Beyond Barrows

Current research on the structuration and perception of the Prehistoric Landscape through Monuments

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Sidestone Press

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Published by Sidestone Press, Leiden
www.sidestone.com
Sidestone registration number: SSP120500001

ISBN 978-90-8890-108-9

Photograph cover: C. Cronberg, Swedish National Heritage Board, Lund
Cover design: K. Wentink, Sidestone Press
Lay-out: F. Stevens / P.C. van Woerdekom, Sidestone Press

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In memory of Tore Artelius

Beyond Barrows – an introduction

By David Fontijn

A few years ago, I visited a group of prehistoric burial mounds in a forest on the Veluwe, a beautiful region in the centre of the Netherlands. The barrows have never been excavated and were reported to be almost undamaged, in spite of the fact that they must be thousands of years old. Fortunately, the barrows are protected national heritage and I was happy to find them in good condition. Trees had been removed from the mounds and precautions had been taken to make sure that new ones could no longer take root easily. However, at a small distance of the mounds, but *outside* the protected heritage zone, parts of the forest recently had been extensively deep-plowed. If there were any archaeological features relating to those mounds, these now would be severely disturbed (Fig. 1).

This anecdote reveals a fundamental archaeological problem. Europe is dotted with hundreds of thousands of prehistoric monuments like megalithic tombs, cairns or earthen burial mounds. Although many of them are important in the

Fig. 1. Traces of extensive plowing at the barrow excavations of Apeldoorn – Wieselseweg 2009. In the foreground the broad grayish black traces of the forest plow just a few meters outside Barrow 1. A feature related to this barrow was found 30 m southeast of the barrow foot and remained out of reach of the plow (behind the photographer). It is likely that more of these features were present in the vicinity of the barrow (photograph: Quentin Bourgeois).

modern landscape, we often do not know much about the prehistoric landscape that they were part of. For the Netherlands, numerous barrow excavations have yielded a substantial body of knowledge on the monuments themselves (*e.g.* Glasbergen 1954; Modderman 1954; Van Giffen 1943). However, excavation of the immediate surroundings of those mounds is surprisingly rare (carried out for far less than 10 %) and for many parts of Europe knowledge of the environment of barrows is lacking. This makes it hard to say anything on the role these monuments had in the landscape of the past. Were they preferably built close to houses or in separate funerary zones of the landscape? How did they fit in the orderings of farming landscapes of later prehistory? This lack of knowledge on the environment in which barrows were situated also has profound consequences for heritage management. If we understand the role of barrows in prehistoric landscapes, we will get an idea of how the area around burial mounds was ordered. It may then become possible to predict what sort of archaeological features are to be found in the surroundings of burial mounds. Zones around barrows with a high archaeological potential can then be selected as areas that ought to be protected as heritage.

The question of the role of barrows in the prehistoric landscape is one of the key issues of the *Ancestral Mounds* research project of Leiden University (for example Bourgeois, Q. 2013; Doorenbosch 2011; Fontijn *et al.* 2013). To discuss this problem in an international setting, a session was organized at the annual meeting of European Association of Archaeologists (EAA) in The Hague (3rd of September, 2010). This volume derives from that session and presents contributions by most of its speakers. In addition, there are a few contributions that did not figure in the original EAA session, but fitted in well. In what follows, the research problem is introduced and something of the outcome of the following chapters is discussed.

By way of introduction – the case of the Low Countries

Let me introduce the problem by means of a specific case study. The Netherlands is one of those regions in Northwest Europe where prehistoric barrows have been researched relatively well. In some regions (like the southern Netherlands), this was done in numbers that are representative enough to make general statements on trends in barrow building. Although excavation was practically always confined to the mound itself, sampling and investigating pollen from barrows yielded important information on the vegetation around them (*e.g.* Casparie and Groenman-Van Waateringe 1980; Waterbolk 1954; see also Doorenbosch this volume). Already in the 1950's, Waterbolk was able to present a broad overview on the sorts of environments in which burial mounds were situated in the Netherlands – showing (among other things) that barrows were often situated in heath environments (Waterbolk 1954). This was done at a time when hardly anything was known on where and how people lived in this environment. Interestingly, it was one of those rare occasions when the excavation included a larger area than just the mound itself, that traces of Middle Bronze Age longhouses were found (in Elp in the northern Netherlands; Waterbolk 1964). Another large-scale excavation, the one at Angelslo-Emmerhout, also uncovered traces of numerous Bronze Age houses in the proximity of a megalithic tomb of the Middle Neolithic Funnelbeaker Culture

(TRB) and Late Neolithic burial mounds (Arnoldussen and Scheele 2012; Kooi 2008). A comparable situation was found during large-scale excavations in West-Frisia, in the west of the Netherlands (Bakker *et al.* 1977). Such impressive, landscape-scale excavations may have steered the general notion that in the Middle Bronze Age, people apparently lived very close to (their) burial mounds. In the early 1990's, Roymans and Fokkens (1991) expressed the relation between barrows and houses in a model that was to become very influential both in the Netherlands and in Belgium and France (*e.g.* Brun *et al.* 2005). They worked from the premise that there was a conceptual link between households and burial locations that was expressed in the Middle Bronze Age landscape in a different way than in the Late Bronze Age/Early Iron Age. In the former, a barrow was a collective funerary monument for a household, built close to the house it belonged to. As houses were moved to another location from time to time, barrows were presumed to have done the same, resulting in the characteristic haphazard scattering of Bronze Age barrow groups. Alternatively, in the Late Bronze Age and Early Iron Age, urnfield cemeteries were seen to emerge. Here, grave (monuments) did not follow house locations, but rather tended to be located close to each other, forming large clusters of graves, true urnfield "cemeteries". Fokkens and Roymans are not the only ones who argued that there was a one-to-one relation between such an urnfield and a settlement. The distribution of cemeteries, thus, was seen to represent some sort of key to understanding the (territorial) organization of the landscape (see also Van Beek and Louwen this volume).

Modeling the relation between graves (usually barrows) and settlement is a very important way to study landscape organization in many parts of Europe. Its conceptual clarity may have been one of the reasons why Roymans and Fokkens' model became so popular. It connected two worlds of field archaeology that were more or less separated in practice – excavations of barrows, something that was rarely done after the 1960's – and the large scale excavations of Bronze Age settlements, which usually took place from the 1960's on (Fokkens and Arnoldussen 2008). In spite of the famous examples like Elp mentioned above, where settlements and barrow were found in the same excavation, remnants of burial mounds were found only rarely at settlement sites during modern excavations (*e.g.* Arnoldussen 2008). Alternatively, as the environment of barrows was usually not excavated, it could not be demonstrated that they were surrounded by remains of contemporary houses.

In the late 2000's, ideas on the relation between barrows and houses in the Middle Bronze Age changed drastically. The first reason for this has to do with new dating evidence. Surprisingly, C14-dated Middle Bronze Age houses tended to date to the later part of the Middle Bronze Age (from *c.* the 15th century BC), whereas most Middle Bronze Age barrows dated to the earlier part of the Middle Bronze Age (Arnoldussen and Fontijn 2006; Bourgeois and Arnoldussen 2006; Bourgeois and Fontijn 2008). This means that even in those cases where houses and barrows were indeed found close to each other, the barrows were usually older than the houses (see Bourgeois and Fontijn 2008, table 3.1). The second reason relates to the fact that we now, for the first time, started to excavate the surroundings of barrows. In one of the largest excavations, Oss-Zevenbergen,

monumental post alignments were discovered around barrows (Fokkens this volume), but no traces of settlements. At another site with Middle Bronze Age barrows, Apeldoorn- Wieselseweg, remains of houses, sheds or other settlement structures were also absent. Here, however, a row of pits filled with large amounts of stones were found that were fired and seem to have been used in funerary rituals.

Scope

The focus of the EAA session was on prehistoric (round) burial mounds as we find them in large parts of Europe and West Asia since the late 4th millennium cal. BC (in West Europe since the early 3rd millennium cal. BC). The idea was to create a platform for discussion where archaeologists from different regions could present fresh ideas on the question how we are to study the role of barrows in the prehistoric landscape. Presentation of new, as yet unpublished data relating to this topic was also highly appreciated. Although studies of the graves in those barrows, or the barrow itself are important issues of the Ancestral Mounds project (cf. Wentink in press; Fontijn *et al*. 2013), they were not the issue here. A recent book of great interest, edited by Jonathan Last (*Beyond the Grave – new perspectives on barrows*; Last 2007) deals particularly (but not exclusively) with those themes. The present book is in the same spirit but exclusively devoted to environmental/ landscape issues. Whereas Last's book is on barrows from Britain, the present book is on barrows and cemeteries from the continent, with one excursion to mounds in North America that are certainly monumental but of which we do not even know what their original function was (Peacock and Rafferty, this volume). During the preparation of the session, it quickly became clear that the problems proposed in the brief to the contributors were not only of relevance to burial mounds, but also to their Early/Middle Neolithic megalithic forerunners (Andersson and Wallebom, this volume). It was also suggested to take in the issue of monumentality in relation to environmental developments and social evolution (Peacock and Rafferty, this volume) and to pay attention to barrow *orderings* as a concept that could be of relevance to later inhabitants of the landscape (Bronze Age mounds in a Viking Period landscape – the contribution by Artelius, this volume; for barrow orderings as a cultural concept, see also Bourgeois 2013). During my own research carried out in the Ancestral Mounds project, I also learnt that an exclusive focus on graves with (highly) visible markers like round mounds gives us just one side of the story (Fontijn 2011). There are funeral places without any monumental presence that appear to have had comparable long histories of use and interpretation as those with monuments. In this volume, Amkreutz' contribution deals with this in detail. We end up with a book on the role of barrows in the landscape from different theoretical and methodological angles and for different periods and regions. It is a collection of current ideas on how to approach barrows aimed to stimulate new research. There is no pretension of completeness and no claim that one particular approach is better than another one – the only thing all authors agree upon is the necessity of an archaeology that goes "beyond barrows".

Monuments and landscape

A quick scan through library entries yields an impressive number of titles relating to the key words "monument" and "landscape". It is indeed true that particularly since the 1990's the relation between prehistoric monuments and landscape has been a hot topic, particularly focusing on Neolithic monuments (for example Bradley 1998; Scarre 2003). It is beyond the scope of this introduction to summarize the different ways landscape is being dealt with in such studies. One general remark to be made is that it seems that since the early 1990's the term "landscape" was used rather than "environment". Although the former concept is not always clearly defined, there is a tendency to understand "landscape" as a term stressing cultural issues such as meanings attached to places. In discussing the concept, Lemaire (1997, 5) argued that the term landscape, "by its semantic ambiguity" (..) "is already an arrangement and structuring of the environment by the human gaze". Even though this definition includes both natural and cultural aspects, many studies of prehistoric monuments and landscape that appeared since the 1990's mostly deal with the ordering of humanly-made elements like barrows or houses in a space that remains non-descript in terms of vegetation or ecology. This was a point that was much debated during the EAA session from which this book derives. It can be argued, for example, that the absence of vegetation in landscape models often simply reflects the lack of available ecological data. On the other hand, if models of landscape are based on cultural elements only this also implies that vegetation is apparently not considered essential to such models. If this is correct is something that should be evaluated from case to case, but this point is raised here for another reason. As cultural interpretations are often the domain of archaeologists with a background in humanities (social anthropology) and vegetation studies that of archaeologists trained in natural sciences (biology), we touch upon a much broader problem here. Both approaches can have their own premises or even paradigms on the role of human beings in the world they live in (Jones 2002). Again, this is an issue that is not easily solved and certainly not in the context of conference proceedings like the one you are reading now. It is important, however, to confront findings of both approaches in archaeological studies of "landscape". Doorenbosch' contribution in this volume is a case in point. She tries to understand the role of barrows in the landscape by means of palynological analyses. These demonstrate that prehistoric burial mounds in her study region were apparently preferably situated on a particular kind of vegetation: heaths. She argues that this type of vegetation can only results from land management (by their use as pasture), but she also argues that such heaths tend to be very long-lived, stable elements in the humanly-altered landscape. Just like the barrows on these heaths tend to be reused for burial for long periods of time, heaths were also used time and again, for hundreds of years. Although we are used to seeing only the barrows themselves as ancestral focal places in the landscape, these barrows are all situated on heaths. It makes us wonder if the significance of barrows could not only be an expression of a much broader concern with *heaths* as long-lived, highly valued, collectively maintained zones in the prehistoric landscape. This might lead us away from the conventional emphasis on the monuments themselves, to a much broader focus: an entire (anthropogenic) *vegetation* zone.

Knowing the landscape through the monuments

If one thing must be said on "landscape and monuments" studies in the 1990's and 2000's it might perhaps be that landscape was studied through the monuments. Prehistoric monuments were, for example, conceptualized as representing parts of the landscape. Long barrows were for example seen as representing houses (for the Neolithic see for example Hodder 1990; for the Late Bronze Age/Early Iron Age: Roymans and Kortlang 1999), or monuments as mimicking landscape settings (Scarre 2003). An interesting approach is also how parts of the environment were re-worked into monuments, with certain megalithic tombs literally being pieces of meaningful places (Cooney 2000). What such studies share is that they emphasize how particular elements of the environment are used, have influenced or are even celebrated in a particular monument. Studying the monument informs us only indirectly on aspects of the environment that were used, appreciated or held in value.

Although there are contributions in this volume in which environmental issues are crucial (Doorenbosch; Peacock and Rafferty), most deal with ordering of humanly-made elements, be they barrows or houses, in a space that remains non-descript in terms of vegetation. In most of the cases, there is simply no data available for this: studies like those of Doorenbosch require an entire web of pollen sample locations over a particular area, which is usually not there. Even then the researcher is hampered by lack of evidence (for example: even Doorenbosch' fine-meshed data comes exclusively from barrows. Peat bogs containing contemporary pollen have not been found, and information on dwelling areas or agricultural fields is entirely absent). Van Beek and Louwen's modeling of the location of urnfield cemeteries suggests that urnfield and house sites are only the archaeologically identifiable elements of a prehistoric environment that was ordered and undoubtedly had many other elements that remain entirely out of consideration but must have mattered (like field fences, pastures, small forests and roads). A thought-provoking way to rethink landscape through the monuments is offered in Løvschal's contribution. She argues that barrows are a material manifestation of communication routes. This does not only apply to the physical ordering of barrows (being preferably situated along routes), she argues that it also applies to the conceptual ordering of the land with barrow lines. As visible, anchored burial locations, rows of barrows do not only direct movement, but perhaps also played an active mnemonic role. The barrow rows that we find everywhere around Europe, may have served to evoke a sense of genealogical time. This fits in with ideas that rows of barrows were not some accidental by-product of road systems but rather a cultural concept *sui generis* (Bourgeois, Q. 2013; Fontijn 2011; Garwood 2007). If this is correct, an intriguing, but still unresolved question that forces itself upon us would be how to make sense of barrows that were not ordered in rows or lines, but rather appear to be extensively dispersed across the land?

Excavating beyond barrows

A practical reason for the approach to landscape through monuments simply lies in the fact that the area around barrows was rarely excavated and evidence on vegetation is lacking. In those cases where it has been done, features were

sometimes found that indicate a different kind of orderings than those known from sites more often investigated (like settlements). Andersen and Wallebom (this volume) are one of those few researchers who did excavate beyond monuments. They show how what seemed to be scattered, single dolmens in reality were part of a true "dolmen landscape", having its own visible ordering with a large palisade and individual plots. Depositions appear to have been an integral element of that landscape. In a similar vein, Fokkens (this volume) demonstrates how excavation of the surroundings of a barrow row showed that at some point in time, extensive post alignments were built around those barrows. However, their orientation differs entirely from that of the barrow row . The ideas behind these alignment remain unclear at this moment, but their presence does indicate that such funerary areas could have visual orderings of their own, which cannot be read off from the dominant orientation of the monuments alone. As Fokkens points out, post alignments leading to or dividing up barrow landscapes were probably much more common in Northwest Europe than is now assumed. Even without excavation, we can get some idea on the role of burial monuments in the wider pre- and protohistoric landscape. Using air photography, De Reu and Bourgeois, J. (this volume) demonstrate the variety of features that are still present around barrow groups. Their excavation of selected areas show that these are sometimes only the tip of the iceberg. This brings us to a particular problem: how are we to use a real landscape-approach to barrows, if our excavations are always confined to small sections of that landscape? This question was raised several times during the conference, but was not really answered. The examples of monuments excavated in their environmental context are still very scarce and statistically unrepresentative. In Denmark alone, the number of still existing barrows is estimated at 86000, and this is a minimum (personal communication dr. Mads Kähler Holst, Aarhus University during the discussion). It goes without saying that only a fraction was excavated and in an even lower number of cases was something of the barrow surroundings excavated or prospected. If barrow environments were excavated, they sometimes reveal orderings and features the existence of which we could not expect. Cases in point are Andersen and Wallebom's megaliths at Döserygg and Skegrie or Fokkens' Oss-Zevenbergen barrow group (this volume). The Bronze Age pit rows with burned stones in and around the barrows of Apeldoorn-Wieselseweg, evidencing particular funerary rituals, are another example. But, as Løvschal's contribution indicates, even these enigmatic pits may not be a once-only phenomenon. Also in Denmark, rows of "cooking pits" are a recurrent phenomenon in barrow landscapes.

Organization of this book

Conferences have a way of being sometimes inspiring and inconclusive at the same time. This one was no exception. A group of archaeologists working on the same problem came together, but everyone approached it differently. There was, however, a general agreement on the significance of the theme. Particularly with regard to heritage issues, there may even be an acute problem, to which I already referred with a personal example in the beginning. How are we to make statements on the boundaries of heritage zones, if we hardly know anything of what sort of

archaeological features are to be expected around prehistoric monuments? This book will not provide an answer to that question, but it hopefully does show which avenues of research might be help to find answers.

The book starts with Artelius' argument on re-use of Bronze Age barrows in the pre-Christian Viking Period, emphasizing how meaning and memory were re-invented. As it is the only contribution that explicitly focuses on the almost permanent presence and long-term histories of barrows, it deserves special attention and is a good introduction to the theme. After all, is not the fact that hundreds of thousands of prehistoric barrows are still with us today, the main reason why we are so interested in them? Artelius argues that the pre-Christian Vikings had a specific interest in Bronze Age barrows, to the extent that we can speak of systematic reuse of Bronze Age monuments in the Late Iron Age as a deliberate social strategy.

Part I Beyond monumentality

In the next part of the book, there are two contributions that question the significance of monumentality. Amkreutz, working on Early and Middle Neolithic communities who inhabited wetlands argues that the current focus on monumentality tends to overlook that non-monumental places can have long-term histories as well. Working with the concept of "persistent places", he shows that living in an environment is based on long-lived engagements with landscape in which particular places can function as nodes over long periods of time. These, however, are not places that are necessarily monumental in terms of being highly visible or requiring heavy labor efforts. In a similar vein, Van Beek and Louwen deal with urnfield cemeteries of a much later period. Usually seen as large cemeteries that as a fixed concentration of hundreds of small barrows and flat graves, they argue that many occur in very different settings: small and often hardly monumental at all. They also deconstruct the prevailing idea on the location of urnfields in the broader landscape, and propose a number of alternatives which all find support in empirical evidence. These new models have an important heuristic value, as they make clear that urnfields and houses are only elements within the frame of a more encompassing ordering of space, the details of which (field systems, celtic fields etc.) we now have to further fill in.

Part II Orderings of funerary locations

In the next part of the book, the reader will find two contributions that give us an impression of the remarkable things one can find when one really tries to excavate beyond barrows. Both Andersson and Wallebom *and* Fokkens start from examples where areas around prehistoric monuments were accidentally investigated in rescue excavations. Interestingly, in all cases evidence was found of funerary orderings of a type not known from contemporary settlements. Visible alignments, be they of stones or posts, appear to be important both in the case of Middle Neolithic dolmens and for earthen round mounds of the Bronze Age and Early Iron Age. Comparing his findings to those of other European regions, Fokkens finds a division between two types of alignment that seem to have a different function. In both the Neolithic and the Metal Age cases, the authors do not pretend to

fully understand the ideas behind the construction of these kinds of orderings. However, the discovery that areas around monuments can have a distinct kind of spatial ordering *sui generis* is of great importance for future discussions on the role of prehistoric burial monuments in the landscape.

Part III Zooming out- barrows in a landscape

Three more contributions try to understand the role of barrows in a broader perspective, zooming out of the immediate environment of the barrows. De Reu and J. Bourgeois give us an overview of the impressive achievements of the Flemish air photography research. From a region without any known barrows, now over 1000 barrow locations have been identified, with lots of information on archaeological features in their surroundings. This contribution provides a full overview of the evidence collected until now. A number of excavations shows that the potential of the sites discovered with air photography prospection is good, yielding an abundance of preserved prehistoric features. The analysis of all these features, and the repercussions for our understanding of barrows in the landscape has only just begun here, but may be expected to play an important role in future discussions on the role of barrows in the cultural landscape. Doorenbosch' chapter is the only contribution where the actual vegetation and ecological setting play a key role. This is rather odd for conference proceedings where issues of landscape are central, but unfortunately this seems to be far from exceptional. In many regions of Europe, scientists focusing on ecology or palaeobotany are rare in archaeological departments, and often absent in books bearing the word "landscape" in the title. This has not only to do with the low number of positions in archaeological departments, but also with a still existing gap between a scientific-ecological and a cultural approach (Jones 2002). Doorenbosch' contribution does show, however, what can be gained if "cultural" and "ecological" approaches come together. Using pollen analyses and archaeological reconstructions, Doorenbosch shows how Dutch barrows were preferably built on humanly-managed heaths, and how these were long-term structuring elements in the broader landscape. It is tempting to connect her ideas with those of Løvschal. The latter focuses on the same sort of barrow lines as Doorenbosch, but takes more account of the specific orderings of the barrows themselves. An innovative element is to be found in Løvschal's approach to barrow lines as conceptual anchors structuring the prehistoric perception.

Part IV Monument building – an evolutionary approach

The last chapter takes us away from Europe. Peacock and Rafferty deal with monumental mounds of Eastern North America. They are posing the question why so much energy was put into – what they call – "wasteful human activities": the building of huge mounds. Using an evolutionary perspective, they relate the timing of mound construction to fluctuations in environmental conditions in a way that deserves some more discussion in a European context. One of the issues that was heavily debated at the conference was that there are clear trends in monument building. There is a marked peak in barrow-building in the Low Countries between the 18th and 15th century BC, followed by an almost absurd

investment in barrow-building in Denmark between 1500 to 1150 BC (with a minimum of 50000 barrows constructed in this period (Holst *et al.* in press; for the Low Countries see Bourgeois and Arnoldussen 2006; Bourgeois, Q. and Fontijn 2008; De Reu and Bourgeois, J., this volume). At this moment, the timing of such trends are primarily understood in terms of regional contingencies, but they might benefit from an approach that takes broader, evolutionary, issues into account. Not in the last place as investment of resources towards barrow building on a scale as we see in Denmark must have had very negative effects on the environment (Holst *et al.* in press).

Final remarks

As follows from this introduction there are many different ways to approach barrow research. Even though the articles in this volume might be far from conclusive, each of them will argue in its own way that there is much more to barrows than just the barrows themselves. After all the aim of this book is to really lead you *beyond barrows*.

Acknowledgments

Many thanks are due to the participants of this session, including those that did not write a contribution in this book. Dr Mads Kähler Holst (Aarhus University) chaired a part of the discussion and provided me with information on his forthcoming article: I am very grateful for both. Sasja van der Vaart (RMA) and Arjan Louwen (MA) gave useful comments on an earlier draft.

Bibliography

Arnoldussen, S. 2008. *A living landscape. Bronze Age settlements in the Dutch river area (c. 2000-800 BC)*, PhD-thesis, Leiden University.

Arnoldussen, S. and Scheele, E.E. 2012. The domestic and funerary landscape of Angelslo-Emmerhout, in: Van de Velde, H., Jaspers, N., Drenth, E. and Scholte-Lubberink, H. (eds.). *Van graven in de prehistorie en de dingen die voorbijgaan.* Leiden: Sidestone Press, 153-186.

Arnoldussen, S. and Fontijn, D.R. 2006. Towards familiar landscapes? On the nature and origin of Middle Bronze Age landscapes in the Netherlands. Proceedings *of the prehistoric society* 72, 289-317.

Bakker, J.A., Brandt, R.W., Van Geel, B., Jansma, M.J., Kuijper, W.J., Van Mensch, P.J.A., Pals, J.P. and IJzereef, G.F. 1977. Hoogkarspel-Watertoren: towards a reconstruction of ecology and archaeology of an agrarian settlement of 1000 BC, in: Van Beek, B.L., Brandt, R.W. and Groenman-van Waateringe, W. (eds.). Ex Horreo, Amsterdam, 187-225.

Bourgeois, Q. 2013. *Monuments on the Horizon. The formation of the barrow landscape throughout the 3rd and 2nd millennium BC*. PhD-thesis, Leiden University: Sidestone Press.

Bourgeois, Q. and Arnoldussen, S. 2006. Expressing monu-mentality: some observations on the dating of Dutch Bronze Age barrows and houses. *Lunula, Archaeologia protohistorica* 14, 13–25.

Bourgeois, Q. and Fontijn, D.R. 2008. Houses and barrows in the Low Countries, in: Arnoldussen, S. and Fokkens, H. (eds.). *Bronze Age Settlements in the Low Countries.* Oxford: Oxbow, 41-57.

Bradley, R. 1998. *The significance of monuments. On the shaping of human experience in Neolithic and Bronze Age Europe*, London / New York: Routledge.

Brun, P., Guichard, Y. and Le Goff, I. 2005. Le tombs à incineration de l'âge du bronze et du premier âge du fer dans le basin de l'Aisne, in: Mordant, C. and Depierre, G. (eds.). *Les pratiques funéraires à l'âge du Bronze en France.* Editions de Comité des Travaux Historiques et Scientifiques. Paris, 477-492.

Casparie, W.A. and Groenman-van Waateringe, W. 1980. Palynological analyses of Dutch barrows, *Palaeohistoria* 22, 7-65.

Cooney, G. 2000. *Landscapes of Neolithic Ireland.* Londen/New York: Routledge.

Doorenbosch, M. 2011. An environmental history of the Echoput barrows. In: Fontijn, D., Bourgeois, Q., Louwen, A. (eds.). *Iron Age Echoes. Prehistoric land management and the creation of a funerary landscape- the "twin barrows' at the Echoput in Apeldoorn.* Leiden: Sidestone Press, 111-128.

Fokkens, H. and Arnoldussen, S. 2008. Towards new models, in: Arnoldussen, S. and Fokkens, H. (eds.). *Bronze Age settlements in the Low Countries*. Oxford: Oxbow Books, 1-16.

Fontijn, D.R. 2011. The "ritual" fabric of prehistoric landscape. Funerary places and deposition sites in the Low Countries, c. 5000 – 1500 BC cal, in: Hansen, S., and Müller, J., (eds.). Sozialarchäologische Perspektiven: Gesellschaftlicher Wandel 5000-1500 v. Chr. Zwischen Atlantik und Kaukasus. *Archäologie in Eurasien* 24, Berlin, 429-447.

Fontijn, D., Van der Vaart, S. and Jansen, R. 2013. *Transformation through Destruction – A Monumental and Extraordinary Early Iron Age Hallstatt C barrow from the Ritual Landscape of Oss-Zevenbergen*. Leiden: Sidestone Press.

Garwood, P. 2007. Before the hills in order stood: Chronology, time and history in the interpretation of Early Bronze Age round barrows, in: Last, J. (ed.). *Beyond the grave, new perspectives on barrows*, 30-52.

Glasbergen, W. 1954. *Barrow excavations in the Eight Beatitudes, the Bronze Age cemetery between Toterfout & Halve Mijl, North Brabant.* PhD-thesis, Groningen University.

Hodder, I. 1990. *The Domestication of Europe*. Oxford: Blackwell Publishers.

Holst, M.K., Rasmussen, M., Kristiansen, K., Bech, J.-H. in press. *Bronze Age ' Herostrats'. Ritual, political and domestic economies in early Bronze Age Denmark.*

Jones, A. 2002. *Archaeological Theory and Scientific Practice*. Cambirdge: Cambridge University Press.

Kooi, P.B. 2008. Nederzettingen uit de bronstijd en ijzertijd in Angelslo-Emmerhout (gem. Emmen), *Palaeohistoria* 49/50, 327-373.

Last, J. 2007 (ed.). *Beyond the grave, new perspectives on barrows*. Oxford: Oxbow Books.

Lemaire, T. 1997. Archaeology between the invention and destruction of landscape. *Archaeological Dialogues* 4, 5-32.

Modderman, P. J. R. 1954. Grafheuvelonderzoek in Midden-Nederland. *Berichten van de Rijksdienst voor het Oud-heidkundig Bodemonderzoek* 5, 7–44.

Roymans, N. and Fokkens, H. 1991. Een overzicht van veertig jaar nederzettingsonderzoek in de Lage Landen, in: Fokkens, H. and Roymans, N. (eds.). *Nederzettingen uit de bronstijd en de vroege ijzertijd in de Lage Landen,* Nederlandse Archeologische Rapporten 13, Amersfoort, 1-27.

Roymans, N. and Kortlang, F. 1999. Urnfield symbolism, ancestors, and the land in the Lower Rhine region, in: Theuws, F. and Roymans, N. (eds.). *Land and Ancestors. Cultural dynamics in the urnfield period and the middle ages in the southern Netherlands*, Amsterdam Archaeological Studies 4, Amsterdam, 33-61.

Scarre, C. 2003 (ed.). *Monuments and landscape in Atlantic Europe. Perception and society during the Neolithic and Early Bronze Age*. London/New York: Routledge.

Van Giffen, A.E. 1943. *Opgravingen in Drenthe tot 1941*. Meppel.

Waterbolk, H.T. 1954. *De praehistorische mens en zijn milieu. Een palynogisch onderzoek naar de menselijke invloed op de plantengroei van de diluviale gronden in Nederland*. PhD-thesis, Groningen University.

Waterbolk, H. T. 1964. The Bronze Age settlement of Elp. *Helinium* 4, 97–131.

Wentink, K. in press. *The biography of grave goods and the identity of the dead*. PhD-thesis, Leiden University.

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Inventions of Memory and Meaning

Examples of Late Iron Age Reuse of Bronze Age Monuments in South-Western Sweden

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Formerly of the Swedish National Heritage Board.
The author passed away before this book went to print.
This is the last article written before his death.

Abstract

The aim of this paper is to describe and reflect upon the functional aspects of the ritual reuse of Bronze Age monuments that occurred in south-western Sweden in the Late Iron Age. The often very complex ritual behaviour cannot be labelled as traces of simple plundering. The archaeological record reveals that the large barrows and stone settings of the Bronze Age were systematically reused in the pre-Christian Iron Age rituals to such an extent that the tradition can be defined as a cultural pattern. Large trenches were dug into the monuments, depositions were made, meals were prepared, bonfires were lit, massive amounts of soil, turf and stones were rearranged, and secondary burials were conducted – activities that all took place in the "ancient" monuments. The labour invested in the pre-Christian Viking Age ritual reuse of the by then 2000-year-old monuments was extensive. The author means that the cultic and cultural pattern that appears in this ritual reuse of Bronze Age monuments can be interpreted as a Late Iron Age social strategy which focused on the necessity to create a history and thus confirm a specific Viking Age ideology. Through repeated ritual reuse of monuments a Viking Age population could create a memory and identity and thus raise social claims to a certain place. From a specific pre-Christian Viking Age worldview perspective, the constant manifestation and recreation of a past through ritual can be understood as traces of ideological resistance during a period characterized by an, in the end, unavoidable transformation of the pre-Christian world.

Keywords: *Memory, reuse of Bronze Age monuments, Viking Age, Sweden*

Introduction

The large Bronze Age burial monuments of southern Sweden – the barrows, cairns, and shallow stone settings – have evoked a great deal of ritual interest ever since the time of their construction. The archaeological record clearly demonstrates that the Bronze Age burial monuments in certain periods were frequently used for

Fig. 1. Halland.

religious and social reasons and this in a multitude of ways. From a Bronze Age religious and social perspective the barrows were probably symbols built to last for an eternity. The reuse of the monuments in some periods was so elaborate that it probably stretched far beyond what the architects of the original monuments could have imagined. As late as in the 19th century AD the farm population in Halland still ascribed the monuments different mythical qualities and capacities. Ghosts and giants were regularly seen in the vicinity of the barrows and cairns, and people who tried to plunder the monuments suffered the most terrible ordeals. The reuse

certainly shows that the monuments, considered as manifestations of ancestral tombs and places, were ascribed mythical functions in the myths, memories and history of Iron Age society.

The objective of this paper is to exemplify how the large Bronze Age monuments in the province of Halland came to be used 2000 years later in the pre-Christian Late Iron Age cult. In the overall Late Iron Age religious tradition, burial grounds and monuments from older periods were of central interest. In parts of south-western Sweden a massive recolonization of burial grounds, which had been abandoned for extensive periods of time, started in the 8th century AD. In the centuries to come, in the pre-Christian Viking Age ritual tradition, the "ancient" monuments in hundreds of examples became the centres of the burial grounds. In Västergötland, the largest province in south-western Sweden, we find that the Late Iron Age burial monuments very often were constructed around and directly upon graves of a much older date. From the archaeological evidence it becomes clear that this very concrete use and return to the past was of essential importance in the pre-Christian Viking Age cult and society (Artelius 2004; 2010). But it is also evident that this return to the by then "ancient" burial grounds, which in some cases had been abandoned for thousands of years, had certain characteristic regional variations. In Västergötland the urnfield burial grounds of the pre-Roman Iron Age became, 800 years later, central places in the Viking Age cult of the past and the dead and in the construction of a history. In Halland, however, we find that the same kind of cult of the past was primarily related to the large monuments of the Bronze Age – that is, the barrows and stone settings.

Following the shifting paradigms in archaeology, research into the use of the past in the past has undergone several theoretical changes during the last decades. The question of whether it is possible to grasp a functional "meaning" in prehistoric material culture that tells us something about how people in a long-gone past concretely used the past in rituals, and how they reflected upon the past, has become a topic in itself. Raising questions about the "meaning" embedded in the use of the past in the past has become something of a trend in the line of contextual archaeological research that deals with notions like memory making and causes of ritual change (Bradley 2002; Edmonds 1999; Gosden and Lock 1998; Olivier 1999). A prerequisite for reflections on a "meaning" in the use of the past in the past is, of course, that we consider it at all possible to study manifestations of religious ideas with archaeological theoretical tools. Historically speaking, scientists inside as well as outside the archaeological field have been sceptical of such a possibility. However, the development of a more holistic contextual approach within the discipline has provided us with constructive methods with which to study and suggest interpretations concerning also such illusive and subtle matters as religious meaning and projection. By definition the level of abstraction is not more complex when it comes to projections of religious ideas in material culture than it is for the understanding of manifestations of political or economic structures. Perspectives on what the past actually represented in different sets of cultures, and how this past was used in the past, have long constituted a major subject in such sciences as anthropology, psychology, sociology and religion. In those disciplines, the very definition of concepts such as "ritual", "memorization",

"cult", "collective memories", "anamnesis", "ancestors" and "history" tells us something about how humanity in a multitude of ways has related to and expressed ideas about the past for varying strategic social reasons (Borgeaud 1987; Burke 1989; Connerton 1989; Halbwachs 1992; Rappaport 1999; Zuesse 1987). In our own discipline, however, research concerning a "meaning" concealed in the actual use of the past in the past is of a more recent date.

In the contextual tradition of interpretation, one of the more concrete directions in research that deals with the use of the past in the past concerns the ritual reuse of burial monuments. Over the years there have been several studies in Scandinavian archaeology that deal with varying aspects of the use of the past in the past in this sense. But it is also obvious that there has been a very distinct focus on secondary burial as the principal form of monument reuse worth investigating. A handful of studies including Jennbert (1993), Hållans Stenholm (2006), Thäte (2007) and Artelius and Lindqvist (2007) apply a more holistic approach to questions concerning the meaning of monument reuse, but other categories of monument reuse than secondary burial have not been reflected upon to the same extent (Artelius 2004).

Yet the identification of reuse of "ancient" monuments is, of course, not a novelty even in Scandinavian archaeology. Already in 1869 Wilhelm Boye remarked that it was obvious that the large Bronze Age barrows he had excavated in southern Halland contained several traces of secondary use. Iron Age reuse of Bronze Age monuments for secondary burial has thus long been recognized as a phenomenon in the whole of southern Scandinavia. Anne Pedersen (2006) has remarked that the pre-Christian Viking Age tradition of monument reuse has long been known in Denmark as well. She describes examples where reuse has been documented that date back to the mid-19th century. Eva Thäte (2007) relates how secondary burial often was underlined in the older Scandinavian archaeological research. Thäte (2007) and Pedersen (2006) state that the Viking Age tradition of conducting secondary burials in much older monuments was comprehended by archaeologists as an obvious trait in the overall burial tradition of the period. In fact, secondary burial was such a distinct and common trait that it distinguished the pre-Christian Viking Age tradition from burial customs of other periods. In the theoretical sense, though, reuse in the form of secondary burial was looked upon as a rather unproblematic issue in the research tradition. No approach concerning the religious and social meaning and function behind this reuse has been presented within the process-related research tradition. The point of departure for this paper is that ritual reuse of "ancient" monuments in the Late Iron Age religious tradition of southern Scandinavia, is a far more complex and distinctive trait than is generally acknowledged by archaeologists. As will be seen in the following, the reuse of Bronze Age barrows and stone settings in Halland took many forms and was guided by various intentions.

Bronze Age Halland

The province of Halland is a narrow landscape and region in south-western Sweden that stretches some 200 km along the North Sea coast. The landscape is characterized by wide and almost fully cultivated coastal plains which shift

towards the east, to a more broken, higher and forested region. Along the borders of Västergötland and Småland the landscape develops into the southern Swedish highlands. In prehistory as well as in later periods, settlements primarily were located in the coastal districts and in the four wide valleys surrounding the major rivers that run through the province. The open landscape along the coast is not just a result of a more modern agrarian development. The archaeological record as well as many pollen diagrams has revealed that the coastal region and the major river valleys to a large extent already in the middle of the Bronze Age (1100–800 BC) can be described as wide-open grasslands, marshes and heaths. In this sense, the development of the natural landscape in Halland greatly resembles a situation that is believed to have existed already in the Bronze Age in northern Jutland, the southern parts of Scania, and some of the Danish isles as well. Already in the Bronze Age, the central settlement region became deforested in these parts of Scandinavia. Since the coastal region and river valleys have comprised open landscape since the Bronze Age, it is obvious that the most characteristic monuments of the period – the large barrows – have attracted a lot of interest as clearly visible and mythical historical landmarks ever since the Early Bronze Age. The monuments have also received a great deal of attention from both archaeologists and historians for at least 200 years. Prominent 19th century scholars like Wilhem Boye and Oscar Montelius showed great interest in the barrows. During the years 1868–1869 Boye excavated 19 barrows in the southernmost part of Halland, and the evidence from the excavations became an essential part of Montelius's elaboration of the typological system of the European and Scandinavian Bronze Age (Lundborg 1972, 11ff.).

Excavations have revealed that reuse of Bronze Age monuments in Halland primarily occurred in relation to the large barrows and, remarkably enough, the much more diminutive and shallow stone settings. The characteristic burial monuments of the period – the large earthen barrows, the often even larger cairns, and the shallow and from a topographical perspective more diminutive stone settings – are found in different parts of the landscape. The different categories of Bronze Age burial monuments are also found in a most varying relation to the contemporaneous settlements. The large barrows are concentrated in the southern half of the province and primarily found in the open and hilly grasslands along the coast. Topographically, the barrows are situated along the ridges and in a close relation to contemporaneous Bronze Age settlement areas. The archaeological record shows that several of the large Bronze Age settlements were completely surrounded by barrows. The large cairns, however, are situated in more varied topographical circumstances. They are common in the inland area, and the typical location is towards the tops of mountains, which means that cairns in general were not primarily located within and in close relation to the contemporaneous settlements. This is probably also the reason that the cairns, when excavated, in general have not provided us with the same kind of evidence of extensive ritual reuse. Unlike the barrows, the cairns were situated quite far from the major settlement areas, and for that reason they were not as interesting to reuse. The third type of burial monument that is typical of the period, the often large but shallow stone setting, is found in all regions of Halland, and topographically it

primarily occurs in the coastal region. In contrast to the present-day situation where these stone settings are hard to find, covered as they are by bushes close to the seashore, they were clearly visible in the much more open prehistoric landscape. As mentioned earlier, ritual reuse primarily has been documented in relation to barrows and stone-setting monuments. The reason for this is that these categories of monuments were located within the Bronze Age settlements, and subsequently also in close relation to what 1.5 millennia later became the central Late Iron Age settlement areas.

Variations in pre-Christian Viking Age reuse of "ancient" monuments

From information in the written sources and sagas we understand that the pre-Christian Viking Age people of Scandinavia were very concrete in their religious cult. This in the sense that the content of myths described in the sources became projected and manifested through ritual action in burials, offerings and feasts. There has long been consensus among scholars from a variety of disciplines regarding the relation between the Viking Age religion and its practice. Already in 1967 Folke Ström emphasized that the pre-Christian Viking Age concept of religion was very concrete in the sense that the practice was central and, one might say, even synonymous with the concept of religion itself. In pre-Christian Viking Age Scandinavia the functional aspects of religion were emphasized in all collective rituals. For that reason the pre-Christian religion of the Viking Age in many ways can be described as almost synonymous with its ritual practice. In that way religion in a pre-Christian Viking Age fashion was principally equal with its rituals. That this was the case is indirectly supported by the fact that there was no word or explanation in pre-Christian Viking Age Scandinavia to cover a more theological concept of what was meant by religion. The term mentioned in the written sources which closest resembles our understanding of the concept of religion is "the old ways". Even in the language the concrete tradition was underlined (Ström 1967). The most natural place for "the old ways" was the burial ground, and the texts state that the burial grounds functioned as the main space where the dead could address the living, and for the living the burial ground in the Late Iron Age functioned as a manifestation of the past, the ancestors and an overall history of myths (Näsström 2001, 318ff.; 215ff.).

Many archaeological excavations, as well as evaluations of reports, have revealed that a general cult of ancestors and the past evolved in the 8th century AD on a wide geographical scale in southern Scandinavia (Artelius 2004; Artelius and Lindqvist 2007; Hållans Stenholm 2006; Lindqvist 2010; Pedersen 2006). In certain areas, such as the province of Västergötland, the ritualized reuse of older burial grounds and monuments in the 9th and 10th centuries AD became so extensive that we can claim that it was a crucial trait in the religious tradition in those parts of Scandinavia. From the archaeological record it is also obvious that the Viking Age reuse of ancient monuments appeared in different forms and contexts in southern Scandinavia. In south-western Sweden, in the province of Halland, there is evidence from several excavated burial grounds and single monuments to show that one obvious focus for this Viking Age cult of the past was the active ritual reuse

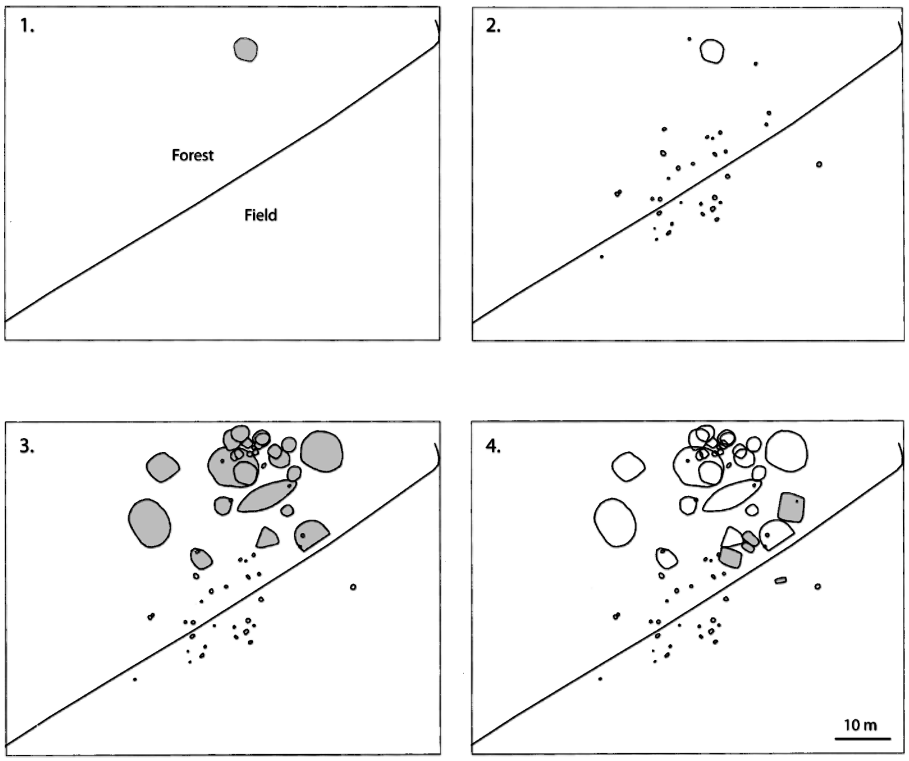


Fig. 2. Chronological development of the burial ground at Vittene in Västergötland. In the primary phase (1) a single, large, stone setting is built in the Bronze Age. In the pre-Roman Iron Age approximately 30 burials are conducted in close relation to the old stone setting. In the 2nd century AD the burial ground is abandoned. In the 8th century AD a reuse of the burial ground starts. Several mounds and a ship-setting are built (3). In the last phase Christian inhumation burials are carried out in stone settings (4) (Artelius and Lindqvist 2007).

of the large Bronze Age burial monuments that are characteristic for the region. In Halland it is clear that the often very large barrows and stone settings dating to the Bronze Age were used extensively in a number of different ways in the Viking Age rituals (Artelius 1999a; 2004b; Olson 1968; Strömberg 2005). But as mentioned earlier, identifying the Viking Age ritual reuse of Bronze Age monuments is not new to archaeology. There are many examples of Viking Age reuse of Bronze Age barrows from other parts of southern Scandinavia. As stated earlier, Anne Pedersen (2006), in a study of Viking Age reuse of monuments from earlier periods in present-day Denmark, presents 35 examples where Viking Age burials had been conducted in what were then quite ancient monuments. But as also stated above, the pre-Christian Viking Age reuse of old burial grounds took many forms, and the documented ritual behaviour was obviously also characterized by several functional variations. Consequently, the reuse also appears in many different ways in excavations and excavation reports (Lindqvist 2010). For instance, it is evident that the massive reuse of urnfield burial grounds dating to the pre-Roman period, places that in the Viking Age had been abandoned for more than seven centuries, is very characteristic for the ritual tradition in the province of Västergötland from

the 8th century AD and onwards. The "ancient" pre-Roman burial grounds were recolonized in the Viking Age; this in the sense that the population started to use places for burial that had been abandoned for a period corresponding to something like 25 generations of farmers. In many places Viking Age burial grounds were established in very close spatial relation to the older urnfields. The reuse of these places indicates that the Viking Age farmers in their ritual behaviour emphasized a concrete connection with a population that had inhabited Västergötland almost a 1000 years earlier. Viking Age graves were built in direct contact with older monuments; and ancient objects and cremated human remains dating back to the pre-Roman Iron Age were collected and moved around in the burial grounds. New monuments were constructed around older graves, and the new graves were

Fig. 3. The often large barrows of the Bronze Age are usually situated in rows along ridges. The monument in the picture is "Tackhöj", a recently excavated barrow in southern Halland. The monument exceeded 25 m in diameter and was 3.5 m high. The photo sequence shows the internal features of the barrow (photo: Robert Ullmann).

connected to the older by the laying out of rows of stones (Artelius 2004; Artelius and Lindqvist 2007; Lindqvist 2010). Recently Mats Lindqvist (2012), in a paper that takes its starting-point in the reuse of Bronze Age monuments in the province of Bohuslän, presented 20 examples of such reuse dating to the Viking Age. In his analysis Lindqvist concludes that this ritual behaviour was not only limited to large and monumental graves. From the evidence in Bohuslän it is clear that more subtle categories of monuments, such as small, shallow, almost invisible and often quite irregularly formed stone settings, also were reused in the Viking Age. Lindqvist's examples thus convincingly demonstrate that the tradition of reuse must have been looked upon as an important trait in the rituals in the sense that a Viking Age population, in order to be able to reuse diminutive stone settings, must have actively sought them in the landscape in a very thorough manner (Lindqvist 2010).

Examples of a varying Viking Age reuse of older monuments can be archaeologically identified in all regions in present-day southern Sweden. When it comes to the reuse of monuments from the Bronze Age, there are examples from regions that were geographically remote from each other a 1000 years ago. The geographical spread of ritual reuse of older monuments in southern Sweden indicates that the tradition was common in pre-Christian Viking Age society and thinking. In my opinion, the examples of Viking Age reuse of monuments from older periods make it possible to view the repeated and often carefully organized ritual behaviour as evidence of a pattern that was a central feature in the Viking Age religious tradition (examples: Fernholm 1982; Hansson 1991; Hemmendorff 1980; Nagy 1976; Rudbeck 1978).

Examples of pre-Christian Viking Age reuse of Bronze Age monuments in Halland

As mentioned earlier, ritual reuse in Halland has primarily been documented in relation to barrows and stone settings. In regard to cairns, there are almost no documented examples of other reuse than secondary burial. As also mentioned, a possible explanation for this is that the cairns are mainly situated in the inland region, in a part of the province that was almost uninhabited in the Late Iron Age.

In order to understand something about the quantitative frequency of the Viking Age reuse of barrows and stone settings, it can be worthwhile to point out that the reuse often appears in very subtle ways in the archaeological material and reports. In older reports that describe results from excavations of burial grounds and monuments from periods prior to the Late Iron Age, it is frequently noted that a certain construction in a burial ground, or, for that matter, a single ^{14}C-sample from a layer within a monument, has been chronologically dated to the Viking Age. The circumstances indicate that the reuse of monuments was much more elaborate and extensive than we generally have assumed it to be. Often a reuse is hard to identify, and historically we have been reluctant to acknowledge reuse as a general tradition. In many cases results of ^{14}C-analysis that strongly and without doubt have indicated and supported a reuse of ancient monuments have

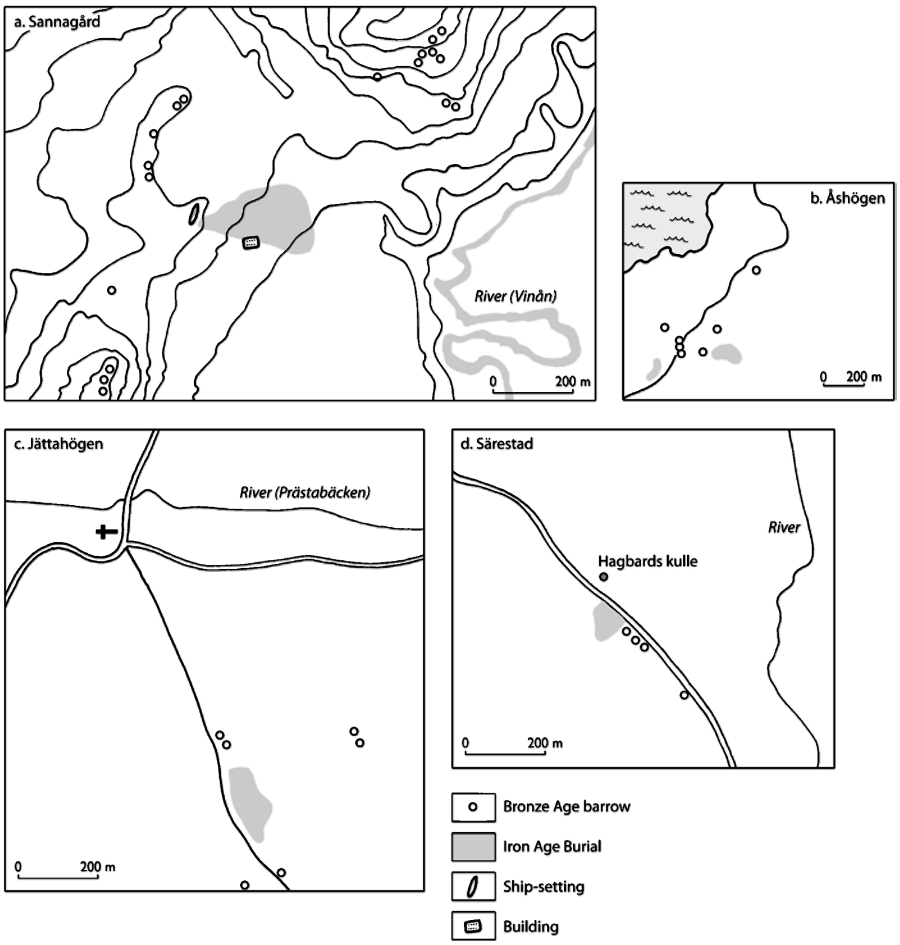


Fig. 4. Spatial relation between Bronze Age barrows and Viking Age burial grounds in Halland. Circles indicate Bronze Age barrows and grey areas are Viking Age burial grounds (Artelius and Lindqvist 2007).

simply been explained as incorrect. From the examples below it is obvious that the amount of labour invested in the reuse was quite extensive, and it has been hard for archaeologists to acknowledge the fact that traces and indications of reuse in some cases reveal that the labour invested in this ritual tradition almost exceeded the original construction of the monument.

Stråvalla

15 years ago a large, shallow and irregularly shaped stone setting from the Bronze Age was excavated on the cliffs close to the seashore at Stråvalla in the northern part of Halland. The monument exceeded 20 m in diameter and was constructed directly on the naturally arched rock surface in a manner that made it quite monumental from a horizontal perspective. The large monument originally had been built in period II, and two graves were documented. The primary grave consisted of an approximately 3 m long and ship-formed stone setting constructed

Fig. 5. The stone setting at Stråvalla was originally constructed in periods II-III (Artelius 2004b).

Fig. 6. The stone setting at Stråvalla. In the Viking Age the entire southern part of the monument had been removed (Artelius 2004b).

of large boulders placed directly on top of a narrow, natural crack in the rock surface. The crack contained the cremated remains of an adult, but no artefacts were found. A secondary cremation grave was situated in the eastern part of the monument. Traces of a cremation pyre were also discovered under the northern part of the stone setting.

Under the dense packing of stones in the southern part of the monument there was a homogenous and approximately 2 cm thick charcoal layer spread over an area of approximately 15 m^2. Radiocarbon analyses of the layer revealed that it dated to the late Viking Age. The circumstances reveal that a very large part of the original stone setting had been removed sometime during the late Viking Age. A large fire had been lit in very direct relation to the ancient grave in the centre of the monument. Afterwards the entire original layer of packed stones had been put back into place in such a way that almost no signs of any deliberate disturbance could be seen during the archaeological excavation. The reconstruction of the external features of the monument had been done in a very careful manner. Burnt animal bones were documented in the layer, thus indicating that the slaughter of animals, and possibly also the consumption of meat, was an essential element in the ritual that took place in the ancient monument (Artelius 2004b).

Tom

A pit filled with charcoal and burnt bones from pigs and sheep was found under a large stone slab. The slab was included in one of the inner curbs of stones discovered at the bottom of a large monument from period III. The large stone setting was excavated in 1966 at Tom in northern Halland. The monument was approximately 18 m wide and more than 1.2 m high. The analysis of charcoal revealed that the pit underneath the large slab in the curb had been dug in the Viking Age (Olson 1968). A great amount of labour had been invested in the by then approximately 2000-year-old monument. A very large part of the covering stone setting had been removed. A couple of stones in the inner curb had also been removed, and the evidence indicated that some kind of ritual meal had been prepared in the pit. Afterwards a large stone had been placed on the spot to cover the pit. The whole of the originally covering stone material had been put back into place.

Värö

In 1995 a Bronze Age barrow dating to period IV – the "Kings Mound" – was excavated at Värö in the central part of Halland. The monument was approximately 14 m wide and 2 m high, and showed several traces of secondary ritual activities. The primary grave was representative for the burial tradition that developed during the course of periods III and IV in the region. Although the primary grave consisted of a deposition of cremated human remains, many features in the organization of the burial showed influences from the older inhumation tradition. Inhumation was abandoned as the primary burial tradition during the course of period III in this part of southern Scandinavia. The monument contained remains of at least two centrally placed burials from the Bronze Age. In both burials the cremated remains had been placed on large stone slabs. The second burial had

Fig. 7. Bronze Age monument at Tom in northern Halland during excavation in 1966. The large stone covering the pit dating to the Viking Age is indicated (O) (photo: Gösta Olson).

been double in the sense that two adults, a man and a woman, had been buried together. Judging from the artefacts it is likely that the burials took place in period IV.

Digging had been done in the barrow on several occasions. In the middle of the barrow a circular shaft had been dug all the way down to the stone slabs and the primary burials. Cremated human remains had clearly been collected and the objects that were displayed in the Bronze Age ritual had been moved. In the top of the barrow a secondary burial in the form of an urn containing cremated human remains was documented. It was placed on the side and very top of the circular shaft that had been dug down through the barrow, and consequently the urn must have been put into position after the deep shaft had been filled up again. The urn contained the remains of a young adult who died in the Early Iron Age. The large trench in the middle of the barrow, however, had been dug much later than that. It is evident from the stratigraphy and the results of radiocarbon analyses that the shaft had been dug into the interior of the mound sometime in the late Viking Age. Scattered remains of burnt animal bones were found at the bottom

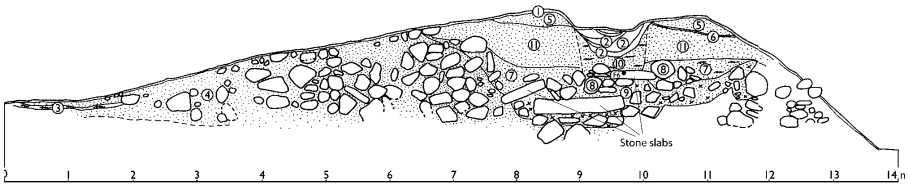


Fig. 8. Section through the "Kings Mound" in Värö. A deep shaft had been dug in the barrow all the way down to the primary grave (Artelius 1999a).

