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**Title:** Ancestral heaths : reconstructing the barrow landscape in the Central and Southern Netherlands  
**Issue Date:** 2013-11-21
Chapter 11

Toterfout-Halve Mijl and surroundings

In Chapters 8-10 a number of barrows in three research areas in the northern half of the Netherlands have been discussed. In the following two chapters the discussion on the barrows landscape will be continued by investigating several barrows that are situated in two regions in the southern half of the Netherlands. Chapter 11 is on the barrows of Toterfout-Halve Mijl and numerous other barrows situated in an area of about 30 by 20 km (see figure 11.1). A large number of these mounds have been visited by several researchers performing palynological analyses (for references see the corresponding sections). In this chapter the palynological data will be described and discussed to determine the barrow landscape in the area.

11.1 Toterfout-Halve Mijl

In an area southwest of Eindhoven, close to the two villages of Toterfout and Halve Mijl, 34 barrows are situated on high cover-sand ridges along a large lake (the now-drained Postelse Weijer, which still existed up to the 19th century, Glasbergen 1954, 17; see figure 11.1 and 11.2). These barrows were excavated and all dated to the Bronze Age (Bourgeois 2013, 91-92). More than half of the barrows in this area have been sampled and analysed for pollen analysis by Waterbolk (Glasbergen 1954, 105-122; Waterbolk 1954, 101-104).

11.1.1 Site description and sample locations

The barrows of Toterfout-Halve Mijl are situated on cover-sand ridges. The old surface underneath all barrows was the top of a Carbic Podzol (Dutch classification: Humuspodzol). Samples were taken by Waterbolk from the old surface underneath the barrows, the sods the mound was constructed of and from the fill of surrounding ditches. Besides determining the surrounding landscape, the barrows were sampled with the purpose of dating them (Glasbergen 1954, 28). The relative chronology based on the palynological results was for a great deal rejected by radiocarbon dates and the surrounding features. Following the well substantiated chronology proposed by Bourgeois (2013, 93-96), three groups can be distinguished based on 14C-dating. The first group represents the oldest barrows. In contrary to several barrows that form part of barrow alignments, described in chapters 8 and 9, these barrows are extensively dispersed (Bourgeois 2013, 102). Based on 14C dates these barrows (14, 4 and 1B) were built roughly between 1850 and 1600 cal BC. The second group represents the youngest barrows (8, 17, 15, 12), which were built between 1500 and 1250 cal BC. The third group consists of 9 barrows that were dated in between the first two groups. However, overlap with both occurs. Then

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13 Theunissen suggested a relative chronological order based upon radiocarbon dates (Theunissen 1993). These radiocarbon dates have been further calibrated by Bourgeois (2013) based on the detailed dating program developed by Lanting and van der Plicht (2001/2002).
there are 18 barrows that have not been dated by $^{14}$C. They have been dated based upon the surrounding features resulting in a broad spectrum of dates. Some of these barrows may belong to the group of the oldest barrows, while others might be relatively young. Not included in the barrow group of Toterfout Halve Mijl by Bourgeois, but situated in this area and sampled for pollen analysis (Glasbergen 1954, 95-97), is an urnfield. The pollen spectrum of this sample is considered to represent the youngest period (approximately 800-500 cal BC). An overview of barrows that have been sampled and the location of the samples in the barrows (e.g. the old surface, sod and ring ditch) is given in table 11.1. The barrows are placed
in chronological order as determined by Bourgeois. Based on their geographical location the barrows can roughly be divided into three groups (see figure 11.1c). An easterly group consists of barrows 1-3 (including 1A and 1B), a central group of barrow 5-11 (including 8A) and a western group of barrow 12-30 (including 22A). All barrows have been extensively described by Glasbergen and Waterbolk (Glasbergen 1954), some findings should be noted. Glasbergen mentions that two barrows (12 and 18) were built on and of former arable soil:

“No podolized surface was found under it (barrow 12) anywhere; like tumulus 18 to be described hereafter it was apparently situated on a plot of prehistoric arable. No plough marking were found in the subsoil.”

