Once again Toterfout-Halve Mijl

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A reanalysis of the former investigation of the Bronze Age barrow cemetery at Toterfout-Halve Mijl has yielded new insights. The aim of the research was to arrive at an interpretation in social terms of the burial evidence of the barrow cluster. Three qualitative variables and the sex and age of the deceased were compared with the main variable the diameter of the mound. New insights in the burial gift pattern were revealed by the physical-anthropological research of the cremation remains

1. Introduction

One of the tasks involved in my research project 'Middle Bronze Age societies in the south of the Low Countries'[1] was the gathering of data on the barrows in the southern part of the Netherlands and northern Belgium. The cluster of barrows of Toterfout-Halve Mijl (Veldhoven, Dutch province of North Brabant) (fig. 1) was taken as a first case study. The aim of the research was to arrive at an interpretation in social terms of the burial evidence of this cluster. The cluster was chosen because its excavation, by W. Glasbergen, had been meticulously conducted and published (Glasbergen 1954). There is currently a trend in Dutch archaeology to interpret burial evidence in terms of social organisation. The reason for this is that of all the remains of prehistoric material culture, those relating to the treatment of the deceased constitute highly concrete evidence for conscious prehistoric behaviour. The way in which the deceased were treated can tell us something about a prehistoric society's views on death. The key question in burial research is to what extent the differences observable in burial evidence reflect social differences within a society. Although it is very difficult to infer direct links, it is worthwhile to determine the variability in burial rites. A quantitative ranking in burial evidence resulting from such an analysis can be used as an indication of the minimum vertical differentiation in the social structure (O'Shea 1984, 18).

An example of an interpretation of burial evidence in terms of social organisation is the study by E.H. Lohof (1991). Lohof tried to demonstrate a vertical stratification in the burial evidence of the northeast part of the Netherlands on the basis of a number of qualitative variables. One of the main criteria he used in his study was the 'labour input', by which he understands all the archaeologically visible efforts required to bury a deceased person. The volume of the mound is one of the most important variables. Although there is always the risk that the overall amount of labour invested in a burial rite may not correspond to the labour investment that is measurable in an archaeological context (O'Shea 1984, 11), a mound covering a grave may be regarded as an important measurable and quantifiable element of burial evidence.

In his study Lohof compared the diameter of the mound[2] with a number of qualitative variables, such as the presence of grave goods, the treatment of the deceased, the presence of a cist or a stone slab covering the grave, the orientation of the grave and the presence of a mortuary structure. He then found that the barrows in the northern part of the Netherlands could be hierarchically grouped. One group, consisting of 'top mounds', dates from the Early Bronze Age to the end of the Middle Bronze Age B (Lohof 1991, 249-252).

Another of Lohof's research aims was to demonstrate hereditary status. His assumption was that the criteria age, sex and personal achievements determined whether or not a person was buried in a barrow. His research consequently evolved around the presence of primary child burials beneath large mounds. According to Lohof's assumption, children could not have status positions higher than those of adults because of their young age and lack of personal achievements. Lohof's analysis showed that primary child burials do occur in the northern part of the Netherlands, but not beneath large mounds. This led him to the conclusion that in his area of research hereditary status cannot be demonstrated on the basis of the labour invested in the burial rite.

Although the amount of evidence from Toterfout-Halve Mijl is dangerously small, an attempt has nevertheless been made to make statements on the social organisation on the basis of the evidence of burial rites obtained from the cemetery. A number of variables were selected from Lohof's study that show a correlation with the basic variable of the diameter of the mound, namely the presence of grave goods, the presence of a mortuary house, the

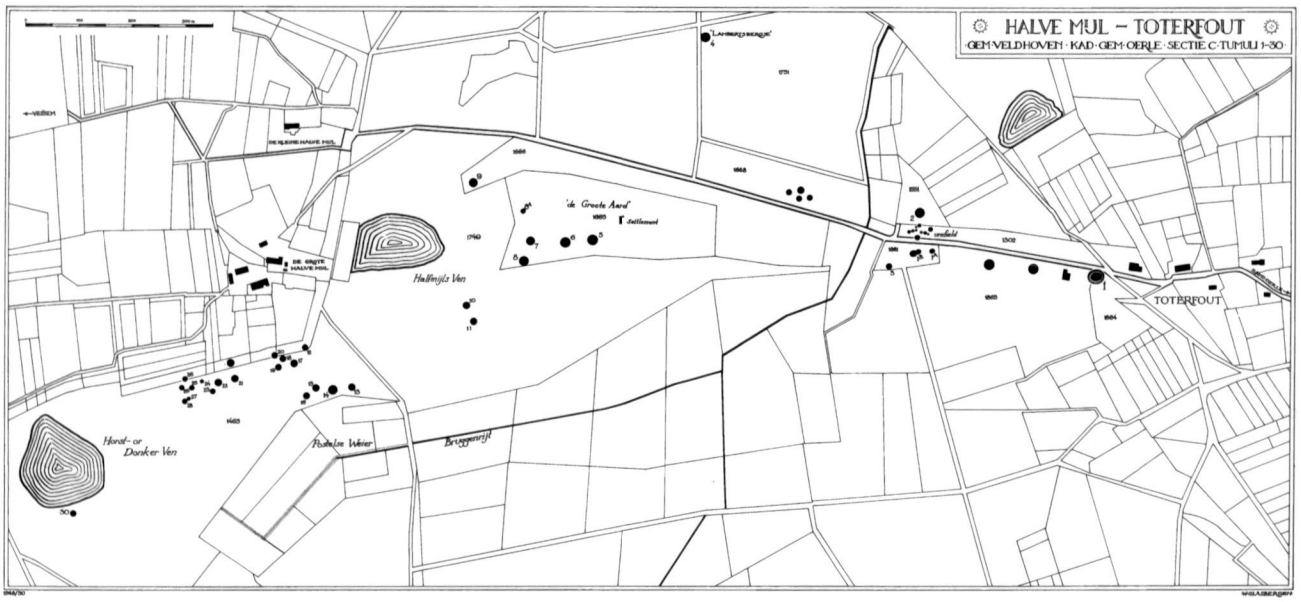

Figure 1. An overview of the Bronze Age cemetry of Toterfout-Halve Mijl (from Glasbergen 1954).

treatment of the deceased and the age class/sex ratio. These variables have been compared with the diameter of the mound. The age class/sex ratio will be included in the discussion of the first three variables below.