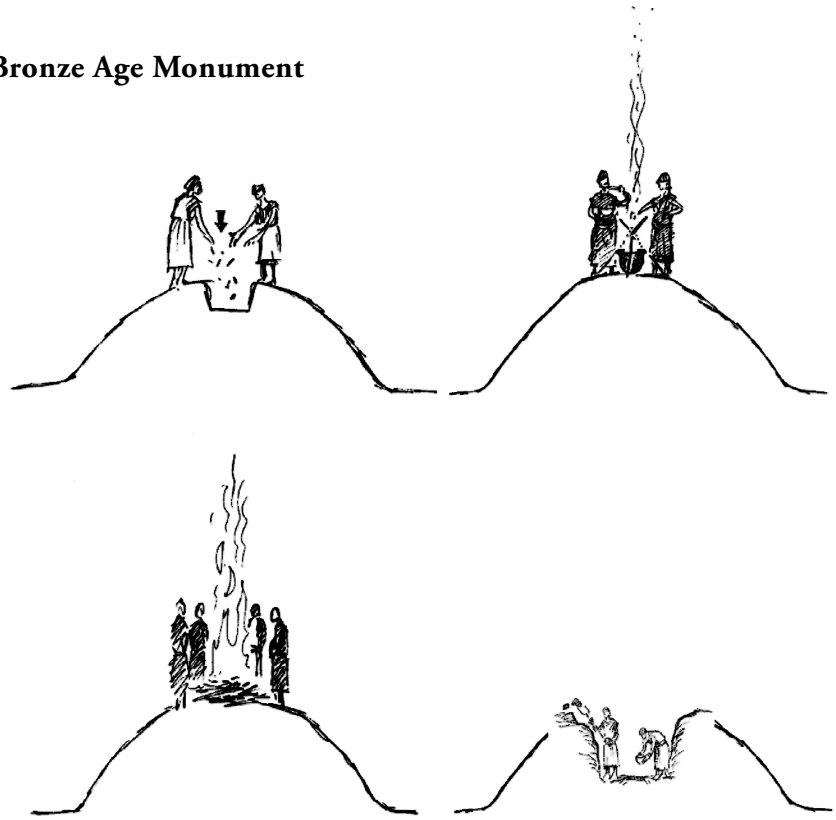
Fig. 9. Miniature sword (right), button (top left) and razor (bottom left) from the "Kings Mound" in Värö (Artelius 1999a).

of the shaft, thus indicating that remains from a ritual meal had been deposited in the old grave. It is noteworthy that the valuable artefacts belonging to the Bronze Age burials had not been removed from the grave. The objects deposited in period IV all remained in the grave. Reasonably, thus, the shaft is not evidence of a traditional plundering of an old monument. The careful handling of the urn from the Early Iron Age that had been put back in the top of the barrow also tells us that the digging in the monument had been conducted in a very careful way (Artelius 1999a).

Pre-Christian Late Iron Age memory-makers

As mentioned earlier, the pre-Christian Viking Age pattern of ritual reuse of burial monuments in southern Scandinavia was characterized by regional variations. The archaeological material suggests that the tradition of ritual reuse varied greatly in form in south-western Sweden. Chronologically a tradition of reuse seems to appear simultaneously in the different regions during the course of the 8th century.

Bronze Age Monument



Pre-Roman or Roman Age Monument

Fig. 10. Schematic illustration of the Viking Age reuse of Bronze Age barrows in Halland (Artelius and Lindqvist 2007).

It also seems that the tradition intensified in the 9th and 10th centuries. Although there was variation in form, in my opinion it is possible to assume that the tradition of reuse in the districts of southern Sweden had a similar ideological content. Whether the reuse mainly concerned Bronze Age monuments, as in Halland, or focused on reuse of pre-Roman Iron Age burial grounds as in Västergötland,

the religious/social behaviour was intended to serve as a ritual arena where the organization of pre-Christian Viking Age society could be strengthened and confirmed. By creating a concrete link with ancestors, and thus also to a certain place, a history could be claimed. Through the very active ritual reuse of older graves it is probable that even judicial rights could be expressed in relation to a given space and place (Andersson 2005).

From the examples above it is evident that the labour invested in the reuse of Bronze Age monuments in Halland was in some cases very extensive. In Stråvalla the labour invested in the rebuilding of a Bronze Age stone setting almost exceeded the labour originally invested in the actual construction of the monument (Artelius 2004b). To acknowledge such a fact also tells us something about the importance of this very specific pre-Christian Viking Age ritual behaviour. As seen in the examples, the pre-Christian Viking Age reuse of Bronze Age monuments in Halland also appears in other forms than as clear signs of secondary burial. The archaeological record from Halland reveals that the Late Iron Age reuse of Bronze Age monuments can be divided into something that can be categorized as repeated variations in ritual behaviour. The first and most obvious reuse is the one already mentioned: Viking Age burials were sometimes conducted in direct relation to the graves in much older Bronze Age monuments. There are several examples from the regions in south-western Scandinavia that show that Viking Age burials were conducted in Bronze Age monuments.

The second variation in the reuse of Bronze Age monuments in Halland can be described as the ritual digging of large trenches and shafts in the barrows. From northern Halland there are examples of large shafts dug down into the monuments. In other examples the archaeological context indicates that large parts of the original monuments had been removed during the Viking Age. In some cases subtle traces of what can be interpreted as secondary burials have been discovered in the trenches, but it is not possible to give a more precise interpretation when it comes to the actual purpose of the digging of trenches and shafts. Judging from the material, however, the trenches and shafts should not be seen as mere traces of plundering. In Värö the shaft had been carefully sealed and the collected objects had been redeposited. It is fair to assume that the digging of shafts and trenches is an indication of a deliberate search for cremated remains of ancestors and objects – remains and objects that could be used in a cult of the past.

I have chosen to label the third variation in the ritual reuse of Bronze Age monuments as traces of ritual feasting. In a couple of cases animal bones have been discovered at the bottom of pits dug into Bronze Age monuments, and radiocarbon dates reveal that the pits had been dug in the Viking Age. It is clear that a lot of labour had been invested in order to be able to deposit the remains of a ritual meal at the very bottom of an "ancient" monument. To my understanding, this behaviour can suggest that ritual meals were an important element in the pre-Christian Viking Age tradition.

A fourth example of Viking Age ritual reuse of Bronze Age monuments can in my opinion be described as traces of large bonfires. There is archaeological evidence to suggest that large fires were lit inside as well as on top of the Bronze Age monuments during the Viking Age. In one of the examples above it seems

that a very large part of a huge stone setting had been removed in order to light a fire – and this in very close relation to the primary grave in the Bronze Age monument.

The archaeological evidence also makes it reasonably clear that certain objects, presumably ones that in the Bronze Age had originally been deposited in relation to burials, have been moved around and sometimes deposited elsewhere in the monument during the pre-Christian Viking Age rituals. Even a small material like that of the few examples indicates that it is also likely that "ancient" urns with cremated remains were relocated within the monuments during the Viking Age.

To a pre-Christian Viking Age population in Halland, the large barrows and cairns probably served as very concrete reminders of a past and of a constant ancestral presence in the landscape. In my interpretation the Viking Age rituals of reuse describe a social/religious strategy that in essence focused on the necessity of creating a history and the maintaining of a pre-Christian ideology. Through the repeated ritual use of "ancient" monuments, a Viking Age population could express a certain identity and social right to a certain area. The old monuments in that sense served as perfect ritual "tools" around which a collective memory could be "invented" in both the mental and the pragmatic physical sense (Hobsbawm 1983; Strömberg 2005, 259). A pre-Christian Viking Age farm population could repeatedly conduct ritual actions to annex ancestors as well as a history, and this in relation to a specific place. Thus, through ritual the people could remind themselves and the surrounding world of their rights to the land and the history. In my interpretation, the Viking Age reuse of Bronze Age monuments that occurred in the province of Halland in the 9th century illustrates that social constructions of a history and a collective memory almost always revolve around a more or less elaborate appropriation of the past, and this for different social/religious reasons. In the pre-Christian Viking Age the past was used both to create and to uphold collective memories. Through a deliberate and institutionalized memorization, and through ritual, the Viking Age local society could manifest and justify itself ideologically in a number of ways. Members of society, as well as society as a whole, could use the past to enforce ideological stability and to provide for possible social, political or religious development. Especially in periods characterized by social instability and threats of more or less radical change, the active and ritualized use of the past was reconsidered as a great social and/or political resource to society. Through a repeated and institutionalized ritualized reuse of the past, the order of pre-Christian Viking Age society could be legitimized over and over again. As such, this kind of legitimization was for obvious pragmatic political reasons a social necessity in society in the late Viking Age. Thus, the repeated ritual use of the past can be looked upon as an ideological defence, and from a pre-Christian Viking Age worldview it was probably of great importance in relation to the changes that were heralded in the 10th century by the coming of Christianity.

Bibliography

Andersson, G. 2005. *Gravspråk som religiös strategi. Valsta och Skälby i Attundaland under vikingatid och tidig medeltid*. Riksantikvarieämbetet Arkeologiska Undersökningar Skrifter nr 61. Västerås: Riksantikvarieämbetet.

Artelius, T. 1999a. Från sorg till saga – Människors handlingar vid en halländsk gravhög, in: Olausson, M. (ed.). *Spiralens öga – Tjugo artiklar kring aktuell bronsåldersforskning*. Stockholm: Riksantikvarieämbetet, 27-47.

Artelius, T. 1999b. A Bronze Age Perception of Identity. *Lund Archaeological Review* 411998, 37-48.

Artelius, T. 2004. Minnesmakarnas verkstad. Om vikingatida bruk av äldre gravar och begravningsplatser, in: Berggren, I.Å., Arvidsson, S. and Hållans, A.M. (eds.). *Minne och myt – konsten att skapa det förflutna*. Vägar till Midgård 5. Lund: Lunds universitet and Nordic Academic Press, 99-120.

Artelius, T. 2004b. Halländsk rösekuliss med stenbåt och bålplats. *Uv Väst Rapport* 2004/23. Göteborg: Riksantikvarieämbetet.

Artelius, T. 2010. *Den gamla döden och den nya. Om vikingatidens förkristna begravningar, religiösa idéer och religionsskiftet*. Jönköpings Länsmuseum Arkeologisk Skriftserie 1. Kalmar: Jönköpings Länsmuseums förlag.

Artelius, T. and Lindqvist, M. 2007. *Döda minnen*. Riksantikvarieämbetet Arkeologiska Undersökningar Skrifter 70. Ödeshög: Riksantikvarieämbetet.

Borgeaud, P. 1987. Memorization, in: Eliade, M. (ed.). *The Encyclopedia of Religion*. Vol 9. New York and London: MacMillan Publishing Company/Collier MacMillan Publishers, 365-370.

Boye, W. 1869. Ättehögar i södra Halland. Hallands Fornminnesförenings Årsskrift, s. Halmstad, 75-118.

Bradley, R. 2002. *The past in prehistoric societies*. London and New York: Routledge.

Burke, P. 1989. History as Social Memory, in: Butler, T. (ed.). *Memory – History, Culture and the Min*d. Oxford: Blackwell, 99-113.

Connerton, P. 1989. *How societies remember*. Cambridge: Cambridge University Press.

Edmonds, M. 1999. *Ancestral geographies of the Neolithic. Landscapes, monuments and memory*. London and New York: Routledge.

Fernholm, R. 1982. Ett flatmarksgravfält från bronsåldern. Fornlämning 86, Stora Sjögestad, Vreta klosters socken, Östergötland. *Riksantikvarieämbetet och Statens Historiska Museer Rapport. Uppdragsverksamheten 1982:44*. Stockholm: Riksantikvarieämbetet.

Gosden, C. and Lock, G. 1998. Prehistoric Histories, in: Richard Bradley and Howard Williams (eds.). The past in the past: the re-use of ancient monuments. *World Archaeology* 30/1, 12-22.

Halbwachs, M. 1992 [1941, 1952]. *On collective memory*. Lewis A Coser (ed. transl. and intro.) Chicago and London: The University of Chicago Press.

Hansson, M. 1991. Hässlegården 1:1, Augerum socken, Blekinge, Fornlämning 28 och 29. *Riksantikvarieämbetet Byrån för Arkeologiska Undersökningar Rapport*. Lund: Riksantikvarieämbetet.

Hemmendorff, O. 1980. Fornlämningarna 267 och 272, stensättningar, samt 307 gravfält och verkstadsplats, yngre järnålder Bäckby, Lundby församling, Västerås, Västmanland. *Riksantikvarieämbetet och Statens Historiska Museer Rapport*. Uppdragsverksamheten 1980:12. Stockholm: Riksantikvarieämbetet.

Hobsbawm, E. 1983. Introduction: Inventing Traditions, in: Eric Hobsbawm and Thomas Ranger (eds.). *The Invention of Tradition*. Cambridge: Cambridge University Press, 1-14.

Hållands Stenholm, A-M. 2006. Past memories. Spatial returning as ritualized remembrance, in: Andrén, A., Jennbert, K. and Raudvere, C. (eds.). *Old Norse religion in long term perspectives. Origins, changes and interactions. An international conference in Lund, Sweden, June 3-7 2004*. Vägar till Midgård 8. Lunds universitet. Lund: Nordic Academic Press, 341-346.

Jennbert, K. 1993. Släkters hågkomst. Om bruket av bronsåldershögar, in: Lars Larsson (ed.). Bronsålderns gravhögar. Rapport från ett symposium i Lund 15-16/11 1991. Report Series No 48. Lund: Lunds universitet, 69-78.

Lindqvist, M. 2010. Återkomst och återbruk. Kulten av det förflutna under den yngsta järnåldern, in: Petersson, H. and Toreld, C. (eds.). *Utblickar från Munkedal – 10 000 år av bohuslänsk förhistoria*. Uddevalla: Bohusläns Museum.

Lundborg, L. 1972. *Undersökningar av bronsåldershögar och bronsåldersgravar i södra Halland. Höks, Tönnersjö och Halmstads härader under åren 1854-1970*. Halmstad: Hallands Museum.

Lundborg, L. 2007. *Undersökningar av bronsåldershögar och bronsåldersgravar i södra Halland under åren 1971-2001. Del 2*. Halmstad: Kulturmiljö Halland.

Nagy, B. 1976. Fornlämning 5, Bronsåldershög, Bunkeflo sn, Skåne. Riksantikvarieämbetet Rapport 1976 B30. Stockholm: Riksantikvarieämbetet.

Näsström, B-M. 2001. Fornskandinavisk religion. Lund: En grundbok.

Olivier, L. 1999. Duration, memory and the nature of the archaeological record, in: Gustafsson, A. and Karlsson, H (eds.). *Glyfer och arkeologiska rum. En vänbok till Jarl Nordbladh*. GOTARC Series A:529-535. Göteborg: Göteborgs universitet.

Olson, G. 1968. Rapport över slutförd undersökning av Raä 152:1-3, Raä 201:1,2 och Raä 208 samt fem härdgropar 1966. Stockholm. *ATA/4730/68*.

Pedersen, A. 2006. Ancient mounds for new graves. An aspect of Viking Age burial customs in southern Scandinavia, in: Andrén, A., Jennbert, K. and Raudvere, C. (eds.). *Old Norse religion in long term perspectives. Origins, changes and interactions. An international conference in Lund, Sweden, June 3-7 2004*. Vägar till Midgård 8. Lund: Lunds universitet and Nordic Academic Press, 346-353.

Rappaport, R. 1999. *Ritual and religion in the making of humanity*. Cambridge Studies in Social and Cultural Anthropology. Cambridge: Cambridge University Press.

Rudbeck, G. 1978. Fornlämning 99, stensättning, Viby, Solletuna köping, Uppland. *Riksantikvarieämbetet och Statens Historiska Museer Rapport. Uppdragsverksamheten 1978:46*. Stockholm: Riksantikvarieämbetet.

Ström, F. 1967. *Nordisk Hedendom. Tro och sed i förkristen tid*. Göteborg: Akademiförlaget.

Strömberg, B. 2005. *Gravplats – Gravfält. Platser att skapa minnen vid – Platser att minnas vid*. GOTARC Series B. Archaeological Theses No. 42. Göteborg: Göteborgs universitet.

Thäte, E. 2007. Monuments and Minds. Monument Re-use in Scandinavia in the Second Half of the First Millennium AD. *Acta Archaeologica Lundensia Series* 4/27. Lund: Lunds universitet.

Zuesse, E. 1987. Ritual, in: Mircea Eliade (ed.). *The Encyclopedia of Religion*. Vol. 12:404–423. New York and London: MacMillan Publishing Company/Collier MacMillan Publisher.

Notes on the contributor

Tore Artelius (1954 – 2011) worked for the Swedish National Heritage Board for around 30 years. He also was the president of the Swedish Archaeological Society and a lecturer at Gothenburg University. Artelius had a tremendous knowledge of graves, burial practices and traditions, both for the Swedish prehistory as for the Viking age. This article, which he handed in just weeks before his death, is an absolute testimony of his passion and knowledge.

Part I
Beyond monumentality

Memorious Monuments

Place persistency, mortuary practice and memory in the Lower Rhine Area wetlands (5500-2500 cal BC)

By Luc W.S.W. Amkreutz

Abstract

Visible monuments form the focus of many ideas regarding the structuring of the landscape and the relationship between communities and their surroundings. While these often durable markers are not static in themselves in that they are created, as well as altered and perceived differently over time, they only offer a limited perspective on what monumentalism may be. Other ways of investment in the landscape, particularly in specific places exists as well. These may include recurrent practices such as visiting, building, burying and renewing. While their effect may be less visual or lasting, they are performative in nature and through this facilitate commemoration. This creates a connection between past, present and future through place-bound remembering, which may be equally structuring in character. This contribution will focus on these types of practices within Late Mesolithic and Neolithic communities in the wetlands of the Lower Rhine Area.

Keywords: *Landscape, Lower Rhine Area, memory, mnemonic, monuments, mortuary practice, Neolithisation, performative, persistency, place ritual, wetlands*

Introduction

The focus of this volume is on visible, palpable monuments and their consistent or renewed role in the landscape and for communities over time. Naturally, such a perspective importantly draws on the enduring qualities of monuments and the way these form a physically and perceivably consistent factor in ordering, structuring and interpreting (Barrett 2006; Bender 1998; Whittle 1996, 256). While this type of monumentality of henges, barrows, megaliths and enclosures is by far most well-known and most easily adapts to our current affinity with monumentalism and its repercussions, it is perhaps not the only one. This contribution will demonstrate that different types of investment in places exist that could be interpreted as monumental as well.

I will focus on the communities in the Lower Rhine Area (LRA) that are in the process of Neolithisation between 5500 and 2500 cal BC and their continuous use of places. Because of the existence of cultural continuity over time it is possible to focus on consistent traditions with respect to place-use from the Late Mesolithic into the developing Neolithic. The existence of continued practices with respect

to place will be illustrated by three topics or scales of analysis, involving mortuary practice, building traditions and, briefly, the long-term use of places. Interpretation will focus on the interrelated dynamics existing between places, communities and, importantly, the characteristic aspects of the environment, in this case the wetlands and wetland margins of the LRA. By adopting this type of embedded, contextual approach, much in line with the dwelling perspective introduced by Ingold (2000), emphasis shifts from an abstract interpretation of monuments to a perspective aimed at detecting the practices and traditions underlying place-related behaviour. This may throw a complementary light on the importance of places over time and their recursive relationship to the communities visiting them.

Palaeogeographical and cultural framework

Before introducing the place related topics that form the focus of this contribution a brief introduction is given into the palaeogeographical and archaeological framework. The study area is situated on the western margin of the North European plain. There the Pleistocene uplands converge on a low-lying triangle of land delimited by the Scheldt basin to the south and the North German Niedersachsen coast in the north. While currently bordered to the west by the North sea, this distinction was much less clear for the time period studied. Between 6000 and 4000 cal BC marine influences and related groundwater levers created a succession of wetland landscapes (Louwe Kooijmans 1987, 227), consisting of five different zones with diminishing marine influences and salt conditions (see Fig. 1). From west to east these are coastal areas with beach barriers, bordered to the east by an area with tidal flats, salt marshes and estuaries (see Louwe Kooijmans 1987; see map '5500 BC' in Vos *et al.* 2011). East of this was a freshwater peat swamp with lakes, rivers and characteristic 'donken', riverdunes of a Pleistocene age forming high and dry inhabitable areas. Further east,in the apex of the triangle, a riverine zone can be defined bordering on the Pleistocene uplands.

Clearly, the area harboured many aquatic and other resources with respect to food and raw material procurement (Nicholas 2007), offering good opportunities for extended stays and investment. On the other hand the specific constellation of water, land and resources was far from static. Over time the continued rise in sea level and associated groundwater levels changed the landscape, while from *c.* 4400 cal BC onwards transgression ceased and peat growth increased (see Van Gijssel and Van der Valk 2005, 60). While resources can be designated as copious, their constellation and that of dry inhabitable places was dynamic. Often this shifting of patterns will have been gradual and foreseeable, but at times it could have been unexpected and perhaps dramatic (Leary 2009) and it will at least have been noticeable at a generational level. It is against this background of dynamic rhythms that a relationship between people, the landscape and the use of places should be understood (Amkreutz 2013; also see Lefebvre 2004; Sturt 2006).

Having sketched the long-term dynamics of the landscape, the archaeological record of the area also enables a long-term perspective of the cultural developments taking place within it. This is characterized by a very gradual transition to agriculture that can roughly be placed between 5000 and 2500 cal BC (Louwe Kooijmans

2007a). Over time a sequence of 'hallmark' Neolithic elements was introduced into the Late Mesolithic communities, while at the same time these retained many of their 'indigenous' elements and routines. This starts with indigenous pottery production (Swifterbant ware) around 5100 cal BC (at Hardinxveld-Polderweg and Hoge Vaart-A27) and includes the use of domesticates (cattle, goat, sheep and pig) at Hardinxveld-De Bruin between 4700 and 4500 cal BC and the first evidence for at least the consumption of cultigens around 4100 cal BC at Swifterbant-S3 and the Hazendonk (see Louwe Kooijmans 2007a; Out 2009, 411-420). Following the Swifterbant culture, occupation in the southern part of the Delta

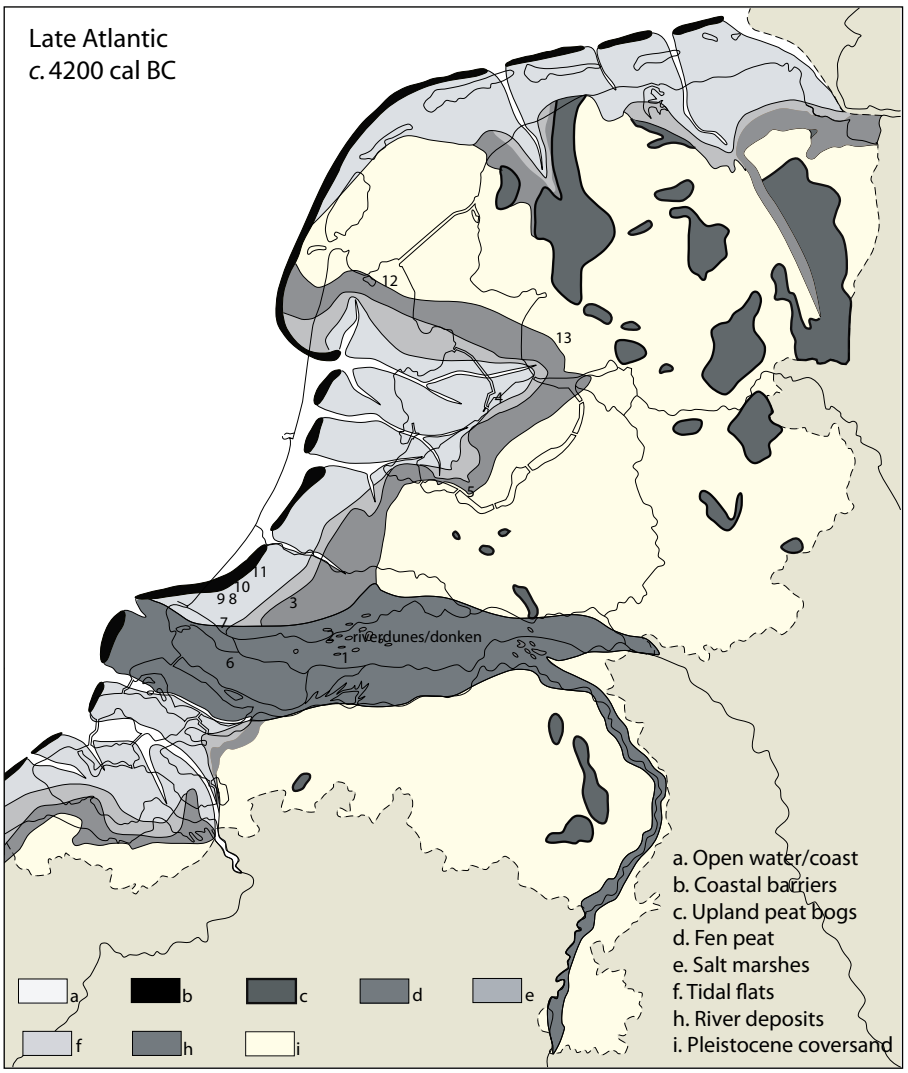


Fig. 1. The Lower Rhine area with its geographical background and a number of sites mentioned in the text:
1. Hardinxveld, 2. Hazendonk, 3. Bergschenhoek, 4. Swifterbant-S3, 5. Hoge Vaart-A27, 6. Hekelingen-3, 7. Vlaardingen, 8. Schipluiden, 9. Wateringen, 10. Ypenburg, 11. Leidschendam, 12. Slootdorp 13. Emmeloord
(map adapted from Van Gijssel and Van der Valk 2005, map 3).

is attributed to the subsequent Hazendonk group (from *c.* 3700 cal BC) which sees the first sedentary settlements, including evidence for crop cultivation and animal husbandry in the coastal zone at sites such as Schipluiden and Ypenburg (Louwe Kooijmans 2009). The Vlaardingen culture (3400-2500 cal BC) forms the last stage in the process of Neolithisation in the area. It demonstrates a mix in the contribution of wild and domesticated resources to the diet and diversity in housing, mobility and crop cultivation (Amkreutz 2010).

While the overall characteristics of this time period between *c.* 5000 and 2500 cal BC demonstrate a continued gradual development towards fully Neolithic communities, it is important to note that indigenous, hunter-gatherer aspects of society, such as the importance of wild resources and mobility, remain an important characteristic of these communities over time.

Having sketched the outlines of the palaeogeographical and cultural context, particular aspects of the long-term use of places by these communities will now be introduced. It is evident that they may be studied within a consistent, continuous cultural framework, but should also be placed against the dynamic environmental background and their relationship with it.

Mortuary practices: burying, abandoning, encountering

As funerary monuments are central in this book, it seems logical to start with funerary evidence first. An overview of all burial sites in the Lower Rhine Area has recently been published by Louwe Kooijmans (2007b). He concludes that we unfortunately are dealing with a limited selection, dictated by the chance of preservation. One general conclusion is the wide choice people had for dealing with the remains of the deceased (*ibid.* 2007b). An important aspect for the present discussion is that there are no indications that any of these burials were ever marked with visible or durable monuments like the barrows we encounter in later periods. At most a wooden post may have been used as a temporary marker (Raemaekers *et al.* 2007, 538). In spite of this absence of durably visible, let alone monumental markers, I will now argue that there are indications that such burial locations were valued as important sites for longer periods of time.

A first interesting case is the Late Mesolithic site Hardinxveld-Polderweg. The site was in use between 5500 and 5000 cal BC, together with the nearby site De Bruin (in use until 4500 cal BC). During its main occupation phase Polderweg was in use as a seasonal base camp, used in the winter half of the year by a small community of hunter-fisher-gatherers (Louwe Kooijmans 2003). These returned year after year to the same location to exploit the rich aquatic resources in the environment. At the Polderweg site, the grave of an elderly woman could stratigraphically be placed right before or during the first limited occupation of the site at *c.* 5500 cal BC (Smits and Louwe Kooijmans 2001, 421; see Fig. 2). This means we are dealing with a very early burial at this site, potentially a pioneer burial, or in more sociological terms, a 'founder burial' (see Helms 2007, 492). It is remarkable that one of the very first acts on the site is distinctly symbolic and that both during the subsequent intensive occupation of phase 1 as well as after, the grave remained undisturbed. This also was the case for one of the dog burials (G3). The other human grave at the site and the other dog burials were disturbed

by postdepositional processes, although it is unlikely that this involved intentional anthropogenic activity (Smits and Louwe Kooijmans 2001, 426). At the nearby site of De Bruin, however, half of grave 1, dating between 5300 and 5100 cal BC, was disturbed by the digging of a pit during phase 2 (Louwe Kooijmans and Nokkert 2001, 101; also see Louwe Kooijmans and Smits 2001, fig 13.3). The inhabitants must have been unaware of the grave or dug deliberately through it. However, a second grave was not disturbed. Both the Polderweg and the De Bruin burials cluster in a small area. The association between both sets of graves suggests the existence of a burial area, which, at least for some time and up to more than a century, formed a consistent element on the site.

For the subsequent Swifterbant culture (5100/5000-3400 cal BC) the small cemeteries and clusters of graves at Swifterbant-S2, (potentially) S4, S11, S21 and S22-23, Urk-E4 and P14 indicate the existence of more formal burial areas. Only a part of the group members who used the location were buried at these locations and children often are absent (Raemaekers 2006, 8-9; also see Louwe Kooijmans 2007b). The limited number of individuals that was buried suggests that these cemeteries functioned over mid to long-term time spans. This is further evidenced by the fact that the graves probably remained visible and may have been marked. At S2 and S22-23 and to some extent Urk-E4 there is an orientation visible among the graves (*e.g.* Deckers *et al.* 1980) which suggests continuing visibility

Fig. 2. Left: Hardinxveld-Polderweg. Late Mesolithic female burial (c. 5500-5300 cal BC).
Below: partially disturbed grave G1 at Hardinxveld-De Bruin (after: Smits and Louwe Kooijmans 2001, fig. 14.3 and Louwe Kooijmans and Smits 2001, fig. 13.3).

and/or knowledge on burial location. At Swifterbant-S4 a post may have featured as a marker for the child burial (Raemaekers 2006; Raemaekers *et al.* 2007). Furthermore S2, S11, S21, S22, Urk-E4 and P14 yield evidence for practices that indicate that graves remained visible, such as the manipulation of skeletal remains, multiple non-contemporaneous (re-)burials and superposition. A fine example is the burial at Zoelen-Beldert, which involved the internment of a young child and an adult woman, separated by a layer of soil and bark from a secondary internment of several bones of another adult woman (Raemaekers *et al.* 2007).

The existence of formal and continuous burial places has also been documented for the Hazendonk group. The most informative site is Ypenburg, occupied in two main phases (3/C and 11/K) between 3860 and 3435/3200 cal BC (Houkes and Bruning 2008). It is situated on a relatively low dune in the coastal plain and its occupation is characterised by a number of houses and a cemetery on top of the middle part of the dune. In an area of approximately 40 x 20 m, 31 graves comprising the remains of 42 individuals could be documented (Baetsen 2008; Houkes and Bruning 2008). The graves were grouped in two clusters, 5-10 m apart (see Fig. 3). While one of the clusters postdates phase 3/C at that location it is difficult to attribute the graves to any of the Ypenburg occupation phases in particular (Houkes and Bruning 2008, 109; Louwe Kooijmans 2009, 46). Among the graves there is a distinct diversity in burial traditions. Seven graves also contained more than one individual. The evidence from the burials indicates

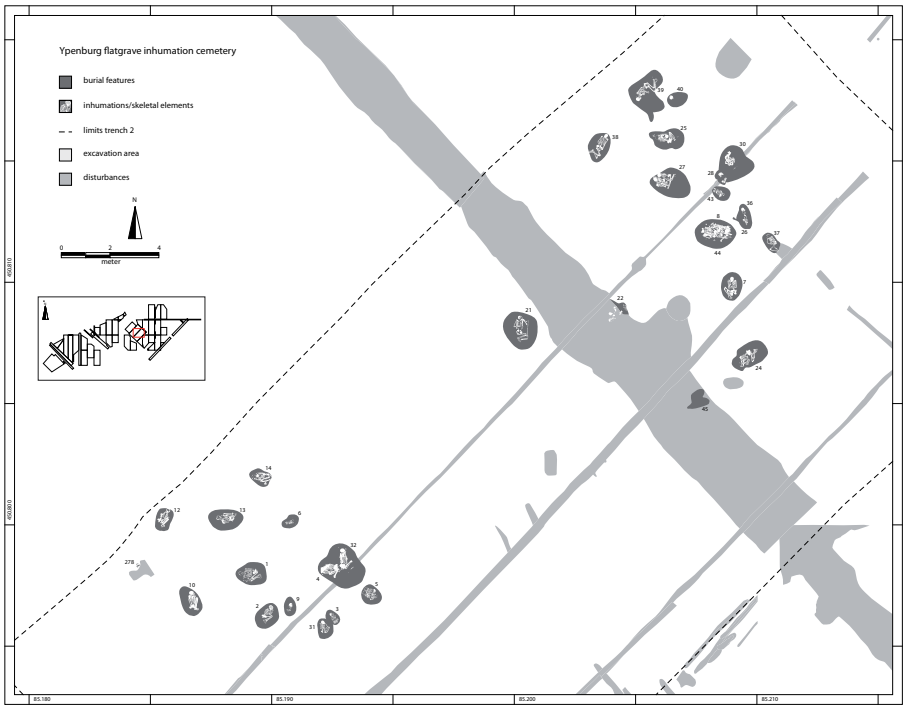


Fig. 3. Overview of the Ypenburg burial site (after Baetsen 2008, fig. 7.1. Drawing by Mikko Kriek. Courtesy of Hazenberg archaeology).

re-opening of the graves, second and third internments and handling of the bones (see Baetsen 2008).

There is evidence that graves remained recognizable, due to the clustering and the fact that on several occasions a younger burial pit interfered or was dug into an older one without significant disturbance of the older burial (Baetsen 2008, 141). Of the 32 features only two were cross-cut by younger ones. Another important site nearby is Schipluiden. The site can be characterized as a permanent settlement occupied between *c.* 3600 and 3400 cal BC. Consistent clusters of posts and the corresponding rubbish dumps and enclosing fence are indicative of approximately four households that occupied the site in a sedentary fashion. Stockfarming (especially of cattle) was important and the occupants also grew emmer and naked barley on the high salt marshes, yet wild plants and especially fish formed an important component of the diet (see Louwe Kooijmans 2006; 2007a).

At Schipluiden six burials clustered within one corner of the inhabited dune, although the earliest and latest of these were located at some distance from the others. The graves can be attributed to the entire span of occupation and show similarity in burial ritual and orientation (Smits and Louwe Kooijmans 2006; Louwe Kooijmans 2007b). One of the burials contained two individuals. The absence of disturbance and the similarities noted suggest the existence of a formal burial area that may have been used for over two centuries.

For the subsequent Vlaardingen culture (date 2500-2000 cal BC) evidence of mortuary practice is less informative. The site of Hekelingen yielded two cremations as well as a potential excarnation platform with skeletal remains found underneath (Louwe Kooijmans and Van de Velde 1980). The fact that an excarnation platform was built close to the camp-site of M1, suggests a visible mortuary feature in the vicinity of the domestic settlement. Other sites also yielded, often dispersed, human remains. This latter category is of importance since many sites within the period and region studied yielded isolated human bones among domestic settlement debris (Louwe Kooijmans 2007b, table 1; Amkreutz in press). Clearly the abandonment or deposition in or on settlement sites formed a characteristic feature of the mortuary practice of these communities for over two millennia (Louwe Kooijmans 2007b, 572). Based on the documented human remains evidence exists that overall inhabitants were more likely to end up like this than to be buried (Smits and Louwe Kooijmans 2001, 432).

Keeping the ancestors near

Of importance for the examples introduced above is the spatial and partially temporal convergence of ritual activities such as burial and deposition of human remains on (domestic) settlement sites is. From the Late Mesolithic onwards these seem to make up a distinct part of everyday domestic life as they spatially are almost all situated within the actual activity and habitation areas, or directly on the edge of these (see for example the burials at Hardinxveld Polderweg and De Bruin, Swifterbant S2, S11, S22-23, Urk-E4, P14, Ypenburg, Schipluiden, Vlaardingen and Hekelingen). While spatial association suggests everyday confrontation and interaction, it is not informative on the nature and regularity of this. Some

additional evidence is available. The potential time span covered by certain burial locations, such as the one at P14 (Gehasse 1995, 75) and to a lesser extent, for example, Ypenburg, indicate that interaction with the deceased and ritual behaviour associated with mortuary practices was an important and recurring place-bound aspect in the context of settlement activity. Such an assumption is substantiated by additional evidence such as the general orientation of graves, manipulation of skeletal remains, multiple non-contemporaneous (re-)burials and superpositioning of graves (*e.g.* Baetsen 2008; Houkes and Bruning 2008; Louwe Kooijmans 2007b; De Roever 2004; Raemaekers *et al.* 2007). While this could not be demonstrated at all sites to the same extent, this type of behaviour suggests genealogical links between the living and the dead, or at least a sense of familiarity. Occasionally, such as at Hardinxveld and possibly Swifterbant-S4, burials formed part of the pioneer activities at a site, or took place or continued when domestic occupation (temporarily) ceased (*e.g.* Swifterbant S2). The presence of scattered remains among the settlement debris and the presence of cut marks and burnt patches on some of the human bones from Hardinxveld (Smits and Louwe Kooijmans 2001, 430) suggest that body parts or bones may have been deliberately used or kept within a domestic context (see Fig. 4). For this there are of course many ethnographic examples, for instance among the Papuans of New Guinea (also see Parker Pearson 1999). These practices signal that the deceased were kept near to the place of the living, if not (perhaps temporarily) physically among them. It also indicates that the deceased may very well have formed a stable and continuous element in the life histories of sites.

Adopting a wider scope and longer time-frame further underlines the spatio-temporal coincidence or succession of domestic and ritual (burial) activity. At certain sites cemeteries and burial grounds remain a stable factor in the build-up or layout of a site (*e.g.* Ypenburg and Schipluiden, P14), while at other locations (*e.g.* Hardinxveld-Giessendam Polderweg and De Bruin; Swifterbant-S2; Swifterbant-S4; Swifterbant-S21-23), there seems to be evidence for an alternation of functions during which cemeteries were either a continuous element, follow-up or basis for other site uses. The spatial coincidence of these different functions suggests a convergence of different aspects of site use and a multi-stranded social entanglement with places. A clear-cut example in this respect is formed by the mortuary practice of body treatment resulting in scattered remains on settlement sites among settlement debris (see Fig. 5). This practice has been documented

Fig. 4. Cut-marks documented on a clavicle from the Mesolithic site of Hardinxveld Polderweg (after: Smits and Louwe Kooijmans 2001, fig. 14.12).

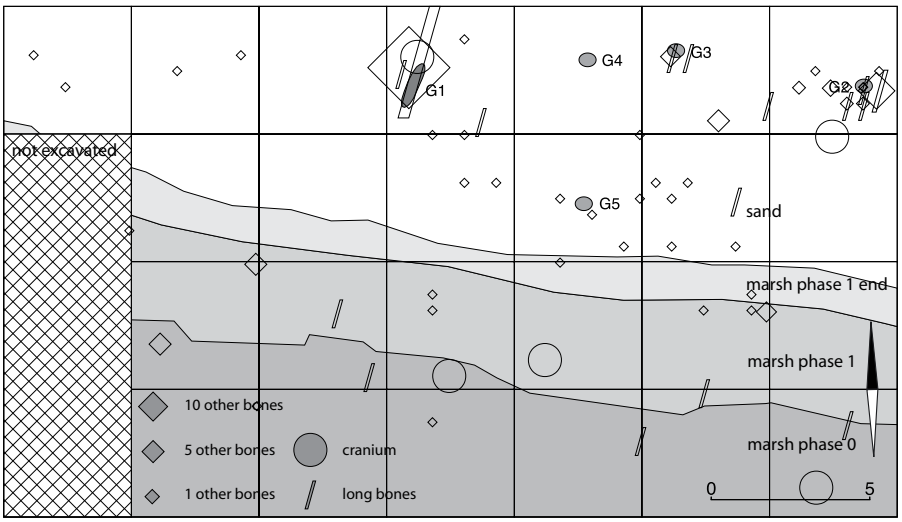


Fig. 5. Distribution of human skeletal remains at Hardinxveld-Giessendam Polderweg (phases 0, 1 and 2 combined). The size of the symbols corresponds with the number of remains (adapted from Smits and Louwe Kooijmans 2001, fig. 14.7).

for over two millennia at various sites in the wetlands and wet margins (Louwe Kooijmans 2007b, 572). It clearly indicates the degree to which everyday practice and activities with clear socio-symbolic connotations interact.

The presence of burials within or directly next to the domestic sphere is not unique. It has for instance been documented among the buildings of Early Neolithic Çatalhöyük (Düring 2007; Hodder 1990) and at various other places. For the Late Mesolithic and Neolithic in the wetlands and wet margins of the LRA it is, however, a distinct tradition that should be interpreted within its own context and that potentially differs from other burial traditions as recorded for the Linearbandkeramik culture (LBK), Michelsberg culture (MK), Funnelbeaker culture (TRB), Stein Group or upland Late Neolithic (see Louwe Kooijmans 2007b). There settlement burials appear to occur only sporadically, although taphonomic factors should be taken into account here as well.

Bones anchor place

There may be many reasons for keeping the deceased in the immediate vicinity of the domestic world, but all basically indicate a convergence of both the living and the dead within the context of distinct places. If we follow along the (ethnographically inspired) lines of Brück (1999), Koch (1999) and others (*e.g.* Carlsson 2008; Conneller 2006; Descola and Pálsson 1996), then there is no distinct division between the natural and cultural world, or between the world of the spirits and ancestors and the one of the living. The deceased and hence ancestors may form a continuous presence at sites even when occupation may cease seasonally or for a longer period, or when the function of a site changes. 'Burying where living' therefore has a potentially strong connotation as a socio-symbolical marker of community presence and community boundaries (*cf.* Cohen 1985).

This may relate to territorial claims, but much more likely involves an expression of identity and a creation and fixation of a familiar world (also see Carlsson 2008, 273). Several parallels may be mentioned. Helms (2007, 492-493) in a discussion of various aspects of houses and house life in archaeology, suggests an existential connection between human mortality, fertility, the living and the ongoing life of the land and the social house (or lineage). In some cases fixed burial sites may in this respect have been precursors for sedentary residence of the living. Human burials within the domicile furthermore express recognition by the living members of the house of a component of their membership that now exists in a different existential realm or context. The deceased, however, remain of influence on earthly life and form an indispensable cosmologically liminal link connecting the living to a specific spatial locale and lending them a certain political-ideological legitimacy (*ibid.*, 493). These notions may also apply to the sites discussed here if we widen the perspective of the house and the domicile to include the settlement as a whole. Boric (2007, 108), discussing houses and settlements of the Vinča culture in the northern Balkans argues for an interdependency between the dead, the living and the settlement, in that the dead in fact permanently inhabited the places to which the living community repeatedly returned. Heitman (2007, 264) and Helms (2007, 494), further stress the way in which bones of the deceased metaphorically tie people to places: 'bones anchor place'. As argued by Littleton and Allen (2007, 294-295) burials may have structured subsequent use of certain locations. Their presence, if only in the form of dispersed remains, probably formed a meaningful and deliberate investment and demarcation of place.

The examples above demonstrate how ancestors may emphasize the importance of a place, bolstering community identity and creating a sense of belonging that even surpasses phases of periodical or more permanent abandonment. The tradition of burial and deposition within the settlement context accentuates the multiple roles of settlements and stresses the importance of certain places. In this case to communities in the wetlands and wet margins of the LRA. The importance of creating such durable connections to places becomes more meaningful in view of the dynamic surroundings of these sites. As documented in several places burials, from the Mesolithic onwards, are sometimes distinctly associated with water (*e.g.* Zvelebil 1997; 2003b; Zvelebil and Jordan 1999) as for instance at Skateholm I and II, Olenii Ostrov, Zvejnieki; Téviec and Hoëdic (Larsson 2003; 2004; Nilsson-Stutz 2003). In his discussion of the burials and depositions at Swifterbant sites, Peeters (2007, 232) also postulates a spiritual landscape where ritual behaviour is on a par with the secular function of sites and water may have had a significant role, due to the fact that most burial sites are siuated in 'island' or 'peninsular' locations. This balance between water and land, wet and dry seems a feature that is characteristic of the communities studied here and also finds expression in ritual activity. Larsson (1998, 71) is more explicit when discussing the Late Mesolithic Skateholm burials. He argues that the practice of burying on the waterline is possibly a response to stress created by natural processes that resulted in the submergence and the reduction of land area available for hunting and gathering. This may be a form of territorial marking, not so much with respect to other societies as against the changeability of nature, which threatened the social and

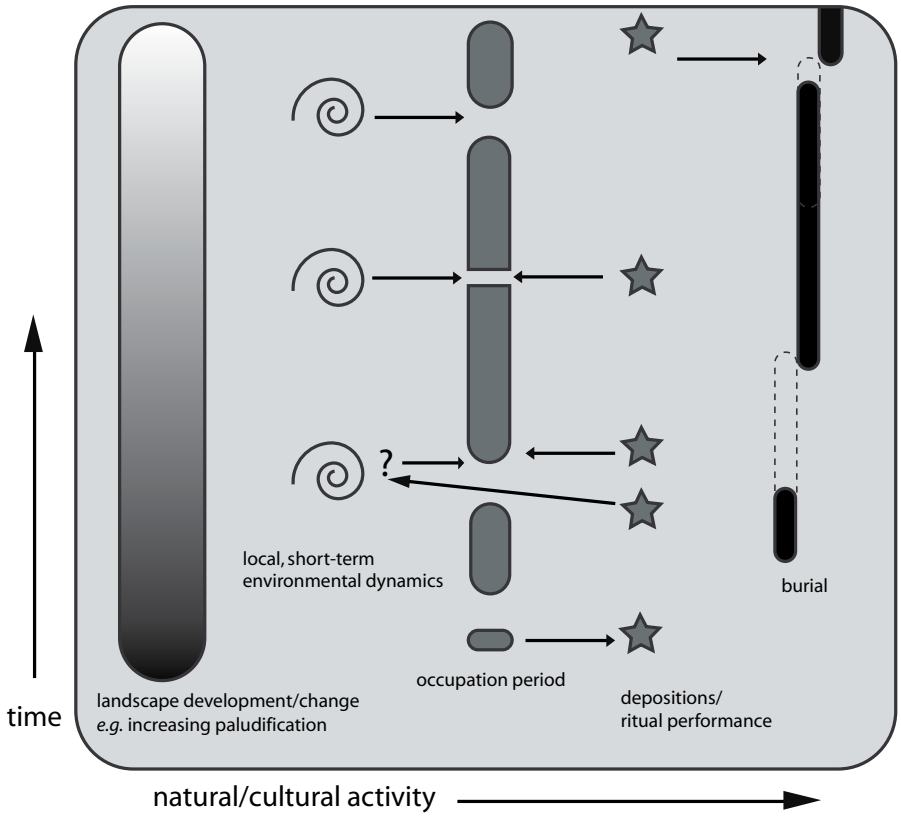


Fig. 6. Schematic representation of the hypothetical relationship between ritual activity such as burial and deposition in relation to the occupation of places and the changing landscape and environment. As illustrated here, burial grounds or cemeteries may provide an (ontological) idea of continuity related to place, while other activities, such as deposition may have marked occupation start, abandonment or specific events.

intellectual situation of humankind. According to him (*ibid.*) this practice can be seen as an attempt to halt nature changing and prolong the status quo. Similar motivations may also have inspired ritual behaviour at settlement sites of the communities studied here. They seem related to the abovementioned importance of places in relation to the dynamics of the environment. The potential role of burials and other ritual practices such as the deposition of objects and human remains has been visualized in Fig. 6.

Occupation practices: building, renewing, maintaining

The examples introduced above, burial in particular, may be interpreted as distinctly symbolic if not ritual practices (Hertz 1907; Nilsson Stutz 2003; Parker Pearson 1999). This makes them stand out, at least partially, as conscious acts that are not necessarily within the mundane sphere of everyday life. Perhaps less evident but equally important is the effect of functional, routine practice in creating meaning and the effect of continuity with respect to places.

Repetition and place continuity

The main point already raised above is that throughout the Late Mesolithic and Neolithic occupation of the wetlands and wetland margins, settlement as well as satellite sites have yielded conclusive evidence that certain structural site features as well as domestic, extractive and symbolic activities (*cf.* Peeters 2007, ch. 5) are characterised by frequent repetition in combination with place continuity. Domestic (dwelling) structures, cemeteries, hearths, fences and other features were maintained in the same place. This is for example evidenced by the clusters of posts at sites such as Schipluiden, Vlaardingen, Ypenburg and Hekelingen or the renewal of hearths and living surfaces at Bergschenhoek and Swifterbant-S3 (Amkreutz 2013). People practise the same activities at the same spot for generations or longer. Extractive sites are maintained and revisited for decennia and wet circumstances and damp living conditions are countered by the consolidation of occupation surfaces (*ibid.*). The patterns documented are not always each other's mirror images at all of the sites, but accentuate common principles in practice.

At first glance these principles may be considered unsurprising, or even trivial since their material residues can be interpreted as the mere result of the repeated use of certain convenient locations in combination with the reward of beneficial or strategic practices. These principles are often rooted in the (expected) functional or economic benefits of certain locations, related to issues such as mobility, risk, opportunities and optimization of behaviour (*e.g.* Kelly 1995; Winterhalder and Kennett 2006). Over time issues of territoriality and ownership may be added to the spectrum as well as the presence of already existing site infrastructure and a managed landscape (Schlanger 1992). Sites in this respect become persistent places in our interpretation because they are ideally located. They remain persistent in our interpretation because the behaviour at these sites is often considered optimal, they have been invested in and may, therefore, have become traditional. This functional perspective on sites offers a primary explanation for their longer term use over time. However, additionally, understanding may be gained from a perspective which focuses more on the interaction and dynamics of places, communities and environment within a regional context. Emphasis here lies with the additional (socio-symbolic) importance places may have had to the communities using them, by focusing on the way in which locations, communities and environment recursively influence each other. Places in this respect actively structure behaviour and may acquire ontological importance in relation to issues of memory, the past and larger changes in the landscape. The potential nature of this relationship will be discussed below, but certain observations may elucidate its existence:

- Many sites are situated in locations that frequently experienced wet conditions, or (seasonal) flooding (*e.g.* Bergschenhoek; Swifterbant-S2; Swifterbant-S3; Hoge Vaart; Hüde I; Hekelingen-3; Vlaardingen; Slootdorp; Schipluiden). It is likely that other, potentially dryer, options for occupation were available nearby, but people chose certain locations and held on to them, coping with the negative effects. This behaviour is, for example, witnessed in the Swifterbant area (see De Roever 2004, Fig. 1) and the Alblasserwaard (see Verbruggen 1992, 117-119; Louwe Kooijmans and Verbruggen 2011). In the latter case

there is an archipelago of more than 100 riverdunes, yet a small location as Hardinxveld-Polderweg was chosen and used until it 'drowned'. Other dunes were also situated in the vicinity of Brandwijk or the Hazendonk (*e.g.* Van Gijn and Verbruggen 1992, 349; Louwe Kooijmans 2005, 261; Zeiler 1997, 111), while Schipluiden was also located on a low and small dune in a beach plain with larger and dryer sites nearby (Mol 2006; Mol *et al.* 2006).

- The previous point demonstrates a commitment to place, yet there is also a commitment in practice. Sites were continuously visited and under ever-increasing wet circumstances, but they remained in use until they became uninhabitable. Sometimes site function shifted. A good example is formed by the relationship between Hardinxveld-Polderweg and Hardinxveld-De Bruin where the major emphasis in occupation shifted to the latter location, while the other one was supposedly used as an extractive location (Louwe Kooijmans 2003). On other occasions people distinctly continued using sites in the same manner. At the special activity site of Bergschenhoek and at the domestic site of Swifterbant-S3 the living surface was renewed at every new occupation to counter wet conditions and facilitate continued use. Similarly, domestic occupation at the Hazendonk continued while the inhabitable site surface decreased from 12500 to 4000 m^2 in 1500 years (Louwe Kooijmans 1985, 124; see Louwe Kooijmans and Verbruggen 2011). It appears that while the composition of the faunal spectrum over time became more aquatic in nature (Zeiler 1997), due to the environmental changes taking place (see Van der Woude 1981), the site remained occupied as a base camp (see Fig. 7). Later on, at Schipluiden a different variant may be witnessed. There a shift from brackish to fresh conditions did not lead to significant changes in occupation, nor to shifts in the food economy (*e.g.* Louwe Kooijmans 2006). Apparently the Schipluiden inhabitants managed to continue their own 'way-of-life', despite noticeable changes in the environment. It appears that rather than abandoning sites, people were flexible in maintaining their use of them, either by investing in the location, or by adapting or attuning strategies to changes in the environment.
- The consistency in using and maintaining distinct places may also be witnessed in more subtle practices. One of these involves the fact that across the wetlands and wet margins many structures were made of perishable wood species, predominantly alder. The mean diameter of the posts used does often not surpass 5-10 cm. Even when more durable wood species were available nearby, such as for instance at Swifterbant (see Casparie *et al.* 1977, 39; Ente 1976), or occupation became sedentary as at Schipluiden and Ypenburg, there was no distinct transition to durable wood species or long-lasting durable structures and building practices. Also, in the vicinity of Ypenburg there is evidence for stands of *Alno-Padion* vegetation, including oak, yet alder remains the most frequently used wood species (see Enderman 2008, 111; Kooistra and Hänninen 2008, 351-355). This indicates that the frequent rebuilding of structures was a characteristic feature of occupation in these areas. Sites such as Swifterbant-S3, Leidschendam and especially Vlaardingen and Schipluiden also demonstrate the place consistency in these rebuilding

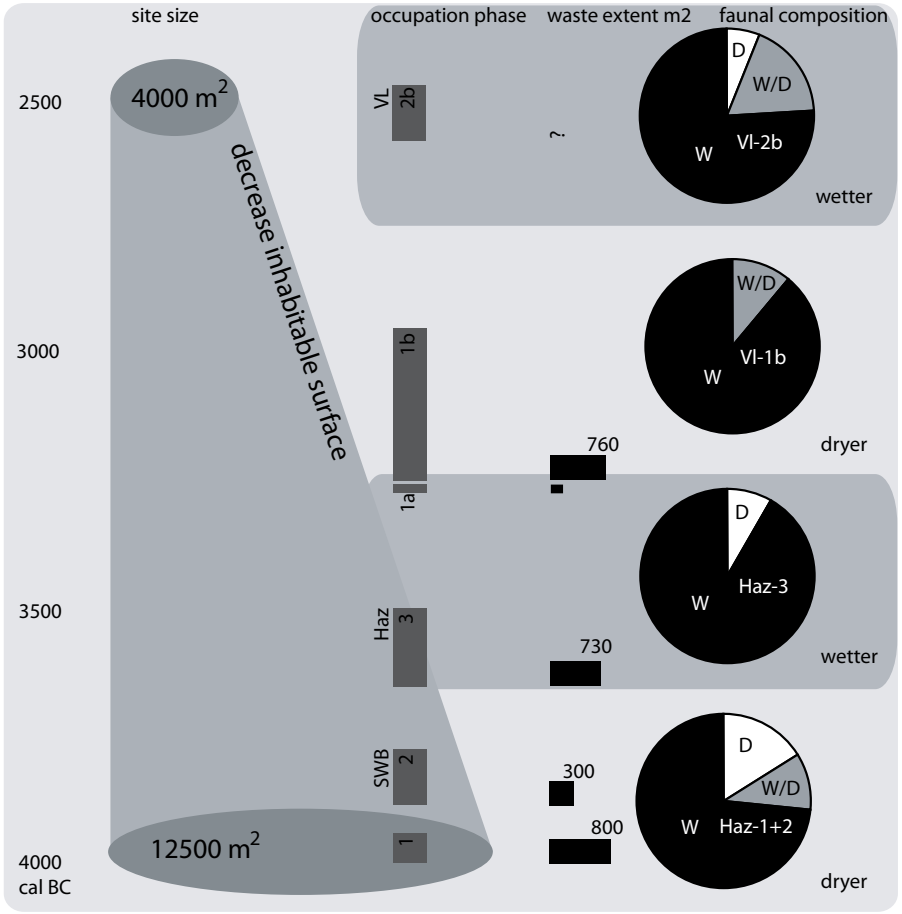


Fig. 7. Schematic overview of the different occupation phases of the Hazendonk site in relation to site size, occupation extent (waste), faunal composition (based on Zeiler 1997) and simplified changes in the environment (w=wild; d=domesticated; w/d=indeterminate).

activities (see Louwe Kooijmans 2009). At the latter site these resulted in dense clusters of posts from which individual houseplans could no longer be isolated, but which testify to place continuity over centuries (Fig. 8).

Similar practices also are witnessed in the overall use and structure of the site. This is, for instance, witnessed in the persistency of the house and water well areas at Schipluiden, or the graded (occupation-activity-waste) use of the Hardinxveld sites from the top of the dune to its foot (see Louwe Kooijmans 2003). Place consistency also is witnessed in the location of certain features. For instance at Swifterbant-S3 certain hearths, both in and outside the living structure, were renewed in the same place for many years, up to a century (De Roever 2004, 32). The clay bases served as reinforcement and enabled place continuity. Similarly, at the Bergschenhoek fowling camp, some 38 layers related to hearth renewal in the same place over a period of some ten years (see Fig. 9).

