A GROUP OF TUMULI ON THE 'HOOGHALEN' ESTATE NEAR HIJKEN (MUNICIPALITY OF BEILEN, PROVINCE OF DRENTHE, THE NETHERLANDS)

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ABSTRACT: In 1952-53 11 burial mounds of a group of 16 on the 'Hooghalen' estate near Hijken were excavated. Only a brief description of one of the tumuli, and a short summary of the results were published (van Giffen, 1956; van Zeist, 1955). Another burial mound on the estate had been excavated in 1937, shortly before it was leveled (van Giffen, 1939a).

In this paper the excavations are fully published, at last. The group comprised largely mounds of the Middle Bronze Age, but three Late Neolithic and 6 Middle/Late Iron Age mounds are present as well. The dating of Dutch burial mounds in general, and of the Hijken-'Hooghalen' group in particular, is discussed. The discovery and the application of Gerritsen's rule on the centring of single, widely-spaced post circles is elucidated. The palynological evidence, originally published by van Zeist (1955), is reconsidered.

KEYWORDS: Northern Netherlands, burial mounds, Late Neolithic, Middle Bronze Age, Middle/Late Iron Age, post circles, Gerritsen's rule, palynology.

1. INTRODUCTION

In the autumn of 1952 and the summer of 1953 a group of tumuli was excavated on the 'Hooghalen' estate near Hijken, municipality of Beilen, province of Drenthe, under the direction of Prof. A.E. van Giffen and by kind permission of the owner of the estate, the life-insurance company 'De Utrecht'. The excavations were carried out by J. Lanting and A. Meijer, field technicians, H. Praamstra, draughtsman, and W. Glasbergen and W. van Zeist, at the time van Giffen's assistants. Tumulus 8, however, was excavated by W.A. van Es, student, and P.S.A. Kikkert, draughtsman of the Instituut voor Prae- en Protohistorie at Amsterdam, as part of a training programme.

The group comprises 16 barrows, although tumulus 2, situated c. 975 m NW of the others, strictly speaking does not belong to the group (fig. 1). On the other hand, it is known that at least one barrow of the group disappeared in the course of heathland reclamation, prior to afforestation. This was the barrow known as Hijkerveld, tumulus 43, excavated by van Giffen in 1937, and located only 200 m NW of the main group (van Giffen, 1939a; see also fig. 1).

The investigations were prompted by the discovery of the remains of a 'Deverel' urn, found by J. Luinge in a rabbit hole in tumulus 1. Eleven barrows were excavated in 1952-53, viz. tumuli 1-10 and 12. All were afterwards restored. Publication of the results never took place, apart from a description of tumulus 3 (van Giffen, 1956) and a very brief description of tumuli 1-10 by van Zeist (1955) in his doctoral thesis, which also includes a discussion of the palynological results from these barrows. The present authors felt that even after all this time the results of this excavation deserved being published in detail. This article is based on a M.A. thesis by the first author (van der Veen, 1979), but, in preparing the text for publication, several alterations and additions have been made to the originial text by the second author, and, to a lesser extent, also by the first author. A description of tumulus 43 of the Hijkerveld has been added (tumulus 17), for the sake of completeness. The interpretation of the barrows presented here differs to some extent from that made by van Giffen and van Zeist.

There is some confusion in the literature regarding the name of the location. Two radiocarbon dates, both from tumulus 1, were published in Lanting & Mook (1977) under the names of 'Hijken-De Utrecht' (p. 93) and 'Hooghalen-De Utrecht' (pp. 113 and 128). The correct description of the location of this group of barrows is, however, 'Hooghalen' estate, (*Landgoed Hooghalen*), near Hijken, or, for short, Hijken-'Hooghalen'.

Fig. 1. The location of the burial mounds on the 'Hooghalen' estate near Hijken.

2. EXCAVATION AND INTERPRETATION

2.1. Method of excavation

All barrows were excavated using the quadrant method (van Giffen, 1930: p. 7); in the case of the elongated tumuli (Nos 3 and 4) a modified version of the method was used, creating one longitudinal and two transverse sections. In most cases all four quadrants (or all six 'sextants') were excavated, with the exception of tumuli 2, 9 and 12, from which only the SW and NE quadrants were removed.

While the quadrant method is generally considered the best procedure for excavating burial mounds, as it provides both horizontal and vertical controls, some comments are necessary here.

First of all, during the long career of Prof. van Giffen it had gradually become customary to dig away whole quadrants in one go, so also during the excavation at Hijken-'Hooghalen'. Prior to the arrival of H.T. Waterbolk as professor at the B.A.I. in Groningen the standard procedure had been to determine the level of the old surface, at the foot of the mound, and subsequently remove a quadrant in one go, down to this level, starting from the periphery (Waterbolk, pers. comm.). Only after Waterbolk, in

an excavation at Eext in 1954, just barely managed to save a Period-2 primary grave containing a body outline, was a new procedure introduced, that of digging the quadrant down in spits. At the time of the excavations at Hijken-'Hooghalen' the old procedure was still used and, consequently, a number of graves were missed (either partially or altogether).

Secondly, the four sections created by the quadrant method do not always provide enough information regarding the structure of the mound, especially in tumuli which contain peripheral structures of more than one period (post and stake circles in particular), as is the case in this group of tumuli. For example, in several cases it turned out that either none or only one of the postholes was cut by a section, while the remaining sections were located in between the other postholes. This meant that observations of these peripheral structures could only be made in the horizontal plane, which is frequently insufficient for an accurate interpretation of the structure of the barrow.

It would, therefore, appear desirable to ensure that in barrows with multiple peripheral structures more vertical sections are available. This is not to say that from now on barrows should all be excavated in 'octants'; more than four sections at the centre of the mound are merely a hindrance. Extra sections are only necessary at the edge of the mound; they need not extend all the way accross the barrow, as long as they are somewhat longer than the width of the peripheral structure. A good example is the way in which the barrow at Amesbury, G71, in Wiltshire, England, was excavated (Christie, 1967: pp. 336-366, fig. 2 and plate XXXIV). It is not necessary to position these sections according to a fixed pattern. Whenever the excavation of the first quadrant shows that the barrow in question possesses a complex peripheral structure, one may decide, according to the size of the barrow and the complexity of the peripheral structures, to retain one or more extra baulks in the remaining quadrants. This increases the chance of postholes being cut by a section, and hence facilitates the interpretation of their stratigraphic position.

2.2. Gerritsen's rule

Single, widely-spaced post circles (Glasbergen, 1954: type 3) were encountered in four tumuli of this group, viz. tumulus 1 Period 3, tumulus 6 Periods 1 and 2, tumulus 7 Period 1 and tumulus 10 Period 2. In all five cases the post circle centred on a single point. The fact that posts in single, widely-spaced post circles were positioned in opposing pairs across a single point at the centre of the tumulus, was discovered in the early fifties by J. Gerritsen (see appendix).

As H.J. Case (Oxford), after investigating the tumulus near Poole, Dorset, also worked on the identification of regular patterns in post circles (Case, 1952), and had already discussed the matter with Glasbergen, the latter decided to delay publication of this discovery in order to write a joint article about it (Waterbolk, 1955: pp. 25-26). Unfortunately this article, which was to be published in *Palaeohistoria*, was never written.

At the Biologisch-Archaeologisch Instituut the principle soon became common knowledge: when the present group of tumuli was excavated in 1953 it was well-known (Glasbergen's field journal, Tuesday 21 July 1953). During the excavation of a barrow south of Eext in 1954, the principle was demonstrated in the field, by connecting pegs in opposing postholes with string (Waterbolk, 1957: plate XIII:2). It was, and still is, used to reconstruct incomplete post circles, to trace entrances to the circles, but also, and perhaps more importantly, to solve problems of stratigraphy, viz. to determine which central grave belongs to the post circle in question (see Lanting, 1973: p. 230: Eext, Tum. 1954a, and pp. 307-308, note 7: Vries, Tum. III). Curiously enough, the principle did not become generally known in Dutch archaeology. Verlinde attempted to explain the irregular pattern of postholes on the east side of a tumulus by assuming that after the circle had been laid out, the positions of posts along this circle were determined by means of a rod of the right length. In his view this would always result in an irregularity where the circle was closed, because the remaining space between the first and the last post would seldom correspond exactly with the length of the rod. According to his field technician Bruijn, however, the positions of posts were determined by laying the posts to be used tangentially around the circumference of the circle (Verlinde, 1973).

Neither realized that the posts had been placed in pairs, focussing accurately on a single point at the centre of the tumulus. If a post circle contains an uneven number of posts, an irregularity will virtually always be found in the spacing of the posts. If then a point is assumed between the two posts in question, the circle will be found to centre on one point after all.

A good example is the two-period barrow of Elp (Waterbolk, 1961). Period 1 features an even number of postholes. The point of intersection of the lines connecting pairs of opposing postholes lies halfway along the northern long side of burial a, the principal grave of Period 1 (fig. 2a). Period 2 has an uneven number of postholes. The irregularity in this case is found on the south side, where one space between two adjacent postholes is considerably smaller than elsewhere in this circle. If these two postholes are replaced by a single one exactly between them, creating an even number of postholes, the post circle is found to centre on a point near the

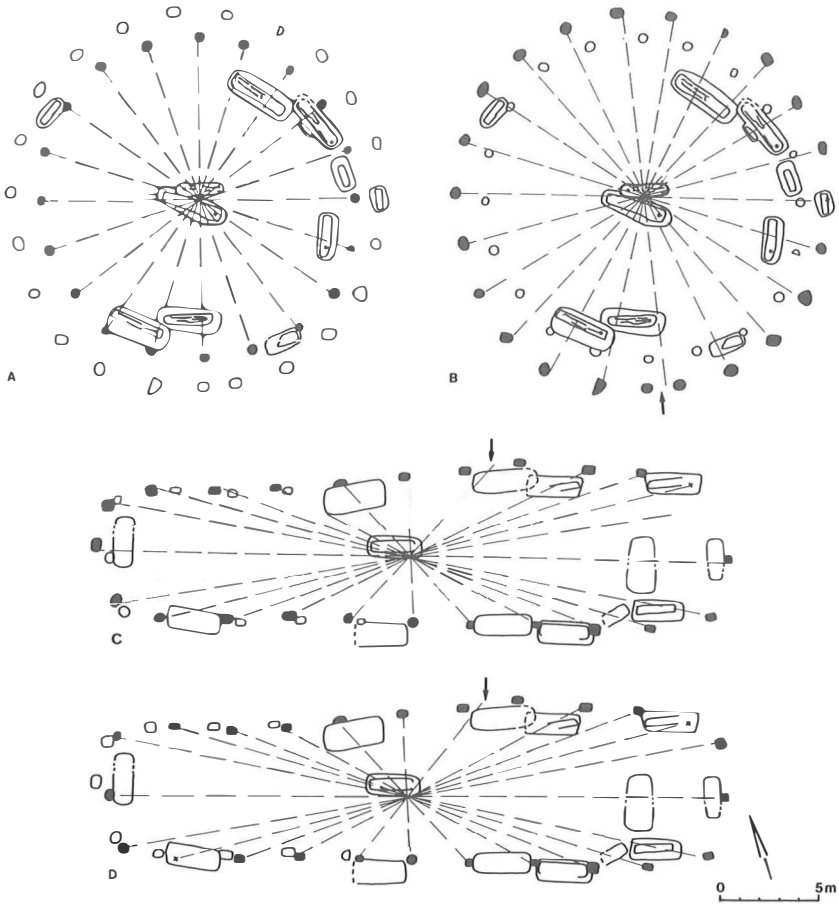


Fig. 2. Gerritsen's rule applied to: a. Elp, Period 1: a post circle with an even number of posts; b. Elp, Period 2: a post circle with an uneven number of posts, showing a clear irregularity; c. Gammelke, tumulus II: an oblong post construction with an uneven number of posts; d. Gammelke, tumulus II: the repair phase of the same post construction.

middle of the south side of burial e, the principal grave of Period 2 (fig. 2b).

Presumably, posts were positioned by means of sighting them across a stake at the centre of the tumulus. The lines connecting opposing pairs in some cases do not cross at one point but may have shifted a few centimetres. This may result from the fact that in digging the postholes small deviations may occur in relation to previously determined positions.

It appears that a post circle always centres on a point on the edge of the burial pit. But there is no fixed rule as to the location of this point. Often it lies near the middle of a long side, and the north and east sides seem to have been preferred. Sometimes it is closer to a corner of the grave pit. The rule not only applies to circular or sub-oval post circles, but even to elongated ones, like that of tumulus II at Gammelke (Verlinde, 1973). In this barrow, the lines intersect near the SE corner of the central grave pit (fig. 2c). Later on the post circle was partly repaired. A centre point near the SE corner of the central grave pit was maintained (fig. 2d).

3. CHRONOLOGY

3.1. Dating burial mounds by means other than grave gifts

Burial mounds were constructed from the beginning of the Late Neolithic Single Grave period to the end of the Middle Bronze Age, and again during the Middle and Late Iron Age. During the Late Bronze and Early Iron Age the dead were cremated, and their remains buried under low mounds in so-called urnfields. During this period substantial mounds were very rare (for some exceptions, see Kooi, 1979: fig. 112-113).

As a rule Bronze Age and Iron Age burials are poor in grave gifts. It is, however, possible to date burial mounds on the basis of intermediary and peripheral structures, construction of graves, etc.

Associated only with graves of the Late Neolithic Single Grave and Bell Beaker Cultures is the so-called 'intermediary foundation trench', i.e. a ditch that held posts, and which played a temporary role in the funerary ritual. Before the mound was construc-

ted, these posts were removed, after which the ditch was covered by the mound. However, not all Beaker graves were surrounded by a ditch of this type.

Peripheral structures in the form of ditches and post circles are typical for the Middle Bronze Age. Largely on the basis of series of radiocarbon dates Lanting & Mook (1977: pp. 109 and 113-114) concluded, that during the earlier half of the Middle Bronze Age burial mounds were surrounded by ring-ditches or were left without any peripheral structure; during the later half of the Middle Bronze Age they were surrounded by post circles of various types. For a short period both ring-ditches and post circles were used. An 'inverted stratigraphy' may result, with a post circle antedating a ring-ditch. This occurs for instance in tumulus II on the Bergakkers near Eext (Jager, 1985: fig. 41), and also in tumulus 3 at Hijken-'Hooghalen' (see 4.3). Most cremation burials under mounds from the Urnfield period were surrounded by a ring-ditch, too. But these are in general much narrower and shallower than the Middle Bronze Age ditches.

Fairly typical for the Late Neolithic Single Grave Culture is the so-called 'beehive grave'. This is a grave-pit, in which a ditch is dug at the bottom, along the edges of the pit. This ditch functions as a foundation trench for a wicker-work or plank construction, which seems to replace a coffin (see also Lanting & van der Waals, 1971: p. 100). At least one 'beehive-grave' of the Bell Beaker Culture is known, in Laaghalerveld, tumulus 1 (Lanting, 1973: pp. 267-268). Two closely comparable structures were found in Middle Bronze Age contexts, namely in Gasteren, tumulus 37 (van Giffen, 1945: afb. 12) and in Velzerbroekpolder (Bosman & Soonius, 1990: fig. 5).

During the Late Neolithic and Early Bronze Age plank-built cists were normally used. The tree-trunk coffin seems fairly typical for the Middle Bronze Age.

Although tangentially-placed secondary burials are more common in the later half of the Middle Bronze Age, especially in mounds surrounded by single, widely-spaced post circles (the so-called 'family barrows' of Waterbolk, 1962: p. 13), they are not restricted to this period. The practice seems to have developed towards the end of the earlier half of the Middle Bronze Age, as is shown by the occurrence of tangential graves in barrows surrounded by ring-ditches, or without peripheral structures.

As a rule, burial mounds of the Late Neolithic and Early Bronze Age are constructed of sand. Mounds of the Middle Bronze Age and of the Middle and Late Iron Age are normally constructed of sand and turves, or turves only. But too many exceptions to this rule exist, to be useful for dating purposes. For example, the Late Neolithic burial mound at Witrijt contained a core of well-developed heather turves (Beex, 1957), whereas a burial mound with grave gifts of the Middle/Late Iron Age near Anlo was constructed of pure sand (van Giffen, 1939b).

During the Late Neolithic, the Early and Middle Bronze Age inhumation burial prevails, but cremations occur occasionally. Especially during the first half of the Middle Bronze Age cremation was not uncommon. During the Late Bronze and Early Iron Age – the Urnfield period – cremation is common practice. The burial of the cremated bones takes place in or without a ceramic vessel, but usually in a pit.

During the Middle and Late Iron Age some burial mounds were constructed over the remains of the pyre and the cremated bones. These mounds are comparable to the NW-German *Brandhügel*, which can be translated as 'pyre-mounds' in English, and *brandheuvels* in Dutch. But not in all cases do the mounds contain large amounts of charcoal and/or cremated bones. Fairly often only small patches of charcoal, or only deposits of cremated bones are found. And occasionally nothing at all is found (van Giffen, 1949; 1951; Harsema, 1971/72). It is possible that these 'findless' mounds covered inhumation burials, of which no traces were left or visible. Most confusing, however, is that occasionally during the first half of the Middle Bronze Age 'pyre-mounds' were constructed as well, for example tumuli Eexterstrubben I and II (Jager, 1985: p. 215 and figs 20-21).

Characteristic for Middle and Late Iron Age mounds is that they are relatively small, that they occur in most cases in groups, and that they often lie very close to one another. Therefore these mounds can often be recognized without excavation.

3.2. The dating of elongated burial mounds

Like stated before, only tumulus 3 of the Hijken-'Hooghalen' cemetery was published by van Giffen (1956). He was of the opinion, that elongated burial mounds formed a link between the chambered long mounds of the Neolithic Funnel Beaker Culture, and the *lange bedden met paalzetting* (graves of Vledder type, Kooi, 1979) of the Late Bronze Age. On chronological grounds this hypothesis has to be rejected. There is a gap of at least 1500 years between the latest chambered long mound and the earliest elongated burial mound.

Although the Hijken-'Hooghalen' group comprised 3 elongated burial mounds (tumuli 3, 4 and 16), the type in general is quite rare. A summary of the results of the excavated examples might be useful:

1. Weerdinge-Kamperesje, municipality of Emmen, province of Drenthe. In 1920 van Giffen excavated two elongated barrows here. One of them was published. It was 25 m long, 8 m wide and 1 m

high, oriented NW-SE. The barrow was surrounded by a circle of boulders, largely destroyed. At both ends of the longitudinal axis it contained primary graves, covered by stone packing. In addition, seven peripheral graves were found (both tree-trunk coffins and stone packing). One of the secondary burials contained a small bronze ring. The barrow revealed several phases of construction (van Giffen, 1930: pp. 33-35, and 1956: pp. 113-115).

2. Odoorn, municipality of Odoorn, province of Drenthe. Tumulus 4, excavated by Bursch in 1937. The barrow was oriented NW-SE, 15 m long, 5 m wide, and surrounded by a ditch and circle of boulders. There were five primary burials, all in tree-trunk coffins oriented NW-SE, and two secondary graves, similarly oriented, with stone packing (Bursch, 1937: pp. 49-50).

3. Mander, municipality of Tubbergen, province of Overijssel. A barrow excavated by Hijszeler in 1958. It was 22 m long, 9 m wide, and surrounded by a ditch 1.25 m wide and 0.80 m deep. Its orientation was N-S. Two primary graves in tree-trunk coffins were found on the longitudinal axis of the barrow as well as two secondary burials. One of these showed the outline of a body, the other that of a tree-trunk coffin (Hijszeler, 1970: photo on p. 19, lower left; *Archeologisch Nieuws* 1958, pp. 118-119).

4. Gammelke, municipality of Weerselo, province of Overijssel. A barrow excavated by Verlinde in 1971. It was oriented WNW-ESE, 27 m long, 6-8 m wide, and c. 0.50 m high. The primary burial (a tree-trunk coffin) lay along the longitudinal axis at the centre of the barrow. In addition, 13 tangential secondary burials were found. The barrow was surrounded by a single, widely-spaced post circle, which on the west side appeared to have been repaired and on the east side to have been replaced by a multiple palisade (Verlinde, 1973).

5. Borger, municipality of Borger, province of Drenthe. The remains of a completely leveled, elongated burial mound with N-S orientation were excavated by the second author in 1987. The mound had been 27 m long and 11 m wide and was surrounded by a ditch, 2 m wide and c. 1.5 m deep. In the centre of the mound an shallow pit was found, probably the grave pit. No grave gifts were present.

6. Gross Stavern, Kreis Meppen, Germany. A barrow excavated by Schlicht in 1951 also deserves mention (Schlicht, 1953: pp. 11-14). It was oriented E-W, 23 m long, 7.50 m wide and c. 1 m high. No primary grave was encountered, but there may have been a coffin on the old surface which was overlooked. There were 12 tangential secondary burials in tree-trunk coffins. Twice the outline of a body was observed. In one of these secondary graves a pin was found with a square shaft, spirally twisted at the lower end, and with a concave nail-like head (*Plattenkopfnadel*, of the Gross Stavern variety, according to Laux, 1976: p. 64, Taf. 27). The pin is thought to date to the transition of early to late *Hügelgräberzeit*, i.e. to the middle of the Middle Bronze Age.

