

BOG TRACKWAYS IN THE NETHERLANDS

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ABSTRACT: This article presents an overview of the prehistoric and historical wooden trackways and paths that have been found in the peat-bogs of the Netherlands. The description is based on the relevant information at the Biologisch-Archaeologisch Instituut. In a few cases cobble trackways are concerned. Of the 40 items dealt with 22 are certainly or most probably bog trackways or paths; 5 items are possibly bog trackways and 13 are certainly not. The oldest trackway dates from c. 2100 BC, the youngest from AD 1665. Much information, especially from the 19th and the beginning of the 20th century, is very unclear. 12 trackways and paths have been studied in some detail; in most cases the function could be demonstrated. The trackways and paths described were very seldom part of a traffic system.

KEYWORDS: The Netherlands, overview, prehistoric and historical, peat-bog, wooden trackways.

1. INTRODUCTION

Since the beginning of the 17th century AD almost all of the raised bogs in the Netherlands have disappeared as a result of peat-digging. Of the prehistoric and historical remains present in these bogs probably only a small proportion have been studied and properly documented. The few written records dating from the 17th and 18th century which refer to bog finds are for the most part very incomplete and inaccurate. Not until the beginning of the 19th century do bog finds, notably remains of (wooden) trackways and footpaths, receive more public attention, sometimes resulting in investigation. This article is intended to present an overview of what has become known about trackways and footpaths in Dutch bogs, notably in raised bogs, seeing that fen peat and wood peat offer fewer possibilities for the preservation of perishable material. This overview is mainly concerned with wooden trackways, and to a lesser extent with stone tracks.

The first excavation of a (prehistoric) wooden bog trackway in the Netherlands took place in 1818. J.W. Karsten (1819) demonstrated the existence of a 12-km-long wooden trackway in the Bourtanger Moor, between Valthe and Ter Apel (figs 1, 2). The excavation of part of a prehistoric wooden trackway in the Smilde bogs (fig. 3) to the south of Assen, in 1983, is the most recent field activity (Casparie, 1985). In this period of 165 years the presence of about 40 (wooden) trackways and footpaths in the bogs has been demonstrated or presumed. In view of the great expansion of raised bog in the Nether-

lands (fig. 4) and the accompanying dissection of the landscape, this is a remarkably small number. The total time span within which these trackways fall is about 3700 years.

In addition to the investigations made by Karsten, research on the Dutch bog trackways was carried out mainly by G.J. Landweer Jz. in the years between 1880 and 1912, and by the Biologisch-Archaeologisch Instituut of the University of Groningen since 1922. Before that date the first director of this institute, A.E. van Giffen, had already carried out research on peat-bog archaeology; since the 1950's W. van Zeist and the present author have been active in this discipline.

In Germany the investigation of wooden bog trackways also started in 1818; since that time research has been carried out extensively. Since 1950 the very wide-scale research here has been undertaken by H. Hayen of the Staatliches Museum für Naturkunde und Vorgeschichte in Oldenburg. The total number of wooden trackways that have been found in the bogs of Northwestern Germany is more than 300, dating from the Middle Neolithic until after the Middle Ages. There are clear indications of prehistoric traffic systems (Hayen, 1985; 1987).

Also in the Scandinavian bogs remains have been found of (prehistoric) trackways. Here far less systematic research has been carried out compared with Germany.

In the peat-bog area of the Somerset Levels in Southwestern England a large-scale research project has been under way since 1970, under the direction of J.M. Coles of the Department of

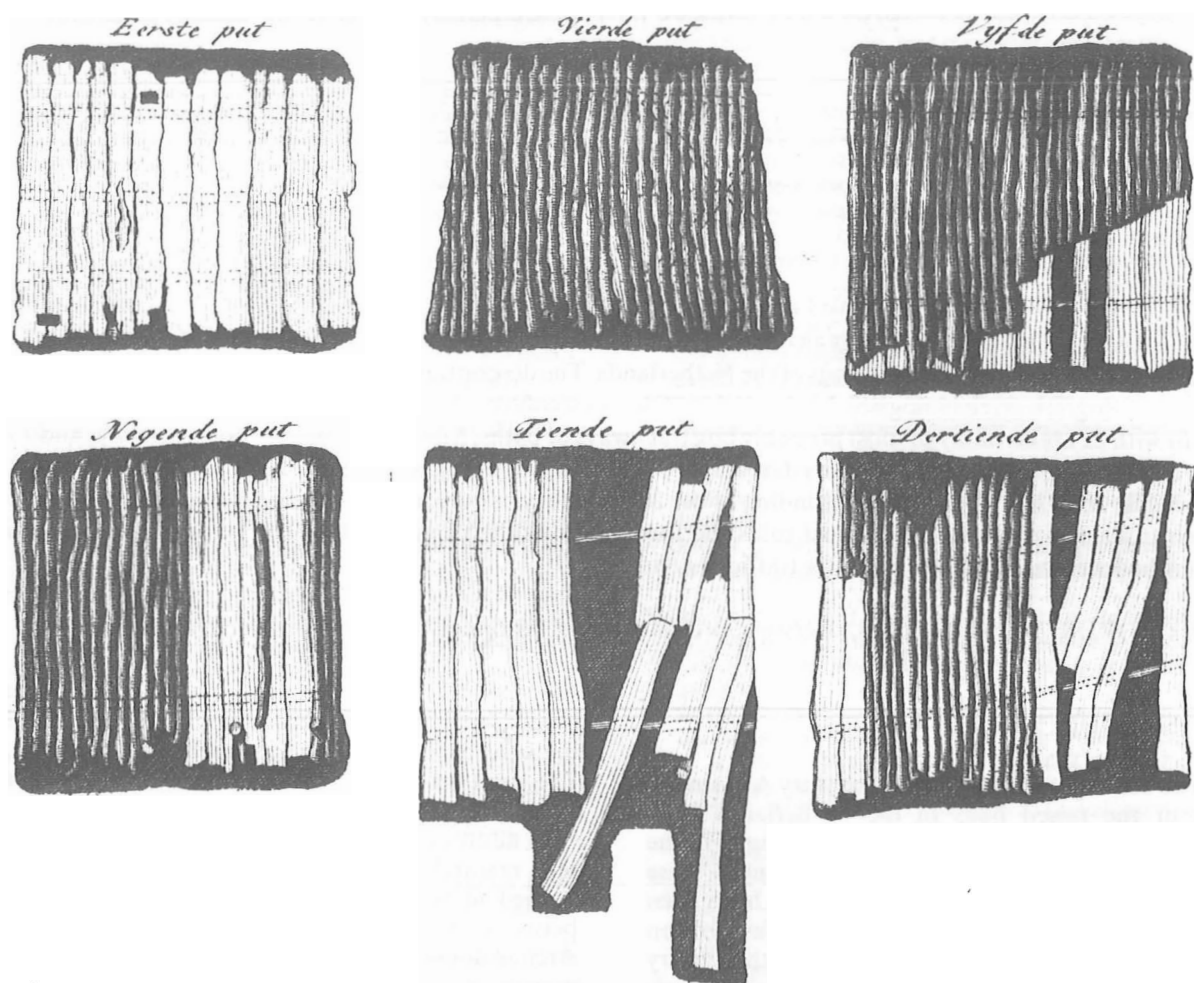


Fig. 1. Valtherbrug, I(Bou), excavation 1818. Trenches 1, 4, 5 (upper row) and 9, 10 and 13 (lower row), each measuring c. 3x3 m, as drawn by J.W. Karsten. From his description (1819) it can be concluded that the drawings are more or less Karsten's interpretation and not an exact reproduction of what he had found. Iron Age, c. 345 BC.



Fig. 2. Valtherbrug, I(Bou), excavation 1892. Photo of Mr. G.J. Landweer Jz, taken by the Rijksmuseum van Oudheden (State Museum of Antiquities) at Leiden. The first photographic record of a prehistoric trackway in the Netherlands.



Fig. 3. Smilde, I(Sm), excavation 1983. The surface-level wood, after the sandy turves had been removed. Iron Age, c. 220 BC.

Archaeology, University of Cambridge. As a result of this research a clear picture has emerged of the development of the trackway system which connected the inhabited higher areas around this bog region from Early Neolithic times until into the Iron Age. Once there were scores of trackways and footpaths here which provided a means of communication over the wet low-lying land (Coles et al., 1975-1986).

The Irish bogs also contain many wooden trackways. B. Raftery, of the Department of Archaeology of University College Dublin, has studied a number of these (1986a; 1986b; 1987). This research is still in process.

The archaeological peat-bog research has provided information on the possibilities that were available to the builders of these trackways and on the problems that they had to overcome. Ingeniously constructed trackways, involving the application of numerous technological improvements, bear

witness to the craftsmanship of the trackway builders.

2. OVERVIEW OF THE DUTCH PEAT-BOG TRACKWAYS

This overview of mainly wooden trackways is based on documentation collected by the B.A.I. It does not give a complete account of all information; a considerable proportion of the data is unreliable. In many cases there is uncertainty as to the accuracy of a relatively large number of reports. The unreliable data were screened and rejected. For each bog trackway as a general rule only a few references to the literature are included, which are intended above all to provide access to more extensive information. This does not mean that the trackway concerned is discussed in the literature referred to. Sometimes merely a few vague indications are the only source of information.

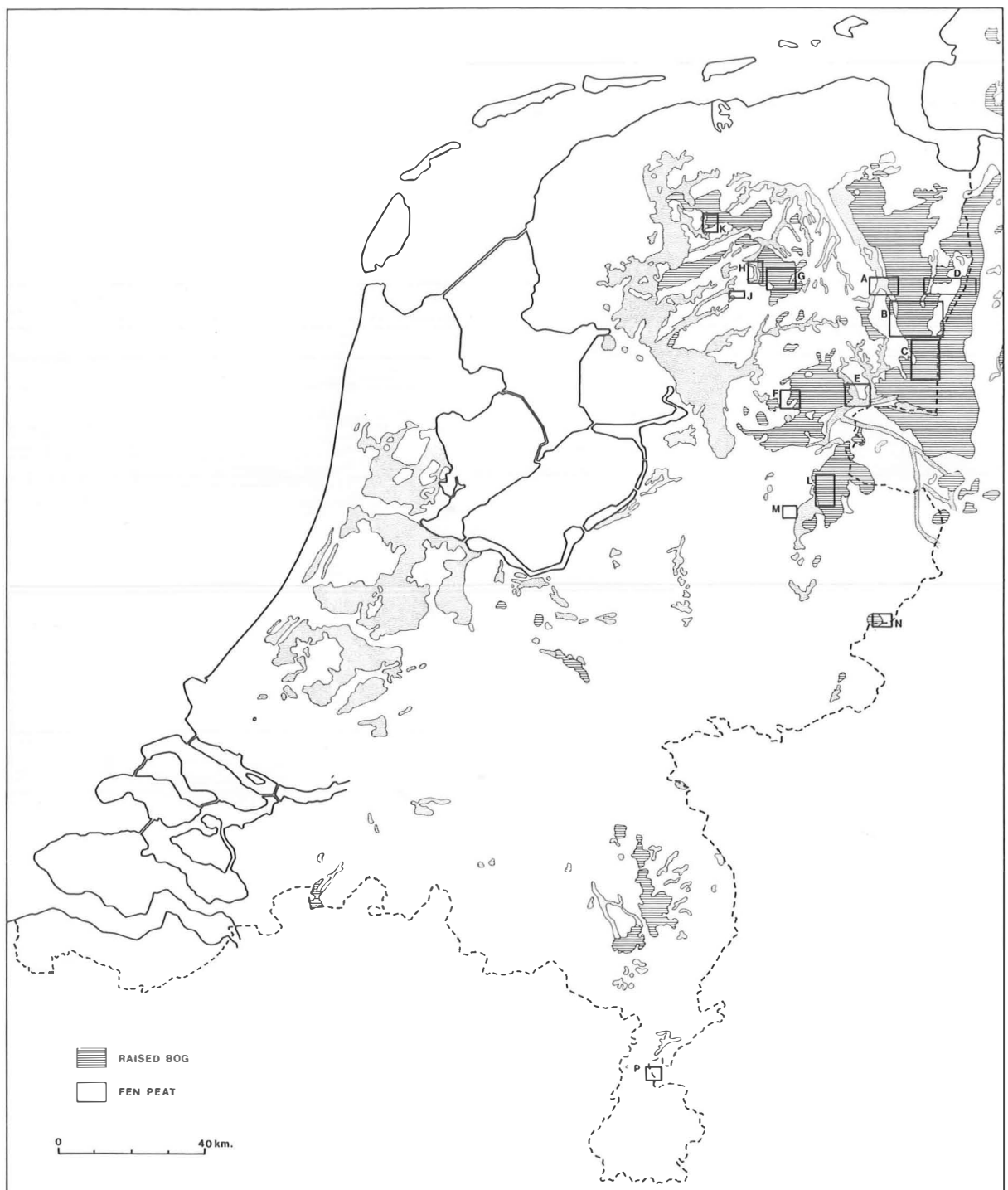


Fig. 4. Ombrogenous peat (raised bogs) and fen peat in the Netherlands; situation of some centuries ago. The raised bogs have now disappeared for the most part. Most of the fen peat has been drained. The rectangles in the figure indicate the maps of figures 6, 10, 12, 19-22, 26-31, 33.