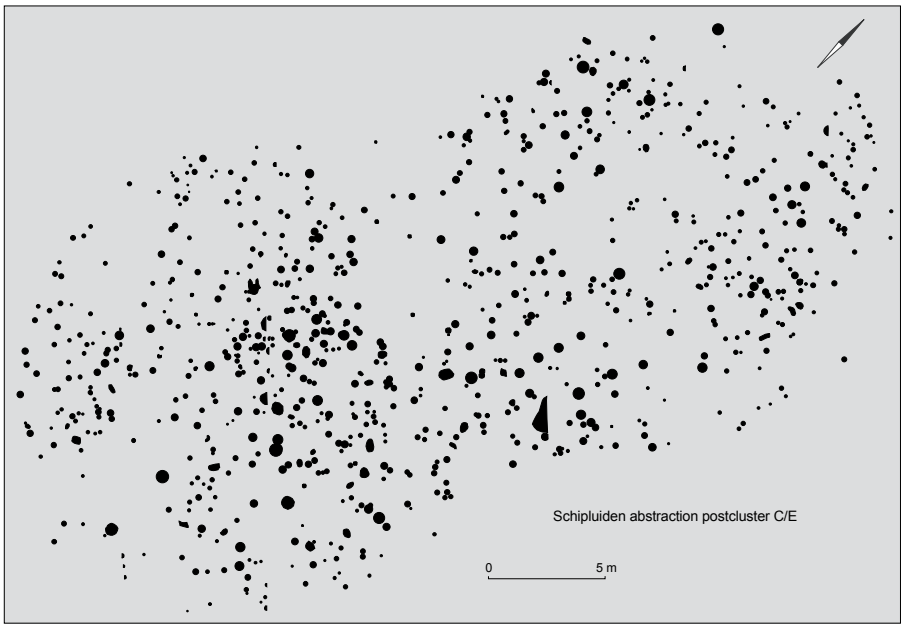


Fig. 8. Clusters C/E at Schipluiden, representing a number of houses or dwelling structures consistently rebuilt in the same place (adapted from Louwe Kooijmans 2009).

Fig. 9. The Bergschenhoek hearth. Note the layering in the stratigraphy (photo: National Museum of Antiquities).

It appears that apart from purely functional or perhaps rational motivations, the overall evidence for place continuity and place-bound repetition and renewal suggests that other ideological motivations may have underlain this as well.

- As argued above, an important point is the fact that the overall character in occupation and the practices of frequent renewal and place continuity did not change considerably when communities became sedentary. This is for example witnessed at Schipluiden and, to a lesser extent, Ypenburg. The renewal of structures at Schipluiden and Ypenburg, the zone of water wells at Schipluiden and the different phases of the fence confining this site, in combination with the recurrent use of a particular area for burial at both locations accentuates the importance of 'doing things in the right place'. This does not differ distinctively from the place consistency at, for instance, Swifterbant-S3 where structures and hearths were also renewed and repeated in the same place. In fact, although certain elements differ per site one may argue that the principles of repeated maintenance and renewal, choice of materials and place consistency was equal to, for instance, Swifterbant-S3. Moreover, from a long-term perspective there are many commonalities in the occupation of the wetlands and wetland margins over time, indicating little change in the nature of habitation may have taken place.

Long-term dimensions of site use

Above different aspects of investment in places, relating to both ritual as well as mundane practices, have been highlighted. These demonstrate that people actively maintained places and that over time these remained stable elements in their mobility rounds and routine livelihood. A different perspective is offered when these sites are reviewed from a distinct long-term perspective. This offers an idea of the extent to which certain locations remained of importance and the permanency of their role. The rationale behind combining different time-scales is related to the idea that these do not operate separately. The type of persistence sketched above is essentially of a short to mid-term nature, involving generational and intergenerational timespans, rather dealing with decades than centuries. In other words, there is often a more or less direct and unbroken link in time and functional use of a location (*e.g.* Borić 2007; Marshall 2000; Souvatzi 2008; Tringham 2000). In contrast to the analysis above, but building from it (Foxhall 2000), the focus now turns to mid-to long-term dimensions of persistent places. This means a shift in perspective towards that of conjunctures and the *longue durée* (Braudel 1966; also see Bailey 2007), towards centuries and even longer. Such a perspective includes the gradual, often irreversible changes in the landscape and documents episodes of increased use-intensity of sites as well as longer periods of absence. These longer-term rhythms of dwelling in the landscape (Ingold 2000; Lefebvre 2004), of the waxing and waning of sites as it were, of course surpasses the quotidian rhythms of routine practices that form the 'everyday' context of existence (*e.g.* Whittle 2003, 22). However, they are eventually built from them (see Foxhall 2000), which implies that the rhythms characteristic of different

timescales are not separate, but find themselves on a continuous scale. They interact and interweave, are encountered, reiterated and reinterpreted. Therefore the dynamics underlying the short-term rhythms are also informative on the longer-term patterns analysed here (Foxhall 2000; Gerritsen 2008; Goodman 1999; Ingold 1993; 2000; Lefebvre 2004).

Long-term commitment

As argued by Louwe Kooijmans (1993, 90), the duration of occupation of a site, irrespective of the degree of permanency (*i.e.* yearround or temporarily), is informative on the stability and continuity of the communities involved. Based on this statement it may be concluded that many sites in the delta demonstrate use over several or many centuries. Even a small extraction camp as Bergschenhoek demonstrates this continuity, with a repeated use of over 10 years. This suggests the existence of rather stable settlement systems with long-term continuity.

On the other hand, it is difficult to find evidence that unambiguously points to the sense of commitment to places that is suggested. Several aspects that potentially mark behaviour related with the socio-symbolic importance of using and re-using certain locations can be found on various interacting levels. Some of these are distinctly short-term and have been discussed above. A first indication for long-term commitment is the distinct life-history of many sites. Many sites have yielded evidence for multiple occupation phases, often separated by many decades and with different functional uses.

The occupation of the twin sites at Hardinxveld lasted *c.* one millennium (see Louwe Kooijmans 2003) during which these locations were used both as domestic and extractive sites, in a changing landscape (see Louwe Kooijmans 2001, 518). Apart from an initial presence at the Hazendonk site around 5840 cal BC, an intermittent occupation span of more than 1500 years could be documented, during which domestic occupation of the site took place in changing environmental conditions (Louwe Kooijmans 1985; Zeiler 1997). The site of Hoge Vaart (*c.* 5500-4000 cal BC) was in use during approximately 2500 years. Apart from occupation during the Middle- and Late Mesolithic characterised by hearth pits, the dune also was occupied during the early Swifterbant culture, at which time the landscape changed, containing more open water and developing reed swamps. After this domestic phase the site was covered with peat, after which it appears to have been visited only sporadically. After this a final use of the site is clearly extractive and wetland oriented as evidenced by the find of three fish weirs (see Peeters 2007). Another distinct example is formed by the site Schokland-P14 where occupation took place over two millennia (*c.* 4400-2000 cal BC). Occupation is of a distinctly domestic nature and dates to different periods (Swifterbant, TRB and Late Neolithic), combined with occasional burials. During the Early Bronze Age, as the landscape became increasingly wet, the site is used in an extractive manner, probably for fishing and cattle herding (see Ten Anscher 2012; Gehasse 1995).

Also within the time frame of several centuries, a distinct commitment to places may be sketched. At Swifterbant-S4, for instance, occupation is initially of a domestic nature, possibly preceded by use of the site as a cemetery (although this

also may be contemporaneous). After flooding the site is abandoned. Domestic occupation might have shifted to nearby S3 and the location of S4 is used as an agricultural plot. After yet another phase of flooding the site is used as a settlement location again. All of these events take place roughly between 4300 and 4000 cal BC (see Huisman and Raemaekers 2008; Raemaekers et al. 2005). A similar continuity in the use of sites may also be sketched for Schipluiden, where the domestic occupation of the site was characterised by a brief hiatus and was followed by an episode where a small structure was constructed on top of the gradually drowning dune, which perhaps facilitated the extractive use of the site. After the site was abandoned completely, it saw renewed, probably extractive use between 2300 and 2000 cal BC during the Bell Beaker period (Louwe Kooijmans 2006).

Continued use

Above only a number of examples could be sketched that support the continued role places had in the settlement system of communities over time. Sites saw functionally different and interspersed use because of changed circumstances in the surroundings. The decreasing occupation area at a number of locations eventually frustrated a domestic use. Yet, the specific and recurrent targeting also may have happened for other, socio-symbolic reasons. Given the dynamic nature of the environment in convergence with the social dynamics of the communities involved, one could also perceive the repeated use of the same location from an active community-based perspective and interpret it as meaningful. Apart from the shorter-term repetition of activities at sites and symbolic investments such as burials and depositions, the long-term commitment to places stands out in view of both the changing environmental and landscape circumstances as well as the potential availability of other locations nearby (see Van Gijn and Verbruggen 1992; De Roever 2004; Verbruggen 1992; Zeiler 1997).

If we incorporate ethnographic arguments and case-studies then it is unimaginable that socio-symbolic arguments would *not* have formed an important incentive to use and re-use the same locations (see Cohen 1985). With regard to the economic and practical benefits of site re-use, and the political and navigational qualities of fixed places with respect to territorial, or interactive activities, the idea and impact of a historical landscape should not be underestimated (also see Cooney 2000, 78; Ingold 2000, 200; Whittle 2003, ch. 5). The importance of achievements and choices of previous generations as well as more abstract phenomena such as ancestors and place-bound community myth and lore would have formed crucial incentives to use and re-use certain locations (*e.g.* Arnoldussen 2008; Casey 1996; Cohen 1985; Feld and Basso 1996; Fontijn 2008; Gerritsen 2008; Jennbert 2005; Politis 2007; Pollard 2000; Rival 2002; Whittle 2003; Zvelebil 2003a). For these many examples can be formulated that all indicate that community values seem to be bound up in and relate to place (Casey 1996, 24; Geertz 1996, 261). Locations therefore function as places of memory and *foci* for the definition of social identity (*e.g.* Gerritsen 2008, 158).

Discussion

Different aspects of site use and in particular commitment to places, involving different time scales have been introduced above. In the following a number of arguments will be introduced that elucidate how these different aspects may be understood in relation to each other, against the context of a changing environment and in view of the creation of stability.

A meaningful consistency

If we assume that continued activities of revisiting, repairing, maintaining and rebuilding, at specific, fixed locations in the landscape should be seen as meaningful behaviour then we should ask ourselves why they were practised and what goal they served. Tringham (1995, 97) argues that there is a need to interpret the domestic record in terms of the interplay of architecture and its surrounding landscape as an arena and construct of social action. This means we should shift our focus from the activities and long-term use of sites themselves, to the way in which they relate to and interact with other scales, most notably with the wider landscape as well as time (Chadwick 2004; Geertz 1996). Places, fixed locations in this sense are also the site where social relations become anchored and develop (see Cooney 2000, 56).

The dwelling perspective (Ingold 2000), with at its core the relationship between individuals, communities and their environment offers a temporal perspective on the way habitation is bound to places and is attuned to the rhythms of the surrounding environment (also see Pollard 1999, 79). On the level of communities and inhabitants, the accumulative outcome of this behaviour over time is a result of practice and memory.

Memory maintenance

If we try to determine the essence of the practices discussed above, it is the repetitive nature of the *habitus* of these communities in combination with the place continuity observed, that may point to an act of re-creation. A few examples may be reiterated. The repeatedly raised surface at Swifterbant S3 and Bergschenhoek enabled an extended use of these location over time, while the consistency in activities and architecture provided a familiar and relatively unchanged context for living. Every return to Swifterbant and Bergschenhoek was in a sense a return to past visits, either by encountering or by renewing its structural conditions. The clustered and fenced-in layout of Schipluiden also implies a high degree of continuity. Due to the fact that it is a permanent site this may seem partially self-evident, but it is the consistency in activities and place-bound behaviour that creates such permanency. There were fixed house sites and fixed yards, relatively constant activity areas and spatially clustered water wells. Life at Schipluiden was sedentary, but for a group of *c.* 25 people, the structuring material conditions of it also remained relatively unchanged for up to 200 years or 10 generations. Activities of maintenance and renewal at sites like these created a certain (artificial) stability and consistency in living conditions. The everyday, often domestic essence of livelihood in this way was, as it were, stretched across time and in the acts of repetition and continuity

there is an extrapolation of a known and familiar environment. The burial areas at some of the Swifterbant sites, Schipluiden and Ypenburg in particular formed a complementary, more ritual affirmation of place importance over time (*cf.* Louwe Kooijmans 2006, 486).

Memory mechanics

The practice of repetition is most likely seldom distinctly intentional. Underlying much of the behaviour mentioned are routines. People confront and draw upon the past by remembering, copying and repeating what has been before (Bailey 2007; Thomas 1996) and the past acts as a reservoir for action in the present and towards the future (Gerritsen 2008, 145). Memory and the creation of memory bind these different temporalities together. The way in which this takes place is predominantly indexical (Jones 2007, 18-22); past material residues are encountered, recognized and reinterpreted, certain places and sites are designated for this or that activity, the remnants of a structure are re-discovered and outline the building site of a new one. 'Keeping things in place' consolidates the values attached to them and thus acts as an index of the past. In this sense objects, structures and patterning encountered, regardless of their state, convey in their physicality and materiality (Ingold 2007; Renfrew 2004) an often subliminal meaning of importance to these communities. Moreover, the physical perdurance of material culture and places and the sensory engagement with them act as a means of presencing past events (see Jones 2007, 24-25).

The way in which these acts of remembrance are performed may be inscribing or incorporating (Connerton 1989; Rowlands 1993), or a combination of both (Mills and Walker 2008, 7). The latter may be proposed for the sites above. Revisiting places and re-encountering the material residues of past visits, or dealing with (maintaining, renewing) the infrastructure of past generations, involves the 'inscription' of persistent places in the landscape. Through this continuity certain memories become durable. To the same extent the incorporated memories, the skills and practices, the know-how involved also are elementary to this.

Practice, routine behaviour and memory are what binds people, places and the material world together, creating continuity (Jones 2007, 37; Kovacik 1999, 167). Through commemoration material culture becomes important for both individual and communal remembrance as well as the maintenance and performance of tradition. It shapes temporal processes and directs future action and as such contributes to the formation of identity (see Jones 2007, 46-50). These formative qualities are strongly linked to the durability (longevity or ephemerality) of the material culture (and places) involved in relation to the human lifespan and the way in which people, things and place interconnect. The concept of 'citation' (Jones 2007, 55; Mills and Walker 2008, 18) is useful in this respect since it implies that for 'structural conditions' (Barrett 2000) of the present to make sense they must reiterate part of similar previous conditions in the past. Therewith the past is encapsulated and re-articulated for the future (Jones 2007, 55). This is linked to the sensory impact and physical endurance of the material culture involved and how it evokes memory. More ephemeral material culture would require more frequent acts of citation in order to evoke memory, while a higher

frequency in practices of citation may create stronger links between past and present. According to Jones (2007, 57) it is because of this temporal framework of material culture and the presence or absence of change in relation to the observer that memory is experienced, produced and made apparent.

Persistent places

A main question following from the theoretical framework presented above is what the underlying reason was for the development of persistent places in these wetlands and wetland margins. If an answer is based on processual archaeology (*e.g.* Binford 1999), or, behavioural ecology (*e.g.* Winterhalder and Kennett 2006), it is likely that ecological and economical motivations would be foregrounded. Persistent places in this respect become persistent, primarily because of their strategic location and favoured settlement conditions supporting beneficial time/energy investments. Such aspects have been discussed by Schlanger (1992) and Barton *et al.* (1995, 106, 108). However, what is remarkable is that these perspectives often assume that persistency in sites is related to the degree to which the functional use of a site remained the same (see Binford 1982, 19; Schlanger 1992, 105). Barton *et al.* (1995, 111), discussing persistent places in the Mesolithic landscape of South Wales, expect much weaker associations to occur at sites in those areas of the landscape where functional stability would be less marked. This highlights the significance of features in the landscape, including streams, pools, watersheds, rivers and lakes as reference points, boundary markers and means of travel and communication (*e.g.* Ames 2002; Barton 1995; Binford 2001(1083)). Barton *et al.* (1995, 111) suggest that continuity of place would be much weaker in those landscapes where the physical properties of these features and those of the environment might change. This is further corroborated by for example Jochim (1991, 311-315) who argues that environments that are temporally and spatially unstable should show weak association between site location, season of use, activities, infrequency of re-occupation and limited redundancy in the separate levels of multi-component sites.

What these perspectives suggest is a positive correlation between the development of persistent places and functional stability and that this is distinctly a factor of relatively stable and unchanging landscapes. This image contrasts with that of the characteristics of the wetland and wetland margin sites studied here, such as waterlogged conditions, repetitive flooding, decreasing site surfaces and changes in the environment, but also functional shifts and hiatuses in occupation do not fit this picture. However, emphasis in the studies mentioned above lies with the qualities of the environment and the beneficial characteristics of locations, regarding the activities performed and the infrastructure or resources provided (see Binford 1982; Schlanger 1992, 79). The emphasis is therefore distinctly not on the communities themselves and their social and ideological motivations.

This is not necessarily untrue or false of course. Certain locations will have distinctly worked as 'magnet locations' because of what they offered, in relation to stability. It is however incongruent with the evidence provided by the sites in the wetlands and wet margins of the LRA and it limits the importance of community choice and agency, with respect to places. Wiessner (1982, 176) in

her valuable comment on Binford's approach already stated that to understand (hunter-gatherer) variation it is necessary to not only study organisation around resources, but to include organisation of social relations. It is thus important to include both environmental factors as well as, not necessarily related, social and socio-symbolic or ideological motivations in a study of how places become persistent (also see Barton *et al.* 2004, 289-290). In this respect Louwe Kooijmans (1993, 100) argues that the change and variation witnessed at the sites studied here are not to be seen as adaptation, but as the reflection of deliberate choices within the socially determined margins of freedom of behaviour (also see Louwe Kooijmans 2009).

Maintaining memories, maintaining places

Returning to the sites in the wetlands the various recurring practices and the place continuity may be interpreted along the lines sketched above, distinctively combining the dynamic characteristics of the environment as well as potential social incentives.

Visiting the same location for decades or centuries, or using the same site for an extended period of time emphasizes the character of place. The mere presence of the Polderweg riverdune, the Hazendonk dune, or the Schokland outcrop formed a direct element from the past, in these cases with a 'use-life' of, respectively 500, 1500 and 2000 years. Place in this sense is initially stable and unchanging. Similar to the ways in which aborigines experience sites in the landscape and endow them with (spiritual) essence from the past (*e.g.* Littleton and Allen 2007), there is a considerable time-depth or even timelessness attached to places (see Bradley 2000), They function across generations, evoke memories and create a certain sense of stability. They become of ontological importance and are, often metaphorically, tied to identity (see Feld and Basso 1996; Tilley 2004, 222).

It is important to realize that it is exactly in the wetlands that this idea of stability is an image. Everywhere places instantiate the qualities and relations found in that region (Casey 1996, 31). In the wetlands sites frequently flooded,

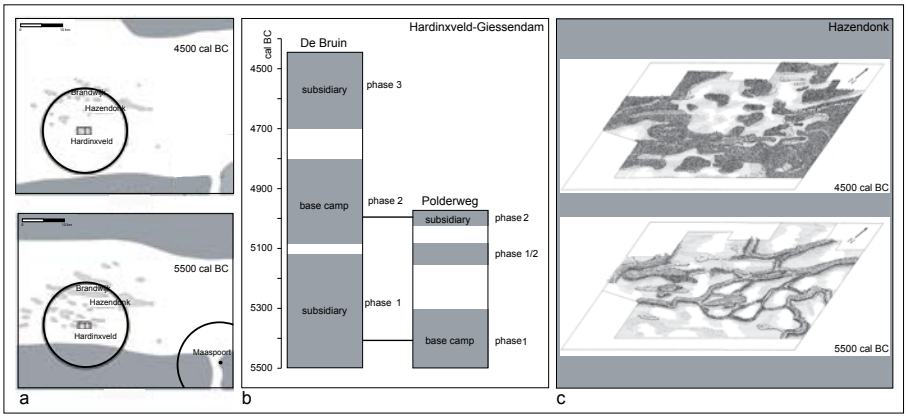


Fig. 10. Schematic depiction of the widening delta area (a) change in landscape (Hazendonk area) (c) in relation to the occupation at Hardinxveld (b) (based on Amkreutz in prep.; adapted from Louwe Kooijmans 2001, fig. 14.4; Louwe Kooijmans 2003, fig. 77.1; Van der Woude 1983).

suffered from water and wind erosion and wet waterlogged conditions, vegetation and access changed and over time many places (slowly) disappeared under covers of clay, or drowned in the encroaching peat. This all placed a strain on patterns of expectation and anticipation with respect to resources, transport routes, exchange etc. Within human time-spans the apparently unchanging stability of place in these areas became relative, and as such formed a strong experience of the passing of time. A good example is formed by the Hardinxveld sites. Within the millennium of their use the landscape changed from an environment with much open water to a marsh forest (Bakels and Van Beurden 2001; Bakels *et al.* 2001). During this period the water level rose *c.* 3.5 m (or 35 cm per century) and the distance from the mainland in that time increased from 5 to 11 km (see Fig. 10). Changes were intense and must have been noticed at a generational level (see Louwe Kooijmans 2001, 504).

Fixing sites in time?

As argued by Leary (2009, 230) the dynamics and risks of living in these types of environment may have created a certain vulnerability, but it is the character of actual human-environment relations that point to the impact this may have had. It is plausible to suggest that in the light of the (potential) dynamics of the landscape the stability of places was of an unreliable nature in wetland environments (Leary 2009; Nicholas 2007, 57). Because of the close-knit relationship between people and places, especially those that were 'a home' (*e.g.* Casey 1996; Feld and Basso 1996) the ontological security that issues from such 'rootedness' in places may have been under threat in the light of their changing diminishing appearance. From such a perspective the intensive use of fixed locations, either in a mobile system, or from a sedentary perspective further accentuates the need that there may have been for stable locations in such a dynamic environment: the creation of stability may have been a way to negotiate the changes in the local surroundings.

Along similar lines certain characteristics of occupation presented above may be interpreted. The examples of artificial surface consolidation, the clay bases of hearths could have functioned to maintain a sense of stability or 'slow down' the passing of time by 'fixing' sites in time.

This could also be achieved by keeping things in place. The distinct spatial consistency of many (dwelling) structures, both on seasonal and permanent sites forms a good example, as does the repetitive renewal of hearths at the same spot. The creation and maintenance of a fence, as the one at Schipluiden, guiding and limiting activity and creating 'inside' and 'outside' for a prolonged period of time, forms another example. Smaller-scale patterns of activities performed such as flint knapping, cooking, making pottery, disposing of rubbish, etc., also contribute to this.

While many of these examples follow from everyday (subconscious) *habitus*, some stand out because of their dramatic impact or performative character. Burying the deceased in the same spot as their ancestors, or performing rituals and depositions at certain locations more distinctly mark and fix sites in time, holding the past in place (Jones 2007, 58).

Place practice

The place-constancy that evolves out of the issues discussed above creates a sense of stability on sites that is essentially of an *inscribing* quality (Connerton 1989). In tandem with these (Gerritsen 2008; Mills and Walker 2008) and at their base are the incorporating practices, skills, techniques and traditions enabling the continued use of these places. The latter activate memory (see Jones 2007, 11) and make tangible the intertwined relationship between routines and places.

In our embedded perception of the world there is therefore a recursive relationship through which places and 'bodies' interanimate each other and through which 'lived bodies' belong to places (Casey 1996, 24). This has widely been documented in ethnography (*e.g.* Feld 1996; Geertz 1996; Küchler 1993; Politis 2007). Basso (1996, 55) also remarks that places possess a marked capacity for triggering acts of self-reflection, inspiring thoughts about who one presently is, memories of who one used to be or might become. This combines the physical landscape to that of the mind (Meredith 1999), familiar places are therefore locations of memory and meaning and as such anchor identity.

These observations form a complementary perspective on the phenomenon of persistent places in relation to history and memory. In the light of the dynamics and changes taking place in the delta landscapes of the LRA things may have been 'kept in place' because *that* is what made them meaningful. In line with Rapoport (1990, 12) meaning *is* often the most important function. This also underlines the role of the associated incorporating practices. These, although many were routine activities, through their place constancy carried forward this ontological stability through time. It is these practices that importantly shape the place-bound *habitus* that render communities their identity (also see Bourdieu 1977). In this respect places 'impress' themselves upon people through habitual experience and as such precipitate remembrance (Jones 2007, 58; also see Cooney 2000, 71). In the wetlands and wetland margins it was important to accommodate the effect of these practices and consolidate sites in doing so.

Conclusion: memorious monuments

The examples and theoretical framework presented in this chapter have sought to provide a complementary perspective on the use of places and their importance through time. Much discussion on this topic often focuses on monuments and monumentality.

Historically these are often regarded as aspects of a new (Neolithic) way of life in which there is an increased ordering of the landscape as well as an increased understanding and division of concepts of 'domestic' and 'wild' (see Bradley 1998; Hodder 1990; Whittle 1996). They result from Prehistoric behaviour that required a certain degree of social complexity and hierarchy, considerable communal effort, planning and preconceived design (Sherratt 1990), aspects not attributed to communities with a hunter-gatherer state-of-mind (Bird-David 1990; Bradley 1998; Ingold 2000) as the ones studied here.

Monuments are also deliberate and often lasting transformations of the natural landscape that structure and dominate their surroundings (*e.g.* Thomas 1999; but also see Arnoldussen and Fontijn 2006). They serve as the focal point for subsequent ritual behaviour, and the potential development of ritual landscapes. The development of monuments as recorded for the Scandinavian, British and Irish Neolithic (*e.g.* Whittle 1996) suggests a relationship between (relative) sedentism, agriculture and the development and transformation of new ideologies and identities (Bradley 1998; Cummings 2007; Thomas 1999). In this respect the physicality and perdurance of monuments serves to create a static and lasting reminder to communities (Gosden 1994, 124). They objectify time and anchor community values such as territory and property (Cohen 1985), as well as community ideals such as identity, represented by notions of history and memory (*cf.* Helms 2005; 2007; Whittle 2003, 123). They also became places of ancestors and deities through the creation of a cosmological sense of history (Jones 2007, 54). They are monuments in an original sense, characteristic places that are designed to last, *lieux de memoire* (Kolen 1999; Schama 1995) that were created and maintained to structure the land and community behaviour.

Monuments in the wetlands?

This coincidence of monumentality and a new (Neolithic) order applies, with some reservations (*e.g.* Cummings 2007; Rowley-Conwy 2004), to much of Northwestern Europe (Scandinavia, Brittany, the British Isles and to some extent Eastern Europe and Northern Poland; Barrett 2006; Whittle 1996), but it seems far less the case for most of the communities in the LRA. For much of the wetland and wetland margin communities these aspects do not seem to apply. Or do they? In a recent paper Fontijn (2011) argues that while concepts of monumentality and ritual landscapes may not have fit the world view of the communities studied here, there was certainly a degree of permanence and ordering to it. This is expressed in the fact that some places form the focus of burial and deposition (of human remains) over a period of time, as such becoming places of ancestors. Yet, it is also the frequent revisiting, renewal and renewed investment that is striking in this respect in combination with distinct examples of place consistency. This indicates that an artificial sense of stability and continuity may have been created. This perspective is supported by the long-term attachment of subsequent generations of these communities to the same places. Against the context of a changing environment, sites remained in long continuous used, or were re-used after periods of less intensive visits. Even when the environmental surroundings limited (domestic) use of a site, sites were rather 're-invented', changing their function and purpose, than being abandoned completely.

Reflections on the Neolithic and monuments

The ideas forwarded in this contribution demonstrate that, although 'classical' monumentality is absent, this degree of ordering, investment and permanence with regard to the landscape and its places can be demonstrated for these communities over a long time period. The absence of classic monumentality may point to the different course that the adoption of farming in combination with

ideological change took in this area (see Fontijn 2011; Louwe Kooijmans 1998; 2007; Rowley-Conwy 2004). The distinction between 'nature' and 'culture' and a new attitude towards the landscape proposed for many Neolithic communities may not have applied to the ones studied here (Bird-David 1990; Ingold 2000). These retained more of a hunting and gathering attitude towards the land and its resources, in which there were no pervasive distinctions or dualism in their attitudes towards the world (*e.g.* Ingold 2000, 47).

There is thus no 'ritual landscape' with monuments in any traditional sense, yet, it is still stimulating to perceive the long-term use of persistent places in the wetlands and their margins in terms of monumentality and to look for differences and similarities. Rather than having a preconceived layout and design, persistent places seem to come about in a much more unstructured manner. Monuments also often have modest beginnings (Whittle 2003, 123) as do persistent places, yet with the latter the subsequent phases of use are as much part of the dynamics of the environment as they are related to community choice. Furthermore, both see activity that is to an important extent of a commemorative character, with practices reiterating or citing past events (*cf.* Jones 2007, 56-66). At 'classic' monumental sites these activities are often of a ritual nature, while the persistent places studied here demonstrate a convergence of practices. This, however, does not necessarily reflect on the importance attached to 'classic' monuments or persistent places. This again seems comparable. Both form long-term focal points for communities that function as important markers of territory and (symbolic) community boundary (see Cohen 1985, 50). Both may also be seen as spatio-temporal nodes at which people define their idea of home or belonging in relation to other places as well as their position with regard to the (ancestral) past and the unknown aspects of the future (Casey 1996; Gerritsen 2008).

This does not mean that persistent places in the LRA wetlands should be classified as 'wetland monuments', rather that they harbour aspects of monumentality. In contrast to the preconceived design and static sequential long-term use of most monuments or ritual landcapes, the persistent places studied here are characterised by a more organic development of monumentality. Places, as it were, witness a distinct ebb and flow in their use, created by the dynamics of the environment as well as community choice. Convergence of different functions and the alternations in site use contributed and added to places creating long-term locations that became socio-symbolically and historically significant to communities. Importantly, they are also all part of the distinctly domestic sphere of life, centred on society itself and not spatially outside of it. This organic development of 'monumentality' and the rather distinct convergence of practices is a characteristic feature of the use of places by these communities.

While there are therefore differences in the type of monumentality portrayed, the reasons for monuments coming into being may not be as dissimilar. While regular monuments often come into being by communal effort, this is usually done with the intent of leaving a lasting mark upon the land and territory. The very monument, what it structures and its meaning may be re-interpreted over time, leading to new roles and perhaps (material) changes. The very essence, however, remains intact and that is the creation of continuity and therewith the

connection with a past and for a future (also see Fontijn 2011; Jones 2007). As argued in this paper the process of the creation of persistent places is for an important part shaped by non-intentional routine practices in combination with long-term commitment to place. While this forms a different starting point, the result is largely comparable. The wetland sites over time became familiar beacons in an, at times, distinctly changing landscape. They may have been symbolic for the continuity of communities despite the dynamics of their surroundings. By traditional repetitive behaviour the communities involved actively shaped, created and maintained an idea of continuity and stability. This idea may have had a different importance and meaning over time, but in essence remained consistent. In this respect megaliths, earthen barrows and slowly drowning soggy places may be rather alike.

Acknowledgements

The author wishes to thank dr. D. Fontijn for the invitation to write this article and the discussions that surrounded it. A. Louwen (MA) and S. van der Vaart (RMA) are thanked for their revision of the text and the corrections of the English. This contribution was partly written in the course of the (NWO/Dutch Organisation for Scientfic Research-Malta Harvest programme) project 'From Hardinxveld to Noordhoorn – From Forager to Farmer' and at the National Museum of Antiquities (RMO/Leiden).

Bibliography

Ames, K.M. 2002. Going by Boat. The Forager-Collector Continuum at Sea, in: Habu, J. and Fitzhugh, B. (eds.). *Beyond Foraging and Collecting. Evolutionary Change in Hunter-Gatherer Settlement Systems.* New York: Kluwer Academic/ Plenum Publishers**,** 19-52.

Amkreutz, L.W.S.W. 2010. De laatsten der Mohikanen? Enige gedachten over de positie van de Vlaardingen-cultuur in het neolithisatieproces. *Westerheem, Special Vlaardingen-cultuur* 2, 12-25.

Amkreutz, L.W.S.W. 2013. Home Is When You Build It. Characteristics of Building and Occupation in the Lower Rhine Area Wetlands (5500–2500 cal BC), in: Hofmann, D. and Smyth, J. (eds.). *Tracking the Neolithic House in Europe. Sedentism, Architecture and Practice.* New York: Springer, 229-260.

Amkreutz, L.W.S.W. in press. *Negotiating Neolithisation. A long-term perspective on communities in the process of Neolithisation in the Lower Rhine Area (6000-2500 cal BC).* PhD-thesis, Leiden University.

Arnoldussen, S. 2008. *A living landscape: Bronze Age settlements in the Dutch river area (c. 2000-800 BC)*. PhD-thesis, Leiden University: Sidestone Press.

Arnoldussen, S. and Fontijn, D.R. 2006. Towards familiar landscapes? On the nature and origin of Middle Bronze Age landscapes in the Netherlands. *Proceedings of the Prehistoric Society* 72, 289-317.

Baetsen, S. 2008. Het grafveld, in: Koot, J.M., Bruning, L. and Houwkes, R.A. (eds.). *Ypenburg – Locatie 4. Een nederzetting met grafveld uit Midden-Neolithicum in het West-Nederlands kustgebied.* Leiden: Station Drukwerk, 119-189.

Bailey, G. 2007. Time perspectives, palimpsests and the archaeology of time. *Journal of Anthropogical Archaeology* 26, 198-223.

Bakels, C.C. and Van Beurden, L. 2001. Archeobotanie, in: Louwe Kooijmans, L.P. (ed.). *Hardinxveld-Giessendam Polderweg. Een mesolithisch jachtkamp in het rivierengebied (5500-5000 v. Chr.)* Rapportage Archeologisch Mounumentenzorg (RAM) 83. Amersfoort: Rijksdienst voor het Oudheidkundig Bodemonderzoek, 325-378.

Bakels, C.C., Van Beurden, L. and Vernimmen, T.J.J. 2001. Archeobotanie, in: Louwe Kooijmans, L.P. (ed.). *Hardinxveld-Giessendam De Bruin: Een kampplaats uit het Laat-Mesolithicum en het begin van de Swifterbant-cultuur (5500-4450 v. Chr.)*. Rapportage Archeologisch Monumentenzorg (RAM) 88. Amersfoort: Rijksdienst voor het Oudheidkundig Bodemonderzoek, 369-434

Barrett, J.C. 2000. A thesis on agency, in: Dobres, M.A. and Robb, J.E. (eds.). *Agency in archaeology.* Oxon: Routledge, 61-68.

Barret, J.C. 2006. A Perspective on the Early Architecture of Western Europe, in: Maran, J., Juwig, C., Schwengel, H. and Thaler, U. (eds.). *Constructing Power, Architecture Ideology and Social Practice*. Münster: LIT Verlag**,** 15-30.

Barton, R.N.E., Berridge, P.J., Walker, M.J.C. and Bevins, R.E. 1995. Persistent Places in the Mesolithic Landscape: an Example from the Black Mountain Uplands of South Wales, *Proceedings of the Prehistoric Society* 61, 81-116.

Barton, C.M., Bernabeu, J., Emili Aura, J., Garcia, O., Schmich, S. and Molina, L. 2004. "Long-Term Socioecology and Contingent Landscapes." *Journal of Archaeological Method and Theory* 11(3): 253-295.

Basso, K.H. 1996. Wisdom sits in places. Notes on a western Apache landscape, in: Feld, S. and Basso, K.H. (eds.). *Senses of place*, Santa Fe: School of American Research Press, 52-90.

Bender, B. 1998. *Stonehenge: Making Space*. Oxford: Berg.

Binford, L.R. 1982. The archaeology of place, *Journal of Anthropological Archaeology* 1, 5-31.

Binford, L.R. 1999. Time as a Clue to Cause, Albert Reckitt Archaeological Lecture, (Reprinted from): *Proceedings of the British Academy* 101**,** 1-35.

Binford, L.R. 2001. *Constructing Frames of Reference, An Analytical Method for Archaeological Theory Building Using Ethnographic and Environmental Data Sets*. Los Angeles: University of California Press.

Bird-David, N. 1990. The Giving Environment: Another Perspective on the Economic System of Gatherer-Hunters. *Current Anthropology* 31(2), 189-196.

Borić, D. 2007. A House Society in the Balkans, in: Beck, R.A. (ed.). *The durable House: House Society Models in Archaeology*. Carbondale: Southern Illinois University, 97-129.

Bourdieu, P. 1977. *Outline of a theory of practice*. Cambridge: Cambridge University Press.

Braudel, F. 1966. *La Méditerranée et le monde méditerranéen à l'époque de Philippe II*, Paris.

Bradley, R. 1998. *The significance of monuments. On the shaping of human experience in Neolithic and Bronze Age Europe.* Oxford: Routledge.

Bradley, R. 2000. An Archaeology of Natural Places. London: Routledge.

Brück, J. 1999. Ritual and Rationality: Some Problems of Interpretation in European Archaeology. *European Journal of Archaeology* 2(3), 313-344.

Carlsson, T. 2008. Where the river bends. Under the boughs of trees, Strandvägen, a late mesolithic settlement in eastern middle Sweden, *Acta Archaeologica Lundensia*, 8/55, Stockholm Riksantikvarieämbetet.

Casey, E. 1996. How to get from space to place in a fairly short stretch of time. Phenomenological prolegomena, in: Feld, S. and Basso, K.H. (eds.). *Senses of place*. Santa Fe: School of American Research Press, 13-46.

Casparie, W.A., Mook-Kamps, B., Palfenier-Vegter, R.M,Struyck, P.C. and Van Zeist, W.A. 1977. The palaeobotany of Swifterbant, *Helinium* 17, 28-55.

Chadwick, A.M. 2004. 'Geographies of sentience' - an introduction to space, place and time, in: A. M. Chadwick, A.M. (ed.). *Stories from the landscape. Archaeologies of Inhabitation*, 1-31.

Cohen, A.P. 1985 (2004). *The symbolic construction of community*. London: Routledge.

Conneller, C. 2006. "Becoming deer. Corporeal transformations at Star Carr". *Archaeological Dialogues* 11(1), 37-56.

Connerton, P. 1989. *How societies remember*. Cambridge: Cambridge University Press.

Cooney, G. 2000. *Landscapes of Neolithic Ireland*. London: Routledge.

Cummings, V. 2007. Mesolithic-Neolithic transition in Western Britain, in: Whittle, A. and Cummings, V. (eds.). *The Mesolithic-Neolithic Transition in North-West Europe*. Oxford: Oxford University Press**,** 493-510.

Deckers, P.H., De Roever, J.P. and Van der Waals, J.D. 1980. Jagers, vissers en boeren in een prehistorisch getijdengebied bij Swifterbant, *ZWO Jaarboek* 1980, 111-145.

De Roever, J.P. 2004. *Swifterbant-aardewerk. Een analyse van de neolithische nederzettingen bij Swifterbant, 5e millennium voor Christus*. Groningen, Barkhuis publishing.

Descola, P. and Pálsson, G. 1996. Introduction, in: Descola, P. and Pálsson, G. (eds.). *Nature and Society. Anthropological Perspectives*. New York: Routledge**,** 1-21.

Düring, B. 2007. The articulation of Houses at Neolithic Çatalhöyük, Turkey, in: Beck, R.A. (Jr.) (ed.). *The Durable House: House Society Models in Archaeology*. Carbondale: Southern Illinois University**,** 130-153.

Enderman, M. 2008. Huisreconstructies, in: Koot, J.M., Bruning, L. and Houkes, R.A. (eds.). *Ypenburg-Locatie 4. Een nederzetting met grafveld uit het Midden-Neolithicum in het West-Nederlandse kustgebied*, Leiden: Station Drukwerk, 111-118.

Ente, P.J. 1976. The geology of the northern part of Flevoland in relation to the human occupation in Late Atlantic time. *Helinium* 16, 15-35.

Feld, S. 1996. Waterfalls of song. An acoustemology of place resounding in Bosave, Papua New Guinea, in: Feld, S. and Basso, K.H. (eds.). *Senses of place*. Santa Fe: School of American Research Press, 91-135.

Feld, S. and Basso, K.H. 1996. Introduction, in: Feld, S. and Basso, K.H. (eds.). *Senses of place.* Santa Fe: School of American Research Press, 3-11.

Fontijn, D.R. 2008. Everything in its Right Place? On Selective Deposition, Landscape and the Construction of Identity in Later Prehistory, in: Jones, A. (ed.). *Prehistoric Europe. Theory and Practice*. Chichester: Wiley-Blackwell, 86-106.

Fontijn, D.R. 2011. The ritual fabric of prehistoric landscape. Funerary places and deposition sites in the Low Countries, c. 5000 – 1500 cal BC, in: Hansen, S. and Muller, J. (eds.). *Sozialarchäologische Perspektiven: Gesellschaftlicher Wandel 5000-1500 v. Chr. Zwischen Atlantik und Kaukasus*. Archäologie in Eurasien 24. Berlin: Deutsch Archäologisches Institut, 429-447.

Foxhall, L. 2000. The running sands of time: archaeology and the short-term. *World Archaeology* 31, 484-498.

Geertz, C. 1996. Afterword. Senses of place, in: Feld, S. and Basso, K.H. (eds.). *Senses of place*. Santa Fe: School of American Research Press, 259-262.

Gehasse, E.F. 1995. *Ecologisch-archeologisch onderzoek van het Neolithicum en de Vroege Bronstijd in de Noordoostpolder met de nadruk op vindplaats P14*. PhD-thesis, Amsterdam University.

Gerritsen, F.A. 2008. Domestic times: houses and temporalities in late prehistoric Europe, in:Jones, A. (ed.). *Prehistoric Europe. Theory and Practice*. Chichester: Wiley-Blackwell, 143-161.

Goodman, M. 1999. Temporalities of prehistoric life: household development and community continuity, in: Brück, J. and Goodman, M. (eds.). *Making places in the prehistoric world: themes in settlement archaeology*. London: UCL Press, 145-159.

Gosden, C. 1994. *Social being and time*. Oxford: Blackwell Publishers.

Kooistra, L. and Hänninen, K. 2008. Hout en houtskool, in: Koot, K., Bruning, L. andHoukes, R. (eds.). *Ypenburg-Locatie 4. Een nederzetting met grafveld uit het Midden-Neolithicum in het West-Nederlandse kustgebied.* Leiden: Station Drukwerk, 345-362.

Heitman, C.C. 2007. Houses Great and Small: Reevaluating the "House" in Chaco Canyon, New Mexico, in: Beck, R.A. (ed.). *The durable House: House Society Models in Archaeology*. Carbondale: Southern Illinois University, 248-272.

Helms, M.W. 2005. Tangible Materiality and Cosmological Others in the Development of Sedentism, in: Demarrais, E., Gosden, C. and Renfrew, C. (eds.). *Rethinking Materiality: Engagement of Mind With Material World*. Cambridge, 117-127.

Helms, M.W. 2007. House Life. The durable House: House Society Models in Archaeology, in: Beck, R.A. (ed.). *The durable House: House Society Models in Archaeology*. Carbondale: Southern Illinois University, 487-504.

Hertz, R. 1907. Death and the right hand. Contribution a une étude sur la representation collective de la mort. *Année Sociologique* 10, 48-137.

Hodder, I. 1990. *The domestication of Europe - structure and contingency in Neolithic societies*. Oxford: Blackwell.

Houkes, R. and Bruning, M. 2008. Grondsporen en structuren, in: Koot, H., Bruning, L. and Houkes, R. (eds.). *Ypenburg-Locatie 4. Een nederzetting met grafveld uit het Midden-Neolithicum in het West-Nederlandse kustgebied.* Leiden: Station Drukwerk, 79-110.

Huisman, H. and Raemaekers, D.C.M. 2008. De akker van Swifterbant. *Nieuwsbrief Rijksdienst voor Archeologie, Cultuurlandschap en Monumenten* 3(2), 16-18.

Ingold, T. 1993. The temporality of the landscape, *World Archaeology* 25(2), 152-174.

Ingold, T. 2000. *The perception of the environment. Essays in livelihood, dwelling and skill*. London: Routledge.

Ingold, T. 2007. Material against materiality, *Archaeological Dialogues* 14(1), 1-16.

Jennbert, K. 2005. Sites and the Mental Landscape, *Lund Archaeological Review* (2005-2006) 11/12, 47-58.

Jochim, M.A. 1991. Archaeology as Long-Term Ethnography. *American Anthropologist* 93(2), 308-321.

Jones, A. 2007. *Memory and material culture*. Cambridge: Cambridge University Press.

Kelly, R.L. 1995. *The Foraging Spectrum*. Washington D.C., Smithsonian.

Koch, E. 1999. Neolithic offerings from the wetlands of eastern Denmark, in: Coles, B. Coles, J. and Schou Jorgensen, M. (eds.). *Bog Bodies, Sacred Sites and Wetland Archaeology.* Exeter: Short Run Press**,** 125-131.

Kolen, J. 1999. Landschap en historisch bewustzijn, in: Kolen, J. and Lemaire, T. (eds.). *Landschap in meervoud, perspectieven op het landschap in de 20ste/21ste eeuw*. Utrecht: Arkel**,** 227-300.

Kovacik, J.J. 1999. Memory and pueblo space, in: Brück, J. and Goodman, M. (eds.). *Making places in the prehistoric world: themes in settlement archaeology.*London: UCL Press**,** 160-177.

Küchler, S. 1993. Landscape as memory. The mapping of process and its representation in a Melanesian society, in: Bender, B. (ed.). *Landscape. Politics and perspectives.* Providence and Oxford**,** 85-106.

Larsson, L. 1998. Prehistoric Wetland Sites in Sweden, in: Bernick, K. (ed.). *Hidden Dimensions. The Cultural Significance of Wetland Archaeology. Pacific Rim Archaeology and Wetland Archaeology Research Project*. (WARP) Occasional Paper Number II, 64-84.

Larsson, L. 2003. Session VII. Ritual and symbolic behaviour. Introduction, in: Larsson, L., Kindgren, H., Knutsson, K., Loeffler, D. and Åkerlund, A. (eds.). *Mesolithic on the Move*. Oxford**,** 463-466.

Larsson, L. 2004. The Mesolithic Period in Southern Scandinavia: with Special Reference to Burials and Cemeteries, in: Saville, A. (ed.). *Mesolithic Scotland and its Neighbours, The Early Holocene Prehistory of Scotland, its British and Irish Context and some Northern European Perspectives.* Edinburgh: Society of Antiquaries of Scotland, 371-392.

Leary, J. 2009. Perceptions of and responses to the Holocene flooding of the North Sea lowlands, *Oxford Journal of Archaeology* 28, 227-237.

Lefebvre, H. 2004. *Rhythmanalysis: space, time and everyday life*. London: Continuum.

Littleton, J. and Allen, H. 2007. Hunter-gatherer burials and the creation of persistent places in southeastern Australia. *Journal of Anthropological Archaeology* 26(2), 283-298.

Louwe Kooijmans, L.P. 1985. *Sporen in het land; de Nederlandse delta in de prehistorie*. Amsterdam.

Louwe Kooijmans, L.P. 1987. Neolithic settlement and subsistence in the wetlands of the Rhine/Meuse delta of the Netherlands, in: Coles, J.M. and Lawson, A.J.(eds.). *European wetlands in prehistory*. Oxford: Clarendon Press, 227-251.

Louwe Kooijmans, L.P. 1993. Wetland exploitation and upland relations of prehistoric communities in the Netherlands, in: Gardiner, J. (ed.). *Flatlands and wetlands: current themes in East Anglian archaeology*. Dereham: Norfolk Archaeological Unit, 71-116.

Louwe Kooijmans, L.P. 1998. Understanding the Mesolithic/Neolithic frontier in the Lower Rhine Basin, 5300-4300 cal. BC, in: Edmonds, M. and Richards, C. (eds.). *Understanding the Neolithic of northwestern Europe*. Glasgow: Cruithne, 407-427.

Louwe Kooijmans, L.P. 2001. Synthese, in: Louwe Kooijmans, L.P. (ed.). *Hardinxveld-Giessendam De Bruin: Een kampplaats uit het Laat-Mesolithicum en het begin van de Swifterbant-cultuur (5500-4450 v. Chr.)*. Rapportage Archeologische Monumenten 88. Amersfoort: Rijksdienst voor het Oudheidkundig Bodemonderzoek,499-528.

Louwe Kooijmans, L.P. 2003. The Hardinxveld sites in the Rhine/Meuse Delta, the Netherlands, 5500-4500 cal BC., in: Larsson, L., Kindgren, H., Knutsson, K., Loeffler, D. and Åkerlund, A. (eds.). *Mesolithic on the Move.* Oxford: Oxbow Books, 608-624.

Louwe Kooijmans, L.P. 2005. Ook de jagers worden boer, Vroeg-neolithicum B en midden-neolithicum A, in: Louwe Kooijmans, L.P., Van den Broeke, P.W., Fokkens, H. and Van Gijn, A.L. (eds.). *Nederland in de Prehistorie*. Amsterdam: Bert Bakker, 249-271.

Louwe Kooijmans, L.P. 2006. Schipluiden: a synthetic view, in: Louwe Kooijmans, L.P. and Jongste, P.F.B. (eds.). Schipluiden, A Neolithic settlement on the Dutch North Sea coast c. 3500 cal BC. *Analecta Praehistorica Leidensia* 37/38. Leiden, 485-516.

Louwe Kooijmans, L.P. 2007a. The gradual transition to farming in the Lower Rhine Basin, in: Whittle, A. and Cummings, V. (eds.). *Going over: the Mesolithic-Neolithic transition in north-west Europe*. Oxford: Oxford University Press, 287-309.

Louwe Kooijmans, L.P. 2007b. Multiple Choices. Mortuary practices in the Low Countries during the Mesolithic and Neolithic, 9000-3000 cal BC., in: Larsson, L., Lüth, F. and Terberger, T. (eds.). *Innovation and Continuity - Non-Megalithic Mortuary Practices in the Baltic. New Methods and Research into the Development of Stone age Society*. Mainz am Rhein: Philipp von Zabern, 551-580.

Louwe Kooijmans, L.P. 2009. The agency factor in the process of Neolithisation – a Dutch case study. *Journal of Archaeology in the Low Countries* 1, 27-54.

Louwe Kooijmans, L.P. and Nokkert, M. 2001. Sporen en structuren, in: L. P. Louwe Kooijmans (ed.). *Hardinxveld-Giessendam De Bruin, Een kampplaats uit het Laat-Mesolithicum en het begin van de Swifterbant cultuur.* Rapportage Archeologische Monumenten 88. Amersfoort: Rijksdienst voor het Oudheidkundig Bodemonderzoek, 75-115.

Louwe Kooijmans, L.P. and Smits, L. 2001. Menselijke skeletresten, in: Louwe Kooijmans, L.P. (ed.). *Hardinxveld-Giessendam De Bruin, Een kampplaats uit het Laat-Mesolithicum en het begin van de Swifterbant cultuur.* Rapportage Archeologische Monumenten 88. Amersfoort, Rijksdienst voor het Oudheidkundig Bodemonderzoek, 479- 498.

Louwe Kooijmans, L.P. and Van de Velde, P. 1980. *De opgraving Hekelingen III, gemeente Spijkenisse, voorjaar en zomer 1980. Interim-rapport over de verkenningen en opgravingen van de steentijd-nederzettingen in de deelplannen Akkers-13 en -14 en Vriesland-1 en -2*. Unpublished manuscript, National Museum of Antiquities, Leiden.

Louwe Kooijmans, L.P. and Verbruggen, M. 2011. Donken door de eeuwen heen. *Westerheem* 60, 274-287.

Marshall, Y. 2000. Transformation of Nuu-chac-nulth houses, in: Joyce, R.A. and Gillespie, S.D. (eds.). *Beyond kinship. Social and material reproduction in house societies*. Philadelphia: University of Philadelphia Press, 73-102.

Meredith, D. 1999. Landscape or Mindscape? Seamus Heaney's Bogs. *Irish Geography* 32(2), 126-134.

Mills, B.J. and Walker, W.H. 2008. Introduction: memory, materiality and depositional practice, in: Mills, B.J. and Walker, W.H. (eds.). *Memory work. Archaeologies of material practices*. Santa Fe: School for Advanced Research Press , 3-24.

Mol, J. 2006. Coastal evolution of Delfland and the Schipluiden microregion in relation to Neolithic settlement. Schipluiden, in: Louwe Kooijmans, L.P. and Jongste, P.F.B. (eds.). Schipluiden, A Neolithic settlement on the Dutch North Sea coast c. 3500 cal BC. *Analecta Praehistorica Leidensia* 37/38, Leiden, 269-284.

Mol, J., Louwe Kooijmans, L.P. and Hamburg, T. 2006. Stratigraphy and chronology of the site, in: Louwe Kooijmans, L.P. and Jongste, P.F.B. (eds.). Schipluiden, A Neolithic settlement on the Dutch North Sea coast c. 3500 cal BC. *Analecta Praehistorica Leidensia* 37/38, Leiden, 19-38.

Nicholas, G.P. 2007. Prehistoric Hunter-Gatherers in Wetland Environments: Theoretical Issues, Economic Organisation and Resource Management Strategies, in: Lillie, M. and Ellis Wetland, S. (eds.). *Archaeology and Environments, Regional Issues, Global Perspectives*. Oxford: Oxbow Books**,** 46-64.

Nilsson Stutz, L. 2003. *Embodied rituals & ritualized bodies. Tracing ritual practices in late mesolithic burials*. Stockholm: Wallin & Dahlholm Boktryckeri AB.

Out, W.A. 2009. Sowing the seed? Human impact and plant subsistence in Dutch wetlands during the Late Mesolithic and Early and Middle Neolithic (5500-3400 cal BC). *Archaeological studies Leiden University* 18. Leiden: Leiden University Press.

Parker Pearson, M. 1999. *The archaeology of death and burial*. Gloucestershire: Sutton publishing.

Peeters, H. 2007. *Hoge Vaart-A27 in context: towards a model of Mesolithic – Neolithic land use dynamics as a framework for archaeological heritage management*. Amersfoort: Rijksdienst voor Archeologie, Cultuurlandschap en Monumenten.

Politis, G. 2007. *Nukak: Ethnoarchaeology of an Endangered Amazonian People*. Walnut Creek: Left Coast Press.

Pollard, J. 1999. "These places have their environment": Thoughts on settlement practices in the British Neolithic, in: Brück, J. and Goodman, M. (eds.). *Making places in the prehistoric world: themes in settlement archaeology.* London: UCL Press, 76-93.

Pollard, J. 2000. Neolithic occupation practices and social ecologies from Rinyo to Clacton, in: Ritchie, A. (ed.). *Neolithic Orkney in its European context.* Cambridge: McDonald Institute, 363-369.

Raemaekers, D.C.M., Devriendt, I.I.J.A.L.M., Cappers, R.T.J. and Prummel, W. 2005. Het Nieuwe Swifterbant Project. *Notae Praehistoricae* 25, 119-127.

Raemaekers, D.C.M. 2006. *De spiegel van Swifterbant*. Groningen.

Raemaekers, D.C.M., Molthof, H. and Smits, L. 2007. The textbook 'dealing with death' from the Neolithic Swifterbant culture (5000-3400 cal BC), the Netherlands, in: Larsson, L., Lüth, F. and Terberger, T. (eds.). *Innovation and Continuity - Non-Megalithic Mortuary Practices in the Baltic. New Methods and Research into the Development of Stone age Society*. Mainz am Rhein: Philipp von Zabern**,** 529-550.

Rapoport, A. 1990. *The meaning of the built environment: A Non-Verbal Communication Approach.* Tucson: University of Arizona Press.

Renfrew, C. 2004. Towards a Theory of Material Engagement, in: DeMarrais, E., Gosden, C. and Renfrew, C. (eds.). *Rethinking materiality: the engagement of mind with the material world.* Cambridge: McDonald Institute for Archaeological Research**,** 23-31

Rival, L.M. 2002. *Trekking Through History. The Huaorani of Amazonian Ecuador*. New York and Chichester.

Rowlands, M.J. 1993. The role of memory in the transmission of culture. *World Archaeology* 25, 141-151.

Rowley-Conwy, P. 2004. How the west was lost: a reconsideration of agricultural origins in Britain, Ireland and southern Scandinavia. *Current Anthropology* 45 (S4), 83-113.

Schama, S. 1995. *Landscape and memory*. New York.

Schlanger, S.H. 1992. Recognizing persistent places in Anasazi settlement systems, in: Rossignol, J. and Wandsnider, L. (eds.). *Space, time and archaeological landscapes*. New York: Plenum Press, 91-112.

Sherratt, A. 1990, The genesis of megaliths: monumentality, ethnicity and social complexity in Neolithic north-west Europe. *World Archaeology* 22, 147-167.

Smits, L. and Louwe Kooijmans, L.P. 2001. De menselijke skeletresten, in: Louwe Kooijmans, L.P. (ed.). *Hardinxveld-Giessendam Polderweg. Een mesolithisch jachtkamp in het rivierengebied (5500-5000 v. Chr.)*. Rapportage Archeologische Monumenten 83. Amersfoort: Rijksdienst voor het Oudheidkundig Bodemonderzoek, 419-440.

Smits, L. and Louwe Kooijmans, L.P. 2006. Graves and human remains., in: Louwe Kooijmans, L.P. and Jongste, P.F.B. (eds.). Schipluiden, a Neolithich settlement on the Dutch North Sea Coast, c. 3500 cal. BC. *Analecta Praehistorica Leidensia* 37/38. Leiden, 91-112.

Souvatzi, S. 2008. *A social archaeology of households in Neolithic Greece. An anthropological approach*. Cambridge: Cambridge University Press.

Sturt, F. 2006. Local knowledge is required: a rhythmanalytical approach to the late Mesolithic and early Neolithic of the East Anglian Fenland, UK. *Journal of Maritime Archaeology* 1, 119-139.

Ten Anscher, T. J. 2012. *Leven met de Vecht. Schokland-P14 en de Noordoostpolder in het Neolithicum en de Bronstijd*, PhD-thesis, University of Amsterdam (UVA), Zutphen.

Thomas, J. 1996. *Time, culture and identity: an interpretative archaeology*. London: Routledge.

Thomas, J. 1999. *Understanding the Neolithic*. London: Routledge.

Tilley, C. 2004. *The materiality of stone. Explorations in landscape phenomenology*. Oxford: Berg.

Tringham, R. 1995. Archaeological houses, households, housework and the home, in: Benjamin, D.N. and Stea, D. (eds.). *The Home: Words, Interpretations, Meanings and Environments*. Aldershot, Ashgate: Avebury Press, 79-109.

Tringham, R. 2000. The Continuous House. A View from the Deep Past, in: Joyce, R.A. and Gillespie, S.D. (eds.). *Beyond Kinship. Social and Material Reproduction in House Societies*, Philadelphia: University of Philadelphia Press**,** 115-134.