2. A brief description of the cemetery

The cemetery lies between the hamlets of Toterfout and Halve Mijl in the municipality of Veldhoven (province of North Brabant) (fig. 1). The cluster of barrows, with a length of two kilometres, lies on an east-west oriented coversand ridge. In the last century a local archaeologist, the well-known Petrus Norbertus Panken (1819-1904), dug up many barrows in this area.[3] In most of the barrows that he 'investigated' he found small amounts of charcoal. In only three did he find any cremation remains (Glasbergen 1954, 16).

After just under a century of undisturbed peace, the area containing the cemetery threatened to be disturbed by extensive large-scale moor reclamations and the digging and agricultural activities of the local occupants. The Biologisch-Archeologisch Instituut (BAI) (Institute for Biology and Archaeology) of Groningen then decided to excavate the cluster of barrows in its entirety. In the period 1948-1951 the cluster consisted of thirty-eight barrows. Thirty-four of these barrows were excavated.

Three separate groups of barrows were distinguished in the cemetery:

1. an eastern group near Toterfout;
2. a central group on the Groote Aard;
3. a western group to the south of the hamlet of Halve Mijl.

One barrow (no. 4) lies to the north of the central group.

In the middle of the 19th century there were some pools and a rivulet to the north and south of the coversand ridge. That environmental situation probably closely resembled that at the time of the Bronze Age occupation. The area is under cultivation today and the pools have been drained by the deepening and canalization of the rivulet 'De Bruggenrijt'.

3. New evidence

One of the problems in barrow research is that a barrow may be the result of several raising or burial phases, which may be spaced between a few days and several hundred years apart. Such a raising or burial phase is generally referred to as a 'mound period' .[4] That term will be used as a working unit in the following analysis. In total, thirty-four barrows were investigated at Toterfout-Halve Mijl. Twenty-four barrows comprised one mound period and nine barrows consisted of two mound periods. One barrow comprised three mound periods. That means that a total of forty-four mound periods were excavated. They were found to contain fifty-one graves, which yielded the remains of forty-seven bodies, five mound periods did not contain human remains.

Some of these mound periods have been dated with the aid of the C14 method (see the dates given in 1 and 2 sigma in fig. 2). Two mounds were found to date from the Early Bronze Age (EBA 2000-1800 cal. BC)[5], nine from the Middle Bronze Age A (MBA A 1800-1500 cal. BC) and four from the Middle Bronze Age B (MBA B 1500-

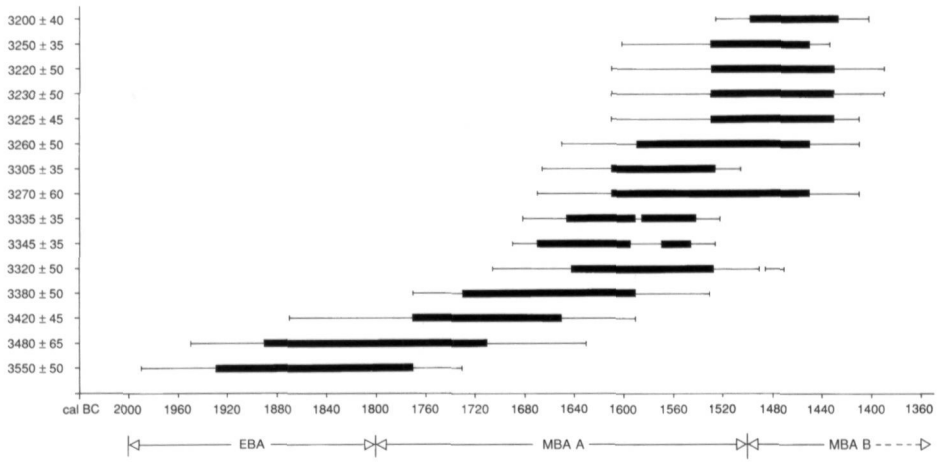

Figure 2. Table of radiocarbon dates (Lanting/ Mook 1977).

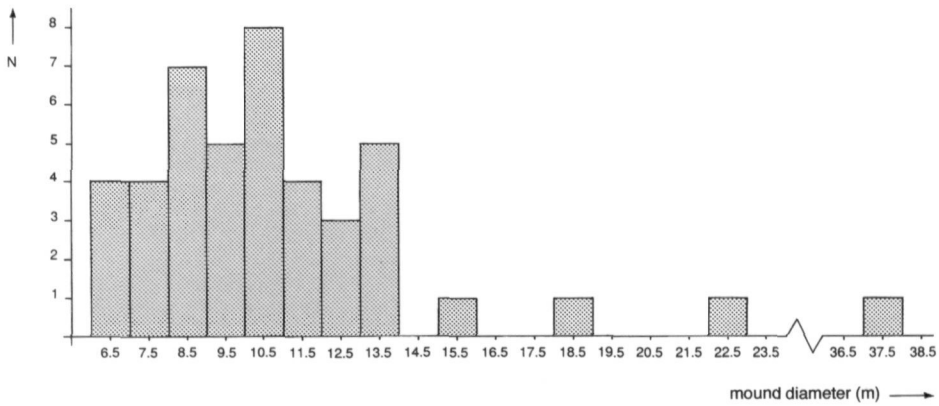

Figure 3. Histogram showing the diametre classes.

1100 cal. BC).[6] On the basis of these dates it is estimated that the cemetery was used for between 460 and 720 years. In the further analysis a period of use of 600 years will be assumed.

The diameters of the mounds were measured so as to enable comparison of the labour invested in the individual mound periods. The maximum width of the peripheral structure was measured. The diameters of the individual mound periods vary from 6 to 37.4 m (fig. 3).