“The barrow (18) was not built on a naturally podolized subsoil but as a stratum of made soil, of a dirty grey colour (thickness 0.10-0.14 cm), probably old arable. (Glasbergen 1954, 62, 72).”

It is however uncertain that such disturbed soil indeed can be interpreted as old arable, since no plough marks are present. The second finding to be noticed is the traces of fences that have been found underneath three barrows (14, 20 and 21).
Figure 11.3a
Figure 11.3a-b. Pollen spectra from the samples taken from the Toterfout-Halve Mijk barrows (11.3a) and the Neolithic settlement (11.3b). Spectra are given in % based on a tree pollen sum minus Betula pollen. In the total AP (=arboreal pollen) Betula is included. In the total NAP (=non arboreal pollen) spores are included, non pollen palynomorphs are excluded. Different scales have been used, indicated with different colours.
<table>
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<tr>
<th>Site name</th>
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<th>Dating range</th>
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<tr>
<td></td>
<td>period 2: old surface</td>
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<tr>
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<tr>
<td>Toterfout Tumulus 5</td>
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<td></td>
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<td></td>
<td>period 2: sod</td>
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<tr>
<td></td>
<td>period 2: sod</td>
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<tr>
<td>Toterfout Tumulus 2</td>
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<tr>
<td>Toterfout Tumulus 19</td>
<td>period 1: sod</td>
<td></td>
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<td></td>
<td>period 2: old surface</td>
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<td>period 4: ditch</td>
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<td>Toterfout Tumulus 17</td>
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<tr>
<td>Toterfout Tumulus 15</td>
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</table>

Table 11.1. Overview of samples taken at the Toterfout- Halve Mijl barrows. Dating ranges for each barrow have been indicated. Figure after Bourgeois (2013, table 5.5).
11.1.2 Results and discussion

Figure 11.3a shows the pollen spectra of the sampled mounds in the relative chronological order proposed by Bourgeois.

The oldest group shows the highest arboreal percentages from 55% to almost 80%. The open spaces these barrows were built in had an ADF that varied from 25 to 100 m. The herbal vegetation at these open spots consisted mainly of *Calluna vulgaris* and grasses. An exception is barrow 4, which is actually not part of one of the (geographical) barrow groups, but situated approximately 300 m north of the central group. Here the vegetation in the open space is a mixture of some *Calluna*, grasses and ferns. The youngest barrows show an AP of approximately 55%, so the open spaces seem to be slightly larger in this period (ADF=50-100 m), indicating an expansion of the heath in the area. The sample of the urnfield shows that the heath at the location of one of the oldest barrows (1B) indeed expanded (AP=35%) with a *Calluna* percentage of more than 100%. Not many changes in landscape seem to have occurred in the period in between. The barrows that were roughly dated to this period show a similar vegetation pattern. Only tumulus 4 shows a different vegetation composition of the open space with a low percentage of heath. This barrow might have been constructed at the edge of the open space where the heath was grassier. This pollen spectrum was derived from a ditch sample and the spectrum shows a remarkable high percentage of *Pteridium* (bracken) spores. This is also the case for another ditch sample of Toterfout-Halve Mijl (barrow 22A). Possibly *Pteridium* was one of the first species to grow on the barrow after it was built. The ferns might already have shed spores before the ditches of barrow 4 and 22A were filled up. Close to the barrows alder carr must have been present, represented in the pollen spectra by high percentages of *Alnus*. Surrounding forest consisted of mainly *Corylus, Quercus, Tilia* and *Fagus*. *Betula* is present in all the pollen spectra in fluctuating percentages. Probably birch trees were present in the surrounding forest. In addition they were probably also present in the heathland area close to some of the barrows, causing percentages of over 100% in for example the pollen spectrum of barrow 13.

