Shippea Hill and after: Wetlands in North European Prehistory and the Case of the *Donken*

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Wetland qualities

WHAT WOULD OUR PICTURE of the North European prehistoric past be without the wonders of the wetlands, without the miracles of the mires, without the beauty of the bog bodies? What would it be without Ezinge and Biskupin, without Friesack and Grahame Clark's Star Carr? It was the wet sites that in the early days of prehistoric archaeology opened our eyes to the people behind the prehistoric objects at Robenhausen and Obermeilen, at Svaerdborg and Mullerup, at Glastonbury and La Tène. Wetlands are found all over Europe, in extensive areas or small pockets and they set the stage for our image of the past because of their many qualities for archaeological research.

First of all their organic preservation offers us objects made of perishable materials, bone and antler tools, wooden utensils, basketry, woven fabrics, and fishing gear like the Bergschenhoek fish trap (Figure 1). Of equal importance from a scientific point of view is their palaeoecological and palaeoeconomical potential: the treasury of pollen, botanical macro remains, wood, insects, bones of mammals, birds and fishes, and—at the apex of preservation—prehistoric people themselves (Van der Sanden 1996). While organic artefacts can correct our upland stone and pottery bias of prehistory, demonstrated in every museum, we are endangered by a potential wetland distortion of the ecological and economic past, because of this dominant source (Coles & Coles 1989; 1995).

A second specific wetland quality is the sealed-in condition of the embedded remains, like the native Roman and Iron Age structures in the peat deposits near Rotterdam and Assendelft (Trierum 1992; Trierum *et al.* 1988; Brandt *et al.* 1987). The sites have a restricted time depth, there is no older or later contamination, everything is packed in a perfect 'time capsule' and potentially well dated. This can all be the work of nature, but

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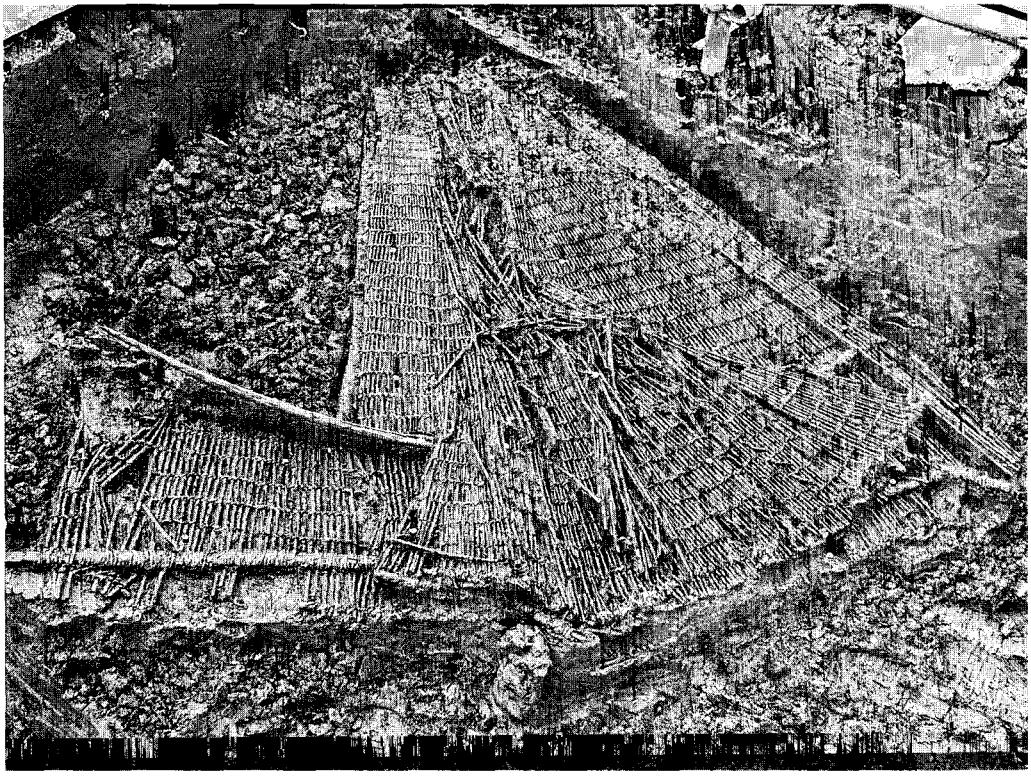


Figure 1. Bergschenhoek, Netherlands, 1981. Early Neolithic fish trap embedded in Calais II deposits, *c.*4200 cal BC. (Photo: National Museum of Antiquities, Leiden)

we should realize that prehistoric men, by placing offerings in bogs and rivers, intentionally anticipated the untouchable context of the wet subsoil.

Within these deposits original archaeological deposition patterns are hardly disturbed. Self-evidently there has been some distortion in the timespan covered by the period of use and embedding, but from then on all patterns have been fully fossilized, whether we speak of Middle Palaeolithic river plain sites like Maastricht-Belvédère, or those from the end of prehistory, like Flag Fen (Roebroeks 1988; Pryor 1992).

But not only spatial patterns are preserved, the same holds for the vertical, for relative chronology and time resolution, on many scales. At one end of the scale is the full sedimentary landscape, like the British Fenland or the Dutch Rhine delta, where geology offers a basic stratigraphic framework on a geographical scale, governed by a natural deposition rate, in these cases linked to post-glacial sea level rise. At the other end are time sequences, established by means of the micro-stratigraphy of individual sites, with a potential resolution up to the individual year or season, as at Glastonbury or Dutch Bergschenhoek (Coles & Minnitt 1995; Louwe Kooijmans 1987). House floor micro-

stratigraphy can be preserved under specific conditions, as in the case of peat fissures in Midden-Delfland (Abbink 1993).