Two main classes of mounds can be distinguished. The first consists of mounds with small diameters, of 6 to 14 metres. This class comprises 91% of all the mound periods (n=40). The second class comprises mounds with diameters of 14 metres or more. A conspicuous feature of the four mound periods of this last class is that they are all surrounded by ring ditches and all have early dates. The forty other barrows are surrounded by rings of postholes.

Waterbolk determined the relative chronology of the cemetery on the basis of the results of his palynological research. There proved to be a spatial chronological distribution: the older mounds were all in the eastern cluster and the younger mounds in the central and western clusters. This was corroborated by the C14 dates.

There also proved to be a spatial difference in the sizes of the mound periods: the larger mounds lay on the eastern part of the coversand ridge, the smaller ones on the western part.

The cemetery of Toterfout-Halve Mijl was found to contain 25 primary burials, 19 of which were cremation burials, the other six being inhumations. The 26 secondary burials comprised 21 cremation burials and one inhumation. In total the cemetery contained 47 cremation burials (85%) and seven inhumations (15%). The majority of the burials were single burials: one corpse per grave. Three were multiple burials. Multiple burials can be explained by

Table 1. The results of the physical-anthropological research by E. Smits.
p = primary burial, s= secondary burial.

Mound period	Find No.	Diameter	P/S	Determination	Treatment of the deceased	Grave gifts
1	1	37.4	s	indeterminated	cremation: remains in urn on surface	-
1	1aI	37.4	p	♂, 22-40 y	cremation: remains scattered on surface	bone pin
1	1aII	37.4	p	♂ ?, 20-40 y + ♀ ??, 12-24 y	cremation: remains scattered on surface	-
1	3 = 1bI	37.4	p	♂ ??, 15-18 y	cremation: remains scattered on surface	-
1	3 = 1bII	37.4	p	♀ ??, 15-20 y	cremation: remains scattered on surface	-
1	4 = 1c	37.4	s	♂, 22-40 y	cremation: remains in pit	bronze discolouration
1	5 = 1d	37.4	s	♀, 22-30 y	cremation: remains in burial pit	bronze discolouration
1	7 = 1f	37.4	s	child, 7-12 y	cremation: remains in tree-trunk (1.52 m)	-
1B	60a	22.3	s	♀, 22-40 y	cremation: remains in urn in pit	bronze discolouration
1B	61a	22.3	s	♀ ?, 22-40 y	cremation: remains in urn in pit	bone pin
1B	62a	22.3	s	♀, 40-60 y	cremation: remains in urn in pit	bronze discolouration
1B	63	22.3	s	child, 8-12 y	cremation: remains in burial pit	pierced phalanx + antler + bronze discolouration
1B	65a	22.3	s	♀, 20-40 y	cremation: remains in urn in pit	bronze discolouration
1B	74	22.3	p	♂, 30-40 y	cremation: remains in urn in burial pit	-
1B	76	22.3	s	♀ ?, 30-60 y	cremation: remains in tree-trunk	-
2	35a	18.4	p	indeterminated	cremation: remains in burial pit	-
4	88	13.0	p	♀, 30-60 y	cremation: remains in tree-trunk	-
5.I	44	10.2	p	child, 2 y ± 8 months	cremation: remains in burial pit	pierced decorated bone fragment + antler
5.I	47	10.2	s	child, 4 y ± 12 months	cremation: remains on surface	-
5.II	39	12.0	s	child, 0-3 y	cremation: remains in burial pit	phalanx brown bear + antler
8.I	48	10.9	p	♀ ??, 18-40 y	cremation: remains in burial pit	-
8a	27	6.4	s	juvenile ?	cremation: remains in posthole	-
8a	28	6.4	s	< 7 y ?	cremation: remains in posthole	-
8a	29	6.4	s	indeterminated	cremation: remains in posthole	-
8a	30	6.4	s	child, 12-15 y	cremation: remains on surface	-
8a	31	6.4	s	child, 7-8 y ± 24 months	cremation: remains in posthole	-
8a	32	6.4	s	child, 7-14 y	cremation: remains in posthole	-
8a	33	6.4	s	indeterminated	cremation: remains in posthole	-
8a	34	6.4	p	child, 2-4 y	cremation: remains in burial pit	-
8a	35	6.4	s	(?)♀, 22-40 y	context unknown	-
10	50	8.9	p	♀ ?, 20-40 y + 7 y ± 24 months	cremation: remains in burial pit	earthenware pot
10	50a	8.9	p	♀, 20-40 y	cremation: remains in burial pit	-
11.I	53	7.8	s	human ?	cremation: remains in posthole	-
14	70	12.7	p	♀, > 35 y	cremation: remains in burial pit	-
16.I	59	6.0	p	adult	cremation: remains in burial pit	-
17.I	14	8.6	p	♂ ?, > 20 y	cremation: remains in burial pit	-
18	13	9.1	p	♂, 30-60 y	cremation: remains in burial pit	-
19.I	16	9.1	p	adult ?	cremation: remains in burial pit	-

Figure 4. Photographs showing the brown bear phalanx, the drilled phalanx and an antler fragment.

assuming that the persons in the grave all died at the same time. Mound No. 1 contained a multiple burial of five individuals.

The cremation remains that were found in the various mound periods were analyzed by Krumbein in 1951 (Glasbergen 1954, 126-128). This German family doctor was one of the pioneers of physical-anthropological research. As our knowledge in this field has greatly increased over the past forty years, it was decided to reanalyse the cremation remains of Toterfout-Halve Mijl.

E. Smits of the Institute for Pre- and Protohistory in Amsterdam analyzed 40 assemblages of cremated remains (tab. 1). There proved to be a great discrepancy between her results and those of Krumbein. Smits arrived at a more specific age class division. In some cases cremation remains that had initially been identified as the remains of a multiple burial of an adult and an Infans I proved to represent the remains of a single burial of one adult. This reduced the number of graves containing the remains of children (Infans I and II) from fifteen to eleven.