Open spaces fluctuated between approximately 25 m and 250 m in ADF. Barrows 1A, 1B, 2 and 3 were built very close together. So were barrows 5–8, 10 and 11. They were most likely built in one open place with heath vegetation. Barrow 13-16, 17-20 and 21-29 were also built close together and perhaps these three groups were built in one large area with heath vegetation. It is not unlikely that all barrows in the Toterfout-Halve Mijl group (except for barrow 4) were constructed in one and the same heathland: in a long stretched open space with a minimum length of approximately 1.5 km. Whether one large heath area or several smaller heath areas, the heath must have been managed throughout the barrow building period, as has been discussed for the more northern areas (Chapter 8-10). Grazing being part of the heath management is likely. This is indicated by the presence of herbal species such as *Plantago lanceolata*, *Succisa* and *Asteraceae liguliflorae*, although only represented in low amounts. No evidence for burning of the heath was found. Charcoal that was found at the site was probably related to funeral activities, since charcoal was mostly found together with bone material (Glasbergen 1954, Theunissen 1993). Sod-cutting could have been a heath-management activity, while sods were cut to build the barrows (see table 11.2). Since the amount of barrows is enormous, and that a large number of them were built in a relatively short time period, sod-cutting must have been a regular activity.
Not much is known about the open spaces for the period prior to the barrow building. The open spaces were not created just before the mounds were constructed, since the herbal vegetation had already had some time to develop. Some of the barrows (12 and 18) were possibly built on of former arable land, indicating that at least part of the area had been used for crop cultivation prior to the barrow building. Unfortunately samples taken from these barrows were unsuitable for palynological analysis. In some of the barrows some cereal pollen grains and arable weeds like Rumex were found, although in such low amounts that it cannot be concluded that they were linked to crop cultivation at or close to the barrow spots. Traces of fences have been found underneath barrow 14, 20 and 21 and could be associated with crop cultivation as well, indicating the boundaries of a field. Pollen analyses of these barrows show that heath vegetation was present at the time the barrows were raised and no crops were cultivated close before the building. Yet, another possibility is that the fences indicate grazing within enclosures. In all cases it is clear that the area was heavily influenced by human activities and the area was most likely part of the economic zone of a farming community. The presence of prehistoric man in the area long before the barrows were built is also indicated by traces of a late Neolithic B settlement that were found approximately 60 m northeast of barrow 5 (Glasbergen 1954, van Beek 1977). A small part of the original soil was preserved. At this location the old surface, which was overblown by sand shortly after abandonment of the settlement

Table 11.2. The minimum size of the open space per barrow based on the sods used to build the barrows.
ancestral heaths (for argumentation see van Beek 1977, 48-49), was still recognizable. The old surface was sampled for pollen analysis by Groenman-van Waateringe. The pollen spectra are likely reflection of the vegetation composition that was present shortly after abandonment of the settlement. These pollen spectra show that heath was already present at that time, although the herbal vegetation was dominated by grasses (see figure 11.3b). Grazing may have already taken place by then. It is not clear whether the presumed arable field and the fence traces underneath some of the barrows, which were found approximately 0.5 km to the southwest, belonged to Neolithic settlement. It is also not clear where the community moved to after abandonment of this settlement. Evidence for a Bronze Age settlement that might belong to the builders of the barrows was not found. Although the function of the area changed from settlement to burial site it stayed part of the economic zone of the community living in the area, while the heath was probably grazed.

11.2 Hoogeloon

Approximately 6 km southwest of the Toterfout-Halve Mijl barrow group two barrows are situated close to Hoogeloon (Hoogeloon 1 and 2; see figure 11.1).