We should also value the wealth of absolute dating opportunities in the wetlands. Radiocarbon material is all around, and dendrochronology in western Europe is fully dependant on wet conservation. Its potential is demonstrated by the spectacular results and time resolution of Hornstaad Hörnle, Bodensee (Billamboz 1990).

Wetland diversity

Talking about wetlands in a general sense we become more and more aware of their diversity. First, in a long diachronic view, they are unstable factors in the landscape. They come and go. Land may be gradually submerged, or overgrown by peat as in Ireland and large tracts of the North German Plain. Reclamation has made many low wetlands dry, as all over the western Netherlands and the British Fenland, and upland bogs have disappeared on regional scales as a result of unrestricted peat cutting. We now realize that wetlands are a phenomenon of all times and that wetlands from more remote times may have turned to dry conditions by uplift and fluvial erosion, as is the case in most Palaeolithic terrace sites.

So a whole range of wetland types should be distinguished from an archaeological point of view, each with its specific qualities and restrictions. There are, in my view, three main categories:

- peat bogs
- sedimentation basins
- drowned land.

Peat bogs

The peat bogs—with all their variations from small *Kesselmoore* (Behre & Kucan 1986) to the cover of full landscapes with extensive raised bogs—offer us mainly trackways and hoards. The bog offerings reflect a sacredness, the relationship with 'the other world' of these specific wetlands, but what do the trackways say? They give us a second prehistoric view. Corduroy roads, like those from Lower Saxony (Hayen 1987) and Corlea (Raftery 1996) and foot tracks, like Sweet track in the Somerset Levels (Coles & Coles 1986), can be perfectly understood in a secular, profane way as a means of crossing an unsafe, damp zone. Bog offerings show us the belief in spirits in this landscape, wooden tracks the secular use of it, a combination plausible for all 'animated' landscapes, but preserved—visible for us—so clearly in the wet.

Sedimentation basins

More important from a Dutch point of view are the sedimentation basins, ranging from

minor inland lakes and brook valleys to river valley floors, estuaries, and deltas. They offered rich natural environments with a wide range of plant and game resources. Sites from the later (Mesolithic) foragers concentrate strategically along the basin edges, from where both the wetland and upland zones could be exploited, as around lake Dümmer (Lower Saxony). Quite often archaeology profits from the wet dump zones of these margin locations, at Star Carr, Tybrind Vig, and Ringkloster (Clark 1954; Andersen 1974; 1985). Occasionally sites are discovered from the wetlands themselves: Duvensee (Bokelmann 1991) and Bedburg (Street 1992), and structures or equipment reflect the exploitation of the wetlands as at Kunda and Noyen-sur-Seine (Mordant & Mordant 1992).

Middle Palaeolithic wetland sites have become archaeologically accessible by the intersection of the rivers in their valley floors and the resulting formation of terraces. In the same way, valley edge sites have been fully eroded and so disappeared. For the Mesolithic the situation is exactly the reverse. Valley floor sites are very problematical in respect of discovery. They are almost beyond archaeological reach, since they have been covered by metres of sediment. They are only recovered by mere accident: deep quarrying or dredging (Bedburg, Noyen). Valley edges and basin margins have, in contrast, not yet been eroded. The archaeological *site* patterns are not representative—to say the least—of the original *occupation* patterns.

These major differences in preservation might even be used to question whether there was really a 'Mesolithic wetland revolution' in the sense of a first full exploitation of aquatic resources, including the development of the necessary equipment. It is true that the Mesolithic sites present us for the first time with the full equipment of dugout canoes, paddles, fish weirs, traps, nets, leisters, hooks, and so on, but we should realize that preservation plays a dominant role and we should not exclude earlier roots. We are warned by the recently discovered sophisticated Palaeolithic lances of Schöningen (Thieme 1996) and the early Mediterranean obsidian networks which provide indirect evidence of maritime mobility.

While one can understand in a simple functionalistic way how hunting and gathering societies with a broad-spectrum exploitation strategy settled in and around low and wet basins, this is more problematical for the later, agrarian societies. Their lake margin, valley floor, and basin settlement preferences might be better explained in a social and/or defensive approach, than in an economic/functionalistic one, taking the protective structures, especially palisades, into account, with the presumed population densities and territorial pressure. Valley floors and coastal plains are included in models of territorial exploitation, because of their rich and full year grazing, but in the same period people also put their offerings in the lowlands. Hoards of axes are especially found in 'low and damp areas', the rivers themselves being locations for intentional deposition of arms, either in relation to funeral ceremonies of specific groups in society, as Bradley (1990) argued, or as a ritual related to ascribed spiritual concepts linked to the animated landscape. We see in the lowlands a similar double value of practical/economic use and ritual sacrifice as we do in the bogs with their trackways and offerings: Glastonbury Lake Village versus the

Battersea shield, Manching versus La Tène. Again we should not consider this as incompatible. It is just a reflection of that complex, manifold attitude to the natural world around in general.

Drowned land

The third category of wetland types is the drowned or submerged dryland sites. These are often upland or wetland margin locations covered by encroaching sedimentation or peat growth. Examples are Tybrind Vig and other coastal Ertebølle sites in southern Denmark, parts of Runnymede on the Thames, and Etton and Haddenham in the Fenland (Andersen 1985; Needham 1992; Shand & Hodder 1990). A considerable part of British estuarine archaeology, including submerged forests, the famous 'Lyonesse Surface' of the Essex coast, and discoveries in the Severn estuary and Langstone harbour near Southampton falls into this category (Fulford *et al.* 1997). These are locations close to the upland–wetland interface, covered over and later washed free. Other 'drowned land' sites are those covered by blanket bogs, like the famous Neolithic field systems of Glenulra, county Mayo (Caulfield 1983) or the megaliths reappearing now from below drained bogs in northern Germany.