The overview has been compiled on the basis of published and thus accessible data derived from (verifiable) research and from research carried out by the B.A.I. Reports of finds that have turned out, on closer investigation, to be unsubstantiated and unpublished in any way have been disregarded. This applies, for example, to five reports of finds that have come from parts of the Bourtanger Moor since 1982 (pers. comm. H. Groenendijk, B.A.I.). On the basis of the circumstances of the finds mentioned, the peat-stratigraphical situation and the environmental conditions, we are convinced that in these cases it is always natural wood in the peat that is concerned. The reports concerned come from Veen-dam (Borgerswold), Stadskanaal (Vledderveen, near the water tower, Ter Maarsch) and Wessing-huizen (Mussel Aa).

It was not possible to work out a homogeneous overview of the available material. The information presented is by no means a catalogue in the strict sense, but it presents a picture of the possible trackways that have been reported and the definite trackways that have been investigated. In some cases we are concerned with a trackway paved with cobbles, in peat or in peaty areas.

Much information from the 19th century and the beginning of the 20th century was inspired by the discussions on the building method, the course, the function and the possible builders of the trackway known as the Valtherbrug, I(Bou). Evidently there was such a great need felt to find parallels that natural wood remains in the bog were repeatedly interpreted as prehistoric or historical trackways. In such cases the building method mentioned often involves tree-trunks, brushwood, indistinctly arranged or laid out transversely, or longitudinally, and observed over a short distance only. During the first excavation of a Dutch bog trackway, the Valtherbrug, in 1818, the natural wood of the fen peat was incorrectly interpreted as a trackway surface in at least 3 excavation trenches; see under I(Bou). Such incorrect interpretations are to a great extent attributable to the lack of knowledge about bog trackways and peat stratigraphy at the time, as well as to the need that was felt to demonstrate bog trackways. Many of the reports of bog trackways positively identified as such by various authors in the 19th century turn out to be derived from hearsay. As such reports were cited more and more frequently, in the course of time they often came to acquire an air of authenticity.

Finally, it may be mentioned that until into the 20th century attempts were often made to attribute the wood remains found to the *pontes longi* referred to by Tacitus in his *Annales* II. In the raised bogs of the Netherlands no evidence of these has been found.

3. RAISED BOG, FEN PEAT: RIVER AND STREAM VALLEYS

The well-studied wooden bog trackways all lay in raised bog; the special growth form of raised-bog peat is conducive to preservation of such wooden trackways. Yet also in fen peat a few (wooden) trackways have been found. In fen peat all such trackways lay right at the top of the peat deposit, indicating that they were constructed after the groundwater level had ceased to rise. During the formation of fen peat the organic material that is laid on the surface is not actually preserved, on account of the biological activity and the soil mechanics in the uppermost layer of the peat. The (annual) fluctuations of the water level play an important role in this connection.

In historical times great numbers of trackways were laid out that crossed river and stream valleys. In the lowest parts, in addition to wood stone was used, notably erratic cobbles. Most of these crossings through a river valley or stream valley cannot properly be called a bog trackway; in a few cases remains of such crossings have become known as bog trackways, and they are therefore included in this overview.

4. THE INFORMATION PROVIDED

For each bog trackway or footpath (whether positively or tentatively identified as such) a brief description is given, based as far as possible on information provided by the authors cited; where possible, results of research are included. In each case a few remarks are made concerning the details of the information available. Here special attention is paid to the validity of reports of presumed trackways, on the basis of current views on this topic.

The numbering of the trackways is based on the system developed by Hayen (1958). With this system, for each trackway the serial number is followed by the abbreviation, between brackets, of the name of the bog or bog region concerned.

5. THE BOG REGIONS DISTINGUISHED

It is possible to discern in the Netherlands seven raised bogs or areas of bogland in which remains of (wooden) trackways occurred or were allegedly found (fig. 5). The most extensive raised bogs have been divided into different find areas. The abbreviations in the figure and in the trackway numbering system are as follow:



Fig. 5. The bog regions and find areas distinguished. 1. Bourtanger Moor with find areas Buinen (B), Valthe (V), Emmen (E) and Westerwolde (WE); 2. the bogs around the border between the provinces of Drenthe and Overijssel, with find areas Coevorden (Coe) and Zuidwolde (Zui); 3. Smilderveen with find areas Smilde (S), Fochteloërveen (Fo) and Makkinga (Ma); 4. Drachtsterven (Dr); 5. Engbertsdijksveen (Eng); 6. Buurserveen (Bu); 7. Roodebeek-Sittard (Si).

1. Bourtanger Moor (Bou); find areas Buinen (B), Valthe (V), Emmen (E), Westerwolde (We).

2. The bogs around the border between the provinces of Drenthe and Overijssel (D-O); find areas Coevorden (Coe), Zuidwolde (Zui).

3. Smilderveen (Smilde bogs) (Sm); find areas Smilde (Sm), Fochteloërveen (Fochtelo bog) (Fo), Makkinga (Ma).

4. Drachtsterven (Drachten bogs) (Dr).

5. Engbertsdijksveen (Engbertsdijks bog) (Eng).

6. Buurserveen (Burse bog) (Bu).

7. Roodebeek-Sittard (Si).

The location of the bog trackways is shown in the distribution maps for each find area (figs 6, 10, 12, 19-22, 26-31, 33). Where the course of a trackway has been established with certainty, this is indicated by a continuous line. The presumed or probable course of part of a trackway is indicated by a dotted line. In those cases where the precise situation is unknown, asterisks are used to indicate the approximate position. Such cases almost always concern small stretches of trackway; these are represented by the larger asterisks. If the course of a considerable length of trackway is very likely or

certain, the possible situation is indicated by a line of small asterisks.

6. DESCRIPTION OF THE BOG TRACKWAYS

6.1. Bourtanger Moor

6.1.1. Buinen find area (fig. 6)

XII(Bou) 'Buinerbrug'. Buinen, wooden trackway 4-5 m wide. The trackway-surface is made out of transversely laid roundwood (fig. 7), probably *Pinus*; there may be a substructure of brushwood. The trackway is known to have extended over a length of at least c. 800 m; it was probably not much longer than this. The starting point of the trackway was not situated on the Hondsrug, the area of high mineral soils that form the western margin of the Bourtanger Moor, but rather on a fluvial ridge to the east of the river the Achterste Diep. Excavation by A.E. van Giffen (1913; see also Mulder, 1912). Dating: probably Neolithic (Waterbolk, 1954).

Remarks: From the excavation drawing it can be deduced that the pattern of side-branching of the tree-trunks used as trackway surfacing was clearly visible, so the side-branches must have been roughly cut off. This will have made the use of the trackway-surface very difficult. The configuration of side-branches indicates perhaps the use of *Pinus* trunks as surfacing, although the wood has not been identified; in older reports wood from bogs is often incorrectly referred to as *Pinus*.

XI(Bou) 'The stone footpath'. Buinen, stone trackway 1.90-2.70 m wide. The trackway-surface (paving) consists of a layer of erratic cobbles measuring 10-20 cm (fig. 8); towards the side of the trackway they are somewhat larger. The trackway is reinforced on each side by a row of vertical oak posts. The trackway may originally have had a covering layer of white sand. In a few places a substructure of brushwood was present; some of the cobbles lay immediately on the peat. The trackway has a known length of c. 1500 m. There is a noteworthy bend in its course; it possibly concerns more than one road. It was built from (a predecessor) of the village of Buinen. Excavation by A.E. van Giffen (1913; see also Mulder, 1912). The trackway has not been dated.

Remarks: This trackway can be regarded as a means of crossing the valley (ford) of the Achterste Diep. It probably dates from the same period as XXVII(Bou), i.e. late 10th/early 11th century AD (see below).

XXVII(Bou) 'The cobble road of Bronneger'. Bronneger, trackway c. 3 m wide with various kinds of surfacing. Over dry levees it consists of a sand

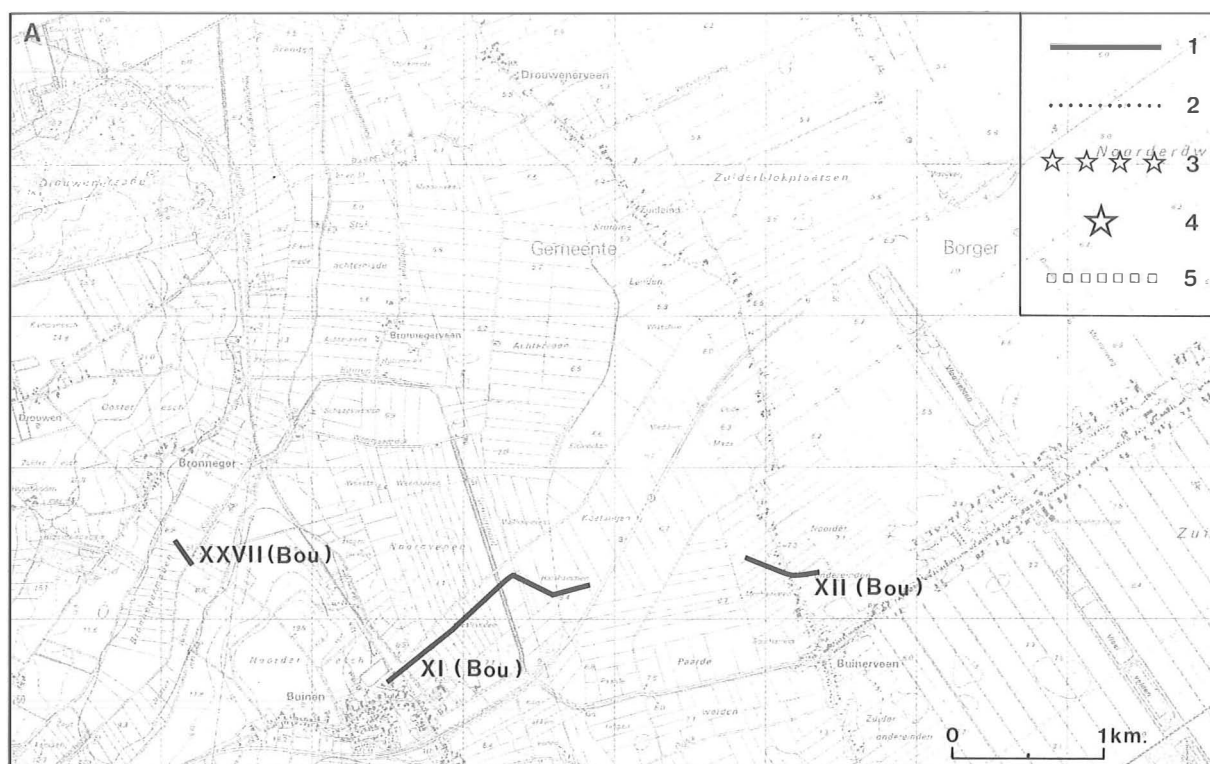


Fig. 6. Buinen find area of the Bourtanger Moor; rectangle A of figure 4. Legend: 1. course of the trackway known precisely; 2. very probable course; 3. possible course of the trackway; the presence of the trackway is not completely certain; 4. possible trackway, location indicated not exact; 5. although a course is mentioned, there was certainly never any trackway present.

trackway with marking stones (erratic cobbles) on each side; a depression filled with peat has a surfacing of *Alnus* brushwood, also with marking stones on each side (fig. 9). A low, wet levee has a surfacing of erratic cobbles measuring 5-20 cm, with larger marking stones present on each side. This stretch of trackway has ditches in the verge. On one side a timber reinforcement is present. It is possible that there was originally a barrier present here. The stretch of trackway with a cobble surfacing was preceded by a sand track, which had been levelled using heather turves. No separate substructure was present. The levee on the Voorste Diep had a rather substantial sheet-piling consisting of cobbles. Alongside the Voorste Diep remains have been found of a (presumed) water mill.

The trackway has a known length of at least 200 m; its course follows a few gentle bends. It was laid out between Bronneger and Buinen. Excavations by the B.A.I. (Casparie et al., 1983). It has been dated to c. 1000 AD.

Remarks: This trackway probably served as a means of crossing the valley of the Voorste Diep and as a way of access to the water mill.

6.1.2. Valthe find area (fig. 10)

I(Bou) 'Valtherbrug'. Valthe, wooden trackway 2.50-3 m wide, with a few noteworthy bends, probably extending right across the entire Bourtanger Moor between Valthe on the Hondsrug and Ter Apel in Westerwolde, over a length of 12 km. The surfacing consists of transversely laid elements, in the form of planks and roundwood (split or left whole) (fig. 11, see also figs 1 and 2). The substructure consists of longitudinally laid roundwood: 2 or 3 logs lying parallel, at a variable distance apart. Here and there vertical pegs are used to secure the surfacing material. The tree species that have been mentioned as providing the building elements are *Quercus*, *Alnus*, *Betula*, *Corylus* and *Pinus*. First excavation in 1818 by J.W. Karsten (1819); excavation in 1892 by G.J. Landweer Jz. (1898), in 1936 by the B.A.I. (van Giffen, 1938); summary article by van Zeist (1958), in which attention is also devoted to the trackways II, III, IV, V, VI, VII and VIII(Bou). ^{14}C dating: 345 ± 50 BC.