Van der Woude, J.D. 1981. *Holocene palaeoenvironmental evolution of a perimarine fluviatile area - Geology and paleobotany of the area surrounding the archaeological excavation at the Hazendonk river dune (western Netherlands).* PhD-thesis, VU Amsterdam.

Van Gijn, A.L. and Verbruggen, M. 1992. Brandwijk - Het Kerkhof, in: Hessing, W.A.M. (ed.). Archeologische Kroniek van Holland over 1991, II Zuid-Holland, *Holland* 24, 348-388.

Van Gijssel, K. and Van der Valk, B. 2005. Aangespoeld, gestuwd en verwaaid: de wording van Nederland, in: Louwe Kooijmans, L.P., Van den Broeke, P.W., Fokkens, H. and Van Gijn, A.L. (eds.). *Nederland in de Prehistorie*. Amsterdam: Bert Bakker**,** 45-76.

Verbruggen, M. 1992. Geoarchaeological prospection of the Rommertsdonk. *Analecta Praehistorica Leidensia* 25. Leiden, 117-128.

Vos, P., Weerts, H., Bazelmans, J. Hogendoorn, B., Van der Meulen, M. 2011 (eds.). *Atlas van Nederland in het Holoceen*, Amsterdam.

Whittle, A. 1996. *Europe in the Neolithic. The creation of new worlds*. Cambridge: Cambridge University Press.

Whittle, A. 2003. *The archaeology of people. Dimensions of Neolithic life*. London: Routledge.

Wiessner, P. 1982. Beyond Willow Smoke and Dog's Tails: A Comment on Binford's Analysis of Hunter-Gatherer Settlement Systems. *American Antiquity* 47/1, 171-178

Winterhalder, B. and Kennett, D.J. 2006. Behaviorial Ecology and the Transition from Hunting and Gathering to Agriculture, in: Kennett, D.J. and Winterhalder, B. (eds.). *Behavioral Ecology and the Transition to Agriculture*. Berkely: University of California Press**,** 1-21.

Zeiler, J.T. 1997. *Hunting, Fowling and Stock-Breeding at Neolithic sites in the Western and Central Netherlands*. Ph-D thesis, Groningen University.

Zvelebil, M. 1997. Hunter-gatherer ritual landscapes: spatial organisation, social structure and ideology among hunter-gatherers of Northern Europe and Western Siberia, in: Van Gijn, A.L. and Zvelebil, M. (eds.). Ideology and social structure of stone age communities in Europe, *Analecta Praehistorica Leidensia* 27, Leiden, 33-50.

Zvelebil, M. 2003a. Enculturation of Mesolithic Landscapes, in: Larsson, L. Kindgren, H., Knutsson, D., Loeffler, D and Åkerlund, A. (eds.). *Mesolithic on the Move*. Oxford: Oxbow Books, 65-73.

Zvelebil, M. 2003b. People behind the lithics. Social life and social conditions of Mesolithic communities in temperate Europe, in: Bevan, L. and Moore, J. (eds.). *Peopling the Mesolithic in a Northern Environment.* BAR International series 1157. Oxford, 1-26.

Zvelebil, M. and Jordan, P. 1999. Hunter Fisher Gatherer Ritual Landscapes: Questions of Time, Space and Representation, in: Goldhahn, J. (ed.). *Rock Art as Social Representation*, Oxford: Hadrian Books Ltd**,** 101-127.

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Luc Amkreutz (1978) studied Prehistory at Leiden University. In 2004 he graduated on a study of the earliest farmers in the Netherlands (Linearbandkeramik) and their settlements along the river Meuse. From 2004 to 2008 he was involved in the Malta Harvest project 'From Hardinxveld to Noordhoorn - from Forager to Farmer', which analysed the Neolithisation process in the Lower Rhine Area. As part of this project, he focused on the issue of socio-cultural changes in small-scale communities during the transition from hunting and gathering to agriculture. In 2013, he expects to receive his doctorate for *Negotiating Neolithisation. A long-term perspective on communities in the process of Neolithisation in the Lower Rhine Area (6000-2500 cal BC)*. From 2008 onwards he has been curator of the collection Prehistory of the Netherlands and the National Museum of Antiquities in Leiden and worked at various exhibitions and research projects. In 2010 the NWO-Odyssey research '*Back to the LBK: forgotten research into the Linearbandkeramik culture*' was granted. In cooperation with other partners the projects aims to enhance our resolution on the settlement system of the earliest farmers in the Netherlands.

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The centrality of urnfields

Second thoughts on structure and stability of Late Bronze Age and Early Iron Age cultural landscapes in the Low Countries

By Roy van Beek and Arjan Louwen

Abstract

In general models on Late Bronze Age and Early Iron Age (1100–500 BC) landscape organization, urnfields are interpreted as focal points that structured the movement of settlements across the landscape, and were located centrally within the settlement area. Urnfields were fixed, settlements shifted. These influential models are assumed to be valid for large areas. However, they have never been formally tested. In this paper an attempt is made to do so. A pilot study in the eastern Netherlands demonstrates that relations between urnfields and settlements were far more diverse than is generally assumed. A survey of data on various other parts of the Low Countries reveals similar patterns. Both spatial and chronological observations indicate that landscape organization was far more varied and dynamic than existing models make believe. Also, important doubts arise with regard to general assumptions underneath 'the urnfield concept'. Urnfields are generally perceived as large, collective burial sites that were used for many centuries and consist of large numbers of urn burials with ditched structures. Various burial sites, however, do not conform to this traditional view at all. Many were short lived, inconspicuous or situated in the 'periphery' of settlement territories.

Keywords: *Urnfields, landscape organization, testing general models, site variety, regional diversity, Late Bronze Age and Early Iron Age, Low Countries*

Introduction

This paper aims to make a critical analysis of general models dealing with spatial relations between settlements and urnfields during the Late Bronze Age and Early Iron Age. The late prehistoric burial mounds and urnfields scattered over the sandy landscapes of the Netherlands have always attracted a lot of attention, ranging from 18th century 'urn diggers' to professional archaeologists. Until the early 1960's the great majority of excavations focused on burial sites. Around that time a major shift towards settlement archaeology occurred, as a result of technological innovations (*e.g.* the development of the dragline) and the introduction of the Monuments Act, which legally protected at least part of the late prehistoric barrows. Ever since only a limited number of 'new' urnfields have been discovered, mostly

during large-scale settlement research. These trends are typical of large parts of the Low Countries. Research of late prehistoric burial sites and settlements has largely taken place in different periods, utilizing different research methods and with various objectives. Urnfield research has generally focused on the typology of burial monuments and pottery, rather than on geophysical setting or spatial relations with settlements. Settlement archaeology was strongly centered on *e.g.* the typology of farmhouses and settlement pottery, instead of on site location and landscape organization.

This situation has come to an end since the early 1990's. Intensification of archaeological research and scaling up of excavations during the last two decades have led to more holistic approaches of the late prehistoric cultural landscape (*e.g.* Fokkens and Arnoldussen 2008; Roymans and Fokkens 1991). Scientific debate on the habitation history of the Pleistocene sandy landscapes ever since has been dominated by the regions that were investigated most intensively, such as the province of Drenthe and the so-called Meuse-Demer-Scheldt region of the southern Netherlands and northern Belgium. These regions have also provided the building blocks used to construct most models on late prehistoric landscape organization. But even though these general models have become very influential and are often implicitly assumed to be valid for far larger areas, some of them have never been formally tested outside the region they have their roots in. How widely applicable are such models actually?

As a test case, this paper analyses the spatial relations between settlements and urnfields in the eastern part of the Netherlands. This region is suitable to do so, because a detailed catalogue of urnfield sites is available (Verlinde 1987). Furthermore, two recent studies have already demonstrated that parts of the eastern Netherlands possess high resolution data on settlements as well as burial sites, and therefore have great potential to address this topic (Louwen 2010; van Beek 2009).

After a discussion of the theoretical background of the subject, the paper is divided in two main parts. The first (part A) concerns the eastern Netherlands case study, which starts with a description of the most important physical geographical characteristics of that region. The urnfield-settlement relations are analysed on three scale levels. The 'supraregional' level deals with the distribution pattern of urnfields and settlements in the eastern Netherlands as a whole. It mainly provides a wider background which enables a better positioning and understanding of the next two levels. The second level consists of four 'regional' test areas, which combined cover the most important physical geographical landscape types present in the research area. These studies enable us to reconstruct settlement-urnfield relations in detail, and to trace regional differences in landscape organization. On the third scale level attention is given to the character of individual burial sites. Here, new viewpoints on *e.g.* urnfield size, life span and site variety are presented. In the second part of the paper (part B) the research results are placed in a wider perspective, by discussing patterns that have been recognised in other parts of the Low Countries.

Theoretical background

In large parts of continental Europe the first appearance of urnfields marks the beginning of the Late Bronze Age (Fokkens 1997, 360). Urnfields are generally perceived as large, collective burial sites that were used for centuries and consist of large numbers of urn burials. Cremation becomes absolutely dominant. Individual burials are often positioned within ditched structures which can take various shapes and dimensions (*e.g.* Hessing and Kooi 2005). Urnfields replace the barrows that had been dominant from the Late Neolithic Period onwards. In these older barrows only a small percentage of the population was buried (Lohof 1991, 225; Theunissen 1999, 35-36). These important changes occurred almost simultaneously in large regions and are nowadays thought to have resulted from a transformation of ideology instead of from migrations or economic crises (Fokkens 1997).

In northwestern Europe various regional 'urnfield provinces' are distinguished, based on typochronological analysis of pottery and burial monuments. In the Netherlands generally a distinction is made between the 'northern' Ems Culture and the 'southern' *Niederrheinische Grabhügelkultur* (*NGK*). This division has its

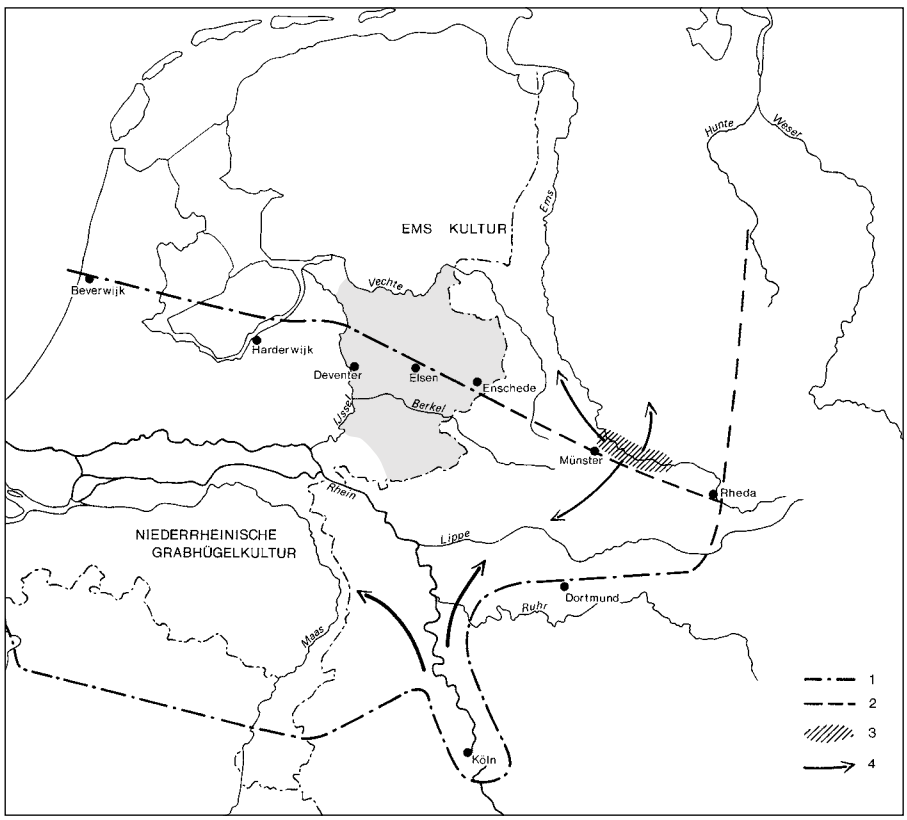

Fig. 1. Geographical position of 'urnfield provinces' as reconstructed by Verlinde. 1. 'border' between culture groups; 2. probable 'border' between culture groups; 3. the 'Oberems' group; 4. main directions of cultural influences (after Verlinde 1987, Abb. 139). The research area of the case study in this paper is marked in grey.

origins in studies published by Kersten (1948), Desittere (1968), Kooi (1979) and Verlinde (1987). Verlinde demonstrated that the urnfields in the province of Overijssel, situated in the eastern Netherlands, display influences from both 'core' regions. Therefore the area of our case study is positioned in the 'transitional zone' between both (Fig. 1). Furthermore, he introduced the so-called Gelderland group as a third, smaller and intermediary style group which is considered part of the *NGK* (Verlinde 1987, 298). Recently an even more detailed division of regional 'urnfield groups' in the Netherlands and adjacent parts of Belgium and Germany was published (Verlinde and Hulst 2010, 100-113), a discussion of which goes beyond the scope of this paper.

Extensive catalogues of urnfield sites in the Netherlands are available for three regions, all situated in the central and northern part of the country (Kooi 1979; Verlinde 1987; Verlinde and Hulst 2010). These studies mainly have their merits in detailed inventories of burial sites, typochronologies of burial monuments and meticulous descriptions of pottery types. Less attention is given to site location and hardly any observations can be found on the spatial relations between settlements and cemeteries or landscape ordering in general. Kooi for example only briefly mentioned that the northern Dutch settlement sites moved frequently, whereas some urnfields remained fixed for over 500 years. Therefore the distance between settlement and burial site could change. He also argued that the site location of some urnfields was influenced by older barrows, local geology and possibly the presence of road systems (Kooi 1979, 152-166).

The northern Netherlands urnfield dataset has also been used in attempts to reconstruct late prehistoric territorial structures in this region and their possible continuity into historic times (*e.g.* Harsema 1980; Kooi 1979, 163-182; Waterbolk 1995). Other site categories are incorporated into these studies as well, such as older barrow groups, Celtic Fields and – to a lesser extent – settlement sites. However, they never lead to systematic analyses of spatial relations between settlements and urnfields. The most significant spatial models with regard to the Late Bronze Age and Early Iron Age mainly are based on research in the Meuse-Demer-Scheldt area, where such detailed urnfield catalogues are lacking (Gerritsen 2003, 291-298 provides a basic list). As mentioned before, this dichotomy can be explained by the fact that especially the southern Netherlands have benefited from an intensification of archaeological research and scaling up of excavations during the last decades. Therefore this region provided the high resolution data needed for modeling purposes at a time when attention for the late prehistoric cultural landscape started to grow.

The first and most influential model on settlement-urnfield relations was published two decades ago by Roymans and Fokkens (1991). In this model urnfields are interpreted as important focal points which structured the movement of settlements across the landscape, and took central positions within the settlement territory (Fig. 2A). Especially important is the dichotomy between 'stable' burial sites and 'dynamic' settlements. As Roymans and Kortlang (1999, 40) formulated the key thought to the model at a later stage, urnfields formed a '*fixed reference*

point providing continuity and stability to the local group, and as such forming a counterbalance to the discontinuities that frequently occurred in the domestic sphere because of the practice of abandonment and small-scale displacement of farmhouses'. This 'dynamic' settlement character calls for some explanation. Late prehistoric settlements in the Netherlands generally consisted of between one and three farmsteads. Settlements were open and had dispersed lay-outs (*e.g.* Arnoldussen and Fokkens 2008). Furthermore, they frequently shifted location (Schinkel 2005). In the northern Netherlands these shifts are demonstrated to sometimes have been structured by Celtic Field systems (Harsema 2005). These usually large, highly structured complexes of agricultural fields confined by earthen banks are assumed to have been used from the Late Bronze Age to the earliest stages of the Roman period (Brongers 1976; Spek *et al.* 2003; Spek 2004, 146-150). Such field systems were abundant in the central and especially northern parts of the Netherlands, but seem to occur less frequently elsewhere. The latter applies to the eastern Netherlands as well. A recent systematic analysis of high-resolution digital elevation maps could only confirm the presence of three undisputed Celtic field systems in this region (Kooistra and Maas 2008). Contrary to for example the central and southern parts of Europe (*e.g.* Harding 2000, 55-72), settlement nucleation in most parts of the Low Countries only starts to appear during the final stages of the Iron Age (*e.g.* Gerritsen 2003, 181-189).

The model published by Roymans and Fokkens and the basic assumptions underlying it have frequently reappeared in publications on late prehistoric landscape ordering and territorial structures (*e.g.* Fokkens 2005; Fokkens and Arnoldussen 2008; Roymans and Kortlang 1999; van den Broeke 2005; Fig. 2B-C). One of the most important new insights that has been gained since 1991 is the notion that frequently the site location of urnfields was influenced by the pre-existing funerary landscape (Fontijn 1996). Therefore, Roymans and Kortlang added older barrows to their spatial model (1999, 51-53; Fig. 2B). They also stressed that settlement territories became smaller and more fixed than during the Middle Bronze Age, mainly as a result of increasing population density. Finally, Arnoldussen has argued that the life spans of late prehistoric farmhouses frequently have been longer than the 20-40 years that usually are suggested (Arnoldussen 2008, 88-92). This implies that location shifts of settlements might have been somewhat less frequent than generally assumed.

We will get back to some of the points discussed in this section in the second part of this paper, when the results of our eastern Netherlands case study are discussed in the wider scope of the Low Countries. For now it suffices to establish that, apart from the relatively minor adjustments to the model that were discussed above, its essence is still standing. It has become the generally accepted model on settlement-urnfield relations in the sandy Pleistocene parts of the Netherlands. Researchers so far have mainly focused on analysis of the separate building blocks underneath the model, instead of on formally testing the spatial relations between settlements and urnfields in their territorial and physical geographical setting.

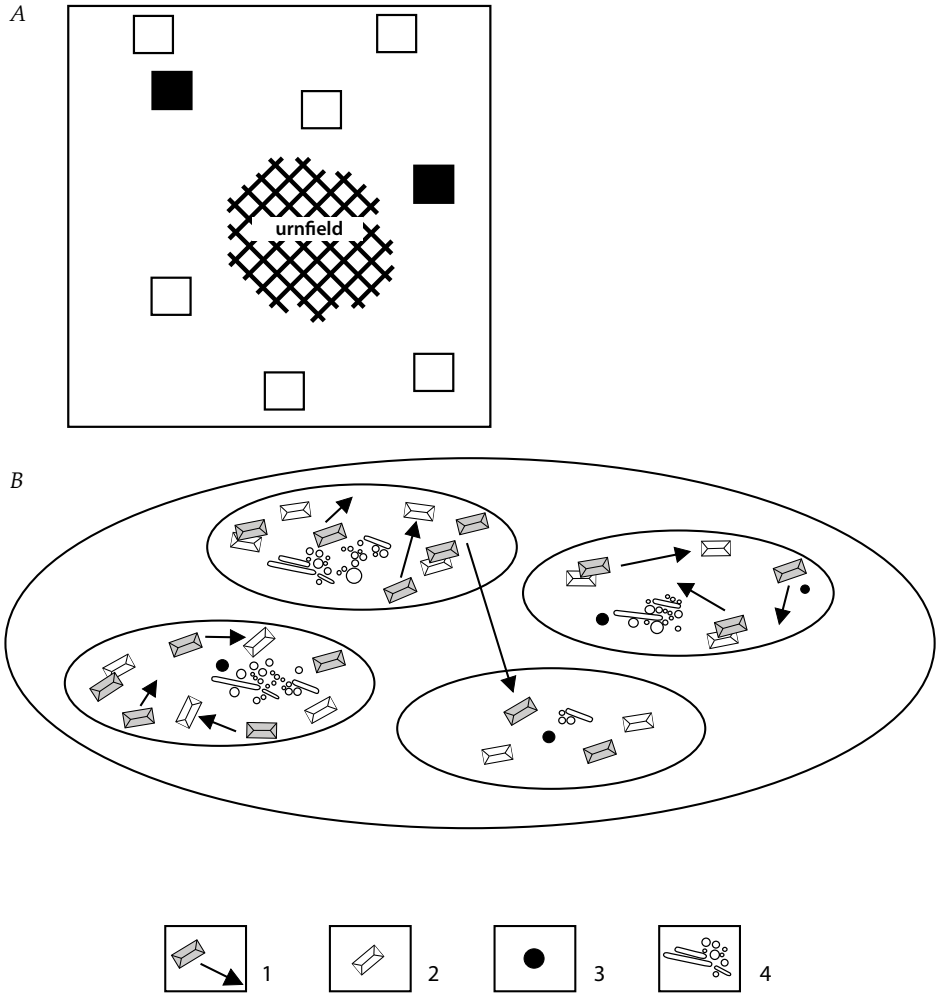

Fig. 2. Three models of spatial relations between settlements and burial sites in the Late Bronze Age and Early Iron Age.

A: Roymans and Fokkens 1991.
Black square: settlement. White square: former settlement.

B: Roymans and Kortlang 1999.
1. settlement; 2. former settlement;
3. older barrow; 4. urnfield

C: Van den Broeke 2005.

Grey rectangle: settlement. White rectangle: former settlement.

(after Roymans and Fokkens 1991, fig. 7b; Roymans and Kortlang 1999, fig. 10; Van den Broeke 2005, fig. 30.1).

PART A EASTERN NETHERLANDS CASE-STUDY[1]

Research area

The research area of our case-study consists of the largest part of the Dutch province of Overijssel and the eastern parts of the province of Gelderland (Fig. 3). It is delimited by the German border in the east and by three large rivers: the Overijsselse Vecht, IJssel and Oude IJssel. Three regions can be distinguished within this area. Overijssel is divided into Salland (west) and Twente (east), while the eastern part of Gelderland is known as the Achterhoek.

Physical geographical research demonstrated that the landscape of the eastern Netherlands is far from uniform (Maas and Makaske 2007; van Beek 2009). The results of an analysis of landscape genesis in combination with the character of the present-day landscape allow for a division into nine main physical geographical landscapes (Fig. 4). The so-called eastern Dutch plateau is situated in the eastern part of the Achterhoek. It was formed mainly during the Tertiary period. Within the Netherlands similar landscapes only occur in small parts of the province of Limburg. Most of Twente and some adjacent smaller parts of the Achterhoek are part of two distinct ice-pushed ridge landscapes. The ice-pushed ridges and glaciofluvial sediments in these areas are the result of geological processes that took place during and after the final stages of the Saalian ice age. Two small parts of the Twente region are classified as coversand landscapes. The first of these, situated near the city of Hengelo, is characterised by east-west oriented coversand ridges separated by stream valleys and depressions. The second coversand landscape in Twente is dominated by the north-south oriented Dinkel valley and the large coversand ridges running parallel to it. Large parts of Salland and the central part of the Achterhoek are classified as coversand landscapes as well. Combined they form a wide zone running roughly parallel to the river IJssel. Finally, two fluvial landscapes can be distinguished. The old river landscape of IJssel and Vecht was formed during the Weichselian. Pleistocene river sediments are especially well represented in the southwestern part of the Achterhoek. The Holocene landscape of the IJssel and Vecht follows the modern course of these rivers.

From a physical geographical point of view, the eastern Netherlands present a diverse landscape. 'Diverse' is indeed the most appropriate term to characterise the research area (van Beek 2011). This is true at all levels, since the nine main physical geographical units are each a mosaic of different landscape types (*e.g.* stream valley landscapes, peat landscapes) which in turn are mosaics of various terrain forms (*e.g.* raised bogs, coversand ridges). Several rivers and stream valleys intersect the eastern Netherlands, and many former peat bogs and wet depressions are scattered throughout the landscape. These low areas alternate with ice-pushed ridges, riverdunes and coversand ridges. This distinctive, fragmented landscape structure has been described as a 'sandy archipelago' (Verlinde 1987). It fundamentally differs from other Pleistocene landscapes in the Netherlands, such as those in the Veluwe region (province of Gelderland) and the provinces of Noord-Brabant and Limburg. These landscapes are mostly more large-scale and homogeneous.

1 This case study has earlier been published in Van Beek and Louwen 2012.

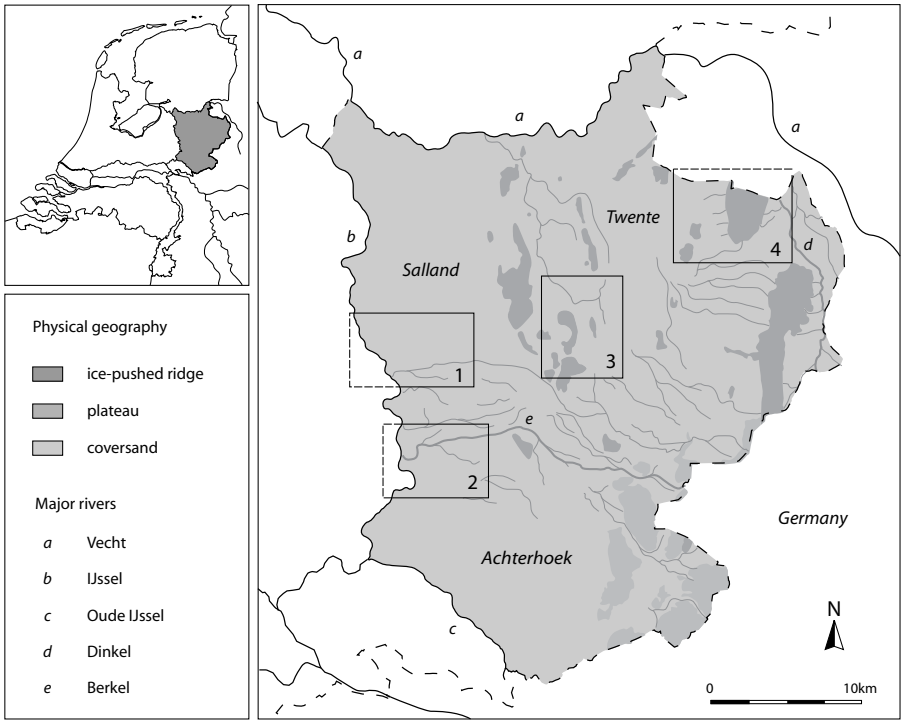

Fig. 3. Geographical location of the eastern Netherlands and the most important regions and rivers mentioned in the text. The test areas that are discussed are indicated by rectangles. 1. southwestern Salland; 2. northwestern Achterhoek; 3. southwestern Twente; 4. northeastern Twente.

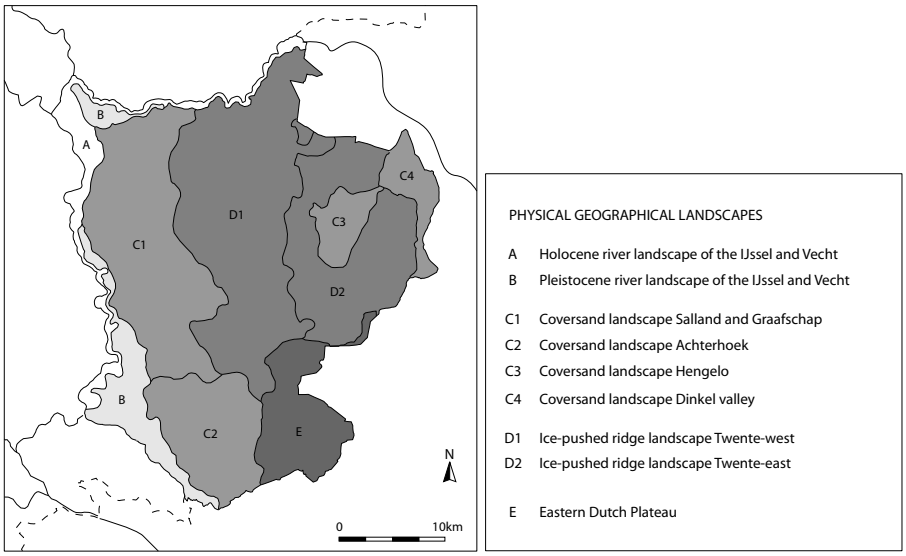

Fig. 4. Main physical geographical landscapes of the eastern Netherlands.

Urnfields of the eastern Netherlands

We will start our analysis by attempting to reconstruct the distribution pattern of urnfields in the eastern Netherlands as a whole. The Late Bronze Age and Early Iron Age cemeteries in the province of Overijssel have been mapped by Verlinde (1987). His catalogue can be supplemented with a small number of sites that were discovered after 1987. This brings the final tally to just over 90 sites. With regard to the Achterhoek less detailed information is available. Therefore a thorough literature survey was conducted, in combination with an analysis of archaeological databases kept by the Cultural Heritage Agency of the Netherlands. The result is a catalogue consisting of approximately 50 certain and probable urnfield locations. Even though the image is undoubtedly influenced by postdepositional factors, it is safe to assume that the combination of both catalogues provides at least a first impression of the distribution pattern of urnfields on this scale level (Fig. 5A).

In the province of Overijssel some clear clusters of urnfield sites can be discerned (see also Verlinde 1987, 308-317). This for example applies to the coversand ridges along the eastern part of the Vecht valley. A second zone with a high density of sites more or less follows the river IJssel in a southern direction, into the western part of the Achterhoek. However, by far the highest densities of sites are encountered in the ice-pushed ridge landscapes of Twente, especially in the southwestern and northeastern parts of that region (*e.g.* Hijszeler 1961). On the other hand, some areas are remarkably 'empty'. Parts of these areas, such as the vast former peat bog of Vriezenveen (Twente), actually appear to have been uninhabited in late prehistory. In other regions where urnfields are lacking, such as the central part of the coversand landscape of Salland, settlement sites dating from the Late Bronze Age and Early Iron Age are known (Groenewoudt *et al.* 1998; see below). The striking differences in site density, however, do appear to reflect differences in population density between Salland and Twente.

In the Achterhoek a relatively large number of urnfields is known from the vicinity of the city of Zutphen (van der Kleij 2003; see also next section). Some of these sites are situated near the Berkel valley. Further upstream more sites have been discovered on coversand ridges and ice-pushed ridges along this river and its tributaries. The eastern Dutch plateau steps forward as a region with a high density of urnfields as well. Part of these cemeteries are situated on the western part of the plateau and near the transitional zone towards the adjacent coversand landscape of the central Achterhoek. The stream valleys and dry valleys that transect the plateau seem to have been an important pull factor. A final, more modest cluster follows the coversand ridges and riverdunes along the Oude IJssel river. Hardly any sites are known from the generally low-lying and moist central part of the Achterhoek, which at least partly was covered with peat during late prehistory (van Beek 2009, 470-476).

In addition to the distribution pattern of urnfields, an attempt was made to map the settlement sites that date to the same period. Since published overviews of Late Bronze Age and Early Iron Age settlements are not yet available, the archaeological databases of the Cultural Heritage Agency of the Netherlands once more are an import information source. Unfortunately, the picture that emerges after a quick scan of these databases (Fig. 5B) is nowhere near as detailed and

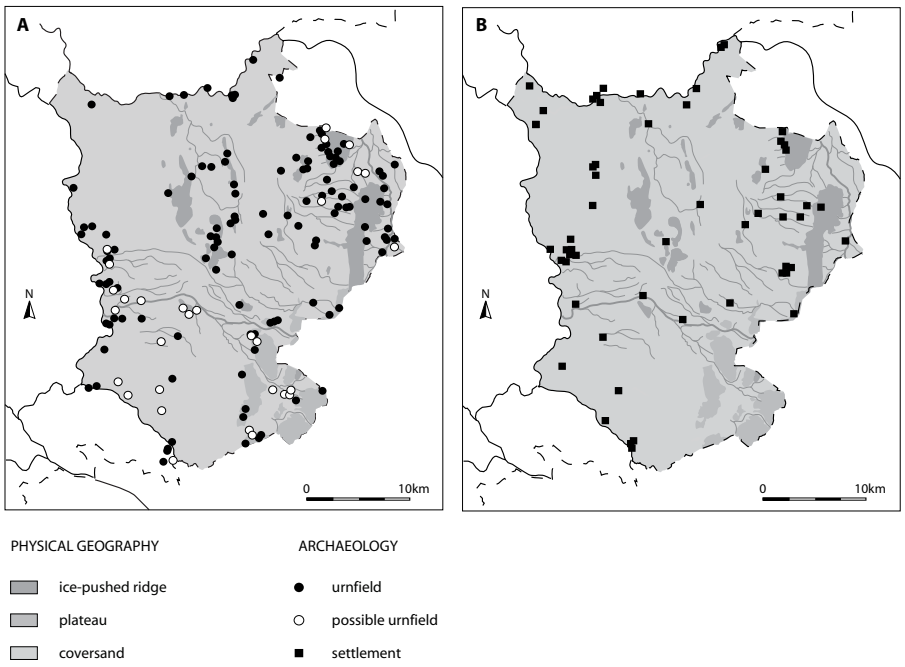

Fig. 5. Distribution pattern of urnfields (A) and settlement sites (B) dating to the Late Bronze Age and Early Iron Age in the eastern Netherlands. Burial sites in Overijssel are largely based on Verlinde 1987. Settlement sites are mainly based on a quick scan of the national Dutch archaeological database 'Archis'.

reliable as the burial data. Only a small percentage of catalogued settlement finds is dated precisely, and detailed research would be needed to assess the reliability of the sites concerned. Furthermore, we might note that urnfields in general have a higher chance of discovery than settlements because of the frequent presence of urns, ditched structures and – sometimes – barrows that are still visible in the landscape. Discovery chances of settlements are far more strongly influenced by professional research intensity. Only a few urnfields have been discovered in Overijssel since 1987, whereas the number of known settlements has increased significantly.

The discrepancies between the distribution patterns of burial sites and settlements provide us with some interesting additional data on habitation patterns (Fig. 5A-B). As mentioned above, urnfields are not yet known from the central part of Salland, whereas settlement sites are. Furthermore, judging from settlement sites alone, one would be tempted to describe the eastern Dutch plateau and its immediate surroundings as a region with a very low habitation density. The distribution pattern of urnfields, however, proves this assumption to be erroneous.

The supraregional distribution pattern of urnfields provides a background for the following research steps. In order to arrive at a more detailed analysis of settlement-urnfield relations and landscape organization it is now necessary to

zoom in towards more detailed levels. With this goal in mind, four test areas have been selected:

1. Southwestern Salland
2. Northwestern Achterhoek
3. Southwestern Twente
4. Northeastern Twente

Taken together these test areas, whose locations are depicted in figure 3, cover the most important physical geographical landscape types present in the eastern Netherlands. It has recently been demonstrated that significant regional differences existed between the late prehistoric occupation history of coversand landscapes on the one hand, and ice-pushed ridge landscapes on the other hand (van Beek 2009, 410-440). These differences will be highlighted here as well. To generalize: test areas 1 and 2 represent coversand landscapes, 3 and 4 ice-pushed ridge landscapes.

It has to be stressed beforehand that the discovered archaeological sites in these four regions do not offer complete images of the Late Bronze Age and Early Iron Age communities living there. Obviously, not all settlements and urnfields have been found yet, and not every site has been investigated as detailed as one would like. However, full site recoveries are not always necessary to make observations on for instance site location and landscape ordering. It is also important to mention that the research history and therefore level and composition of knowledge varies from region to region (van Beek 2009, 19-44). Several large-scale excavations have taken place in test areas 1 and 2 during the last decades, providing high-resolution data on late prehistoric habitation development. Especially some well-investigated microregions situated within these areas will be highlighted in the next section. Large-scale settlement excavations of relevance are virtually lacking in test areas 3 and 4. Instead, these areas are far richer in barrows and urnfields. Analysis of their distribution pattern, combined with excavation data, demonstrated that landscape organization in these ice-pushed ridge landscapes differs in interesting ways from coversand landscapes.

Test areas

Southwestern Salland (prov. Overijssel)

The southwestern part of Salland is built up of a series of elongated, east-west oriented coversand ridges which are separated from each other by valley-like depressions. This also applies to the most intensively excavated microregion of this area, which is situated near the village of Colmschate (Fig. 6). Several excavations have taken place on a large ridge known as the Weteringer Enk (Verlinde 2000). It probably has been occupied continuously from *c.* 1500 BC onwards. During the Late Bronze Age and Iron Age this settlement consisted of a single farmstead that shifted location frequently. South of the Weteringer Enk we find a series of smaller coversand ridges, where at four locations single Early Iron Age farmsteads

were found. These are interpreted as the remains of a relatively short 'colonisation phase' consisting of a single farmstead that was moved a number of times (ten Bosch *et al.* 1997).

During the Late Bronze Age the community living on the Weteringer Enk used two burial sites (Fig. 6). East of the settlement an urnfield was partly excavated. Several urns were found and some ringditches were documented. The exact life span of this urnfield has not been established, but evidence for use during the Early Iron Age is lacking (van Tent 1974). West of the settlement a smaller burial site was found, which exclusively consists of cremation burials without ditched structures. This site was used intermittently during the Late Bronze Age, Middle/ Late Iron Age and Roman period (van Beek 2009, 172-174). Only one out of four burials dated to the Late Bronze Age included an urn. This site clearly does not resemble the 'classic' urnfield image and was only used incidentally. Interestingly, neither of both burial sites took a central position within the settlement area.

Landscape organization changed drastically in the Early Iron Age. The small burial site remained unused and the urnfield in the east was abandoned. A new urnfield was founded on one of the smaller ridges (Verlinde 1997). It contained approximately 100 burials and was probably used by two settlements: the first situated at the Weteringer Enk, the second at the southern sandy ridges.

Several other urnfields are known from southwestern Salland (Verlinde 1987, 9-21). We will only discuss two sites near the village of Epse. Recently the largest part of an Early Iron Age urnfield was excavated on a narrow river

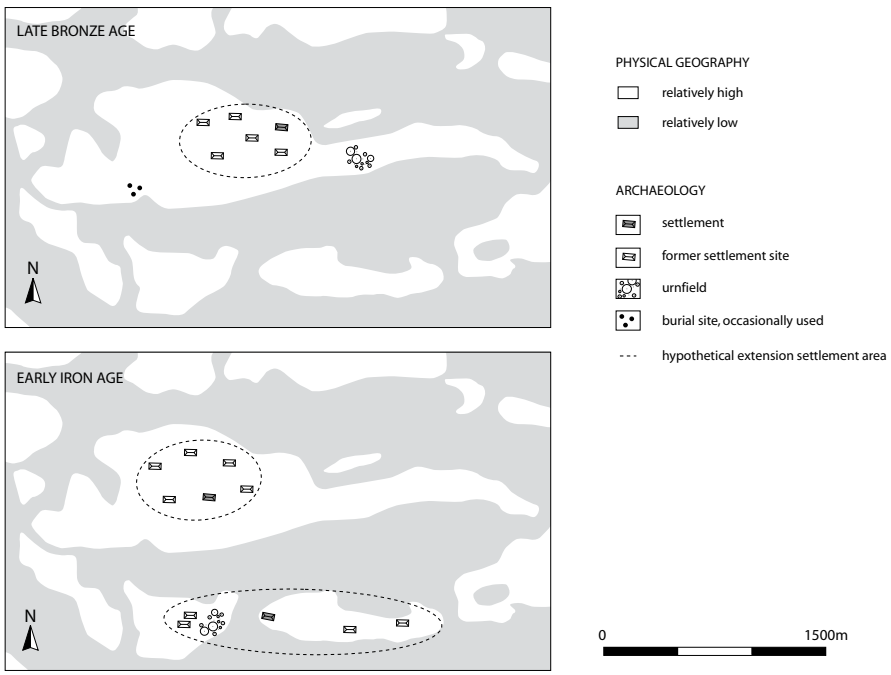

Fig. 6. Schematic overview of the spatial relations between settlements and burial sites in the microregion of Colmschate during the Late Bronze Age and Early Iron Age. The Weteringer Enk is situated in the center of this image.

terrace. It probably consists of 40-50 burials (Hermsen 2006). The limited size of the elongated ridge makes continuous habitation unlikely, which is confirmed by the fact that only a small number of Early Iron Age settlement features were found. The settlement of the community using this cemetery must have been situated on a separate landscape unit (Fig. 10C). The second burial site was found during research of a Middle/Late Iron Age settlement (Prangsma 2002). Nine or ten cremation burials were found, and four more burial were documented at a later stage. The burials were ascribed to the younger Iron Age, because only one ringditch and hardly any urns were found. ^{14}C-analyses, however, date this burial site in the Late Bronze Age, illustrating that such 'deviating' burial sites (with regard to both life span and appearance) might actually be more common than expected (van Beek 2009, 174-175).

Northwestern Achterhoek (prov. Gelderland)

The physical geography of the northwestern Achterhoek is largely comparable to southwestern Salland, even though the east-west structure of ridges and valleys is less distinct. During the last decades several excavations have taken place southeast of the city of Zutphen, which provide detailed insights into the late prehistoric occupation of this microregion. We focus on these data rather than on the low-resolution information on urnfields in other parts of the northwestern Achterhoek (but see van der Kleij 2003). The most interesting area consists of a series of three adjacent riverdunes called Looërenk, Leestense Enk and Ooyerhoek, separated from one another by stream valleys and depressions. Significant observations have also been made at a fourth riverdune near Bronsbergen (Fig. 7).

Excavations have shown that the northern part of the Looërenk riverdune was inhabited continuously from the later Middle Bronze Age to the Late Iron Age (Bouwmeester *et al.* 2008). This settlement consisted of a single farmstead, which shifted location frequently. About 400 m south a burial site was partly excavated (Bouwmeester 2002, 46-54). Its exact life span has not been established yet, but it was certainly used during (parts of) the Late Bronze Age and Early Iron Age. The settlement and burial site are situated at the same riverdune, but continuously remained at separate locations (Fig. 10A). Even though the Leestense Enk has been investigated less intensively, it is clear that this landscape unit was inhabited during the Late Bronze Age and Early Iron Age (Groothedde 1996). No burials dated to this period have been found yet. The Ooyerhoek displays a strikingly different pattern. Large parts of this riverdune have been excavated, but apart from an isolated *Harpstedt* pot not a single Late Bronze Age or Early Iron Age settlement feature was found (Groothedde *et al.* 2001). However, two isolated cremation burials were found. One of these contained sherds of a Late Bronze Age bowl and fragments of a horse skull (Bouwmeester 2000, 16). Apparently this riverdune was incidentally used as a burial site.

In the early 20th century urns were found at two separate locations on the riverdune of Bronsbergen (van der Kleij 2003, 12-13). Both cemeteries are situated near the edges of the dune. Even though neither site has been excavated, it seems likely that they rather reflect a movement of burial site instead of simultaneous use (Fig. 10B). The latter possibility can not be excluded, however. Prospective

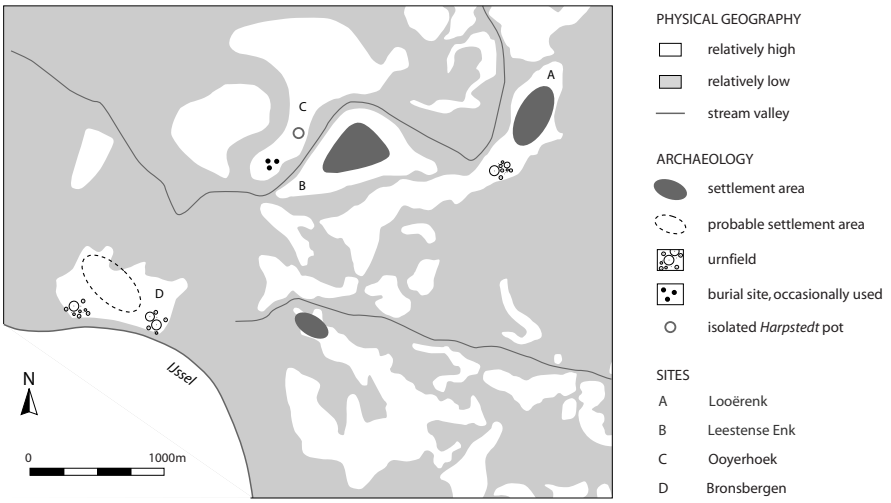

Fig. 7. Schematic overview of the most important Late Bronze Age and Early Iron Age sites on a series of large riverdunes south and southwest of the city of Zutphen.

research has demonstrated that a settlement was situated in the same landscape unit (Oude Rengerink 2003). To summarise, this microregion illustrates that within short distances very different settlement-cemetery relations can be encountered. In one case settlement and urnfield are situated at separate locations at the same landscape unit (Looërenk). A second riverdune was only incidentally used as a burial location (Ooyerhoek), whereas a third one housed a settlement as well as two burial sites in 'peripheral' positions (Bronsbergen).

Southwestern Twente (prov. Overijssel)

Southwestern Twente is part of the ice-pushed ridge landscape of Twente-west. Its physical geography is far more diverse than both regions discussed above, and late prehistoric habitation patterns were quite different as well. This can be illustrated by focussing on a large ice-pushed ridge complex situated between the towns of Rijssen and Markelo (Fig. 8). No large-scale excavations have taken place here yet, and only two settlement sites dated to the period under discussion are known. Both Late Bronze Age sites were found close to each other south of a moraine ridge (Groenewoudt and Thomas 1979). They probably represent different habitation phases of one settlement. Far more interesting observations, however, can be made by the analysis of burial sites.

The ice-pushed ridge complex of Rijssen-Markelo stands out for the presence of a large number of barrows pre-dating the Late Bronze Age (van Beek 2009, 307-319). Approximately 70 barrows are known, most of which cluster in small groups on the highest parts and western slopes of the ridge. Hardly any of these monuments have been excavated professionally. Therefore detailed information on individual barrows is lacking, let alone insight in the genesis of barrow groups. It is clear, however, that these monuments partly determined the structure of the late prehistoric funerary landscape. At least eight Late Bronze Age and/or Early Iron Age burial sites are known, three of which are situated adjacent to older

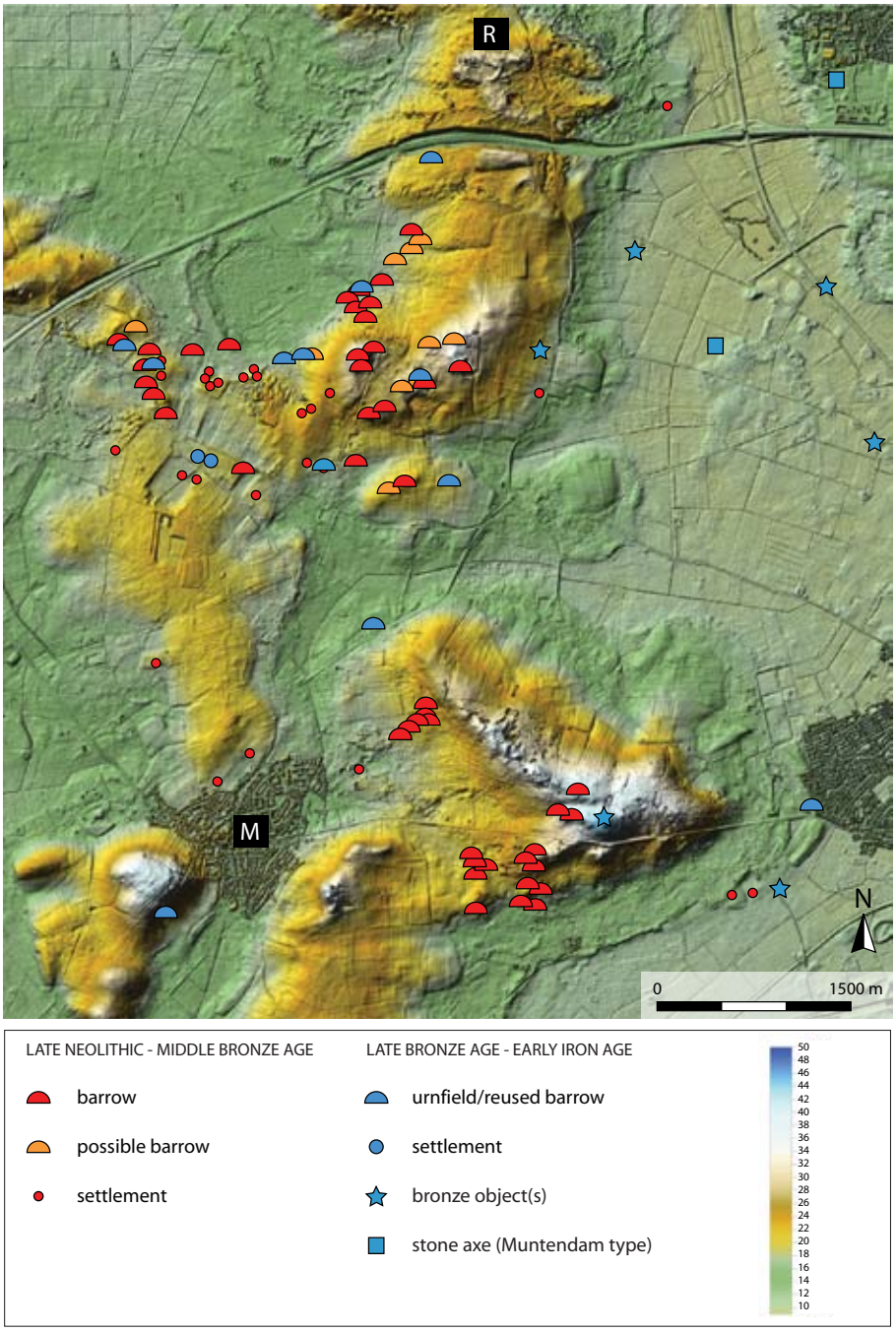

Fig. 8. Distribution pattern of barrows, urnfields and settlement sites plotted on the digital elevation model of the Actueel Hoogtebestand Nederland (copyright AHN) of the ice-pushed ridge of Rijssen-Markelo. M = Markelo, R = Rijssen.

barrows. A fourth site consists of a Late Bronze Age cremation burial placed in the body of an older barrow and a second one near the base of this mound. Therefore the site location of at least half of the burial sites has been influenced by older monuments, even though continuity of use of such funerary landscapes can not be proven (cf. Fontijn 1996). Similar patterns of reuse occur far less frequently in the regions discussed above.

On average, the remaining four burial sites are located at slightly lower positions than the barrows dating to older phases. The settlements discussed above are situated at a distance of 800 m from the nearest known cemeteries. Their location is relatively low-lying compared to the urnfields and barrows on the slopes and higher parts of the neighboring ice-pushed ridges (Fig. 10E). The latter are probably unsuitable for long-term habitation because of the presence of gravelly morainic sediments in the subsoil. Therefore it appears that most urnfields in this microregion were not situated in the center of settlement territories, and did not structure the movements of settlements.

One urnfield displays a different site location. It is situated on a large, elongated coversand ridge alongside the lower slope of the ice-pushed ridge. Similar terrain forms are present alongside all ice-pushed ridges in Twente. They offer excellent conditions for long-term habitation, generally are characterised by a high density of archaeological sites from different phases and are likely to have formed the most important settlement areas in these ice-pushed ridge landscapes in the Late Bronze Age and Early Iron Age. In the vicinity of the town of Enter, situated on a small ice-pushed ridge near the microregion discussed here, three urnfields, as well as a number of settlement sites, were found in a very similar geophysical setting (van Beek 2009, 318-319). In these cases, both settlement and burial site are located on the same sandy ridge adjacent to an ice-pushed ridge (Fig. 10D).

Northeastern Twente (prov. Overijssel)

The physical geographical structure of northeastern Twente is roughly comparable to southwestern Twente, especially with regard to its diversity and the dominance of ice-pushed ridge complexes. A very large number of barrows and urnfields is known from this area (Verlinde 1987, 59-162; Hijszeler 1961; 1966; Louwen 2010). Most are situated on or near the high ice-pushed ridge of Ootmarsum (Fig. 9). We will briefly discuss this microregion which displays some patterns that are similar to the previous test area. One of these parallels is the small number of Late Bronze Age and Early Iron Age settlement sites that are known. Most of these have been discovered through chance finds and hardly provide detailed information (but see de Wit *et al.* 2002). Burial sites provide far better insights into late prehistoric landscape ordering. The numerous barrows pre-dating the Late Bronze Age display a preference for the highest parts of the ice-pushed ridge, as well as for positions alongside dry valleys. Some monuments are aligned along the central axes of the ridge.

18 urnfields are known from the ice-pushed ridge and its adjacent moraine and coversand landscape, as well as five possible cemeteries. Most of them are situated on the ice-pushed ridge itself or in its immediate vicinity. Some urnfields are incorporated in larger 'funerary landscapes' with origins in the Late Neolithic

and Early and Middle Bronze Age, whereas the site locations of others do not seem to have been influenced by older monuments. This pattern compares well to the site location of urnfields on the ice-pushed ridge of Rijssen-Markelo. Late Bronze Age and Early Iron Age settlement sites are not likely to be present on the highest parts of the ice-pushed ridge, but rather on its sandy slopes and/or adjacent moraine and coversand landscape (Fig. 10E).

Reuse of older burial sites is not restricted to ice-pushed ridges. We find similar patterns in coversand landscapes in Twente as well. The urnfield of Oldenzaal-De Zandhorst developed around a Late Neolithic barrow, for example (Hijszeler and Verlinde 1975).

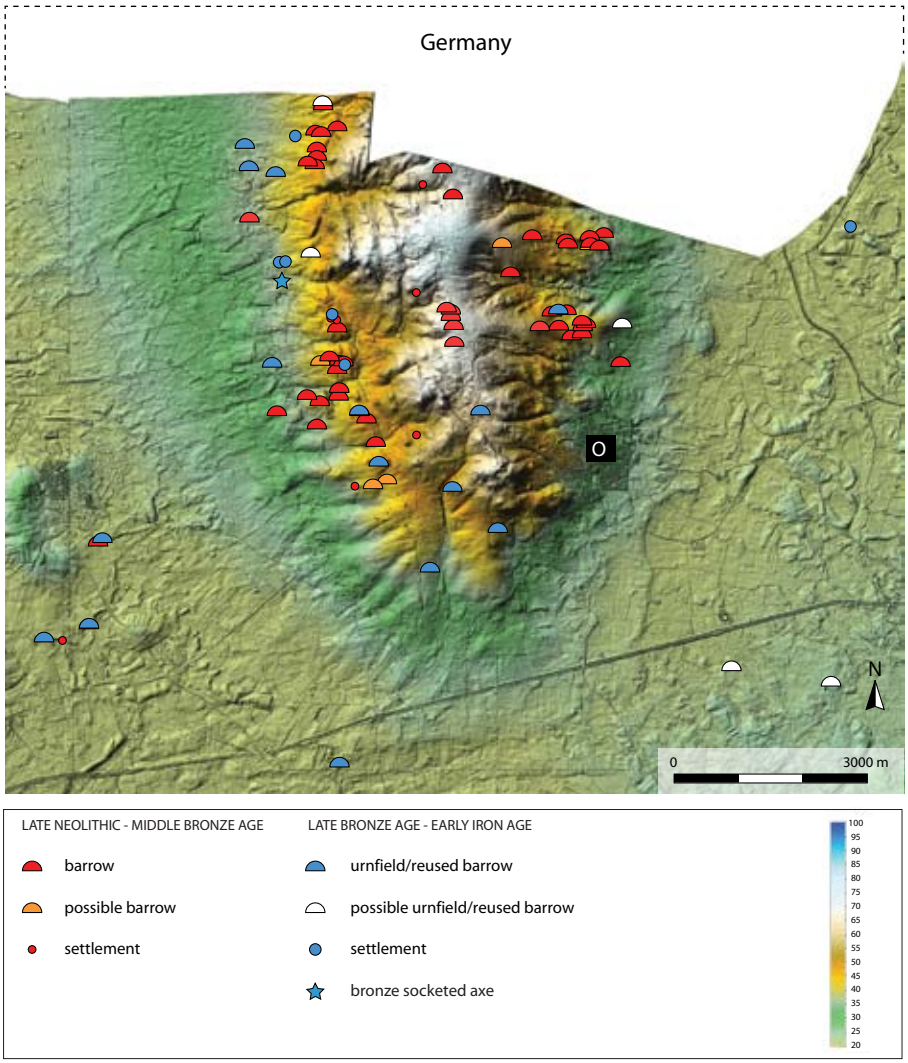

Fig. 9. Distribution pattern of barrows, urnfields and settlement sites plotted on the digital elevation model of the Actueel Hoogtebestand Nederland (copyright AHN) of the ice-pushed ridge of Ootmarsum. O = Ootmarsum.