11.2.1 Site description and sample locations

A barrow near Hoogeloon, approximately 4 km from Toterfout-Halve Mijl, called the ‘Zwartenberg’ (Hoogeloon 1) was excavated in 1950 by Brunsting on behalf of the ROB (presently known as Cultural Heritage Agency of the Netherlands, RCE). The mound was dated to the Middle Bronze Age A, based on the find of a bronze axe in 1846 by Panken. The barrow was constructed of sods that were still clearly visible during the excavation. Measurements were 18 m in diameter and 1.4 m in height (Waterbolk 1954, 108; Beex 1964a). A sample from the old surface was analysed by Waterbolk and published in his thesis (Waterbolk 1954, 103).

Approximately 150-200 m to the west of Hoogeloon 1 a small barrow was located called the ‘Smousenberg’ (Hoogeloon 2). This barrow was a two-period barrow of which the first period was dated to the Middle Bronze Age. Its diameter was approximately 4 m. The barrow was excavated by Beex and a pollen sample from the old surface was analysed by Waterbolk (Beex 1954).

11.2.2 Results and discussion

Hoogeloon 1 was built in an open space with the forest at an average distance of approximately 50-100 m. The open space was covered with heath vegetation that was dominated by Calluna vulgaris (see figure 11.4). The heath was very poor in other herbal vegetation, including anthropogenic indicators. The area that was used for sod cutting had a radius of approximately 15 m (based on an average sod thickness of 0.25 m, see also 8.2.2). Hoogeloon 2, which was probably younger than Hoogeloon 1, was built in a much smaller open space with an ADF of approximately 25 m. Calluna vulgaris was also the dominant species in this small open space. The surrounding forest consisted mainly of Quercus and Tilia. Fagus was also present in low amounts. Corylus was most likely present at the edge of the forest. Some Betula trees were probably present as solitary trees in the heathland or were perhaps part of the forest. In the lower and wetter parts of the area alder carr was present, represented by high percentages of Alnus in the pollen spectra from both mounds.
Figure 11.4. Pollen spectra from the samples taken from the barrows at Hoogeloon, Kneegsel, Steensel, Eersel and Bergeijk. Spectra are given in % based on a tree pollen sum minus Betula pollen. In the total AP (=arboreal pollen) Betula is included. In the total NAP (= non arboreal pollen) spores are included, non pollen palynomorphs are excluded. Different scales have been used, indicated with different colours.
11.3 Knegsel-Urnenweg

Circa 2 km south of Toterfout-Halve Mijl a cemetery complex is located. An urnfield was constructed around and partially on top of several older barrows. The cemetery complex is situated around a small pool, which was drained around 1930. Over several excavations the urnfield was excavated including five of the older barrows (Braat 1936, Glasbergen 1954). Two of these barrows (Knegsel 1 and 2) and four ring ditches belonging to the urnfield (Knegsel ditch a-d) had been sampled and analysed for pollen by Waterbolk, with results being published in his thesis (Waterbolk 1954, 104-108; see figure 11.1).

11.3.1 Site description and sample locations

Knegsel 1 is a three-period barrow of which the first and the second period are dated to the Middle Bronze Age B. The third period dates to the Early Iron Age. The diameter of the first period is 7.5 m, of the second 10 m and of the third 8 m. The height of the barrow is unknown, which makes it impossible to calculate the sod-area. Samples were taken from the old surface of the primary mound and from a sod originating from the grave pit, belonging to the first period.

Knegsel 2 is a two-period barrow. The first period dates to the Middle Bronze Age, the second period to the Late Bronze Age/Early Iron Age. The diameter of the first period barrow is 8 m and of the second 5.4 m. The barrow was 0.28 m high. Samples were taken from the old surface of the primary mound and from three consecutive humic layers in the ring ditch.

In addition samples were taken from the fills of four ring ditches that belonged to the urnfield. Ditch (a) was a circular ring ditch, ditch (b) and (c) belonged to two long beds (oblong barrows, belonging to an urnfield) and ditch (d) was a rounded rectangular ring ditch with posts.