A remarkable discovery was the green discolouration that was observed on six assemblages of cremation remains (tab. 2). This phenomenon had already been observed before by German researchers (Kühl 1987). They found that this green discolouration is the result of the oxidation of bronze objects which accompanied the deceased on the pyre. The high temperature of the pyre (approx. 850°C) softened the bronze and caused a chemical reaction to take place on the remaining bones (Kühl 1987, 94). The position of the green discolouration is a strong indication of the original position of the bronze objects.

The green discolourations observed at Toterfout-Halve Mijl were on diaphysis fragments (bracelet?), on fragments of vertebrae, on skull fragments and on a fragment of a rib (fibula?). The green discolouration on the os frontale may be the result of the burning of a bronze decorative element of some headdress. In northwest Germany most cases of green discolouration on the *os frontale* concerned the remains of adults but at Toterfout-Halve Mijl the bronze oxide was observed on the bones of a child of 8-12 years old. Although this bronze oxide was observed on six assemblages of cremation remains, no bronze was found during the excavation. This must mean that the bronze objects were recovered from the cooled ashes and reused, which would imply that the original number of grave goods that accompanied the deceased at Toterfout-Halve Mijl was greater than that found during the excavation. The German researchers also found that the percentage of graves that originally contained bronze objects was twice as high as initially believed (Kühl 1987, 97).

The green discolourations proved to be limited to the cremated remains of the secondary graves of two mounds. These mounds, *i.e.* tumuli 1 and 1B, are not only the largest of the cluster, but also the oldest.

In addition to human bones, the cremation remains also included remains of animals. In three cases the remains of children were found to be mixed with fragments of antler. Two of these children had moreover been buried accompanied by a pastern: one concerned a brown bear and the other a pierced pastern of an unidentified animal species. (fig. 4).

Animal bones found in burial contexts are usually interpreted as the remains of a meal for the deceased. Bear phalanges or deer antler encountered in graves are however

Table 2. Precise position of the green discolouration, P= primary burial, S= secondary burial.

mound period	find number	P/S	result of determination	position of green discolouration
1	4=1	s	? ♂, 23-40 y	fragment of vertebral body
1	5=1	s	♀, 23-30 y	fragment of vertebra and on a fragment of an arm or a leg
1B	60a	s	♀, 23-40 y	fragment of a rib
1B	62a	s	♀, 40-60 y	fragment of a diaphysis (arm/leg) and on a knee joint
1B	63	s	child, 8-12 y	on the forehead (midway above the eyes)
1B	65a	s	♀, 20-40 y	on vertebra fragments, arm/leg and skull

more likely to have had a symbolic significance. Claws and canine teeth of the brown bear, *Ursus arctos* L. appear rarely in prehistoric graves. Most claw finds occur in an Iron Age or Roman period grave context, where they are drilled through and therefore used as a pendant (Schönfelder 1994, 221). This use is a strong indication that the teeth and paws, the deadly weapons of the brown bear had magic qualities. According to Ranke the bear symbolised power in the Germanic world (Ranke 1985, 47).

German literature mentions examples of bears' phalanges found in rich male graves from the Iron Age (Lehmkuhl 1987, 109). In cases in which several bear's phalanges have been found in a grave it is believed that the corpse was wrapped in a bear's hide (Holck 1986). The Bronze Age child's grave at Toterfout-Halve Mijl contained only one phalanx, which had not been pierced; it may possibly have been kept in a small purse carried around the neck. Bronze Age bear phalanges are very rare. It is striking that the few known cases were found in the graves of young children (Kühl 1981; Teichert 1990). In the Bronze Age maybe the magic quality of the bear amulet was not a symbol of power as in later periods but more a protective sign exclusively intended for children.

Only few other cases of antlers grave goods are known; occasionally antler fragments are found in Iron Age graves (Kühl 1984, 212).

Since the reanalysis by E. Smits we know the age and/or sex of 35 individuals.

The division according to age shows that all age classes are represented with the exception of that of Senil.
In addition to the six relatively well-defined age classes, three less specific groups of 'adult' (n=2)', 'juvenile' (n=1)' and 'indeterminate (n=4)' remains have been distinguished. The classes of children younger than 14 (Infans I and II) and adults of between 22 and 40 (Adult) have the highest percentages. Two assemblages of the remains of children younger than 7 (n=5) were recovered from primary burials, three from secondary burials (tab. 2). The cremation remains recovered from the secondary tree-trunk coffin of mound period 1 proved to be those of a child aged between seven and twelve. The length of the tree-trunk coffin (1.52 m) was in accordance with the height of a child of that age. In view of the small length of the tree-trunk coffin, one of the inhumation burials is probably also that of a child.[7]

The results of the sex determination of the cremated remains show that males, females and children were buried in both primary and secondary graves (tab. 3). Men were buried predominantly in primary graves. Women and children were buried in secondary graves more frequently than men. A striking fact is that more than twice as many women as men were buried. Children (aged less than seven) were buried in all types of graves, both single and multiple and both primary and secondary. The division according to sex shows that the number of secondary child burials is three times the number of primary ones. Single primary child burials were only encountered there where the secondary burials were also child graves. This was observed twice. Mound periods 5.1 and 8a contained two primary child burials of very young children (younger than four years old). The cremated remains of the secondary burials contained in this mound proved to be of children too.

4. Comparison of the diameter of the mound with the three qualitative variables

4.1 The relation between the diameter of the mound and grave goods

The deceased that were buried in the cemetery of Toterfout-Halve Mijl were accompanied by only few grave goods, unlike those whose remains were found in the northern part of the Netherlands.[8]

Table 3. Division of burials according to age class.

class	age (year)	primary position	secondary position	number	%
Infans I	< 7	2	3	5	16
Infans II	7-14	1	5	6	19
Juvenil	14-22	3	-	3	9
Adult	22-40	8	6	14	44
Matur	40-60	2	2	4	12
Senil	> 60	-	-	-	-
total		16	16	32	100
juvenile		-	1	1	
adult		2	-	2	
indeterminate		1	3	4	

Table 4. Division of burials according to sex.

sex	primary position	secondary position	number	%
child/juvenile	3	10	13	41
male	5	1	6	19
female	6	7	13	41
total	14	18	32	101

Eleven graves (three primary and eight secondary) yielded grave goods or indications of the former presence of grave goods (tab. 5). Of the deceased who were buried in the primary graves one had been accompanied by an earthenware pot and two by bone artefacts. Six graves contained strong indications of bronze grave, or at least pyre goods. The mound periods with the largest diameters and the earliest dates, *i.e.* 1 and 1B, contained the most grave goods (fig. 5). For the northern part of the Netherlands Lohof found a clear correlation between the diameter of the mound period and the number of grave goods in the Middle Bronze Age periods A and B (Lohof 1991, 125, 192).

