to more than one of the above mentioned characteristics. Objects that scored positive on the presence of ochre or presence of traces of packing/transport were only selected if they also scored on any of the other characteristics. Objects that were longer than 218mm, unpolished or coming from a multiple object hoard were automatically selected. This method resulted in the selection of 55 axes belonging to 36 depots, which could be interpreted as being of a potential ceremonial character.

### *Natural landscape of depositions*



**Fig. 8.** Spatial Distribution of TRB depots on the Drenthe Plateau.

When the 36 depots that were selected as likely candidates of selective deposition were spatially plotted, a clear pattern emerged. When examining the spatial distribution it is striking to see that virtually all selected axes are located in stream-valleys that would have been filled up with peat (see fig. 8). It was already noted that many hoards with contextual information were found near the border of the peat, however in Drenthe peat-growth was common in many different places. The obvious lack of selected axes in the most extensive raised bogs such as the Bourtanger Bog, must therefore be noted. Depositions only seem to occur here in the direct vicinity of an intersecting stream.

Axes dated to the TRB but which were not included in the selection, showed a far more diverse distribution pattern. These were present in all zones, including

the higher grounds where they are found between the megaliths and find scatters of a potential domestic nature (hardly any settlement has been excavated). Also a high proportion of TRB axes between 150 mm and 218 mm appeared to be located in the stream valleys possibly suggesting that these also concern deposited objects. This group therefore would be an interesting subject for further research. The same applies to many of the TRB battle axes that have gone unmentioned so far, but were also often found in stream valleys. Virtually no contextual research has been carried out for this group in the Netherlands. It is however known from Denmark that battle-axes appear in a variety of ritual contexts, such as at enclosures (buried in pits with pottery and flint axes at Sarup), or as part of multiple object hoards (Midgley 1992, 245; Skaarup 1990, 86; Tilley 1996, 101).

The stream valleys in which the selected axes were found formed predominantly in the Pleistocene, when at the end of the Saalian ice-age streams of meltwater eroded their way through the newly formed till plateau (Spek 2004: 203). In the Weichselian these valleys were deepened and widened. However at the end of the Weichselian the valleys were blocked by large deposits of cover-sands, resulting in the formation of large strings of small bogs and fens (Spek 2004: 203; Kuijer 1991: 23). Due to the Holocene rise in groundwater-levels (as a result of rising sea-levels) these obstructions eventually eroded and streams re-emerged. During the Atlantic, sea-levels continued to rise causing the streams to become more stable and stimulated peat growth in the stream valleys (Kuijer 1991: 23). This would have resulted in a situation during the Middle-Neolithic in which the lower parts of the valleys would be the domain of peat growth and would be flooded during winter. The lack of clear wood-remains indicate a fairly open landscape with only few trees, in contrast to the higher grounds on which a dense forest was present (Spek 2004: 209; Bakker 1982: 114). A number of depots are located near the starting point of a stream while others are found further downstream in the valleys. Within these valleys the depots are predominantly found at the border of the peat, which would have been the most practical position since then the person(s) depositing the axes would not have to enter the potentially dangerous peat zone.

Although archaeologists usually focus upon the peat itself in their explanations, Neolithic people did not

necessarily do the same thing. As many depots are located at the transitional point in these valleys between the lower peat and the higher sands, the latter may potentially be equally important.

At some locations on the higher grounds in the valleys, non-permeable layers of sediment (till, loam) were present beneath the sand. It is known that in historical times at these places water would seep from the ground. These places should have been recognized by people from obvious differences in local vegetation (oak/birch forest) (Spek 2004: 206). It is impossible to predict exactly where these places would have been located in the Neolithic (due to highly variable groundwater-levels and local geology). Also groundwater levels would have been influenced by the dense forest on the higher grounds, which would have caused high evaporation rates, thus lowering groundwater levels (Spek, pers. comm.). It is striking, however, that most of the hoards in the stream valleys are located on a soil type that would be expected in the above scenario. Together with the observation that part of the hoards are located at the beginning of streams we might envisage that people were depositing items at places where water would emerge from the ground. These places would not have been clear wells, however, historical sources indicate the existence of specific names to describe such places from the Middle Ages onwards (Spek 2004: 206). This indicates that people did recognize such places and could attribute special meaning to them. At this point it is unfortunately impossible to prove such a scenario, as it would require the exact find location of each depot and also detailed geological information of that find spot. Since the first is generally lacking the latter is impossible to gather. The point being made however is that we should not solely focus on the peat as being of prime importance. For some hoards for which detailed contextual information is present, it is clearly stated that finds were retrieved from the sand, near the peat and not from the peat itself. Furthermore the rise in groundwater-levels caused the peat to grow and to cover areas that in the Neolithic would have been sand. Therefore axes recovered during peat digging or during other activities on the land that would formerly have been covered with peat, were not necessarily deposited in the peat but might well have been engulfed by it during later times.