Settling in the wetlands

We might wonder why pre-industrial farmers settled themselves in extensive wetlands like the coastal deposits around the southern North Sea, especially in the extensive Rhine delta plain. Our surprise reflects our ethnocentric attitude to and our modern agrarian depreciation of marshland, and also our modern opposition to the dry and the wet, the high and the low. This might be obvious around the Wash or the Thames estuary, but is less so in Holland. At any rate the wetland–upland distinction is ours, based on our geological erudition, separating the Holocene from the Pleistocene geology. Prehistoric people were no geologists and in prehistory the landscape of Holland certainly showed far fewer contrasts. Land was split up by many wide and marshy brook valleys, while on the other hand the delta held more solid stream deposits, salt marshes, and dunes. To prehistoric eyes the differences would have been more gradual and not as fundamental as in our view. Farmers made the deliberate choice to settle on the few and slight elevations in the fertile, rich wet environment to profit from its wealth and to avoid the soil exhaustion and sand drift of the poor and acid coversand landscape. In other words, the wetland way of life should not be seen as aberrant, but—if not fully representative—at any rate reflecting the wet side of the range of acceptable life styles. For Early Neolithic Swifterbant this range was apparently wide, as was the case for the later Vlaardingen group, whereas for the Middle Bronze Age the range was very narrow (Louwe Kooijmans 1997; 1998b).

Start of modern research

Britain: Grahame Clark

Although recognized for their informative value in the early days of prehistoric research, I have the feeling that wetland values have only been fully discovered, recognized, and exploited in the more recent past, not only in Great Britain, but in Denmark, Holland, and the Alpine area as well. For this modern research tradition Grahame Clark, no doubt, was a pioneer. His Mesolithic, together with his anthropological, interest must have opened his eyes to the crucial role of wetland research conditions for constructing images of the past. He lectured on his excavations at Plantation Farm, Shippea Hill for the London Society of Antiquaries at the surprisingly young age of 25, on 11 November 1932, the same year in which his *Mesolithic Age in Britain* appeared. The Fenland Research Committee had

Figure 2. Peacock's Farm, Shippea Hill, 1934. The excavations show Grahame Clark in the cutting and Gordon Fowler sitting on the edge. (Photo: Department of Archaeology, University of Cambridge)

been founded earlier, in June of the same year, and Shippea Hill was one of its first formal projects. The report combined Quaternary geology with prehistoric archaeology, palynology, and reports on molluscs, forams, and animal remains. Profit was derived from the discoveries and knowledge of Major Gordon Fowler (Figure 2). New concepts were introduced into traditional archaeology: Buttery Clay, roddons, and so on. It was the start of a research period in which the Mesolithic and the wet were intimately combined: the Meso/Neolithic stratigraphy at Peacock's Farm (1935), *The Mesolithic Settlement of Northern Europe* in the same year, and later, in post-war times, the excavation of Star Carr (1949–50) and the papers that together would form Clark's famous *Prehistoric Europe: the Economic Basis* (Clark 1936; 1952; 1954; Clark *et al.* 1935; Clark & Godwin 1962).

Wetland archaeology was reactivated in Britain by John Coles' involvement in the Somerset Levels in 1962, ultimately resulting in the Somerset Levels Project in 1973 (Coles & Coles 1986). Work in the Fenland was reopened with the Fenland surveys of 1978–88 (Hall & Coles 1994) and then Francis Pryor's prospections and excavations, culminating in his Flag Fen excavation (Pryor 1992). Now a full series of coastal and wetland projects has been or still is being executed all around Britain (Fulford *et al.* 1997). The crusade for more wetland archaeology was and still is successfully led by both John and Bryony Coles. This means good discussion partners on both sides of the North Sea.

The Netherlands

Grahame Clark's research was particularly inspiring for archaeologists on the other side of the North Sea, in the Netherlands. It might surprise those who know that 50 per cent of the Netherlands consist and consisted of Holocene sedimentation, that the discovery and research on prehistoric wetland settlement started that late. It is true that the *terpen* were well known early in the nineteenth century but their full archaeological potential was only demonstrated by Van Giffen in his excavations of the *terp* at Ezinge in 1931–34 (Van Giffen 1936). The *terpen* were, however, considered to be a special case: that of the brave Frisians living on—by Dutch standards—high and dry mounds. Surprisingly for a population spending its full life below sea level, occupation of the 'true' wetlands in prehistory was considered both impossible and improbable. This must have to do with negative perceptions held by educated and civilized intellectuals of the wild and uncontrolled wetlands, where these were not drained and reclaimed (Louwe Kooijmans 1997). So, the discovery of Bronze Age barrows on the Westfrisian clay in 1937 was a very great surprise and even more so the discovery of the first true wetland settlement, the Late Neolithic site of Hekelingen on the levees of an Early Subboreal tidal gully. Modderman's excavation in 1948 and his report of 1953 were very much inspired by his personal contacts with Grahame Clark, and by Clark's work in the Fenland and at Star Carr (Modderman 1953).

While the Fenland research was not continued after the Second World War, wetland research in Holland grew very rapidly. Underlying it were the new, widespread and detailed soil surveys and the growth of organized amateur archaeology in post-war times. Both

meant an intensive prospection, not only of the surface, but especially of the subsoil, and intensive monitoring of the increasing number of public works.

The *donken* and the Meso–Neolithic transition

Hazendonk

Grahame Clark also guided me into the wetlands in a type of distance learning *avant la lettre*. As a student in geography I chose to write my MA essay on the Holocene of East England as a reference for the Dutch case and ultimately I found myself in the 1960s in a Ph.D. project inspired by prehistoric sites, newly discovered, and fully unexpected, on the Dutch equivalents of roddons and on outcropping hills in the Rhine/Meuse delta, not dissimilar to the Shippea Hill case 30 years before. In this case the outcrops are the very tops of extensive complexes of Late Glacial dunes, locally called *donken*. I would like to present a first comment on the present research on these *donken* as an *hommage* to Grahame Clark.