7. Wiesens, Stadt Aurich, Landkreis Aurich, Germany. A leveled oblong burial mound, excavated by Linke and Schwarz in 1980. The mound was 25 m long, 9 m wide and WNW-ESE oriented. It was surrounded by a single widely-spaced post 'circle' of 21 posts, which focus on a single point in the centre. No central grave was found. A tangential grave with two tree-trunk coffins was found at the south side (Wilhelmi, 1986).

In his article about the elongated barrow of Gammelke, Verlinde mentions some other parallels as well, such as tumulus 6 at Emmen, tumulus 1 at Odoorn, tumulus IV at Eext and some more near Haps, Berghem and Knegsel (Verlinde, 1973). The latter are, in fact, Iron Age barrows (Lanting & Mook, 1977: pp. 101-105). The Emmen barrow probably was not an elongated barrow, but a round one next to a group of flat graves. The barrow of Odoorn is merely oval, and hardly comparable to the elongated ones of Hijken-'Hooghalen', while van Giffen probably was mistaken when he designated the Eext tumulus as an elongated barrow.

Apart from a single pin from one of the secondary burials at Gross Stavern, none of the elongated barrows have yielded grave goods that allow satisfactory dating. Nor are any radiocabon dates available. However, the various peripheral structures, viz. surrounding ditch and circles of posts or boulders, the use of tree-trunk coffins and the tangential secondary graves all seem to suggest that we are dealing with variants of the round barrows of the Middle Bronze Age.

It is not clear why these elongated burial mounds were constructed occasionally. The dead in question may have had a special status. If so, this status did not show in the wealth of grave gifts, but only in the extra labour needed to construct an elongated mound instead of the usual round one.

4. DESCRIPTION OF THE TUMULI

4.1. Tumulus 1 (figs 3-6)

This burial mound had a diameter of c. 18.5 m and a height of 2.10 m. The centre of the mound had been disturbed, but not down to old ground level. Furthermore the mound was riddled with rabbit burrows. Tumulus 1 was excavated according to the quadrant method. The excavation started in November 1952, but was stopped within a few days, because of bad weather. It was completed in the summer of 1953. During the excavation, parts of the west and south

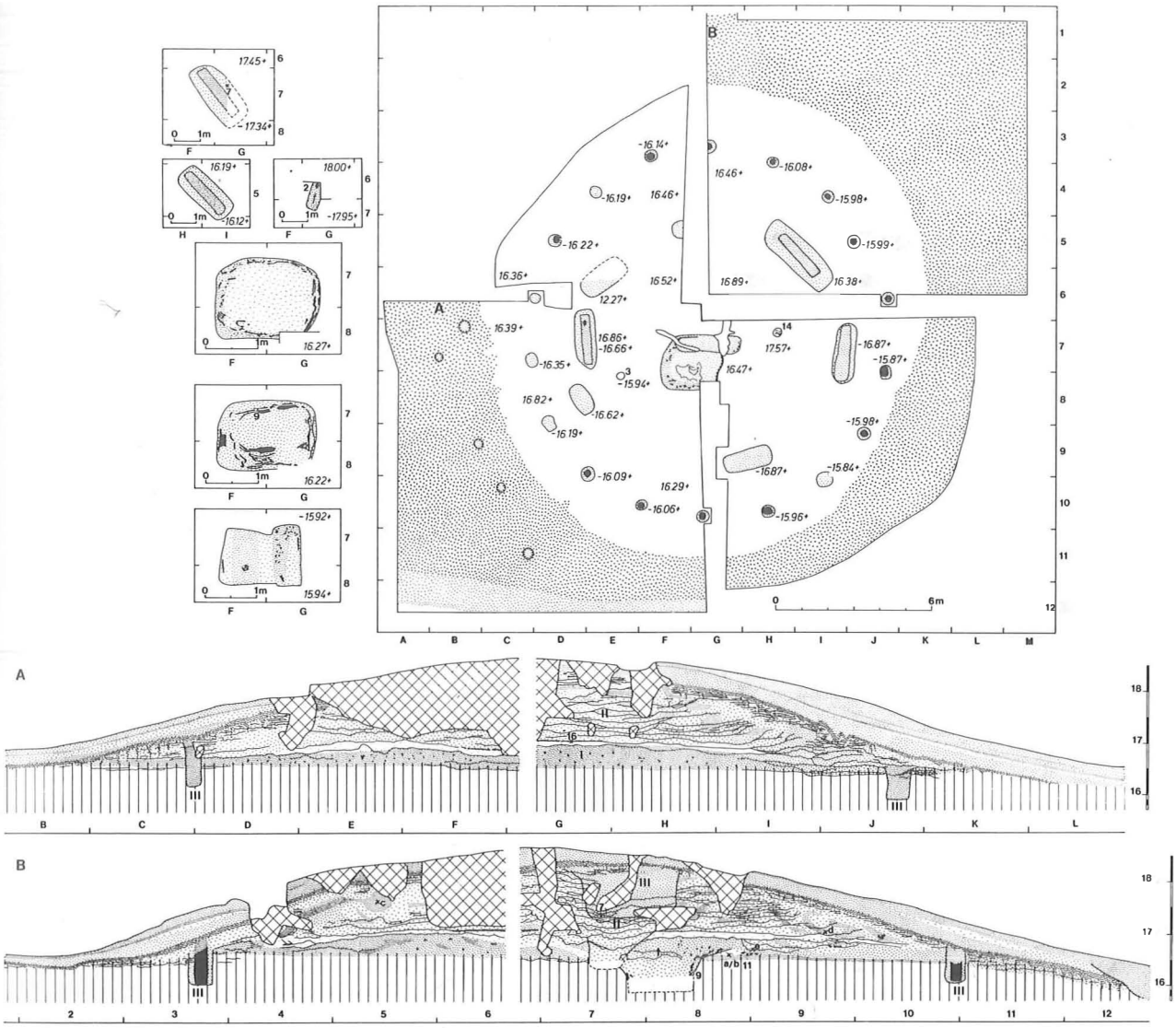


Fig. 3. Hijken-'Hooghalen', tumulus 1: plan and sections.

profile baulks collapsed before being drawn. In the mound, three periods of construction were recognizable.

Period 1. This period saw the construction of a low mound (0.50 m high, c. 15 m across), built out of grey sand containing scattered charcoal fragments. As this material is similar to that of the underlying old soil profile, the transition could be discerned only in the centre-south section, where yellow sand from the grave pit marked the transition. The homogeneous greyish old soil, without a darker humic layer at the top, might well be ploughsoil. The grave pit was sub-rectangular and oriented E-W. Along the sides of the pit the charred remains of a plank-built cist were encountered. The bottom of the pit revealed the remains of two transverse timbers. No grave goods were found. Charcoal from the grave (find No. 9) produced a radiocarbon date of 3665±35 BP (GrN-6261).

Dating: Plank-built cist, grave orientation and radiocarbon date indicate that Period 1 is of the Late Neolithic Bell-Beaker period.

Period 2. On the leached horizon which had developed over the first mound lay a thin layer of charcoal particles, which is probably associated with activities surrounding the construction of the second phase. The charcoal (find No. 16) produced a radiocarbon date of 3455±35 BP (GrN-6262). In this phase the barrow was made up with pale-orange sand and some turves. At the centre it was raised by at least

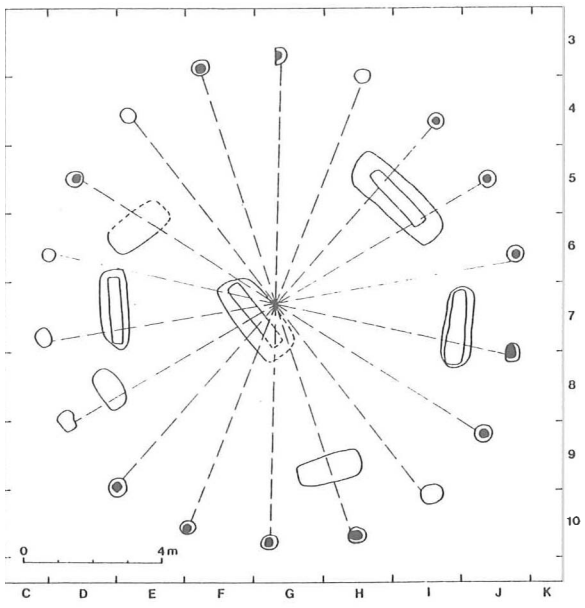


Fig. 4. Hijken-'Hooghalen', tumulus 1: Gerritsen's rule applied to the post circle of Period 3.

1.20 m; its diameter was at least 16 m. Unfortunately, because of the well-developed podzol profile in the mound it is impossible to determine whether the barrow reached its ultimate height in this phase or was raised once more in the third period.

The grave pit, partly cutting that of the preceding period, was oriented E-W and narrow, rectangular in shape. Some charcoal was found at the eastern end and in the northwest part of the pit.

Dating: The absence of a peripheral structure and the radiocarbon date place Period 2 in the first half of the Middle Bronze Age.

Period 3. This phase is formed by the third central grave and a circle of posts. Whether the mound was added to at this stage cannot be determined; possibly the barrow attained its ultimate height in Period 2. If not, it was raised by c. 0.40 m at most.

The barrow was surrounded by a single, widely-spaced circle of posts (Glasbergen type 3). In the centre-north and -west sections it is clear that the posts cut through the Period-2 mound, so that they are not, as is assumed in the excavation reports, part

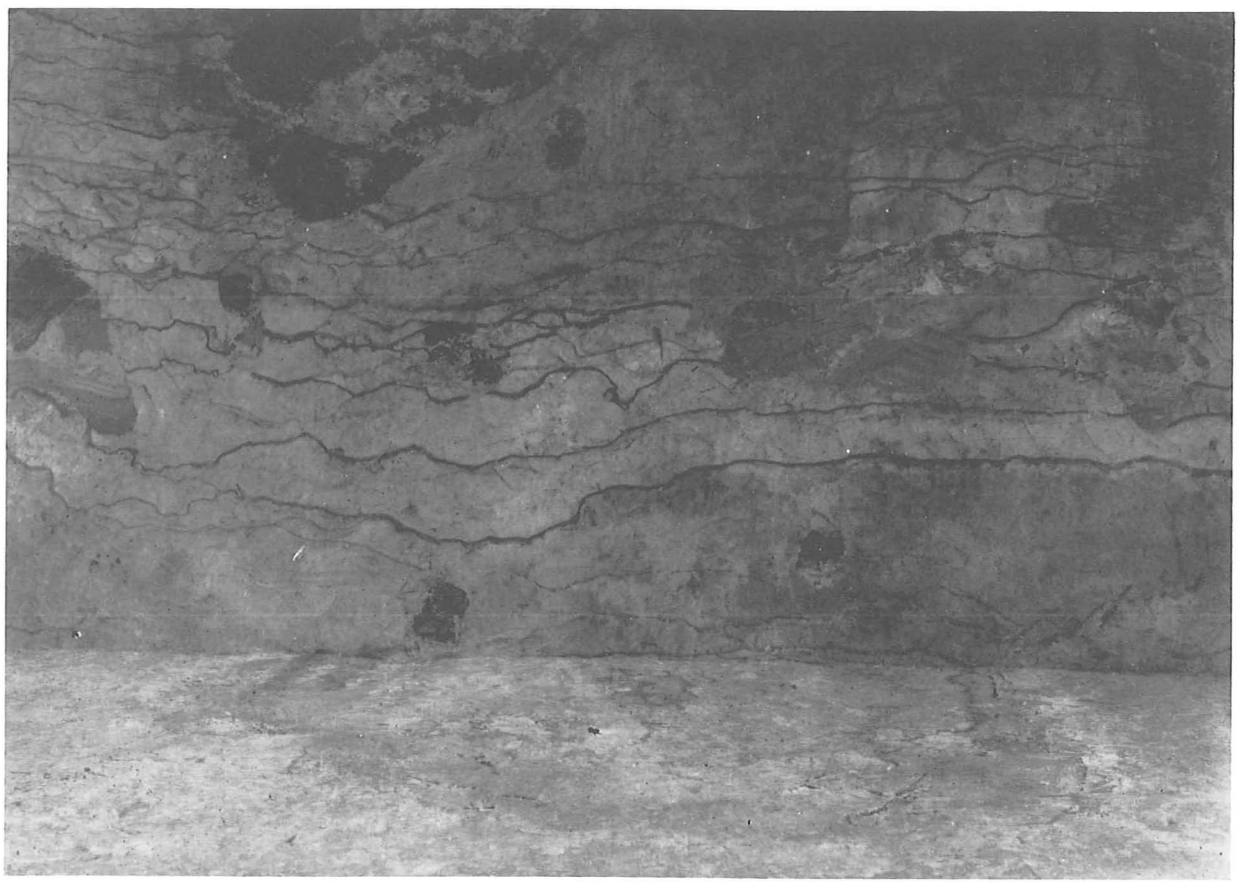


Fig. 5. Hijken-'Hooghalen', tumulus 1: the central graves of the Periods 1, 2 and 3 in horizontal (1 and 2) and vertical section. Centre-south section, seen from W.

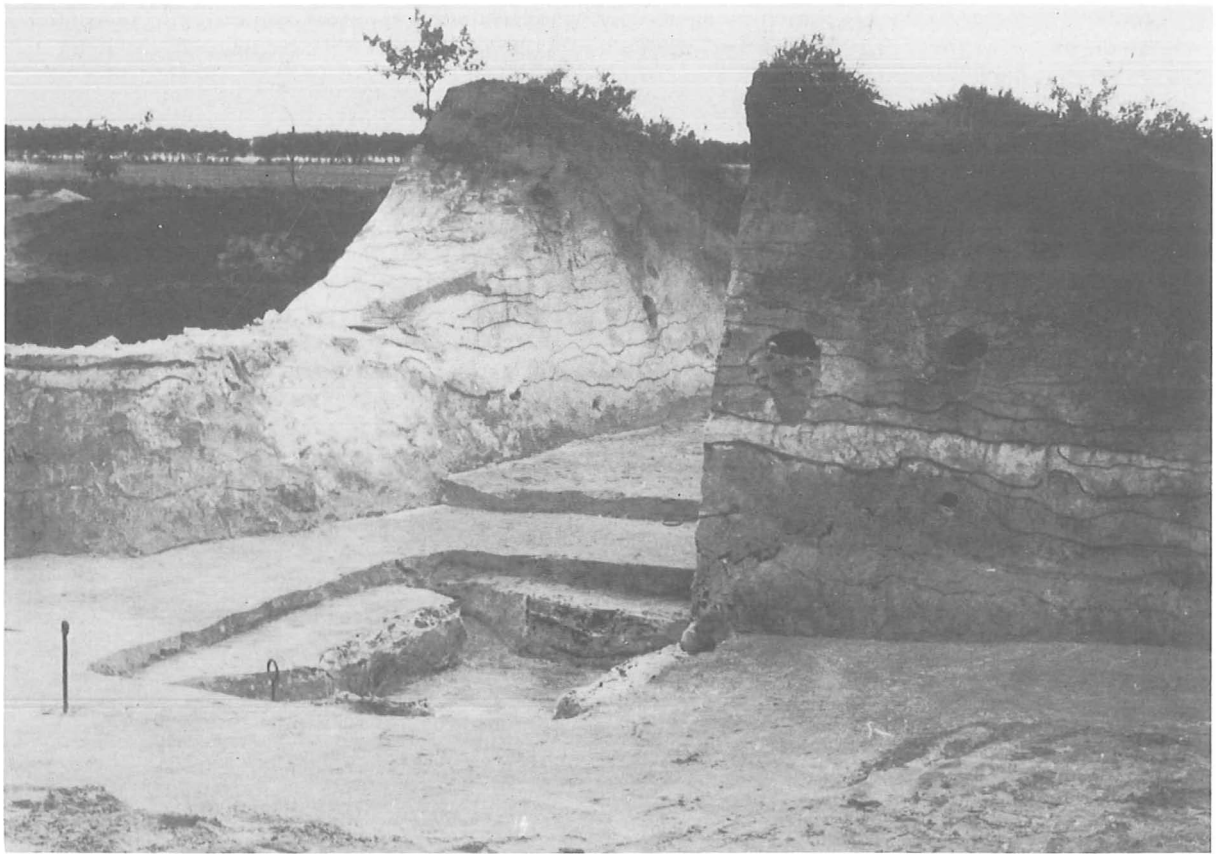


Fig. 6. Hijken-'Hooghalen', tumulus I: grave of Period I and part of the centre-south section seen from WSW.

of Period 2, but belong to a third period. The post circle measured c. 14 m across, and comprised 18 postholes; 14 of these still showed remains of post cores. The post circle centred on a point halfway along the northeastern, long side of the grave pit.

The central burial, a tree-trunk coffin, was oriented NW-SE and overlay the graves of the two earlier periods without cutting into them. As a result of the collapse of the central part of the centre-south profile baulk, the southeastern part of this grave pit could not be recorded. A bronze palstave (find No. 7; fig. 38) made up the grave inventory. This axe belongs to the Nordic type, Var. CIIa (Kersten, 1936: pp. 74-76) and to the type OstHannover, Var. B, as defined by Laux (1971: pp. 80-81). According to Kersten this type dates to the middle of Period II, according to Laux to his phase Bonstorf which corresponds to the *jüngere Hügelgräberzeit*. In the Dutch chronology this means roughly the end of the earlier half, and the first part of the later half of the Middle Bronze Age.

Dating: The single, widely-spaced post circle and the archaeological date of the palstave together indicate that Period 3 dates to the beginning of the second half of the Middle Bronze Age.

There are nine secondary burials, which almost certainly belong to Period 3:

– Six peripheral, tangentially-placed inhumation graves in rectangular grave pits, two each in the SE and SW quadrants, one each in the NW and NE quadrants. In three of them traces of a tree-trunk coffin were observed;

– Fragments of a *Kümmerkeramik* vessel containing a cremation (find No. 1; fig. 37), in the excavation reports described as a 'Deverel' urn. It was these sherds that prompted the excavations. The findspot (a rabbit hole) is not indicated on the field drawings;

–An urn with cremated remains (find No. 3; fig. 37) in the SW quadrant. The urn is difficult to classify: its shape and fabric are somewhat reminiscent of one of two small vessels found at Emmerhout, in the ditch around a *langbed* of Noordbarge type (B.A.I. excavation, unpublished). Charcoal from a similar *langbed* nearby was dated to 2935±35 BP (GrN-6398, Lanting & Mook, 1977: pp. 131-132). The urn is also a little like an urn from Valthe

(Waterbolk, 1962: fig. 14 No. 9), which by an accompanying pin with a truncated biconical head was dated to around 3000 BP, as well. Therefore this burial probably dates to the transition of the Middle to the Late Bronze Age;

– A cremation deposit, without pot, in the SE quadrant (find No. 14).

At the centre of the mound a small, rectangular grave pit was encountered, containing a well-preserved skull and other skeletal remains (find No. 2). The state of preservation of the bones shows that this grave must be of medieval or even younger date.

Outside the mound, in the SW quadrant 5 postholes were discovered. They seem to be unrelated to the mound.

Also in the SW quadrant the edge of a deep, subrecent cart-track was found, running more or less E-W. The track is almost certainly part of the old road Groningen-Steenwijk, via Hooghalen and Diever, which went out of use at the end of the 18th century, when its route was cut off by the digging of a number of canals in this area (Harsema, 1982: p. 156).

4.2. Tumulus 2 (figs 7-8)

The barrow had a diameter of c. 12 m, and a height of c. 1.3 m. The centre had been partly disturbed by unauthorized digging, but this had produced no great damage. The NE and SW quadrants and the centre of the mound were excavated. The mound was made up of turves; the lower half contained dark-coloured turves, the top half turves of a lighter colour, which were covered by a layer of brown sand also containing some turves. There is no reason, however, to interpret this as evidence of three construction phases, as van Zeist (1955: pp. 34 and 37) did. Indeed, tumulus 2 appears to have been built in one go. The old soil under the mound was an undisturbed podzol profile.