11.3.2 Results and discussion

Knegsel 1 and 2 show similar pollen spectra (see figure 11.4). They were both dated to the Middle Bronze Age-A and it is possible they were built (almost) at the same time. They were built in an open space with an ADF of approximately 50-100 m. About 28 m² of heath area needed to be stripped to build the primary Knegsel 2 barrow (based on an average sod thickness of 0.25 m, see also 8.2.2). The secondary mound required about 13 m². The vegetation of the open space was dominated by Calluna vulgaris with most likely some Betula trees nearby. Other herbs were almost absent, also Poaceae were only present in low amounts. Alder carr was present in the river valleys in the environment. Corylus, Quercus and Tilia were the main trees in the forest that could be found in the drier areas. Other samples that were taken from this site came from urnfield ditches. Three of them (a-c) show almost similar AP as Knegsel 1 and 2 indicating an ADF of approximately 50-100 m. The fourth ditch showed a higher arboreal pollen percentage of 65%, indicating an open space of approximately 30-50 m. The forest composition seemed slightly different with a relatively high percentage of Quercus (30%) at cost of Corylus.

11.4 Knegsel-Moormanlaan

Approximately 3 km southeast of the Toterfout-Halve Mijl barrow group and approximately 2 km east of the Knegsel barrows a tumulus is located at the Moormanlaan, a sandy road close to Knegsel (see figure 11.1).
11.4.1 Site description and sample locations

The barrow at the Moormanlaan is a 2 or 3 period barrow of which the first period was dated to the Early Bronze Age/Middle Bronze Age-A (diameter=6 m). The second (and third) period was dated to the Middle Bronze Age (diameter=5.4 m/6 m). The barrow was excavated by Modderman, Verwers and Boogerd in 1967. Samples for pollen analysis were taken from a sod and from the original surface in the north-west quadrant by Bakels (Modderman and Bakels 1971).

11.4.2 Results and discussion

The pollen spectra (see figure 11.4) show an arboreal pollen percentage of approximately 50%, indicating that the barrow was built in an open spot with an ADF of approximately 100 m. This open spot was mainly covered with heath vegetation (*Calluna vulgaris*). Other herbal species are present in very low amounts, including Poaceae. The surrounding forest consisted of *Quercus*, *Tilia* and *Fagus* with *Corylus* and possibly *Salix* at the forest edge. Alder carr was present in the wetter parts of the area.

11.5 Steensel

Circa 4 km southeast of Toterfout-Halve Mijl, close to Steensel, an urnfield with over 100 (urnfield) barrows is situated at a locality called the ‘Heibloem’. This cemetery has been the subject of several excavations since the first in 1844 by Panken. In 1948 van Giffen decided to undertake there a trial-excavation to rescue the cemetery (Modderman and Louwe Kooijmans 1966). At that time samples for pollen analysis were taken by Waterbolk from one of the ‘long beds’ in the cemetery, the results of which were published in his thesis (Waterbolk 1954, 103, 109-110; see figure 11.1).

11.5.1 Site description and sample locations

The cemetery is situated on the northern half of a ridge consisting of loamy, fine sand deposited by wind (Modderman and Louwe Kooijmans 1966). Samples for pollen analysis were taken by Waterbolk from the old surface and the fill of a ditch belonging to one of the long beds (Waterbolk 1954, 103, 109-110). No dating is known for this barrow, but in general long beds are dated to the Late Bronze Age/Early Iron Age.

11.5.2 Results and discussion

The barrow was built in an open place with an ADF of approximately 125 m, based on the percentage of arboreal pollen observed in a sample from the old surface. The pollen spectrum of the ditch seems to represent a slightly younger period with a higher percentage of herbal pollen, like Poaceae, *Rumex* and *Plantago lanceolata* (see figure 11.4). A high percentage of *Pteridium* in the ditch spectrum possibly is the result of a *Pteridium* being present on top of the barrow, as a pioneer species, after construction of the barrow and shedding spores before the ditch was filled up (see also 11.1, p.46-47). *Calluna vulgaris* was the dominating species at the open place, indicated by the high percentages of this species in both samples. Compared to the other barrows in the region the heath was grassier, indicated by percentages of Poaceae of 20-50%. *Betula* trees were probably present in or close to the heathland.
11.6 Eersel

Approximately 5 km to the south of Toterfout-Halve Mijl, close to Eersel a ring and ditch barrow called ‘De Gloeiende Engelsman’ is situated (Beex 1964b; see figure 11.1).