The course of the trackway as given by Karsten (1819) is incorrect; this applies notably to the



Fig. 7. Buinen, XII(Bou), the wooden track, excavation 1912. The trackway has clearly been overgrown by peat on which a *Pinus*-bog forest became established. Neolithic.

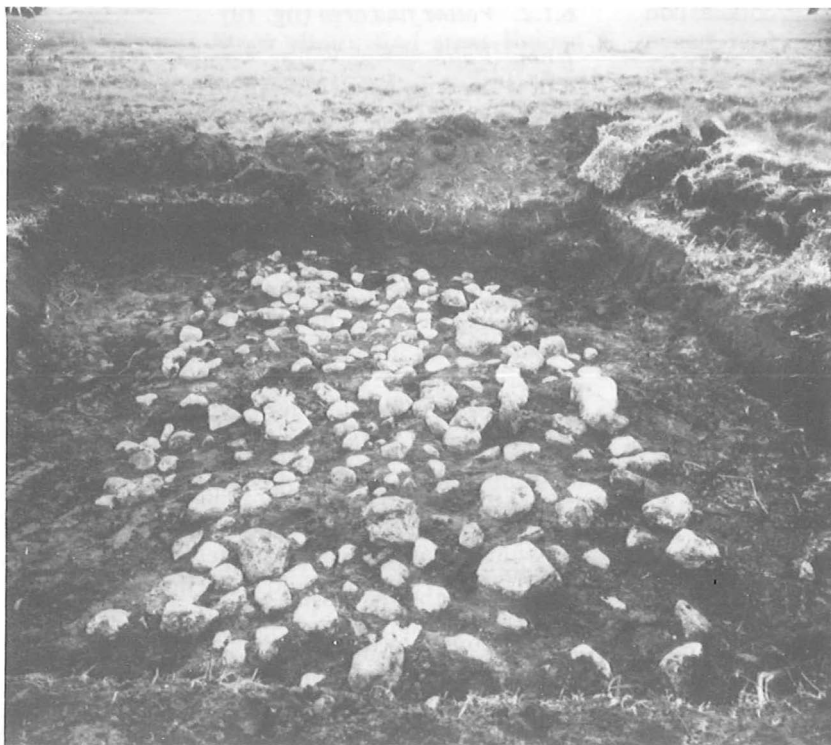


Fig. 8. Buinen, XI(Bou), the stone footpath, excavation 1912. Medieval.



Fig. 9. Bronneger, the cobble road, XXVII(Bou), excavation 1978. In the foreground, between the marking stones, the trackway-surface consists of brushwood of *Alnus*, on a deposit of fen peat. Medieval, c. AD 1000.

westernmost 6 km of the route. The 'southern branch' of the track assumed on the basis of the research of van Giffen (1938) of the 'northern branch' never existed. Although it is impossible to establish the entire course with certainty, the most likely route is a combination of van Giffen's stretch, the stretch of the 'northern branch' determined by van Zeist, and the eastern trenches of Karsten, notably those in which planks were found.

Remarks: There is a wide discrepancy in size between the building elements excavated by van Giffen and Landweer's photographic information, and the planks and logs drawn by Karsten. Karsten's trenches 18, 19 and 20 do not represent a

trackway-surface, but are rather a very free rendering of natural wood present in the fen-peat at this spot (Casparie, in prep.). There are various reports of finds made on and near the trackway, including parts of wagons; this indicates the use of the track. Nevertheless van Giffen's stretch of the trackway seems to have been hardly suitable for taking wagons with spoked wheels. No indications have been found of a covering layer of e.g. turves. Karsten estimated that for the construction c. 60,000 logs and planks would have been required, coming from about 10,000 trees. For this amount of timber an area of a few hundred hectares of forest would have been necessary.

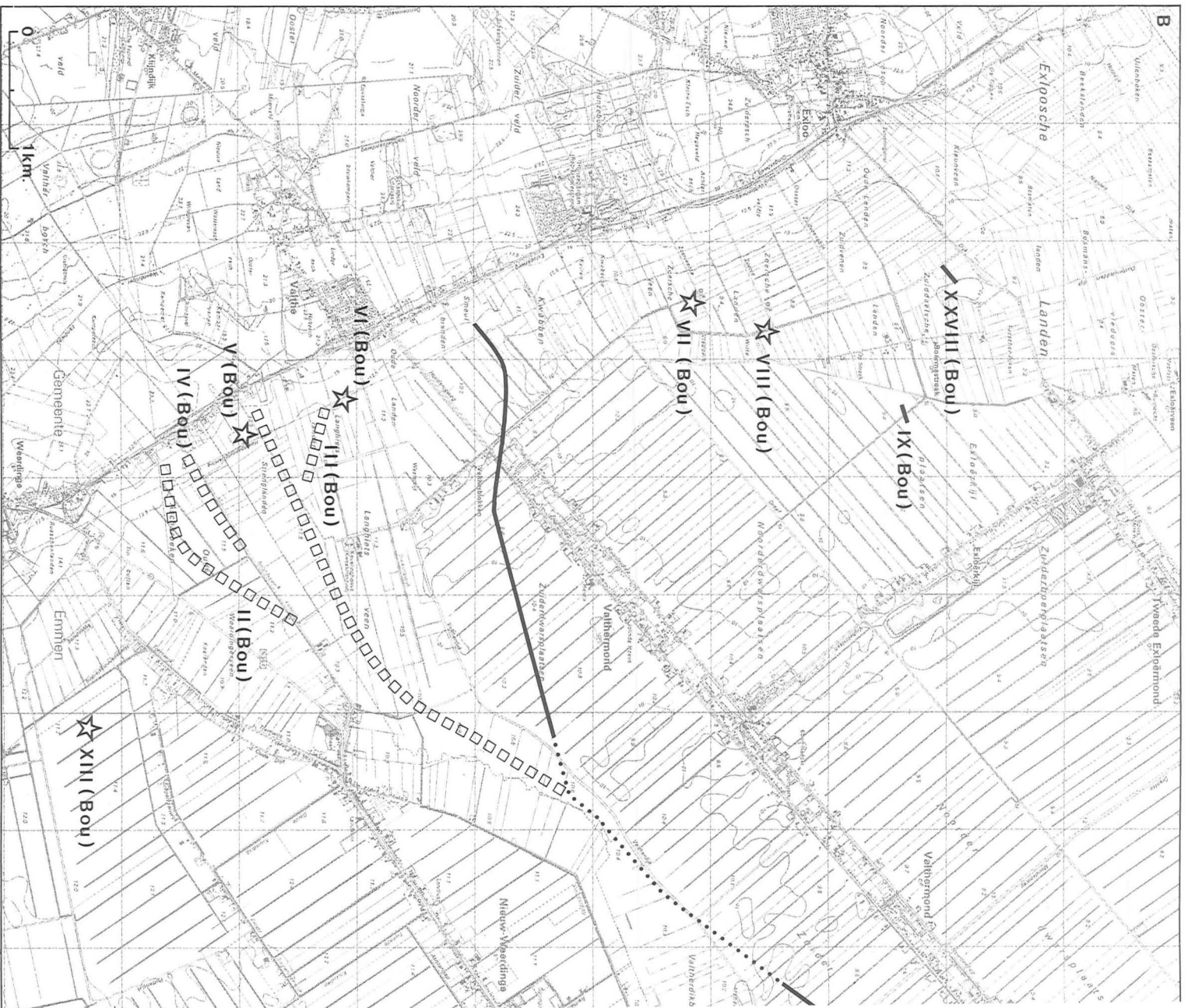


Fig. 10 Valtke find area of the Bourtanger Moor, rectangle B of figure 4. Legend: see fig. 6.





Fig. 11 Valtherbrug, I(Bou), excavation 1936. The surface-level in this section is mainly built of (split) tree trunks. Iron Age, c. 345 BC.

II(Bou). Weedingerveen, tree-trunk trackway and (slightly further along in an easterly direction) brushwood, measuring c. 3 m and 1.20 m in width, respectively. Trackway II of van Zeist (1958). Tree species: *Pinus*, *Betula* and *Alnus*. The tree trunks lie on a substructure of logs; the bundles of brushwood lie in the direction of the longitudinal axis of the trackway. The trackway is approximately 2 km long. It is supposed to follow a distinct bend. The trackway allegedly runs in the direction of the (highly doubtful) southern branch of I(Bou), without actually reaching it. There is no known dating; the trackway lay partly immediately below the peat surface. The precise location is not known; the location reported is not correct.

Remarks: This trackway suffers, as it were, the same problems as Karsten's trenches 18, 19 and 20. Here very wood-rich fen peat was present, which means that natural wood remains present here could have been interpreted as a trackway. There is good reason to doubt the actual existence of this trackway.

III(Bou). Valthe, Langhietslanden, trackway of roundwood, about 3 m wide. The trackway-surface consists of small, round tree trunks, lying on a substructure of logs. Underneath there lie bundles of brushwood in the direction of the longitudinal axis of the trackway. Trackway I of van Zeist (1958). The trackway has been found to extend over a length of about 600 m.

Remarks: There is no information available as to whether this trackway lay in or on the peat. In the latter case it could be a medieval or younger brushwood trackway that was used for the exploitation of this bog area, e.g. for the purpose of winning bog-iron ore or for reaching hay fields. At the same time, it is not impossible that here too we are concerned with natural wood remains present in wood-rich peat.

IV(Bou). Valthe, Weedingershout, trackway of small tree trunks, some of which lie in the direction of the longitudinal axis of the trackway. Trackway III of van Zeist (1958). No further details are known. The trackway supposedly runs in the direction of the 'southern branch' of I(Bou).

Remarks: It is unlikely that a wooden trackway is concerned here. So little information is available that a function like that proposed for III(Bou) cannot be seriously considered.

V(Bou). Valthe, Strenglanden, footpath of planks, which do not lie close together but are situated some distance apart. Trackway IV of van Zeist (1958). The planks, of *Quercus*, are 0.9–1.2 m long. At the ends of each plank a hole has been cut through. They may have been fixed into the peat by means of pegs measuring c. 1.2 m in length, or they may have rested with their openings over these pegs, with the peg heads projecting through the holes. The path has been observed over a very short distance. Its location and direction are uncertain.

Remarks: It is not clear whether the observed planks are situated in the longitudinal direction of the trackway or whether they lie transversely. In the latter case it is possible that they are the transverse timbers of a footpath one or two planks wide, of which the walking surface has disappeared.

VI(Bou). Valthe, the Lange Hiet, a number of square posts driven into the bog; *Quercus* (van Zeist, 1958: p. 40). The posts were about 50 cm long, 5–10 wide and pointed. Here and there they stood in pairs, spaced 40 cm apart. The path could be traced over a length of c. 100 m in an easterly direction.

Remarks: Possibly the remains of a bog trackway of which most of the material has disappeared, although this is by no means certain.

VII(Bou). Exloo, Zuurveense Dijk, wood remains in the peat, about 300 m from the Hondsrug, possibly the remains of a wooden trackway (van Zeist, 1958: p. 45–46), at a depth of 0.8 m.

Remarks: It is possible that these are the remains of activities in this bog area, in which the Hunze flows. Iron ore was dug here, for example, until into the 20th century. Similar indistinct wood remains are known from other places in this Hunze peatland area.

VIII(Bou). Exloo, Zuurse Dijk, near the Hunze, found in 1953, a row of tree trunks of unequal length lying over a distance of c. 3 m (van Zeist, 1958: p. 46); the direction followed is north-south; depth 0.8 m.

Remarks: In this case too it cannot be said whether these are the remains of a wooden trackway; see also the remarks on VII(Bou).

IX(Bou). Exloo, Boermastreek, collection of logs, up to 4 m long, in the peat at a depth of c. 1.5 m, found in the spring of 1912 (Landweer, 1913: p. 204).

Remarks: Too little information available to form any kind of clear impression.

XIII(Bou). Weerdingerveen, two rows of small vertical posts in the peat, spaced one metre apart (Landweer, 1898: pp. 207–240). Possibly the pegs of a pathway made out of sods.

Remarks: No further details can be given.

XXVIII(Bou). Exloo, Holle Landen, near the Hunze, brushwood trackway, near the spot where the remains of (presumably) a post-mill were excavated in 1976 by the B.A.I. (unpublished). A surface of brushwood with some sand in between, measuring about 2 m wide. At the top of the peat, immediately below the surface layer of grass of the peatland. Direction approximately west-east, observed over a length of c. 15 m. The trackway is older than the present-day parcel-system (17th century AD?), but younger than the undated post-mill.

Remarks: In this region bog-iron ore was dug intensively until into the 20th century, as a result of which the surface of this peatland was considerably disturbed.