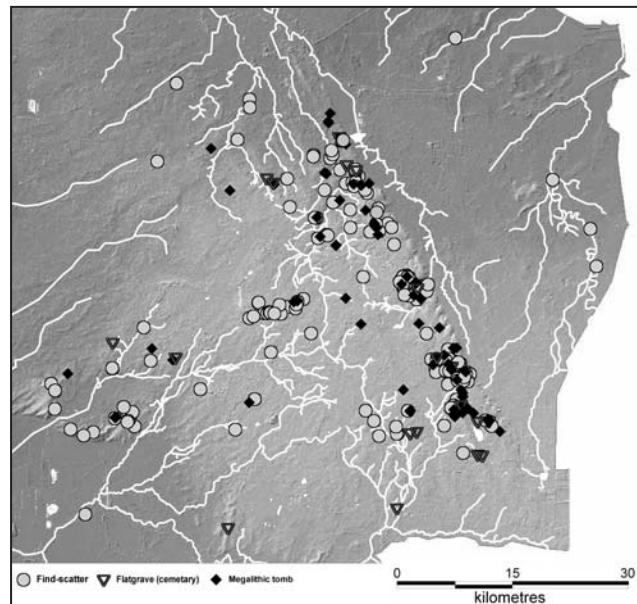


Fig. 9. Spatial distribution of TRB sites on the Drenthe Plateau.

### Cultural landscape of depositions

The spatial distribution of the 36 selected depots conformed very well to the overall distribution of TRB sites, depicted in figure 9. For Denmark it was noted that half of the hoards were found within close proximity (500-1500 m) to megalithic graves (Midgley 1992: 282). This also appears to be the case in the Netherlands as clearly many locations can be found where a depot was located close to a megalithic tomb, but also proximity to flat-graves can be noted. Many flat-graves will not have been discovered, due to their naturally obscured nature. It could very well be possible that hoards that do not conform to these observations are instead located in proximity to undiscovered flat-graves.

About half of the depots (53%) could be found within a range of 600-1900 m from the nearest grave. Although this suggests a link between the two it also indicates a separation since no depot was found less than 600 m from a grave. This is in contrast to many of the find-scatters, possibly remnants of settlements, which are located within 500 m of a grave. By no means should this be interpreted as settlements being located near graves. Many find-scatters are found isolated in the landscape with no indication as to the presence of nearby graves. It does however imply that it was apparently not considered problematic to locate a settlement within 500 m from a tomb (or vice versa, assuming these find-scatters represent settlements), whereas all depots were kept well outside this ran-

ge. Depots occurred relatively near graves, however at the same time a certain distance was maintained between the two.

Although the objects deposited are of a non-local origin the practice of depositing however is very much a local affair. Appropriate places where depositions took place were selected in close range of places of burial and habitation. Habitation and tomb-construction primarily took place on the higher grounds of the Drenthe Plateau. The places selected for deposition at the transition from marshes to the higher, dry grounds are therefore of a liminal nature. On the one hand these stream-valleys will have been perceived as natural boundaries between social groups as well as boundaries between people and supernatural entities (Fontijn 2002: 265). On the other hand, the higher grounds were densely forested. The many stream valleys would therefore have played an important role in water transport, thus connecting social groups. On a physical level these places can therefore be perceived as clear-cut divisions between the higher habitable grounds and the natural waterlogged stream valleys. On a cultural level these places can both be perceived as boundaries separating social groups, but at the same time also as places binding social groups.

## Conclusion

The present paper set out to report the preliminary results of the research currently being carried out. Interpretation of the role these axes played within their cultural context will be the aim of further study, which will be reported upon in future publications. We can therefore conclude here with the observations that flint axes played an important role in TRB cosmology/ideology. The axes that were found in depots were probably used in rituals or ceremonies. They were kept apart from functional tools at all stages of their lives. They were specially produced and were exchanged over vast distances. These axes would often have been visually set apart from other axes by their size or by being unpolished. This separation was further emphasized by red pigments (ochre), located near the cutting-edge of the axe. During transport they would have been packed in soft material to protect them from damage. It is unfortunately impossible to tell the exact role these axes played during ceremonies and rituals. Their biographies however ended when they were deposited near the edge of the

peat in one of the numerous stream valleys present on the Drenthe Plateau. Although these places were located near the places of burial and habitation, at the same time an appropriate distance between the two was observed. By doing so it was clearly emphasized again and again, that these objects had to be placed apart from profane, functional objects.

Together with the very consistent micro-wear patterns involving traces of packing or wrapping and the residue of red ochre, the spatial patterns seem to suggest the existence of a well-defined ritual. These depositions occur over the entire Drenthe Plateau, indicating that this ritual was widely adopted and performed by the TRB people. The fact that these axes were specially produced for ceremonial or ritual practices combined with the fact that they are found deposited in wet places over so vast an area of Northern Europe, seems to indicate that this ritual is closely intertwined with TRB cosmology/ideology. It would therefore be fascinating to extent this analysis to the deposited axes from Germany and Denmark. This would provide information about the homogeneity as well the local nuances of this ritual.

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## **Contact**

Karsten Wentink  
Annelou van Gijn

Laboratory for Artefact Studies,  
Faculty of Archaeology  
PB 9515, 2300 RA  
Leiden  
The Netherlands  
[k.wentink@arch.leidenuniv.nl](mailto:k.wentink@arch.leidenuniv.nl)  
[a.l.van.gijn@arch.leidenuniv.nl](mailto:a.l.van.gijn@arch.leidenuniv.nl)