At the centre of the tumulus, on the old surface, lay some charcoal, some cremated remains and a

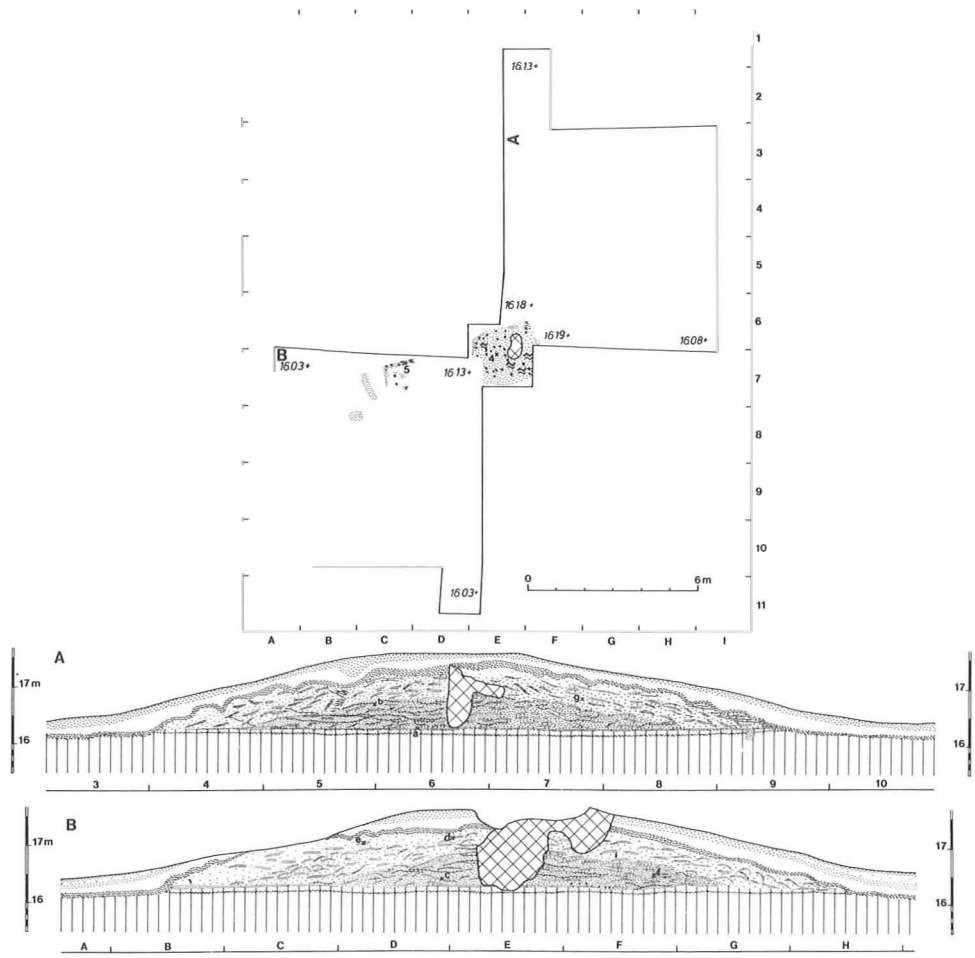


Fig. 7. Hijken-'Hooghalen', tumulus 2: plan and sections.

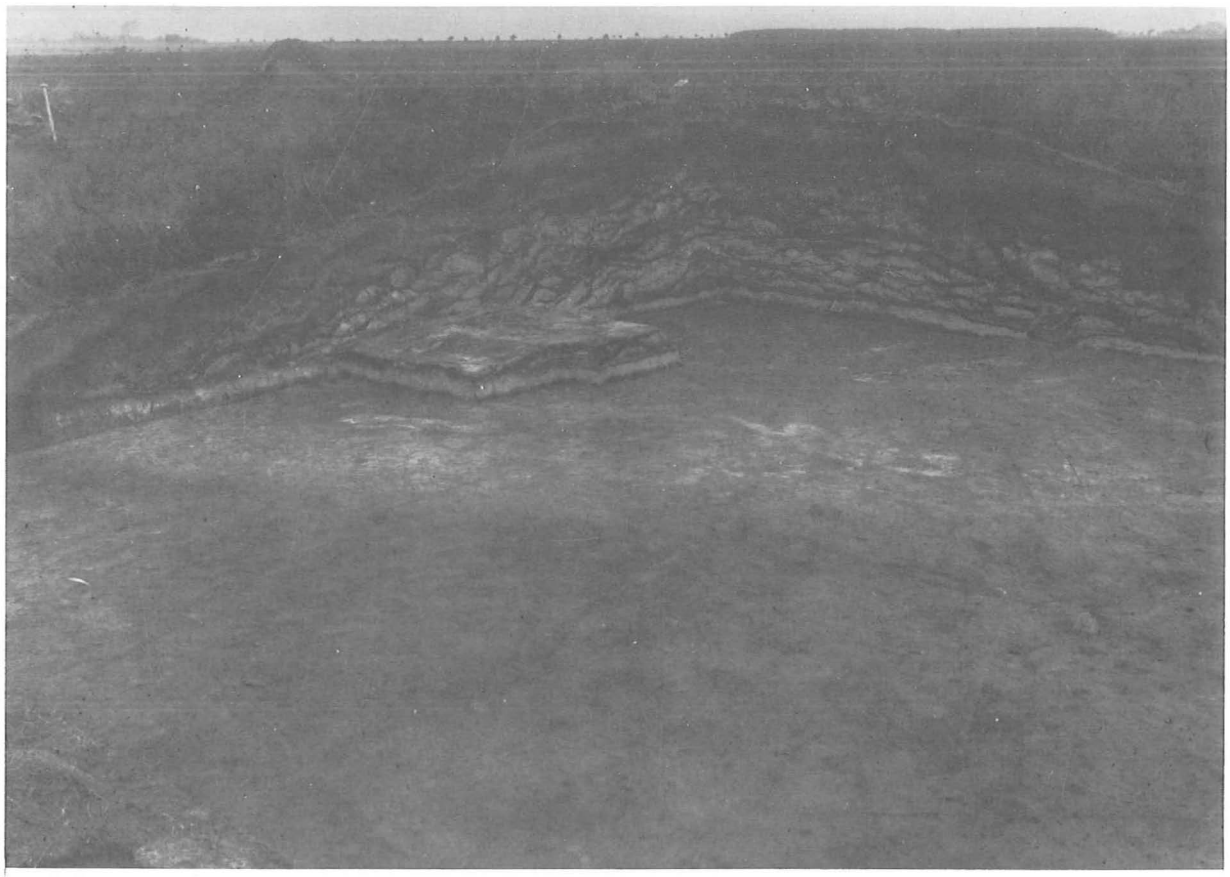


Fig. 8. Hijken-'Hooghalen', tumulus 2: SW quadrant seen from SW.

lump of corroded iron (find No. 4). Some burnt timbers were found in the SW quadrant, near the centre-west section (find No. 5).

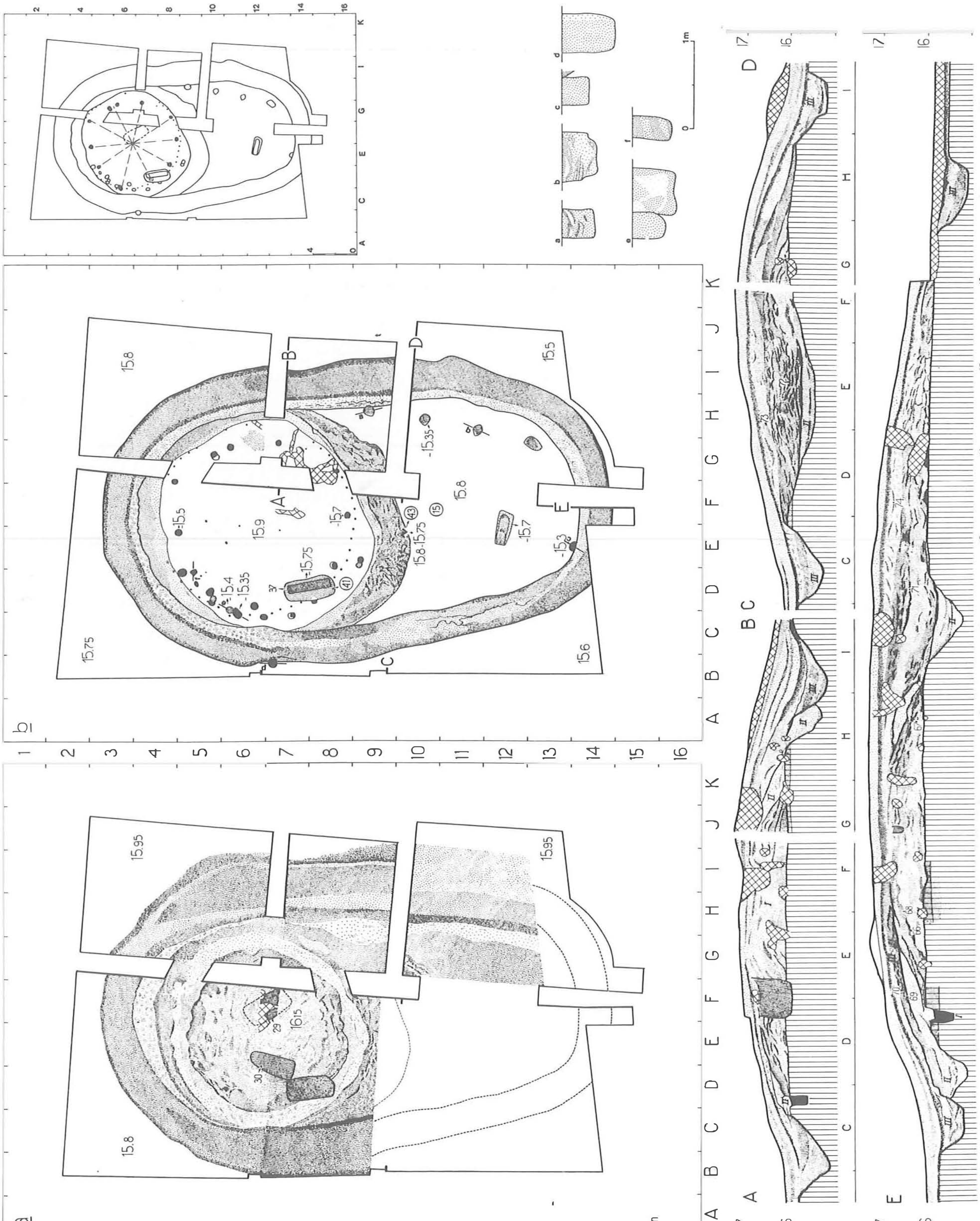
Dating: This is a typical *Brandhügel* (pyre-mound) of the Middle to Late Iron Age. Charcoal from the remains of the pyre at the centre was radiocarbon-dated to 2430±35 BP (GrN-14722).

4.3. Tumulus 3 (figs 9-11)

This barrow was elongated, with a length of c. 20 m, a width of 9-10 m, and a height of c. 1.3 m. The long axis was directed NNW-SSE. It was completely excavated in 'sextants', with a long N-S profile baulk and two E-W baulks. The mound, which was virtually intact before excavation, was found to have been constructed in three phases. Periods 1 and 2 are hard to distinguish in the body of the mound, because no soil had yet developed in the top of Period 1 when the yellow sand of Period 2 was deposited on its slopes. The old soil under the mound consisted of a homogeneous greyish layer, on top of an orange infiltration zone.

Period 1. The barrow in its initial form is a round one, about 1 m high and 9-10 m across. The mound consists of dirty-yellow sand with turves, covered with a layer of only turves. The tumulus was built on arable land that had been abandoned some time previously (van Zeist, 1955).

The principal grave consisted of a tree-trunk coffin set upon the old surface, slightly off-centre within the mound. Unfortunately it was largely destroyed in the course of excavation, but its orientation was almost certainly NW-SE. The tumulus was surrounded by a single, widely-spaced post circle (Glasbergen type 3) and a stake circle (Glasbergen type 9) just outside the post circle. The stake circle had a diameter of 8.80 m, and still contained 34 stakeholes. In a few places it appears to have been cut by the ditch. This effect may be due, however, to the edge of the ditch caving in. It seems debatable whether the postholes found beneath the mound did in fact form a post circle. The distances between them are highly variable; moreover, far more of them were found on the west side than on the east side. Several were drawn in section: some turned out not to be


a
b
15.8
15.95
16.15
15.75
15.9
15.6
15.5
2m
1m
A
B C
D
E

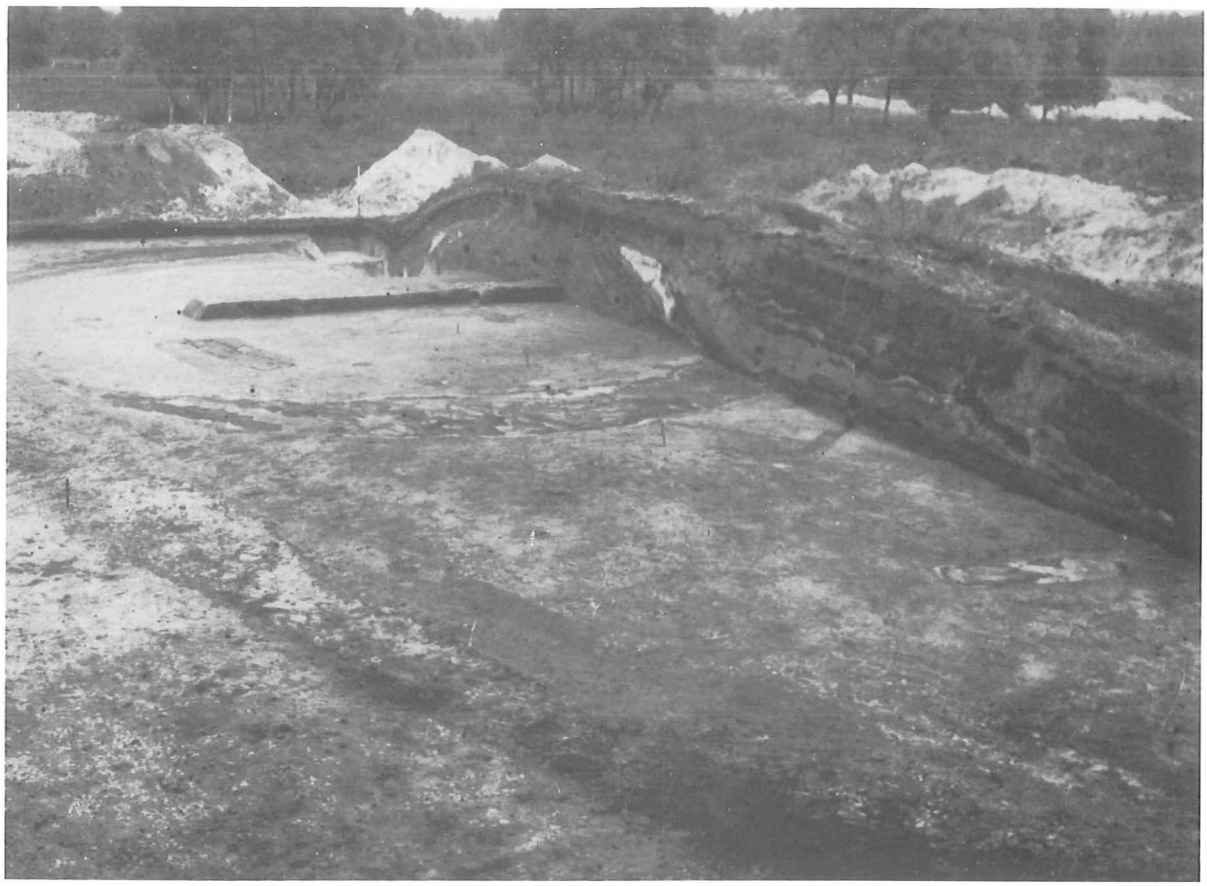


Fig. 10. Hijken-'Hooghalen', tumulus 3: the western half of the mound, seen from SSW.

postholes after all. Of the two postholes cut in the main sections, one is situated at the foot of Period 1, while the other cuts through it. Both are sealed by yellow sand from the ditch of Period 2. It is possible, however, to single out within the stake circle a single, widely-spaced post circle of 11 postholes, one of which was erased by the tangential grave in the centre-west sextant. In the north-east sextant, the post circle displays an irregularity in the form of two closely-spaced postholes. The centre of the post circle lies near the NW corner of the reconstructed central grave (fig. 9).

Period 2. Before a distinct soil profile was able to develop in the mound of Period 1, the barrow was given a new peripheral structure. This was a ring-ditch, V-shaped in section, with a width of c. 1.4 m and a depth of 0.8 to 1.0 m. Its diameter, measured between the deepest points, is 10.5 m. The excavated yellow sand from this ditch was deposited on the slopes of the original barrow. No grave belonging to this period was discovered, nor were there any indications of one in the sections. Maybe Period 2 should be seen as merely an adjustment of the original plan. In this case, the 'modern' post circle was replaced by an 'old-fashioned' ring-ditch.

Dating: Given the stratigraphy – a ring-ditch succeeding a post circle – Periods 1 and 2 can only date to the short transitional phase halfway through the Middle Bronze Age.

Period 3. By the time the circular ditch of Period 2 had partly silted up, the round barrow was extended southward by some 10 m, creating an oblong mound c. 1.30 m high, c. 20 m long and 9-10 m wide. The mound consisted of dirty-yellow sand, with a cover of turves, topped by a layer of orange-yellow sand containing some turves.

The barrow was surrounded by a ditch, V-shaped in section, with dimensions (between the deepest points) of c. 22.00x11.50-12.00 m; deep 0.80-1.00 m and c. 2 m wide. On the west side of the round barrow the ditch of Period 2 had been completely cut away in the digging of this second surrounding ditch; on the north and east sides the second ditch lies a little further out.

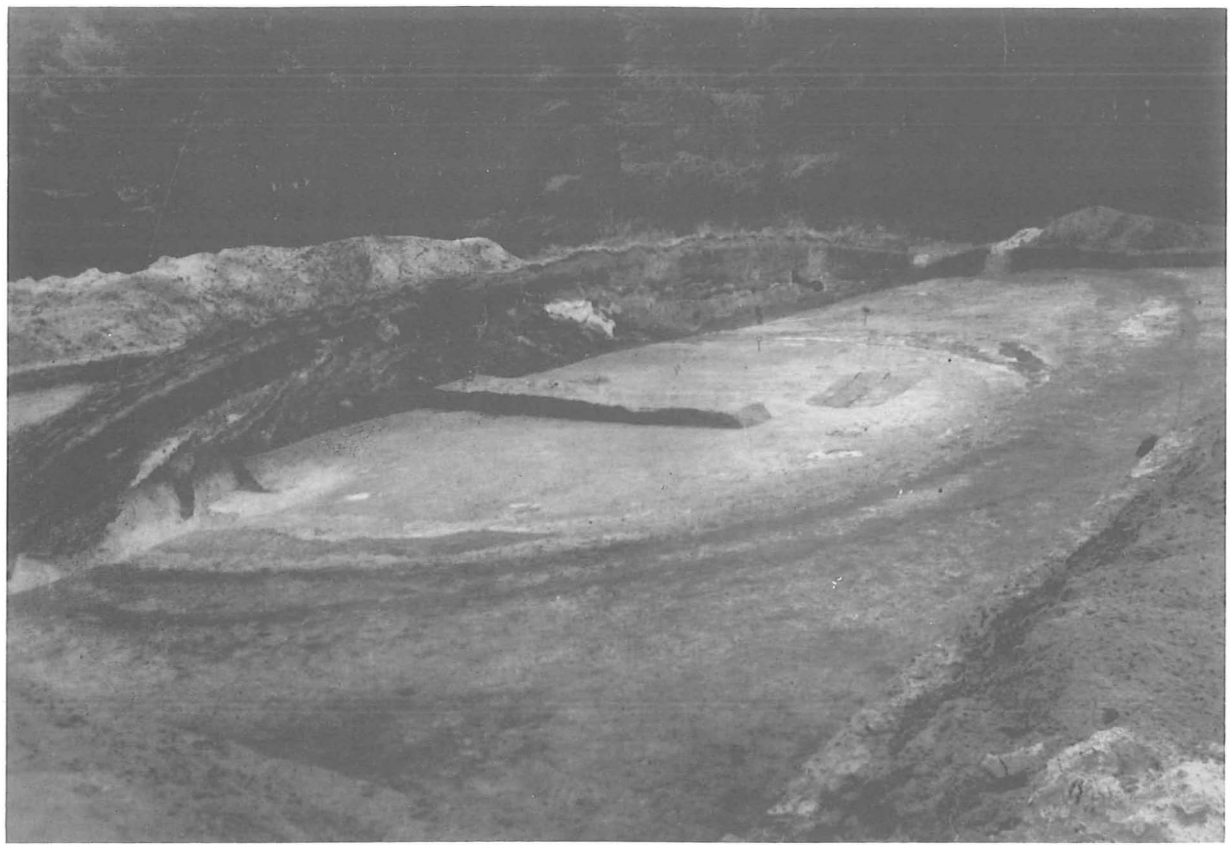


Fig. 11. Hijken-'Hooghalen', tumulus 3: the western half of the mound, seen from NW.

The cremation deposit at the centre of the tumulus, above the fill of the Period-2 ditch and covered by the turves of the Period-3 extension, probably constitutes the primary burial (find No. 43). About 1 m SSE of this cremation, a large fragment of a small bowl with a flat base and short, vertical sides (find No. 15; fig. 37) was found on the old surface beneath the southward extension of the tumulus. It is not clear whether the cremation and bowl fragment are associated.

In the southeast part of the barrow there are four pits in a row, the northernmost of which cuts the surrounding ditch. It is unclear what the function of these pits was; their sections show that they were not postholes.

Dating: Like the two earlier periods, Period 3 must date to the short transitional phase halfway through the Middle Bronze Age.