11.6.1 Site description and sample locations

The barrow was dated to the Middle Bronze Age-A, based on \(^{14}\)C-dating (3460 ± 35 BP, GrN-5350; 1777-1603 cal BC, calibrated with Oxcal 4.2) and the find of a Drakenstein urn. The barrow measured 20.2 m in diameter and approximately 1 m in height. It was built partially on an undisturbed Carbic Podzol (Dutch classification: Humuspodzol) and partially on grey, fairly homogenous soil, interpreted by van Zeist (1967) as former arable land. This interpretation can be questioned, given the absence of ploughing marks (see also section 11.1.1) The tumulus was excavated in 1966 by the ROB and sampled for pollen analysis by van Zeist (van Zeist 1967b). Samples were taken from the old arable land, from the old surface underneath the mound (the Carbic Podzol) and from sods with which the mound was constructed.

11.6.2 Results and discussion

The pollen spectra show that the barrow was built in an open space that was covered in heath vegetation (see fig 11.4). If the open space had been used for agricultural activities as was suggested by van Zeist (see 11.6.1), the old arable was at the time the barrow was built no longer in use as such, indicated by the high percentage of \textit{Calluna vulgaris} and the absence of cereal pollen and other indicators of crop cultivation. Based on the arboreal pollen percentage the average distance to the forest was approximately 150-300 m. The minimum area that was used for sod cutting to build the barrow could be calculated. This was an area of circa 643 m\(^2\), indicating a radius of approximately 14 m. Alder carr must have been present in the neighbourhood of the barrow shown by percentages of approximately 30\% \textit{Alnus}. Forest in the drier regions mainly consisted of \textit{Quercus} and \textit{Tilia} with \textit{Corylus} present at the forest edge. The pollen spectra of the old arable land show higher percentages of \textit{Tilia} than the other pollen spectra and also \textit{Fagus} is present in both samples. Since these samples came from disturbed soil, the relatively high number of \textit{Tilia} pollen can be attributed to an older sediment that was mixed with younger sediment.

11.7 Bergeijk

Approximately 15 km south of Toterfout-Halve Mijl a barrow, close to Bergeijk is located (see figure 11.1).

11.7.1 Site description and sample locations

The barrow is situated on a high sandy ridge. The barrow was dated to the late Neolithic-A period based on \(^{14}\)C-dating (3950 ± 150 BP, GRO 381; 2707-2460 cal BC, calibrated with Oxcal 4.2). This is the oldest barrow that will be discussed in this chapter. The centre of the barrow was sandy and had a diameter of approximately 3-4 m. Around the centre of the barrow a small ditch was dug from which the sand was accumulated, forming a small bank encircling the barrow. On top of this bank a second bank was constructed with sods expanding the diameter of the monument to approximately 8 m. On top of this bank and barrow a layer of sand was deposited, enlarging the total tumulus to a diameter of approximately...
20 m and a height of 0.70 m. Samples for pollen analysis were taken by Beex from the old surface underneath the barrow, from the old surface outside the secondary bank and from a sod belonging to this bank. The samples were analysed by Waterbolk (Beex 1957, Waterbolk 1957).

11.7.2 Results and discussion
The mound was probably built in a small open space with an ADF of approximately 25-50 m, based on the high percentage of arboreal pollen (70%; see figure 11.4)). Part of this open place was probably used for sod cutting. A minimum area of approximately 630 m$^2$ was required to build the barrow, indicating a radius of approximately 14 m. The small open place was covered with species-poor heath vegetation that was dominated by *Calluna vulgaris*. *Quercus* and *Tilia* were the main species of the surrounding forest, with *Corylus* dominating at the forest edge. Alder carr was present in the wetter parts in the surroundings.