The dune tops provided small dry spots in the immense wetlands, attracting prehistoric people who exploited the marshes. The camp sites themselves on the dune tops are deeply disturbed by post-depositional processes, but the refuse levels extending into the surrounding marshland have been covered over and preserved. The Hazendonk (excavated 1974–6) appeared to have been used as a base for over two millennia, from *c.*4000 cal BC until the very end of the Neolithic, *c.*2000 cal BC. Phases of more intensive use were separated by periods of occasional visits or even disuse. Main activities were fishing and hunting, predominantly beaver and otter, but also of some large game such as red deer, roe deer, and wild boar in different ratios according to the various phases. Most surprising is the presence of agrarian domestic animals (cattle and pig) in low percentages and of charred cereals, grain, and chaff in all phases. This, together with the presence of pottery and polished axes from the lower level onward, make the site fully Neolithic, albeit that its function cannot have been a permanent agrarian settlement, in view of the dimensions of the outcrop, the palaeogeography, and the archaeozoology. It must have been a special camp site, supporting fishing, fowling, specialized hunting, and herding by societies in an evolved but very long-lasting stage of 'substitution', that is, transition to a fully agrarian subsistence (Bakels 1981; Louwe Kooijmans 1987; Zeiler 1997).

Since the Hazendonk excavation my interest in the *donken* has persisted. They proved to be a perfect example of wetland potential in archaeology, in this case related to the Mesolithic–Neolithic transition in north-western Europe, the fifth and fourth millennia cal BC, which occurred in societies presently archaeologically known as the Swifterbant Culture. It is the western counterpart of Ertebølle, but related only in some general characteristics of its pottery style. Hardly any upland evidence for these interesting communities between the Elbe and the Scheldt is known, except for some flint surface assemblages, many of them mixed up with earlier or later material. Every field of knowledge is prob-

lematical on the upland: dating, non-flint material culture, subsistence, environmental impact. The main upland information is from a spread of unassociated imported adzes and axes. Only the phase and its internal processes are known, and there in great detail, from some local wetlands and their specific archaeological values: the famous Dümmer depression in Lower Saxony, the sites in the Dutch central lake district, and the *donken* between Rhine and Meuse (Louwe Kooijmans 1993a; 1998a).

In this perspective relevant questions were: in what sense could the Hazendonk site be considered as representative and could the results of that single and singular site be generalized? How are the results related to the more general process of Neolithization in this corner of the North European Plain? What about the more than 100 other dune tops, some of which had already produced Neolithic remains?

General survey

It was decided to execute a detailed coring prospection. This work was done as a Ph.D. project by Marten Verbruggen (Leiden University) in the period 1990 to 1996. On 20 out of a selection of 25 *donken*, 65 distinct Neolithic 'occupation levels' were found, that is, surfaces in the surrounding peat containing archaeological indicators, like sand, charcoal, burnt and unburnt bone, and pottery fragments (Figure 3). The ages of the levels range from 5500 to 2000 cal BC. The extent and expression of the levels change upward, becoming wider and more intense, possibly reflecting a gradual change from more ephemeral to a more intensive use. The deepest levels are under-represented because of their depth below the general coring routine. Apparently the sandhills were fully used as a group to support the exploitation of this delta district up to the general establishment of fully agrarian societies in Beaker times. The fluctuating intensity, reflected in a cumulative radiocarbon graph, might reflect changing environmental conditions together with the shift in site character mentioned.

Most intriguing are the earlier levels in the district. We see at the Hazendonk and Brandwijk (a test excavation in 1991) the late stages of a longer tradition that started well back in the Mesolithic. It seems to be the continuation of a mobile settlement system, with extraction camps on the dunes in the middle of the wetlands, or perhaps even temporary base camps.

Excavations at Hardinxveld, 1997–1998

We recently had an opportunity to dig to some of these deep levels at two sites near the village of Hardinxveld: 'site 4' in 1997, 'site 3' in 1998. A new railway connecting Rotterdam harbour with the German industrial centres, is planned through the river district and will disturb two of these dunes that have traces of occupation. They are not visible at the surface, since their tops are at 6 and 5 m, respectively, below mean sea level