Secondary burials: Three tangential burials were encountered, all in tree-trunk coffins; two in the centre-west sextant of the barrow and one in the SW sextant. The northernmost was seen in section: there is a slight indication that it was added between Periods 1 and 2. In the other tangential burial in this sextant, two small sherds of *Kümmerkeramik* were found (find No. 41).

4.4. Tumulus 4 (figs 12-13)

This almost intact burial mound was elongated in shape, with a N-S orientation. It had a length of c. 20 m, a width of 8.0-9.4 m, and a height of c. 0.60 m. It was completely excavated, in sextants, with a long N-S profile baulk and two E-W baulks.

It turned out to be a single-period barrow, surrounded by a ditch. It was made up of turves, and around the sides also of sand from the ditch. The latter was V-shaped in section, 1.00-1.20 m deep, with horizontal dimensions (between the deepest points) of 21.50 by 9.50-10.15 m. The old soil under the mound was an undisturbed podzol profile.

A remarkable phenomenon was the presence of a stretch of ditch in the NE part, within the actual surrounding ditch and running roughly parallel to it. It was 0.60-0.70 m wide, 0.70-0.80 m deep, and U-shaped in section. At its northern end this ditch was cut by the surrounding ditch. Maybe we are dealing

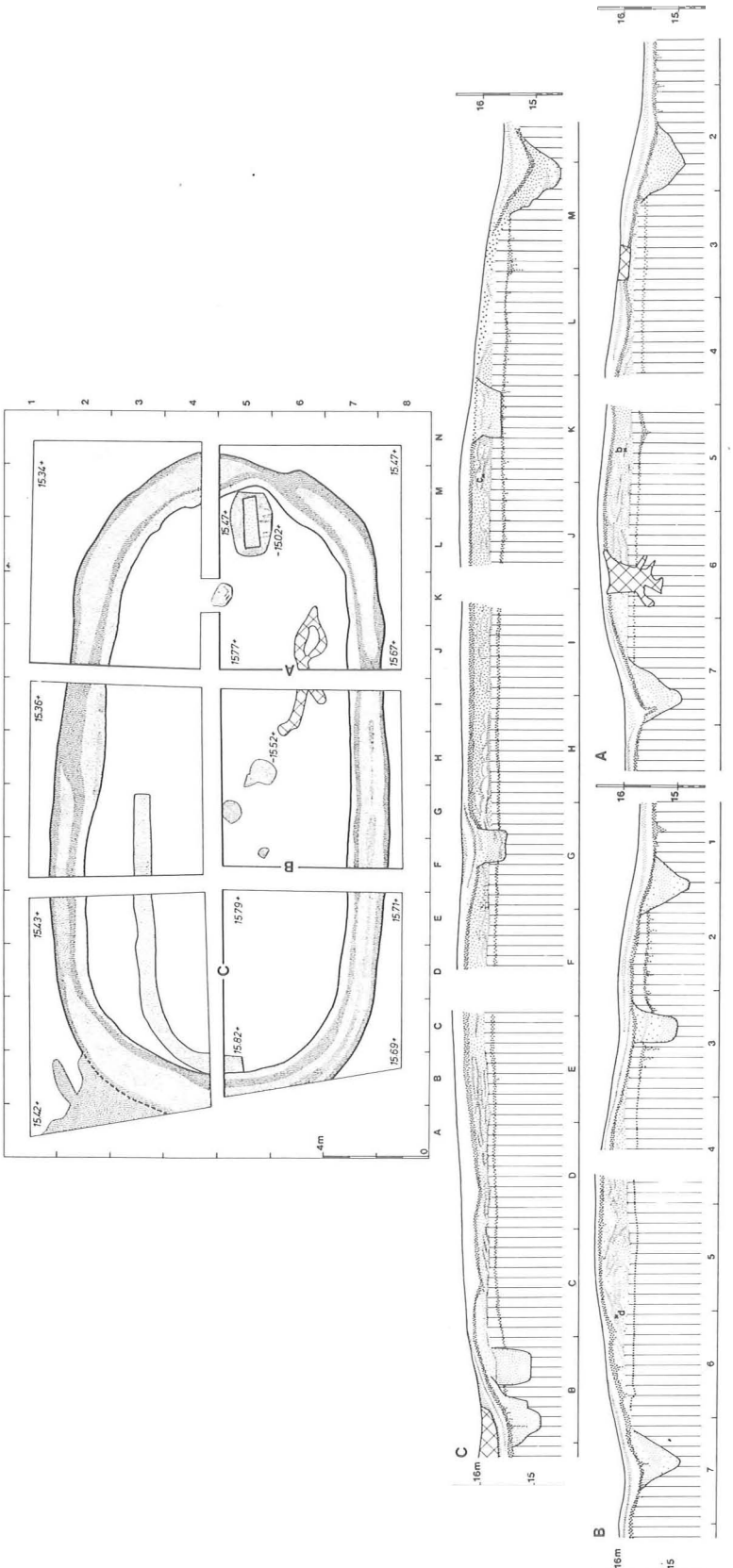


Fig. 12. Hijken-'Hooghalen', tumulus 4: plan and sections.

Fig. 13. Hijken-'Hooghalen', tumulus 4: southern part of the tumulus with grave, during excavation, seen from S.

with the beginning of a surrounding ditch which for some reason was abandoned in favour of a larger and wider version.

No grave was found in the centre of the mound. The baulks were not removed, however, and a tree-trunk coffin, placed on the old surface may have been missed for that reason. In the southern end of the tumulus, on its longitudinal axis, there was a grave pit with tree-trunk coffin, oriented N-S. Unfortunately, no detailed stratigraphic evidence is available. But given the fact that in no other elongated barrows known to us the primary grave is situated so far off-centre, this was probably not the principal grave.

Dating: The ring-ditch indicates that tumulus 4 dates to the first half of the Middle Bronze Age.

4.5. Tumulus 5 (figs 14-15)

This single-period mound with a diameter of c. 15 m and a height of c. 1.2 m, was completely excavated. Its centre showed a recent disturbance; moreover the top of the mound had disappeared, so that its original height could not be established with certainty. The barrow had been constructed on a homogeneous greyish layer, beneath which a large number of plough marks were observed, suggesting it concerns a ploughsoil. The mound consists of a core of dirty-yellow sand with a covering of long turves. A small potsherd with barbed-wire decoration turned up in the mound (find No. 13; fig. 37). Its dating (Early Bronze Age) serves as a terminus post quem.

The tumulus was surrounded by a circle of stakes (Glasbergen type 9), c. 13 m across and comprising 97 stakes. Of one stakehole a vertical section was recorded: the stake was pointed and had been driven into the ground. In the NW quadrant and extending into both the SW and NE quadrants, within the stake circle, there was a second row of stakes (30). The primary grave consisted of a tree-trunk coffin, placed on the old surface. The burial was oriented NW-SE. Within the coffin a body outline was observed; some of the molars even survived. A bronze pin was found beside the skull (find No. 19; fig. 38). It has a flat, nail-type head, and beneath it bands of horizontal grooves (covering a length of 3.5 cm). Beneath

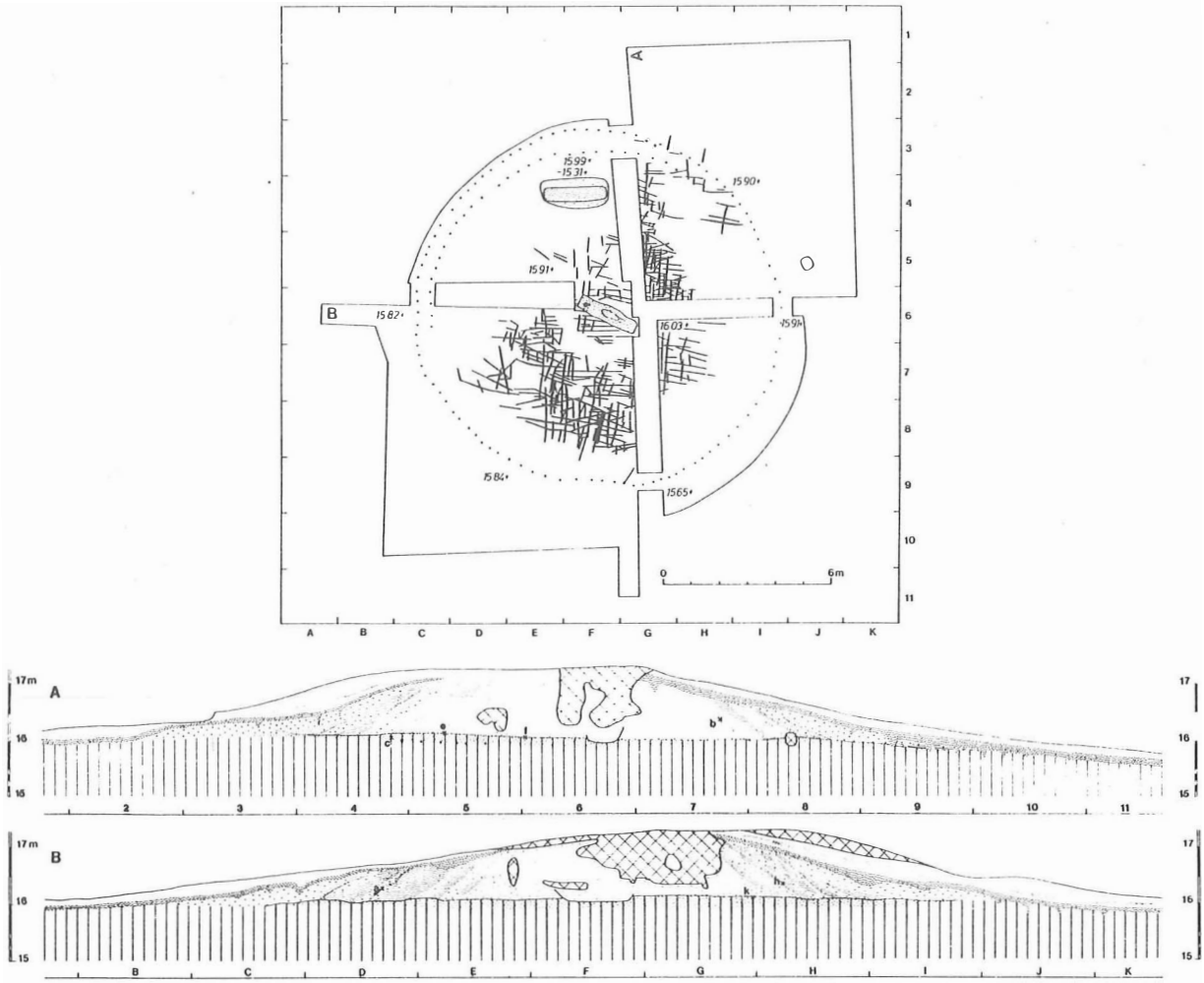


Fig. 14. Hijken-'Hooghalen', tumulus 5: plan and sections.

this there are vertical grooves with a punctated design. The pin is comparable to one from Nistelrode (municipality of Vorstenbosch, province of Noord-Brabant), which was found in an urn of Hilversum type with barbed-wire decoration (Butler, 1969: p. 46); another parallel is one of the pins of the 'Lady of Weerdinge' (Butler, 1969: pp. 114-116).

Dating: The bronze pin from the central burial indicates that tumulus 5 was constructed in the first half of the Middle Bronze Age.

Secondary burial. There was one secondary burial: a tangential grave with tree-trunk coffin in the NW quadrant. Maybe the inner, incomplete stake circle is associated with this secondary burial. Unfortunately there were no sections in which stakes of both circles were cut, so that it is not possible to determine from the stratigraphy whether they were contemporary. Given the regular distance between the two, we are inclined to think that the outer one was still standing when the inner one was constructed; unless, of course, they were erected simultaneously.

4.6. Tumulus 6 (figs 16-18)

This almost intact mound – a shallow disturbance in the central part had created no damage of any significance – had a diameter of c. 15 m and a height of c. 1.6 m. It was completely excavated, and turned out to be a four-period construction, or more precisely a two-period barrow with a two-period addition.

Period 1. The barrow was constructed on top of a homogeneous greyish layer beneath which plough marks survived. The core of the barrow consisted of dirty-yellow sand with some light-coloured turves; the covering of long, darker turves. The barrow was c. 13 m across. The primary grave consisted of a tree-trunk coffin placed on the old surface. The

Fig. 15. Hijken-'Hooghalen', tumulus 5: subsoil of the SW quadrant with ploughmarks, and part of the centre-south section, seen from WNW.

coffin was oriented E-W. In it a small, quartzite whetstone was found (find No. 22; fig. 38).

The tumulus was surrounded by a single, widely-spaced post circle (Glasbergen type 3), which centred on a point halfway along the north side of the coffin (fig. 17). The circle comprised 14 postholes, in three of which post cores were still visible. One posthole was erased by one of the tangential graves. The diameter of the circle was c. 12.5 m. A small *Kümmerkeramik* vessel was found in the NW quadrant (find No. 8; fig. 37), apparently without a cremation.

Dating: The single, widely-spaced post circle dates Period 1 to the second half of the Middle Bronze Age.

Period 2. The second phase consists of a slight addition of dark orange sand. This is evident especially in the centre-north section, where it amounts to c. 0.30 m. On the south side, as recorded in the centre-south section, sand appears to have been added at the edge only. In the centre-west section the addition is also visible at the edge; towards the centre a recent disturbance prevented detailed observation. Evidence of any addition in the centre-east section was obliterated by a later extension, two peripheral burials and a recent disturbance.

Just beneath the recent disturbance at the centre of the barrow (see centre-west section), a deposit of cremated bones (find No. 26) was found. No traces remained of a grave pit. The bones probably constitute the principal burial of this period. The pit that partially shows up in the centre-south section is of a later date (it cuts through iron-infiltration veins, whereas the cremation is penetrated by such a vein), and hence cannot be related to the cremation or any other burial at the centre of the barrow.

Obliquely beneath the cremation there was a dark stain, associated with a slight dip in the infiltration veins. Unfortunately no further information is available (the baulk was not removed), so that interpretation of this feature is not possible.

The barrow was surrounded by a circle (Glasbergen type 9) of at least 79 stakes, with a diameter of c. 13.5 m, within which stood a single, widely-spaced post circle (Glasbergen type 3) with 14 pos-

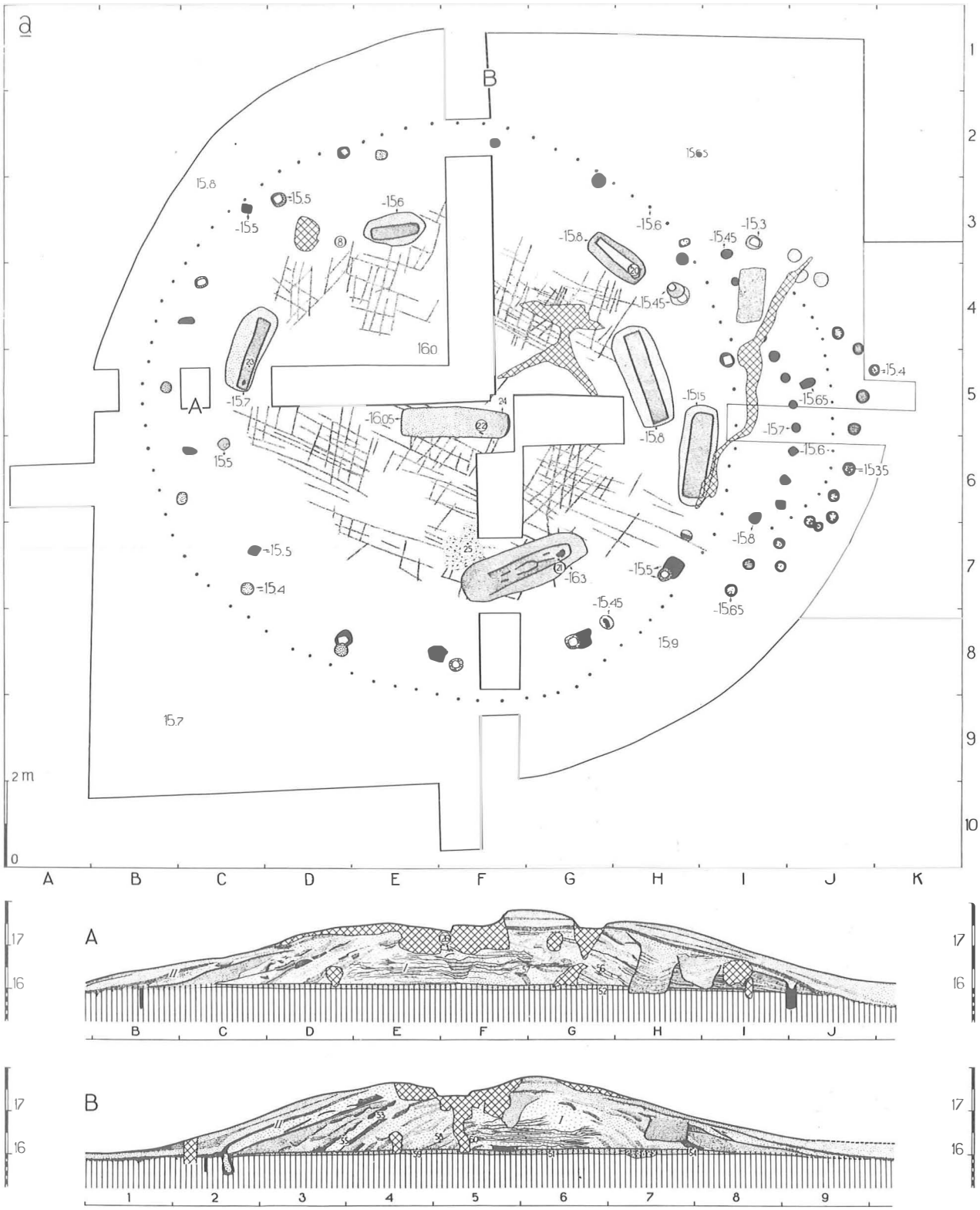


Fig. 16. Hijken-'Hooghalen', tumulus 6: plan and sections.

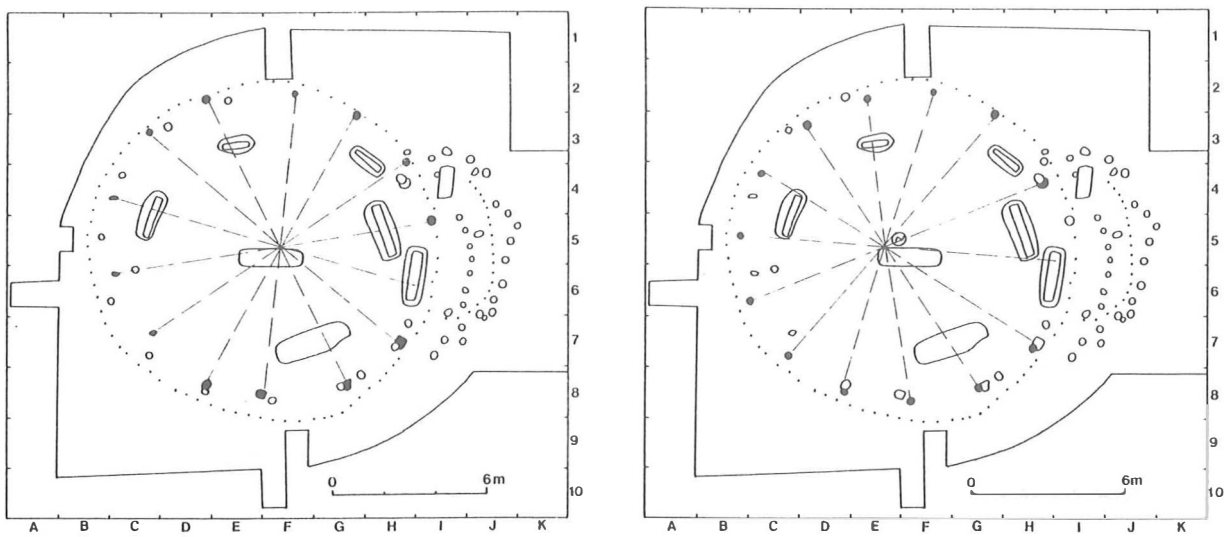


Fig. 17. Hijken-'Hooghalen', tumulus 6: Gerritsen's rule applied to the post circles of Periods 1 and 2.

Fig. 18. Hijken-'Hooghalen', tumulus 6: central grave of Period 1 and ploughmarks in the subsoil, seen from W.

tholes, one of which was erased by a tangential grave. Seven of the postholes still showed a post core. At three points in the SW and SE quadrants this 'second' post circle cuts postholes of the previous period. In the NE quadrant there are two postholes that appear to have been used in both periods. This suggests that the Period-1 post circle (or remnants of it) still existed when the second was constructed. The latter circle shows a shift of c. 1 m towards the west in relation to the former. Its centre is situated just west of the cremated bones in the centre-west section (fig. 17).

Dating: Like Period 1, Period 2 dates to the second half of the Middle Bronze Age.