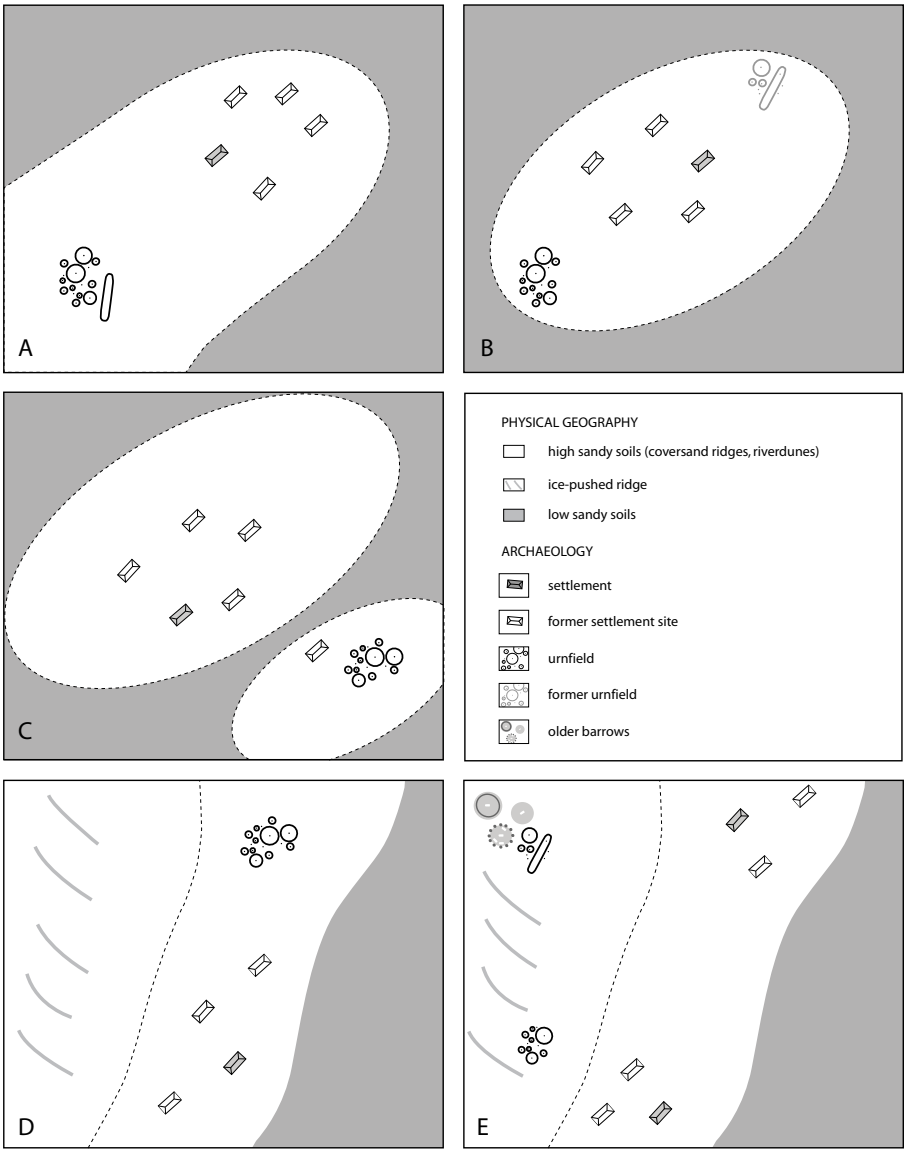

Fig. 10. Schematic 'snapshots' of urnfield-settlement relations documented in different parts of the eastern Netherlands. Key:
A: settlement and urnfield situated in different parts of the same, relatively large sandy ridge;
B: settlement and urnfield situated on the same sandy ridge. The burial site, which is located in the 'periphery' of this landscape unit, is moved at a certain point in time;
C: settlement and urnfield situated on separate sandy ridges. The landscape unit in which the urnfield is located might occasionally be used for short-term habitation;
D: settlement and urnfield situated on the same coversand ridge deposited on/alongside the lower slopes of an ice-pushed ridge;
E: settlement situated on a coversand ridge deposited on/alongside the lower slopes of an ice-pushed ridge. Some of the burial sites (used by different communities) are situated near older barrows on higher parts of the adjacent ice-pushed ridge. Other urnfields appeared in 'new' locations within the same landscape unit.

To summarize it appears that in the ice-pushed ridge landscapes of Twente, Late Bronze Age and Early Iron Age settlement areas and urnfields – the latter sometimes part of 'funerary landscapes' with older origins – often are found in different parts of the same microregion. This does not apply to sandy ridges alongside ice-pushed ridges, where both site categories can be found. Even in the latter cases, however, it has not been demonstrated yet that these cemeteries took central positions within settlement territories.

Site variety and general appearance of urnfields

The third scale level of analysis concerns the individual cemetery. Unfortunately only a limited number of eastern Netherlands urnfields have been investigated professionally, and (almost) completely excavated burial sites are rare (Verlinde 1987, 170-171). Despite this relatively low knowledge level the available data do give rise to some interesting observations. Attention will mainly be given here to the population size of the local community and the life span and general appearance of urnfields.

We will first focus on estimations of the size of the local community that made use of an urnfield. Verlinde already attempted to make such calculations by using five burial sites that have been almost fully excavated. Four of these are situated in the ice-pushed ridge landscape of Twente, the fifth on a coversand ridge along the Vecht valley. The latter site, near the hamlet of Mariënberg, actually consists of three small burial sites that were used by the same community. Verlinde estimated the size of the populations making use of the burial sites in these five microregions to vary between 10 and 20 persons (1987, 324-326).

Of the urnfields in Overijssel for which reliable dates are available, 33 date to the Late Bronze Age and 14 to the Early Iron Age. Only twelve were in use during (parts of) both phases (Verlinde 1987, 322-323, with recent additions). The remarkable difference between both phases can partly be explained from the chronology used by Verlinde, in which the Late Bronze Age lasts 350 years and the Early Iron Age only 200 years. More important is the observation that apparently only a limited number of burial sites was in use during the whole time span of the Late Bronze Age and Early Iron Age. Obviously it is important to take into account the fact that urnfields with long life spans are likely to be underrepresented, because only relatively few sites have been excavated completely. All evidence, however, points to the conclusion that displacements of burial sites were quite normal facts. This has been demonstrated in some of the test areas discussed above and becomes increasingly clear if we bring the number of burials in urnfields into the picture.

The eastern Netherlands provide us with 22 burial sites for which the exact number of burials is known, or which allow at least general estimations (Fig. 11). Three more sites consist of over a 100 burials but do not allow more detailed statements. At least five sites consist of only one or a few burials and were clearly used for short periods of time, probably by the inhabitants of single farmsteads. Only one site, Haarle, indisputably consists of over 150 burials. It seems that urnfields as large as this site are actually quite rare. The number of burials in more than half of the sites listed does not even exceed 60. These urnfields have been used

Site	Estimated number of burials
Colmschate-'t Bramelt	90-100
Baalder	1
Mariënberg I	40
Mariënberg II	10-15
Mariënberg III	20
Noord-Elsen	150
Elsen-Friezenberg	100
Goor-De Whee	15-20
Losser-De Aust	140
Oldenzaal-De Zandhorst	120
Denekamp-De Borchert	3
Tubbergen-Hilbertshaar	90
Haarle	300-350
Manderveen	30-40
Mander III	80
Vasse	2
Colmschate-Hunneperweg	2
Oldenzaal-De Tij	> 100
Weerselo-Hondeveld	> 100
Rossum-Oranjestraat	> 100
Woolde-Schild Es	33
Zutphen-Ooyerhoek	2
Zutphen-Looërenk	100
Epse-Olthof Noord	40-50
Epse-Waterdijk II	20-30

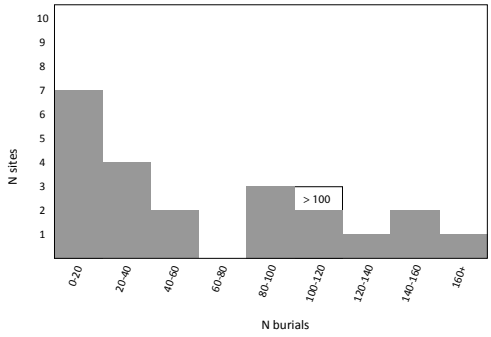

Fig. 11. Estimates of the numbers of burials in eastern Netherlands burial sites dated to the Late Bronze Age and/or Early Iron Age. Site estimates in the table that are exactly on the boundary of two histogram categories have been classified in the upper categories. The three sites consisting of over a hunderd burials have been depicted as well, but cannot be placed in a more specific category.

for no longer than a few centuries, and often probably shorter. All this implies that Late Bronze Age and Early Iron Age landscape ordering and territorial structures in the eastern Netherlands were not only quite diverse – as demonstrated in our test areas – but also less stable and 'fixed' than expected.

To conclude this eastern Netherlands case study a remark has to be made on the general appearance of urnfields. As mentioned above, urnfields are generally perceived as large, collective burial sites that were used for many centuries and consist of large numbers of urn burials with ditched structures. We might have to rethink, however, how representative this image actually is. Many burial sites do not conform to this 'traditional' view at all. That a large variety existed in the size and life span of urnfields has been demonstrated above. Furthermore a number of sites that have been discussed for example almost completely lack urns or ditched structures, or yield remarkable grave goods. Most of these 'strange' burial sites have been found relatively recently during large-scale settlement research in the most intensively investigated parts of the eastern Netherlands. It is in these regions that a more detailed view of Late Bronze Age and Early Iron Age burial practices starts to emerge, shedding some light on what might still be expected in other regions.

PART B URNFIELDS IN THE LOW COUNTRIES: NEW PERSPECTIVES

In the second part of this paper the data from our eastern Netherlands case study will be placed in a wider perspective, by discussing patterns that have been documented in other parts of the Low Countries. This allows an assessment of the representativity of the research results. A critical analysis of some of the most important building blocks underneath our general perception of urnfields and their position in Late Bronze Age and Early Iron Age societies demonstrates that our current interpretative frameworks probably are too onedimensional. The topics addressed here might open new perspectives and function as focal points for future research.

Regional differentiation

Our case study has demonstrated that the eastern Netherlands are characterised by a high degree of diversity in burial practice and landscape ordering during the Late Bronze Age and Early Iron Age. This leads to the question whether this heterogeneity is typical for the eastern Netherlands or has existed elsewhere as well. This question can be addressed on different scale levels. In this section we will focus on supraregional patterns. Some observations on differentiation within specific regions can be found in the next sections.

Various regional differences in Late Bronze Age and Early Iron Age burial practices are known to have existed within the Low Countries. Regional variations in the character of burial monuments and urn types for example are reflected in the so-called 'urnfield provinces' that have been distinguished (see above). Also, the earliest urnfields in the northern Netherlands are generally dated to around 1150 BC, whereas they in the southern Netherlands only appear from *c.* 1050 BC onwards (*e.g.* Hessing and Kooi 2005, 632-633). Remarkable differences are also found between Pleistocene landscapes, which are the main focus of this paper, and so-called Holocene regions. As these differences clearly illustrate that Late Bronze Age and Early Iron Age burial practices were actually quite diverse two examples will briefly be discussed here.

The first is that hardly any 'formal' Late Bronze Age and Iron Age sites have yet been found in the northern and western coastal zones of the Netherlands. The burials that have so far been recorded consist of isolated inhumations within settlements. Furthermore, small numbers of disarticulated human remains have frequently been found (Hessing 1993; Hessing and Kooi 2005, 633-634). It is assumed that these inhumations were not the common form of burial in the coastal regions but rather reflect a 'special' category, possibly with some kind of ritual background. This has been suggested for human remains found in Westfrisia as well (IJzereef 1981, 209-212). According to Hessing and Kooi (2005, 634) the absence of urnfields might be explained from the environmental conditions of these regions. The dynamic character of the landscape possibly precluded the formation of 'stable' settlement territories containing large, 'fixed' and long-lived urnfields. Small cemeteries – if present in the first place – have poorer archaeological visibility, and might also be obscured from our views by *e.g.*

erosion and sedimentation. It seems unjustified, however, to ascribe these patterns to physical geographical factors alone. They certainly also reflect the cultural and ideological values of local communities, resulting in specific burial practices and landscape ordering patterns that differ from other regions.

A second example of regional differentiation is the recent discovery of Early Iron Age inhumation burials in various cemeteries in the eastern part of the central Dutch river area, especially the Waalsprong region (*e.g.* van den Broeke 2011). Most of these cemeteries consist of both inhumation and cremation burials, in varying proportions. Similar burial sites are unknown from other parts of the Low Countries. According to van den Broeke (2011, 140-141) the inhumation burials possibly reflect a group of immigrants originating from the German Middle Rhine region. This hypothesis still has to be tested. Interestingly, in the Middle Iron Age inhumation burials were more common in the eastern part of the central Dutch river area than elsewhere as well, as has been documented at Geldermalsen, Meteren and again the Waalsprong region (Hulst 1999; Meijlink 2001; van den Broeke and Hessing 2005).

The genesis of urnfields

Various theories have been developed to explain the widespread appearance of urnfields in the beginning of the Late Bronze Age. These will not be elaborated upon here (but for example see Gerritsen 2003, 237-239). As we have seen already, the genesis of urnfields nowadays is generally thought to reflect important ideological transformations, even theories on the exact causes and development of this process differ (Fokkens 1997; Gerritsen 2003; Roymans and Kortlang 1999). Here, we will focus on the reliability of the general assumption that the earliest urnfields appeared in the Late Bronze Age.

A recent study of urnfields in the Belgian Scheldt basin and adjacent parts of northern France by De Mulder has led to important new insights (De Mulder 2011). By systematic use of ^{14}C-analysis it is demonstrated that various urnfields in these regions contain burials dated to the second half of the Middle Bronze Age. This for example goes for Bliqcuy, Aalter and Neerharen-Rekem in Belgium and Verneuil-en-Halatte, La Croix-Saint-Ouen, Migennes, Changis-sur-Marne, Marolles-sur-Seine and Mareuil-lès-Meaux in France. It generally concerns cremation burials without peripheral structures. Most of these sites appear to have been used continuously from the second half of the Middle Bronze Age (*c.* 1500 BC) onwards until at least the Late Bronze Age (De Mulder 2011, 203).

This pattern still has to be analysed more thoroughly, but the large number of sites and ^{14}C-dates indicate that the observed trend is probably reliable. It seems therefore that part of the burial sites in Belgium and northern France classified as urnfields actually were founded centuries before the Late Bronze Age.

The trend observed by De Mulder raises a series of important questions. What did these Middle Bronze Age 'urnfield predecessors' look like exactly? Were they collective burial sites? Should they be described as urnfields already, or did they 'develop into' urnfields in the course of time? And if the former is true, what does this mean with regard to current interpretations with regard to the genesis of urnfields? It is a well-known fact that many urnfields in the Low Countries

are situated near older burial monuments. Especially the often considerable age differences and lack of continuity between both have been stressed (Fontijn 1996; Gerritsen 2003, 143-145) whereas the sites discussed above appear to have been used continuously. Is the latter pattern typical for the Scheldt basin – and therefore yet another example of regional differentiation – or were similar sites present in other parts of the Low Countries? It is difficult to tell yet, as ^{14}C-dates of urnfield burials are still relatively rare in both Germany and the Netherlands. More systematic ^{14}C-analyses obtained through sensible sampling strategies, however, should be able to provide the answer.

Urnfield size, life span and burial communities

Our case study has demonstrated that the number of burials in urnfields in the eastern Netherlands varies considerably and that movements of cemeteries were common. Do urnfield in other Pleistocene sandy regions within the northwest European plain display similar characteristics?

With regard to the number of burials in cemeteries a first reference can be made to research in the central Dutch Veluwe region. Verlinde and Hulst (2010, 75-76) divide the urnfields in this region for which reliable size estimates can be made into three categories: small (1-9 burials), medium-sized (10-100) and large (more than 100). No less than 33 out of 37 sites are classified as 'small' or 'medium-sized'. Similar classifications are not available for other regions, but it is clear that cemeteries consisting of no more than a few dozen burials have existed in large parts of the Low Countries. In the Meuse-Demer-Scheldt region the sites of Beegden (Fig. 12), Oss-IJsselstraat and Oss-Ussen are examples (Gerritsen *et al.* 2005, 7; Roymans 1999). De Mulder (2011, 201-203) notes that both size

Fig. 12. Plan of the small Early Iron Age urnfield of Beegden, situated in the southern Dutch province of Limburg. The cemetery was probably used for one or two generations only (after Roymans 1999, fig. 4).

and life span of burial sites in the Belgian Scheldt basin and northern France vary considerably. At Aire-sur-la-Lys (France) for example different clusters of Middle and Late Bronze Age burials are found, resulting in an image of burial zones rather than large, formal cemeteries.

The exact life span of many urnfields can not be determined because fully excavated cemeteries are rare throughout the Low Countries. Even if this bias is taken into account, all available regional overviews point to the fact that a high percentage of these cemeteries were used in (parts of) either the Late Bronze Age or the Early Iron Age. This goes for the northern (Kooi 1979, 153-156) and central Netherlands (Hulst and Verlinde 2010, 78; 138-160), the Meuse-Demer-Scheldt region (Gerritsen 2003, 291-298), the Belgian Scheldt basin and northern France (De Mulder 2010, 489-492) and the German region of Westfalia (Mecke 1998, 114-220). In the Meuse-Demer-Scheldt region for example numerous urnfields were founded in the Early Iron Age (Gerritsen 2003, 220-221; Roymans and Kortlang 1999, 38-39).

It will not be argued here that large urnfields with long life spans were absent in the Low Countries. They clearly were not, and their numbers are undoubtedly underrepresented because of the lack of large scale excavations. All evidence, however, points to the fact that large, long-lived cemeteries represent only one burial site category: an option rather than a rule. As exactly these sites so far have dominated our perception of Late Bronze Age and Early Iron Age burial sites it is essential that we start looking beyond their boundaries in order to obtain more reliable insights into the actual variety in burial practices. The same goes for the important role they have been awarded with regard to landscape organization, territoriality and ideology (next section).

As pointed out by Gerritsen it is generally assumed that the great majority of the population was buried in urnfields. Infants seem to be underrepresented, but all other members of society are present in more or less expected numbers. The people buried in a cemetery were probably in some way connected in life. Therefore 'burial communities' probably closely resembled social communities (Gerritsen 2003, 138, 146-147). Estimates of the size of these Late Bronze Age and Early Iron Age burial communities are quite uniform. They roughly vary between five and 25 persons (Hessing and Kooi 2005, 647-649). Therefore we might conclude that an 'average' cemetery was used by the inhabitants of between one and three or four farmsteads inhabited by nuclear families, even though some researchers give slightly higher estimates (Gerritsen 2003, 146-147).

This general pattern appears reliable, but exceptions do occur. Obviously, very small burial sites consisting of only a few burials can not be interpreted as a reliable cross-section of society. Because of a lack of physical anthropological studies it is not possible to tell yet whether specific patterns are present in the selection of persons buried in these short-lived cemeteries or if they reflect mere chance. The latter seems likely. Another exception is the extremely large urnfield of Weert-Boshoverheide, situated in the soutern part of the Netherlands (Bloemers 1993; Hissel and Theunissen 2012). The number of burials present has recently been estimated at *c.* 3000. The urnfield, described as 'too large for its environment', must have been used by a far larger community than an 'average' cemetery. Possibly

people from a very wide region were buried here. That practice might in some way have functioned to enhance social connections on a supraregional level (Hissel and Theunissen 2012). Physical anthropological research has yielded deviating results as well. Fifty burials were analysed. Only one (possibly) female individual is present, whereas all other burials contain adult men and children (d'Hollosy 1990). No parallels for the Weert urnfield are known yet.

Landscape organization and territoriality

Urnfields are thought to have been located, both geographically and symbolically, at the heart of the settlement territories (Roymans and Fokkens 1991; Roymans and Kortlang 1999). They were used by communities in the construction of their social identity, which was based on the relationship with a specific area and on the ancestors who had lived there before and were buried in the cemetery. Whereas the territorial ordering of the Middle Bronze Age landscape is considered to have been relatively 'open and loose', with isolated barrows and barrow groups for a selective group of people that provided means for identification with land and ancestors, these relations became much more fixed and formalised in the Late Bronze Age and Early Iron Age (Gerritsen 2003, 190-192).

The idea that urnfields played a major role in the representation of territorial claims is often underbuilt by their assumed fixed location in the landscape, as well as their monumental character. This monumentality rather depended on the clustering and vast spread of burial monuments rather than on their individual character. Claims to a settlement territory were represented and negotiated through an idiom of ancestral ownership. The appropriation of 'mythical' ancestors could also take the shape of reusing (far) older burial monuments present in the territory. Such practices have been described as the purposeful creation of a fictituous genealogical link, whereas both groups were not linked genealogically (Fontijn 1996; Gerritsen 2003, 143-145). Celtic Field systems are also thought to have functioned as a focus of communal identity and territoriality. In the course of time the system of low banks became more pronounced and visible, resulting in a physical and permanent record of the history of a local community and its interaction with the land (Gerritsen 2003, 190-192).

These theories form an elegant explanatory framework for the changes in burial practice and landscape ordering that took place in the Late Bronze Age and Early Iron Age. When they are tested to the archaeological evidence, however, some serious problems arise. As discussed above, the relatively short life spans of various cemeteries demonstrate that landscape ordering within settlement territories often was far less stable than expected. It is difficult to see how this category of burial sites could have functioned as territorial markers. Also, our eastern Netherlands case study has demonstrated that landscape organization in that region was very diverse, and that literally none of the urnfields situated in the test areas actually were situated at the centre of a settlement territory. It would be very interesting to see whether these patterns are parallelled in other parts of the Low Countries as well. Unfortunately the geographical position of urnfields in the cultural landscape has hardly been formally tested yet in other regions. Gerritsen has published case studies of four microregions in the Meuse-Demer-Scheldt

region (Gerritsen 2003, 204-219), but it is difficult to assess the reliability of his conclusions. Urnfields and settlements are not depicted on the same distribution maps, and sites are plotted on 19th maps instead of using detailed soil data. One of the urnfields in his Weert-Nederweert region seems to be located on the central part of a large coversand ridge and therefore might have taken a central position in a settlement territory. Most other cemeteries, however, rather appear to be positioned in more 'peripheral' locations. Furthermore, in the Oss region – one of the most intensively investigated parts of the Netherlands – only small cemeteries have been found. On a more general note, we might refer again to the apparent increase of urnfields in the Meuse-Demer-Scheldt region (see above). This trend is mainly interpreted as a result of population growth (Gerritsen 2003, 220-221; Roymans and Kortlang 1999, 38-39). This explanation might be true. But the very fact that these people founded new cemeteries and did not use the same, centrally positioned urnfield with a Late Bronze Age origin points to the changeability of territorial structures.

Urnfields on the move

Ever since the late 18th and 19th centuries, urnfields have played an important part in the perception, description and chronological divisions of late prehistoric societies in Europe (Stig Sørensen and Rebay-Salisbury 2008). The important meaning attributed to these cemeteries has fossilised in well-known terms as 'Urnfield culture' and 'Urnfield period', that are still current in some regions. Therefore it is not remarkable that urnfields have been placed central (literally and figuratively) when Dutch models on Late Bronze Age and Early Iron Age landscape ordering were developed, and that especially the largest and most impressive examples were crucial in that process. In this paper it has been demonstrated, however, that the scope of these models is too limited. Late Bronze Age and Early Iron Age burial practices and landscape organization were far more diverse and dynamic than previously assumed. Some urnfields might indeed have functioned as focal points and territorial markers of local communities, but they are only part of the story. Various others were short-lived, less monumental or situated decentral within settlement territories.

Obviously, the research results give rise to a series of interesting new questions that might be addressed in future research. For example, why did some urnfields evolve into large, fixed cemeteries, and others did not? Gerritsen, who mainly emphasizes aspects of uniformity and stability in Late Bronze Age and Early Iron Age burial practices and territorial structures, also briefly mentions the continued existence of a considerable degree of flux in the actual constitution and distribution of social groups (Gerritsen 2003, 243). That degree in flux in fact seems to have been quite large, and may be part of the explanation. Physical geographical and economical factors probably were important as well. All settlement territories were different, and some offered more suitable conditions for continuous habitation and the emergence of 'fixed' territorial structures than others. Another important question is why some burial sites were positioned near older burial monuments, and others were not. Do such choices reflect local differences in the interactions

with ancestors? Were these links only established when territorial claims needed to be made?

Acknowledgements

Part of the research that forms the basis of this paper was conducted by the first author at Leiden University as part of the project 'Deconstructing Stability. Modelling changing environmental conditions and man-land relations in the Pleistocene landscape of Twente (2850-12 BC)', funded by the Netherlands Organisation for Scientific Research (filenr. 275-60-006). The authors would like to thank Liesbeth Theunissen and Bert Groenewoudt (both Cultural Heritage Agency of the Netherlands) and David Fontijn and Karsten Wentink (both Leiden University) for commenting on earlier drafts of this paper. Menne Kosian (Cultural Heritage Agency of the Netherlands) assisted with drawing figures 8 and 9. Ad Verlinde (Amersfoort) kindly provided size estimates for a selection of urnfields in the province of Overijssel. Sasja van der Vaart (Leiden University) edited the final English draft.

Bibliography

Arnoldussen, S. 2008. *A Living Landscape. Bronze Age Settlements in the Dutch river area*. PhD-thesis, Leiden University.

Arnoldussen, S. and Fokkens, H. 2008 (eds.). *Bronze Age settlements in the Low Countries*. Oxford: Oxbow.

Bloemers, J.H.F. 1993. Een urnenveld in een stuifzandgebied. Het onderzoek op de Boshoverheide bij Weert, in: Roymans, N. and Theuws, F., (eds.). *Een en al zand. Twee jaar graven naar het Brabantse verleden*. 's-Hertogenbosch: Stichting Brabantse Regionale Geschiedbeoefening, 12-21.

Bouwmeester, H.M.P. 2000. *Eme in de Romeinse en Frankische tijd. Archeologisch onderzoek naar de nederzetting en het grafveld op de terreinen van het Laaksche veld en de Laaksche tuin in de Ooyerhoek, gemeente Zutphen*. BAAC-rapport 98.045. 's-Hertogenbosch: BAAC BV.

Bouwmeester, H.M.P. 2002. *Prehistorie tussen de schapen I. Archeologisch onderzoek Zutphen-Looërenk (Leesten-Oost): opgraving van deelplan fase I, AAO van deelplan fase II*. BAAC-rapport 00.068. 's-Hertogenbosch: BAAC BV.

Bouwmeester, H.M.P., Fermin, H.A.C. and Groothedde, M. 2008 (eds.). *Geschapen landschap. Tienduizend jaar bewoning en ontwikkeling van het cultuurlandschap op de Looërenk in Zutphen*. Zutphen/'s-Hertogenbosch: gemeente Zutphen/BAAC BV.

Brongers, J.A. 1976. *Air photography and Celtic Field Research in the Netherlands* (Nederlandse Oudheden 6). PhD-thesis, Groningen University.

De Mulder, G. 2011. *Funeraire rituelen in het Scheldebekken tijdens de late bronstijd en de vroege ijzertijd. De grafvelden in hun maatschappelijke en sociale context*. PhD-thesis, Ghent University.

De Wit, M.J.M., Koopstra, C.G., Niekus, M.J.L.Th., De Roller, G.J. and Ufkes, A. 2002. *Een Definitief Onderzoek te Vasse 'De Steenbrei', gemeente Tubbergen (Ov.)*. ARC-publicaties 66. Groningen: Archaeological Research and Consultancy.

Desittere, M. 1968. *De urnenveldenkultuur in het gebied tussen Neder-Rijn en Noordzee*. PhD-thesis Ghent University.

d'Hollosy, M. 1990. *Crematies, associaties en correlaties*. Unpublished MA-thesis, University of Amsterdam.

Fokkens, H. 1997. The genesis of urnfields: economic crisis or ideological change? *Antiquity* vol. 71, nr. 272, 360-373.

Fokkens, H. 2005. Mixed farming societies: synthesis, in: Louwe Kooijmans, L.P., Van den Broeke, P.W., Fokkens, H. and Van Gijn, A.L., (eds.). *The Prehistory of the Netherlands*, volume I. Amsterdam: Amsterdam University Press, 463-474.

Fokkens, H. and Arnoldussen, S. 2008. Towards new models, in: Arnoldussen, S. and Fokkens, H., (eds.). *Bronze Age settlements in the Low Countries*. Oxford: Oxbow, 1-16.

Fontijn, D.R. 1996. Socialising Landscape. Second thoughts about the cultural biography of urnfields. *Archaeological Dialogues* 3, 77-87.

Gerritsen, F. 2003. *Local Identities. Landscape and community in the late prehistoric Meuse-Demer-Scheldt region*. Amsterdam Archaeological Studies 9. Amsterdam: Amsterdam University Press.

Gerritsen, F., Jongste, P. and Theunissen, L. 2005. *De late prehistorie in Noord-, Oost- en Zuid-Nederland en het rivierengebied*, NOaA hoofdstuk 17 (versie 1.0)(www.noaa.nl), 1-44.

Groenewoudt, B.J., Spek, Th., Van der Velde, H.M., Van Amen, I., Deeben, J.H.C and Van Smeerdijk, D.G. 1998. *Raalte-Jonge Raan: de geschiedenis van een Sallandse bouwlandkamp.* Rapportage Archeologische Monumentenzorg 58. Amersfoort: Rijksdienst voor het Oudheidkundig Bodemonderzoek.

Groenewoudt, B.J. and Thomas, J.J. 1979. Een late Bronstijd nederzetting bij Markelo (Ov.). *Westerheem* 28, 193-208.

Groothedde, M. 1996 (ed.), *Leesten en Eme. Archeologisch en historisch onderzoek naar verdwenen buurschappen bij Zutphen*. Kampen: Stichting Archeologie Ijssel/Vechtstreek.

Groothedde, M., Bouwmeester, J., Deeben, J., Groenewoudt, B., Peeters, H. and Peeters-Verneau, S. 2001. *Steentijdjagers en Frankische boeren in het Laaksche Veld bij Zutphen*. Leesten en Eme 2. Zutphen: Walburg Pers.

Harding, A.F. 2000. *European Societies in the Bronze Age*. Cambridge: Cambridge University Press.

Harsema, O.H. 1980. *Drents boerenleven van de bronstijd tot de middeleeuwen*. Museumfonds publicatie 6. Assen: Provinciaal Museum van Drenthe.

Harsema, O.H. 2005. Farms amongst Celtic fields. Settlements on the northern sands, in: Louwe Kooijmans, L.P., Van den Broeke, P.W., Fokkens, H. and Van Gijn, A.L., (eds.). *The Prehistory of the Netherlands*, volume I. Amsterdam: Amsterdam University Press, 543-555.

Hermsen, I. 2006. *Steentijdjagers en prehistorische boeren langs de Dortherbeek. Archeologisch onderzoek aan de noordkant van boerderij de Olthof in Epse-Noord (gemeente Deventer).* Archeologie in Deventer 6. Deventer: gemeente Deventer.

Hessing, W.A.M. 1993. Ondeugende Bataven en verdwaalde Friezinnen? Enkele gedachten over de onverbrande menselijke resten uit de IJzertijd en Romeinse tijd in West- en Noord-Nederland, in: Drenth, E., Hessing, W.A.M. and Knol, E., (eds.). *Het tweede leven van onze doden. Voordrachten gehouden tijdens het symposium over het grafritueel in de pre- en protohistorie van Nederland op 16 mei 1992 te Amersfoort*. Nederlandse Archeologische Rapporten 15. Amersfoort: Rijksdienst voor het Oudheidkundig Bodemonderzoek, 17-40.

Hessing, W. and Kooi, P. 2005. Urnfields and cinerary barrows. Funerary and burial ritual in the Late Bronze and Iron Ages, in: Louwe Kooijmans, L.P., Van den Broeke, P.W., Fokkens, H. and Van Gijn, A.L., (eds.). *The Prehistory of the Netherlands*, volume I. Amsterdam: Amsterdam University Press, 631-654.

Hijszeler, C.C.J.W. 1961. De ligging en verspreiding van de urnengrafvelden in Twente. *Verslagen en Mededelingen van de Vereniging tot Beoefening van Overijsselsch Regt en Geschiedenis* 76, 1-85.

Hijszeler, C.C.J.W. 1966. Mander en omgeving, Gem. Tubbergen. *Verslagen en Mededelingen van de Vereniging tot Beoefening van Overijsselsch Regt en Geschiedenis* 81, 1-50.

Hijszeler, C.C.J.W. and Verlinde, A.D. 1975. Das Urnenfeld 'De Zandhorst' in Oldenzaal. *Berichten van de Rijksdienst voor het Oudheidkundig Bodemonderzoek* 25, 37-50.

Hissel, M. and Theunissen, L. 2012. Cold case in het stuifzand. Het prehistorische grafveld op de Boshoverheide ontsloten (prov. Limburg, Nederland). *Lunula. Archaeologica protohistorica* XX, 75-80.

Hulst, R.S. 1999: Geldermalsen: an Early La Tène cemetery. Diffusion or convergence, in: Sarfatij, H., Verwers, W.J.H.and Woltering, P.J. (eds.). *In Discussion with the Past. Archaeological studies presented tot W.A. van Es.* Amersfoort: Stichting Promotie Archeologie/Rijksdienst voor het Oudheidkundig Bodemonderzoek, 41-49.

Kersten, W. 1948. Die Niederrheinische Grabhügelkultur. *Bonner Jahrbücher* 148, 5-80.

Kooi, P.B. 1979. *Pre-Roman Urnfields in the North of the Netherlands*. PhD-thesis, Groningen University.

Kooistra, M.J. and Maas, G.J. 2008. The widespread occurrence of Celtic Field systems in the central part of the Netherlands. *Journal of Archaeological Science* 35, 2318-2328.

Lohof, E. 1991. *Grafritueel en sociale verandering in de bronstijd van Noordoost-Nederland*. PhD-thesis, University of Amsterdam.

Louwen, A. 2010. *Urnfields in the land of isles. An analysis of urnfield-settlement relations in the eastern Netherlands*. Unpublished MA-thesis, Leiden University.

Maas, G. and Makaske, B. 2007. *Het natuurlijke landschap van Oost-Nederland. Geomorfologische detailkarteringen van de gebieden Deventer-Colmschate, Neede-Eibergen, Markelo-Rijssen, Zutphen-Warnsveld en Ruurlo* (internal report). Wageningen: Alterra.

Mecke, B. 1998. *Die Urnenfriedhöfe von Rhede, Kr. Borken, Bottrop, Stkr. und Warendorf-Milte, Kr. Warendorf. Studien zur jüngerbronze- und ältereisenzeitlichen Gräberfeldern des westlichen Westfalens*. PhD-thesis, Westfälischen Wilhelms-Universität Münster.

Meijlink, B.H.M.F. 2001. The barrow of De Bogen, in: Metz, W.H., Van Beek, B.L., Steegstra, H., (eds.). *Patina. Essays presented to Jay Jordan Butler on the occasion of his 80th birthday*. Groningen/Amsterdam (private publication), 405-430.

Oude Rengerink, J.A.M. 2003. *Archeologische inventarisatie en verwachtingskaart, in: Lantschap. Stedelijk uitloopgebied Zutphen-Warnsveld. Een cultuurhistorische landschapsvisie.* Lantschapsstudies 41. Haaften/Zutphen: Bureau Lantschap/ Gemeente Zutphen, 50-99.

Prangsma, N.M. 2002. *De eerste bewoners van Waterdijk II. Archeologisch onderzoek in een nieuwbouwlocatie, Epse, gemeente Gorssel.* ADC-rapport 142. Amersfoort: Archeologisch Diensten Centrum.

Roymans, N. 1999. The Early Iron Age urnfield of Beegden, in: Theuws, F. and Roymans, N., (eds.). *Land and Ancestors. Cultural dynamics in the Urnfield period and the Middle Ages in the Southern Netherlands*. Amsterdam Archaeological Studies 4. Amsterdam: Amsterdam University Press, 63-86.

Roymans, N. and Fokkens, H. 1991. Een overzicht van veertig jaar nederzettingsonderzoek in de Lage Landen, in: Fokkens, H. and N. Roymans, (eds.). *Nederzettingen uit de bronstijd en de vroege ijzertijd in de lage landen*. Nederlandse Archeologische Rapporten 13. Amersfoort: Rijksdienst voor het Oudheidkundig Bodemonderzoek, 1-19.

Roymans, N. and Kortlang, F. 1999. Urnfield symbolism, ancestors and the land in the Lower Rhine region, in: Theuws, F. and Roymans, N., (eds.). *Land and Ancestors. Cultural dynamics in the Urnfield period and the Middle Ages in the Southern Netherlands*. Amsterdam Archaeological Studies 4. Amsterdam: Amsterdam University Press, 33-61.

Schinkel, K. 2005. Hamlets on the move. Settlements in the southern and central parts of the Netherlands, in: Louwe Kooijmans, L.P., Van den Broeke, P.W., Fokkens, H. and Van Gijn, A.L., (eds.). *The Prehistory of the Netherlands*, volume I. Amsterdam: Amsterdam University Press, 519-541.

Spek, T. 2004. *Het Drentse esdorpenlandschap. Een historisch-geografische studie*. PhD-thesis, Wageningen University.

Spek, T., Groenman-van Waateringe, W., Kooistra, M. and Bakker, L. 2003. Formation and landuse-history of Celtic fields in North-West Europe. An interdisciplinary case study at Zeijen, The Netherlands. *European Journal of Archaeology* 62, 141-173.

Stig Sørensen, M.L. and Rebay-Salisbury, K.C. 2008. The impact of 19th century ideas on the construction of 'urnfield' as a chronological and cultural concept, in: Lehoerff, A., ed. *Construire le temps. Histoire et méthodes des chronologies et calendriers des derniers millénaires avant notre ère en Europe occidentale. Actes du XXXe colloque international de Halma-Ipel, UMR 8164 (CNRS, Lille 3, MCC), 7-9 décembre 2006, Lille*. Glux-en-Glenne: 57-67.

Ten Bosch, F., Groothedde, M., Groenewoudt, B. 1997. De archeologie van 'het Swormink'. Over bewoningsexpansie en –continuïteit in Colmschate (gem. Deventer). *Westerheem* 46, 23-40.

Theunissen, E.M. 1999. *Midden-bronstijdsamenlevingen in het zuiden van de Lage Landen. Een evaluatie van het begrip 'Hilversum-cultuur'*. PhD-thesis, Leiden University.

Van Beek, R. 2009. *Reliëf in Tijd en Ruimte. Interdisciplinair onderzoek naar bewoning en landschap van Oost-Nederland tussen vroege prehistorie en middeleeuwen*. PhD-thesis, Wageningen University.

Van Beek, R. 2011. Diversity rules. On late prehistoric settlement of the eastern Netherlands and the need for regionally specific models. *Proceedings of the Prehistoric Society* 77, 25-47.

Van Beek, R. and Louwen, A. 2012. Urnfields on the move. Testing burial-site settlement relations in the eastern Netherlands, c. 1100-500 BC. *Archäologisches Korrespondenzblatt* 42-1, 41-60.

Van den Broeke, P.B. 2005. Increasing diversity: synthesis, Louwe Kooijmans, L.P., Van den Broeke, P.W., Fokkens, H. and Van Gijn, A.L., (eds.). *The Prehistory of the Netherlands*, volume I. Amsterdam: Amsterdam University Press, 683-692.

Van den Broeke, P.B. 2011. *Een ijzertijdgrafveld en een erf uit de Ottoonse tijd in het Lentseveld. Archeologisch onderzoek in Nijmegen-Lent*. Archeologische Berichten Nijmegen Rapport 24. Nijmegen: Gemeente Nijmegen, Bureau Archeologie en Monumenten.

Van den Broeke, P.B. and Hessing, W. 2005. An alternative to the pyre. Iron Age inhumation burials, in: Louwe Kooijmans, L.P., Van den Broeke, P.W., Fokkens, H. and Van Gijn, A.L., (eds.). *The Prehistory of the Netherlands*, volume I. Amsterdam: Amsterdam University Press, 655-658.

Van der Kleij, G. 2003. *Prehistorische grafvelden en tumuli rondom Zutphen*. Zutphense Archeologische Publicaties 3. Zutphen: Gemeente Zutphen.

Van Tent, W.J. 1974. A Cremation Cemetery at Colmschate, Municipality of Deventer, Province of Overijssel. *Berichten van de Rijksdienst voor het Oudheidkundig Bodemonderzoek* 24, 133-141.

Verlinde, A.D. 1987. *Die Gräber und Grabfunde der späten Bronzezeit und frühen Eisenzeit in Overijssel*. PhD-thesis, Leiden University.

Verlinde, A.D. 1997. Deventer-Colmschate-'t Bramelt, in: Verlinde, A.D., ed. *Archeologische Kroniek van Overijssel over 1996.* Overijsselse Historische Bijdragen 112. Zwolle: Waanders, 156-158.

Verlinde, A.D. 2000. *Inventarisatie en onderzoek van archeologische locaties op en rond de Colmschater Enk te Deventer*. Rapportage Archeologische Monumentenzorg 75. Amersfoort: Rijksdienst voor het Oudheidkundig Bodemonderzoek.

Verlinde, A.D. and Hulst, R.S. 2010. *De grafvelden en grafvondsten op en rond de Veluwe van de Late Bronstijd tot in de Midden-IJzertijd.* Nederlandse Archeologische Rapporten 39. Amersfoort: Rijksdienst voor het Cultureel Erfgoed.

Waterbolk, H.T. 1995. Patterns of the peasant landscape. *Proceedings of the Prehistoric Society* 61, 1-36.

IJzereef, G.F. 1981. *Bronze Age animal bones from Bovenkarspel. The excavation at Het Valkje*. Nederlandse Oudheden 10. Amersfoort: Rijksdienst voor het Oudheidkundig Bodemonderzoek.

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Part II
Orderings of funerary locations

Döserygg and Skegrie

Megalithic centres in south-west Scania, southern Sweden

By Magnus Andersson and Björn Wallebom

Abstract

Two impressive megalithic complexes, dated to the early and middle Neolithic periods, have been discovered on the archaeological sites of Döserygg and Skegrie in south-western Scania. At least 20 megalithic monuments (dolmens) have been found at Döserygg as well as a palisade and other complex structures. The site has yielded a rich find of material consisting of grave goods, ritual deposits and votive offerings. A few kilometres south of Döserygg, a dolmen not far from the still standing Skegriedösen (Skegrie dolmen) was also discovered. These sites contribute to an entirely new understanding of the way society was organized during that era. This article gives a brief presentation of the two sites and their contexts. The analysis of the material from the excavations is still in its infancy. Several years of analysis remains, and more detailed studies will be presented further on.

Keywords: *Neolithic, Döserygg, Skegrie, Megalithic monument, Dolmen, Palisade*

Monuments of stone

More than 6000 years ago, people in the Stone Age societies of Western Europe began to build monuments and graves out of large stones; these are known as megalithic monuments or megalithic tombs (from the Greek *mega*, large, and *lithos*, stone). More or less complex monuments and tombs occur along the whole coast of Western Europe, in the British Isles, and in the Mediterranean area. The most famous examples are Stonehenge in England, Newgrange in Ireland, and the long rows of stones at Carnac in France. In southern Scandinavia there are megaliths above all in Denmark, but also in Scania, along the west coast of Sweden, and in the Falköping district (*e.g.* Burenhult 1999, 284ff.).

Megalithic tombs were erected in southern Sweden at the start of the Neolithic, between 5600 and 5300 years ago *(e.g.* Tilley 1999, 3). They were built of large, unworked stone slabs, and they are usually divided into dolmens and passage graves. A dolmen consists of several slabs making up a burial chamber. The chamber is enclosed in a rectangular or round mound of earth and stone – long dolmens and round dolmens respectively – edged by lying or standing stones. The passage grave is a development of the dolmen with the addition of a covered passage leading into the burial chamber. Dolmens are chiefly assumed to have been tombs for a

single person, but they may sometimes have been used for several burials. Passage graves, on the other hand, were always intended for several people, perhaps the inhabitants of a farm or a kin group.

Megalithic graves in Söderslätt, south-west Scania

In Scania, in southern Sweden, megalithic graves can be found above all in the coastal regions, where they occur in a number of concentrations (*e.g.* Andersson 2004a, 170; Burenhult 1999, 288ff.; Strömberg 1980; Tilley 1999, 4) (Fig. 1). These coincide with areas of settlement density and sacrificial sites from the same time (Karsten 1994) and probably correspond to the settlement regions at the start of the Neolithic. A concentration of megalithic graves can be found in south-west Scania. Dolmens are particularly numerous in this part. Of the roughly 45 surviving dolmens in Scania, almost half are in the south-west plains also known as Söderslätt (Sköld 1968, 33). Moreover, studies of the degree of preservation of megalithic tombs, partly through analyses of old field names and maps, shows that there used to be even more. It is calculated that just 200 or 300 years ago there were nearly a 150 megalithic tombs in south-west Scania (Larsson 2007; Sandén

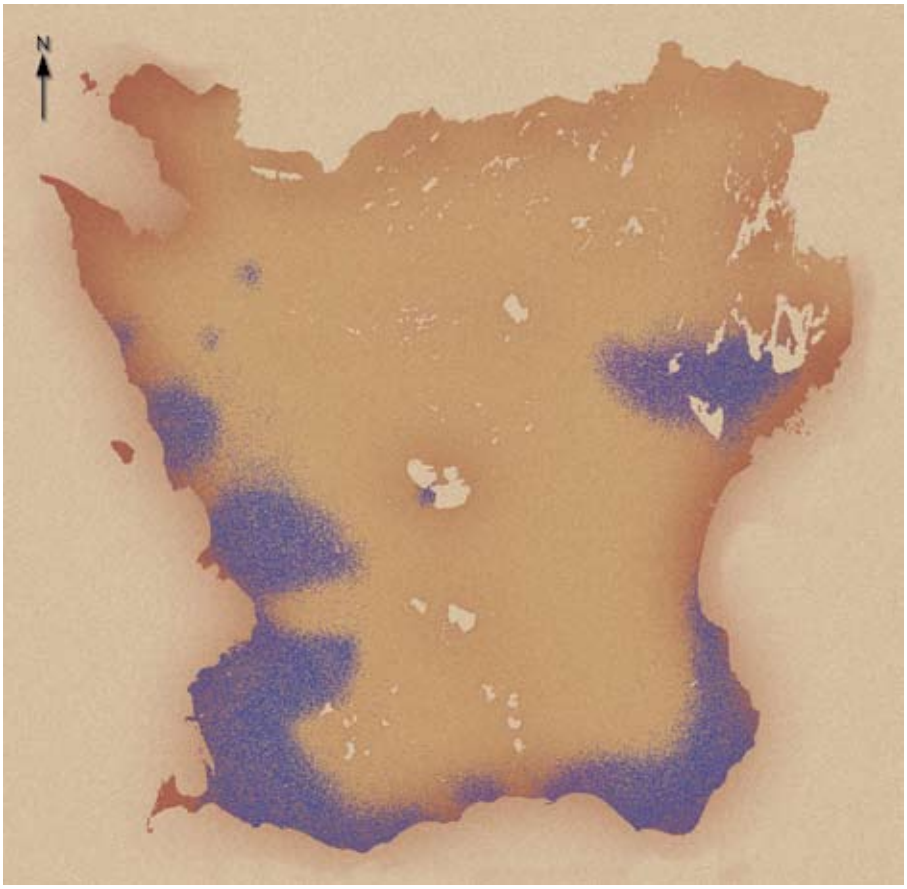

Fig. 1. Distribution of megalithic graves in Scania, southern Sweden. Denser hatching indicates concentrations (revised after Andersson 2004a, 170).

Fig. 2. South-west Scania, with Döserygg and Skegrie marked (illustration: Magnus Andersson).

1995). Despite this density of megaliths, not one of them has been excavated in modern times.

Now, however, when the National Road Administration is planning to rebuild the very busy E6 highway between Vellinge and Trelleborg in south-west Scania to motorway standard, we archaeologists have an opportunity to gain new insight into this megalith-rich setting. In 2006–2008 The Swedish National Heritage Board, Southern Excavations Department conducted excavations along the planned course of the road. At two sites, Döserygg and Skegrie (Fig. 2), excavated in the autumns of 2007 and 2008, there were significant remains from the Neolithic, including traces of a large number of megalithic tombs (Andersson and Wallebom 2011a; Söderberg in press).

Döserygg

Under the soil, a dolmen landscape

The most striking thing we found was at the small village of Södra Håslöv. In the preliminary studies preceding the excavation a map from the 1770's was found to show a dark, oblong patch with four dots in the middle, drawn in the middle of a field. The place was called "Döserygg" on the map. It seems obvious that this indicates a ploughed-out megalithic tomb, and the name meaning "Dolmen Ridge" suggests a dolmen. Yet even if there is nothing left above ground, we know that there are almost always traces surviving under ground. We thus expected to find traces of a dolmen. This is how they occur today, above all in Scania: separately, scattered like solitary islands in the arable landscape. But the mark on the map revealed not just one dolmen but a whole dolmen

Fig. 3. The earth is stripped to reveal a dolmen. In this case several of the kerbstones still survived (photo: Cecilia Cronberg).

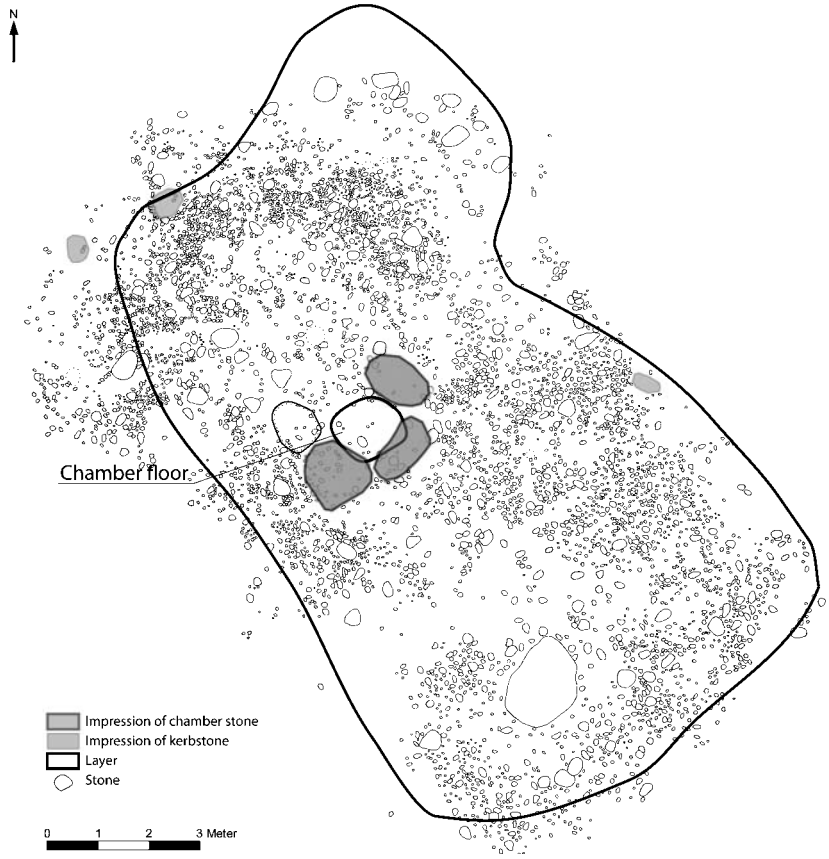

Fig. 4. Ground plan of one of the dolmens at Döserygg (illustration: Henrik Pihl).

landscape. Under the topsoil cover were the remains of no less than 20 dolmens. The dolmens had suffered varying degrees of damage but were still surprisingly well preserved. Virtually all the wall slabs and roof slabs in the chambers were missing, as were the kerbstones. The majority of the dolmens nevertheless consisted of stone packings and were surrounded by a rim of small stones places in a rectangular form around the tomb. Most of these were completely intact, clearly revealing where the dolmens had once stood (Fig. 3 and 4). Gaps in the rims and dark impressions in the earth showed where the kerbstones had been placed. In most of the dolmens there were also remains of the mound that had originally covered the burial chamber. The chambers themselves were indicated by impressions of the wall slabs. In one of the larger long dolmens the impressions revealed a structure that had been divided into two burial chambers. Dolmens with more than one chamber are unusual in Sweden. Only one was known previously (Blomqvist 1989). It too has two chambers and is located in Söderslätt, in Skegrie Parish. In the dolmens we unearthed a great many interesting finds (Fig. 5). The most common finds were flint objects, chiefly axes, scrapers, and blades. A considerable proportion of the flint objects displayed damage that suggested deliberate destruction. Moreover, a large share of them were burnt. We also found a lot of pottery of varying type and quality. Most of the finds

Fig. 5. Examples of finds from one of the dolmens: thin-bladed axe, scraper, two flake axes (the small one is made from a fragmented polished flint axe) and pottery (photo: Staffan Hyll).

occurred around the burial chambers and beside the kerbstones. No traces of human remains were found, however, which can be easily explained by the generally poor preservation conditions for organic material on the site. Altogether, the finds and radiocarbon dates (appendix 1) indicate activities above all connected to the construction of the dolmens on the site at the start of the Neolithic, and also show that the burial monuments were highly significant later in the Neolithic.

The palisade through the dolmen landscape

Apart from all the dolmens, perhaps the most spectacular find was two parallel trenches filled with stones, running in a north-south direction the whole length of the excavated area (Fig. 6). As we gradually exposed them by machine, their course became increasingly clear. The width between the trenches varied between 3 and 8 m. We were able to follow them for almost 640 m and could see where they disappeared outside the excavated area in both directions, without revealing either a start or a finish. The excavation showed that there had been closely spaced posts and standing stones at places in the trenches (Fig. 7). The posts had been buried to depths varying between 0.3 and 0.8 m and were stabilized with large amounts of stone. The diameter of the posts varied between 0.15 and 0.25 m. The variation in the depth of the trenches and the thickness of the posts may mean that the palisade varied in height and thickness at different stages of its length, although the effects of ploughing may have affected the degree of preservation to some extent. An estimate of the number of posts required to build the palisade can be based on a section of three to four posts per metre, which gives roughly 5000 posts for the length of the trenches within the excavated area alone. Cutting through the trenches there were also three distinct openings which we interpret as entrances (or exits), that is to say, breaks in the otherwise fairly regular and continuous line of posts in trenches. Two of the openings had a width of about 2 m and were marked with retracted posts or standing stones and other adjacent structural devices. The openings appear to have been monumental in character and placed in strategic locations. The third opening had a width of about 1 m and only broke the eastern palisade trench. In the trenches we found copious flakes from axe manufacture, axe fragments, scrapers, and a lot of burnt flint. In addition we found several broken whetstones for sharpening axes. The finds and the datings (appendix 1) suggest that they are contemporary with the dolmens. The trenches with the closely spaced posts probably belong to the first phase of construction at Döserygg and were perhaps also the first manifestation on the site together with the first dolmens. Between the trenches there were only a few features along the entire course: some foundations for standing stones, occasional stone packings and a few hearths. With regard to the latter, it should be noted that they all contained large amounts of burnt flint pieces, a feature often associated with ritual activities (*e.g.* Larsson 2000). Moreover, also worth mentioning is that, in the central part of the excavated area, where the palisade curved slightly over a small rise, there was a hard-packed area of stone, resembling a floor, which was an integral part of the palisade. Gaps along the edges of the stone packing revealed places where there were probably originally

Fig. 6. The palisade trenches viewed from the south after the removal of the topsoil (photo: Conleth Hanlon).

Fig. 7. Part of the western trench after excavation. In the trench there were clear impressions of posts which were stabilized with large amounts of stone (photo: Björn Wallebom).

Fig. 8. Part of the excavated area viewed from the west. In the foreground and beside the palisade, two dolmens are being excavated. The palisade trenches can be discerned between them (photo: Conleth Hanlon).

standing or laying stones. A larger area without stones in the middle of the feature may have been the site of a larger block. The stone packing forms an open but nevertheless defined space in the palisade. However, the function of the structure is not known.

It is perfectly obvious that the dolmens and the trenches were constructed in relation to each other. The dolmens were clearly oriented along and on either side of the trenches (Fig. 8 and 9). The trenches are thus not a limit in the sense of an enclosure. Based on this, our initial interpretation was that the structure could be part of a palisade-lined road that passes through the burial area (Andersson and Nilsson 2009; Andersson and Wallebom 2011a). Perhaps a processional road or a way to distinguish the living passers-by from the dead in the graves. The link between more or less magnificent graves, often from several different periods, and particularly important pieces of road is well substantiated today in archaeology (cf. *e.g.* Rudebeck 2002). The palisade follows the course of the old highway between Trelleborg and Malmö that goes back at least to the seventeenth century. It is striking that there are several dolmens right beside this highway. The highway is possibly an ancient transport route linking the megalithic tombs in the area. According to our initial idea, the palisade at Döserygg, in this perspective, could be a part of this route which was given this monumental design where it passed the tombs. It is worth noting, moreover, that the site is at the location of a fork in the road. Junctions and crossroads have been natural meeting places and have often been symbolically charged sites (cf. Rudebeck 2002). However, after the two seasons of contract archaeology in 2007 and 2008, two smaller complementary research excavations have been conducted in the vicinity to the Döserygg site. The site was excavated during two days in the late summer

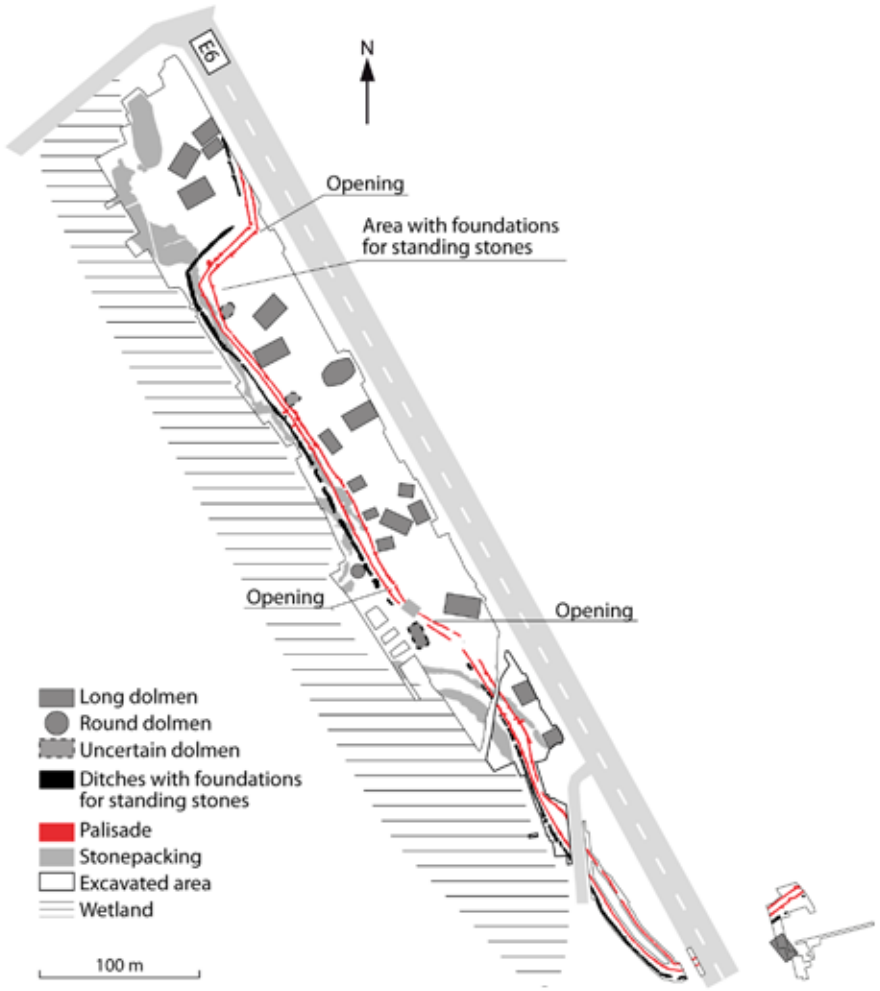

Fig. 9. Schematic plan of the excavated area, marking the dolmens, the palisade, and other features (illustration: Henrik Pihl).

of 2009 (Andersson and Wallebom 2011b) and for a period of five days in the autumn of 2011 (Andersson and Wallebom *in press*). The aim of the excavations were primarily to investigate the direction of the two palisade trenches to the south, outside the already excavated area, on the other side of the old motorway. In this respect, the excavation in 2009 was not successful, although the remains of yet another dolmen were discovered. In 2011 we finally rediscovered the palisade trenches and were also able to follow them for another 95 m in an eastward direction. However, we did not have the opportunity to continue the excavation at this time. Although it is still open for discussion whether the palisade trenches will turn to the south (as it turns to the north in the northern part of the excavation area, see Fig. 9), in a course to other megaliths situated in the southern region, the most reasonable interpretation is that it crosses the ridge and in fact forms an unusual type of early Neolithic enclosure, similar to those unearthed for example in Sarup, Denmark (cf. *e.g.* Andersen 1997; 1999a; 1999b). To find out the answer,

the intent is now to continue the research in the autumn of 2012, and follow the palisade trenches both to the south and to the north of the site.