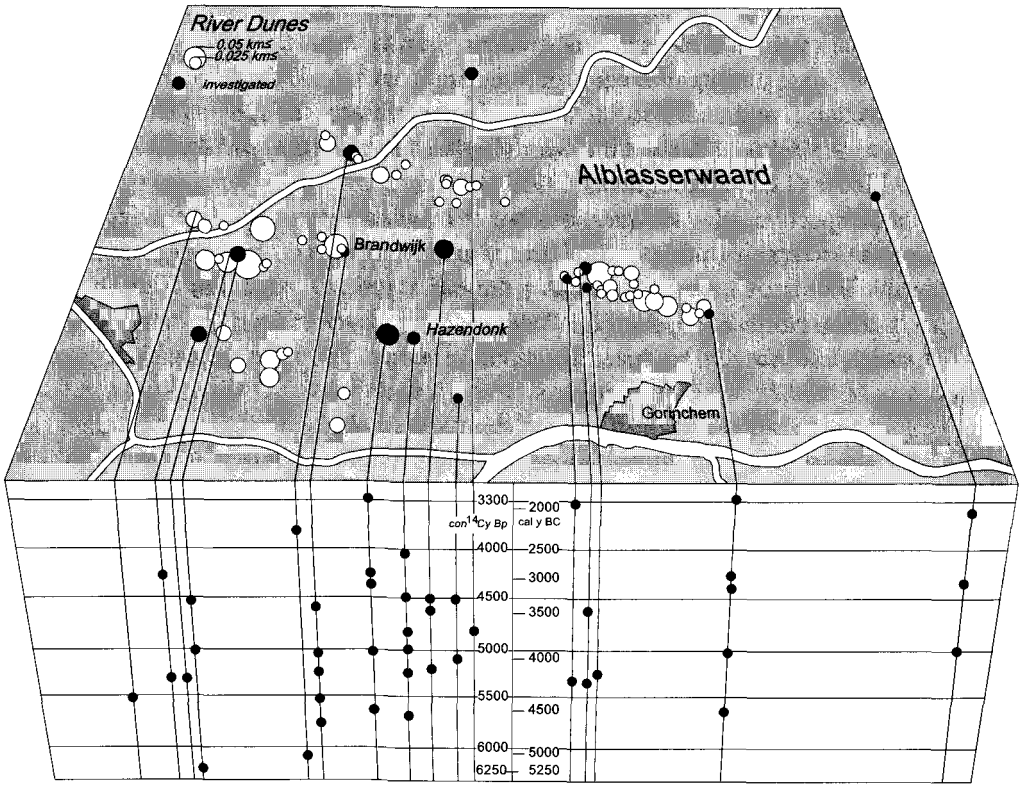


Figure 3. Diagram showing the Alblasserwaard region in the western Netherlands with its *donken*. Those in black have been surveyed by hand coring. C14-dated Late Mesolithic and Neolithic refuse levels indicated in the section. (Published by kind permission of drs M. Verbruggen)

and they disappeared below the delta peat and clay as early as 4600 and 4200 cal BC. Dutch Rail has accepted responsibility for this archaeological heritage, and is freely financing the necessary archaeological work ahead of the new railway, including both these excavations.

The attested occupation of 'site 4' dates from 5300 to 4700 cal BC. A trench of 18 × 30 m has been dug, reinforced with steel planking, kept dry by an advanced drainage system, and covered by a huge tent because of the autumn and winter weather conditions (Figure 4). The refuse levels on the slope of the dune are over 1 m in depth and reach down to −10 m as a result of later compaction. They are recorded in twenty thousand 50 × 50 cm units of 5 cm thickness, giving us full control over horizontal and stratigraphic patterning.

The finds at present comprise a flint blade and flake industry on river pebbles, antler axes in a wide range of forms and their production refuse, a socketed axe made out of an

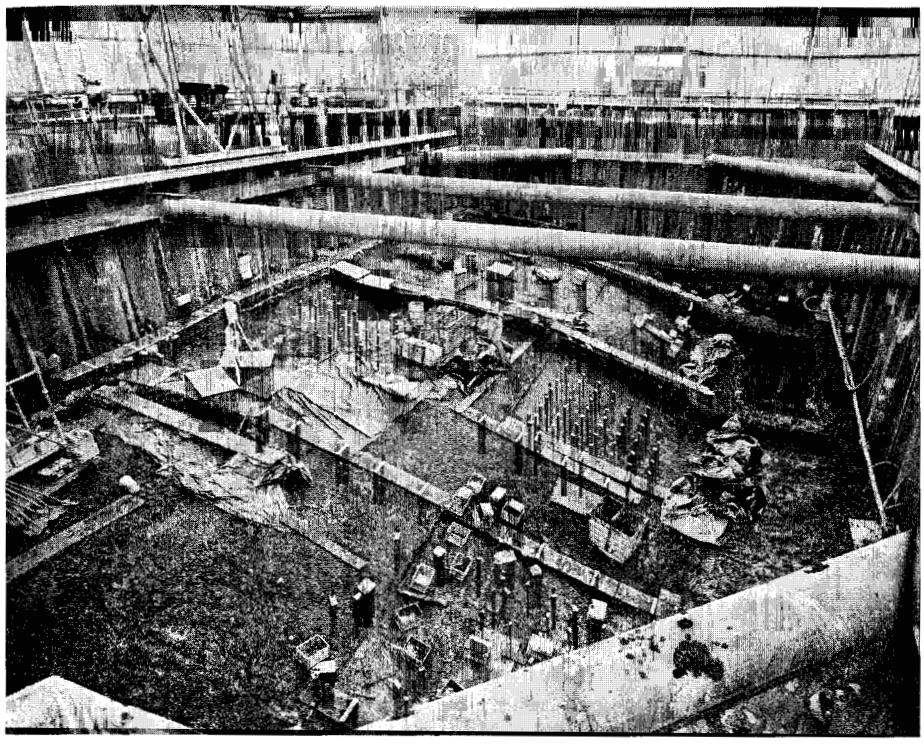


Figure 4. Hardinxveld site 4 'Polderweg' 1997. Trench dug down to the top of a river dune with Late Mesolithic settlement refuse layers at 6–10 m below mean sea level.
(Photo: Faculty of Archaeology, Leiden University)

aurochs' metapodial, an elm bow, and several paddles made of ash. An original aspect of the antler work is the range of unperforated axe blades, apparently inserts for shaft-hole handles. There are quantities of bones of fish, birds, and mammals (beaver, otter, small predators, wild boar, red deer, but *no* agrarian animals). The botanical work attests *no* cereal remains at present. This apparently is an assemblage fully in a Late Mesolithic north European tradition, except for one new aspect: a modest number of sherds of point-based pottery in a (very) early Swifterbant tradition, found in the uppermost level only. At the edge of the dune four burials were discovered, two of humans and two of dogs, all firmly dated before 4700 cal BC. One human interment and one dog are seriously disturbed, but the other human and dog are both fully intact. The human is a woman of more than 40 years of age, buried on her back in a stretched position (Figure 5). The burials together form a section of the first Mesolithic cemetery in the Netherlands and its wider surroundings, a cemetery modest in extent but with its dogs an important comparison for Skateholm, and by its very presence important for site function interpretation and our image of Mesolithic society.