4.2 The relation between the diameter of the mound and the presence of a mortuary house

The cemetery of Toterfout-Halve Mijl contained the remains of several mortuary houses: configurations of four or more postholes around a grave (tab. 6). The posts that stood in these holes probably supported a roof. The remains of ten such structures were found at Toterfout-Halve Mijl. Nine of these were elongated structures of small, thin posts.[9] The tenth mortuary house was more soundly founded on thicker posts.

Three of the ten mortuary houses were not associated with a visible grave. They probably covered inhumation burials on the original ground surface. One double mortuary house was found associated with a multiple burial. One mortuary house was associated with a patch of charcoal. The posts of the other five mortuary houses surrounded cremation graves.

Several interpretations of the function of these four-post structures are to be found in the literature. Because of their flimsy structure, Glasbergen believed that they were temporary buildings. In his opinion, mortuary houses had a protective function; the posts served to support only a small roof to protect the deceased for the period between burial and the construction of the burial mound.

Van Vilsteren (Van Vilsteren 1988, 6) has suggested a different interpretation. If there is a clear correlation between the presence of four-post structures and cremation remains then, according to Van Vilsteren, these structures should not be interpreted as mortuary houses or little temples, but as the remains of pyres. Wahl (1982, 40) has described experiments with different wooden pyre structures. His results can tell us whether the structures whose remains were found at Toterfout-Halve Mijl may have been pyres, *i.e.* whether they may have contained sufficient wood to cremate a body. The amount of wood

Table 5. Distribution of the grave goods.
P = primary position, S = secondary position, y = year, m= month.

mound period	find number	diameter (m)	P/S	burial	grave goods
1	1al	37.4	p	? ♂, 23-40 y	bone pin
1	4=1c	37.4	s	? ♂, 23-40 y	bronze discolouration
1	5=1d	37.4	s	♀, 23-40 y	bronze discolouration
1B	60a	22.3	s	♀, 23-40 y	bronze discolouration
1B	61a	22.3	s	♂, 23-40 y	bone pin
1B	62a	22.3	s	♀, 40-60 y	bronze discolouration
1B	63	22.3	s	child, 8-12 y	bronze + antler + pierced pastern
1B	65a	22.3	s	♀, 20-40 y	bronze discolouration
5.I	44	10.2	p	child, 2 y ± 8 m	antler + decorated bone
5.II	39	12.0	s	child, 0-3 y	brown bear phalanx + antler
10	50	8.9	p	♀ ?, 20-40 y + child, 7 y ± 24 m	earthenware pot

Table 6. Distribution of the mortuary houses.
y= year, m= month, P= primary position, S= secondary position.

mound period	find number	diameter	P/S	burial
1B	74	22.3	p	♀, 30-40 y
5.1	44	10.2	p	child, 2 y ± 8 m
8.1	48	10.9	p	♀, 18-40 y
10	50, 50a	8.9	p	2× ♀ ?, 20-40 y + child, 7 y ± 24 months, ♀, 20-40 y
11.I	-	7.8	p	no grave
14	70	12.7	p	♀ ? > 35 y
15	-	10.1	p	patch of charcoal
19.I	-	9.1	p	adult?
21	-	13.0	p	no grave
27	-	7.3	p	no grave

required for a pyre depends on several factors. A first important factor is the construction method used: the pieces of wood can be either randomly stacked or arranged in a grid structure. The amount of wood required also depends on the posture of the corpse: more wood is required to burn an extended corpse than to burn a corpse lying with its knees bent, placed in a sitting posture or held upright with the aid of a post. It could be argued that the four small postholes found at Toterfout-Halve Mijl confined the limits of a randomly stacked pyre. In that case the elongated shape of the structures suggests that the deceased were burned with extended limbs. If the pyre is assumed to have been 1.5 m high, then it may have contained approximately 1.5 to 2.2 m^3 wood. According to Wahl, such an amount of wood is sufficient to cremate a corpse (Wahl 1982, 40).

An argument against the interpretation of mortuary structures as the remains of pyres is the absence of large amounts of charcoal beneath the mounds. The small amounts of charcoal found in the cemetery of Toterfout-Halve Mijl make it highly unlikely that the structures of that cemetery were pyres.

In comparison with the northeast part of the Netherlands the number of mortuary houses of Toterfout-Halve Mijl is exceptionally high. The 365 mound periods that have been investigated in the north contained as many mortuary houses as the barrows at Toterfout-Halve Mijl (Lohof 1991, 68, 124, 141).

Another difference is that most mortuary houses in the northern part of the Netherlands are associated with multiple central burials, one of which burials at least is an inhumation. According to Lohof the mortuary house covered (and protected) the central inhumation until the other corpses that were also to be buried in the grave had been cremated. Lohof therefore also assumes a temporary, protective function, although the structure of the mortuary houses of the northern part of the Netherlands does not

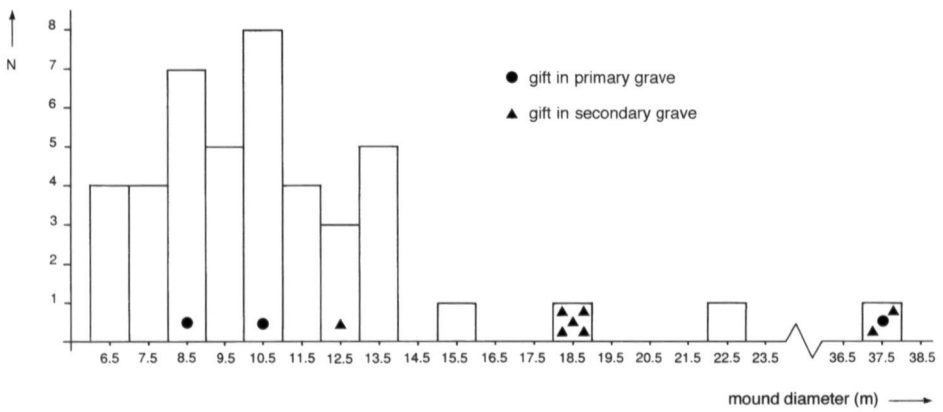

Figure 5. Histogram showing the grave goods in relation to the mound diameters.