Period 3. As the post circle and the Period-2 stake circle continue around the east side of the barrow, we must assume that the addition on this side is of a later phase. Unfortunately, both horizontal and vertical stratigraphical evidence is lacking (the centre-east section cuts through only one posthole), which means that we can only guess at the exact sequence. Apparently this phase saw only a semicircular addition to the east side of the tumulus, surrounded by the innermost of the two irregular rows of posts, and by the row of stakes. Maybe the addition is associated with the innermost of the two tangential graves in the centre-east baulk, which lies roughly in the centre of the extension. A similar phenomenon was observed in tumulus 31 at Oldenstadt, Kreis Uelzen, where a secondary burial in a barrow with a circle of boulders was associated with an extension with another boulder circle. Tumulus Molzen No. 16, also near Uelzen, even featured four peripheral burials, associated with three semicircular additions all surrounded by semicircular boulder structures (Schirnig, 1970 and 1975).

Period 4. This phase may have seen a further increase in height of the extension, the outermost of the two irregular rows of posts, in connection with the insertion of another tangential burial (the outermost; at a higher level its grave pit cuts that of the preceding one).

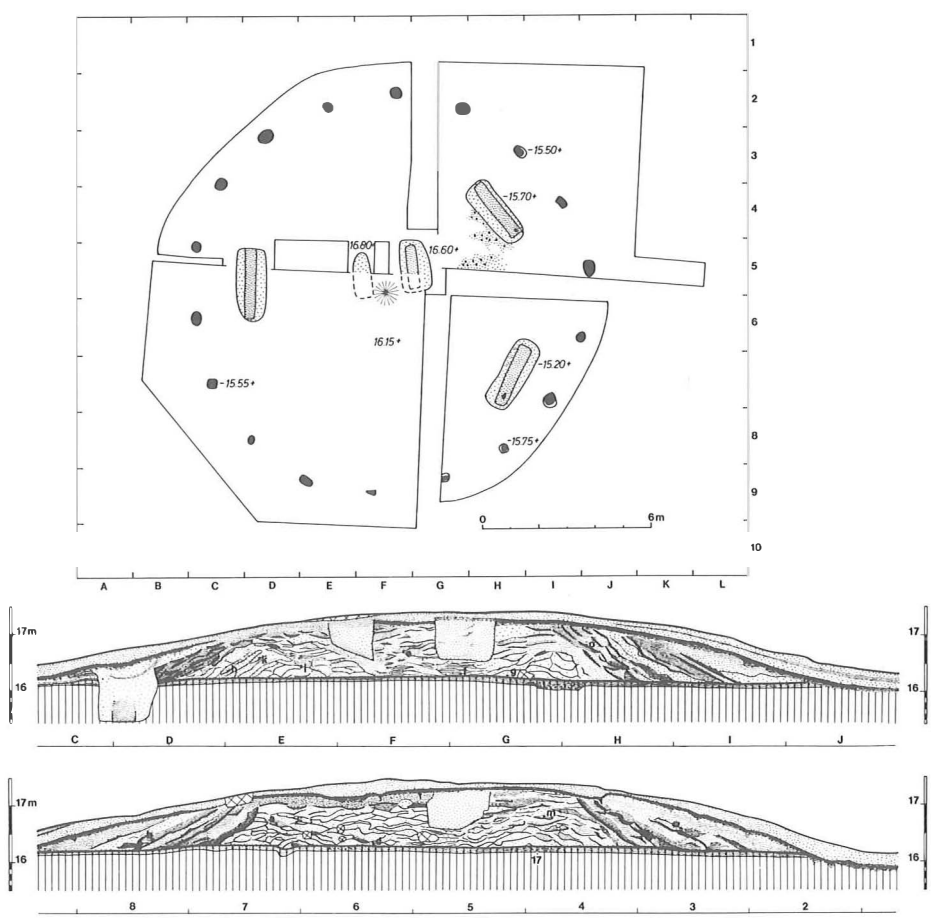


Fig. 19. Hijken-'Hooghalen', tumulus 7: plan and sections. The rosette in the SW quadrant near the centre of the mound indicates the point of intersection of lines connecting opposing postholes.

Fig. 20. Hijken-'Hooghalen', tumulus 7: NE and SE quadrants, seen from E.

Secondary burials. Apart from the two tangential burials on the east side already mentioned, four more were encountered: two in the NW quadrant, and one each in the NE and SE quadrants. All of them are in tree-trunk coffins. Amber beads were found in two of these: four small ones of rather irregular shape in the burial in the NE quadrant (find No. 20; fig. 38) and two disc-shaped beads (one with a wide perforation) from the grave in the SE quadrant (find No. 21; fig. 38). Unfortunately it cannot be determined to which period these graves belong, as none of them were observed in a section. According to a note on the field drawing the rectangular pit that cuts the arc-shaped post settings of phases 3 and 4 turned out not to be a grave.

4.7. Tumulus 7 (figs 19-20)

The barrow had a diameter of c. 14 m and a height of c. 1.1 m, and was almost intact. It was completely excavated, and was found to be a single-period construction.

The barrow consists of yellow sand with short turves at the centre, and a covering of long turves of a darker colour. The orange sand at the edge of the centre-east section almost certainly derives from one of the postholes. The old soil under the barrow consisted of a humic layer on top of a c. 0.10 m thick pale grey horizon, and a soft, brownish infiltration horizon. The pale grey layer contained some charcoal. It is probably old arable soil, abandoned and returned to heathland some time before the tumulus was constructed (van Zeist, 1955: pp. 36-37).

The barrow was surrounded by a single, widely-spaced post circle (Glasbergen type 3). This circle had a diameter of c. 14 m and comprised 18 postholes, four of them still showing post cores. The post circle had been centred on a single point with great precision.

No primary grave was found next to the centre of the circle, even though this should have been the case according to Gerritsen's rule. But given that the SW quadrant was probably excavated down to the old surface in one go, a primary burial on the old surface, of the type found in some other barrows of this group, may have been missed. The outline of the

secondary grave at the centre of the barrow, as well as that of a recent pit in the centre-west section, similarly failed to be recorded in the horizontal plane.

Dating: The single, widely-spaced post circle dates tumulus 7 to the second half of the Middle Bronze Age.

Secondary burials. There was one secondary grave in the centre of the mound. In addition there were three tangential ones. All four of them contained tree-trunk coffins. In those in the NE and SE quadrants stains were observed showing the outline of a skull. A pit with a curiously sloping bottom was observed in the centre-west section. It was recorded as a grave in the field drawings of 1953. The pit seems to be younger than the secondary graves: it interrupts the podzol profile that had developed in the mound. Yet the pit cannot be very recent, as a light podzol is visible in its filling.

4.8. Tumulus 8 (figs 21-23)

This intact barrow had a diameter of c. 13.5 m and a height of c. 0.9 m. It was completely excavated. Two periods of construction were discernable.

Period 1. The barrow of Period 1 is a low mound of dirty-yellow to grey sand, 0.20-0.30 m high. The interface between the mound and the old surface is hard to discern, as the iron-pan horizon of the podzol in the mound roughly coincides with the underlying old surface. Only in the centre-north section do we see some yellow sand from the grave pit on the old surface. The diameter of this barrow is also hard to determine, but probably was c. 8 to 10 m.

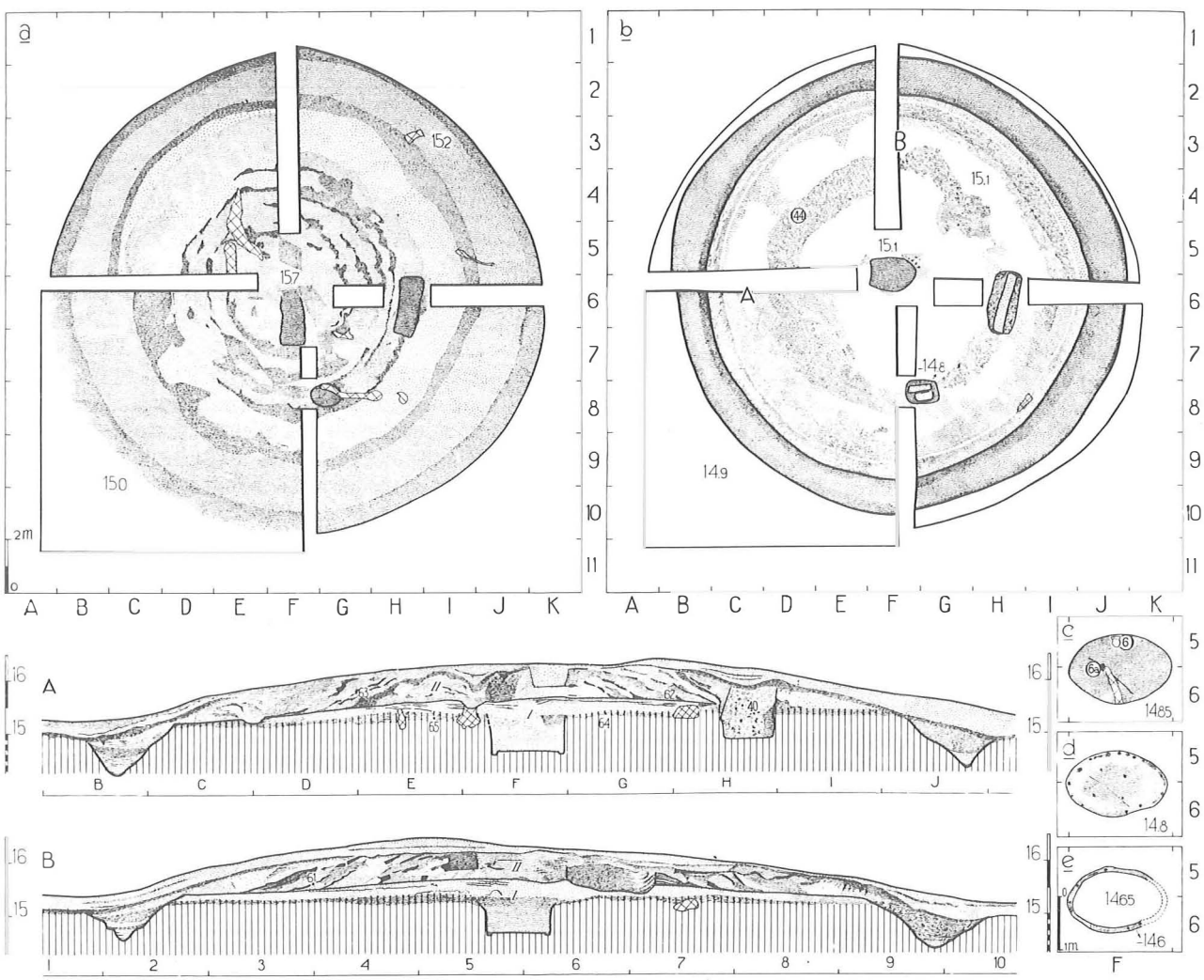


Fig. 21. Hijken-'Hooghalen', tumulus 8: plan and sections.

Fig. 22. Hijken-'Hooghalen', tumulus 8: SW quadrant seen from SW. In the centre-south section the shallow grave pit of the central burial of Period 2 is clearly visible.

The central grave was an oval, E-W oriented pit, c. 1.6 m long, 1.1 m wide and 0.5 m deep. It is a so-called 'beehive grave' (see 3.1). The ditch at the grave bottom was the foundation trench for a wicker-work construction as indicated by the stains of small, vertical posts in the filling of the ditch and along the edges of the grave pit at a slightly higher level. The grave goods comprised (fig. 37):

– A complete Single Grave beaker, type 1b, with a herringbone and groove decoration (find No. 6). This beaker was found lying against the northern side of the grave pit;

– The larger part of a small bowl with slightly convex base, found near the centre of the grave pit (find No. 6a). The incomplete state of this bowl may be due to rabbits, as a burrow was visible in the filling of the grave pit, next to the findspot of the bowl. Near the bowl a flint flake with gloss patina, almost certainly of natural origin, was found. No traces of use or working are discernible.

In the old soil underneath the mound, two small potsherds were found (both numbered 44), one in the NW quadrant, the other in the NE quadrant. Both are orange and have a smooth surface. The broken edges display a sandwich effect: a black core between orange layers. One of the sherds has a definite shoulder (fig. 37). The pottery is reminiscent of Late Havelte ware. The sherd with the shoulder could be a fragment of a low, shouldered bowl (cf. Bakker & van der Waals, 1969: fig. 10). The sherds give a terminus post quem for the dating of the mound.

Dating: Period 1 dates to the Late Neolithic Single Grave period.

Period 2. In this period the barrow was raised by c. 0.60 m with grey sand and turves, and around the periphery with yellow sand from a surrounding ditch. This ditch, encircling the mound, was V-shaped in section, c. 15 m in diameter (between the deepest points), c. 2.0 m wide and 0.90 m deep.

The central burial was a tree-trunk coffin oriented N-S, placed in a shallow pit in the top of Period 1, but visible even in the make-up layer of Period 2. Because of the way the mound was excavated, the northern

Fig. 23. Hijken-'Hooghalen', tumulus 8: central grave of Period 1 with the Single Grave beaker in situ, seen from WSW. Notice the rabbit burrow in the filling of the grave pit.

end of the coffin was poorly recorded; probably the centre-south profile gives the most reliable impression.

Two tangential graves were encountered, both in the SE quadrant, and both of them partly in a baulk. The grave in the centre-east baulk contained traces of a tree-trunk coffin. The dimensions suggest an adult inhumation. The small pit in the centre-south baulk contained traces of two small tree-trunk coffins, which must have been used for the inhumation of children. Both grave pits are secondary to Period 2.

Dating: The ring-ditch indicates that Period 2 was constructed during the first half of the Middle Bronze Age. Charcoal from the secondary grave in the centre-east baulk (find No. 40) was radiocarbon-dated to 3215±35 BP (GrN-14723). This date confirms the archaeological dating.

4.9. Tumulus 9 (figs 24-26)

This barrow was only slightly damaged. Its diameter was c. 14.5 m, its height c. 1.70 m. The SW and NE quadrants were excavated, a trench c. 1.8 m wide was dug into the NW quadrant, along the centre-north baulk. At the centre of the mound, a small part of the SE quadrant was excavated. The mound showed two periods of construction.

Period 1. The mound consists of a core of dark turves with a covering of sand and turves, c. 1.70 m high and 14.5 m across. There is a clear podzol profile beneath the barrow with a well-developed humic layer. Only in the centre-north section does the original turf appear to have been cut away in places. An ancient disturbance was observed at the base of the same section: the leached horizon and the iron pan were interrupted by a pit c. 1 m wide and 0.40 m deep.

The primary burial consisted of a shallow pit, with a NW-SE orientation. In the pit traces of a cist or tree-trunk coffin were visible. The grave was extremely rich in grave goods (fig. 39a):

– A pair of spirals of gold wire 1 mm thick (find No. 39): their diameter is c. 18 mm. The metal of both of them was analyzed by Hartmann (1982: Tab.

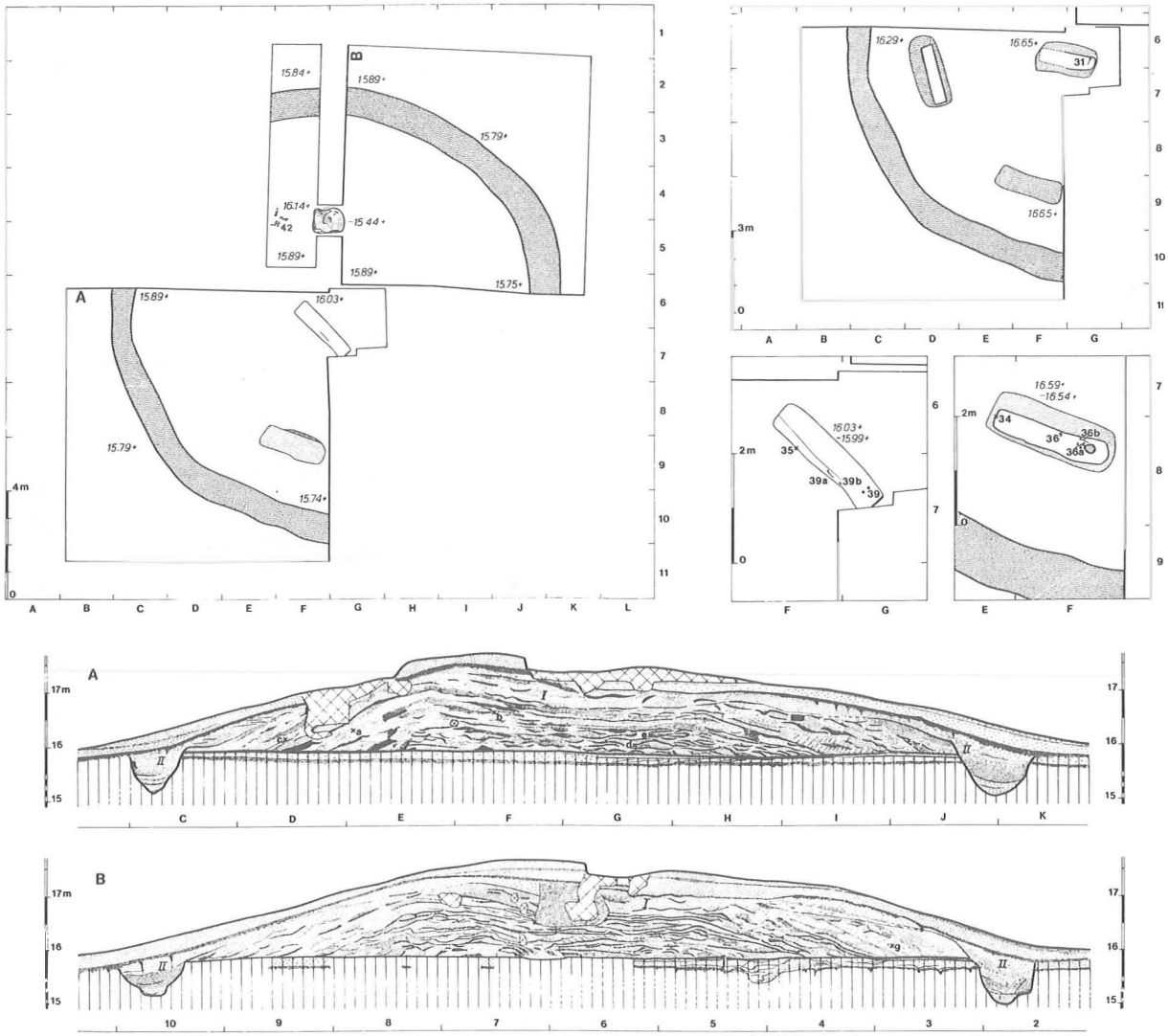


Fig. 24. Hijken-'Hooghalen', tumulus 9: plan and sections.

6, p. 100). One contained c. 10% silver, 0.25% copper and 0.01% tin, the other c. 11% silver, 0.56% copper and 0.23% tin. They were found lying c. 0.15 m apart, some 0.30 m from the SE end of the grave pit. Spiral rings of this kind are usually found beside the head of a body, for which reason they are interpreted as earrings or, more likely, hairrings. The find circumstances in tumulus 9 show that the body must have been buried with the head towards the SE;

– A bronze pin (?) with a rolled-up head and spirally twisted shaft (find No. 39a). Its tip has broken off; remaining length is 17 cm. It was found near the middle of the southern long side of the grave, outside the coffin, in its present, twice-bent condition;

– A bronze pin (find No. 39a), 14 cm long, with an inverted conical head, 6 mm long, above a flat horizontal disc, 2 mm thick and 12 mm across. The edges of the disc and the flat head are notched. It was found next to the pin with twisted shaft described above, in broken condition;

– Ten (or more) barbed and tanged arrowheads, made of sheet bronze (find No. 39a). Very badly preserved; at least four had hooked barbs attached to the tang. Lengths vary between 4.0 and 5.5 cm. Found together, with the two pins;

– A fairly thick and coarse flint blade, bifacially worked, encrusted in places with iron oxide (find No. 39b). Almost certainly used as a strike-a-light; the iron oxides may be the remains of weathered pyrite. Found along the southern long side of the grave, at some distance SE of the bronze objects, outside the tree-trunk coffin.

Fig. 25. Hijken-'Hooghalen', tumulus 9: northern part of the centre-north section with ring-ditch, seen from E.

The two pins and the arrowheads were not lifted individually during the excavation, but were left together on a block of soil that was consolidated with diluted glue. In this configuration the objects were drawn, shortly after the excavation, by P.C.A. van der Kamp, assistant at the Museum in Assen (fig. 27; shown earlier by Butler, 1969: fig. 27). Through the years, the condition of this preparation seriously deteriorated, particularly the arrowheads were gradually crumbling away. Around 1970 it was decided to give the individual objects a belated treatment for consolidation and conservation. It was on this occasion that the top of the pin with inverted conical head was discovered, lying beneath the arrowheads.