Stones in lines and other stone structures

Clearly oriented along the palisade there were also several rectangular and continuous ditch-like dark features which followed the palisade along the whole edge of the western palisade trench. Looking at the plan of the site, these ditches are very similar to the so called system-ditches. These were made use of at many enclosed structures in the European Neolithic in the second half of the 5th millennium and throughout the 4th millennium BC (cf. Andersen 1997, 284ff.). However, in most parts the ditches within the excavated area at Döserygg, showed few similarities with the character of system-ditches as seen at Sarup and other enclosed sites. The ditches proved to have very few finds, almost none, but they did contain foundations for and impressions left by large stones which had been raised upright along the palisade. The impressions were of exactly the same character, with packing stones and homogenous filling, as the impressions of the kerbstones and chamberstones in the dolmens. The impressions of stones in the ditches tended to be distributed in groups of two and four, but they also occurred in continuous longer series of seven to ten (Fig. 10). The size varied from 0.5 m up to over 1 m in diameter. The number amounted to at least 300 within the excavated area alone.

The phenomenon of standing stones in long rows like this was not previously known in Scandinavia. The closest parallels can be found in the British Isles and in France, with sites like Avebury (*e.g.* Gillings *et al.* 2008; Harding 2003; Smith 1965) and Carnac (*e.g.* Burl 1993; Roughley *et al.* 2002). Foundations for and impressions left by standing stones are now known not just along the palisade but at several places in the excavated area. They were found both as solitaries and in groups, for instance at and around the burial monuments.

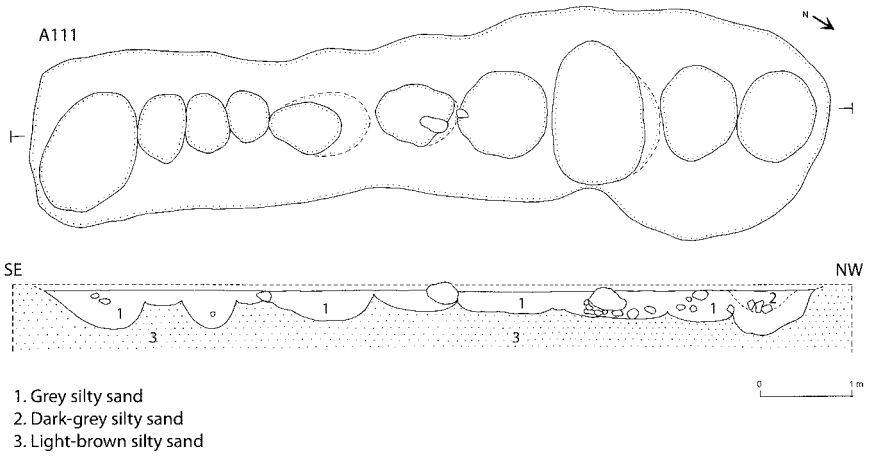

Fig. 10. Plan and section of one of the ditches with a series of ten impressions of stones (illustration: Björn Wallebom).

In some places the fallen stones were even lying where they once stood. Perhaps they served as dividers or boundary markers between the dolmens, as some kind of plot borders for the graves of different farms or families.

A boundary between land and water

Döserygg is located on a former ridge that once had wetlands on either side. Today we cannot see any traces of the wetland since it has been drained. On the former shoreline we found several interesting things. These included a long, narrow stone packing of varying density, well-laid in places in recurrent square formations, constituting a boundary between land and water (Fig. 11). We were able to follow it in every place where the former wetland was included in the excavated area, corresponding to a stretch of almost 500 m. Beside the stone packing there were some places with small stone foundations sticking out into the former wetland. It is possible that there were jetties here. The most bewildering thing about the stone packing was that it cut across the palisade at a couple of places. At the same time the trenches for the palisade could be clearly discerned at the intersections, which suggests that the palisade existed when the stone packing was laid. The function is not entirely obvious, but the stratigraphic conditions suggest that the stone packing was constructed after the palisade and the dolmens, but still during the time when the site was actively used. The interpretation that is currently preferred is that this was constructed in connection with a flood as an attempt to save the structures close to the wetland from the rising water level.

Fig. 11. Part of the stone packing on the former shoreline viewed from the south (photo: Anders Edring).

Wet and dry deposits

In the wetland we discovered several finds that can be dated to the Neolithic. They were above all objects of flint, including several flint axes and large numbers of scrapers, some of which had been subjected to destruction or had been burned to pieces. In the central part of the excavated area, where one of the dolmens was adjacent to the edge of the wetland, we found, right beside the dolmen, out in the wetland, a deposit of two pots containing burnt animal bones. The pottery is of early Funnel Beaker type with simple impressions under the rim and can be dated to the start of the Neolithic. Beside the pot there were numerous flint objects, including several concentrations of scrapers. We interpret the finds from the wetland as deliberate depositions or sacrifices. The phenomenon of votive deposits in wetlands is known from much of prehistory, not least the Neolithic. Moreover, cultic and votive sites with deposits in wetland increase significantly at the start of the Neolithic, simultaneously with the start of megalithic tomb construction in southern Scandinavia (Andersson 2004b, 187ff.; Karsten 1994). It was not just in the wetland that we were able to detect different kinds of sacrificial acts. These also took place on dry land. In a couple of pits beside the openings in the palisade we found deposits of pots together with large quantities of flint flakes and parts of axes. In a pit just beside one of the dolmens we found almost 40 deposited flint scrapers in a dense concentration. Several of the scrapers were stacked on each other as if they had originally been in a basket or a leather pouch when they were deposited in the pit. The same pit also contained large quantities of flakes and fragments of polished flint axes and some pottery. Just

Fig. 12. Perhaps this was what Döserygg looked like one day 5500 years ago (illustration: Staffan Hyll).

as in the wetland, there were several places close to the dolmens with concentrations of deliberately broken or burnt flint objects, above all fragments of axes and chisels. Ritual destruction of objects is a phenomenon that is attested with varying frequency throughout the Stone Age (Karsten 1994). Above all, fire seems to have been important, perhaps because of its transforming role and its symbolic significance in both sacred and profane contexts. The burning of flint gives an immediate audiovisual experience. During the burning the flint undergoes a series of changes. For example, it breaks with a dull crack while simultaneously changing colour to white (cf. Nilsson and Hanlon 2006, 172). There is a striking similarity to the cremation of a human body (cf. Larsson 2000, 101), so one can understand why the burning of flint could have been part of some kind of passage rite (van Gennep 1960).

The Skegrie dolmens

A few kilometres south of Döserygg stands the well-known Skegrie dolmen. This is one of the best-preserved in Scania today, an excellent example of a long dolmen (Fig. 13). The dolmen is not directly affected by the motorway plans, but an area about 50 m to the west of it is affected, which gave us the opportunity to investigate it. The excavation showed that the Skegrie monument was not the only dolmen on the site. A few dozen metres north-west of the surviving dolmen, a little way down a gentle slope towards a former wetland, traces of yet another dolmen – a round dolmen – were discovered (Fig. 14). Although the dolmen was largely destroyed, it was possible to discern several interesting details (Fig. 15). The burial chamber had been constructed of three wall slabs. These had stood in such a way as to form a rectangular chamber. Inside the chamber was a paved floor of just over a square metre. Towards the south-east, as an entrance and threshold to the burial chamber, there were four flat stones. Leading into the chamber was a narrow, well-laid path of crushed flint and pebbles. Unfortunately, no skeletal remains were found in the chamber, but we may assume that the limited space in the chamber was intended for just one person, who was probably placed in

Fig. 13. The Skegrie dolmen viewed from the north-west. Today it stands in solitary majesty, but it used to have the company of at least one other dolmen (photo: Thomas Hansson).

Fig. 14. From the Skegrie dolmen it was just a very short distance to the newly discovered dolmen (photo: Cecilia Cronberg).

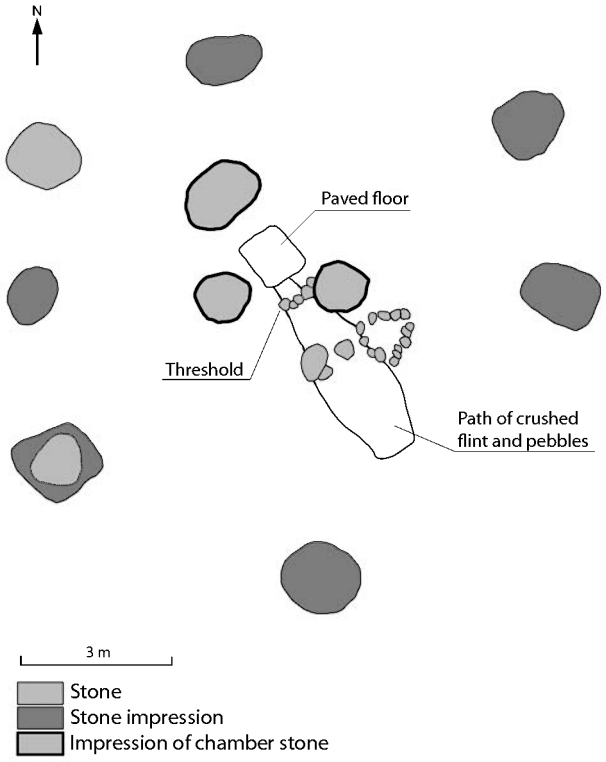

Fig. 15. Schematic ground plan of the newly discovered round dolmen (illustration: Thomas Hansson).

seated position with his or her back towards one of the wall slabs. The chamber was surrounded by a stone packing and a stone rim in which several impressions and foundations of kerbstones were found. It seems as if in the first phase this was

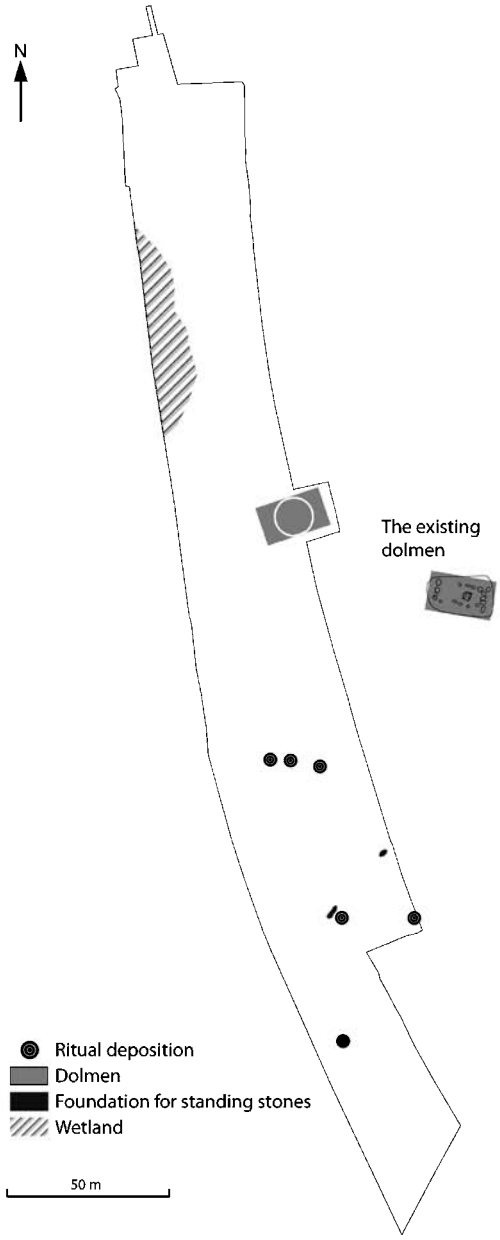

Fig. 16. Schematic plan of the excavated area at Skegrie, showing the relationship between the existing dolmen and the newly discovered dolmen and other features (illustration: Kenneth Stark).

a round dolmen which may have been expanded into a long dolmen. The finds in the dolmen were sparse, consisting above all of flint flakes and pottery, a sea urchin, and a flint axe.

Apart from the dolmen, foundations for single and double standing stones were uncovered in places. These may also very well have belonged to megalithic structures. A little way south of the dolmen were two foundation ditches similar to those along the palisade at Döserygg. In this connection it may also be worth mentioning the western kerb of the existing dolmen. This is distinguished by four large blocks of stone, partly separated from the other stones in the kerb. The similarities to the foundation ditches at Döserygg as regards the dimensions and the number of the stones is striking. It may also be worth noting the direction of the kerbstones, which corresponds in many ways to that of the two foundation ditches in the excavated area. It cannot be ruled out that they belonged to a continuous megalithic structure similar to the one along the palisade at Döserygg. The Neolithic remains at Skegrie also include a number of pits (Fig. 16) in which objects were placed, interpreted as ritual depositions or sacrifices. Many of the pits contained large quantities of finds. For example, a single pit measuring about 1 m in diameter and with a depth of 0.3 m had over seven kilos of knapped flint, copious potsherds, and a small amount of burnt bones. The flint mainly consists of flakes and debitage, but the material also includes parts of a large number of polished axes, several scrapers, and a transverse arrowhead. Among the pottery there were sherds from both finely decorated funnel beakers and coarse, undecorated storage vessels, along with sherds of several different clay discs decorated with stick marks and wavy bands. The burnt bones seem to be exclusively from animals.

To sum up, we may note that the excavation at Skegrie, just like the one at Döserygg, shows that the dolmens were not solitaries. Several occur together, moreover in complex settings and with other types of structures. The two sites differ in size, of course, and also partly in the nature of the activities. At Döserygg, for example, there were many ritual deposits in the wetland. At Skegrie we could not find any such deposits; instead they were on the top of the plateau. It should be added that only limited areas were excavated, as dictated by the extent of the development for the motorway. Perhaps future research efforts outside this limited area will increase and qualify our knowledge. In addition, the excavations at Skegrie corroborate the assumption that there were further groups of megalithic tombs along the course of the old road.

An organized society

It is perfectly obvious that Döserygg and Skegrie were sites of great significance. The dolmens were probably graves for the leading stratum of the population. But the sites were much more than just cemeteries. The palisade and deposits or sacrifices in adjacent wetland and around the graves show that ceremonies were held, perhaps open to the entire population of the district. The rituals associated with the burial monuments may have been intended to legitimize and maintain the supremacy of the elite through the sacrifice of surplus production to the ancestors (Andersson 2003; Nordquist 2001). The megalithic graves were also symbols of permanence. The endurance of the

monuments is a reminder that people in the Neolithic were not just committed to the past but also to the future. The graves built of stone were a mediator between past, present, and future. In addition, the whole idea of constructing megalithic tombs suggests a new view of the landscape. It was an activity that involved the first remodelling of the surrounding nature: moving large stones, clearing forest, and levelling surfaces. Unlike the older flat-earth graves, the megalithic tombs were visible in the landscape in a completely new way. The impressive monuments at Döserygg and Skegrie, built of thousands of wooden posts and hundreds of stones each weighing several tons, indicate a well-organized society. Felling trees and making posts required labour, as did the digging of trenches and foundation ditches. The transport of stone, probably brought from coastal areas where stones are exposed and more easily accessible, is an organizational chapter on its own. There must have been powerful forces with the ability to summon the resources in terms of manpower and material required to erect the monuments. Besides the manpower, this network of resources must have involved a number of specialists, everything from the stonesmiths who made all the axes needed for felling and working timber, to the skilled "megalithic architects", designers, and builders.

Among Iron Age farmers

Judging by the archaeological remains, Döserygg and Skegrie were actively used for just over a 1000 years in the Neolithic. There is a great deal to suggest that the sites then lost their significance as ritual centres, but that they continued to be respected and were left undisturbed for several subsequent millennia. At Döserygg there is no trace of any later activities to speak of, no settlement site remains, no graves or other clear ritual remains of later periods. It is not until the Late Iron Age (*c*. 500–1000 AD) that we see the first signs of settlement, with a small sunken-floor hut on the eastern edge of the excavated area. The situation seems to be similar at Skegrie. It was not until the Iron Age that the site was claimed for settlement. Here, however, the traces of settlement are more noticeable and more intensive. The people appear to have lived in the midst of the Neolithic monuments. It seems as if Iron Age people respected the monuments to a large extent and adapted the location of their houses to suit them. In one case a standing stone had even been incorporated as part of the wall in a sunken-floor hut (Söderberg *in press*). Moreover, there are signs suggesting that Iron Age people deposited objects at the dolmens, perhaps as some kind of votive act. A cutting of an Arabian coin and a gilded pendant close to the chamber of the newly discovered dolmen could be examples of this. It is not particularly rare to find objects and traces of later activities when excavating megalithic tombs. A case in point is the Trollasten dolmen in south-east Scania. The excavation of the burial chamber uncovered large quantities of Viking Age pottery and some other artefacts from the Viking Age (Strömberg 1968). There may be many explanations for why people chose to respect megaliths and even integrate them in the settlement structure at Skegrie. Perhaps they found the old monuments attractive or viewed them as assets ascribed to the ancestors, which gave the owner or the kindred of the farm the right to the land. There is a great deal of source material to corroborate this. For instance, both Old

Norwegian and Old Swedish laws state that burial mounds could serve as "title deeds" for a family's land holdings (*e.g.* Anglert 2003, 121; Skre 1998). Also, it is not unusual to find that the mounds constructed during the Bronze Age, sometimes covering megalithic graves (*e.g.* Hansen 1931; Jacobsson 1986), were used for new burials in the Iron Age (*e.g.* Anglert 2003, 118; Strömberg 1961, 60). This might suggest the persistence of a tradition. Yet another category of sources revealing the significance of barrows in the context of settlement is place-names. The ending -ie, as in Skegrie, is a worn-down form of hög meaning "mound". Place-name scholars think that this element, which is particularly widespread in Söderslätt, may go back to the Iron Age (Skansjö 1983, 64; 95). The Skegrie dolmen has an eye-catching location beside the church, adjacent to a farm that is probably contemporary with the creation of the place-name. It therefore seems reasonable to assume that it was the Skegrie dolmen that gave its name to the village, although little survives today of the mound to which the name refers, which once covered the dolmen.

The destruction of the monuments

There is thus a great deal to suggest that the stone monuments were allowed to stand undisturbed until the Iron Age. So when did the destruction of the monuments begin? There is reason to believe that the first demolition came with the introduction of Christianity and that in some places the new religion in its missionary zeal wanted to eradicate old cultic sites like Döserygg and Skegrie. A good deal of stone was no doubt used to build the many churches that manifested the new religion in the 12th and 13th centuries. The use of slabs from the megalithic graves to build churches may also have symbolized continuity with older traditions. Although most of the churches in Söderslätt are mainly built of other material than granite (Anglert 1995, 69ff.), a considerable amount of stone must have been used to build the foundation walls of all these churches, here in this part of Scandinavia with the greatest density of churches (Skansjö 1983, 172ff.). In addition, a great deal of stone was used to build the town of Malmö, above all in the 15th, 16th, and 17th centuries, and especially the castle of Malmöhus. It is surely not a coincidence that the number of megalithic tombs is small in the Malmö area, and that none of the megalithic tombs documented in the vicinity of the town survive. Large amounts of material of different kinds were transported to Malmö from a large area in connection with the fortification of the town (Rosborn 1977). It therefore cannot be ruled out that the development of the town may have affected the stock of megalithic tombs in a wider area. Other towns in the region needed large amounts of stone, requiring long-distance transports. There are examples from the town of Landskrona dating to the mid-18th century showing how the shortage of stone was solved by making advance payments to "farmers, horsemen, and cottagers" in order to increase the transports of broken and unbroken stone. Fisherman likewise brought stone by sea for the construction of the town's fortifications (Jönsson 1993, 229). The best-documented destruction of megalithic tombs took place in the 18th century and from the early to the mid-19th century (Sandén 1995, 68). Above all, a lot of stone was needed for the construction of new farms as a result of the

enclosures. At the same time, several megalithic tombs were cleared because they were regarded as an obstacle to agriculture when new arable fields were broken and the district became fully tilled (Skansjö 1983, 104). This was also a time when new harbours were built in many nearby towns, such as Trelleborg and Ystad. Besides this, we know that some churchmen were still active, going more or less berserk among the antiquities in their parishes. There are several recorded descriptions of this. We have an account, for instance, of how Per Hindström, vicar of Dalköpinge and Gislöv at the end of the 18th century, deliberately destroyed megalithic tombs as a way to eradicate superstition among his parishioners: 'P.H. has acquired a Herostratic reputation for his vandalism as regards the antiquities of the parish. "Whether out of affected heroism or a wish to drive superstition out of his congregation, he was not deterred by the legends [that the village was seen burning when they tried to blast away the dolmens] or the fate of his predecessors; no, with a dreadful lack of shame he simply had them blown up", in particular the most remarkable monument in the district, the legendary dolmen of Jelle, located west of Gislöv in homestead no. 27 near the priest's road from Dalköpinge to Gislöv, but in addition 4 other dolmens, including the so-called Mode's dolmen in Simmarödsmarken, the stones of which were placed in the church tower in Gislöv, and one that was called the Torberg dolmen' (authors translation, Lunds stifts herdaminne 1951, 315ff.). It was presumably in this connection that the last megalithic tombs at Döserygg disappeared. From maps and records by parish priests in different writings we know that there was at least one dolmen, and probably two, still standing in the mid-18th century. They have vanished on later maps and are no longer mentioned in any written sources. No records of any more dolmens apart from the one still standing at Skegrie can be found in the historical source material, which may mean that the destruction of the other monuments took place early. There may be many reasons why only "the Skegrie dolmen" of all the dolmens at Skegrie was allowed to stand. Perhaps this sole magnificent example was considered sufficient as a "title deed" to the land owned by the family.

Towards a new outlook

After the excavations at Döserygg and Skegrie, we certainly see the phenomenon of megalithic tombs with new eyes. Nothing like Döserygg has ever been found before in Scandinavia. The complexity is of a kind that requires us to look at the British Isles and France to find counterparts. We still know very little about what sites of this kind looked like, why they were built, and what role they played in their society. With Döserygg we are able, for the first time, to study how a large-scale megalithic burial place and assembly site from the earliest part of the Neolithic was organized. Döserygg is at present in a class of its own by virtue of its size and complexity. But what does it actually look like around the existing solitary dolmens? Are there elements at other sites to suggest that similar complex settings like Döserygg and Skegrie may have existed elsewhere? It is clear that our image of megalithic tombs as solitary monuments must be completely reappraised. There were in fact groups of megalithic tombs and composite megalithic cemeteries. Both Döserygg and Skegrie, moreover, indicate that the

destruction of monuments was much more extensive and effective than we previously imagined. The estimated number of megalithic tombs that originally existed in Söderslätt must presumably be raised considerably, perhaps to several hundred. If we assume that similar sites have also existed elsewhere in Scania, for the province as a whole the number may be over a thousand, perhaps even several thousand. To sum up, we may note that the E6 project has also given us an opportunity to shed more light on the question of prehistoric communication. Along the old highway, now the E6, there seems to have been a route that was used as early as the Neolithic and in places, as at Döserygg and Skegrie, was of a magnificent format. At the moment we have only started analysing the material from the excavations. Several years of analysis remain. Some of our current ideas will probably be modified, and new discoveries will expand the picture. One thing, however, is certain: we are on the way to a new outlook on the Neolithic and megalithic tradition, as regards both Söderslätt and Scandinavia and Western Europe as a whole.

Translated by Alan Crozier.

Bibliography

Andersen, Niels H. 1997. *The Sarup Enclosures. The Funnel Beaker Culture of the Sarup site including two causewaysed camps compared to the contemporary settlements in the area and other European enclosures.* Sarup vol. 1. Jutland Archaeological Society Publications XXXIII:1, 1997. Højbjerg: Jutland Archaeological Society.

Andersen, Niels H. 1999a. *Saruppladsen*. Sarup vol. 2. Jysk Arkæologisk Selskabs Skrifter XXXIII:2, 1999. Højbjerg: Jysk Arkæologisk Selskab.

Andersen, Niels H. 1999b. *Saruppladsen*. Sarup vol. 3. Jysk Arkæologisk Selskabs Skrifter XXXIII:3, 1999. Højbjerg: Jysk Arkæologisk Selskab.

Andersson, M. 2003. *Skapa plats i landskapet: Tidig- och mellanneolitiska samhällen utmed två västskånska dalgångar*. Acta Archaeologica Lundensia, Series in 8°, No. 42. Stockholm: Almqvist & Wiksell International.

Andersson, M. 2004a. Domestication and the First Neolithic Concept, in: Andersson, M., Karsten, P., Knarrström, B. and Svensson, M., *Stone Age Scania: Significant Places Dug and Read by Contract Archaeology*. Riksantikvarieämbetet Skrifter 52. Stockholm: Riksantikvarieämbetet, 143–190.

Andersson, M. 2004b. *Making Place in the Landscape: Early and Middle Neolithic Societies in Two West Scanian* Valleys. Skånska spår – arkeologi längs Västkustbanan. Lund: Riksantikvarieämbetet.

Andersson, M. and Nilsson, B. 2009. Döserygg och Skegriedösarna – Megalitgravar på Söderslätt i ny belysning. *Ale* 1/2009, 1–15.

Andersson, M. and Wallebom, B. 2011a. Döserygg. Grav- och samlingsplats från början av yngre stenålder. Skåne, Håslöv socken, Håslöv 10:1 och 13:1, RAÄ 47. Väg E6, Trelleborg–Vellinge. *UV Syd Rapport* 2010:30. Arkeologisk undersökning 2007–2008. Lund: Riksantikvarieämbetet.

Andersson, M. and Wallebom, B. 2011b. Håslöv 19:19 och 19:3. Skåne, Vellinge kommun, Håslöv socken, RAÄ 47 och RAÄ 51. Arkeologisk forskningsundersökning 2009. Lund: Riksantikvarieämbetet.

Andersson, M. and Wallebom, B. In press. Håslöv 19:1 och 19:3. Skåne, Vellinge kommun, Håslöv socken, RAÄ 47 och RAÄ 51. Arkeologisk forskningsundersökning 2011. *UV Syd Rapport*. Lund: Riksantikvarieämbetet.

Anglert, M. 1995. *Kyrkor och herravälde*. Lund Studies in Medieval Archaeology 16. Stockholm: Almqvist & Wiksell International.

Anglert, M. 2003. Uppåkra: Bland högar, ortnamn och kyrkor, in: Anglert, M. and Thomasson, J. (eds.), *Landskapsarkeologi och tidig medeltid* 1. Uppåkrastudier 8. Acta Archaeologica Lundensia Series in 8°, No. 4. Stockholm: Almqvist & Wiksell, 115–144.

Blomqvist, L. 1989. *Megalitgravarna i Sverige. Typ, tid, rum och social miljö*. Theses and Papers in Archaeology 1. Institute of Archaeology, University of Stockholm. Stockholm: Institute of Archaeology, University of Stockholm.

Burenhult, G. 1999. *Arkeologi i Norden 1*. Stockholm: Natur och kultur.

Burl, A. 1993. *From Carnac to Callanish: The Prehistoric Stone Rows of Britain, Ireland, and Brittany*. London: Yale University Press.

Gennep van, A. 1960. *The Rites of Passage*. Chicago: University of Chicago Press.

Gillings, M., Pollard, J., Wheatley, D. and Peterson, R. 2008. *Landscape of the Megaliths. Excavation and Fieldwork on the Avebury Monuments, 1997-2003*. Oxbow: Oxbow Books.

Hansen, F. 1931. En nyfunnen dös i Skåne. *Meddelanden från Lunds universitets historiska museum* 1930–1931. Lund, 227–239.

Harding, J. 2003. *Henge Monuments of the British Isles. Mount Pleasant*. Stroud: Tempus.

Jacobsson, B. 1986. The Skogsdala Dolmen: A Long Dolmen beneath a Bronze Age Burial Mound at Skogsdal, South Scania, Sweden. *Meddelanden från Lunds universitets historiska museum* 1985–1986. Lund, 84–114.

Jönsson, Å. 1993. *Historien om en stad. D. I, Landskrona 1413–1804*. Landskrona: Landskrona kommun.

Karsten, P. 1994. *Att kasta yxan i sjön: En studie över rituell tradition och förändring utifrån skånska neolitiska offerfynd*. Acta Archaeologica Lundensia Series in 8°, No. 23. Stockholm: Almqvist & Wiksell International.

Larsson, L. 2000. Axes and Fire – Contacts with the Gods, in: Olausson, D and Vandkilde, H. (eds.), *Form, Function and Context: Material Culture Studies in Scandinavian Archaeology*. Stockholm: Almqvist & Wiksell International, 93–103.

Larsson, L. 2007. Ett långt liv i trakten av Trelleborg: Konstruktion och destruktion av långhögar och storstensgravar, in: Larsson, S. and Arcini, C. (eds.), *En arkeolog i Trelleborg*. Stockholm: Riksantikvarieämbetet, 132–147.

Lunds stifts herdaminne: från reformationen till nyaste tid. Ser. 2, Biografier, 3, Skytts och Vemmenhögs kontrakt. 1951. Lund: Gleerup.

Nilsson, B. and Hanlon, C. 2006. Life and work during 5,000 years, in: Karsten, P. and Nilsson, B. (eds.), *In the Wake of a Woman: Stone Age Pioneering of North-eastern Scania, Sweden, 10,000–5000 BC, The Årup Settlements*. Arkeologiska Undersökningar, Skrifter 63. Stockholm: Riksantikvarieämbetet, 57–178.

Nordquist, P. 2001. Hierarkiseringsprocesser: Om konstruktionen av social ojämlikhet i Skåne, 5500–1100 f. Kr. Umeå: Arkeologiska institutionen.

Rosborn, S. 1977. *Malmöhus: Från 1400-talets kastell till 1900-talets museum*. Malmö: Malmö museer.

Roughley, C., Sherratt, A. and Shell, C. 2002. Past Records, New Views: Carnac 1830–2000. *Antiquity* 76 (2002), 218–223.

Rudebeck, E. 2002. Vägen som rituell arena, in: Jennbert, K., Andrén, A. and Raudvere, C. (eds.), *Plats och praxis: Studier av nordisk förkristen ritual*. Lund: Nordic Academic Press, 167–200.

Sandén, U. 1995. Bevare oss väl: En studie av megalitgravarnas bevaringsgrad på Söderslätt. Photocopy. Arkeologiska institutionen, Lunds universitet.

Skansjö, S. 1983. *Söderslätt genom 600 år: Bebyggelse och odling under äldre historisk tid. Skånsk senmedeltid och renässans* 11. Skriftserie utgiven av Vetenskaps-societeten i Lund. Lund: Liber/Gleerup.

Sköld, P.E. 1968. *Söderslätts förhistoria*. Lund: Gleerup.

Skre, D. 1998. *Herredømmet: Bosetning og besittelse på Romerike* 200–1350 e.Kr. Acta Humaniora. Oslo: Scandinavian University Press

Smith, I.F. 1965. *Windmill Hill and Avebury*. Oxford: Clarendon.

Strömberg, M. 1961. *Untersuchungen zur Jungeren Eisenzeit in Schonen* II. Katalog und Tafeln. Acta Archaeologica Lundensia. Series in 4°, No. 4. Bonn/Lund: Habelt/Gleerup.

Strömberg, M. 1968. *Der Dolmen Trollasten in St. Köpinge, Schonen*. Acta Archaeologica Lundensia. Series in 8°, No. 7. Bonn/Lund.

Strömberg, M. 1980. Siedlungssysteme in südschwedischen Megalithgräbergebieten. *Fundberichte aus Hessen. Jahrg. 19./20, Ulrich Fischer zum 65. Geburtstag am 3. Juli 1980 gewidmet*. Festschrift U. Fischer. Wiesbaden: Landesamt für Denkmalpflege Hessen.

Söderberg, B. In press. Väg E6 Trelleborg – Vellinge delområde 6:1. Järnåldersgårdar och andra lämningar i en dösmiljö. Skåne, Trelleborgs kommun, Skegrie socken, fastighet 39:1, RAÄ 39. Arkeologisk slutundersökning 2007. *UV Syd, Dokumentation av fältarbetsfasen*. Lund: Riksantikvarieämbetet.

Tilley, C. 1999. *The Dolmens and Passage Graves of Sweden: An Introduction and Guide*. London: Institute of Archaeology, University College.

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Appendix 1. Radiocarbon dates from Döserygg

Lab. No.	Context	Dated Material	Date BP	Cal. 1 sig. 68,2	Cal. 2 sig. 95,4
Ua-28702	Dolmen 1	Charcoal	4305±50	3010-2970 BC (16.6) 2960-2880 BC (51.6)	3090-2860 BC (93.4) 2810-2760 BC (2.0)
Ua-29518	Dolmen 1	Charcoal	5213±32	4045-4010 BC (36.8) 4005-3975 BC (31.4)	4230-4210 BC (1.3) 4160-4130 BC (2.8) 4060-3950 BC (91.2)
Ua-29519	Dolmen 2	Bone (Red deer)	5140±403	4500-3300 BC (68.2)	4900-2900 BC (95.4)
Ua-28698	Dolmen 2	Charcoal	4205±45	2900-2850 BC (20.5) 2820-2740 BC (35.9) 2730-2690 BC (11.8)	2910-2830 BC (28.7) 2820-2660 BC (64.6) 2650-2630 BC (2.1)
Ua-29516	Dolmen 2	Cereal	2092±30	170-50 BC (68.2)	200-40 BC (95.4)
Ua-28697	Dolmen 5	Charcoal	4840±45	3700-3680 BC (5.8) 3670-3630 BC (34.4) 3580-3530 BC (28.0)	3710-3620 BC (54.7) 3610-3520 BC (40.7)
Ua-28696	Dolmen 6	Charcoal	8985±65	8290-8180 BC (45.5) 8120-8090 BC (5.9) 8080-8060 BC (2.9) 8040-7990 BC (13.9)	8300-7960 BC (95.4)
Ua-29521	Dolmen 7	Cereal	3619±30	2025-1940 BC (68.2)	2120-2090 BC (3.7) 2040-1890 BC (91.7)
Ua-29127	Dolmen 9	Charcoal	4101±36	2850-2810 BC (15.7) 2740-2720 BC (3.8) 2700-2570 BC (48.7)	2870-2800 BC (21.8) 2780-2560 BC (71.4) 2520-2490 BC (2.3)
Ua-29122	Dolmen 10	Charcoal	4153±38	2880-2830 BC (15.0) 2820-2670 BC (53.2)	2880-2610 BC (95.4)

Lab. No.	Context	Dated Material	Date BP	Cal. 1 sig. 68,2	Cal. 2 sig. 95,4
Ua-29522	Dolmen 10	Cereal	4015±30	2575-2510 BC (54.4) 2505-2485 BC (13.8)	2620-2590 BC (1.9) 2580-2460 BC (93.5)
Ua-29126	Dolmen 12	Charcoal	1312±34	660-710 AD (50.0) 740-770 AD (18.2)	650-780 AD (95.4)
Ua-29121	Dolmen 13	Charcoal	4953±52	3780-3660 BC (68.2)	3940-3870 BC (9.8) 3810-3640 BC (85.6)
Ua-29120	Pit just beside dolmen 8	Charcoal	4966+36	3785-3700 BC (68.2)	3910-3870 BC (4.3) 3800-3560 BC (91.1)
Ua-29128	Pit beside the north opening of the palisade	Charcoal	5029+38	3940-3850 BC (43.9) 3820-3760 BC (24.3)	3950-3710 BC (95.4)
Ua-28695	Palisade	Charcoal	5080±50	3960-3900 BC (24.5) 3880-3800 BC (43.7)	3980-3760 BC (95.4)
Ua-28699	Palisade	Charcoal	4585±40	3500-3460 BC (16.4) 3380-3330 BC (33.0) 3220-3180 BC (10.2) 3160-3130 BC (8.5)	3500-3420 BC (24.0) 3380-3260 BC (39.4) 3240-3100 BC (32.0)
Ua-28701	Palisade	Charcoal	4490±40	3340-3210 BC (41.5) 3190-3150 BC (13.6) 3140-3090 BC (13.1)	3350-3080 BC (90.4) 3070-3020 BC (5.0)
Ua-28694	Palisade (Hearth)	Charcoal	5195±50	4045-3955 BC (68.2)	4230-4190 BC (3.8) 4170-3930 BC (87.6) 3860-3810 BC (4.0)
Ua-29517	Palisade	Cereal	4079±30	2840-2810 BC (10.2) 2670-2570 BC (54.9) 2520-2500 BC (3.1)	2860-2810 BC (15.6) 2750-2720 BC (67.2) 2540-2490 BC (8.8)
Ua-29125	Palisade	Charcoal	4228±38	2900-2860 BC (36.4) 2810-2750 BC (31.8)	2920-2830 BC (43.4) 2820-2670 BC (52.0)
Ua-28693	Wetland	Bone	1445±35	590-650 AD (68.2)	555-655 AD (95.4)
Ua-29520	Wetland	Bone (Seal)	4787±88	3660-3500 BC (55.9) 3430-3380 BC (12.3)	3720-3360 BC (95.4)
Ua-29124	Wetland (Hearth on top of the former wetland)	Charcoal	1820 ±35	80-235 AD BC (68.2)	80-260 AD (91.0) 290-330 AD (4.4)
Ua-28703	Foundation for standing stone	Charcoal	4200±35	2890-2850 BC (19.6) 2810-2750 BC (38.8) 2720-2700 BC (9.7)	2900-2830 BC (27.4) 2820-2660 BC (68.0)
Ua-29123	Foundation for standing stone	Charcoal	4276±36	2915-2880 BC (68.2)	3010-2860 BC (90.1) 2810-2750 BC (5.3)
Ua-29523	Foundation for standing stone	Cereal	4031±30	2580-2545 BC (23.6) 2540-2485 BC (44.6)	2630-2470 BC (95.4)
Ua-28700	Hearth	Charcoal	2925±35	1210-1050 BC (68.2)	1260-1010 BC (95.4)

Post alignments in the barrow cemeteries of Oss-Vorstengraf and Oss-Zevenbergen

By Harry Fokkens

Abstract

In the last two decennia in the southern Netherlands new examples have been discovered of post alignments in the context of burial mounds and urnfields. In this article the alignments in the 'barrow cemeteries' of Oss-Vorstengraf and Oss-Zevenbergen are discussed and placed in a wider geographical and temporal context.

Keywords: *Post alignment, burial mounds, barrow landscape*

Introduction

Between 1997 and 2007, the Faculty of Archaeology and ARCHOL b.v. investigated an extensive barrow landscape south of Oss (Fig. 1). Two clusters of burial mounds were present here: the Oss-Vorstengraf and the Oss-Zevenbergen cluster, laying 400 m apart. Originally these clusters probably were connected, but in present time they are divided by a junction of highways that may have destroyed or obscured several monuments.

The clusters have a totally different preservation history. In the Vorstengraf cluster all mounds were totally destroyed by later activities (an extensive junkyard), and nothing was visible of the original barrows. However, we knew they had been there – though not where exactly – because some had been excavated in the 1930's (Bursch 1937). The cluster derives its name Vorstengraf (chieftains burial) from an extremely rich Early Iron Age burial underneath a very large mound (53 m in diameter) that had accidently been discovered here in 1932 (cf. Holwerda 1934; Modderman 1964; Fokkens and Jansen 2004). The purpose of our 1997 excavations was to find the original location back and at the same time investigate the extends of the original cemetery. In order to do so we first surveyed the whole area of 10 ha with narrow test trenches (1.5 m wide), sometimes 100 m long, and 10 m apart (Fig. 1). This gave us good insight in the location of burial monuments, but also of features in the area in between them.

In contrast, in the Zevenbergen cluster all mounds had been preserved as visible monuments (though not undisturbed) and were 'protected' by forest. Here the forest had to be removed before we could start the research. When this had

Fig.1.The location of Oss-Vorstengraf (A) and Oss-Zevenbergen (B). In white the survey and excavation trenches are indicated that we have used to explore the area (100 ha)(Drawing: Joëlla van Donkersgoed and H. Fokkens).

been done, in 2004, all seven mounds (*Zeven bergen*) were visible (Figs. 1, 4; cf. Fokkens *et al.* 2009; Fontijn *et al.* 2013). Here we applied the same methodology. Before starting to excavate the barrows, we surveyed the whole area in between the mounds with test trenches in order to bring the archaeological landscape into view. In that stage we already discovered long post alignments, which prompted us to excavate the entire area between the mounds (Fig. 4).

This methodology had, as far as we know, not been applied consistently before. That probably is the reason that we found so many features that were not at all expected, but nevertheless proved to be an integral part of such barrow landscapes. One class of those features we would like to highlight here: post alignments. The goal of this paper is to describe the alignments that we have found in these mound clusters and to compare them with similar alignments elsewhere.

The post alignment at Oss-Vorstengraf

Our research at Vorstengraf demonstrated that the enormous mound that had been erected over the chieftains burial incorporated an older Bronze Age mound (Fig. 2). Probably associated with this mound is a double post alignment, that we have indicated as an allée because the alignment could also be interpreted as a corridor leading towards the Bronze Age mound. This should be seen as descriptive label, however, because we have no real indication that such alignments were used as 'road' or corridor (see discussion below).

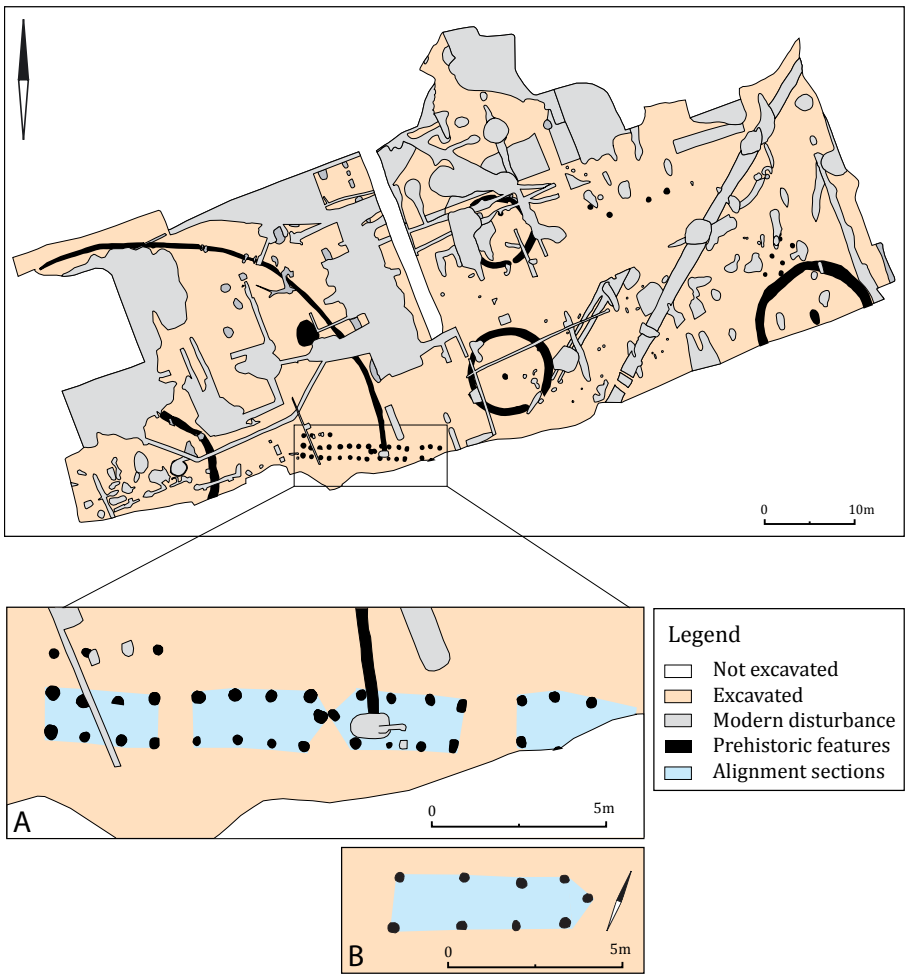

Fig. 2. The double post alignment of Oss-Vorstengraf (A) with the post alignment of Oss-Zevenbergen (B) below. This demonstrates that the Oss-Vorstengraf alignment actually may consist also of sets of eight posts (drawing: H. Fokkens and Joëlla van Donkersgoed).

This allée presently is still 16 m long, and its orientation is nw-se. The south-eastern part is disturbed, so it could have been substantially longer (Fig. 2). The posts stood 1.5 m apart and the distance between the rows was 1 m. On the west end four extra posts were placed, so there the alignment was partly triple. The alignment is not very straight. There is a slight indication that groups of four sets of posts are present with a bit larger spaces in between those groups. This is also suggested by a comparable 'allée' underneath mound 7 of the Zevenbergen cluster (Fontijn *et al.* 2013, 292-293; Fig. 2).

The association of the Vorstengraf allée with the Middle Bronze Age mound is based on circumstantial evidence: we know of more examples of such allées in association with Bronze Age barrows, most notably mound 75 at Zeijen (Fig. 3; Van Giffen 1949). This mound is securely dated to the Middle Bronze Age, and has comparable dimensions. Like the Oss-alignment, the alignment at Zeijen possibly too consists of segments, is in any case not sharply aligned and not

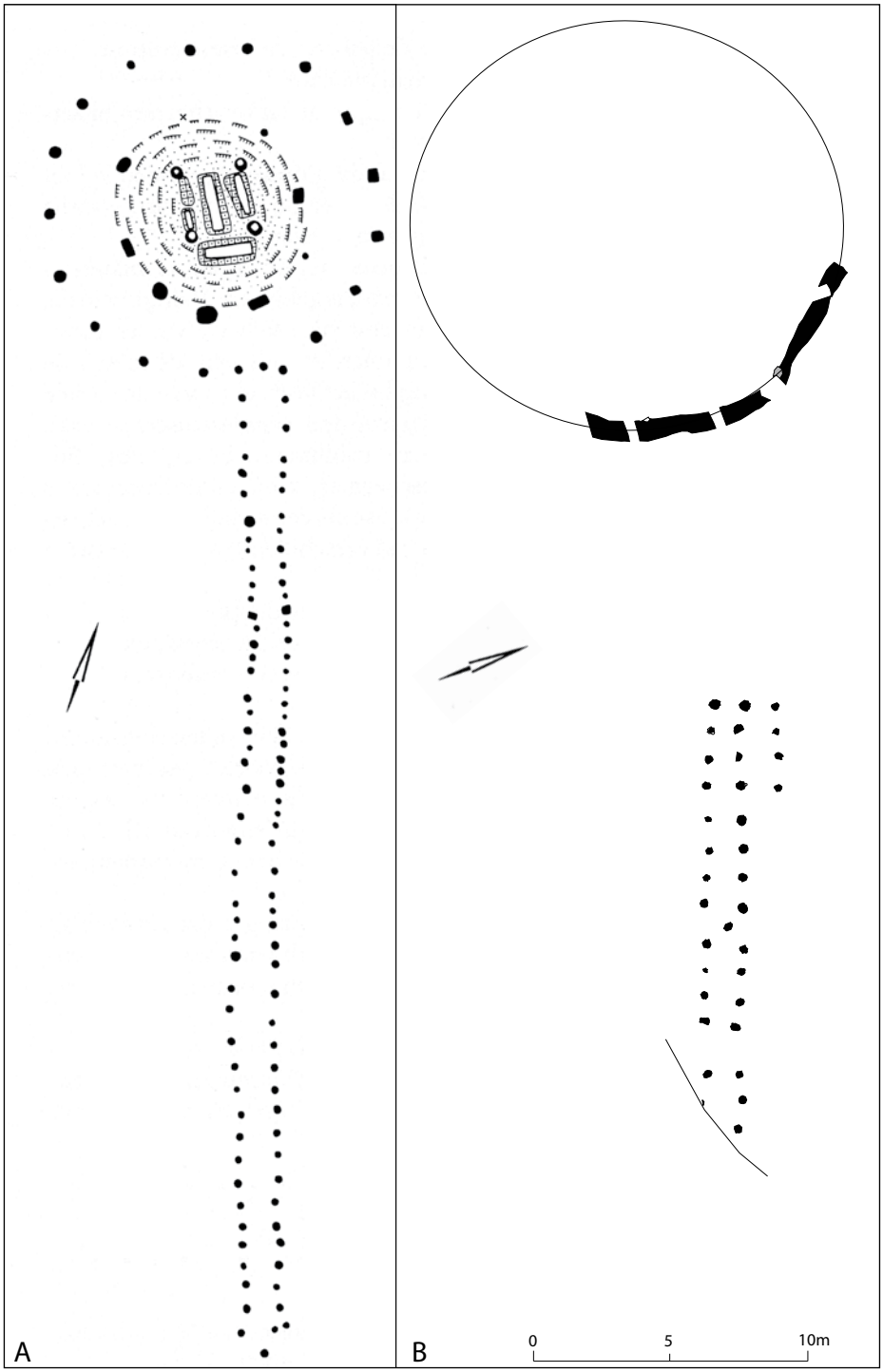

Fig. 3. The Middle Bronze Age burial mound of Zeijen pith a double post alignment leading up to the barrow (A), compared to the post alignment of Oss-Vorstengraf (B) (source: Zeijen: Van Giffen 1949; Oss: drawing H. Fokkens).

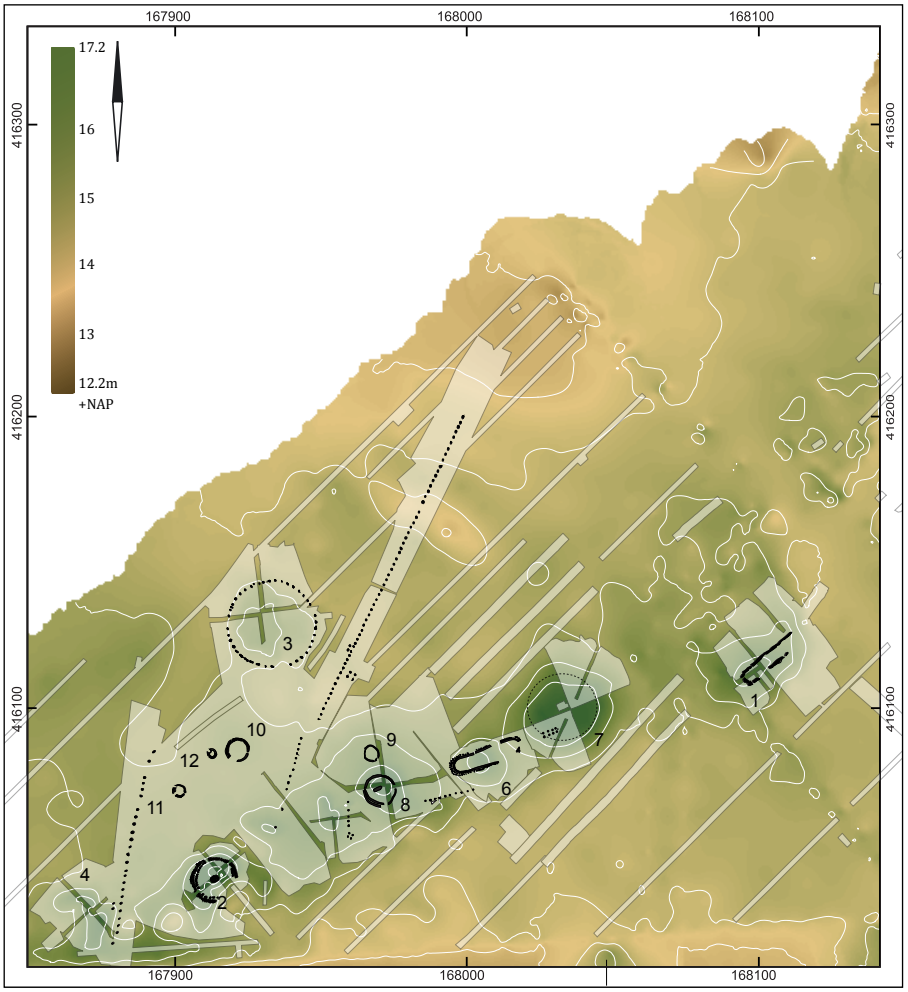

Fig. 4. Post alignments in the Oss-Zevenbergen barrow cluster. The green – brown colours indicate the height above mean sea level (NAP) in meters (drawing Archol b.v. and Joëlla van Donkersgoed; Fontijn et al. 2013, Fig. 16.6).

oriented towards the centre of the mound, but a bit more north of the centre. That aspect can be seen in many alignments (see discussion below). In all we think that the allée of Oss-Vorstengraf is associated with a Middle Bronze Age barrow and dates to that same period. The allée of Oss-Zevenbergen is dated to the same period on the basis of the same circumstantial evidence (cf. Fontijn *et al.* 2013, 292). That alignment is not associated with a Bronze Age burial mound, but interestingly with a natural wind blown dune in the shape of a mound. It is possible that this dune was interpreted as a burial mound in later periods (cf. Fontijn *et al.* 2013, 292-293).

The post alignment at Oss-Zevenbergen

At Oss-Zevenbergen also post alignments have been found, but of a different type. There are five alignments of single rows of posts, and one small allée (Fig. 4, Fig. 2), The latter was excavated in 2007 when the last barrow was investigated (mound 7, see above; Fontijn *et al.* 2013). All single lines of posts are spaced wider than the allées. They do not seem to be running towards mounds, but rather divide the space between them. One of the alignments is over 100 m long, the others are shorter. Since the individual mounds are of a different date (Middle Bronze Age – Early Iron Age), the chronology is difficult to establish. Direct indications in the form of datable finds are absent. The palynological research of one of the postholes indicates an Early or Middle Bronze Age date based on the lack of *Fagus*-pollen (Fokkens *et al.* 2009, section 8.3.7). It is our view, however, that this date is much too old. De Kort (2009) also indicates that infiltration of older pollen in postholes can be a problem.

In our opinion there are a number of arguments for making a well-balanced choice. In the first place we can establish that the post rows and accompanying structures do not transect any of the mounds, nor are they transected by the mounds. They seem to have taken the location of the mounds into account and referred to it. This term is used here to indicate that people deliberately constructed the post rows in relation to the mounds. In other words, they are probably ritual structures that need to be viewed in relation to the mounds. The uniform character of the features, the post rows and the accompanying structures strongly give the impression that we are not dealing with additions that were constructed over many centuries. If this were the case, then one post row would likely have disintegrated before the other was constructed. The configuration rather has the characteristics of a configuration that was constructed in a relatively short time period, a couple of years at the most. The fact that the whole cemetery was compartmentalized, including mound 3, suggests that the whole configuration dates rather later, possibly to the Early Iron Age.

It is not easy to interpret post rows such as those present in the cemetery of Oss-Zevenbergen. It seems clear to us that the five post rows form an integral part of the cemetery. That is to say, that they were constructed in the cemetery and with a reference to it, without it being clear whether this was done in connection with burials. Indications that they are part of the cemetery are that they are almost the same in nature and have the same characteristics:

- Their location and orientation apparently has to do with the location of the mounds and the present relief. Mounds, however, are never 'hit' and the post rows are never oriented on the centre of the mounds;
- The rows do not run straight nor on a line. Within small margins deviations are possible;
- The distances between the posts varies per row and within rows. The posts are at least 1.6 and at the most 3 m from each other. The minimum of 1.6 m in particular is important in this context as it pretty much excludes an interpretation as palisade.

Fig. 5. Posts of the alignment in situ. The white lines indicate the outline of the actual post pits. The dark colours outside that originate from natural processes of iron transport in the soil profile (photo: Archol b.v.).

- The size of the postholes, 30-50 cm in diameter, 25-70 cm wide and 35-65 cm deep, suggests the posts themselves must have been of considerable size and length: on average 20-30 cm in cross-section and probably 2 m or longer. This is indicated by the depth of the postholes: originally 80 cm or more (Fig. 5).

Comparable finds

There are parallels for post alignments as we have found in Oss-Zevenbergen, but they so far have been considered more the exception than the rule. This is probably partly because extensive excavation of barrow cemeteries is rare in the Netherlands. In the past only individual mounds were excavated. Interestingly, when we applied a similar methodology to an urnfield at Slabroekse Heide, a few kilometres further south, also a post alignment was found. Here also a very rich Iron Age burial has been discovered, so these alignments may have been associated with rich burial sites (Jansen and Van Wijk 2008, 104 ff.).

Looking at the data from other regions, post alignments in cemeteries, especially in urnfields, are not common, but neither are they rare. Wilhelmi (1986) was the first to draw attention to this phenomenon, but his discussed only one type, the double post row or allée. We have indicated these as a type 2 alignment. Single rows are indicated as type 1, and multiple rows as type 3. The typology proposed here is purely intended as a categorical classification. Table 1 gives an overview of the sites known to us with post rows of the various types. In this table I have left out the post rows that Verlinde has recognised in Colmschate (Verlinde 2001, 589) because in my opinion they are too suggestive to accept as structures.