6.1.3. Emmen find area (fig. 12)

XIV(Bou) 'hurdle trackway'. Emmerschans, trackway of hurdle mats measuring c. 2.70 m wide (fig. 13). The trackway-surface is made out of hurdles of four-year-old *Salix* branches, on a substructure of a loose framework of roundwood of i.a. *Betula*, *Alnus*, *Fraxinus* and *Pinus*. Where a small bog stream had to be crossed, an extra foundation of bundles of *Salix* rods was present. The trackway was probably about 3 km long and led to a spot where bog-iron ore was present. Excavation by the B.A.I. in 1962 and 1963 (Casparie, 1986; see also Wesselink, 1924). ¹⁴C dating: 170±40 BC.

Remarks: These hurdles were made in exactly the same way as hurdles produced today. The use of hurdles indicates the presence of *Salix* osier bed culture on the Hondsrug in this locality. The trackway was most probably laid out to facilitate the extraction of bog-iron ore.

XV(Bou) 'northern plank footpath'. Bargerroosterveld-Emmererfscheidenveen, wooden footpath 40–50 cm wide. The walking surface consists of pairs of planks, laid out next to each other longitudinally, measuring about 3 m (fig. 14). The overlapping ends of the planks are firmly secured together between so-called double transverse timbers. These have a lower plank and an upper plank; each has two square holes, one on each side of the foot planks. The double transverse timbers are consistently fixed into the bog by means of two pegs; in this way the foot planks are firmly secured. Approximately in the middle between the double transverse timbers the foot planks are given additional support by a transverse timber without any holes. The construction elements are made out of *Quercus* trees,

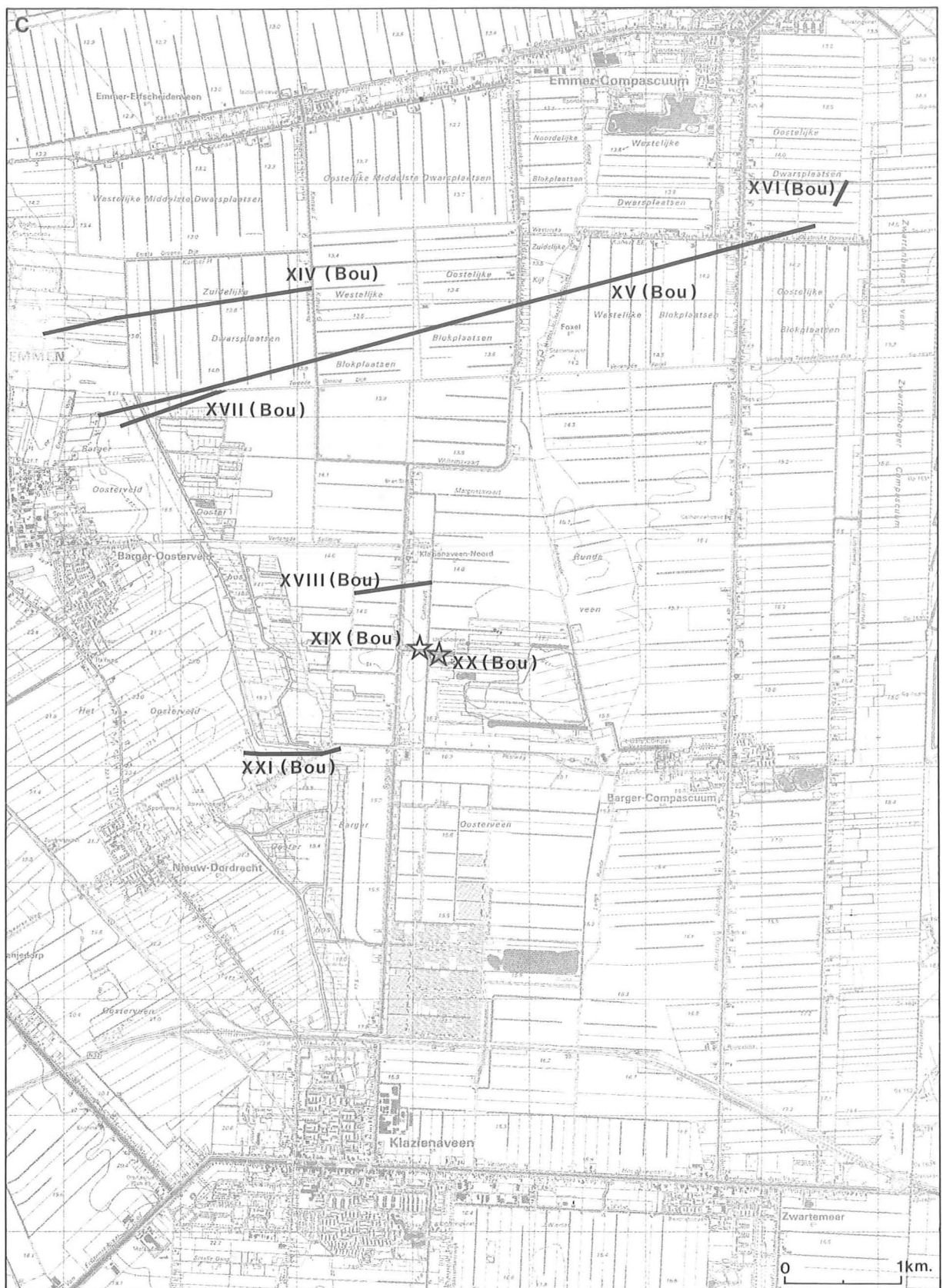


Fig. 12. Emmen find area of the Bourtanger Moor; rectangle C of figure 4. Legend: see fig. 6.

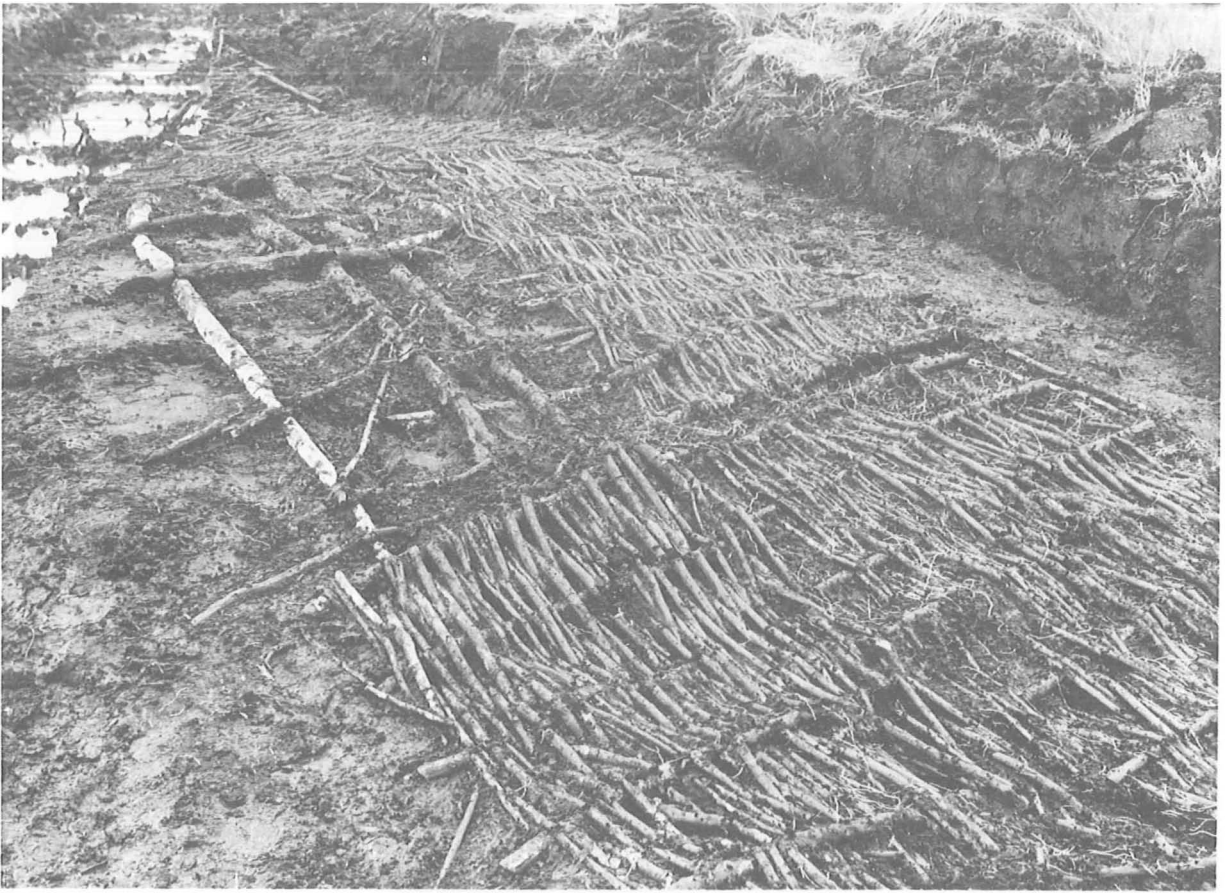


Fig. 13. Emmerschans, hurdle trackway, XIV(Bou), excavation 1962. One hurdle is missing. Iron Age, c. 170 BC.

40-45 cm thick, which were on average more than 100 years old. The heartwood was used for the foot planks, the sapwood for the transverse timbers and the pegs.

The footpath has been traced with certainty over a length of 4.5 km. Starting from the Hondsrug, it may have provided access right across the bog, over a distance of c. 12 km. Excavations in 1910 by Wesselink (1924), and by the B.A.I. between 1952 and 1967 (Casparie, 1986). ^{14}C dating: 530 ± 40 BC. Shortly after it had been built it was destroyed intentionally. When this happened the planks were either taken away to the settlement on the Hondsrug, or driven vertically into the peat.

Remarks: The path would have been very comfortable to walk along and of good stability; only in very wet parts of the bog surface would there have been insufficient protection against water. The destruction of the path is probably related to the increased danger on the bog surface as a result of wide-scale erosion after a bog burst in the peat, c. 500 BC.

XVII(Bou) 'southern plank footpath'. Bargerroosterveld, wooden footpath measuring 25-30 cm in width. The walking surface is one plank wide. The ends of the planks, which measure c. 3 m in length, overlap and have a square hole cut through them (fig. 15). Underneath this overlap there lies a transverse timber with a square hole in the middle. These construction elements are fixed into the bog by means of a wooden pen. The construction elements are of *Quercus*; trees 40-45 cm thick and more than 100 years old. The foot planks are made out of heartwood, the transverse timbers and pegs out of sapwood. The path may have been c. 3 km long; it was laid out from the Hondsrug in order to reach an area with bog-iron ore. In a very wet part of the bog surface the building method had been adapted; planks from somewhat drier spots (hummocks) were shifted to hollows (fig. 16). Excavations by the B.A.I. between 1961 and 1967 (Casparie, 1984). Dendrochronological dating c. 1350 BC (pers. comm. B. Schmidt, Cologne); ^{14}C datings: 1170 ± 50 BC and 1195 ± 55 BC.



Fig. 14. Bargerooterveld, northern plank footpath, XV(Bou), excavation 1963. The path was destroyed already in prehistoric times. Iron Age, c. 530 BC.

Remarks: The path was very stable; it would have been moderately comfortable on account of its narrowness and the presence of pegs in the midline of the pathway. Moreover in many places on the bog surface the footpath was situated too low to permit pedestrians to pass dry-shod at all times. On this path an iron punch was found (Charles, 1984; Casparie, 1984), indicating iron-working activities in this region in the Middle Bronze Age.

XVIII(Bou) 'roundwood footpath'. Klazienaveen-North, footpath measuring c. 50 cm in width. The walking surface consists of logs, 10-15 cm in diameter, laid out longitudinally, with 4 or 5 logs lying together all the way along (fig. 17). Both ends of this roundwood lie on transverse logs: one on

each side. The walking-surface logs were kept together by means of pegs driven vertically into the bog, with 4 such pegs being used per 'construction unit'. All the construction elements were made of *Pinus* trunks. The tops of the trunks served as pegs; the base ends as trackway-surface elements. The transverses are made out of the intermediate parts of the tree trunks. The footpath logs fall into two size categories: c. 3 m and c. 4.50 m long. The pine trees, which had grown in the bog, were 75-85 years old.

The path was possibly c. 3 km long, and had been built from the Hondsrug in order to reach an area with bog-iron ore in the bog. Excavation by van Giffen in 1930 (Casparie, 1984). ¹⁴C dating: 1120±50 BC.



Fig. 15. Bargeroosterveld, southern plank footpath, XVII(Bou), excavation 1963. Middle Bronze Age, c. 1180 BC.



Fig. 16. Bargeroosterveld, southern plank footpath, XVII(Bou), excavation 1963. Adapted method of construction on a very damp section of the bog surface.