11.8 Alphen
A barrow called ‘Op de Kiek’ (Alphen 1) is located approximately 30 km west of the Toterfout-Halve Mijl barrow group. The barrow was excavated in 1955 by Modderman (Modderman 1955; see figure 11.5).

Circa 3.5 km to the southwest of Alphen 1 another barrow is present called ‘The Kwaalburg (Alphen 2). It was excavated in 1964 by Beex (1964c; see figure 11.5).

11.8.1 Site description and sample locations
Alphen 1 is a multi-period barrow that was dated to the Middle Bronze Age-A period based on $^{14}$C-dating of the primary cremation (3450 ± 60 BP, GrA-15479; 1922-1618 cal BC, calibrated with Oxcal 4.2). The inner diameter of the encircling ditch was approximately 6 m and the original barrow was approximately 1 m of height. Samples for pollen analysis were taken by Modderman from the old surface underneath the primary mound, outside the primary mound, from the ring ditch and from the old surface underneath the secondary mound. Results were published by Casparie and Groenman-van Waateringe (1980, 37, 40).

Alphen 2 was dated to the Middle Bronze Age-A period based on a bronze flanged axe. This barrow was a so-called bank-and-ditch barrow, meaning that the original barrow was surrounded by a circular bank and ditch. Alphen 2 was built of sods and had a diameter of approximately 15 m. At a distance of approximately 1 m a circular bank with sods of approximately 4 m wide was placed. At approximately 1.5 m from this bank another surrounding bank of approximately 3.5 m wide was made. The complete monument had a diameter of approximately 41 m. Samples for pollen analysis were taken during the excavation from the old surface, a sod and from the encircling ditch and primary bank (Casparie and Groenman-van Waateringe 1980, 38).

11.8.2 Results and discussion
The pollen spectrum of Alphen 1 and 2 both showed an arboreal pollen percentage of approximately 70% (see fig 11.6). This indicates that the barrows were built in a small open space with an ADF of approximately 25-50 m. The vegetation at the open space was dominated by *Calluna vulgaris* with most likely some solitary trees of *Betula*. Other herbs are, including Poaceae, are only present in very low amounts. The samples from the ditch and the bank of Alphen 2 show a slightly different (younger?) vegetation composition, with an expansion of the heath.
Comparable to Toterfout-Halve Mijl and surroundings, the forest in the environment consisted of mainly *Quercus* and *Tilia*. *Corylus* was present in considerable amounts at the forest edge. In the lower and wetter parts of the area *Alnus* was the dominating tree.

### 11.9 Goirle

Approximately 2 km to the east of the barrow ‘Op de Kiek’ an alignment of barrows on a cover sand ridge close to a river valley is situated in an area called ‘Rechte Heide’. Along approximately 1.5 km of this barrow alignment a barrow is situated that was excavated in 1949 by Glasbergen and Waterbolk (Glasbergen 1954; see figure 11.5).

![Figure 11.5. Location of the Alphen and Goirle barrows.](image)

The map is based on digital elevation model of the AHN (copyright www.ahn.nl).
11.9.1 Site description and sample locations

A two-period barrow (h=0.90 m, d=15 m) of which the primary mound was dated to the Middle Bronze Age. The secondary mound was probably almost similar in age (Bourgeois 2013). From the mound a number of large wall and rim fragments of a Drakenstein urn were recovered. The monument was heavily damaged by deep ploughing. The old surface underneath the barrow was strongly affected by rabbits and intrusion of tree roots. A sample for pollen analysis was taken from one of the clearly recognizable sods (Waterbolk 1954, 103, 111).