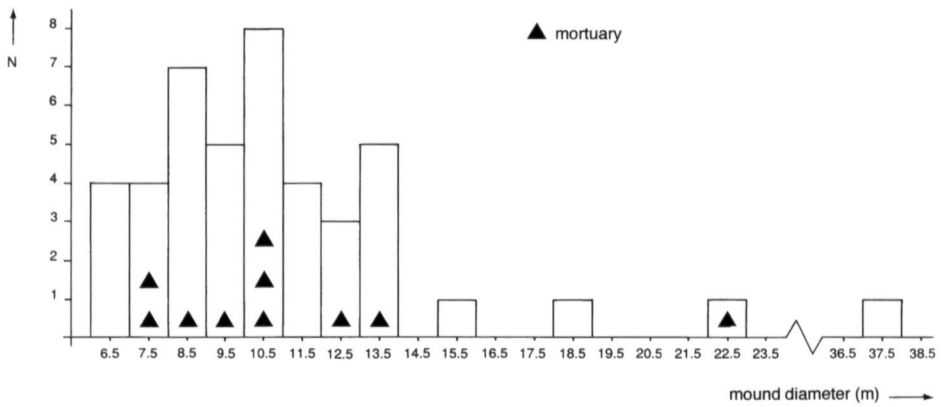

Figure 6. Histogram showing the mortuary houses in relation to the mound diameters.

suggest such a function: they were all built from thick posts, some of which were founded 60 cm deep.[10] The fact that in some of these cases the remains of the posts could be traced several decimeters into the body of the mound makes it very likely that the posts were not removed before the erection of the mound (Lohof 1991, 122). At Toterfout-Halve Mijl the posts had been removed before the erection of the mound. The sods that had been used to construct the mound lay on top of the postholes (Glasbergen 1954, 142).

Mortuary houses were found over graves of men, women and children and also over multiple graves. Apparently the burial rite that (probably) involved the erection of the mortuary house was not sex- or age-related.

There is no correlation between the diameter of the mound and the presence of a mortuary house at Toterfout-Halve Mijl: mortuary houses were encountered in both large and small mounds (fig. 6). There does not appear to be a direct connection between mortuary houses and rank or status in the northern part of the Netherlands either, although mortuary houses do seem to be more common in mound periods with small diameters than in those with larger ones. The same seems to hold for the cluster of barrows at Toterfout-Halve Mijl.

4.3 The relation between the diameter of the mound and differences in the treatment of the deceased

It is difficult to quantify the difference in the treatment of the deceased between primary cremation and inhumation. From an objective point of view, cremation is more labour-intensive than inhumation. We know of ethnographic examples where inhumation is reserved for higher social ranks and cremation for lower ones (Lohof 1991, 27). But examples of the opposite are also known. The treatment of the deceased is so closely tied up with ideology that it is not possible to compare the different burial practices simply

Table 7. Treatment of the deceased.

Treatment of the deceased	primary	secondary	total
cremation; remains in urn/scattered in burial pit[1]	15	4	19
cremation; remains in urn/scattered in pit	1	7	8
cremation; remains in urn/scattered on surface	6	4	10
cremation; remains in tree-trunk coffin	-	2	2
cremation; remains scattered in posthole	-	7[2]	7
inhumation on original ground surface	5	-	5
inhumation in tree-trunk coffin	1	1	2
total	28	25	53

[1] A distinction has been made between a 'burial pit' (rectangular, with the length being at least twice the width) and a 'pit' (oval to round).
[2] As the cremated remains were recovered from the fills of the postholes of the peripheral structure, this form of burial is considered secondary in this table.

on the basis of the amount of labour invested. It is a qualitative difference. The link with the social rank of the deceased can only be inferred from the overall combination of variables of the grave.

There are a number of remarkable factors (tab. 7): in the first place, only few inhumations were found. The sandy soil of the site had not favoured the preservation of archaeologically visible traces of inhumations. In five cases, *i.e.* those in which a mound period without a grave was found, Glasbergen assumed that a body had been buried on the original ground surface. In view of the small number of male burials (n=5), we may probably assume that inhumation on the original ground surface was a form of burial reserved for men.

The second remarkable factor is the absence of evidence for inhumations in burial pits in comparison with the many cases of cremation remains found in burial pits.

A very unusual form of burial is that of the deposition of cremation remains in a posthole. Glasbergen's site plans and descriptions do not tell us exactly how the cremation remains had been buried in the ring of postholes. The remains were recovered from the fills of the postholes, where they had probably lain against the wooden posts (Glasbergen 1954, 56).[11] It is not clear whether the cremation remains were buried before or after the erection of the posts and, in the latter case, whether or not the posts were temporarily removed from the postholes. In the case of tumulus 11 the cremation remains had been deposited in a pit before the post was placed in it. E. Smits' reanalysis has shown that this particular form of burial was not reserved for specific parts of the skeleton. In one mound, tumulus 8a.I, this form of burial was encountered six times. Five of these six assemblages of cremated remains have been identified as those of children (Infans I and II). The primary grave in this small mound with its diameter of 6.4 m contained the remains of a young child. The deposition of cremation remains in a posthole was probably a form of burial exclusively intended for children.

Remarkable burial evidence was also observed in mound 1B. To the southeast of the central burial of a man aged 30-40 were four secondary burials beneath the ring bank. These urn burials contained the cremated remains of adult women. The position of the opening of the urn differed per burial: in one case the urn had been placed upright (like that of the primary burial), in two cases the opening was directed away from the primary burial and in one case it was directed towards the primary burial.