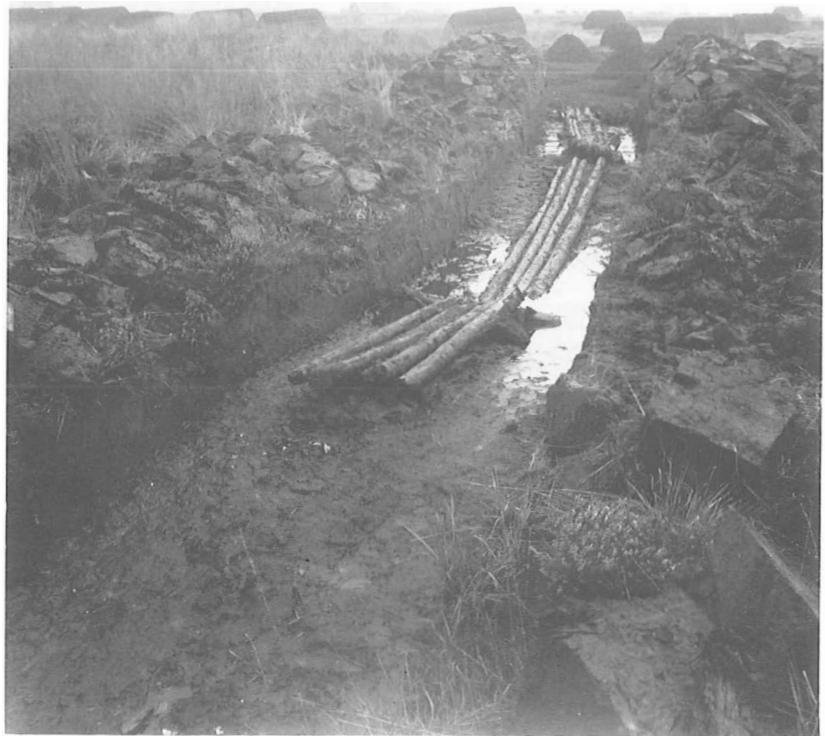


Fig. 17. Klazienaveen-North, roundwood footpath, XVIII(Bou), excavation 1930. The surface-level in the foreground has been removed by peat-digging activities. Middle Bronze Age, c 1120 BC.

Remarks: This was a stable path, although it would not have been very comfortable on account of the longitudinally laid logs used as surfacing. For each construction element of 4 logs only 2 transversals are required; as a result of this the construction units come in two lengths: c. 3 m and c. 4.50 m.

XIX(Bou). Klazienaveen-North, near lock 2, trackway or platform about 3.5 m in width, made of smooth tree trunks resting on 4 evenly spaced substructural elements. The direction followed is north-south. This was reported by G.J. Landweer Jz. (1912). Not dated, but as Landweer mentions that the construction lies under one metre of peat, it probably dates from the Bronze Age; it may even date from the Late Neolithic.

Remarks: The presence of this construction is certain; it may have some relation with XXI(Bou).

The construction was definitely not a wooden trackway from the Hondsrug, but it may have been a platform used for winning bog-iron ore.

XX(Bou). Klazienaveen-North, near lock 2, a bog trackway. This trackway was reported by Landweer (1912), without any indication of its dimensions or the construction method. It lies about 100 m east of XIX(Bou). Not dated.

Remarks: The presence of this construction is also certain; like XIX(Bou) it may be connected with winning iron ore, which was present locally. Landweer does not mention this, however; in any case this construction was not a wooden trackway from the Hondsrug.

XXI(Bou). Nieuw-Dordrecht, wooden trackway measuring 2.5-3 m in width. The trackway-surface



Fig. 18. Nieuw-Dordrecht, XXI(Bou), excavation 1964. Neolithic, c. 2100 BC.

is made of transversely laid roundwood, partly split, of *Alnus*, *Betula*, *Quercus* and *Tilia* (fig. 18). On the trackway-surface planks of slabwood are used to make the surface even; the trackway was intended to carry wheeled traffic. Only the westernmost part has a substructure of longitudinally laid tree trunks; predominantly *Betula*. This trackway, which was built from the Hondsrug, has been traced over a length of about 1 km; it was certainly not longer than 2.5 km. Excavations by the B.A.I. between 1955 and 1981 (Casparie, 1982). Dating: around 2100 BC; on the basis of 3 ^{14}C datings: 2150 ± 55 BC, 2130 ± 55 BC and 2070 ± 35 BC.

Remarks: Although the trackway was built to carry wheeled traffic (surface-levelling wood!) it could not be used for this purpose, on account of the absence of a substructure over a great length of the stretch of trackway found. Here the transport of a wheeled vehicle over the wet bog surface requires a stronger construction than that provided by the trackway-surface only. The trackway was not intended to provide access right across the bog (c. 12 km); for that purpose the extremity of the Hondsrug from which the trackway is built provided too little wood. It is possible that we are concerned here with an uncompleted trackway. The purpose of the trackway is not clear. Near the trackway a broken wagon wheel, of the disc wheel type, of *Quercus* was found (van der Waals, 1964), as well as an axe haft of *Taxus* wood and a haft of *Sorbus* wood.

6.1.4. *Westerwolde find area* (figs 10, 12, 19)

X(Bou). Ter Apel, trackway of brushwood (*rijshoutweg*), 3 m wide, found 50 m north of the Valtherbrug (= I(Bou)), at the front of parcel of peat No. 10 in the Terhaarsterveen (Landweer, 1898: pp. 212-213). Direction more or less the same as I(Bou); observed over a length of a few metres. Location, see figure 10.

Remarks: Although we are undoubtedly concerned with a trackway here, too little information is available to form a clear picture.

XVI(Bou) 'batten trackway'. Emmercompascuum, footpath 30 cm wide. The walking surface consists of longitudinally laid planks, which are stabilized by remarkable transverse timbers, of *Quercus* (Landweer, 1902; Casparie, 1984). The path was present at a depth of c. 1.50 m in the peat at parcel of peat No. 16 of the Oostelijke Dwarsplaatsen. Location, see figure 12. The direction it followed was approximately northeast-southwest. The path was traced over a length of a few tens of metres; it was probably almost 2 km long. Location, see figure 5. It served the purpose of providing access to something in the bog, and not as a passageway right across the bog, as is evident from the method of construction and

direction. ^{14}C dating: 1160 ± 35 BC.

Remarks: the path was carefully made, but its construction is insufficiently solid and too unstable to provide an efficient means of getting over the bog surface.

XXVI(Bou) *Hasseberg*. Sellinger, near the Hasseberg, footpath or possibly a small bridge measuring 50-60 cm in width, built over the peat-filled arm of a river at the foot of the Hasseberg. Location, see figure 19. The walking surface consists of two planks lying alongside each other on a substructure of brushwood of *Betula*. Reconnaissance in 1924 by van Giffen (1924: pp. 6-7; possibly also described in *Tijdschrift voor Genealogie en Historie 'Westerwolde'*, 1983, 4, p. 21). The coarsely worked planks or tree trunks, *Quercus*, lay at a depth of 1.90 m below the surface, probably at the base of the poorly humified *Sphagnum* peat. The length of the construction was probably 50-60 m (the width of the peat-filled river arm). Direction approximately west-east, on the west side of the Hasseberg.

Remarks: The peat-filled depression is one of the Westerwolde 'rills', which still played a role in the natural drainage of this landscape during the Late Glacial. In view of the depth of the construction in the peat and the description of the peat material found it can be deduced that here we are most probably concerned with a footpath dating from the Bronze Age.

XXIII(Bou). Onstwedder Horst, to the north of Musselkanaal, substructural elements of the same type as those of the Valtherbrug I(Bou), possibly of a bog trackway running northeast-southwest (van Zeist, 1958: p. 46; as is evident from reports in the *Drentsche Courant* No. 27, 4.4.1843, and No. 30, 14.4.1843; see also van der Aa, Dl. VIII, 1846, under Onstwedde). This trackway supposedly joins up with I(Bou). Location, see figure 19.

Remarks: The information cannot be considered as reliable; here we see a typical example of the spirit of the time, involving the desire to find connections with I(Bou). The area concerned was still occupied in the Neolithic, but shortly afterwards the peat formation here gained the upper hand.

XXII(Bou) 'Bommen Berend'. Jipsinghuizen, wooden trackway, made out of material requisitioned in the Emsland, built for the purposes of the army of Bishop Bernhard von Galen, bishop of Munster, in 1665, with a view to launching an attack on the fortification of Bourtange. Location, see figure 19. The trackway had a length of 1236 roods or two hour's walking distance (probably 6 km) and a width of 5 infantrymen or 3 cavalrymen (about 3 m). It was made out of doors, window frames, planks, brushwood, etc.



Fig. 19. Westerwolde find area of the Bourterange Moor, rectangle D of figure 4. The tracks X and XVI(Bou) of this find area are marked in figures 10 and 12, respectively. Legend: see fig. 6.

Remarks: The trackway served as an attack route and a possible retreat route through the bogs of Bourterange, for the troops of Munster, who were operating in Westerwolde in the wet autumn of 1665. A description of the trackway and the associated military events is given by J.B. Diepenbrock (1885: pp. 481-484).

II(Coe). Coevorden, hurdle trackway, built in the autumn of 1536 over the marshy land near Coevorden, by Georg Schenck, general of Charles V, for bringing his artillery to Coevorden (van der Scheer, 1850: p. 181).

Remarks: Trackways of this kind will often have been built in times of war.

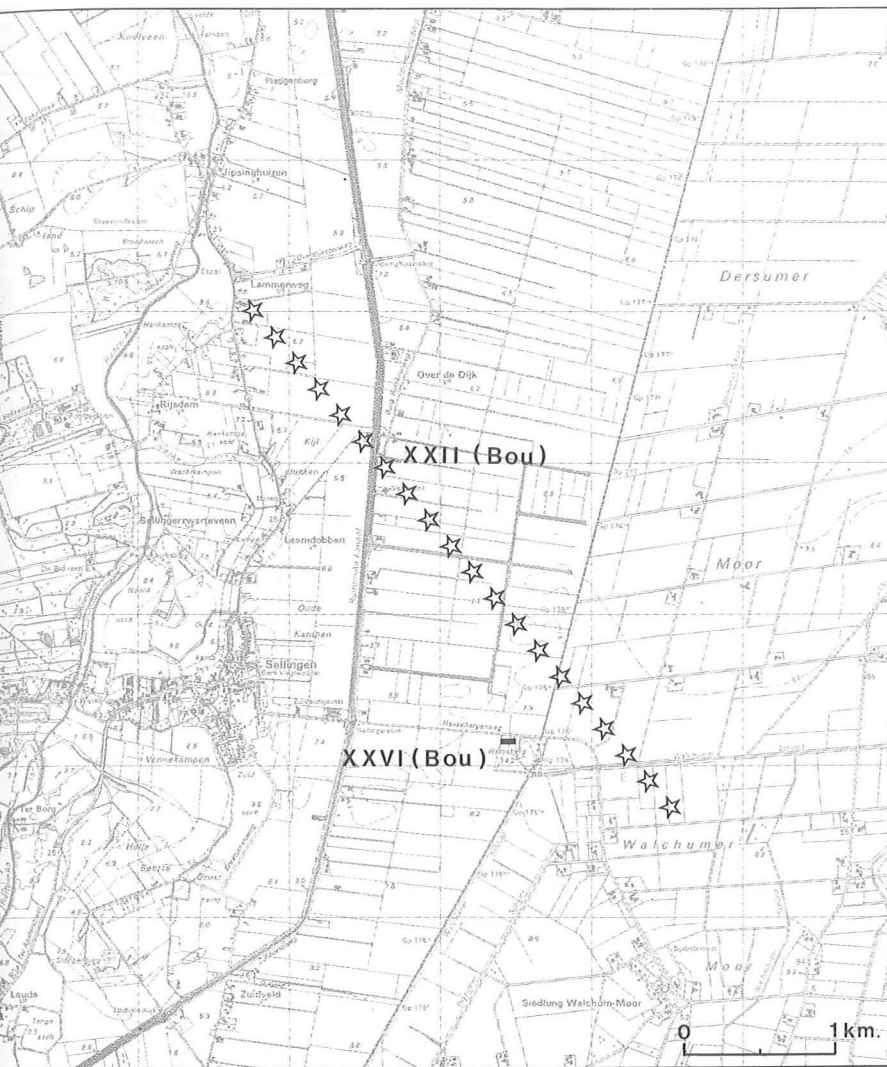
6.2. The Drenthe-Overijssel border bogs

6.2.1. Coevorden find area (fig. 20)

I(Coe). Steenwijksmoer near Coevorden, wooden trackway in the peat; reported as having the same construction as the Valtherbrug I(Bou), (A.v.H., 1837: pp. 126-142).

6.2.2. Zuidwolde find area (fig. 21)

I(Zui). Zuidwolde, footpath, found since 1880 in the bogs of Sanders and Koekoek in the Steenberger Oosterveld in the course of peat-digging. The footpath is 1 m wide; the walking surface is formed by four split oaks lying adjacently, 1 foot below the peat surface (Landweer, 1912: pp. 135-141). The



logs measure 1.20-1.40 m in length; they are kept firmly in place by pegs driven into the peat on either side of them.