In Drenthe, similar gold spirals were found in the graves of the so-called 'chieftains' of Drouwen and Sleenerzand (Butler, 1969: pp. 107-114, figs 49 and 50), and in one of the graves of tumulus 1 near Valthe (Bursch, 1937: afb. 19). The two gold spirals of Drouwen are larger than the present ones from Hijken, viz. 45 mm, and those from Sleen and Valthe are somewhat smaller, namely 12 resp. 15 mm. The Drouwen rings date to the end of the Early Bronze Age or the beginning of the Middle Bronze Age; those from Sleenerzand to the beginning of the second half of the Middle Bronze Age. Such gold spirals occur in sites on the Lüneburger Heide in Germany from the end of the Early Bronze Age to the end of the Middle Bronze Age (Periods I-III, Laux, 1971: p. 39).

The twisted pin, if a pin, is reminiscent of a *Rollennadel* of Putensen type (Laux, 1976: pp. 51-52, Taf. 24). Laux dates this type to the Sögel/Wohlde and Westendorf phases, i.e. to the end of the Early Bronze Age, and the beginning of the Middle Bronze Age. The pin with the conical head and flat disc is comparable to the *norddeutsche gezackte Nadel* (Laux, 1976: pp. 68-70, Taf. 30). Unfortunately there is no reliable dating for this type of pin.

Arrowheads of sheet bronze are comparatively rare. Two parallels are known in the Netherlands; from the Galgenberg tumulus near Sleen (among the grave goods of the so-called 'chieftain of Sleenerzand'; Butler, 1969: pp. 110-114, fig. 50), and from a secondary burial in tumulus II with ringditch at Vries (van Giffen, 1941: fig. 12). The arrowheads from Sleen and Vries are more slender in outline and

Fig. 26. Hijken-'Hooghalen', tumulus 9: the central grave of Period 1, seen from W.

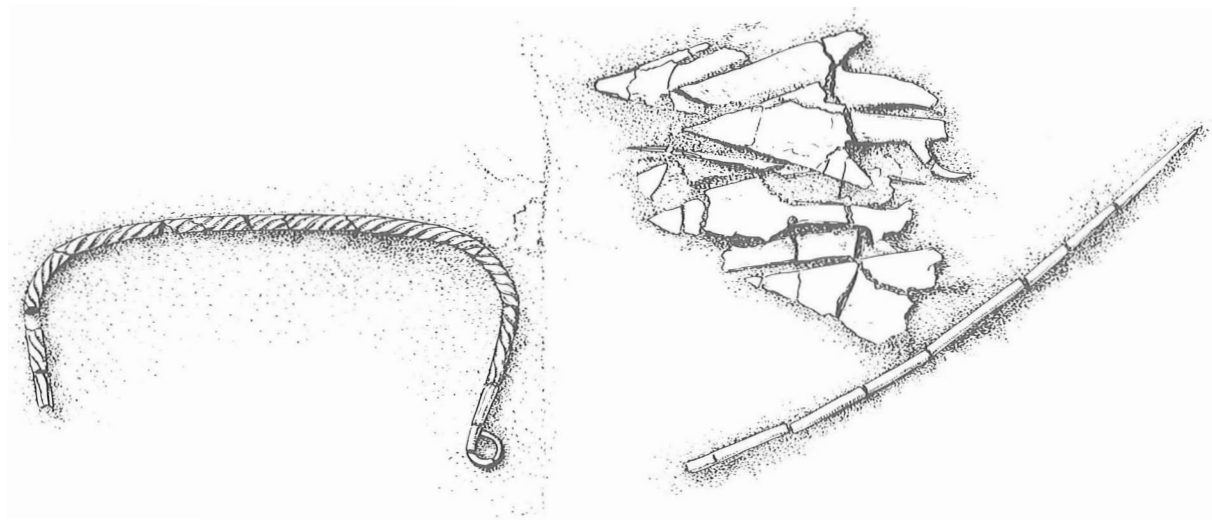


Fig. 27. Hijken-'Hooghalen', tumulus 9: the two bronze pins and the bronze arrowheads *in situ*. Drawing P.C.A. van der Kamp (Drents Museum, Assen).

lack the hooked barbs on the tang. The Sleen arrowheads date to the beginning of the second half of the Middle Bronze Age. In the settlement of Arbon-Bleiche, Switzerland, also two bronze arrowheads were found together with a *Rollennadel* with a twisted shaft. They can be dated to the end of the Early Bronze Age or to the beginning of the Middle Bronze Age (Fischer, 1971: Taf. 3 and 5).

Flint strike-a-lights only rarely occur as grave goods in the Netherlands and neighbouring parts of NW Germany. The only other instance in Drenthe is that from the rich grave of the 'chieftain' of Drouwen (Butler, 1969: fig. 49). Sudholz (1964: p. 67) mentions a few more examples from NW Germany. All date to the first half of the Middle Bronze Age.

Dating: The absence of a peripheral structure, and the grave goods indicate that Period 1 dates to the first half of the Middle Bronze Age. This is confirmed by the radiocarbon dating of the charcoal found on the old surface beneath Period 1 in the NW quadrant (find No. 42): 3290±35 BP (GrN-10747).

Period 2. This period saw the digging of a surrounding ditch and a slight raising of the sides of the mound with sand from the ditch. The ditch was V-shaped in section, with a diameter (between the deepest points) of c. 15.50 m, a width of 1.00 to 1.40 m, and a depth of 0.80 to 1.00 m.

The central burial, in a tree-trunk coffin, lay at the centre of the barrow, obliquely above that of the previous period. It was oriented E-W. A long bronze pin was found within it (find No. 31; fig. 39b). It is 30 cm long and has an inverted conical head with a diameter of 13 mm. The flat head is slightly concave. Just below it is a decoration of grooves. The shaft is thickened in two places (in each case along 18 mm), which also bear grooved decoration. The pin is comparable to the *Plattenkopfnadel* of Wiershausen type as defined by Laux (1976: p. 61, Taf. 27), which is dated to the Bonstorf phase, i.e. the second half of the Middle Bronze Age. It is also similar to pins of Reckenrode type as defined by Kubach (1977: pp. 263-273, Taf. 44-46). He dates this type to the *mittlere und jüngere Hügelgräberzeit*, i.e. the end of the first half, or the beginning of the second half of the Middle Bronze Age, according to Dutch chronology.

Dating: The ring-ditch, and the archaeological date for the pin together indicate a dating towards the end of the first half of the Middle Bronze Age.

Secondary burials. There were at least two tangential burials (the NW and SE quadrants were left unexcavated), both in the SW quadrant. It is not clear after which of the periods they were added. The northernmost was a tree-trunk coffin in which the outline of a skull was still visible; no grave goods were found. The other tangential grave, also with a tree-trunk coffin, contained several grave gifts (fig. 39c):

– A small *Kümmerkeramik* vessel, 5.5. cm high. At about 1.5 cm below the rim it is decorated with a row of small, but deep round impressions (find No. 36);

– The shaft of a bronze pin (find No. 36a). Because the head is missing, closer determination is impossible;

– Sixteen more or less disc-shaped amber beads of various sizes (the largest is 18 mm in diameter, the smallest 7 mm). The beads show clear signs of wear at the sides, from having rubbed against one another (find No. 36b).

4.10. Tumulus 10 (figs 28-32)

This barrow, with a diameter of c. 12.5 m, and a height of c. 1.20 m, was completely excavated. The centre of the mound had been disturbed. Two periods of construction could be discerned.

Period 1. The body of the mound was 0.60-0.70 m high and c. 10 m across, consisting of a core of dark-coloured turves, with a covering of dirty-yellow sand containing some turves. Beneath the mound there is a well-developed, undisturbed podzol profile, with a leached horizon of c. 0.20 m.

The primary burial was a tree-trunk coffin on the old surface, oriented NW-SE, situated in the SW quadrant. In the centre-west section it could just be seen how some of the turves had subsided when the coffin collapsed.

The barrow was surrounded by a circle, c. 8 m across, of closely-spaced stakes, at least 98 of them (Glasbergen type 9). This was surrounded by a very irregular circle of at least 30 widely-spaced stakes.

Dating: Probably the first half of the Middle Bronze Age.

Period 2. The second period saw the addition of more dirty-yellow sand and turves. On the northeast side this amounted to c. 0.60 m, on the southwest 0.40 m at most; towards the centre of the mound this increase in height became difficult to observe.

The barrow was surrounded by a single, widely-spaced post circle (Glasbergen type 3). In 9 of the 15 postholes the core of a post could still be seen. The circle was c. 12 m in diameter. If two of the postholes in the SE quadrant were to be replaced by a single one in between the two, the post circle would be found to centre on a single point, just above the central grave of Period 1. But of the central grave of Period 2, which according to Gerritsen' rule could be expected next to this centre point, no traces were found. It had probably been destroyed by the recent disturbance in the centre of the mound (fig. 29).

Dating: The single, widely-spaced post circle in-

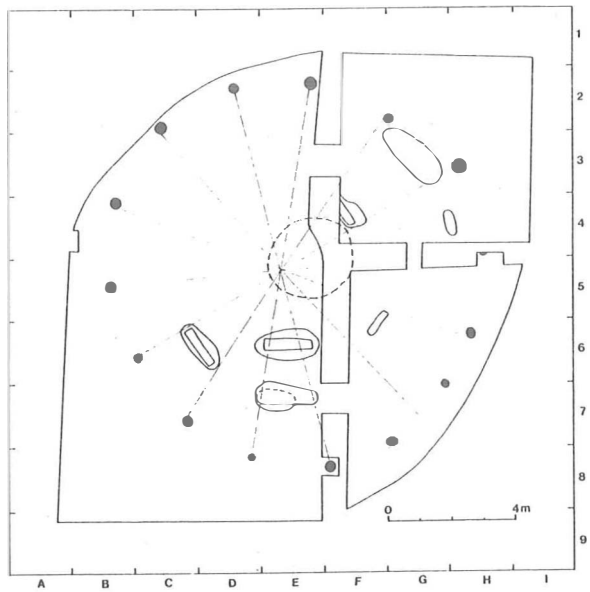


Fig. 29. Hijken-'Hooghalen', tumulus 10: Gerritsen's rule applied to the post circle of Period 2.

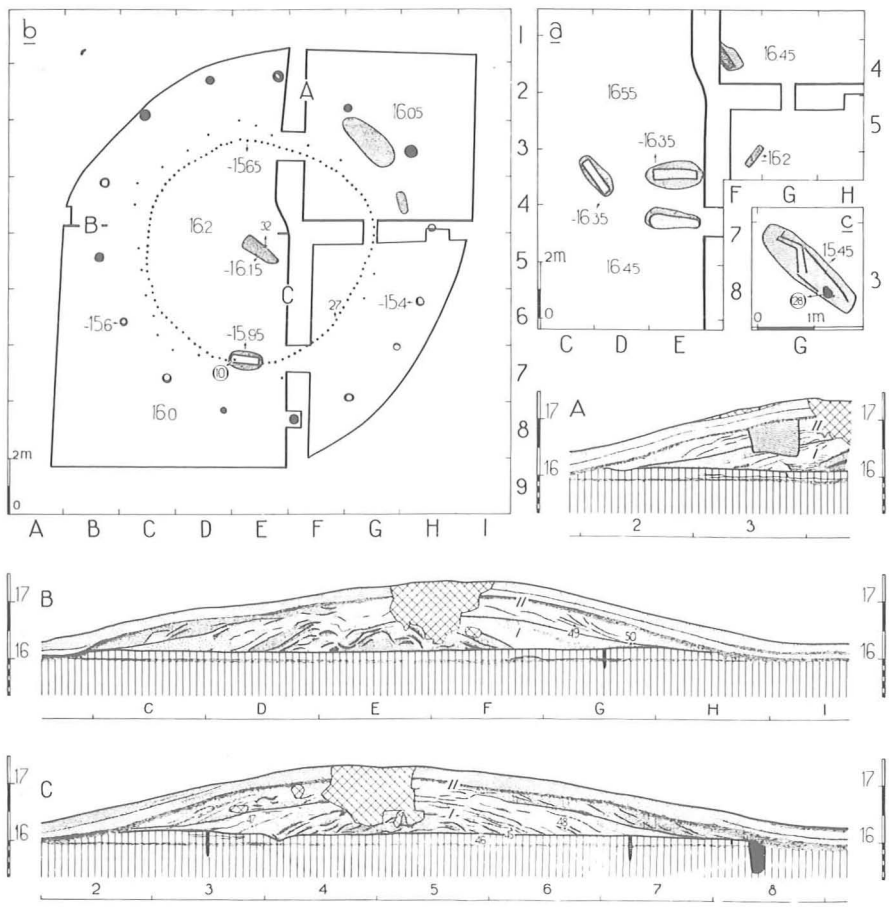


Fig. 28. Hijken-'Hooghalen', tumulus 10: plan and sections.

Fig. 30. Hijken-'Hooghalen', tumulus 10: NW and SW quadrants with stake circle and post circle, seen from W.

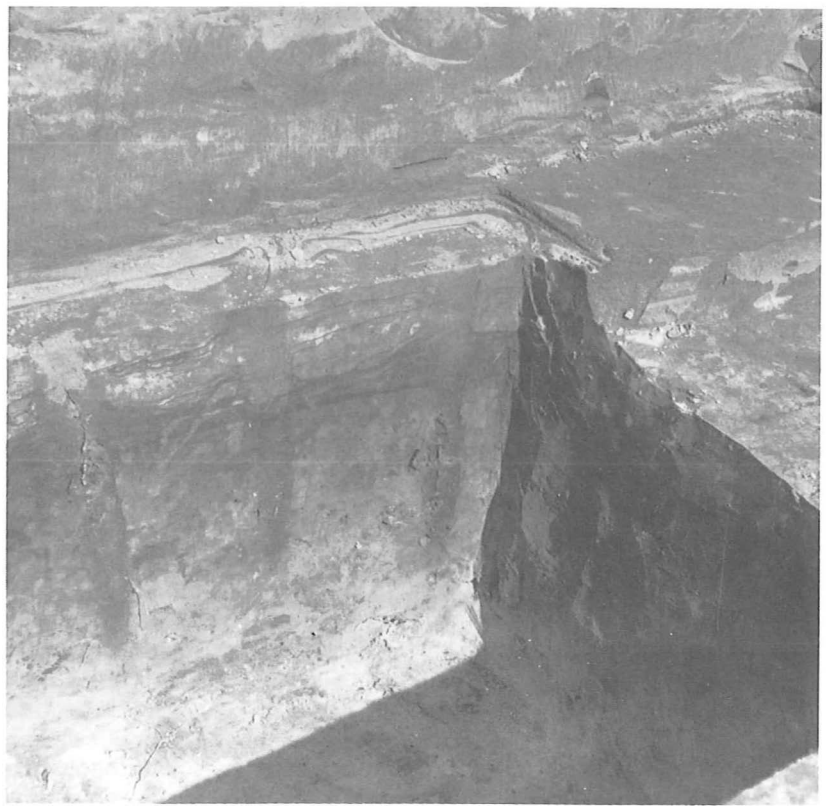


Fig. 31. Hijken-'Hooghalen', tumulus 10: stake circle in section.

Fig. 32. Hijken-'Hooghalen', tumulus 10: secondary grave in NE quadrant, seen from NW.

dicates that Period 2 dates to the second half of the Middle Bronze Age.

Secondary burials. Eight tangential burials were found in the barrow, four in the SW, three in the NE, and one in the SE quadrant. A remarkable thing was that in the SW quadrant two burials had been placed immediately above one another. In the lower one of the two, judging by its size a child's grave, a small *Kümmerkeramik* vessel was found (find No. 10; fig. 37). All four of the burials in this quadrant were in tree-trunk coffins. The narrow rectangular stain in the SE quadrant probably represents the base of a disturbed grave. In the NE quadrant, obliquely beneath the centre-north section, there were a burial in a tree-trunk coffin, a small grave (another child's grave?), and a grave containing a body silhouette with slightly bent knees. Two disc-shaped amber beads were found on the skull (find No. 28; fig. 38).

Given the level at which they were first recorded – by way of exception the quadrants were not excavated down to the old surface in one go – and their depth in relation to the surface of the mound, these graves must belong to Period 2. This is certainly true for the grave visible in the centre-north section, which clearly cuts through the addition of Period 2.

4.11. Tumulus 12 (fig. 33)

This burial mound is one of a small subgroup of tumuli, numbered 11-15. The barrow has a diameter of c. 7.0 m and a height of c. 1.0 m. Two quadrants – the NE and the SW – were excavated. Only one phase of construction was discernable.

The mound had been constructed out of dirty-yellow sand with a few turves, on top of a clear and undisturbed podzol profile. Some charcoal was found on the old surface (find No. 33). No graves or peripheral structures were found.

Dating: The size and structure of the mound and the close proximity of several other barrows of the same size strongly suggest a Middle to Late Iron Age date. Unfortunately, the charcoal sample was lost soon after the excavation. Radiocarbon dating is impossible, therefore. For unknown reasons none of the pollen samples from the mound were analyzed.

In the centre-south section, but outside the mound a heavily podzolized old cart-track was cut. Dating

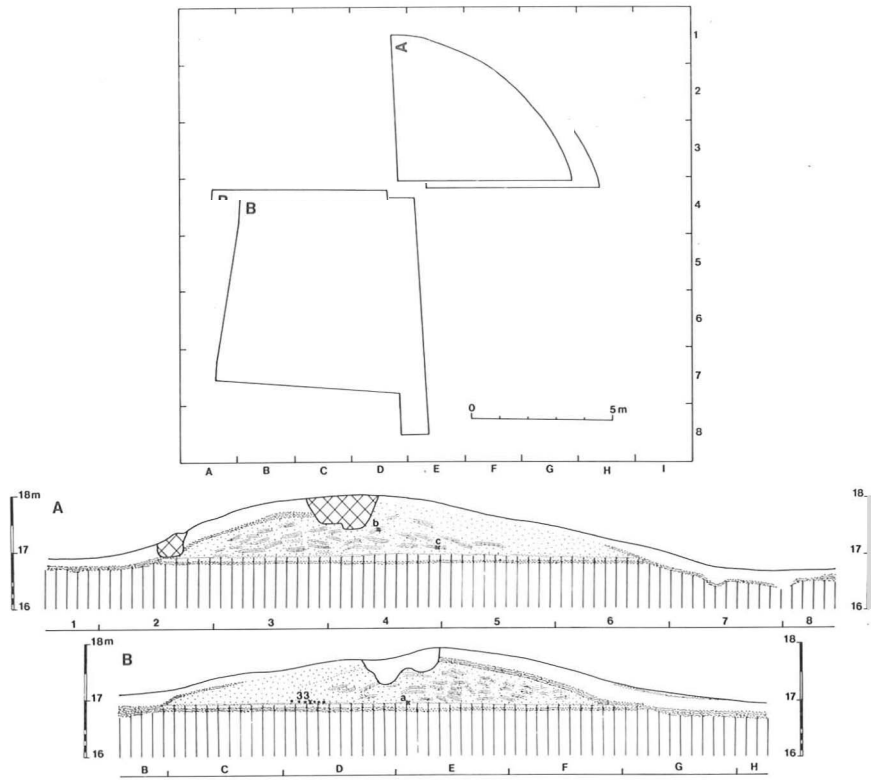


Fig. 33. Hijken-'Hooghalen', tumulus 12: plan and sections.

this track is not possible, but a Late Bronze Age or Iron Age date is not beyond the possibilities (cf. Jager, 1985).

4.12. Tumulus 17 (Hijkerveld tumulus 43). (figs 34-36)

This superficially ploughed-over barrow was investigated in the autumn of 1937, in advance of the levelling and subsequent afforestation of a plot of heathland. The excavation was carried out by J. Lanting, field technician, and the draughtsman L. Postema. The mound was excavated by the quadrant method, and afterwards not restored. It was found to be a two-period barrow. The investigation was published at the time (van Giffen, 1939), but now some minor points require correction.

Period 1. Although van Giffen and his assistants often had difficulty in recognizing the old surface beneath burial mounds, this was not the case with tumulus 17. As van Giffen noted (1939: p. 130), it lay at 20.00 m above N.A.P. The old soil was a greyish layer, c. 0.20 m thick. Van Giffen writes that the subsoil was not podzolized; yet the photos of the excavation show a thin infiltration zone underneath the grey horizon (fig. 36). In Postema's report the grey layer is designated as 'arable', but it is far from certain that this really was a ploughsoil.

The mound itself had been constructed from the same greyish material and yellowish soil from the two deep ditches surrounding the grave (see below). The barrow had a diameter of c. 12 m, and a height of only 0.40 m. The grave was of the 'beehive' type (see 3.1). At the old surface level it must have been visible as a subrectangular pit of 4.0 by 2.4 m, but it was not recorded at this level. The actual bottom of the pit lay 0.20 m beneath the old surface. At that level a subrectangular ditch remained, with interior dimensions of c. 3.0 by 1.2 m and a width of 0.50-0.60 m. Its depth was about 1.0 m. The ditch had presumably held some kind of consolidation of the edge of the grave pit, viz. planks or wicker-work. Near the eastern end of the platform within the ditch, a grave gift in the form of a flint blade (fig. 38) was found. This lay at 19.80 m above N.A.P.; not, as van Giffen wrote, at 20.00 m. The grave was surrounded by a circular ditch with an internal diameter of 5.20 m, a width of 0.60-0.70 m, and a depth of 1 m. It is a so-called 'intermediary foundation trench' (see 3.1). The excavation photographs suggest that locally stains of former postholes were visible in the ditch.