Type	Location	length	date	author
1	Oss-Zevenbergen	8 – 116 m	EIA	Fokkens *et al*. 2009; Fig. 4
1	Uden-Slabroek	>125 m	MBA-EIA	Jansen *et al*. in prep.
1	Barleycroft	77.5 – 129 m	MBA	Evans & Knight 2004
1	Raalte-de Zegge	>10 m	E/MIA	Verlinde 2001
1	Gent-Hogeweg	c. 20 m	MBA?	Tina Dyselinck (information Aug. 2012)
2 and 1	Dartmoor (many)	many > 100 m	LN and EBA	Newman 2011; Emmett 1979
1	Glauberg	15 m?	MIA	Hermann 2005
2	Hüsby	40 m	MBA	Freudenberg 2012
2	Oss-Vorstengraf	>16 m	MBA/LBA	Fokkens en Jansen 2004
2	Oss-Zevenbergen	6 m	< HA C	Fontijn *et al.* 2013; Fig. 4, Fig. 2
2	Telgte	> 25 m	MBA?	Wilhelmi 1974, 1986
2	Achmer	> 27 m	EBA	Wilhelmi 1986
2	Wiesens	65 m	EBA	Wilhelmi 1986
2	Westerholt	121/17 m	EBA	Wilhelmi 1986; Fig. 7
2	Haps	60 m	MBA/ LBA	Verwers 1972
2	Zeijen	37 m	MBA	Van Giffen 1949; Fig. 3
1/2	Hesel	56 m	MBA?	Schwartz 2004
?*	Knegsel-Huismeer	> 5 m	MBA	Theunissen 1999, fig. 3.22
?**	Sint Oedenrode	36 m	< EIA	Van der Sanden 1981: 320, 325

Table 1. Survey of published structures known to the author. The palisades of Knegsel-Huismeer (*) and Sint Oedenrode (**) are discarded here as alignments. In our view the configuration at Knegsel may have be a burial monument with post-setting. The post cluster at Sint Oedenrode rather is indeed wide cluster, almost like a medieval landweer.

Fig. 6. One of the Merrivale stone alignments in Dartmoor oriented on a cairn/stone circle as part of it (photo: H. Fokkens, Oct. 2011.

Though the classification in itself has no dating value, it turns out that the type 2 alignments, the allées, prove to mostly date to the Bronze Age (cf. table 1). These are all post rows that connect with, and are clearly oriented on, mounds. Sometimes they consist of bundles of rows (Wiesens, Achmer, Westerholt). Clear examples of alignments oriented on mounds also come from Dartmoor (Newman 2011; Fig. 6). These are single, double and sometimes even multiple rows of stones that are oriented on cairns. They cannot be sharply dated, but most likely date from the Late Neolithic or the Early Bronze Age (Newman 2011, 41).

Though there is no direct dating evidence, the allée of Oss-Vorstengraf has to be older than the Vorstengraf itself as it was found underneath the mound (Fokkens and Jansen 2004, 137). Since the type 2 post rows discovered elsewhere in the Netherlands and abroad are dated to the Middle or Late Bronze Age, we suggest a Middle Bronze Age date for the Oss-Vorstengraf row as well. This fits with the date of the mound on which is probably was oriented.

Until recently no Dutch parallels of single post rows (type 1) related to burial monuments were known. But during new research of the cemetery of Slabroek, a single post row was discovered that appears to transect the cemetery (Jansen and Van Wijk 2008). Slabroek is located only a few kilometers south of Oss-Zevenbergen, which might mean that we are dealing with a regional tradition here. Possibly this tradition is related to rich Hallstatt C burials, since in Slabroek a very rich Ha C burial was discovered as well (Jansen and Van der Laan 2011). At Slabroek we are dealing with a rather large Late Bronze and Early Iron Age urnfield that connects with older mounds. The date for the post row is therefore unclear, but possibly comparable to those of Oss-Zevenbergen.

Outside of the Netherlands a good parallel for single post rows is known from England (Barleycroft; Evans and Knight 2004), but they also occur in Dartmoor (Newman 2011). In Germany there is an example of a single post row that connects with a double row, which in turn refers to a mound (Hesel; Schwarz 2004). Lastly there is also a striking parallel from the princely burial by the Glauberg. To the north of the mound runs a ditch with on its inner side a post row of four posts. Directly next to it at the end there is a four-post structure with two centre posts that is indicated as a temple (Hermann 2005). The complex dates from the fifth century BC.

The problem with the post rows from Barleycroft is that even though they compartmentalize the landscape, they do not refer to burial mounds. There are mounds in this landscape, but they are located separately from the post rows. The situation is therefore different from Oss, Slabroek and the other examples mentioned that do relate directly to barrows. The post rows of Barleycroft are nonetheless an interesting parallel because they are also associated with two-post and four-post structures that in this case are located at the end of the rows, or rather form a connecting element between the post rows (Evans and Knight 2004, 89).

In conclusion we suggest that the single rows (type 1) all date to the Early or the beginning of the Middle Iron Age.

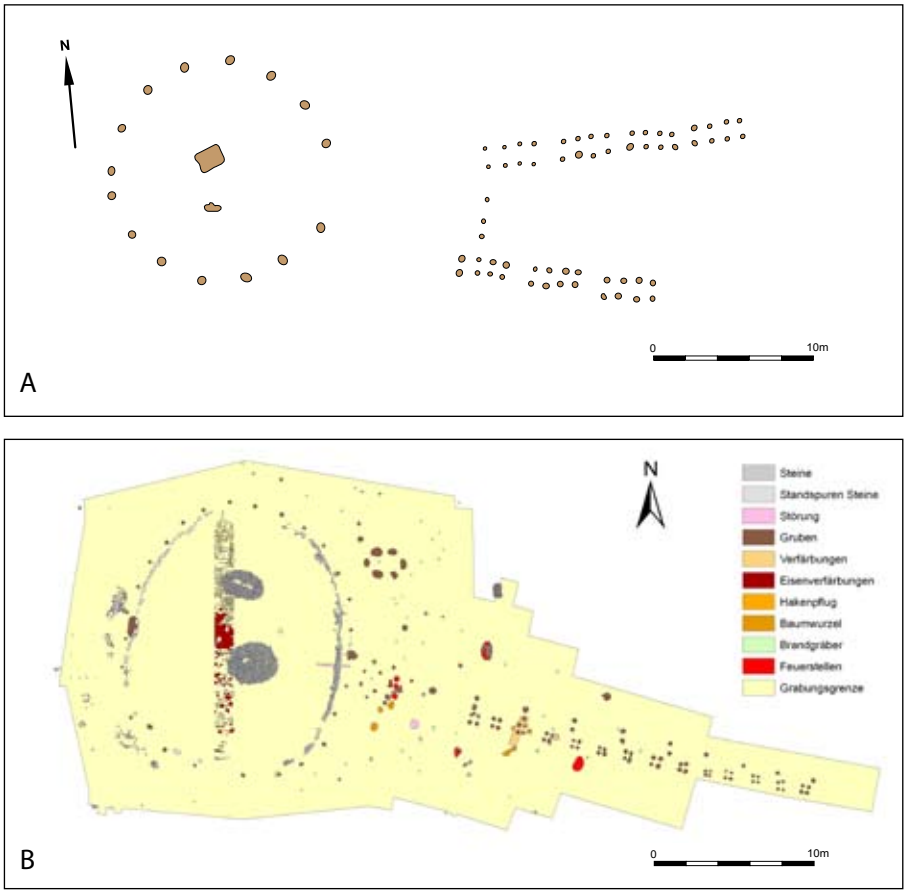

Fig. 7. The alignments of Westerholt (A). Very clearly they consist of eight-post settings or structures (after Wilhelmi 1986). Below (B) on the same scale the alignment of four-post structures of Hüsby (after Freudenberg 2012, 634 Abb. 11: courtesy M. Freudenberg).

Final discussion

It is very difficult to discuss meaning, for one because there may be a fundamental difference between type 1 and type 2. Type 2, the allées, are *oriented* on barrows or cairns, though not on the grave itself. Type 1, the alignments, seem to *divide* the landscape between barrows. The allées have other characteristics as well that may point at a different meaning. They have in common, for instance, that they all stop a few meters short of the barrow they are referencing, and that they generally are not oriented on the primary burial underneath the mound. That may imply that they were later additions and represent interaction with (distant) ancestors rather than a direct association with the primary burial.

There is also a strong possibility that we are not dealing with alignments at all, but with small structures of sets of (eight) posts, over time set in sequence. This idea evolved from the discovery of a double row of four pair of posts found underneath a Hallstatt C burial at Oss-Zevenbergen (mound 7: Fontijn *et al.* 2013; Fig. 2). This short row appears to reference to a natural sand dune underneath barrow 7.

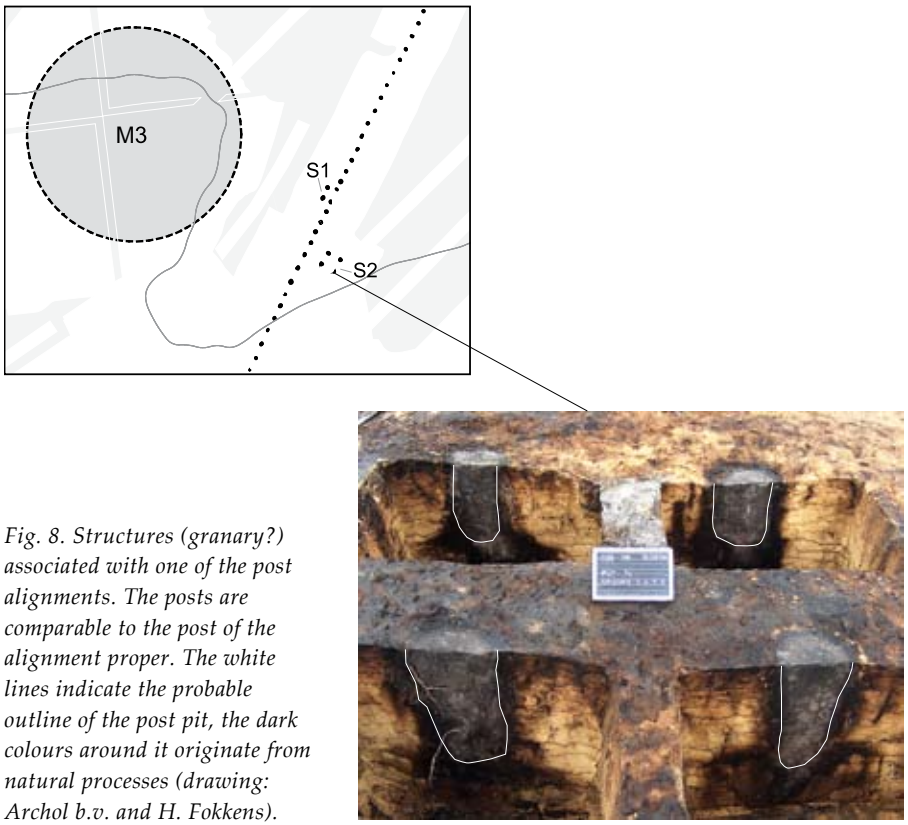

Fig. 8. Structures (granary?) associated with one of the post alignments. The posts are comparable to the post of the alignment proper. The white lines indicate the probable outline of the post pit, the dark colours around it originate from natural processes (drawing: Archol b.v. and H. Fokkens).

This dune was probably mistaken for an older burial mound. Projected over the rows underneath Oss-Vorstengraf, it becomes clear that there too we are probably dealing with sets of four pairs of posts. What they represent is not clear, but they might even be small structures. At closer inspection these eight-post structures are never set exactly in one line, which causes the 'allées' always to look a bit 'wobbly'. If this is the case, then these structures reference each other and therefore can be considered to be roughly contemporary.

If we look at the other examples of type 2 alignments, it becomes clear that they all share the same characteristics. A very clear example are, for instance, the converging alignments of Westerholt (Fig. 7A). Just as clear are the alignments at Wiesens (Schwarz 2004). There too we have sets of eight posts with short breaks in between, exactly comparable to the Oss-Vorstengraf alignment. Yet another fine example of such a configurations provides the barrow of Hüsby (Fig. 7B; Freudenberg 2012, 634). At Hüsby the structures consist of four rather than eight posts, thus closely resembling granaries. Even the double alignment at Zeijen might exist of compartments of sets of posts, though the published plan does not allow to say this with certainty (Fig. 3).

Therefore I suggest that the alignments of type 2 were not intended as alignments at all, but were small structures placed in succession to each other. That accounts for the often 'wobbly' appearance and the compartimentalisation of these structures. How we have to interpret these structures is a matter of debate.

Considering that the alignments of type 1 are substantial in size and not oriented on graves (the centre of the mound), they could have been intended as delineation or separation. Such rows of posts have the effect that when you look along them to the end, you cannot see what is located on the other side. In this manner at least the longer rows separate the burial monuments from each other. On the other hand, from a distance they are 'permeable': one can see and walk through them. One might also view these alignments as connections between the points where they end. Post row 1 of Oss-Zevenbergen, for example, runs from the relatively high cover sand ridge to the terrace located a metre further down. Soil formation reveals that it was wetter there, but the question remains whether the difference in moisture level in the soil was actually visible in prehistory.

Of significance for an interpretation are, in our opinion, also the small rectangular structures that are associated with the alignments (Fig. 8). It is not unthinkable that these were granaries or were supposed to represent them. The association of burials with grain storage or with buildings used for that purpose is a frequently occurring phenomenon (cf. Bradley 2005). In many cultures fertility and death are viewed as related to each other in a cyclical process. It is well possible that granaries were placed in cemeteries in this manner, and should be associated with ancestor rituals and not viewed as purely economic structures. Bradley shows how rituals and daily life can be interwoven with each other and are sometimes hard to separate. In Oss, as well as in Barleycroft, this appears to be the case.

Whether such an interpretation could also be attached to the eight- and four post structures associated with Middle Bronze Age burial mounds is difficult to say. What is certain indeed, is that barrow 'cemeteries' like we excavated at Oss have been complex ritual landscapes with a very long time depth. The burial mounds were there to stay. They were intended for eternity, or so it seems, and to become the focus of ritual activities until generations later.

Bibliography

Bradley, R. 2005. *Ritual and Domestic Life in Prehistoric Europe*. Londen and New York: Routledge.

Bursch, F.C. 1937. Grafheuvels te Oss, *Oudheidkundige Mededelingen uit het Rijksmuseum van Oudheden te Leiden* 18, 1-3.

De Kort, J.W. 2009. Palynologisch Onderzoek Zevenbergen, in: Fokkens, H., Van Wijk, I. and Jansen, R. (eds.). *Het grafveld Oss-Zevenbergen. Een prehistorisch grafveld ontleed*. Archol Rapport 50. Leiden,155-182.

Evans, C. and Knight, M. 2001. The 'comminity of builders': the Barleycroft post alignments, in: Brück, J. (ed.). *Bronze Age Landscapes. Tradition and transformation*. Oxford: Oxbow, 83-98.

Fokkens, H. and Jansen, R. 2004. *Het vorstengraf van Oss. Een archeologische speurtocht naar een prehistorisch grafveld*. Utrecht: Matrijs.

Fokkens, H., Van Wijk, I. and Jansen, R. 2009 (eds.). *Het grafveld Oss-Zevenbergen. Een prehistorisch grafveld ontleed*. Archol Rapport 50. Leiden.

Fontijn, D., Van der Vaart, S and Jansen R 2013. *Transformation through destruction. A monumental and extraordinary Early Iron Age Hallstatt C barrow from the ritual landscape at Oss Zevenbergen.* Leiden: Sidestone Press.

Freudenberg, M. 2012. Grabhügel und Kultanlage der älteren Bronzezeit von Hüsby, Kreis Schleswig-Flensburg – rituelle Landschaft oder eine Demonstration de Macht am Verbindungsweg zwischen Jütischer Halbinsel und Norddeutschlan, in: Bérenger, D., Bourgeois, J., Talon, M. and Wirth, S. (eds.). *Gräberlandschaften der Bronzezeit. Internationales Kolloquium zur Bronzezeit.* Darmstadt: Philipp von Zabern, 619-664.

Hermann, F-R. 2005. Glauberg – Olympia des Nordens oder unvollendete Stadtgründung?, in: Biel, J. and Krause, D. (eds.). *Frühkeltische Fürstensitze. Älteste Staädte und Herrschaftszentren nördlich der Alpen?* Archäologische Infromationen aus Baden-Württemberg, Heft 51; Schriften des Keltenmuseums Hochdorf/Enz 6, Esslingen.

Holwerda, J.H. 1934. Een vroeg Gallisch vorstengraf bij Oss (N.B.), *Oudheidkundige Mededelingen uit het Rijksmuseum van Oudheden te Leiden* 15, Leiden, 39-53.

Jansen, R. and Van Wijk, I.M. 2008. *Het urnenveld Slabroek op de Maashorst, Een verkennend en waarderend archeologisch onderzoek*. Archol Rapport 106. Leiden

Jansen, R. and Van der Laan 2011. *Landschaps- en bewoningsgeschiedenis van de Maashorst. Verleden van een bewogen landschap*. Utrecht: Matrijs.

Modderman, P.J.R. 1964. The chieftain's grave of Oss reconsidered, *Bulletin van de Vereeniging tot Bevordering der Kennis van de Antieke Beschaving* 39, 57-62.

Newman, P. 2011. *The Field Archaeology of Dartmoor*. Swindon: English Heritage.

Schwarz, W. 2004. Hesel, Siedlungsreste der Bronzezeit, in: Fansa, M., Both, F. and Haßmann, H. (eds.). *Archäologie Land Niedersachsen. 400000 Jahre Geschichte*. Stuttgart: Konrad Theiss Verlag, 390-395.

Theunissen, E.M. 1999. *Midden-bronstijdsamenlevingen in het zuiden van de Lage Landen. Een evaluatie van het begrip 'Hilversum-cultuur'*. PhD-thesis, Leiden University

Van der Sanden, W.A.B. 1981. The urnfield and late Bronze Age settlement traces on the Haagakkers at St.-Oedenrode (Province North Brabant), *Berichten van de Rijksdienst voor het Oudheidkundig Bodemonderzoek* 31, 307-328.

Van Giffen, A.E. 1949. Oudheidkundige aanteekeningen over Drentsche vondsten XVI, *Nieuwe Drentse Volksalmanak* 67, 93-148.

Verlinde, A.D. 2001. Lastige palenrijen uit Raalte en Deventer-Colmschate. Een allee uit de IJzertijd?, in: Metz, W.H., Van Beek, B.L. and Steegstra, H. (eds.). *Patina,* essays presented to Jay Jordan Butler on the occasion of his 80th birthday. Groningen/Amsterdam: The editors, 585-596.

Verwers, J. 1972. *Das Kamps Veld in Haps in Neolithikum, Bronzezeit und Eisenzeit*. PhD-thesis, Leiden University.

Wilhelmi, K. 1974. Siedlungs- und Bestättungsplatze der Bronzezeit und Eisenzeit bei Telgte, Kr. Münster. *Archäologisches Korrespondenzblatt* 4, 213-22.

Wilhelmi, K. 1986. Ältebronzezeitliche Grabanlage mit Pfostenzuwegung in Westniedersaschen und ihre englischen Muster, *Helinium* 26, 58-66.

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Bronze Age barrow research in Sandy Flanders (NW Belgium): an overview

By Jeroen De Reu and Jean Bourgeois

Abstract

Since the beginning of the 1980's, Sandy Flanders (north-western Belgium) has been the subject of systematic and intensive aerial photographical surveys which chiefly aimed to discover new archaeological sites. One of the major results of these surveys has been in the area of Bronze Age barrow research where more than thousand monuments have been discovered. In addition to the photographic surveys, several barrow sites have been further investigated during excavations. Over recent years, in the framework of our research project, this dataset has been entered into a systematic and thorough inventory including a total of 1105 identified and precisely located Bronze Age burial monuments. This detailed inventory now forms the basis of an extensive statistical and GIS-based analysis of the Bronze Age barrow phenomenon in north-western Belgium. This approach is leading to new insights into the distribution and the location of the burial mounds in the landscape and in the mutual relations between the different monuments.

Keywords: *Bronze Age, barrows, landscape research, Geographic Information Systems, aerial photography, excavations, spatial analysis, Belgium*

Introduction

The burial mound or barrow is one of the most widespread funerary monuments of (north-western) Europe and even Eurasia. The Bronze Age barrow in particular is one of the best-known, recognisable and studied remnants of the northwest European Bronze Age, mainly as a result of their high visibility and recognisability in the present-day landscape. For example, in Scandinavia tens of thousands of burial mounds have been preserved and are still clearly perceptible in the landscape (Holst *et al.* 2001; Johansen *et al.* 2004). In the Netherlands too (Bourgeois, Q. and Arnoldussen 2006; Lohof 1991; Theunissen 1999), as well as in Central Europe (Forenbaher 1993) and in the British Isles (Bradley 2007; Last 2007) large numbers of barrows are preserved in the landscape, while others have been identified by means of excavations or aerial photography. However, in regions such as Sandy Flanders (north-western Belgium) and northern France (Toron 2006), these monuments have all but disappeared from the landscape, mainly due to intensive agricultural activities and erosion. Yet at the same time, these

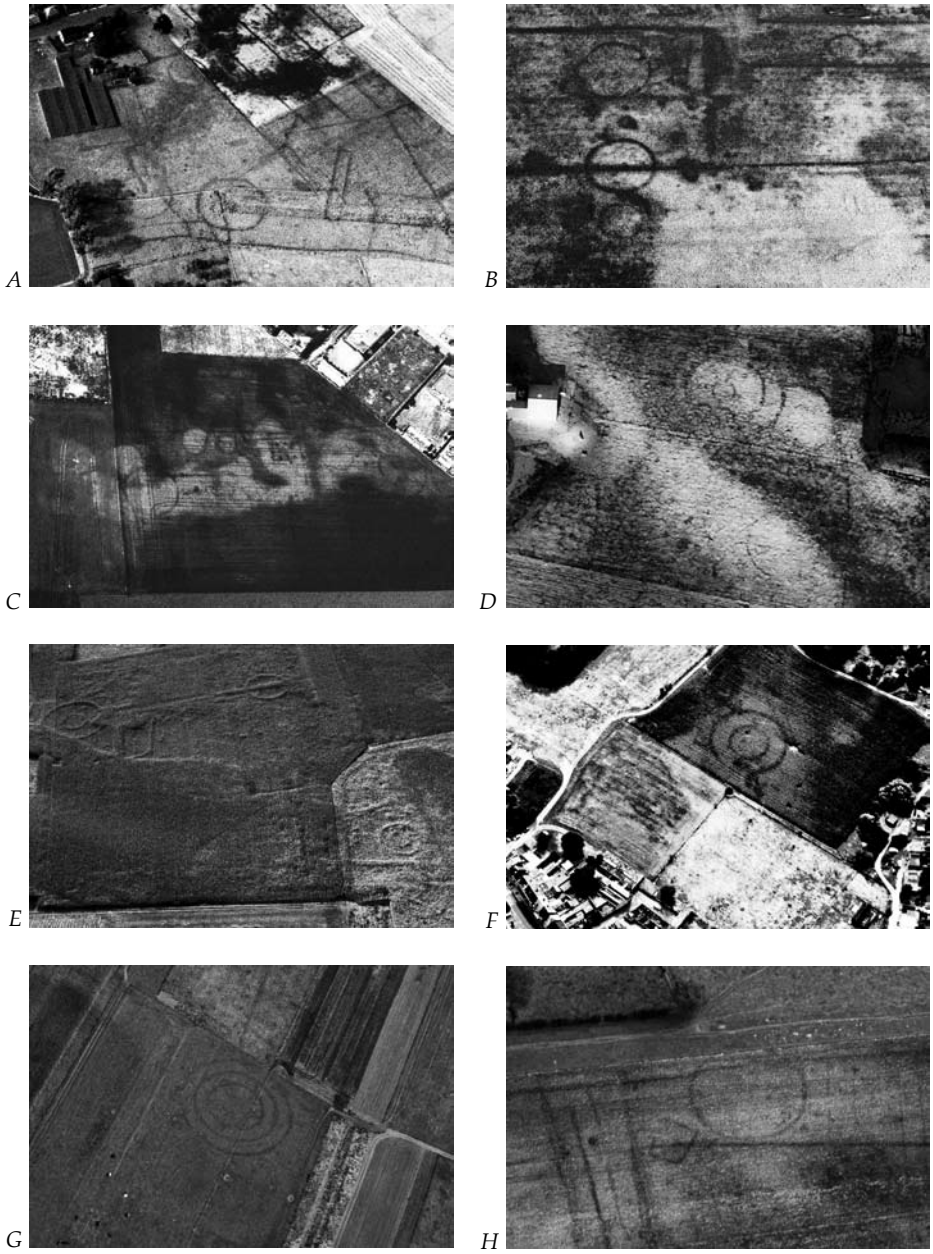


Fig. 1. Selection of aerial photographs revealing Bronze Age monuments. (A) Three single ditched barrows and a long barrow at Zedelgem; (B) four single ditched barrows at Hansbeke "Veer": (C): several monuments and traces of a building at Zulte; (D) two single ditched barrows and a multiple ditched barrow with adjoining circle at Oedelem; (E) two double ditched and one single ditched barrow at Koekelare "Potboezem"; (F) two double ditched barrows at Ghent "Hogeweg"; (G) multiple ditched barrow at Kortemark; (H) rectangular monument in association with a barrow at Koekelare "Boutikel" (images 56519, 178402, 112506, 104319, 99611, 176826, 54107 and 60614: J. Semey, Department of Archaeology, Ghent University).

intensively farmed areas do offer good opportunities for detecting the remnants of these Bronze Age barrows through aerial photographical surveys (Fig. 1). In particular, the circular ditches surrounding the former mounds are easily detected from the air (Ampe *et al.* 1996).

The aim of this paper is to provide a historical overview and a state of Bronze Age barrow research in Sandy Flanders (north-western Belgium). The first part of this article concerns the history and evolution of research on the Bronze Age barrows in Sandy Flanders starting from the first observations during the early 1980's until the present day. In the second part, the new research initiatives will be presented.

Sandy Flanders

The study area, Sandy Flanders, is situated in north-western Belgium, roughly between the North Sea coast, the lower valley of the Scheldt River and the modern city of Antwerp (Fig. 2). The area is situated on the southern edge of the lower Pleistocene sands of the great north-western European plain. It is only in the northernmost parts of Sandy Flanders that these aeolian sands are sealed with peat and clay (so-called polders), while to the south, the sands are bordered by loamy and silty soils.

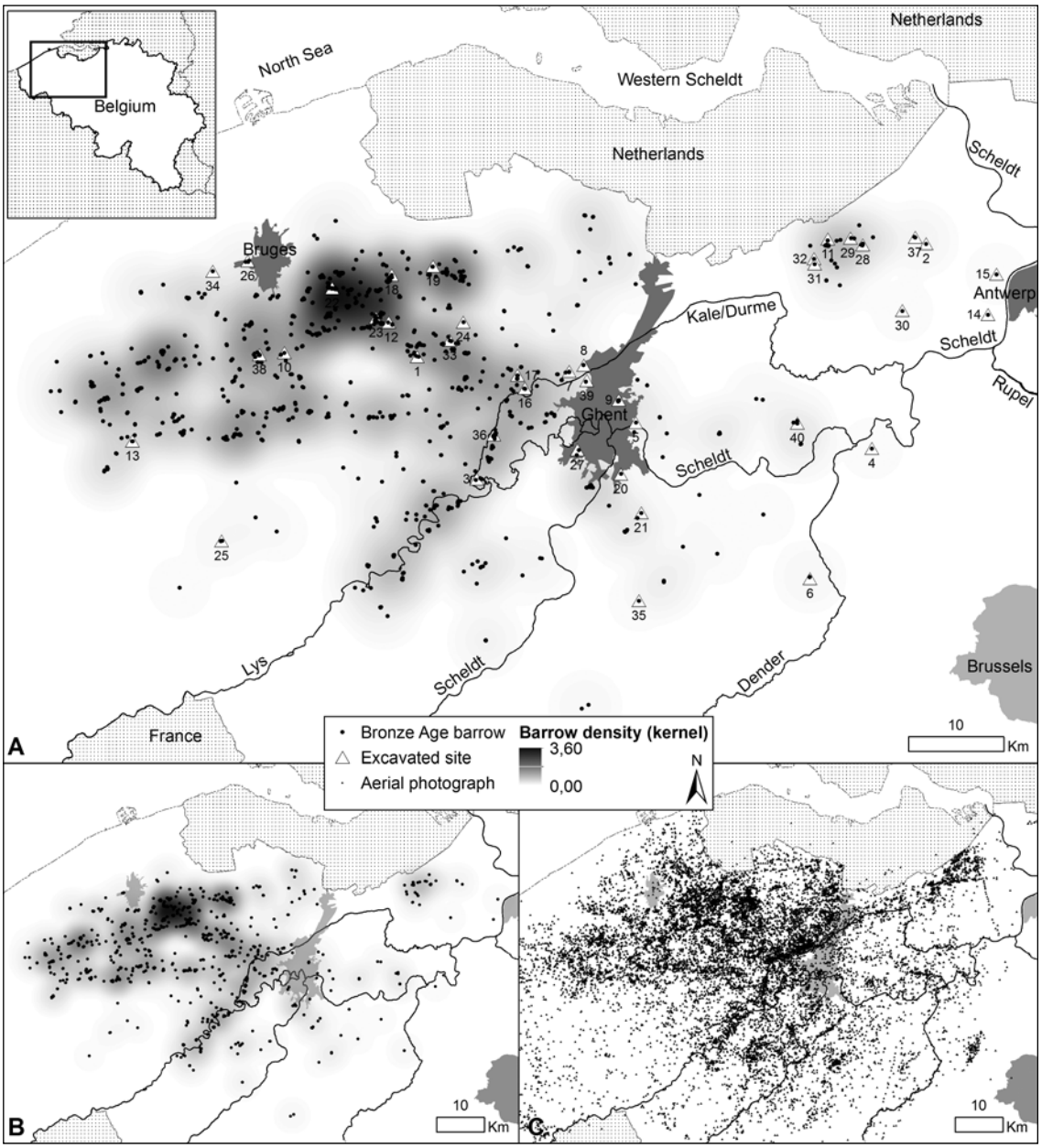
Archaeological evidence

Aerial archaeology

The chief impetus for Bronze Age barrow research in Sandy Flanders was the development of archaeological aerial photography in the late 1970's, led by the main protagonists of this research, Jacques Semey, pilot, and Jan Vanmoerkerke, at that time an archaeology student. The foundation for this aerial archaeological research was laid when pilot Jacques Semey was struck by obvious anomalies (crop marks, soil marks, etc.) in the landscape below him. Since 1984, in close collaboration with and under the guidance of the Department of Archaeology of the Ghent University, Sandy Flanders became the subject of systematic and intensive aerial photographical surveys with the main purpose of discovering archaeological sites (Bourgeois, J. *et al.* 2002; 2005; Meganck *et al.* 2004). Thus over the past three decades, these surveys have resulted in a dataset of more than 70,000 photographs (Fig. 2, C), allowing researchers to build up extensive archaeological datasets and distribution maps.

One of the major results of the aerial surveys has been in Bronze Age barrow research. When the surveys started, not a single monument was known in the area (Ampe *et al.* 1996; Bourgeois, J. and Cherretté 2005; De Laet 1982). In Belgium, this phenomenon had only been recorded in the Campine area (De Laet 1961; Meex 1976; Van Impe 1976; Van Impe and Beex 1977), in the Flemish Ardennes (Fourny 1985) and in Walloon Brabant (Fourny and Van Assche 1993; Van Assche *et al.* 2010). In these regions several monuments had survived the ravages of time and remained visible in the landscape, yet in Sandy Flanders, not a single mound was preserved, mainly due to intensive agricultural activities and erosion. However,

this picture changed completely when it became clear that the numerous circular features being observed from the air were the remnants of vanished Early/Middle Bronze Age burial mounds. Based on the excavation data, these remnants could be identified as the circular ditches which once surrounded the mounds. Today, mainly thanks to the aerial archaeology, more than 1100 barrows are known in Sandy Flanders (Fig. 2, B) (Ampe *et al*. 1995; 1996; Bourgeois, J. and Cherretté 2005; Bourgeois, J. *et al*. 1998; 1999; De Reu *et al*. 2010; 2011a; 2011c).



Excavations

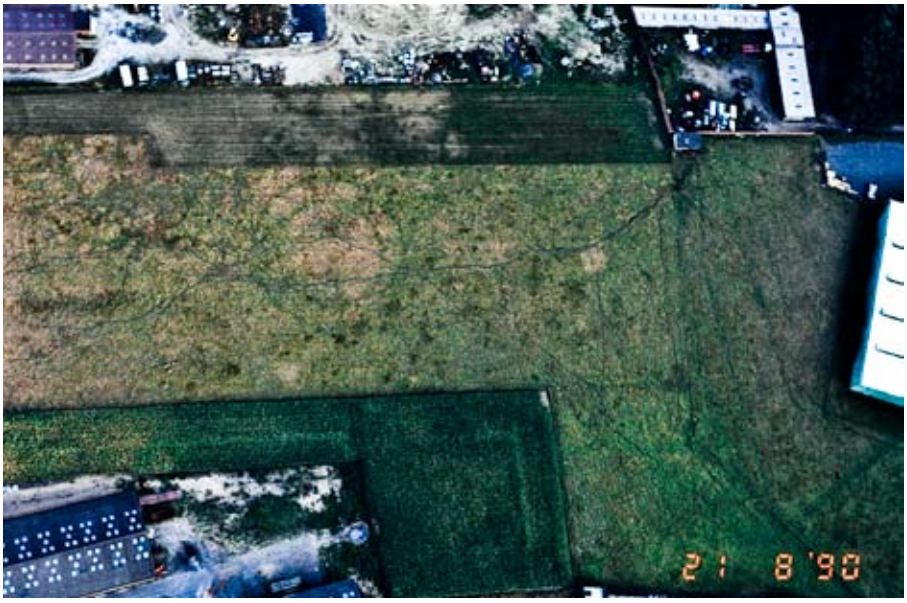
History of the excavations on Bronze Age barrows in north-western Belgium

The earliest excavations, starting in the 1980's, were conducted mostly by the Department of Archaeology of the Ghent University. These small-scale excavations, mostly consisting of one or more trenches, shared one key research question, namely the evaluation of the 'circular features' visible on the aerial photographs. Key excavations happened at these sites: Ghent "Hogeweg" (Raveschot *et al.* 1984), Evergem "Ralingen" (Semey and Vanmoerkerke 1983), Evergem "Molenhoek" (Semey and Vanmoerkerke 1985), Lovendegem "Brouwerijstraat" (Semey and Vanmoerkerke 1986), Lovendegem "Vellare" (Bourgeois, J. *et al.* 1999, 76-78) and Ursel "Rozestraat" (Fig. 11 and 12) (Bourgeois, J. *et al.* 1989).

The 1990's saw a clear increase in the number of rescue excavations and a decrease in the research-focused excavations at unthreatened sites. This trend started early in the 1990's with large-scale rescue excavations in industrial zones and other developed areas. At this time, several aerial detected monuments were preventively

Fig. 2. (left page)
Spatial distribution of the Bronze Age barrows in north-western Belgium (A-B), with indication of the excavated sites (A). Spatial distribution of the aerial photographs taken by the Department of Archaeology of the Ghent University in north-western Belgium (C).

(1) Aalter "Woestijne" (prov. East Flanders);
(2) Beveren "Nerenhoek" (prov. East Flanders);
(3) Deinze "RWZI" (prov. East Flanders);
(4) Destelbergen "Eenbeekeinde" (prov. East Flanders);
(5) Dendermonde "Hoogveld-J" (prov. East Flanders);
(6) Erembodegem "Zuid IV" (prov. East Flanders);
(7) Evergem "Molenhoek" (prov. East Flanders);
(8) Evergem "Ralingen" (prov. East Flanders);
(9) Ghent "Hogeweg" (prov. East Flanders);
(10) Hertsberge "Papenvijvers 4" (prov. West Flanders);
(11) Kemzeke "Verkeerswisselaar" (prov. East Flanders);
(12) Knesselare "Flabbaert" (prov. East Flanders);
(13) Kortemark "Koutermolenstraat" (prov. West Flanders);
(14) Kruibeke "Bazelstraat" (prov. East Flanders);
(15) Kruibeke "Hogen Akkerhoek" (prov. East Flanders;
(16) Lovendegem "Brouwerijstraat" (prov. East Flanders);
(17) Lovendegem "Vellare" (prov. East Flanders);
(18) Maldegem "Burkel" (prov. East Flanders);
(19) Maldegem "Vliegplein" (prov. East Flanders);
(20) Merelbeke "Axxes" (prov. East Flanders);
(21) Moortsele "Uilhoek" (prov. East Flanders);
(22) Oedelem "Drie Koningen" (prov. West Flanders);
(23) Oedelem "Wulfsberge" (prov. West Flanders);
(24) Oostwinkel "Veldhoek" (prov. East Flanders);
(25) Rumbeke "Mandelstaat" (prov. West Flanders);
(26) Sint-Andries "Refuge" (prov. West Flanders);
(27) Sint-Denijs-Westrem "Flanders-Expo" (prov. East Flanders);
(28) Sint-Gillis-Waas "Houtvoort" (prov. East Flanders);
(29) Sint-Gillis-Waas "Kluizemolen" (prov. East Flanders);
(30) Sint-Niklaas "Europark-Zuid" (prov. East Flanders);
(31) Stekene "Bormte" (prov. East Flanders);
(32) Stekene "Kerkstraat" (prov. East Flanders);
(33) Ursel "Rozestraat" (prov. East Flanders);
(34) Varsenare "d'Hooghe Noene" (prov. West Flanders);
(35) Velzeke "Provinciebaan" (prov. East Flanders);
(36) Vosselare "Kouter" (prov. East Flanders);
(37) Vrasene "Profruco" (prov. East Flanders);
(38) Waardamme "Vijvers" (prov. West Flanders);
(39) Wondelgem "Lange Velden" (prov. East Flanders);
(40) Zele "Kamershoek" (prov. East Flanders).



A

B

Fig. 3. Maldegem-Vliegplein, Bronze Age barrows discovered by aerial archaeology in 1990 (A) and during evaluation in 1992 (B) (images 58429 and 79624: J. Semey, Department of Archaeology, Ghent University).

excavated, for example at the Maldegem "Vliegplein" (Fig. 3) (Bourgeois, J. *et al.* 1994), Knesselare "Flabbaert" (Bourgeois, J. *et al.* 1993) and Deinze "RWZI" (De Clercq and Van Strydonck 2002) sites. It is also important to note that a certain number of previously unknown monuments were discovered during these rescue excavations, including the sites of Sint-Gillis-Waas "Kluizenmolen" (Bourgeois, J. *et al.* 1999, 103-106; Meganck *et al.* 2001), Kemzeke "Verkeerswisselaar"

(Bourgeois, J. *et al*. 1993) and Sint-Niklaas "Europark-Zuid" (Bourgeois, J. and Meganck 1993).

The trend of increasing rescue excavations continued during the 2000's. Academic-led research on funerary monuments has (almost) come to a halt, except for the scientific excavation at Oedelem "Wulfsberge" (Fig. 5 and 6) (Bourgeois, J. *et al*. 2001; Cherretté and Bourgeois 2005b), and instead preventive operations in the framework of heritage management have taken over (De Clercq *et al*. 2012). Several known and unknown monuments have been preventively excavated or discovered during such preventive excavations, including the sites of Waardamme "Vijvers" (Fig. 4) (Demeyere and Bourgeois 2005), Zele "Kamershoek" (De Clercq *et al*. 2005) and the new excavations at the site of Ghent "Hogeweg" (Laloo and Blanchaert 2010).

Overview of the excavations on Bronze Age barrows in north-western Belgium

Since the early 1980's, 70 circular structures have been excavated partly or completely during academic-led or developer-led excavations in Sandy Flanders. This work has led to a much better understanding of the morphology of the monuments and the chronology of the Bronze Age barrow phenomenon in the region. Figure 2, A shows the spatial distribution of the excavated barrows in relation to all aerially detected barrows, while table 1 provides an overview of the excavated sites.

Bronze Age barrow database

The continuous interplay between evidence from the systematic aerial surveys and from the academic excavations (and later the development-led excavations) contributed greatly to our knowledge and understanding of Early and Middle Bronze Age burial practice in north-western Belgium. The systematic aerial surveys led to the discovery of large numbers of monuments, while the excavations resulted in a better understanding of the monuments themselves. This research was reported in several regional syntheses of the Bronze Age barrow phenomenon (Ampe *et al*. 1995; Bourgeois, J. *et al*. 1998; 1999) and also in some important international overview papers (Ampe *et al*. 1996; Bourgeois, J. and Cherretté 2005).

However, despite the high intensity of Bronze Age barrow research and the rapid gathering of knowledge about the subject during the 1980's and 1990's, the last decade has seen a certain stagnation, even though the excavations at Oedelem "Wulfsberge" (Fig. 5) (Bourgeois, J. *et al*. 2001; Cherretté and Bourgeois 2002; 2003; 2005b) and Waardamme "Vijvers" (Fig. 4) (Demeyere and Bourgeois 2005) have produced their share of new data and information. These two sites are the best 14C-dated sites in the region (Tab. 1 see end of chapter). In addition, the development of new digitising and inventory techniques, in particular the GIS technology, meant that the Bronze Age barrow database was no longer up-to-date. Furthermore, there was evidence for a certain number of wrong attributions and a lack of accuracy in the localisation of the barrows. It therefore became imperative

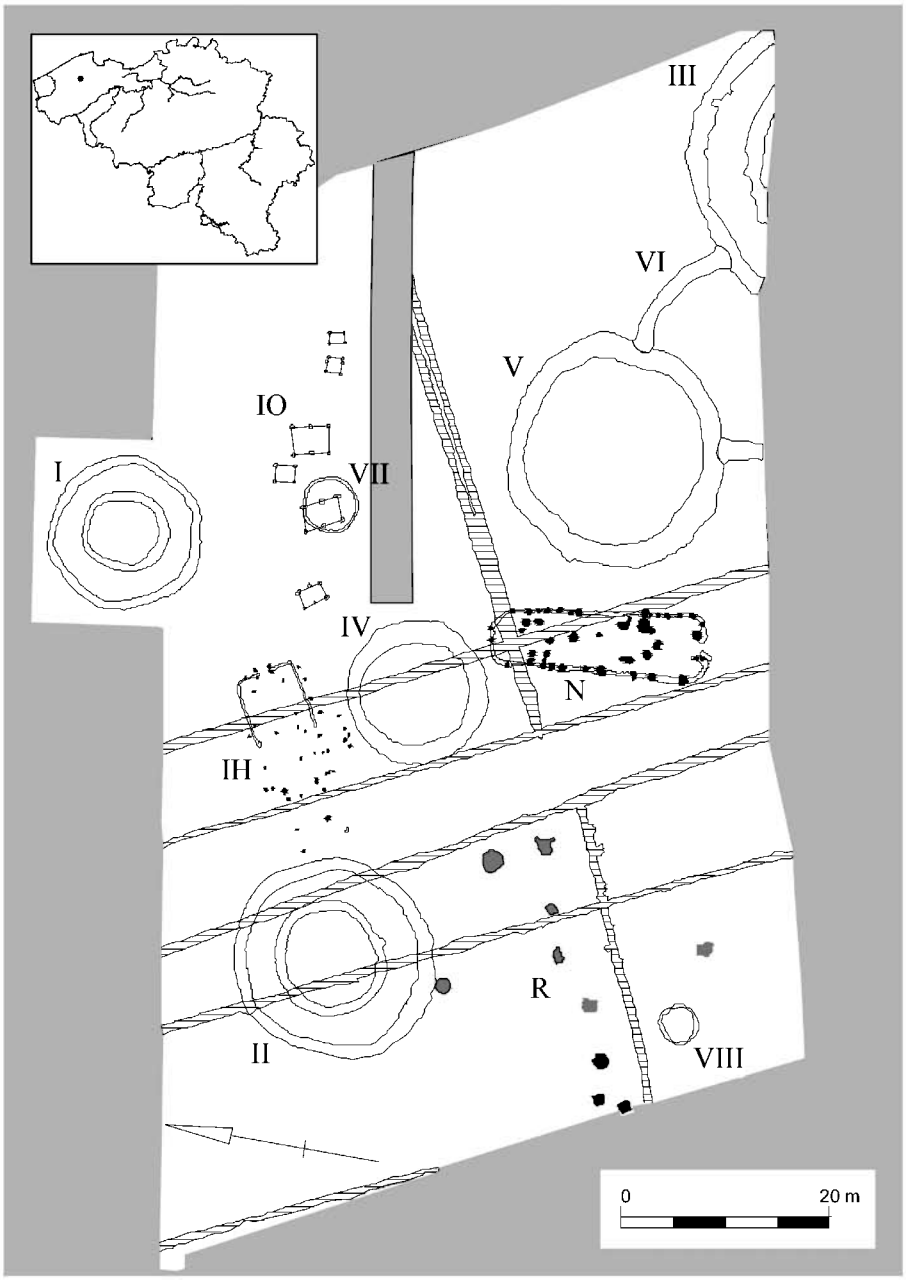


Fig. 4. Excavation plan Waardamme "Vijvers" (after Demeyere and Bourgeois 2005). (I-VIII: Bronze Age barrows; N: Final Neolithic house; IH: Early Iron Age house; IO: Early Iron Age outbuildings; R: Roman cemetery).

that a thorough review of the dataset was conducted and a new systematic inventory put together, in order for new insights and knowledge to be gained. In particular, information related to the spatial distribution and the environmental location of the barrows in the landscape can be collected, reflecting land use strategies and perceptions of Bronze Age communities in the region. The use of spatial statistics

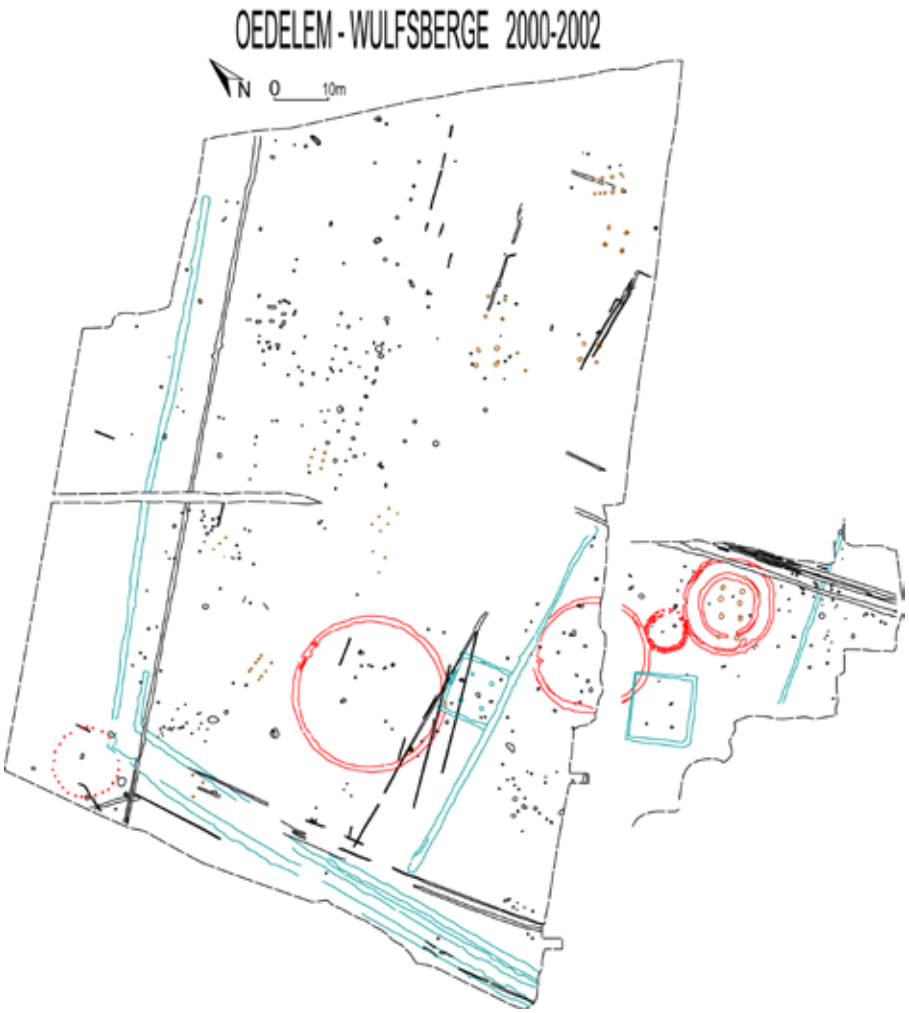


Fig. 5. Excavation plan Oedelem "Wulfsberge" (after Cherretté and Bourgeois 2005b). Red: Bronze Age monuments; blue: Iron Age monuments and ditches; orange: post configurations; black: Roman, Medieval and modern traces).

and spatial analyses in a GIS environment is a new research approach for (later) prehistoric Sandy Flanders.

The first step towards constructing this inventory was to systematically review all the available aerial photographs in order to detect circular features. Then, one aerial photograph was selected for each circular feature and this was used for georeferencing in a GIS environment (e.g. Figure 6). In terms of the technical aspects of the georeferencing process (De Reu *et al*. 2010), an average of ten ground control points was used, while the transformation method was a second order polynomial transformation as advised for rectifying oblique aerial photographs (Antrop and De Maeyer 2008), and the root mean square error (RMS error) was kept as low as possible. In total, more than 2000 features were digitised as polygons and were given a 'coefficient of certainty', defining how likely it is that an observed feature is a Bronze Age barrow. The coefficient is based on several criteria

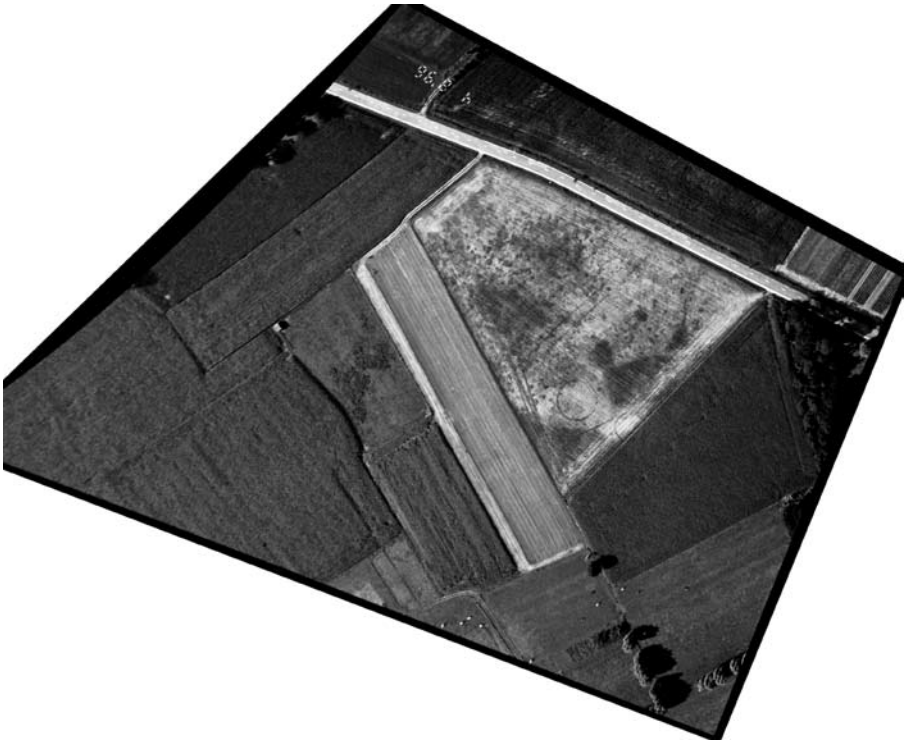


Fig. 6. Georeferenced aerial photograph of Oedelem "Wulfsberge", revealing two barrows (image 117121: J. Semey, Department of Archaeology, Ghent University).

including the shape of the features (typology), their completeness (whether the entire monument was observed or only a part or a segment), their visibility on the aerial photograph (if sharply delineated or not) and the number of independent observations (confirmation of observations). Based on this coefficient, the features were subdivided into three groups of high, good and low probability. Features with high probability can be interpreted as Bronze Age barrows with a certainty of 100% (644 monuments). They score high or maximum values on all of the above-mentioned criteria. The group with good probability includes features which are highly likely to be Bronze Age barrows (461 monuments), but for which the interpretation contains a minor uncertainty. They score at least good or acceptable values on all criteria. As such, a total of 1105 circular features (the monuments with high and good probability) were identified as Bronze Age barrows. Finally, features with low probability score too low on one or more criteria to be reliably interpreted as Bronze Age barrows. In several cases, sites in this group probably contain features with a natural origin, features related to agricultural activities, younger anthropogenic sites such as Medieval and Post-Medieval moated sites (e.g. Bats *et al.* 2006), or cropmarks which are difficult to read. The features in this group are rejected for further analysis and set aside until new observations are conducted that obtain more information about their origins. All circular features are precisely located (georeferenced) in a GIS environment and a linked database comprises both spatial and environmental information.

This detailed inventory forms the basis of a comprehensive statistical and GIS-based analysis of the Bronze Age barrow phenomenon in north-western Belgium (De Reu 2012). This approach enables a better understanding of the Bronze Age barrow building strategies in Sandy Flanders. Within the approach, several parameters are analysed, including spatial (nearest neighbour distance, multi-scalar patterning, density, anisotropy, etc.), environmental (soil texture, soil drainage, elevation, slope, aspect, relative topography, etc.) and other parameters (monument typology, visibility, intervisibility, etc.).

Barrow analysis, some preliminary results

Monument typology

The first results of the systematic inventory and the digitising of the data on Bronze Age barrows are related to the individual monuments, and concern the barrow typology and the shape and size of the barrows. It is important to note that the survey method itself has had an influence on these results.

The large majority of barrows, about 85% of them (Fig. 7), are characterised by a single circular ditch (e.g. Fig. 1, A-C). Barrows with a double circular ditch (e.g. Fig. 1, E-F) appear in 10% of the cases (Fig. 7), while less than 5% of the monuments can be interpreted as adjoining circles (Fig. 7), namely circular ditches attached to an already existing monument (e.g. Fig. 1, D). There is only evidence of a few long barrows ("langbedden" in Dutch, "Langgraben" in German) (e.g. Fig. 1, A), post circles (Fig. 5) or multiple ditched barrows (e.g. Fig. 1, G and 9), in the study area, together representing less than 1% of the monuments (Fig. 7).

The monument diameters were calculated based on the digitised polygons, in the same way as during fieldwork and measured from the midpoint (the deepest point) of the outer ditch (Ampe *et al*. 1996). This makes it possible to compare the diameters of the different barrows, despite the differences in width of the ditches and the state of preservation of the monuments. The double ditched barrows have

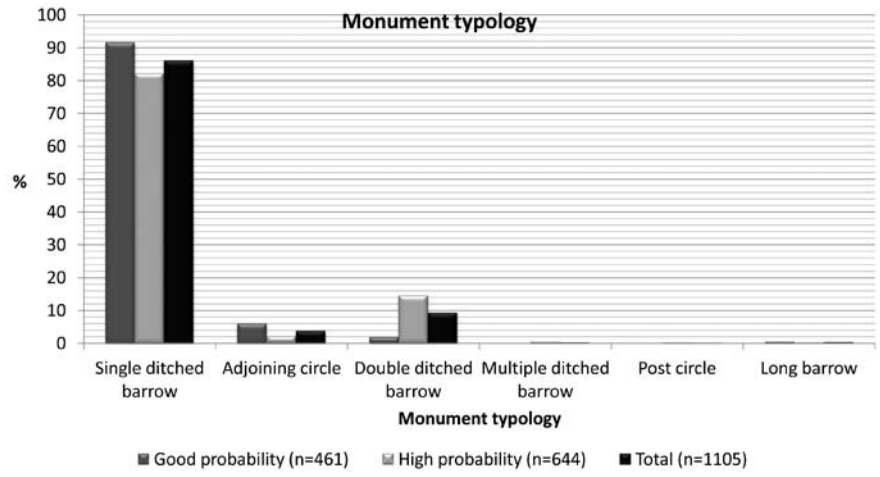


Fig. 7. Typology of the Bronze Age barrows in north-western Belgium.

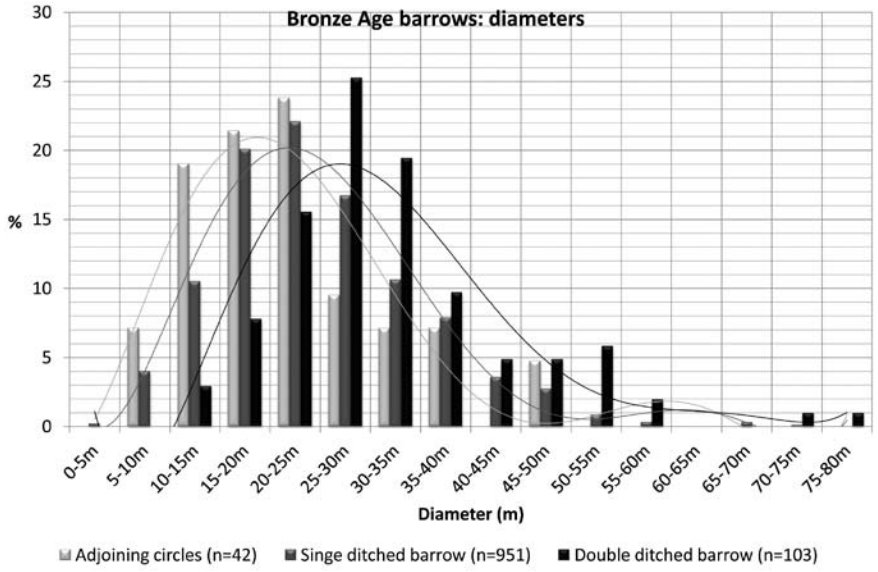


Fig. 8. Diameters of the Bronze Age barrows in north-western Belgium.

an average diameter of 31.5 m (Fig. 8). This makes them clearly larger (7 m on average) than the simple ditched monuments which have an average diameter of 24.5 m (Fig. 8). The adjoining circles are even smaller with an average diameter of 21 m (Fig. 8). For the sake of completeness, we can note that the average diameter of the few multiple ditched barrows and post circles measure respectively 38.0 m and 10.5 m. It seems likely that both the size of the monuments and the number of ditches are indications of the importance of the monuments, the buried person(s) or the social group. Indeed, the double ditched barrows not only have an additional circular ditch, but they also turn out to be larger than the single ditched monuments. Single ditched barrows are larger than adjoining circles, which are structures which were added later to an already existing monument.