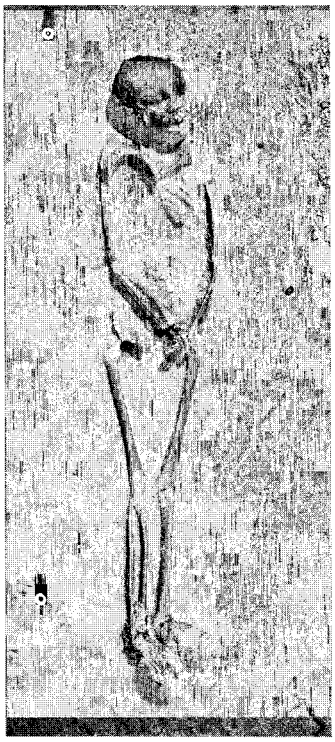


Figure 5. Hardinxveld site 4 'Polderweg' 1997. Late Mesolithic burial at 7 m below mean sea level. (Photo: Faculty of Archaeology, Leiden University)

Contemporaneous with the upper levels, *c.*4700 cal BC, is a site situated further north at Hoge Vaart in the central Dutch lake district. It was dug a few years ago by the State Service for Archaeological Investigations (Amersfoort) and offers a similar picture. The site is at –5 m, in a submerged upland margin situation, located on a coversand ridge along a former course of the river Vecht. In spite of large-scale sieving, no cereals have been found and the few indications for domestic animals other than dog seem to be questionable, but there is characteristic early Swifterbant pottery in combination with a Late Mesolithic broad blade trapeze flint complex (Hogestijn & Peters 1996).

Both sites represent the very earliest contacts of the latest native hunter gatherers with the Late bandkeramik (LBK) and early Rössen farmers in the loess zone, 100–150 km to the south. The sites give us a wealth of information, thanks to their wetland conditions, for a crucial and interesting phase in social evolution, a period we could not approach until now—the early fifth millennium.

The exploitation of a drowning landscape, 9000–2500 cal BC

We are looking at a landscape and a society that were changing considerably over a period of several millennia, between *c.*9000 and 2500 cal BC, the Early and Middle Holocene, the Late Meso, and Early Neolithic. We can now give a hypothetical view on the changing man–land relations in this area (Figure 6). The occupation sequence starts with numerous Late Palaeolithic and Early Mesolithic barbed points dredged up from below –20 m at Europoort, Rotterdam harbour (Verhart 1988). They fit into the same time slice as the bone implements from the Brown Bank, North Sea and Grahame Clark's famous barbed point from the Leman and Ower Bank in the southern North Sea.

The Late Glacial braided river plain, 30 km wide, had by now changed into more marshy conditions around the Preboreal–Boreal transition as a result of the more temperate climate, a meandering river regime, and ground water rise. The barbed points appear to indicate that the valley floor was an attractive hunting and fishing ground. We have no direct evidence for the location of camp sites, except very modest Mesolithic traces on some of the dunes. It is likely that the valley floor was exploited from sites along its margins, at the edges of a low terrace documented in the contour map of the subsoil Late Glacial surface. These presumed sites are, however, beyond the depth of regular prospection. The then still extensive dune complexes in the middle of the valley floor seem not to have had any special significance.

Their importance increased when the terrace edges disappeared below the accumulation of peat and river clays. The wetlands grew quickly in extent and their margins became wide apart and diffuse in the undulating coversand landscape. The dunes, although shrunken to small and isolated tips, still offered some firm ground in the middle of the swamps, at an increasing distance from the surrounding upland, and became intensively used. In the meantime society had changed by adopting cereal cultivation and the husbandry of cattle, pigs, and ovicaprids, introduced by the farmers of the loess zone. But these later, formally Neolithic, communities continued to include the traditional locations in their settlement system as a support not only of hunting and fishing but, at least from 4000 cal BC (Hazendonk, level 1) onward, of cattle herding as well. Archaeological indicators (clearings in the pollen diagrams, extensive dark levels full of refuse) point to more intensive and longer-lasting stays, that is, to a more lasting function in the settlement system. This continued to the very end of the Neolithic, that is, late Bell Beaker times, *c.*2000 cal BC. It seems that we only can speak from that time onward of fully settled farming communities on the surrounding uplands (Louwe Kooijmans 1993b).

We have the feeling—as we ever have with the north European wetlands—that nature made for us an experimental station in the *donken* district, a systematic sampling of forager societies, and packed the samples for us in their spatial and chronological patterns and under perfect conditions for organic preservation. They give us a minimum option for the degree of Neolithization and demonstrate an ongoing old mobile and foraging aspect of these communities. We have to learn how to extrapolate from these special activity data