Dating: Late Neolithic, Single Grave period.

Period 2. Through an addition of yellowish sand

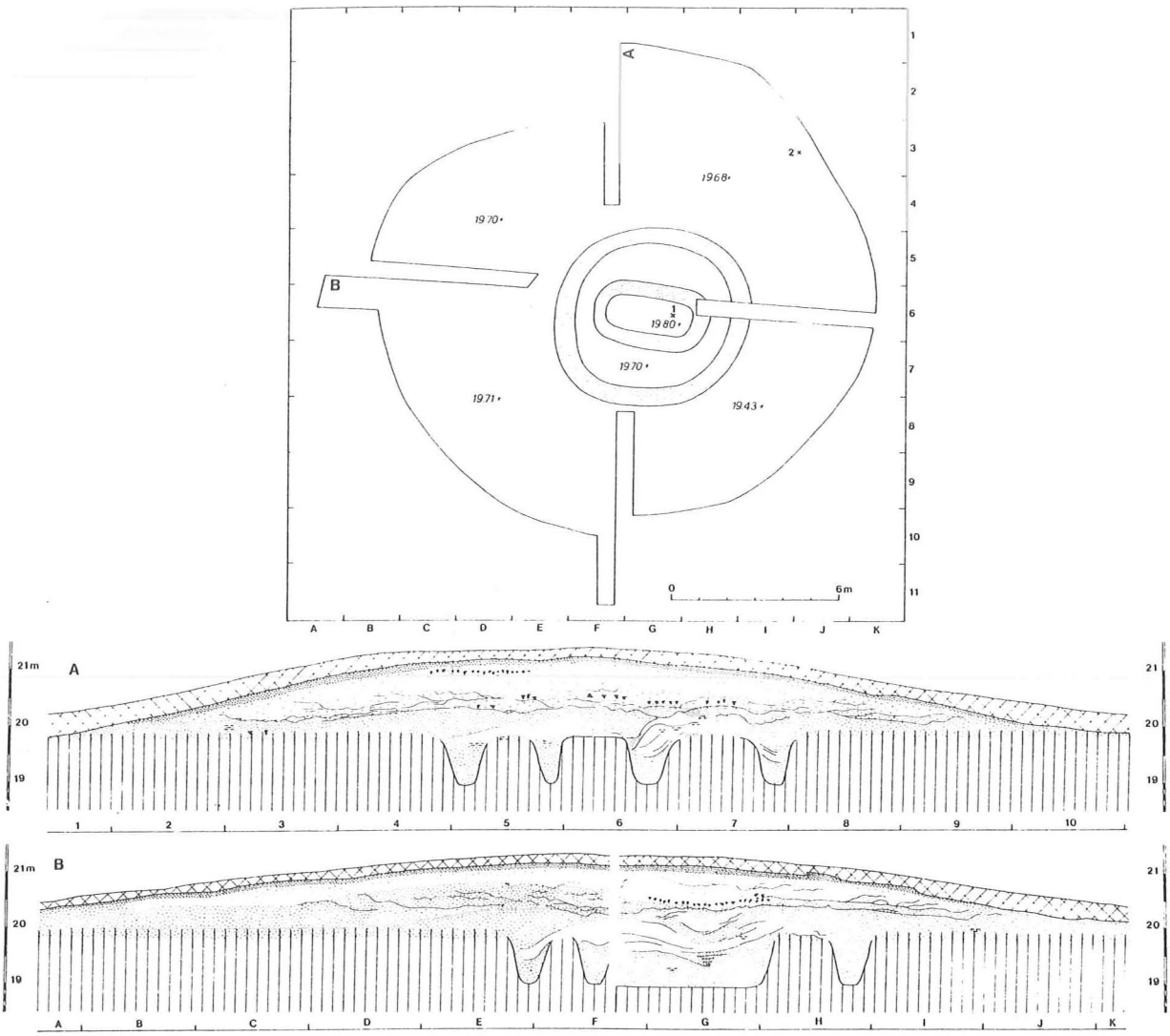


Fig. 34. Hijken-'Hooghalen', tumulus 17 (Hijkerveld 43): plan and sections.

with grey patches, the barrow obtained a diameter of c. 20 m and a height of c. 1.4 m. Infiltration veins had formed in the body of the mound. No associated grave was observed, which possibly results from the method of excavation. It could have been a shallow grave with a tree-trunk coffin, as in other barrows of this group. On top of Period 1, at the centre of the mound, lay quite a lot of charcoal, which may have been connected with the Period-2 burial.

Dating: Period 2 is difficult to date. Barrows without a peripheral structure occur from the Late Neolithic into the first half of the Middle Bronze Age. The lack of a sunken central burial argues in favour of the first half of the Middle Bronze Age.

Secondary burial. In the NE quadrant, in the edge of the mound, a vessel of Gasteren type with three lugs (fig. 37) was found, dating to the beginning of the Late Bronze Age (cf. Waterbolk, 1962: pp. 17-18 and Abb. 7). According to a remark in the field drawing, this pot was found in advance of the excavation. The cremation evidently was thrown away at the time. That the vessel once did contain cremated bones is shown by the fact that tiny white specks still adhere to its inner surface.

5. DISCUSSION

5.1. The chronological structure of the tumuli group of Hijken-'Hooghalen'

Although only 12 of the, originally, 17 barrows on the 'Hooghalen' estate were investigated, the dating

Fig. 35. Hijken-'Hooghalen', tumulus 17 (Hijkerveld 43); SE quadrant, with central grave and intermediary foundation trench of Period I, seen from SE.

Fig. 36. Hijken-'Hooghalen', tumulus 17 (Hijkerveld 43): central grave and intermediary foundation trench of Period 1, seen from SW.

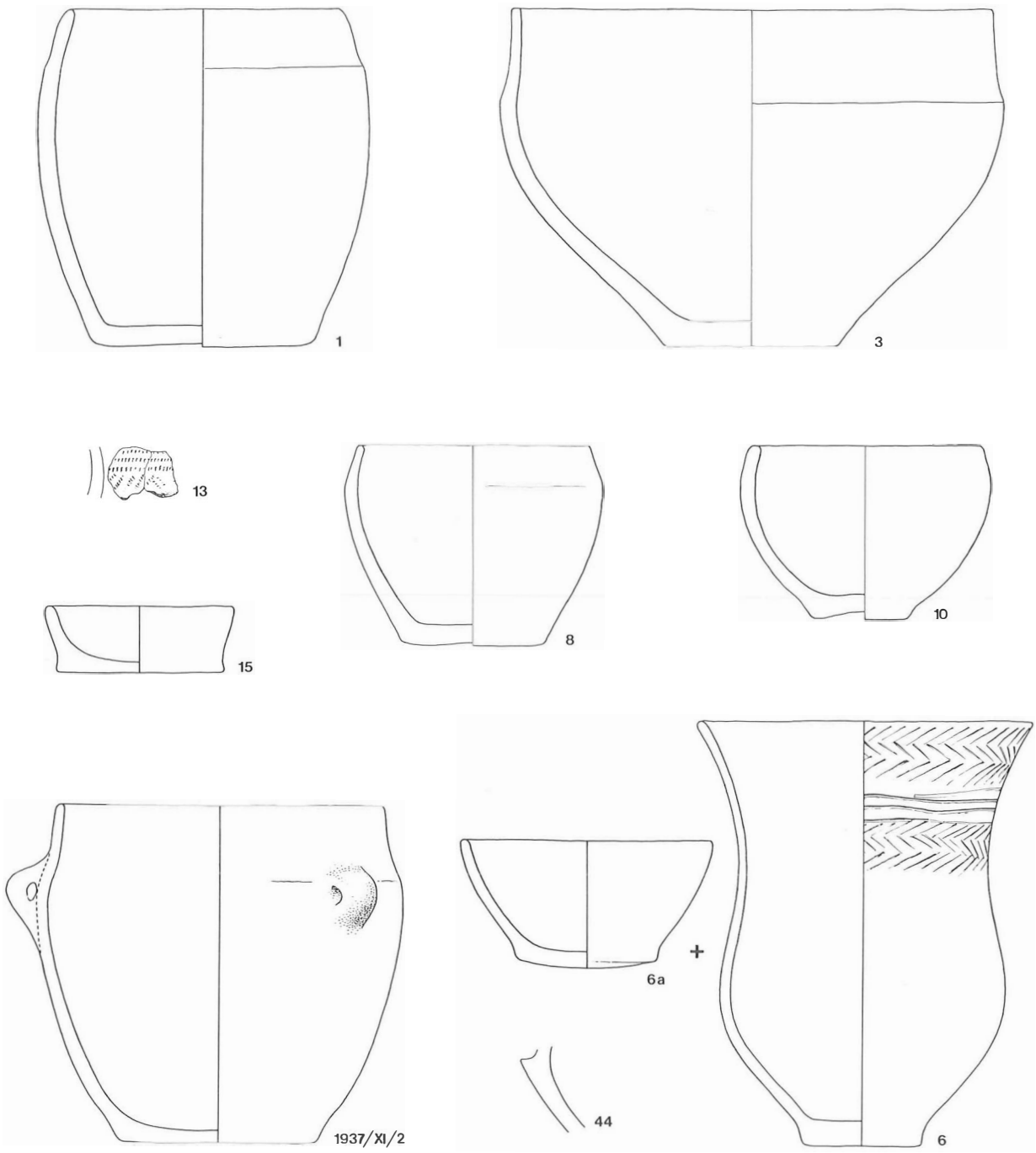


Fig. 37. Hijken-'Hooghalen': ceramics found in the burial mounds, indicated by find number. Scale 1:3.

of all the tumuli seems sufficiently clear. The elongated tumulus 16 will probably have been erected in the Middle Bronze Age like tumuli 3 and 4, while the small tumuli 11, 13, 14 and 15 are likely to be, like tumulus 12, burial mounds of the Middle or Late Iron Age. The oldest barrows in the group are tumulus 8 Period 1, and tumulus 17 (Hijkerveld 43) Period 1. Both belong to the Late Neolithic Single Grave Culture. They were remarkably low and inconspicuous barrows, rising only 0.20-0.30 and 0.40 m respectively. Other examples of such low barrows are known from this period, such as Tumulus C on the Schaapsdijksweg north of Eext (Waterbolk, 1957: pp. 32-33). With flat graves encountered in ploug-

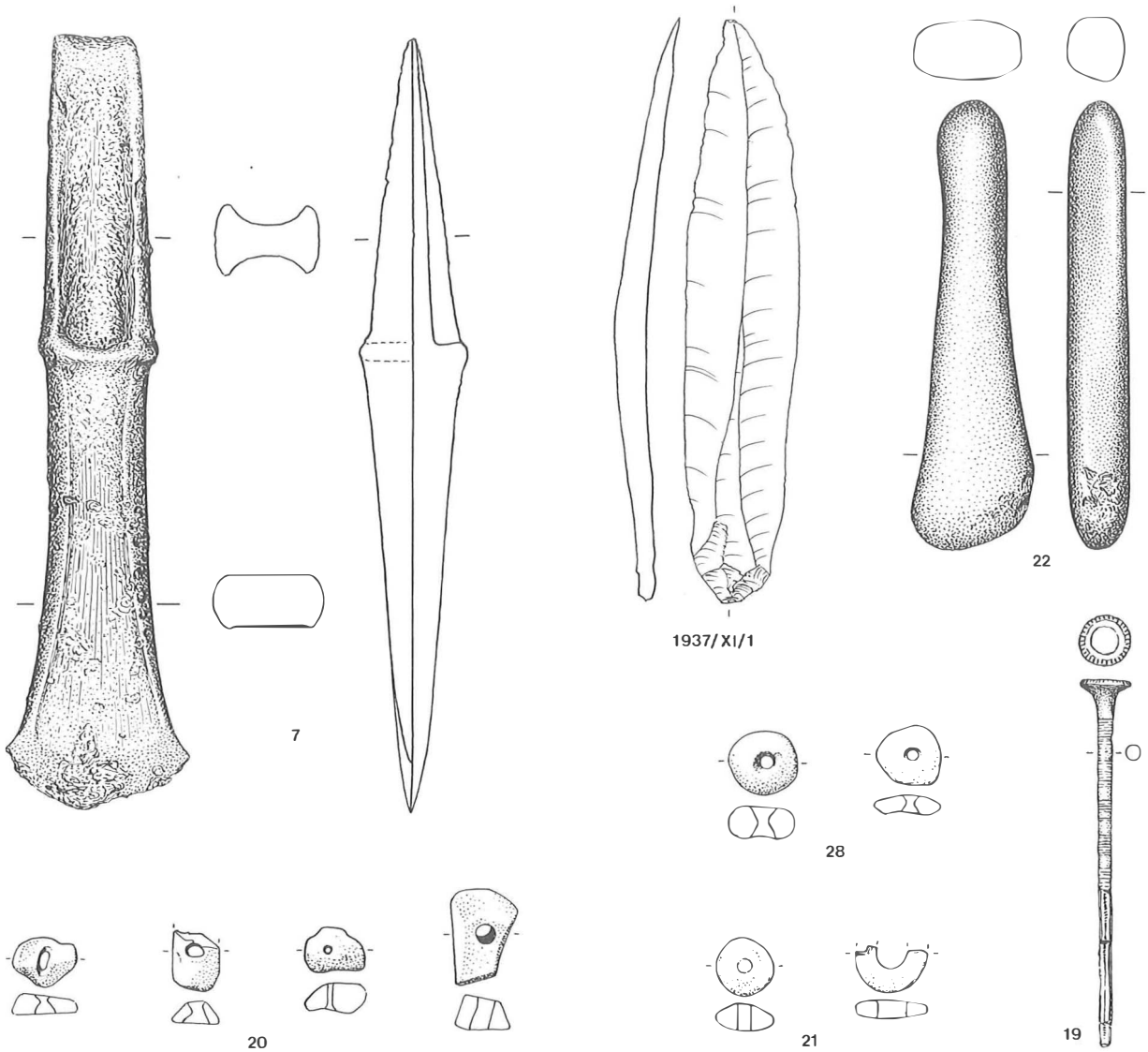


Fig. 38. Hijken-'Hooghalen': objects of bronze, stone, flint and amber found in the burial mounds, indicated by find number. Scale 2:3.

hed land, consideration should be given to the possibility that these originally were covered by very low barrows.

The nearest burials of the Single Grave Culture are situated about 1750 m SW of the barrow group of Hijken-'Hooghalen', namely tumulus Hijkerveld I and several flat graves, which were investigated in 1930 and 1969-71 respectively (Harsema, 1974; this paper fig. 40).

Also Late Neolithic, but belonging to the Bell Beaker Culture, is Period 1 of tumulus 1. The grave was radiocarbon-dated 3665±35 BP (GrN-6261). The nearest contemporary burial lies only 550 m east of tumulus 1, virtually on the boundary of the estate (fig. 40). This is tumulus Laaghalerveld I, which in 1930 was excavated by van Giffen. This grave contained a fine battle axe of Zuidvelde type and a small flint knife (Lanting, 1973: pp. 267-268, figs 8 and 24). Charcoal from the grave was dated to 3735±35 BP (GrN-6711). A further 400 m eastwards lies tumulus Laaghalerveld II (fig. 40), which was also investigated in 1930 and found to date to the Bell Beaker period as well (Lanting, 1973: pp. 268-269, figs 7b and 25).

Most of the barrows on the 'Hooghalen' estate can be dated to the Middle Bronze Age. Furthermore, the Neolithic tumuli 1 (Period 1) and 8 (Period 1) were raised and extended in the Middle Bronze Age. Period 2 of tumulus 17 (Hijkerveld 43) most probably also dates to the Middle Bronze Age. Judging by

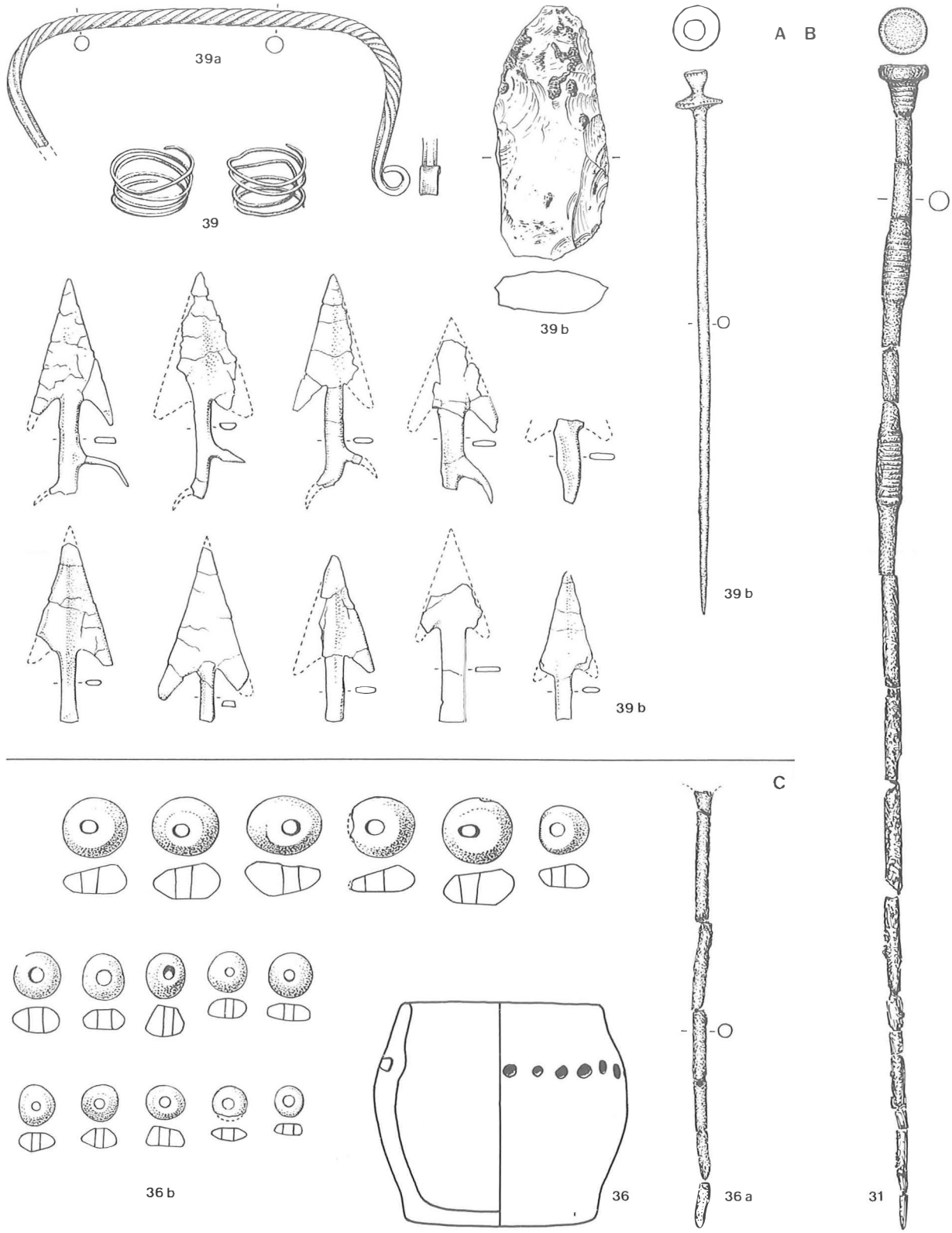


Fig. 39. Hijken-'Hooghalen', tumulus 9: finds from the central grave of Period 1 (A), the central grave of Period 2 (B) and from a secondary burial (C). Scale 2:3.