Remarks: Landweer probably did not see the pathway himself; the description, based on a report on the *Provinciale Drentsche en Asser Courant* of August 3rd, 1887, is so clear that a bog trackway must be concerned here.

6.3. Smildervenen (Smilde bogs)

6.3.1. Smilde find area (fig. 22)

II(Sm) 'Pelinck's track'. Smilde, Suermondsdijk, wooden trackway almost 3 m wide (fig. 3). The trackway-surface is made out of transversely laid logs of *Alnus* (fig. 23), covered by heather turves; a small stretch of the trackway has a substructure of

longitudinally laid logs of *Alnus*. The trackway measures 280 m in length; it traverses a peat-filled depression in the eastern peripheral zone of the Smilde bogs. Excavation by the B.A.I. in 1983 (Pelinck, 1903: pp. 191-201; Casparie, 1985). The trackway could be followed as a sand track over a ridge of sand (fig. 24); like *II(Sm)*, it is part of a route about 9 km long that runs to a great extent over sand ridges. ^{14}C datings: 245 ± 30 BC and 210 ± 30 BC.

Remarks: Next to the part of this trackway that exists as a sand track on the sand ridge a supply of sand was found, which was presumably intended for improving the trackway-surface; the wooden trackway functioned for only a short time. This is the only prehistoric wooden trackway in the Netherlands that is definitely known to have had a surface covering of turves.

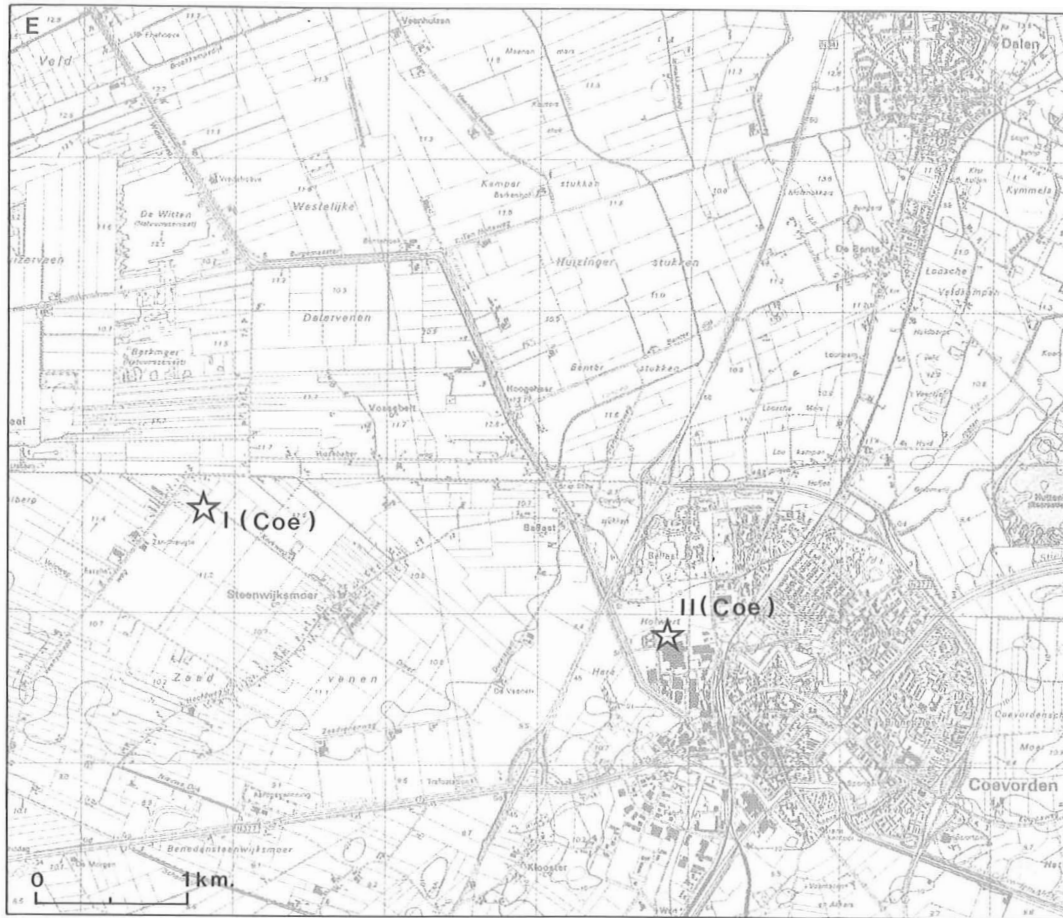


Fig. 20. Coevorden find area of the Drenthe-Overijssel border bogs; rectangle E of figure 4. Legend: see fig. 6.

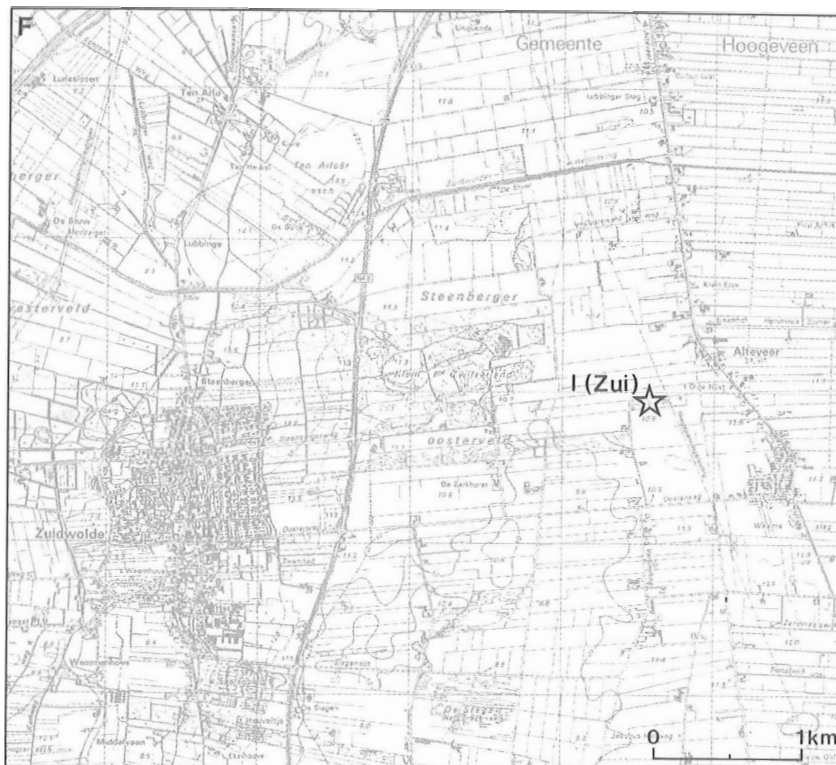


Fig. 21. Zuidwolde find area of the Drenthe-Overijssel border bogs; rectangle F of figure 4. Legend: see fig. 6.

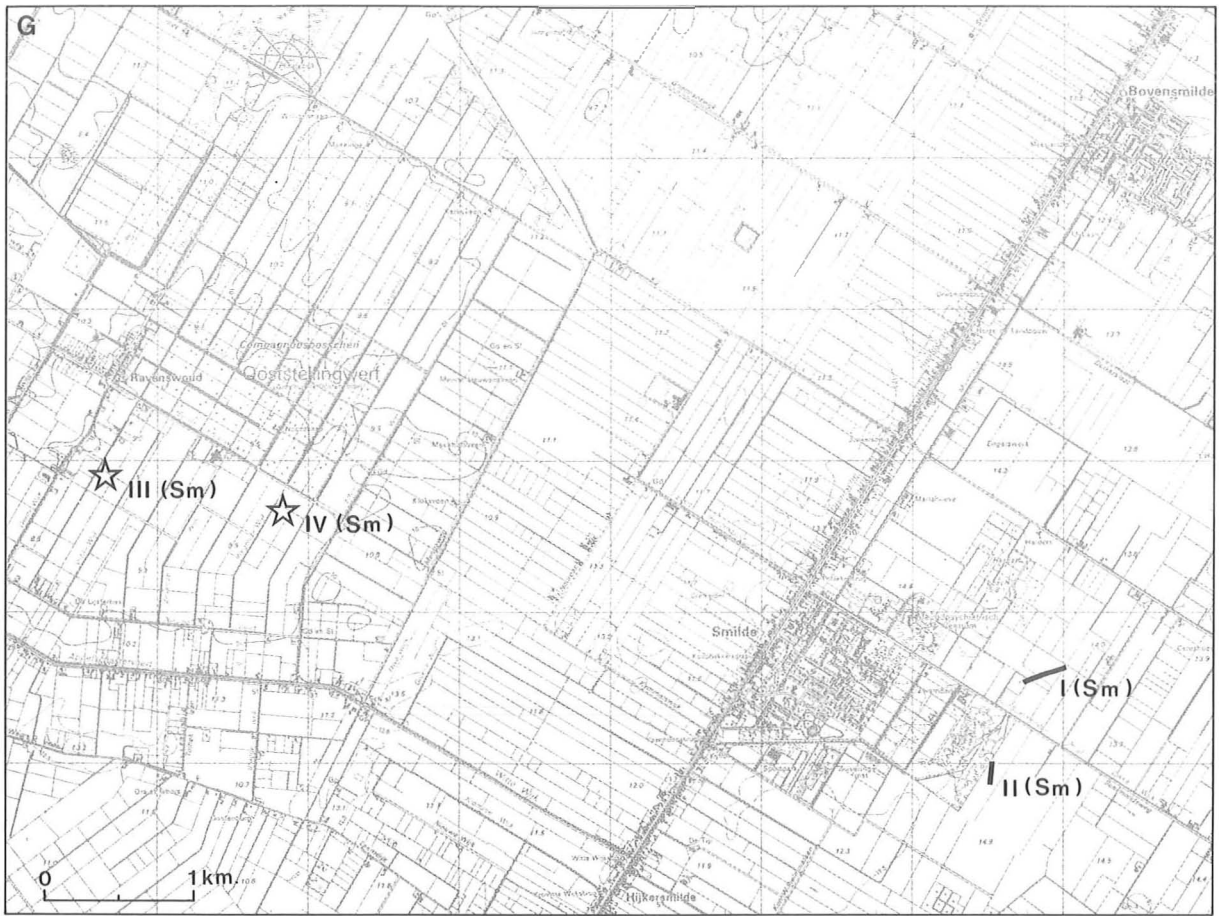


Fig. 22. Smilde find area of the Smilde bogs; rectangle G of figure 4. Legend: see fig. 6.



Fig. 23. Smilde, Pelinck's track, I (Sm), excavation 1902. Photo by G.J. Landweer Jz, Iron Age, c. 220 BC.

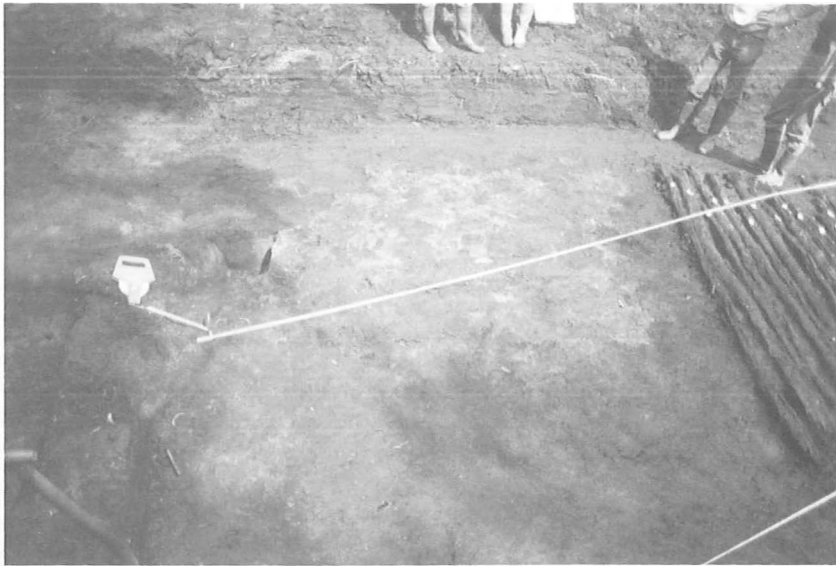


Fig. 24. Smilde, Pelinck's track, I (Sm), excavation 1983. The southwest end of the wooden track (on the right), and the elongation as sand track, visible as a variegated pattern of heather turves. Black-and-white print of a colour negative.



Fig. 25. Smilde, Korteweg's track, II(Sm), Photo of 1926. Iron Age, very probably c. 220 BC.

II(Sm) 'Korteweg's track'. Smilde, south of the Suermonswijk, wooden trackway almost 3 m wide. Although the trackway has not been excavated, it was nevertheless possible to establish the method of construction, the precise location and the course followed, on the basis of photographs taken in 1926 (fig. 25). The length of the road was 170 m (Casparie, 1985).

Remarks: This trackway is situated to the south of the sand ridge mentioned under I(Sm). It undoubtedly forms part of the previously mentioned route over sand ridges. Consequently it must date from around 220 BC.