It is difficult to determine the overall time span and the order of the burials of mounds 8a and 1B. Research into burial rites in Yorkshire showed that the deceased had been buried according to certain rules (Mizoguchi 1993). It would seem that some kind of 'rules' were also applied in the case of the burials in the two Dutch mounds. The different categories of deceased had been deposited according to some standard. In mound 1B the remains of adult women had been buried in urns, the position of the urn possibly expressing some form of kinship; in mound 8a only children had been buried in postholes.

Mizoguchi has suggested that the specific recollection of the position, sex and age of the previous burials may have played an important role at the time of a new burial. From ethnographic examples we know that specific knowledge may be the 'property' of a specific interest group: the exclusive possession of such knowledge confirms the ties between the members of a group and legitimises and naturalises their specific relations with the members of the other groups of the community.

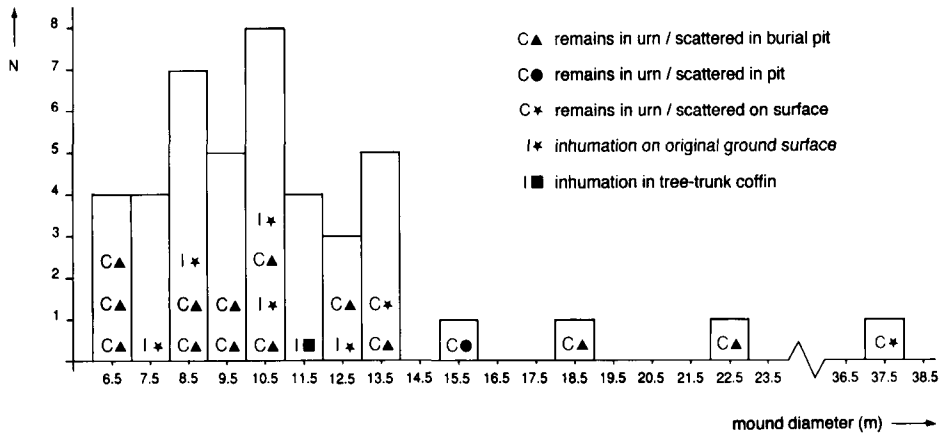

Figure 7. Histogram showing the treatment of the primary deceased in relation to mound diameters.

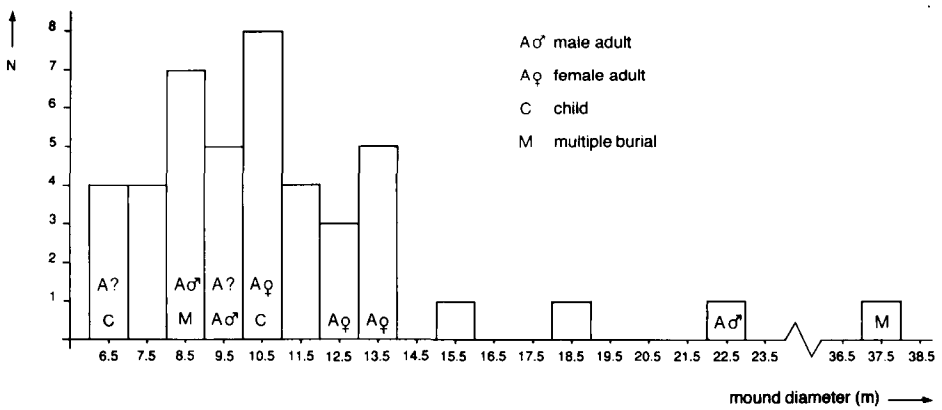

Figure 8. Histogram showing the ages of the deceased buried in the primary graves in relation to the diameter classes.

The comparison of the treatment of the deceased with the diameter shows that cremation remains were buried in burial pits in mounds of both small and large diameter classes (fig. 7). Inhumation on the original ground surface was observed only under mound periods with small diameters. Because of the small numbers of burials found, no statements can be made about the other forms of burial.

4.4 The relation between the diameter of the mound and the age/sex ratio

Adult males and females and children had all been buried in both primary and secondary graves, beneath mounds of different sizes (fig. 8). The right to be buried in a primary grave beneath a mound was apparently not dependent on age, because children younger than four years old were also buried in graves at the centre of mounds. The two primary single child graves were found in the smaller mound periods. This evidence is in accordance with that obtained in the northern part of the Netherlands (Lohof 1991, 256). A trend appears to be observable in the small amount of evidence available and that is that children were buried in smaller mounds and adults in larger ones, thus a weak indicator of age classes has been found.

5. The Toterfout community

The 600 years of use and the total number of 44 mound periods suggest that the cemetery contains the deceased of a small group of people.

Determining the size of a group of people on the basis of burial evidence is a risky business. There are often many uncertainties. It is for example difficult to say whether the total number of mounds found (38) is the same as the original number. From the Middle Bronze Age period B until the arrival of Panken the area between the two hamlets was probably an extensive moor. No activities took place here in protohistoric times. The first disturbances were

those caused by Panken in 1845. It is difficult to estimate the impact of his activities. We know for sure that he set his spade into at least seventeen mounds, but none of the mounds disappeared completely as a result of his activities (Glasbergen 1954, 16). The greatest disturbances were caused during and just after World War II, when farmers in the area buried cattle in the mounds and dug sand from them. No mounds disappeared completely due to these activities either. We may therefore assume a total of 62 deceased[12] buried in mounds in determining the size of the group.

What we do not know for certain either is what percentage this number of 62 deceased is of the total number of deceased of the Toterfout community. A total of 62 deceased in 600 years implies one death every ten years, which would indicate a population of only two individuals. Such a small population cannot independently survive. According to the present views, Middle Bronze Age societies lived in small settlements comprising two or three farms (Roymans/Fokkens 1991, 11). These households may have constituted a social group of about twenty individuals. The average life expectancy in the Bronze Age is believed to have been between 25 and 30 years (Acsádi/Nemeskéri 1970). The six centuries of use can be divided into 20 to 24 generations, which would imply a population of between 400 and 480 individuals. The actual number of 62 deceased found in the cemetery is only a small percentage of the calculated population. It would mean that only 13 to 16% of the overall population was buried in a mound context. This assumed percentage is in accordance with the percentage assumed by Lohof for the Early Bronze Age (Lohof 1991, 225).