11.9.2 Results and discussion

This barrow was constructed in an open space with an ADF of approximately 100 m. The open space was covered with heath vegetation that was, when compared to the other barrows discussed in this chapter, quite grassy with a percentage of Poaceae of 30% (see figure 11.6). Calluna vulgaris is the dominating species with 75%. This barrow was probably situated close to an alder carr, indicated by the high percentage of Alnus (60%). Sods were cut to build the barrow; a minimum area of approximately 320 m$^2$ was required to obtain the sods.

11.10 Summary: the barrow landscape of Toterfout-Halve Mijl and surroundings

From the area around Toterfout-Halve Mijl pollen data are available from the late Neolithic-A to the Iron Age. The vegetation in the surroundings of the discussed barrows seems not to have differed greatly from each other during this entire period. Barrows were built in open spaces with heath vegetation which was dominated by Calluna vulgaris with in most cases probably some solitary Betula trees. All other herbal vegetation, including Poaceae, was very low in number. These heath areas formed, in the case of the Toterfout-Halve Mijl group, most likely long stretched areas in which groups of barrows were built in the Bronze Age period. The forest in this area could be divided into two components. In the lower and wetter parts alder carr was present, indicated by the high percentage of Alnus in all of the pollen spectra. The forest at the drier parts in the area consisted mainly of Quercus and Tilia and in the Bronze Age also of some Fagus. As has been discussed in the previous chapters as well, the activity of man is required to manage the heath. The method of management in this area is not easy to deduce from the pollen spectra. Anthropogenic indicators are very low in amount. Some grazing indicators have been found in the barrows from Toterfout-Halve Mijl. There is no evidence for burning. Sod cutting is indicated by the barrows, while they were built of sods. Especially for the amount of barrows being built at Toterfout-Halve Mijl sod-cutting could certainly been part of the heath maintenance.

One of the research questions concerns the origin of the open spaces the mounds were raised in. For the Toterfout-Halve Mijl group the history of its open spaces is available. Some of the barrows were built on possibly former arable land (although questionable, see sections 11.1.1 and 11.6.1) and traces of a Neolithic settlement have been found nearby. After abandonment of the settlement an open area covered with grasses and some heath was left behind. Possibly the area was grazed at that time, causing an expansion of the heath in which later the barrows were built. The construction of the mounds in the area did not stop prehistoric man from using the area as pastoral grounds, because the heath could only be maintained by human interference. The destination of the area changed through time from settlement area with agriculture, to pastoral area, to burial site combined with pastoral area. On the other barrows discussed in this region no
Figure 11.6. Pollen spectra from the samples taken from the barrows at Alphen and Gœrle. Spectra are given in % based on a tree pollen sum minus Betula pollen. In the total AP (= arboreal pollen) Betula is included. In the total NAP (= non arboreal pollen) spores are included, non pollen palynomorphs are excluded. Different scales have been used, indicated with different colours.
data are available that can reveal the origin of the open places these barrows were built in. It is clear that the open spaces were already present some time before the barrows were built, since heath vegetation had already developed, a process that in general takes approximately 40 years (Stoutjesdijk 1953). It is likely that grazing was involved in the maintenance of the heath vegetation already before the barrows were constructed.

<table>
<thead>
<tr>
<th>Diameter (m)</th>
<th>Height (m)</th>
<th>Sod thickness (m)</th>
<th>Sod area (m²)</th>
<th>Radius (m)</th>
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<tbody>
<tr>
<td>Hoogeloon 1</td>
<td>18</td>
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<td></td>
</tr>
<tr>
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<td>unknown</td>
<td></td>
<td></td>
</tr>
<tr>
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<td>0.25</td>
<td>28.19</td>
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<td></td>
<td></td>
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<td>Steensel</td>
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<td>unknown</td>
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<tr>
<td>Goirle</td>
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<td>0.9</td>
<td>0.25</td>
<td>319.61</td>
</tr>
</tbody>
</table>

Table 11.3 The minimum size of the open space per barrow based on the sods used to build the barrows.