III(Sm). Appelscha, Friesche Scheid, a trackway 2-3 m wide running northwards which can be traced as far as the Ravensmeer. The trackway lies 0.5-1 m below the surface (Pelinck, 1903: pp. 191-201).

Remarks: Very unclear information; Pelinck himself never saw the trackway.

IV(Sm). Appelscha, half an hour's walking distance from the Ravensmeer, a trackway made out of thin tree trunks of birch (Pelinck, 1903: pp. 191-201).

Remarks: Almost certainly a trackway distinct from III(Sm), but the information available is not at all clear. Pelinck himself never saw this trackway

either. The reported method of construction does not exclude the possibility that natural wood is concerned here and not a trackway.

6.3.2. Fochterloërveen (Fochtelo bog) (fig. 26)

I(Fo). Fochtelo, stone trackway under the peat,

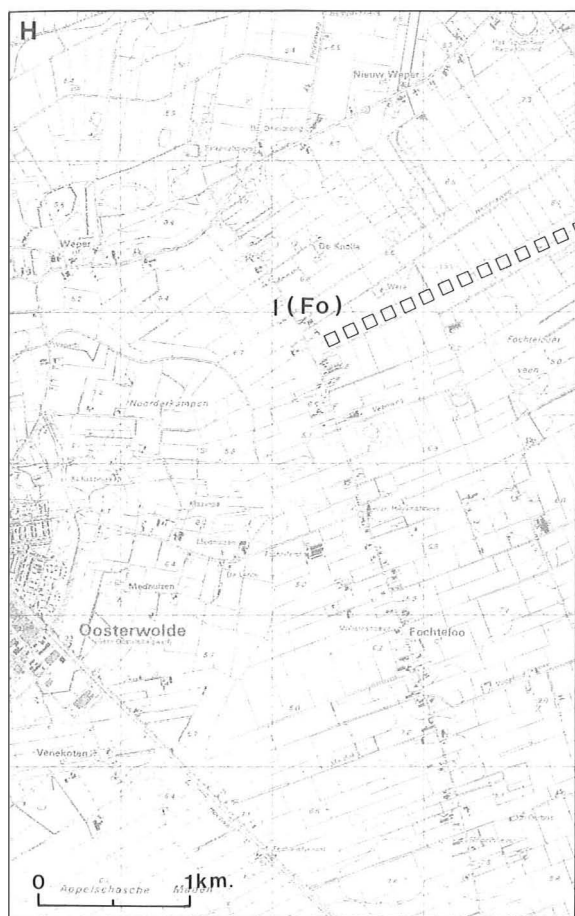


Fig. 26. Fochteloërveen find area of the Smilde bogs; rectangle H of figure 4. Legend: see fig. 6.

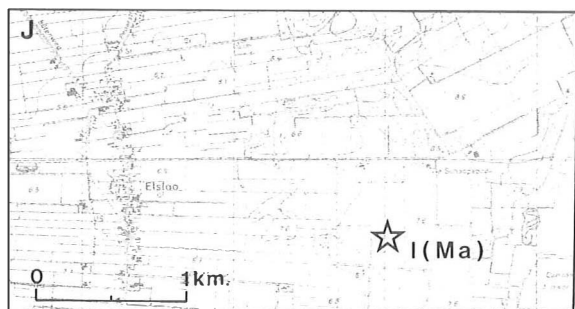


Fig. 27. Makkinga find area of the Smilde bogs; rectangle J of figure 4. Legend: see fig. 6.

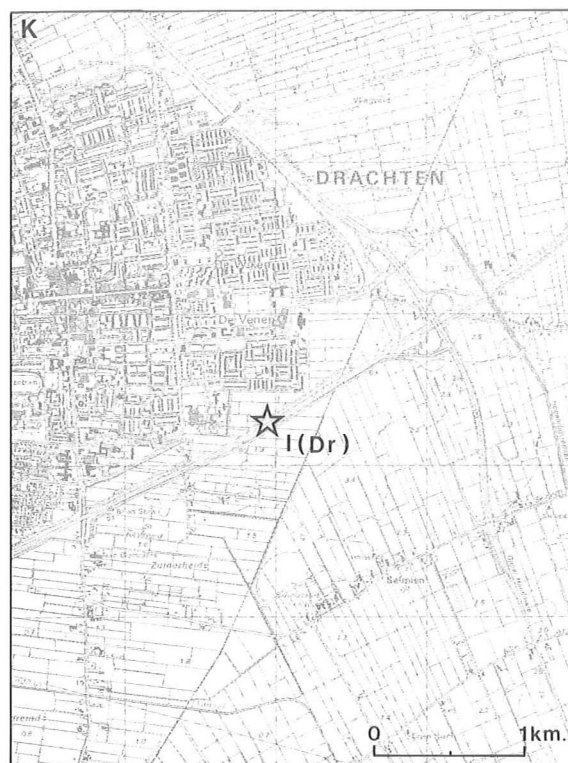


Fig. 28. Drachten bogs find area; rectangle K of figure 4. Legend: see fig. 6.

north of Fochtelo, not far from De Knolle (Pelinck, 1903: pp. 191-201).

Reconnaissance in 1921 by A.E. Remouchamps, who mentions that he was able to trace the trackway over a distance of 700-800 m. In his opinion the cobbles and boulders were no longer in situ but had sunk 0.5-1.5 m into the bog.

Remarks: Not a wooden trackway; the information given by Remouchamps is not convincing. Subsequent investigation by S.W. Jager (B.A.I.) in 1988 has clearly shown that no trackway is concerned here. The natural occurrence here of boulder-clay, very rich in cobbles, at the base of the peat was erroneously interpreted as a trackway under the bog.

(The Fochtelo bog is the northern part of the Smilde bogs.)

6.3.3. Makkinga (fig. 27)

I(Ma): Appelscha, a trackway of logs and brushwood under the peat, on the heath between Appelscha and Elsloo; also brushwood on a sand ridge, under a hillock of blown sand (Pelinck, 1903: pp. 191-201).

Remarks: The reported 'method of construction' could well indicate the natural presence of wood. It

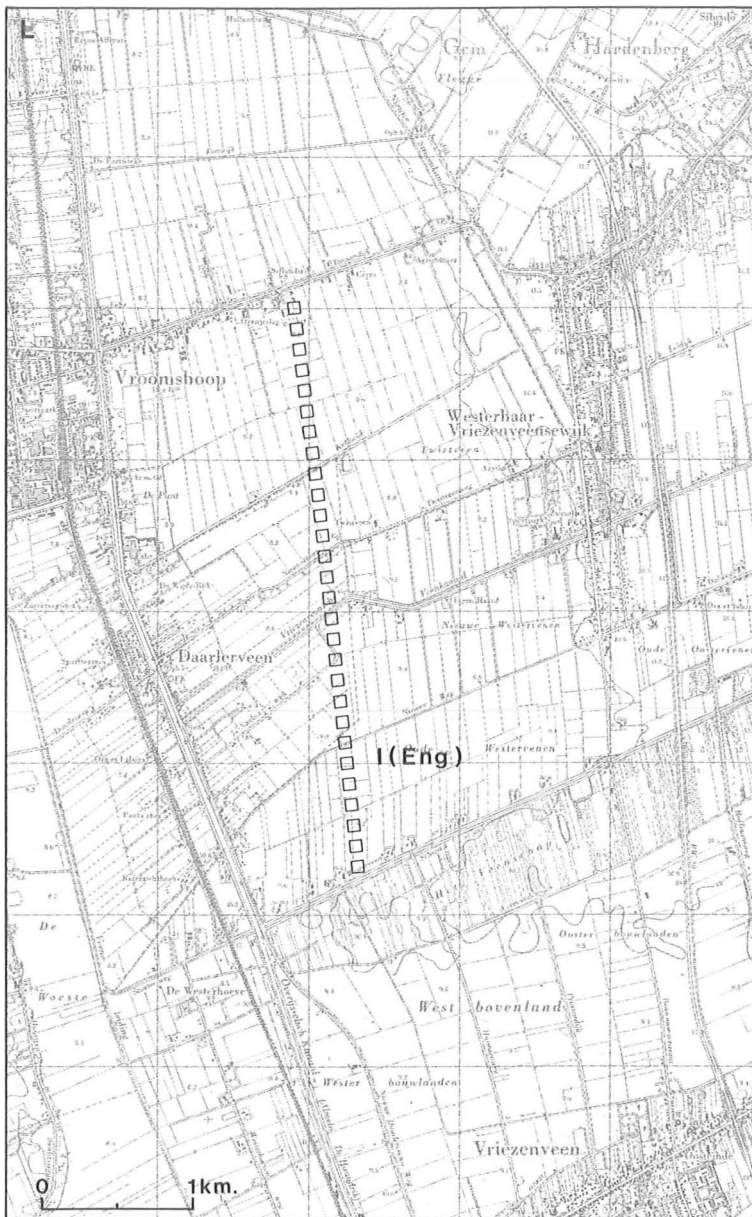


Fig. 29. Engbertsdijksveen find area; rectangle L of figure 4. Legend: see fig. 6.

is therefore very uncertain whether a trackway is concerned here at all.

(The peat-bog area of Makkinga-Elsloo lies adjacent to the southwestern part of the Smilde bogs.)

6.4. Drachtstervenven (Drachten bogs) (fig. 28)

I(Dr). Drachten, a pathway between Drachten and Ureterp, possibly a path made of branches cut up with an axe, laid down over short distances in woodland. The path is said to have been found around or just before 1766 in a peat-digging site on the Ureterpervaart (Pelinck, 1903: pp. 191-201).

Remarks: The information is extremely vague. Pelinck refers to various reports. He is fairly certain that no path or trackway was concerned here.

6.5. Engbertsdijksveen (Engbertsdijks bog) (figs 29, 30)

I(Eng). Vroomshoop, a trackway 6 km long, about 1.5 m below the peat surface, running north-south (according to J.A. Ort, n.d., *De Marsen en hun Land*, on p. 62, mentioned in G.J. ter Kuile, 1909: p. 25). It has the same construction as the trackways in the Bourtanger marshes (i.e. Valthe find area). Location, see figure 29.

Remarks: The existence of such a trackway is questionable. From the point of view of the landscape a trackway 6 km long at a depth of c. 1.5 m below the peat surface is an impossibility. Moreover, a trackway of this length would have been found many times in the course of peat-digging operations; apart from the above-mentioned report, no (supplementary) reports or other indica-

tions of this trackway are known. Nor has any wood from it been preserved. Therefore the actual existence of this trackway is uncertain.

II(Eng). Vroomshoop, wooden trackway of unknown construction, that may possibly be situated in Hellendoorn. Since 1887 the wood remains have been preserved in the Provinciaal Oudheidkundig Museum in Zwolle (Lanting & Mook, 1977). ^{14}C dating: 165 ± 30 BC. Location, figure 30.

Remarks: The existence of this trackway is certain. It is possible that it did not lie in a raised bog, but that it formed a means of crossing a valley, as part of a route passing straight across the peaty valley of the Midden-Regge near Hellendoorn. On account of the lack of data concerning the origin of the wood the trackway is here included in the Engbertsdijksveen find area, although the Midden-Regge valley does not actually belong to this raised bog. It is possible that I(Eng) and II(Eng) are one and the same trackway; there is no longer any way of ascertaining this, however.

6.6. Buurserveen (Burse bog) (fig. 31)

I(Bu). Haaksbergen, wooden trackway made out of trunks of birch lying next to one another on top of twigs, on the transition from sand to bog. The direction followed is not known and the trackway has been observed only over a very short distance (Hijzeler, 1947: pp. 327-350; including a photograph opposite p. 345). ^{14}C dating: 2460 ± 35 BC.

Remarks: The photograph clearly shows that there is no trackway here but remains of a *Betula* carr forest at the base of the peat deposit (fig. 32). The ^{14}C dating thus relates to the beginning of the peat formation at this spot.

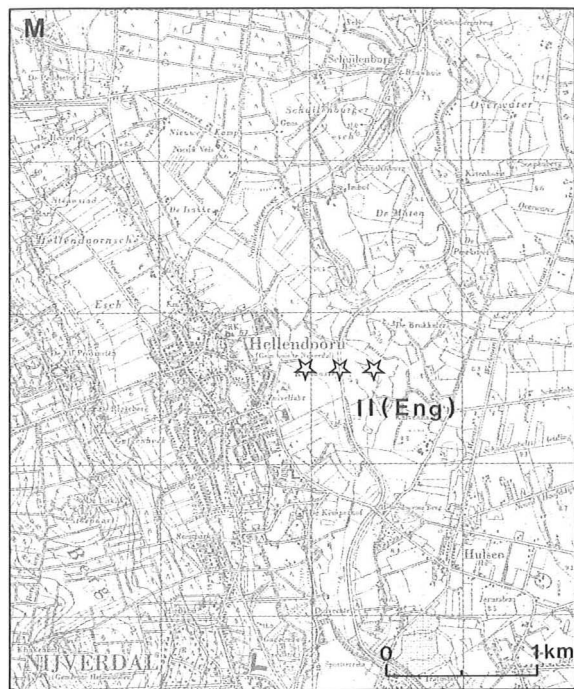


Fig. 30. Find area near Hellendoorn, here considered as part of the Engbertsdijksveen; rectangle M of figure 4. Legend: see fig. 6.