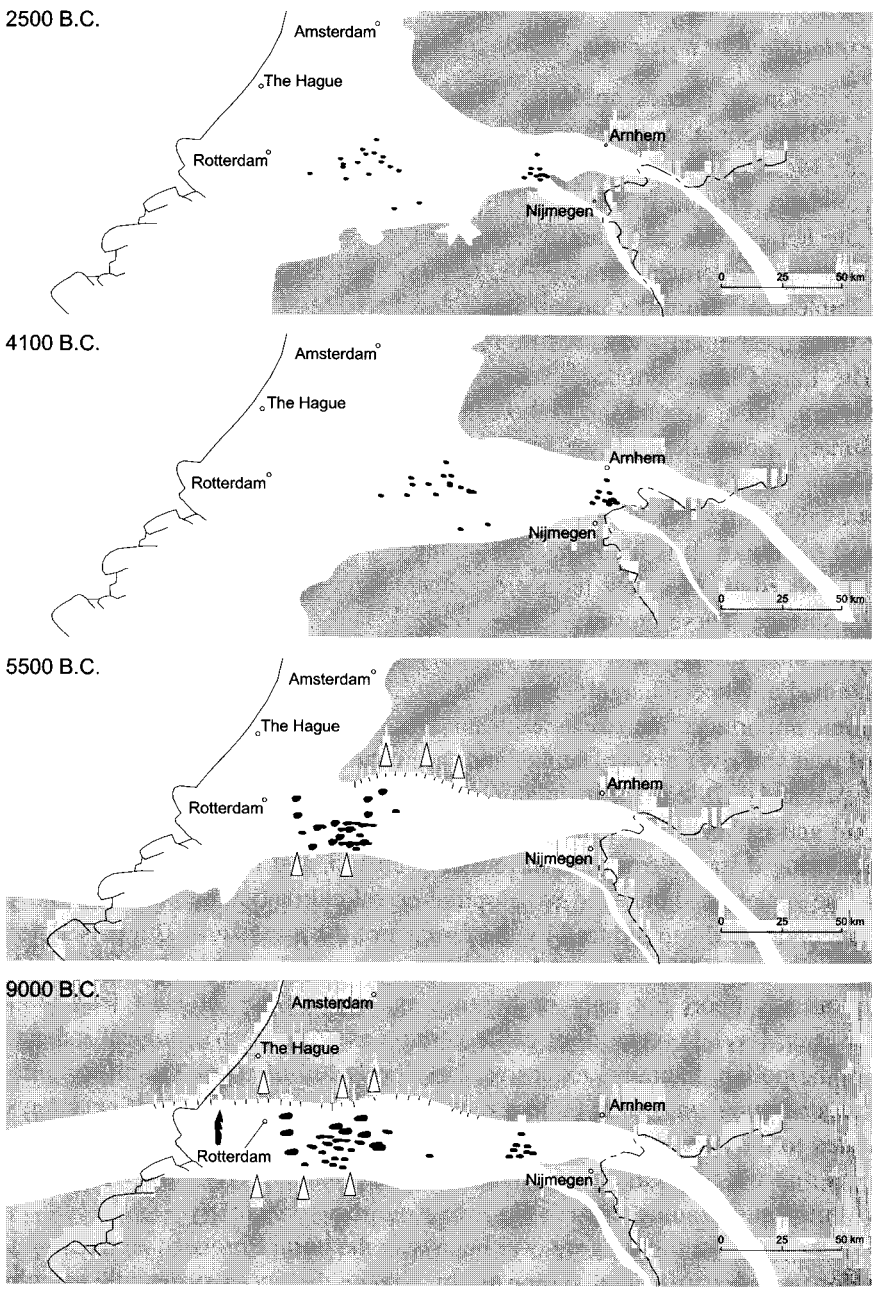
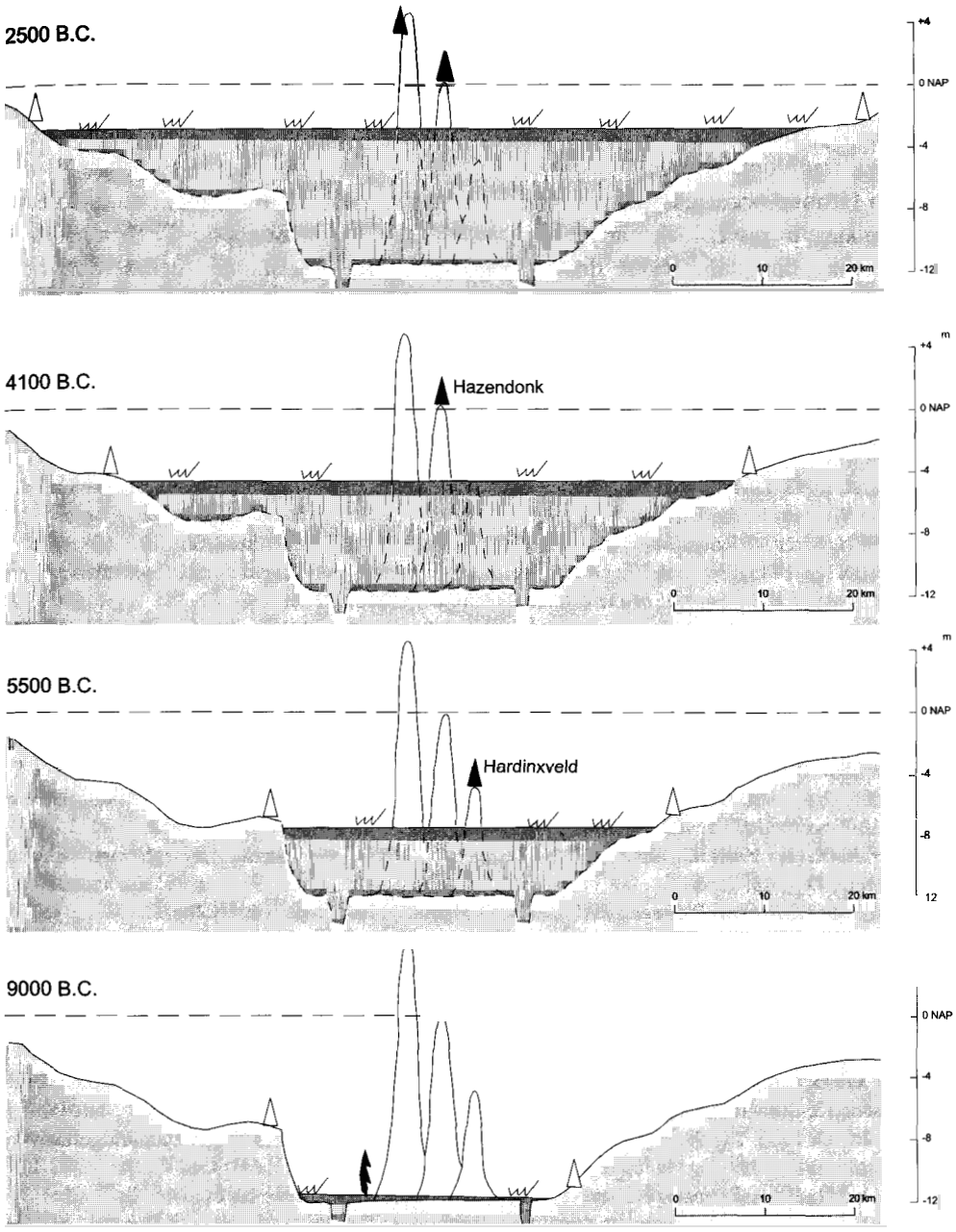