The population buried some of its dead in mounds which were erected in a fairly concentrated cluster. The settlement was probably situated somewhere near the cemetery, although hardly any evidence for a Bronze Age settlement site has been found. Middle Neolithic occupation remains have been found in some places (Van Beek 1977, 43; Glasbergen 1954, 98; De Laet 1974, 288; Verwers 1990, 33). From the palynological research we moreover know that cereals were cultivated in the vicinity of the mounds (Glasbergen 1954, 178). The fences whose remains were found beneath mounds 12 and 18 probably marked the limits of farmyards or fields.

6. Conclusion

The cemetery of Toterfout-Halve Mijl contained little evidence in terms of labour input for social hierarchy. The comparisons of the diameter of the mound with other qualitative variables, *i.e.* the grave goods, mortuary houses and the treatment of the deceased, revealed four mound periods which differ clearly from the others: periods 1, 1B, 5.1 and 10. Mound periods 1 and 1B contained many burials accompanied by grave goods. Both mound periods had large diameters, namely of 37.4 and 22.4 m, respectively. The diameters of the two other mound periods, 5.1 and 10, were not very large: 10.2 and 8.9 m, respectively. The main differences between the two pairs of mounds are not so much differences in the qualitative variables but rather differences in the volume of the mound, the number of burials and the dates. These differences may be attributable to changes in the burial rites during the Bronze Age. There are indications suggesting that the burial practices in the early phase of the cemetery in particular were more clearly intended to express kinship ties. The evidence of mound periods 1B and 8a suggests the use of certain 'rules': specific knowledge about the deceased was probably the 'property' of a specific kinship group.

Throughout the entire Bronze Age only a small percentage of the overall population was buried in mounds. Lohof assumes that that percentage was at most 15% in the Early Bronze Age (Lohof 1994, 113). As far as the Toterfout evidence is concerned this seems a realistic figure. The 62 deceased found in the cemetery amount to 13 to 16% of the total number of between 400 and 480 deceased.

The deceased who were buried in mounds probably belonged to a group with a high status or rank: the erection of a mound, whether it was small or large, involved much effort. There is no evidence for any hierarchy within that high-ranking group. The deceased who were buried in the cemetery did not belong to some specific age or sex category: children, women and men were all buried in mounds. They constitute a regular representation of a society.

What is remarkable is the percentage of children buried in the cemetery of Toterfout-Halve Mijl, which appears to be exceptionally low. Ethnographic studies have shown that the mortality rate for babies and infants in primitive societies may be as high as 50-60%. Lohof arrived at a child mortality rate of 19% for the Middle Bronze Age period B in the northern part of the Netherlands (Lohof 1991, 254). It would seem that babies and infants are very much underrepresented in the overall evidence of Toterfout. The deceased of this age category were probably disposed of in some other manner than through burial in a mound. Where the other 85% of the Toterfout population has been buried is not clear. Corpses may have been disposed of in many different ways which are not visible in the archaeological record. Hardly any traces of inhumations or cremated remains scattered in flat graves are preserved in areas of dry sandy soils. Flat graves have only been found at Cuyk; they date from the Middle Bronze Age (Bogaers

1966). Sometimes human remains are recovered from contexts other than mounds, such as those recovered from ditches between settlement refuse in Westfrisia (Brandt/IJzereef 1980, 55). The Wassenaar grave is also an example of a different form of burial (Louwe Kooijmans this volume).

It is likely that the Toterfout group lived somewhere near the cemetery. The three households buried a select number of their deceased on the sand ridge. In the earliest phase of the cemetery the deceased were buried in mounds surrounded by banks (1 and 1B). The large number of secondary burials indicate that these mounds were used for a long time. In the Middle Bronze Age periods A and B the cemetery slowly expanded, from the east to the west, to ultimately comprise almost forty mounds. It would seem that a relatively larger number of mounds was erected in the final phase. By then the burial rite appears to have focused on individual burials and no longer on burials in which a kinship group's specific knowledge of previous burials still played a crucial part, as in the earlier phase. The individual burial tradition of the late phase of the Middle Bronze Age was probably continued in the burial rite of the urnfields.

Further research into the barrows of the southern part of the Netherlands and northern Belgium may show whether the Toterfout evidence presents an exceptional or a normal picture of Middle Bronze Age society.

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notes

1 Theunissen (in prep.): Midden-Bronstijdsamenlevingen in het zuiden van de Lage Landen. Een herwaardering van het begrip 'Hilversum-cultuur'. Research sponsored by a grant from the Netherlands Organization for Scientific Research (NWO; file number 280-151-060).

2 Lohof's analysis is based on the diameter of the mound instead of the volume of a mound period (see note 4) because it is often no longer possible to determine the original height of a mound. If it is assumed that there was a fixed relation between the original height of a mound period and its diameter then the diameter is a more reliable criterion for comparing mound periods on the basis of labour input than the volume (Lohof 1991, 62).

3 The consequences of his activities are still visible in Glasbergen's site plans.

4 A 'mound period' is not a unit of time but a synonym for a mound 'burial event'.

5 No corded ware was found in the cemetery.

6 The cemetery was dated using the calibrated dates and the chronology of the Dutch prehistory as presented in "De prehistorie van Nederland" (Van den Broeke *et al.*, in prep.).

7 The tree-trunk coffin was 87 cm long.

8 An urn, *i.e.* a pot containing cremation remains, is not considered a grave good in the analysis.

9 The average diameter of the postholes was 8 cm. Their depths varied from 4 to 53 cm.

10 Probably measured from the excavation surface.

11 Another possibility is that the cremation remains were buried after the posts had rotted (Glasbergen 1954, 94).

12 The 34 excavated mounds contained the remains of 47 deceased. At least nine mounds were not excavated. It is estimated that these uninvestigated mounds contained 15 burials.

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