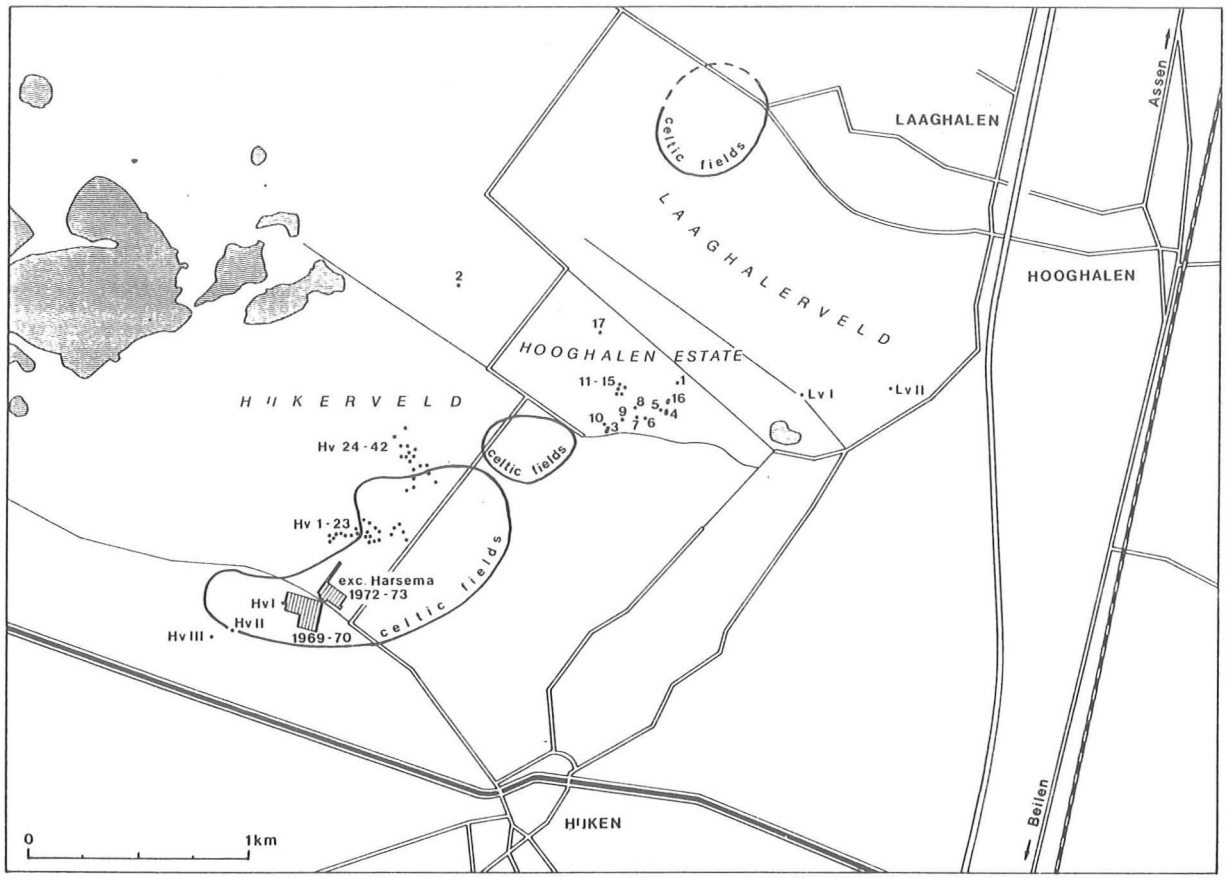


Fig. 40. The barrow group of Hijken-'Hooghalen' in its wider context. Indicated are: the burial mounds Hijkerveld I-III (of which No. I was excavated in 1930), the burial mounds Hijkerveld 1-23 (partly excavated in 1930) and 24-42 (partly excavated in 1954) and the burial mounds Laaghalerveld I and II (excavated in 1930). Indicated, too, are the known outlines of the Celtic fields on the Hijkerveld and the Laaghalerveld, and the areas in the Hijkerveld excavated by Harsema in 1969-70 and 1972-73. He discovered houseplans of the Middle Bronze Age and the Middle Iron Age, and a number of flat graves of the Late Neolithic Single Grave Culture.

the excavation results, the site of the present estate served as a cemetery throughout the Middle Bronze Age. It probably was the fixed necropolis of a small community, whose settlement changed its location maybe several times in the course of the centuries. It should be noted that several of the barrows were constructed over old arable land.

The nearest major group of tumuli with barrows of the Middle Bronze Age (besides older and younger ones) is that of tumuli 1-23 on the Hijkerveld, c. 1.5 km to the southwest (fig. 40). It is not impossible that among tumuli 24-42 on the Hijkerveld, which lie roughly 1 km WSW of the Hijken-'Hooghalen' barrows, some were constructed in the Middle Bronze Age. Yet those that were excavated in 1954 all appeared to be Iron Age barrows (unpublished).

The youngest barrows in the Hijken-'Hooghalen' group are tumuli 2 and 11-15, which date from the Middle or Late Iron Age. Tumulus 2 seems to occupy an isolated position, c. 850 m northwest of the cluster comprising tumuli 11-15.

Their closest counterparts lie on the Hijkerveld, in the above-mentioned groups of tumuli 1-23 and 24-42. With the exception of tumulus Hijken-'Hooghalen' 2, these Iron Age mounds all lie at the edge of, or even partially within, an extensive area of Celtic fields (fig. 40).

5.2. Some remarks about Middle Bronze Age burial ritual

In several respects, the excavation of this barrow group produced remarkable results. Although primary graves in the form of a coffin placed upon the old surface are generally quite rare, at least five of these were encountered here (in tumuli 3, 5, 6, 9 and 10). The primary grave in tumulus 7 too is likely to have been of this kind, though none was found. In tumulus 8 the primary grave of Period 2 took the form of a tree-trunk coffin placed in a shallow pit in the top of the earlier barrow and covered over with a layer of soil.

Although the occurrence of such burials upon the old surface had been postulated before, based on the absence of primary burials beneath some barrows, the positive indications for this were very few indeed. The only published, incontestable example was the primary burial in tumulus 1 on the Dwingelose Heide near Lhee (Lanting, 1979). The investigation of the barrow group on the 'Hooghalen' estate shows that primary burials of this form probably were more widespread.

Another point of interest is that at Hijken-'Hooghalen' it was established in two instances that grave goods had not been placed in the tree-trunk coffin, but lay beside it in the grave pit. This applies to the bronze palstave of tumulus 1, Period 3, and to the bronze pins, the bronze arrowheads and the strike-a-light in the central grave of tumulus 9, Period 1. No comparable observations elsewhere are known. Therefore we cannot tell whether it is mere coincidence that this should have occurred in two of the richest graves of Hijken-'Hooghalen'.

The barrows of Hijken-'Hooghalen' were found to contain some 40 Middle Bronze Age graves altogether, including the secondary cremation burials. There is no doubt that some graves were dug away unobserved during the excavations. In addition, there will have been further graves in the unexcavated quadrants of tumulus 9 and in tumulus 16. Yet the total number of Middle Bronze Age graves is unlikely to have been more than about 60. The number of children's graves is remarkably small. If this cemetery is assumed to have been used continuously during 500 radiocarbon years (i.e. 550-600 calendar years), then the conclusion must be not only that the majority of the children of the community was not buried in these tumuli, but not all of the adults either. The calculated size of the adult community (number of graves times life expectancy, divided by the length of use of the cemetery) would produce a result of three or four individuals. Even if it is assumed that the Hijkerveld barrow groups belonged to the same community, and that the settlement shifted around a fairly wide area, this conclusion remains unaltered. Even if the number of graves should be doubled for the same period of 550-600 years, the number of adult members of the community would still be far smaller than considered likely. Large-scale excavations around burial mounds in Drenthe and elsewhere in the Netherlands have produced no indications that flat graves played a significant role in the funerary tradition. The conclusion should probably be that only the members of a social upper class were buried at all. Indeed similar conclusions have been arrived at for other parts of Europe in this period (Randsborg, 1974).

By Dutch standards, the barrows of the 'Hooghalen' estate yielded particularly fine grave goods. The central grave of tumulus 9, Period 1, is especially striking, containing two gold spirals, two bronze pins, ten (or more) bronze arrowheads and a strike-a-light. It is one of the richest graves of Drenthe. Interestingly, in this same barrow both the central grave of Period 2, containing a long bronze pin, and one of the secondary burials, with a bronze pin, a string of amber beads and a small decorated vessel, are also rich.

The bronze palstave from the central grave of tumulus 1, Period 3, also is quite remarkable. The number of bronze axes in funerary contexts in Drenthe is less than half a dozen; the only other palstave is that from the grave of the 'chieftain of Sleenerzand' (Butler, 1969: fig. 50). For other parts of the Netherlands only 4 or 5 more-or-less well-documented finds of axes in graves are known. Curiously, three of these are bronze palstaves of Osthannover type, although this type is comparatively rare in the Netherlands (J.J. Butler, pers. comm.). The other instances are finds from Epe (Modderman, 1960-61), Texel (Woltering, 1974: fig. 5) and Velzerbroekpolder (Bosman & Soonius, 1990: afb. 4).

6. POLLEN ANALYSIS

During the excavations some 80 pollen samples were collected by W. van Zeist, both from the old surfaces underneath the tumuli and from the turves used in the construction of the mounds. In the end 32 samples were analyzed (9 of old surfaces, 23 of turves); the results were published in van Zeist (1955).

In a later paper, reviewing the results of pollen analyses from burial monuments in the Netherlands, van Zeist (1967) interpreted these pollen spectra in terms of two different types of land use: the so-called Troels-Smith-type *landnam* and Iversen-type *landnam*. Pollen spectra with high values of *Plantago lanceolata*, *Rumex* and Gramineae were identified with the Iversen-type *landnam*, which was defined as consisting of large clearances in the forest which served partly for the cultivation of crops, while the rest was used for the grazing of animals. Pollen spectra with low values for *Plantago lanceolata*, *Rumex* and Gramineae were interpreted as representing the Troels-Smith-type *landnam*, i.e. consisting of only small clearances in the forest, just large enough for a few houses and some crops. In this situation, the animals were thought to have been kept in stables or enclosures, being fed on leaf fodder. The results of the samples from the Hijken-'Hooghalen' cemetery were identified as characteristic of the Iversen-type *landnam*, and this suggested that there was a continuation of land use practices from the Neolithic to the Middle Bronze Age period in the north of the Netherlands.

A critical review of the interpretation of pollen

spectra from burial monuments solely in terms of economic and cultural practices, was presented by Casparie & Groenman-van Waateringe (1980). In this publication the authors, having re-analysed the pollen samples from Neolithic burial monuments in the Netherlands (including samples from tumuli 1 and 8 at Hijken-'Hooghalen'), came to the conclusion that the differences in the pollen spectra, as identified by van Zeist, could be better explained by local differences in the types of forest cleared and the types of soils occupied (in terms of soil nutrients, particle size and moisture availability), than by differences in land use. They also concluded that activities like the cultivation of grain and the grazing of animals were activities difficult to establish with certainty in the pollen record. More recently the use of *Plantago lanceolata* and *Rumex* as indicators of pasture land has been criticized, as these species can occur in arable land, recently abandoned arable or fallow land, as well as grassland (Behre, 1981; Groenman-van Waateringe, 1986).

It is outside the scope of this article to enter into this discussion or to re-analyse the original data in any detail, but a few general comments about the vegetation around the cemetery are offered here.

The tumuli dated to the Neolithic period (i.e. tumuli 1, 8 Period 1, and 17 Period 1) were made up of structureless sand, but those dated to the Bronze Age and Iron Age (i.e. the remaining tumuli) were constructed of, mostly inverted, heather turves (van Zeist, 1955). There are some differences in the pollen spectra of samples from the old surface and from the turves, which suggests that the turves were not always cut from the vegetation in the field on which the mounds were built.

To get some measure of the degree to which the landscape had been cleared of trees, the figures presented by van Zeist (1955: table II) were recalculated, expressing the total sum of arboreal pollen (TAP) as a percentage of total dry land pollen (TDLP). The proportion of tree pollen in the samples is on average c. 52% of TDLP, which indicates that the landscape was already cleared of trees to quite a considerable extent. Even more so when we take into account that *Betula* (birch) pollen take up on average 32% of the total arboreal pollen. Birch is the first tree to recolonize abandoned fields and is likely to be overrepresented in the samples. For this reason van Zeist (1955) excluded *Betula* pollen from his total arboreal pollen sum. The pollen spectra suggest that the tumuli were not constructed inside small clearances within the forest, but, instead, were built on open land. However, there was a fair amount of mixed deciduous woodland nearby, with alder, oak, hazel and lime as the main constituents. The proportion of tree pollen (minus *Betula*) decreases from c. 44% in the Neolithic samples, 31% in the Bronze Age samples, to 27% of TDLP in the Iron Age samples, which suggests a gradual decrease through time in the amount of tree cover in the area around the cemetery. The proportion of heather (*Calluna*) increases through time, from c. 13%, to 23%, to 58% of TDLP. The fact that the Neolithic barrows were made up of sand rather than heather turves may be related to the fact that there was not yet much heathland present near the site during that period.

The consistent presence of Cerealia pollen in the samples suggests that the land on which the tumuli were built had previously been used as arable land. This is corroborated by the presence of plough marks underneath tumuli 5 and 6. Furthermore, the soil profiles underneath tumuli 5, 6 and 7 did not show a typical podzol, but, instead, consisted of a homogeneous greyish layer, characteristic of arable land. The pollen spectra from these soils differ from the others in that they contain rather low levels of tree pollen (including *Betula*) compared to the other samples, but high levels of herbaceous species, expecially *Plantago lanceolata*. These soils appear to represent recently abandoned arable or fallow land. The soil profiles underneath the remaining barrows were podzols. This, together with the high levels of *Betula*, *Calluna* and Gramineae in the pollen spectra, does suggest that much of the land had been abandoned after arable use, and had been left to convert to grassland and heathland.

7. LIST OF FINDS AND SAMPLES

Finds and samples from the excavations of 1952 and 1953 were until recently stored in the Biologisch-Archaeologisch Instituut. Most of the finds had been numbered in pencil, others were identifiable through drawings made shortly after the excavations. The charcoal samples were still in their original, well-marked paper bags. Finds and samples were transferred to the Provinciaal Museum van Drenthe in Assen, after being numbered in ink. The registration numbers given were those reserved by van Giffen in 1953, viz. 1953/VII.1-44. In the following list only the last part of the registration number is used. This part is the actual find number given during the excavations.

1. Larger part of a barrel-shaped Bronze Age pot, and cremated bones. Found by J. Luinge in a rabbit hole in tumulus 1. Exact findspot unknown (fig. 37).

2. Well-preserved human skull and long bones from a small, rectangular grave pit in the top of tumulus 1. Sub-recent.

3. Bronze Age vessel with cremated bones, found in the SW quadrant of tumulus 1 (fig. 37).

4. Cremated bones, charcoal and a lump of iron oxide, from the centre of tumulus 2. The charcoal

was radiocarbon-dated to 2430±35 BP (GrN-14722).

5. Charcoal from charred timbers in the SW quadrant of tumulus 2.

6. Single Grave beaker, type 1b, from grave of Period 1, tumulus 8 (fig. 37).

6a. Heavily damaged bowl, with slightly convex base, from grave of Period 1, tumulus 8 (fig. 37).

6a1. Flint flake of natural origin. Unworked. Found near 6a.

7. Bronze palstave from the central grave of Period 3, tumulus 1.

8. Bronze Age pot from the NW quadrant of tumulus 6.

9. Charcoal from charred planks of cist in grave of Period 1, tumulus 1. Radiocarbon-dated 3665±35 BP (GrN-6261).

10. Small Bronze Age pot from tangential grave in the SW quadrant of tumulus 10 (fig. 37).

11. Charcoal, found on the old surface beneath soil from grave pit of Period 1, SE quadrant of tumulus 1.

12. Charcoal found in the old soil under tumulus 5.

13. Sherd with Barbed Wire decoration, found in the make-up of tumulus 5 (fig. 37).

14. Cremated bones from the SE quadrant of tumulus 1.

15. Fragments of a shallow Bronze Age vessel, found on the old surface beneath Period 2 of tumulus 3 (fig. 37).

16. Charcoal found on top of Period 1, under Period 2 in tumulus 1, centre-east section. Radiocarbon-dated 3455±35 BP (GrN-6262).

17. Charcoal found in old soil beneath tumulus 7.

18. Charcoal found in old soil beneath tumulus 5.

19. Bronze pin with a flat, nail-type head, and remains of teeth and molars from the central grave of tumulus 5 (fig. 38).

20. Four amber beads from tangential grave in the NE quadrant of tumulus 6 (fig. 38).

21. Two amber beads from tangential grave in the SE quadrant of tumulus 6 (fig. 38).

22. Small whetstone of quartzite from the central grave of Period 1, tumulus 6 (fig. 38).

23. Small amount of charcoal from secondary grave in the NW quadrant of tumulus 6.

24. Soil sample from the tree-trunk coffin in the central grave of Period 1, tumulus 6. Later discarded.

25. Charcoal found in and below the old soil underlying Period 1 of tumulus 6.

26. Cremated bones from centre-west section, tumulus 6. Probably central interment of Period 2.

27. Soil sample from stake holes in the SE quadrant of tumulus 10. Later discarded.

28. Two amber beads from secondary burial in the NE quadrant of tumulus 10 (fig. 38).

29. Soil sample from tree-trunk coffin in the central grave of Period 1, tumulus 3. Later discarded.

30. Soil sample from the filling of the northernmost tangential grave in tumulus 3. Later discarded.

31. Long bronze pin from the central burial of Period 2, tumulus 9 (fig. 39b). Damaged beyond repair during unauthorized cleaning of a showcase at the B.A.I., June 1984.

32. Soil sample from the wall of the tree-trunk coffin in the central burial of tumulus 10. Later discarded.

33. Charcoal found on the old surface under tumulus 12. No longer available.

34. Soil sample from tree-trunk coffin in secondary grave in the SW quadrant of tumulus 9. Later discarded.

35. Soil sample from the edge of the central grave pit of Period 1, tumulus 9. Later discarded.

36. Small, decorated Bronze Age pot from secondary burial in tumulus 9 (fig. 39c).

36a. Bronze pin from the same grave as 36 (fig. 39c).

36b. Sixteen amber beads from the same grave as 36 (fig. 39c).

37. Soil sample from the wall of the tree-trunk coffin in secondary grave in the centre-west sextant of tumulus 3. Later discarded.

38. Soil sample from stake circle in tumulus 10. Later discarded.

39. Two spiral hair rings of gold, from the central grave of Period I, tumulus 9 (fig. 39a).

39a. Bronze pin with twisted shaft and rolled-up head. The tip is missing. Twice bent, to form a wide U-shape. From the same grave as 39 (fig. 39a).

39b. Flint strike-a-light, ten (or more) barbed-and-tanged arrowheads of bronze sheet, and a bronze pin from the same grave as 39. Pin and arrowheads were lifted together with 39a, in a block of soil (fig. 39a).

40. Charcoal from secondary grave in tumulus 8. Radiocarbon-dated to 3215±35 BP (GrN-14723).

41. Two small sherds of Bronze Age pottery, found in secondary grave in the NW part of tumulus 3.

42. Charcoal found on the old surface beneath Period 1 of tumulus 9, in the trench in the NW quadrant. Radiocarbon-dated to 3290±35 BP (GrN-10747).

43. Cremated bones on top of the filled-in ring-ditch of Period 1, tumulus 3, probably constituting the central burial of Period 2.

44. Two sherds of TRB pottery found in the old soil beneath tumulus 8 (fig. 37).

The samples for pollen analysis were originally identified with letters, per mound. Later on, some were registered with numbers following on those of the finds and samples. It was these numbers that

were entered on the publication drawings. The numbers used are:

45-50 pollen samples from tumulus 10;
51-60 pollen samples from tumulus 6;
61-65 pollen samples from tumulus 8;
66-74 pollen samples from tumulus 3.

We have been unable to locate the remaining, c. 50 pollen samples which were not analyzed by van Zeist. It is likely that they were discarded.

The finds from tumulus 17 (Hijkerveld 43) were registered in Assen under the numbers 1937/XI.1 and 2.

1937/XI.1. Flint blade, unworked, from grave of Period 1, tumulus 17 (fig. 38).

1937/XI.2. Pot of Gasteren type (Waterbolk, 1962) with three lugs. Found in the NE quadrant, before the excavation. The cremated bones in the pot were thrown away by the labourers who found the pot (fig. 37).

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NOTE ON FIGURES AND TEXT

Some of the plans and sections for this publication were drawn by H. Praamstra shortly after the excavation of 1953. The remainder are by G. Delger who also carried out corrections and changes to Praamstra's plans and sections.

The pottery, the stone and amber objects, and some of the bronze implements were drawn by H.R. Roelink. The remaining bronze objects were drawn by a draughtsman of the Z.W.O. project 'Bronze Age metalwork in the Netherlands', under the direction of Dr. J.J. Butler.

This paper was translated by A.C. Bardet.

APPENDIX.

How it was done
J. Gerritsen

During the period from September, 1950 to February, 1954, at Scheveningen, I prepared the English translation of Glasbergen's dissertation on *Barrow excavations in the Eight Beatitudes*. By January, 1953, most of the book was in type, and we were reading the proofs of the second part. An important feature of this is the survey of barrow types, and on the evening of 28 January I was going over the barrows with a single circle of posts and comparing the descriptions with the plans (which are not part of the book). In one of these descriptions (I do not remember which) there was then a remark to the extent that the rather wide gap between two of the posts presumably meant that a posthole had been missed. Looking at the plan I was struck by the fact that the diametrically opposed interval was remarkably narrow. Connecting opposing posts by two crossing diameters gave a crossing point on one of the long sides of the grave, and continuing the exercise round the circle then showed that all the other diameters crossed approximately at this same point. Thinking I might have something, I turned to other plans, in part I, but also in the volumes of the *Nieuwe Drents(ch)e Volksalmanak* and elsewhere, and tried the idea out on some twenty similar circles. The result was so encouraging that I rang Heereweg 44 at Groningen to report. Recognition was instant, in both its senses: enthusiasm first, realization second: 'Now at last I understand what is was that Case tried to tell me at Oxford last time'. The discovery had plainly been in the air. The letter from Groningen next day confirmed: unknown to me, H.J. Case had made the same observation apropos of his barrow at Wallis Down.