Figure 6(a). Palaeogeography (a) and sections (b) of the Rhine/Meuse river district in the Netherlands in several stages of submersion during the Holocene, showing the decrease of the number and dimensions of the *donken* and their increasing distance from the shifting upland margin. Site locations indicated with triangles (open = presumed, black = attested).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9000 B.C.
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Figure 6(b)

to models that cover the total of the communities in this part of the North European Plain. We feel that these special activity sites reflect a deliberate choice of the Swifterbant people, and are representative of the way their society was organized and of the choices made by them. Apparently the Swifterbant communities had made a deliberate choice to continue their traditional way of life beyond the fully agrarian societies to the south. The transition to farming occurred piecemeal, step by step, and, it seems to me, rather differently from the start of the British Early Neolithic and the Danish Ertebølle–TRB transition.

We may complain about this wetland bias, but we should realize that upland information is factually non-existent. What would our image of the past be without the wonders of those wetlands?

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The shell middens of south-western Scandinavia have been well known for a long time, not least as a result of Grahame Clark's publications. Renewed studies show, however, that there is still a great deal of new information to be derived from these features. The cemeteries of the Late Mesolithic in southern Scandinavia are a late observed phenomenon whose implications for research have been emphasized. There is a constant growth in factual material showing that an association between settlement sites and graves was common in the Late Mesolithic. A proposed function for the graves in an environmental perception of the Late Mesolithic conceptual world is presented. Greater consideration must be given in future analyses to the mental relationship between the people and the environment, in order to fully appreciate the Late Mesolithic coastal societies.

In recent years, knowledge of the Mesolithic in northernmost Scandinavia has increased significantly. In northern Sweden this is due to increased archaeological activity combined with extensive surveys. The art of ceramic fabrication appeared at roughly the same time in northern Sweden as in southern Scandinavia. In recent years graves, in a few cases in cemetery-like assemblages beside settlement sites belonging to the Late Mesolithic, have also been documented in northernmost Sweden.

In the study of the Mesolithic, our perspective on society and environment has been broadened by creative efforts in both theory and method. In some cases, new points of view can be obtained by choosing new ways to excavate a settlement site. A few examples of this are presented.

LEENDERT P. LOUWE KOOIJMANS

Shippea Hill and after: Wetlands in North European Prehistory and the Case of the *Donken*

Wetlands are like gold mines for our knowledge of the past and this is particularly so for north European prehistory. They have so many qualities: organic perishable materials are preserved and patterns are undisturbed in 'time capsules', while stratigraphy on all scales gives us a high time resolution. The contrast in all these aspects to upland sites invokes contrasts in our views of upland and wetland people. One can, however, question whether prehistoric people saw these same contrasts. We observe in this paper that most wetlands were used for 'cultic' deposition, and for traffic and settlement as well. The Dutch delta wetlands even seem to have been a preferred agricultural land in later prehistory. We should not transfer the historic or our own (negative) wetland appreciation to prehistoric communities and we realize that prehistoric people settled themselves there by free choice. So wetland data, if cautiously used, can be considered as representative of former subsistence and organization.

The second part of this paper is a case study. An overview is given of a research programme for which Grahame Clark was the inspiration in his Fenland work of the early 1930s. Outcropping dune tops in the Rhine delta deposits offer us a unique and rich dataset

on the Late Mesolithic and Neolithic communities, 5500–2500 cal BC, and on the adoption of agriculture in the Dutch part of the North European Plain. We note that prospection and excavation down to 10 m below sea level require a special technology.

PETER ROWLEY-CONWY

Economic Prehistory in Southern Scandinavia

This contribution explores hunter-gatherer settlement and society, and the appearance of agriculture. It argues that zooarchaeology and radiocarbon dating have been the major sources of new information and have led to many theoretical changes.

Hunter-gatherer settlement and society: in the Danish early Mesolithic all the diagnosed sites were occupied in summer; the winter half of the year may have been spent in areas now below present sea level. The late Mesolithic is above or only just below sea level, and in Jutland is characterized by permanent central sites and small satellite camps; in southern Sweden the main base camps may have been seasonal, while in the Øresund it is unknown. The extent to which the Ertebølle was based on fishing has become clear in recent years, due to the finding of large static fish traps and the recovery of many large samples of fish bones. Various aspects of the archaeological record enhance the impression that the Ertebølle was what is commonly described as 'complex'; this is an adaptation to prevailing conditions rather than the result of internal social development, because the middle Mesolithic shows such features as soon as sea level nears the modern level and becomes accessible to study.

Appearance of agriculture: claimed chronological overlap between hunter gatherers and farmers in Denmark was the result of relative dating methods subsequently shown to be faulty by radiocarbon; the result was the development of a processual theory emphasizing a stable frontier between Danish hunter gatherers and German farmers that lasted at least a millennium. When agriculture finally appeared in Denmark, it apparently did so rapidly, in contrast to some current suggestions of gradual change. Less evidence is available from Norway because of poor organic preservation, but agriculture may not have reached south-western regions until the late Neolithic. In eastern Sweden there was a re-adoption of hunting and gathering in the middle Neolithic; recent work on Gotland has shown that after an early Neolithic based on agriculture, the middle Neolithic moved back to the sea shore and concentrated on marine resources.