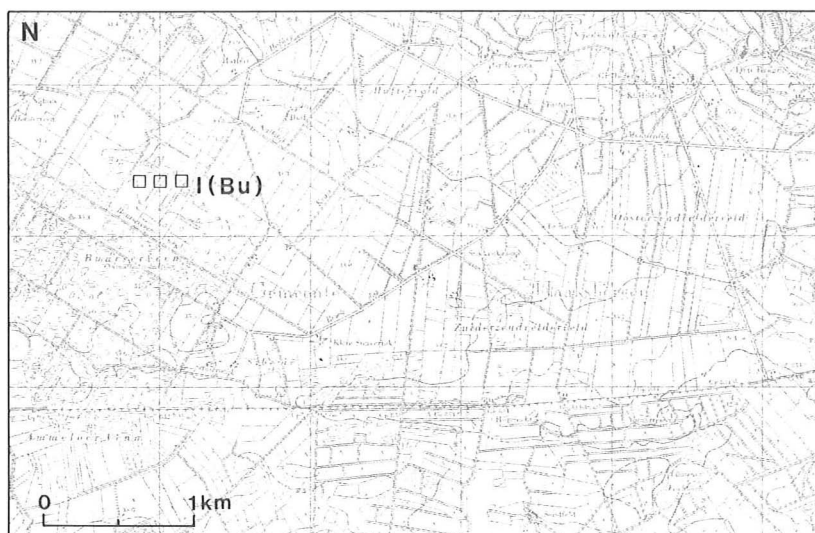


Fig. 31. Buurserveen find area; rectangle N of figure 4. Legend: see fig. 6.



Fig. 32. Buurserveen I(Bu), excavation 1947. Natural wood (*Betula*) at the base of the peat deposits, erroneously interpreted as a section of a trackway. Dated to 2460 BC. Photo by C.C.W.J. Hijzeler.

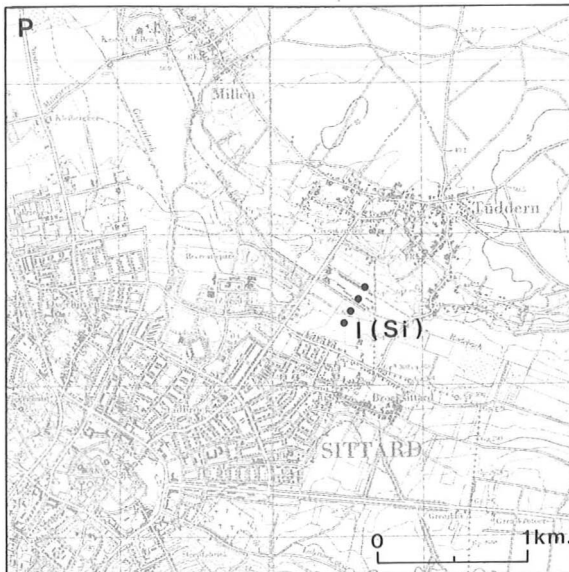


Fig. 33. Roodebeek-Sittard find area; rectangle P of figure 4. Legend: see fig. 6.

6.7. Roodebeek-Sittard (fig. 33)

I(Si). Broek-Sittard, wooden trackway, probably partly a bridge, across the valley of the Roodebeek, the fen-wood bog of Broek-Sittard, extending over a length of a few hundred metres. The trackway has a very complex method of construction (fig. 34), and can be interpreted as part of a Roman (military) road (Janssen, 1850: pp. 19-32; the same article as in the *Staatscourant* of September 20th, 1848). In addition to a trackway-surface of oak planks resting on a substructure of oak logs, there may also have

been a footpath present over a lattice of (birch) twigs.

Remarks: Although this part of the trackway is largely made out of wood, it does not really belong in this overview as it concerns a section of a Roman road (*heirbaan*). Janssen mentions that it was covered over by peat. He uses this information in his discussion on the dating and origin of the Valtherbrug I(Bou), in which he considers the possibility of a Roman road being present there. For this reason this trackway I(Roo) is included here nevertheless.

7. DATINGS

Datings are known for some of the bog trackways, as indicated in figure 35. The dates given are based on ^{14}C datings (table 1) and historical datings (XXII(Bou) and II(Coe)); archaeological datings and estimations of age on the basis of peat-stratigraphical data have been disregarded. The ^{14}C dating for I(Bu) has not been included in the figure, as this was certainly not a trackway.

Although the figure indicates that trackways and footpaths were built and used from Neolithic times on, the total amount of information is too restricted and above all too fragmentary to obtain a clear picture of developments in trackway construction.

8. DISCUSSION

Out of the total number of 40 items, it is not possible to indicate precisely how many trackways, paths or other constructions are concerned. In all probability 22 are definitely and 5 probably or possibly a

Romeinsche brug van hout en kribwerk gevonden te Broeksittard

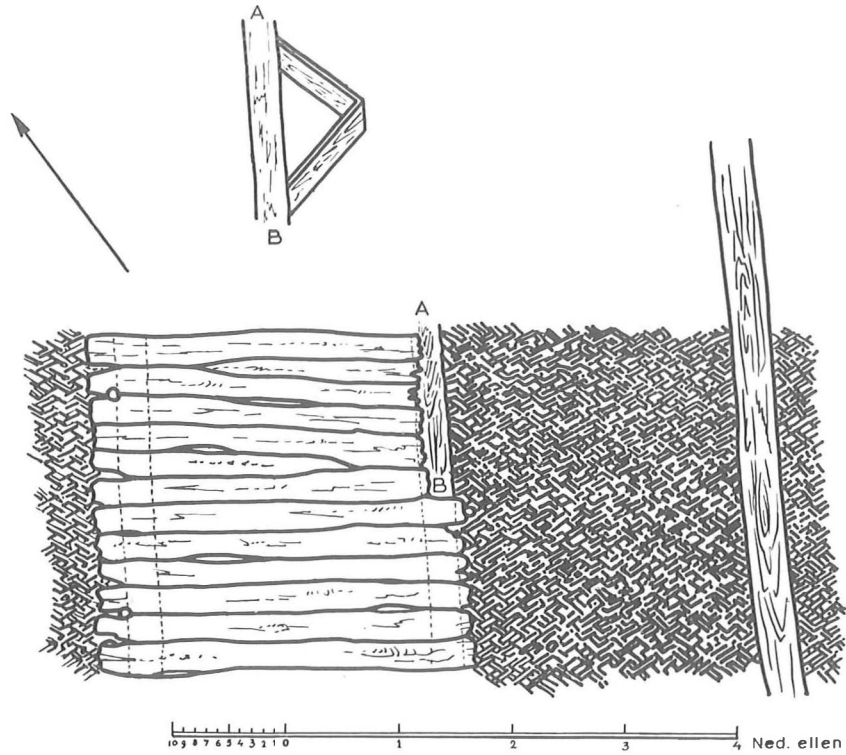


Fig. 34. Broek-Sittard, Roodebeek, I(Si), reconnaissance 1845. Modern drawing based on a poorly preserved drawing, made in 1845 by L.J.F. Janssen, with the notice 'Roman bridge of wood and groyning'. Roman Age.

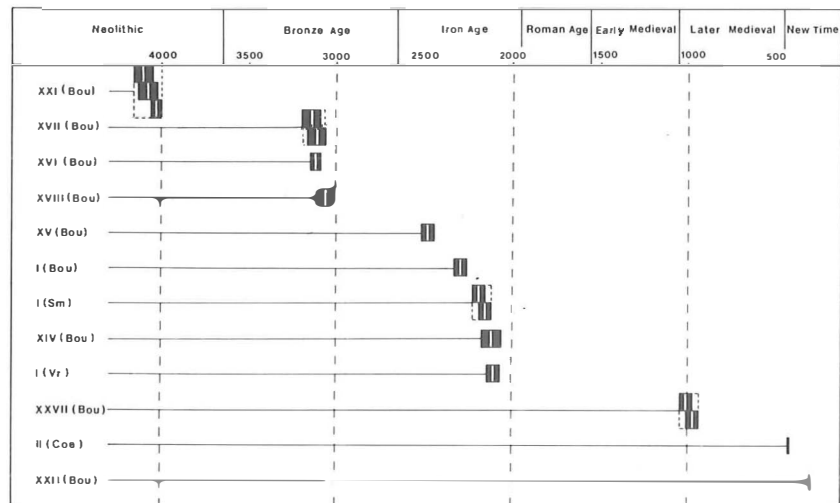


Fig. 35. ^{14}C datings, given with 1 standard deviation (not calibrated), and historical datings (of II(Coe) and XXII(Bou)) of the (wooden) trackways. The dating of I(Bu) is disregarded here, for this is not a track but the natural wood at the peat base.

trackway or path, while 13 are neither of these. In view of the wide distribution in time and the presence of many raised bogs, which functioned as natural barriers in the landscape, wooden trackways can be regarded as very exceptional. Thus it is possible in one case only to demonstrate that a trackway forms part of a traffic system: I(Sm) and II(Sm) in the bogs of Smilde, which served to

provide a means of passage across narrow depressions, filled with peat in a route extending over 9 km.

In relation to the advanced dissection of the landscape and in comparison with finds made in adjacent Northwest Germany, the small number of bog trackways is remarkable. We may assume that in the Dutch bogs many trackways and paths have

Table 1. ^{14}C datings of (wooden) tracks, arranged according to find area.

XXVII(Bou)	Cobble road of Bronneger	GrN-8630	970 \pm 35 BP	(980 \pm 35 AD)
		GrN-8631	1005 \pm 35 BP	(945 \pm 35 AD)
I(Bou)	Valtherbrug	GrN-1085	2295 \pm 50 BP	(345 \pm 50 BC)
XIV(Bou)	Hurle trackway	GrN-4147	2120 \pm 50 BP	(170 \pm 50 BC)
XV(Bou)	Northern plank footpath	GrN-4622	2480 \pm 40 BP	(530 \pm 40 BC)
XVII(Bou)	Southern plank footpath	GrN-4149	3120 \pm 50 BP	(1170 \pm 50 BC)
		GrN-4342	3145 \pm 55 BP	(1195 \pm 50 BC)
XVIII(Bou)	Roundwood footpath	GrN-11785	3070 \pm 50 BP	(1120 \pm 50 BC)
XXI(Bou)	Nieuw-Dordrecht	GrN-1087	4080 \pm 55 BP	(2130 \pm 55 BP)
		GrN-2986	4100 \pm 55 BP	(2150 \pm 55 BC)
		GrN-10760	4020 \pm 35 BP	(2070 \pm 35 BC)
XVI(Bou)	Batten trackway	GrN-7900	3110 \pm 35 BP	(1160 \pm 35 BC)
I(Sm)	Pelink's track	GrN-11336	2195 \pm 30 BP	(245 \pm 30 BC)
		GrN-11337	2160 \pm 30 BP	(210 \pm 30 BC)
II(Eng)	Vroomshoop	GrN-7453	2115 \pm 30 BP	(165 \pm 30 BC)
I(Bu)	Haaksbergen	GrN-7454	4410 \pm 35 BP	(2450 \pm 35 BC)

disappeared, unnoticed, in the course of peat-digging operations. In addition it is also certain that natural barriers in the landscape, in the form of raised bogs, were traversed by far fewer wooden trackways than in the bog region of the Northwest German lowland plain. This applies in any case to the 12-km-wide Bourtanger Moor; the number of trackways that spanned the whole bog was probably not more than 2.

A long-standing point of discussion in bog archaeology is the question as to what extent 'un-completed' trackways were present, i.e. where the trackways did not connect areas of higher ground on either side of the bog. It has often been assumed that the trackway builders stopped working before the job was finished, for some reason or other. There is only one case of a trackway that was probably left unfinished: XXI(Bou) in Nieuw-Dordrecht in the Bourtanger Moor. In various other cases, in which it was possible to demonstrate the presence of a bog trackway or path over a relatively short distance, research has shown conclusively that such constructions had some particular function other than providing a means of passage across the whole bog. In the Emmen find area of the Bourtanger Moor paths were laid out for the purpose of winning iron ore. It is clear that such trackways were not laid out primarily to meet the needs of traffic, i.e. as part of a road network. A more important motivation was access to attractive raw materials in the bog. In this respect a distinction can be made between our information and the picture that Coles and Hayen have outlined of their research areas.

Building wooden trackways is particularly labour-intensive and requires much material. In a few cases it has been possible to give a rough idea of the quantity of forest and the amount of work that is required to build such trackways, e.g. I(Bou) in the

Valthe find area, XIV(Bou), XV(Bou), XVII(Bou), XVIII(Bou) and XXI(Bou) in the Emmen find area, and I(Sm) in the Smilde bogs. These aspects, the building techniques and various technological and organizational details, which are closely inter-related factors in road-building, are disregarded here. Further details of these aspects, of the environmental situation and of the impassability of the peat bog surface are mentioned in the publications concerning these trackways and paths.

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