However, it is also worth discussing the impact of the aerial survey method on the results. A first observation is that the double and multiple ditched barrows have generally higher coefficients of certainty. This can obviously be linked to their higher recognisability compared to single ditched barrows and adjoining circles and their clear differentiation from other natural and/or anthropogenic circular features. The size of the circular features also influences the final interpretation. In general, small circular structures appear to have a lower coefficient than the larger ones. This is especially true for single ditched monuments and adjoining circles. Post circles are not seen on aerial surveys but are only documented during excavations. In north-western Belgium, three post circles are documented, of which two have been excavated at the site of Oedelem "Wulfsberge" (Fig. 5) (Cherretté and Bourgeois 2002; 2005b). The third post circle has been excavated at Sint-Gillis-Waas "Kluizenmolen" (Bourgeois, J. *et al*. 1999, 103-106), however, it consists only of a few posts added to an existing monument. At the site of Oedelem, alongside the two post circles the excavation also revealed two single ditched barrows and one double ditched barrow (Tab. 1; Fig. 5). It is important

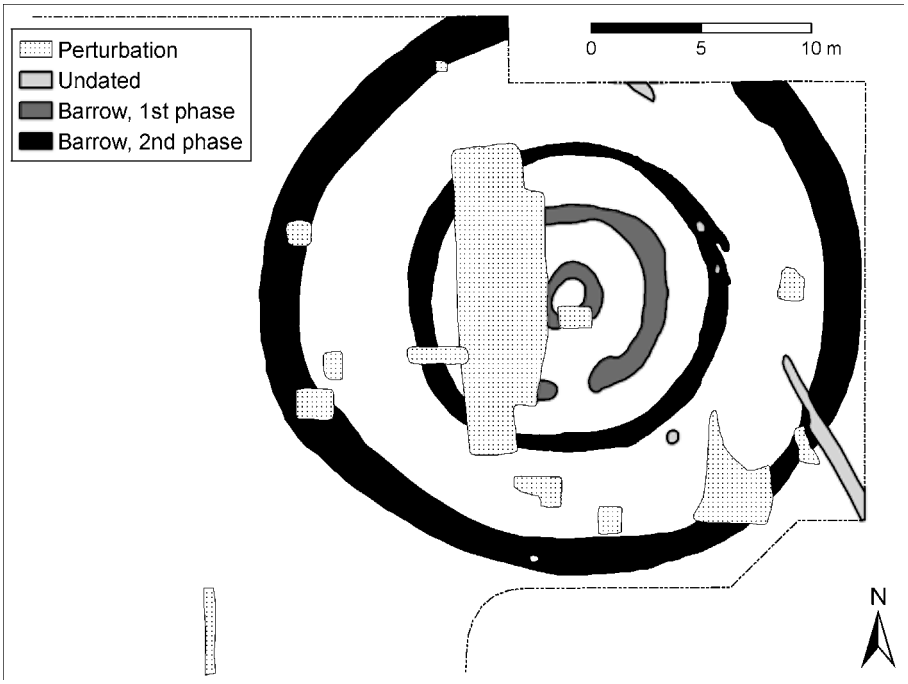


Fig. 9. Excavation plan Sint-Andries "Refuge" (after Cordemans and Hillewaert 2001).

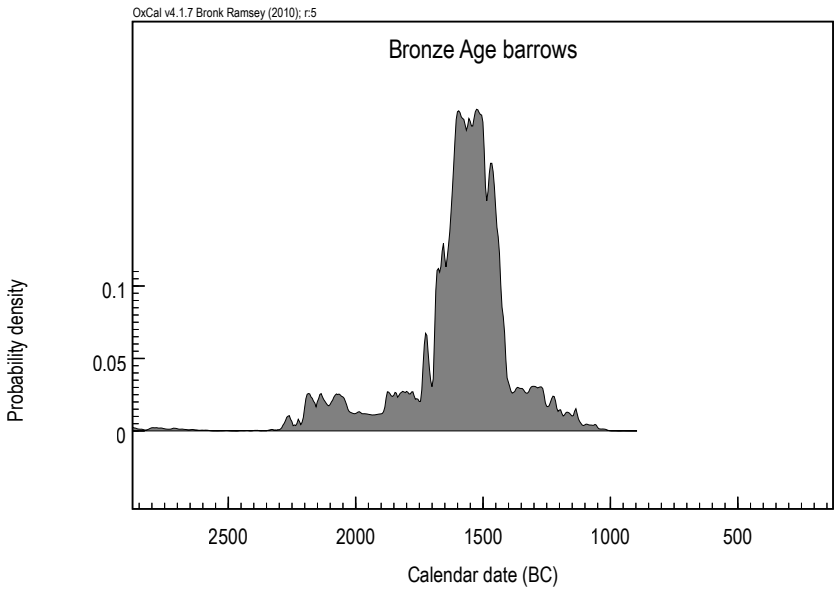
to note that the systematic aerial photographic surveys only detected the barrows surrounded with one or more ditches as peripheral structure. Although the ditched barrows were observed several times, the post circles were not visible on a single image (Fig. 6). This illustrates exactly how difficult it is to detect post circles during aerial photographic surveys and thus it can be expected that more post circles will be discovered in the future during excavations. However, unlike in the Netherlands, the number of post circles is still expected to remain rather low compared to the monuments with a ditch as peripheral structure. Another type of barrow that is absent from the dataset is the barrow without peripheral structures (e.g. without circular ditches or post circles), again unlike monuments found in the Netherlands for example (e.g. Theunissen 1999). Even if this type of barrow ever was also present in Sandy Flanders, the monuments can simply no longer be traced today by any means because of intensive agricultural activities and erosion, resulting in the disappearance of the mounds from the landscape, and a lack of peripheral structures.

Another observation is that during some excavations, more monuments were discovered than had been expected from the aerial imagery (Cherretté and Bourgeois 2005b). Examples of this can be found at the aforementioned site of Oedelem "Wulfsberge" (Cherretté and Bourgeois 2002; 2005b), and at the sites of Waardamme "Vijvers" (Demeyere and Bourgeois 2005), Ghent "Hogeweg" (Laloo and Blanchaert 2010) and Maldegem "Vliegplein" (Fig. 3) (Bourgeois, J. *et al.* 1994). Finally, in some cases the typology of the monuments needed to be reviewed based on the observations made during excavations. For example, according to the aerial imagery a number of monuments had been interpreted as single ditched

barrows, however excavation then showed that these barrows were in fact double ditched barrows. Examples of this can be found at the sites of Evergem "Ralingen" (Semey and Vanmoerkerke 1983) and Kortemark "Koutermolenstraat" (Bourgeois, J. and Meganck 1993). At both of these sites, unlike the outer ditches of the monuments, the inner ditches were not visible as cropmarks on the aerial imagery. In other cases, on closer examination a double ditched monument proved to be two succeeding single ditched monuments. Such distinctions can only be made after excavations and based on pedological observations and 14C dates. A good example of such a monument was excavated at the site of Sint-Andries "Refuge" (Fig. 9) (Cordemans and Hillewaert 2001; Hillewaert and Hoorne 2006). This site revealed a multiple ditched monument, consisting of four concentric ditches of which the inner ditch was interpreted as a foundation trench of a post circle. In fact the monument consisted of two successive monuments each consisting of two double ditches. By the time of the construction of the second monument (namely the two outer ditches), the two inner ditches from the first phase of the monument had been covered over. However, despite these comments and observations, it is unlikely that these will significantly change the broader picture regarding the typology of the Bronze Age barrow phenomenon.

Chronological framework

Also an inventory and a review of the available 14C dates was made. In most cases, 14C dates were obtained by using charcoal samples taken from the ditches of the monuments (as no graves are preserved). To build a truthful chronology of the barrow phenomenon, only 14C dates that were taken from the bottom layers of the ditches were used (Tab. 1; Fig. 10). Furthermore, not all excavated barrows have been 14C dated, in which case the monuments have been dated based on typo-chronological characteristics, the presence of ceramics (e.g. Hilversum pottery)



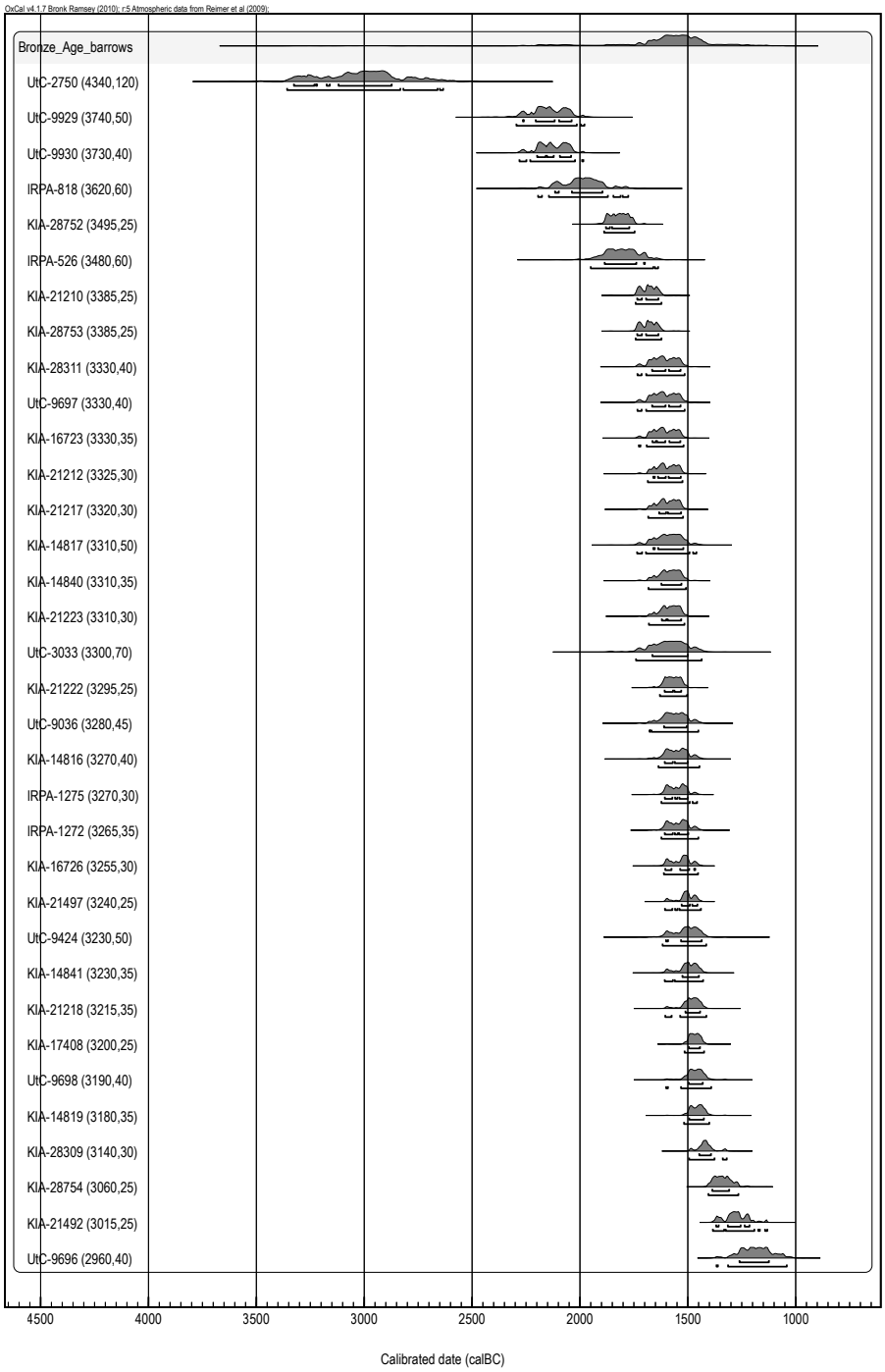


Fig. 10. (both left page and this page)
Chronology of the Bronze Age barrows in north-western Belgium. The lab ID's can be found in table 1 (OxCal v4.1.7 (Bronk Ramsey 2009; 2010); r:5 Atmospheric data from Reimer et al. 2009).

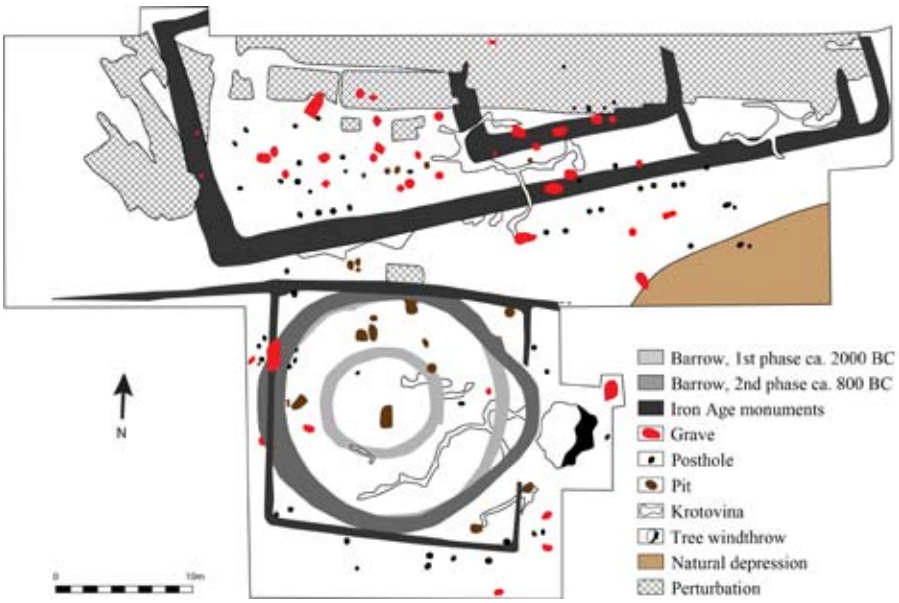


Fig. 11. Excavation plan Ursel "Rozestraat" (after Bourgeois, J. et al. 1989).

and/or the archaeological stratigraphy of the site. In some cases, the classification of the monuments as (Middle) Bronze Age needs to be viewed with caution (e.g. Wondelgem "Lange Velden").

Using this series of 14C dates, it was possible to formulate a chronology for the Bronze Age barrow phenomenon in Sandy Flanders (Fig. 10). The oldest barrows date back to the Late Neolithic and Early Bronze Age. Examples of these early barrows can be found on the sites at Deinze "RWZI" (De Clercq and Van Strydonck 2002), Evergem "Ralingen" (Van Strydonck 1983), and Ursel "Rozestraat" (Van Strydonck 1989). The climax of the barrow phenomenon can be placed in the Middle Bronze Age A, largely between 1700 and 1400 BC (Fig. 10). It seems likely that no new barrows were built after that period, but that older, already existing monuments were reused (Bourgeois, J. and Talon 2009).

As an exception to this rule, two circular monuments which do date from a later period can be found on the sites of Destelbergen "Eenbeekeinde" (De Laet *et al.* 1986) and Velzeke "Provinciebaan" (De Mulder et al. 2007). In both cases, these are rather small monuments, measuring 11 m and 8.5 m respectively. However, their association with Late Bronze Age and Early Iron Age urnfield cemeteries is striking, as both monuments were found in the middle of these cemeteries. In the past, such circular monuments have been interpreted by the excavators in the tradition of the Middle Bronze Age monuments, and seen as founder monuments of the urnfield cemetery (e.g. De Laet *et al.* 1986). However, recent research has revealed that these monuments were built after the cemetery had already been in use for a long time. At Destelbergen, the cremation grave in the centre of the circular monument has been 14C-dated to the Early Iron Age (De Mulder *et al.* 2009). As such, these are similar to other circular monuments found in Late Bronze Age and Early Iron Age urnfield cemeteries in other regions (e.g. Hessing and Kooi 2005; Roymans 1995).

A

B

Fig. 12. Aerial photograph (A) and excavations (B) of the multiple phased barrow at Ursel "Rozestraat" (images 18633 and 20520: J. Semey, Department of Archaeology, Ghent University).

There have been frequent instances of multiphase barrows and the reuse of barrows, mainly in the form of the addition of new ditches, the filling up or the redigging of ditches and the construction of a larger mound. Examples can be found at the sites of Sint-Andries "Refuge" (Fig. 9; Cordemans and Hillewaert 2001; Hillewaert and Hoorne 2006), Ursel "Rozestraat" (Fig. 11 and 12) (Bourgeois, J. *et al*. 1989), Oedelem "Wulfsberge" (Bourgeois, J. *et al*. 2001; Cherretté and Bourgeois 2003) and Waardamme "Vijvers" (Demeyere and Bourgeois 2005).

Fig. 13. Excavation plan Dendermonde "Hoogveld-J" (after Vandecatsye and Laisnez 2009).

Reuse of barrows was not restricted to the Bronze Age. There is clear archaeological evidence for the reuse of Bronze Age barrows and Bronze Age barrow cemeteries for ritual practices in more recent periods, also giving us information about the long-term history and later perceptions towards these monuments in the landscape. These phases of reuse provide important information about the preservation of the Bronze Age monuments in the landscape. For example, we can observe a direct association between Bronze Age barrows and rectangular or quadrangular Iron Age monuments at the sites of Ursel "Rozenstraat" (Fig. 11 and 12) (Bourgeois, J. 1998; Bourgeois, J. *et al*. 1989) and Dendermonde "Hoogveld-J" (Fig. 13; Vandecatsye and Laisnez 2009), whereby the barrows are enclosed and delimited by a rectangular monument. At the site of Oedelem "Wulfsberge" (Bourgeois, J. *et al*. 2001; Cherretté and Bourgeois 2003; 2005b), two quadrangular monuments were meticulously placed in between the earlier barrows. At the site of Ghent "Hogeweg" (Vanmoerkerke 1985), a small Late Iron Age rectangular monument was placed in between the inner and outer ditches of one of the Bronze Age

monuments. At the site of Ursel "Rozenstraat" (Fig. 11 and 12; Bourgeois, J. 1998; Bourgeois, J. *et al.* 1989), a second Iron Age rectangular monument was placed next to the pre-existing monument. There is a clear association between this monument and a Late Iron Age and Early Roman cemetery. Indeed, there are several instances of Roman cremation graves being found in or around a Bronze Age barrow (Vermeulen and Bourgeois 2000), for example, the sites of Waardamme "Vijvers" (Demeyere *et al.* 2005), Evergem "Ralingen" (Semey and Vanmoerkerke 1984), Evergem "Molenhoek" (Verlot 1984), Kemzeke "Verkeerswisselaar" (Van Roeyen and Van Hove 1992a) and Sint-Gillis-Waas "Kluizemolen" (Van Hove and Van Roeyen 1991). The collection of aerial photographs also include evidence of several reused barrow cemeteries. For example, quadrangular enclosures near Bronze Age barrows can be observed at Koekelare "Boutikel" (Fig. 1, H) and Sint-Gillis-Waas "Reinakker". The site of Koekelare "Boutikel" was further investigated through a geophysical survey by means of a GPR (ground penetrating radar; Verdonck *et al.* 2009), while the monuments at Sint-Gillis-Waas "Reinakker" were further analysed by means of archaeological augerings (Van De Vijver 2008).

Current research topics

The general distribution map of all known and precisely located Bronze Age barrows shows a clear non-random distribution over the study area, characterised by micro-areas with a high density, low density or complete absence of the burial moments. Using kernel density estimates (Baxter and Beardah 1996; Baxter *et al.* 1997), it is possible to roughly delimit these micro-areas, characterised by presence or absence of Bronze Age barrows, and to get insights in their global distribution pattern (Fig. 2, A). The main questions are how these patterns can be explained and which were the (most) important parameters influencing the choice to erect a barrow on a certain location in the landscape. The areas characterised by a relatively high concentration of Bronze Age barrows appear to be very attractive to our protohistoric ancestors. Other areas seem to be unattractive, as these are characterised by a complete absence of monuments despite several surveys. An explanation for these patterns can probably be found in the environmental characteristics of the area, however other parameters have played undoubtedly a role too.

The investigation of these parameters is currently one of the objectives of a PhD research, entitled "Land of the Dead. A comprehensive study of the Bronze Age burial landscape in north-western Belgium". The main objectives of the research are (i) the study of the (Middle) Bronze Age landscapes and communities in north-western Belgium (De Reu *et al.* 2011a; 2011c; 2013), and (ii) the investigation and development of GIS methodologies for the analysis and modelling of archaeological landscapes (De Reu *et al.* 2011b; 2012).

Conclusions

Despite their wide distribution and long research traditions, Bronze Age barrows rarely have been studied on a larger scale than the regional context. On the one hand, this is related to the different and highly fragmented national archaeological

research traditions. On the other hand, the often asymmetrical cartographic (e.g. regional maps and digital elevation models (DEM), national coordinate systems) and archaeological data (state of research, publications, research methods, accuracy of inventories, preservation of monuments, etc.) present an obstacle to intra-regional comparisons and studies. However, such studies are important for a solid intra-regional social and cultural understanding of Bronze Age communities and the Bronze Age barrow phenomenon. For example, a comparison of the Bronze Age barrow phenomenon in Sandy Flanders, with that in the valley of the Somme (northern France; Toron 2006), Kent (England; Perkins 2010) and other regions could provide new insights into the evolution of the Bronze Age barrow phenomenon and the processes behind it. To this end, this overview paper has aimed to collect, describe and synthesise the available data on the Bronze Age barrow phenomenon on the sandy soils of north-western Belgium.

It is clear that many years of intensive aerial surveys and the increasing number of excavations on known and unknown sites has led to a considerable increase in our knowledge about the Early/Middle Bronze Age landscape and society in Sandy Flanders. Without the important contribution of the aerial photography, however, such a large dataset would have been unimaginable. The academic-led research executed in the 1980's and 1990's and the more recent excavations in the framework of heritage management decisions have been key to the identification, evaluation and interpretation of the features observed. The accumulated dataset shows both the definite possibilities but also limitations of the prospection method, and the importance of a thorough follow-up of development projects.

The extensive inventory of the available data also led to the formulation of new research questions, requiring a different methodological approach. The use of GIS applications presents new possibilities and opportunities for approaching and analysing such a large dataset in archaeological landscape research. This approach offers the chance to gain new insights into the spatial distribution of Bronze Age barrows in the landscape and into the perception of the Bronze Age communities towards these monuments.

Acknowledgements

The authors would like to thank Jacques Semey for 30 years of systematic aerial photographic surveys in north-western Belgium.

Bibliography

Ampe, C., Bourgeois, J., Fockedey, L., Langohr, R., Meganck, M. and Semey, J. 1995. *Cirkels in het land. Een inventaris van de cirkelvormig structuren in de provincies Oost- en West-Vlaanderen, I.* Ampe, C., Bourgeois, J., Crombé, P., Fockedey, L., Langohr, R., Meganck, M., Semey, J., Van Strydonck, M. and Verlaeckt, K. 1996. The circular view. *Germania* 74/1, 45-94. Archeologische Inventarisatie Vlaanderen, Buitengewone reeks 4. Gent.

Antrop, M. and De Maeyer, P. 2008. *Theoretische concepten van GIS.* Gent: Academia Press.

Bats, M., Bourgeois, J., Lachaert, P.-J., Lens, A., Meganck, M., Noens, G., Semey, J. and Stichelbaut, B. 2006. Een mysterieuze circulaire structuur. Interpretatie door middel van multidisciplinair onderzoek. *Het Land Van Beveren* 49/3, 132-143.

Baxter, M. J. and Beardah, C. C. 1996. Beyond the histogram. Improved approaches to simple data display in archaeology using kernel density estimates. *Archeologia e Calcolatori* 7, 397-408.

Baxter, M. J., Beardah, C. C. and Wright, R. V. S. 1997. Some Archaeological Applications of Kernel Density Estimates. *Journal of Archaeological Science* 24/4, 347-354.

Bourgeois, I. 1994. *Palynologisch onderzoek van grafheuvelstructuren uit de bronstijd in zandig Binnen-Vlaanderen.* Unpublished masterthesis, Gent University.

Bourgeois, I. 1995. Palynologisch onderzoek van grafheuvelstructuren uit de bronstijd in zandig Binnen-Vlaanderen. *Lunula, Archaeologia protohistorica* 3, 9-11.

Bourgeois, J., Semey, J. and Vanmoerkerke, J. 1988. Ursel. Rozestraat: grafheuvel uit de bronstijd, grafmonumenten en grafveld uit de late ijzertijd/Romeinse periode, in: S.N. (ed.). *Speuren, spitten, sparen. Oost-Vlaanderen archeologisch doorgelicht.* Gent, 57-61.

Bourgeois, J., Semey, J. and Vanmoerkerke, J. (eds.) 1989. *Ursel. Rapport provisoire des fouilles 1986-1987. Tombelle de l'âge du bronze et monuments avec nécropole de l'âge du fer.* Gent: Seminarie voor Archeologie, Rijksuniversiteit Gent.

Bourgeois, J. and De Mulder, G. 1992. Een grafheuvel uit de bronstijd en prehistorische perceleringen. Opgravingen 1990 op de kouter te Vosselare. *Het land van Nevele* 23/4, 245-266.

Bourgeois, J. and Rommelaere, J. 1992. Bijdrage tot de kennis van het Meetjesland in de metaaltijden. De opgravingen te Ursel (1985-1989) en Aalter (1989-1990). *Appeltjes van het Meetjesland* 42, 59-88.

Bourgeois, J. and Meganck, M. 1993. Noodonderzoek 1992 op een door luchtfotografie ondekt site te Kortemark-Koutermolenstraat. Grafheuvels uit de bronstijd en nederzetting uit de late ijzertijd. *Westvlaamse Archaeologica* 9/1, 1-10.

Bourgeois, J., Meganck, M. and Rondelez, P. 1993. Noodonderzoek naar grafheuvels uit de bronstijd in de provincies Oost- en West-Vlaanderen in 1991-1992. *Lunula, Archaeologia protohistorica* 1, 7-10.

Bourgeois, J., Meganck, M. and Rondelez, P. 1994. Noodonderzoek 1993 te Maldegem-Vliegplein (prov. Oost-Vlaanderen): grafheuvels uit de Bronstijd, nederzettingen uit de Romeinse periode en uit de middeleeuwen. *Lunula, Archaeologia protohistorica* 2, 1-3.

Bourgeois, J. 1998. La nécropole Laténienne et Gallo-Romaine d'Ursel - Rozestraat (Flandre Orientale - Belgique), in: Brunaux, L., Leman-Delerive, G. and Pommepuy, C. (eds.) *Les rites de la mort chez les Celtes du Nord. Actes de la table ronde de Ribemont-sur-Ancre (Somme), les 4 et 5 décembre 1997.* Amiens: Service Régional de l'Archéologie de Picardie, 111-125.

Bourgeois, J., Meganck, M. and Semey, J. 1998. *Cirkels in het land. Een inventaris van de cirkelvormig structuren in de provincies Oost- en West-Vlaanderen, II.* Archeologische Inventarisatie Vlaanderen, Buitengewone reeks 5. Gent.

Bourgeois, J., Meganck, M., Semey, J. and Verlaeckt, K. 1999. *Cirkels in het land. Een inventaris van de cirkelvormige structuren in de provincies Oost- en West-Vlaanderen, III.* Archeologische Inventarisatie Vlaanderen. Gent.

Bourgeois, J., Cherretté, B. and Meganck, M. 2001. Kringen voor de doden. Bronstijdgrafheuvels te Oedelem-Wulfsberge (W.-Vl.). *Lunula, Archaeologia protohistorica* 9, 23-27.

Bourgeois, J., Roovers, I., Meganck, M., Semey, J., Pelegrin, R. and Lodewijckx, M. 2002. *Flemish aerial archaeology in the last 20 years: past and future perspectives, in: Bewley, R.H. & Raczkowski, W. (eds.) Aerial Archaeology. Developing Future Practice.* Amsterdam: IOS Press, 76-83.

Bourgeois, J. and Cherretté, B. 2004. Evolution of burial places in western Flanders in the Bronze and Iron Age, in: Smedja, L. and Turek, J. (eds.). *Spatial Analysis of Funerary Areas.* Plzen: University of West Bohemia, 94-102.

Bourgeois, J. and Cherretté, B. 2005. L'âge du Bronze et le premier âge du Fer dans les Flandres Occidentale et Orientale (Belgique): un état de la question, in: Bourgeois, J. and Talon, M. (eds.). L'âge du Bronze du nord de la France dans son contexte européen. *Actes des congrès nationaux des sociétés historiques et scientifiques, 125e Lille, 2000.* Paris: CTHS, 43-81.

Bourgeois, J., Meganck, M. and Semey, J. 2005. Almost a Century of Aerial Photography in Belgium. An Overview, in: Bourgeois, J. & Meganck, M. (eds.). *Aerial Photography and Archaeology 2003. A Century of Information.* Gent: Academia Press, 37-48.

Bourgeois, J. and Talon, M. 2009. From Picardy to Flanders: Transmanche connections in the Bronze Age, in: Clark, P. (ed.). *Bronze Age Connections. Cultural Contact in Prehistoric Europe.* Oxford: Oxbow Books, 38-59.

Bourgeois, Q. and Arnoldussen, S. 2006. Expressing monumentality: some observations on the dating of the Dutch Bronze Age barrows and houses. *Lunula, Archaeologia protohistorica* 14, 13-25.

Bradley, R. 2007. *The Prehistory of Britain and Ireland.* Cambridge: Cambridge University Press.

Bronk Ramsey, C. 2009. Bayesian Analysis of Radiocarbon Dates. *Radiocarbon* 51/1, 337–360.

Bronk Ramsey, C. 2010. *OxCal v4.1.7.*

Bruggeman, J. and Reyns, N. 2011. *Archeologische opgraving Kruibeke – Bazelstraat 1, Houten kruis.* Bornem: All-Archeo bvba.

Cherretté, B., Bourgeois, J. and Meganck, M. 2001. Kringen voor de doden. Bronstijdgrafheuvels te Oedelem - Wulfsberge (W.-Vl.). *VOBOV-Info* 53, 30-36.

Cherretté, B. and Bourgeois, J. 2002. Palenkrans uit de midden-bronstijd en nederzettingssporen uit de late ijzertijd te Oedelem-Wulfsberge, W.-Vl. (2001). *Lunula, Archaeologia protohistorica* 10, 13-15.

Cherretté, B. and Bourgeois, J. 2003. Oedelem-Wulfsberge 2002: grafmonumenten uit brons- en ijzertijd (W.-Vl). *Lunula, Archaeologia protohistorica* 11, 33-36.

Cherretté, B. and Bourgeois, J. 2005a. Circles for the Dead. Early and Middle Bronze Age Funerary Practices in Western Flanders - Belgium (2000-1100 BC), in: Laffineur, R., Driessen, J. and Warmenbol, E. (eds.). *Section 11: The Bronze Age in Europe and the Mediterranean, General Sessions and posters, Acts of the 14th UISPP Congress, Liège, Belgium 2-8 September 2001.* Oxford, 25-31.

Cherretté, B. and Bourgeois, J. 2005b. Circles for the Dead. From Aerial Photography to Excavation of a Bronze Age Cemetary in Oedelem (West-Flanders, Belgium), in: Bourgeois, J. and Meganck, M. (eds.). *Aerial Photography and Archaeology 2003. A Century of Information.* Gent: Academia Press, 255-265.

Cordemans, K. and Hillewaert, B. 2001. Een eeuwenoude begraafplaats te Sint-Andries/Brugge (W.-Vl.). *Lunula, Archaeologia protohistorica* 9, 8-10.

Crombé, P. 1993. De nederzetting uit de midden-bronstijd te Maldegem "Burkel" (O.-Vl.). *Lunula, Archaeologia protohistorica* 1, 3-6.

Crombé, P. and Bourgeois, J. 1993. Een midden-bronstijd nederzetting te Maldegem - Burkel (O.-Vl.): Resultaten van de opgravingscampagne 1992. *Archeologisch Jaarboek Gent 1992*, 35-48.

Crombé, P., De Clercq, W., Meganck, M. and Bourgeois, I. 2005. Een meerperiodensite bij de vallei van de Ede te Maldegem-Burkel (gem. Maldegem). Menselijke aanwezigheid uit de Steentijd, een nederzetting en grafheuvel uit de Bronstijd en een nederzetting uit de Romeinse tijd, in: In 't Ven, I. and De Clercq, W. (eds.). *Een lijn door het landschap. Archeologie en het VTN-project 1997-1998. Deel II.* Brussel: VIOE, 93-117.

Cuypers, E., Raveschot, P. and Vanmoerkerke, J. 1984. Circulaire structuren uit de Metaaltijden aan de Hogeweg te Gent (O.-Vl.). *Archeologie* 1984/2, 95.

Cuypers, E., Raveschot, P. and Vanmoerkerke, J. 1985a. Circulaire strukturen aan de Hogeweg te Gent. *Archeologie* 1985/2, 88.

Cuypers, E., Raveschot, P. and Vanmoerkerke, J. 1985b. Structuren uit de Metaaltijden aan de Hogeweg in Gent (O.-Vl). *Archeologie* 1985/1, 20-21.

De Clercq, W. 1999. Een onverwachte kijk op het archeologisch patrimonium. Noodopgraving en archeologisch waarderingsonderzoek op de Axxes-locatie: resten uit de bronstijd en de Romeinse periode. Monumentenzorg en Cultuurpatrimonium. *Jaarverslag van de Provincie Oost-Vlaanderen 1998*, 100-103.

De Clercq, W. 2000a. Archeologisch noodonderzoek op de RWZI-installatie in Bachte-Maria-Leerne. Een greep Oost-Vlaamse pre- en protohistorie tussen Leie en Kale. Monumentenzorg en Cultuurpatrimonium. *Jaarverslag van de Provincie Oost-Vlaanderen 1999*, 138-142.

De Clercq, W. 2000b. Preventieve opgravingen op de Axxes-locatie te Merelbeke. Een landelijke Romeinse nederzetting uit de eerste eeuwen van onze jaartelling. Monumentenzorg en Cultuurpatrimonium. *Jaarverslag van de Provincie Oost-Vlaanderen 1999*, 144-148.

De Clercq, W. 2000c. Voorlopig rapport over het noodarcheologisch onderzoek op de RWZI-locatie Deinze: metaaltijdsporen tussen Leie en Kale (O.-Vl.). *Lunula, Archaeologia protohistorica* 8, 22-25.

De Clercq, W., Bastiaens, J., Deforce, K., Desender, K., Ervynck, A., Gelorini, V., Haneca, K., Langohr, R. and Van Peteghem, A. 2004. Waarderend en preventief archeologisch onderzoek op de Axxes-locatie te Merelbeke (prov. Oost-Vlaanderen): een grafheuvel uit de Bronstijd en een nederzetting uit de Romeinse periode. *Archeologie in Vlaanderen* 8/2001/2002, 123-164.

De Clercq, W. and Van Strydonck, M. 2002. Final report from the rescue excavation at the Aquafin RWZI plant Deinze (prov. East-Flanders, Belgium): radiocarbon dates and interpretation. *Lunula, Archaeologia protohistorica* 10, 3-6.

De Clercq, W., Van Rechem, H., Gelorini, V., Meganck, M., Taayke, E. and Tency, H. 2005. Een meerperioden-vindplaats langs de Schelde te Zele Kamershoek. Een grafheuvel uit de Bronstijd, een erf uit de Gallo-Romeinse periode en sporen van Germaanse inwijkelingen, in: In 't Ven, I. and De Clercq, W. (eds.). *Een lijn door het landschap. Archeologie en het VTN-project 1997-1998. Deel II*. Brussel: VIOE, 177-229.

De Clercq, W., Bats, M., Bourgeois, J., Crombé, P., De Mulder, G., De Reu, J., Herremans, D., Laloo, P., Lombaert, L., Plets, G., Sergant, J. and Stichelbaut, B. 2012. Developer-led archaeology in Flanders: an overview of practices and results in the period 1990-2010, in: Webley, L., Vander Linden, M., Haselgrove, C. & Bradley, R. (eds.). *Development-led Archaeology in Northwest Europe. Proceedings of a Round Table at the University of Leicester. 19th-21st November 2009*. Oxford: Oxbow Books, 29-55.

De Laet, S. J. 1961. Quelques Précisions nouvelles sur la civilisation de Hilversum en Belgique. *Helinium* 1/2, 120-126.

De Laet, S. J., Van Doorselaer, A., Desittere, M. and Thoen, H. 1965. Verdere opgravingen in het urnenveld te Destelbergen (1965 en 1966). *Oudheidkundige Opgravingen en Vondsten in Oostvlaanderen* 4, 10-25.

De Laet, S. J. 1982. La Belgique d'avant les Romains. Wetteren: Universa.

De Laet, S. J., Thoen, H. and Bourgeois, J. 1985. De opgravingen te Destelbergen/Eenbeekeinde in het raam van de vroegste geschiedenis van de stad Gent I. De voorgeschiedenis. *Handelingen der Maatschappij voor Geschiedenis en Oudheidkunde te Gent, Nieuwe Reeks* 39, 3-35.

De Laet, S. J., Thoen, H. and Bourgeois, J. 1986. *Les fouilles du séminaire d'archéologie de la Rijksuniversiteit te Gent à Destelbergen-Eenbeekeinde (1960-1984) et l'histoire la plus ancienne de la région de Gent (Gand). I. La période préhistorique*. Brugge: De Tempel.

De Mulder, G. 1994. Aspects of the funeral ritual in the Late Bronze Age and the Early Iron Age in the western part of the Flemish Region. *Helinium* 34/1, 94-133.

De Mulder, G. and Rogge, M. 1995. *Twee urnengrafvelden te Zottegem-Velzeke*. Zottegem: PAMZOV.

De Mulder, G., Van Strydonck, M., Boudin, M., Leclercq, W., Paridaens, N. and Warmenbol, E. 2007. Re-evaluation of the Late Bronze and Early Iron Age chronology of the Western Belgian Urnfields based on 14C Dating of Cremated Bones. *Radiocarbon* 49/2, 499-514.

De Mulder, G., Van Strydonck, M. and Boudin, M. 2009. The impact of cremated bone dating on the archaeological chronology of the Low Countries. *Radiocarbon* 51/2, 579-600.

De Mulder, G. 2010. Old bones, new ideas. 14C-dating of cremated bones from Late Bronze Age and Early Iron Age urnfield cemeteries in Flanders, in: Sterry, M., Tullett, A. & Ray, N. (eds.). *In Search of the Iron Age. Proceedings of the Iron Age Research Student Seminar 2008, University of Leicester*. Leicester: School of Archaeology and Ancient History, University of Leicester, 217-243.

De Reu, J., Bats, M., Bourgeois, J., Antrop, M., Court-Picon, M., De Maeyer, P., De Smedt, P., Finke, P., Van Meirvenne, M., Verniers, J., Werbrouck, I., Zwertvaegher, A. and Crombé, P. 2010. Digitizing, inventorying, reviewing and analyzing the "Bronze Age barrows database" of East and West Flanders (Belgium). *Lunula, Archaeologia protohistorica* 18, 43-47.

De Reu, J., Bats, M., Crombé, P., Antrop, M., Court-Picon, M., De Maeyer, P., De Smedt, P., Finke, P., Van Meirvenne, M., Verniers, J., Werbrouck, I., Zwertvaegher, A. and Bourgeois, J. 2011a. Een GIS benadering van de bronstijdgrafheuvel in Zandig-Vlaanderen: enkele voorlopige resultaten (België). *Lunula, Archaeologia protohistorica* 19, 3-8.

De Reu, J., Bourgeois, J., De Smedt, P., Zwertvaegher, A., Antrop, M., Bats, M., De Maeyer, P., Finke, P., Van Meirvenne, M., Verniers, J. and Crombé, P. 2011b. Measuring the relative topographic position of archaeological sites in the landscape, a case study on the Bronze Age barrows in northwest Belgium. *Journal of Archaeological Science* 38/12, 3435-3446.

De Reu, J., Deweirdt, E., Crombé, P., Bats, M., Antrop, M., De Maeyer, P., De Smedt, P., Finke, P., Van Meirvenne, M., Verniers, J., Zwertvaegher, A. and Bourgeois, J. 2011c. Les tombelles de l'âge du bronze en Flandre sablonneuse (nord-ouest de la Belgique) : un status quaestionis. *Archäologisches Korrespondenzblatt* 41/4, 491-505.

De Reu, J. 2012. *Land of the Dead. A comprehensive study of the Bronze Age burial landscape in north-western Belgium*. Gent: University Press.

De Reu, J., De Mulder, G., Van Strydonck, M., Boudin, M. and Bourgeois, J. 2012. 14C dates and spatial statistics: Modeling intrasite spatial dynamics of urnfield cemeteries in Belgium using case study of Destelbergen cemetery. *Radiocarbon* 54/3, 635-648.

De Reu, J., Bourgeois, J., Bats, M., De Smedt, P., Gelorini, V., Zwertvaegher, A., Antrop, M., De Maeyer, P., Finke, P., Van Meirvenne, M., Verniers, J., Crombé, P., 2013. Beyond the unknown: understanding prehistoric patterns in the urbanised landscape of Flanders. *Journal of Historical Geography* 40, 1-15.

De Vos, S. and Pype, P. 2007. *Wondelgem – Lange Velden (Gent, Oost-Vlaanderen). Archeologisch Proefsleuvenonderzoek.* Sijsele: Ruben Willaert bvba.

Demeyere, F. and Bourgeois, J. 2005. Noodopgraving te Waardamme (Oostkamp, West-Vlaanderen): grafheuvels uit de Bronstijd en een bewoning uit de vroege IJzertijd. *Lunula, Archaeologia protohistorica* 13, 25-30.

Demeyere, F., Dewilde, M., Wyffels, F. and De Clercq, W. 2005. Twee Gallo-Romainse brandrestengrafvelden: Waardamme en De Panne (West-Vlaanderen). *Romeinendag Brussel, 16-04-2005*, 21-26.

Demeyere, F., Bourgeois, J., Crombé, P. and Van Strydonck, M. 2006. New evidence of the (Final) Neolithic occupation of the Sandy Lowlands of Belgium: the Waardamme 'Vijvers' site, West Flanders. *Archäologisches Korrespondenzblatt* 36/2, 179-194.

Demeyere, F. and Lammens, W. 2007. Cirkelvormige sporen langsheen de Mandelstraat (Rumbeke - Roeselare, provincie West-Vlaanderen). *Lunula, Archaeologia protohistorica* 15, 13-21.

Deschieter, J. and De Wandel, T. 2010. Het archeologisch noodonderzoek in de Moerasstraat te Kruishoutem in 2007, Velzeke: Archeologisch Museum Velzeke, Provincie Oost-Vlaanderen.

Dyselinck, T. 2012. Gent-Hogeweg, het beeld vervolledigd (prov. Oost-Vlaanderen, België). *Lunula, Archaeologia protohistorica* 20, 23-29.

Forenbaher, S. 1993. Radiocarbon dates and absolute chronology of the central European Early Bronze Age. *Antiquity* 67/255, 218-256.

Fourny, M. 1985. Nouvelle contribution à l'étude de la nécropole de la civilisation de Hilversum/Drakenstein (âge du bronze ancien et moyen). Examen des anciennes collections du Musée du Centenaire à Mons. *Vie archéologique* 5, 41-68.

Fourny, M. and Van Assche, M. 1993. Les tombelles protohistorique du Bois de la Houssière (Braine-le-Comte, Hennuyères et Roncquières, Hainaut). Monuments classés. *Amphora* 71-72, 2-39.

Heim, J. 1989. Annexe II: Première contribution à l'étude du paléoenvironnement d'une tombelle de l'âge du bronze, située à Ursel (arr. de Gent, prov. de Flandre Orientale), in: Bourgeois, J., Semey, J. and Vanmoerkerke, J. (eds.). *Ursel. Rapport provisoire des fouilles 1986-1987. Tombelle de l'âge du bronze et monuments avec nécropole de l'âge du fer.* Gent: Seminarie voor Archeologie, Rijksuniversiteit Gent, 63-67.

Hessing, W. and Kooi, P. 2005. Urnenvelden en brandheuvels. Begraving en grafritueel in late bronstijd en ijzertijd, in: Louwe Kooijmans, L.P., Van Den Broeke, P.W., Fokkens, H. and Van Gijn, A. (eds.). *Nederland in de prehistorie*. Amsterdam: Bert Bakker, 631-654.

Heyse, I. 1984. Geomorfologische opbouw van het site. *Stadsarcheologie* 8/1, 29-36.

Hillewaert, B. and Hoorne, J. 2006. Een tweede en derde bronstijdgrafheuvel te Brugge-Sint-Andries - Expressweg (prov. West-Vlaanderen). *Lunula, Archaeologia protohistorica* 14, 105-110.

Hollevoet, Y. 2002. d'Hooghe Noene van midden Bronstijd tot volle Middeleeuwen. Archeologisch onderzoek in een verkaveling langs de Zandstraat te Varsenare (gem. Jabbeke, prov. West-Vlaanderen). *Archeologie in Vlaanderen* 6/1997/1998, 161-189.

Holst, M. K., Breuning-Madsen, H. and Rasmussen, M. 2001. The South Scandinavian barrows with well-preserved oak-log coffins. *Antiquity* 75/287, 126-136.

Hoorne, J., Bartholomieux, B., Clement, C., De Doncker, G., Messiaen, L. and Verbrugge, A. 2008. *Sint-Denijs-Westrem - Flanders Expo Zone 2 & 3: Archeologische wegkofferbegeleiding van 13 mei tot 7 juli 2008 (stad Gent, provincie Oost-Vlaanderen)*. Gent.

Hoorne, J., Bartholomieux, B. and De Doncker, G. 2009. Grafcirkel uit de bronstijd en nederzettingssporen uit de ijzertijd tijdens het wegkofferonderzoek te Sint-Denijs-Westrem - Flanders-Expo - Zone 3 (Gent, provincie Oost-Vlaanderen, België). *Lunula, Archaeologia protohistorica* 17, 97-99.

Johansen, K. L., Laursen, S. T. and Holst, M. K. 2004. Spatial patterns of social organization in the Early Bronze Age of South Scandinavia. *Journal of Anthropological Archaeology* 23/1, 33-55.

Laloo, P. and Blanchaert, H. 2010. *Gent - Hogeweg. Archeologisch proefsleuvenonderzoek 19/05 - 08/06/2010.* Gent: Ghent Archaeological Team bvba.

Langohr, R. and Pieters, M. 1989. Annexe I: Paysage pédologique des sites archéologiques d'Ursel - Étude de la carte des sols de Belgique, in: Bourgeois, J., Semey, J. and Vanmoerkerke, J. (eds.). *Ursel. Rapport provisoire des fouilles 1986-1987. Tombelle de l'âge du bronze et monuments avec nécropole de l'âge du fer.* Gent: Seminarie voor Archeologie, Rijksuniversiteit Gent, 49-62.

Last, J. 2007 (ed.). *Beyond the Grave: New Perspectives on Barrows.* Oxford: Oxbow books.

Lohof, E. 1991. *Grafritueel en sociale verandering in de bronstijd van Noordoost-Nederland*. PhD thesis, Universiteit van Amsterdam.

Meex, F. 1976. *Grafheuvels en urnenvelden in de Kempen*. Brussel: Nationale Dienst voor Opgravingen.

Meganck, M. and Fockedey, L. 1995. Het bronstijdgrafveld "Drie Koningen" te Oedelem (W.-Vl.). *Lunula, Archaeologia protohistorica* 3, 50-52.

Meganck, M., Bourgeois, I. and Cherretté, B. 2001. Noodonderzoek 2000 te Sint-Gillis-Waas/Kluizemolen (O.-Vl.). *Lunula, Archaeologia protohistorica* 9, 28-31.

Meganck, M., Bourgeois, J. and Lodewijckx, M. 2004. *Luchtprospectie, een must voor de archeologie. Ontdekking van duizenden archeologische relicten, CAI-I De opbouw van een archeologisch beleidsinstrument.* Brussel: Centrale Archeologische Inventaris, 69-74.

Messiaen, L. 2011. *Stekene-Kerkstraat. Rapportage archeologische prospectie. 17 & 18/03/2011*. Gent: Ghent Archaeological Team bvba.

Messiaen, L., Teetaert, D. and Van Eenoo, M. 2011. *Stekene-Kerkstraat. Rapportage archeologische opgraving. 15/06 - 30/06/2011.* Gent: Ghent Archaeological Team bvba.

Messiaen, L., Teetaert, D. and Van Eenoo, M. 2012. Een grafheuvel en nederzettingssporen te Stekene-Kerkstraat (prov. Oost-Vlaanderen, België). *Lunula, Archaeologia protohistorica* 20, 17-21.

Perkins, D. 2010. The Distribution Patterns of Bronze Age Round Barrows in North-East Kent. *Archaeologia Cantiana* 130, 277-314.

Raveschot, P., Semey, J. and Vanmoerkerke, J. 1984. Circulaire structuren aan de Hogeweg. *Stadsarcheologie* 8/1, 2-36.

Reimer, P.J., Baillie, M.G.L., Bard, E., Bayliss, A., Beck, J.W., Blackwell, P.G., Bronk Ramsey, C., Buck, C.E., Burr, G.S., Edwards, R.L., Friedrich, M., Grootes, P.M., Guilderson, T.P., Hajdas, I., Heaton, T.J., Hogg, A.G., Hughen, K.A., Kaiser, K.F., Kromer, B., Mccormac, F.G., Manning, S.W., Reimer, R.W., Richards, D.A., Southon, J.R., Talamo, S., Turney, C.S.M., Van Der Plicht, J. and Weyhenmeyer, C. E. 2009. IntCal09 and Marine09 radiocarbon age calibration curves, 0–50,000 years cal BP. *Radiocarbon* 51/4, 1111-1150.

Roymans, N. 1995. The cultural biography of urnfields and the long-term history of a mythical landscape. *Archaeological Dialogues* 2/1, 2-38.

Semey, J. and Vanmoerkerke, J. 1982. Evergem-Ralingen (O.-Vl.). *Archeologie* 1982/2, 82-83.

Semey, J. and Vanmoerkerke, J. 1983. Opgraving van een circulaire structuur uit de Metaaltijden te Evergem-Ralingen. Voorlopig verslag. *VOBOV-Info* 11, 26-30.

Semey, J. and Vanmoerkerke, J. 1984. Evergem-Ralingen (O.-Vl.). *Archeologie* 1984/1, 14-15.

Semey, J. and Vanmoerkerke, J. 1985. Evergem-Molenhoek (O.Vl.): circulaire structuur uit de metaaltijden. *Archeologie* 1985/1, 19-20.

Semey, J. and Vanmoerkerke, J. 1986. Lovendegem (O.-Vl.): Brouwerijstraat. *Archeologie* 1986/2, 88-89.

Sergant, J., De Mulder, G. and Van De Vijver, M. 2010. Sporen uit de metaaltijden te Oostkamp Nieuwenhove, Hertsberge Papenvijvers 3 & Hertsberge Papenvijvers 4 (gemeente Oostkamp, provincie West-Vlaanderen, België). *Lunula, Archaeologia protohistorica* 18, 23-29.

Theunissen, L. 1999. *Midden-bronstijdsamenlevingen in het zuiden van de Lage Landen. Een evaluatie van het begrip 'Hilversum-cultuur'*. PhD thesis, Leiden University.

Toron, S. 2006. De la Picardie aux Flandres belges: une approche comparative des enclos circulaires de l'âge du bronze ancien et moyen. *Lunula, Archaeologia protohistorica* 14, 71-76.

Van Assche, M., Fourny, M. and Fechner, K. 2010. Nouvelles traces protohistoriques au Bois de la Houssière : enclos circulaire double et céramique de l'âge du Fer à Virginal-Samme "Mon Plaisir" (Ittre, province du Brabant Wallon, Belgique). *Lunula, Archaeologia protohistorica* 18, 57-62.

Van De Vijver, M. 2008. Een kritische analyse van brons- en ijzertijdoccupatie in het noordelijk deel van het Waasland. *Terra Incognita, Annual Review of Archaeological Master Research in Flanders (Belgium)* 2, 125-134.

Van De Vijver, M., Wuyts, F. and Cherretté, B. 2009. Bronstijd- en ijzertijdsporen te Erembodegem: cirkels, rechthoeken en kuilen (Aalst, provincie Oost-Vlaanderen, België). *Lunula, Archaeologia protohistorica* 17, 15-22.

Van De Vijver, M., Reniere, S., Keppens, K. and Vandendriessche, H. 2010. *Archeologisch vooronderzoek te Aalter-Woestijne (prov. Oost-Vlaanderen)*. Brussel: VIOE.

Van Hove, R., De Meester, P., Van Roeyen, J.-P. and Staes, M. 1990. Sint-Gillis-Reepstraat, in: Van Hove, R., De Meester, P., Van Roeyen, J.-P. and Staes, M. (eds.). *Jaarverslag Archeologische Dienst Waasland 1989*. Sint-Niklaas: Archeologische Dienst Waasland, 12-13.

Van Hove, R. and Van Roeyen, J.-P. 1991. Sint-Gillis - Ambachtelijke zone Kluizenmolen, in: Van Hove, R., Van Roeyen, J.-P. and De Meester, P. (eds.). *Jaarverslag Archeologische Dienst Waasland 1990*. Sint-Niklaas: Archeologische Dienst Waasland, 16-29.

Van Hove, R. and Van Roeyen, J.-P. 1993. *Sint-Niklaas - Europark-Zuid, in: Van Hove, R. & Van Roeyen, J.-P. (eds.) Jaarverslag Archeologische Dienst Waasland 1992.* Sint-Niklaas: Archeologische Dienst Waasland, 33-34.

Van Impe, L. 1976. *Ringwalheuvels in de Kempense Bronstijd. Typologie en datering*. Brussel: Nationale Dienst voor Opgravingen.

Van Impe, L. and Beex, G. 1977. *Grafheuvels uit de vroege en midden-bronstijd te Weelde*. Brussel: Nationale Dienst voor Opgravingen.

Van Neste, T. 2012. Funeraire sporen uit de brons- en ijzertijd te Stekene–Dorpsstraat (O.-Vl.). *Lunula, Archaeologia protohistorica* 20, 103-109.

Van Roeyen, J.-P. and Van Hove, R. 1992a. Archeologisch noodonderzoek aan de verkeerswisselaar te Kemzeke. d'Euzie. *Tijdschrift van de Heemkundige Kring voor Groot-Stekene* 11/1-2, 164-169.

Van Roeyen, J.-P. and Van Hove, R. 1992b. Kemzeke-Verkeerswisselaar, in: Van Roeyen, J.-P. and Van Hove, R. (eds.). *Jaarverslag Archeologische Dienst Waasland 1991*. Sint-Niklaas: Archeologische Dienst Waasland, 23-39.

Van Roeyen, J.-P. 1998. Sint-Gillis-Houtvoortstraat, in: Van Roeyen, J.-P., Van Hove, R. and Peters, M. (eds.). *Jaarverslag Archeologische Dienst Waasland 1997*. Sint-Niklaas: Archeologische Dienst Waasland, 22-29.

Van Roeyen, J.-P. 1999. Sint-Gillis-Houtvoort, in: Van Hove, R., Baetens, I. and Van Roeyen, J.-P. (eds.). *Jaarverslag Archeologische Dienst Waasland 1998.* Sint-Niklaas: Archeologische Dienst Waasland, 14-23.

Van Roeyen, J.-P. 2002. Sint-Gillis-Kluizenmolen, in: Van Hove, R., Baetens, I., Van Roeyen, J.-P., De Wilde, G., Meersschaert, L. and Klinck, B. (eds.). *Jaarverslag Archeologische Dienst Waasland 1999-2000, deel 2.* Sint-Niklaas: Archeologische Dienst Waasland, 54-55.

Van Strydonck, M. 1983. Bijlage I. Radiokoolstofdatering. *VOBOV-Info* 11, 31.

Van Strydonck, M. 1989. Annexe III: Datations radiométriques du site d'Ursel (arr. de Gent, prov. de Flandre Orientale). Tombelle de l'âge du bronze et nécropole de l'âge du fer, in: Bourgeois, J., Semey, J. and Vanmoerkerke, J. (eds.). *Ursel. Rapport provisoire des fouilles 1986-1987. Tombelle de l'âge du bronze et monuments avec nécropole de l'âge du fer.* Gent: Seminarie voor Archeologie, Rijksuniversiteit Gent, 69-76.

Van Vaerenbergh, J. 2005a. Een dubbele grafcirkel en Gallo-Romeinse resten te Kruibeke-Hogen Akkerhoek, in: Van Hove, R. (ed.). *Jaarverslag resultaatverbintenis 2004 tussen de projectvereniging Archeologische Dienst Waasland en de Afdeling Monumenten en Landschappen*. Sint-Niklaas: Archeologische Dienst Waasland, 44-48.

Van Vaerenbergh, J. 2005b. Een dubbele grafcirkel te Kruibeke-Hogen Akkerhoek (O.-Vl.). Een eerste stand van zaken. *Lunula, Archaeologia protohistorica* 13, 11-13.

Van Vaerenbergh, J. and Van Roeyen, J.-P. 2007. Recent archeologisch onderzoek in het Waasland (2004-2006). *Annalen van de Koninklijke Oudheidkundige Kring van het Land van Waas* 110, 381-454.

Van Vaerenbergh, J. 2011. Archeologisch onderzoek bij de samenvloeiing van de Beverse en de Vrasenebeek. *Het Land Van Beveren* 54/1, 14-22.

Vandecatsye, S. and Laisnez, K. 2009. *Een toekomstige industriezone met een Keltisch-Romeins verleden. Basisrapportage omtrent het archeologisch onderzoek van Hoogveld-J te Sint-Gillis-Dendermonde.* Mechelen: Archaeological Solutions bvba.

Vandecatsye, S. 2010. Het Keltisch-Romeinse verleden van een toekomstige industriezone, in: Verlaeckt, K., Vandecatsye, S., Van Durme, L., Van Doorselaer, A., Willems, F. and Stroobants, A. (eds.). *Dendermonde van Metaaltijden tot Vroege Middeleeuwen*. Dendermonde: Stedelijke Musea Oudheidkundige Kring Dendermonde, 33-40.

Vanmoerkerke, J. and Semey, J. 1983. Circulaire structuur uit de Metaaltijden te Moortsele - Uilhoek. *VOBOV-Info* 11, 33-35.

Vanmoerkerke, J. 1985. Vierkante grafstructuur uit de ijzertijd aan de Hogeweg. *Stadsarcheologie* 9/2, 42-49.

Vanmoerkerke, J. 1988. Gent. De opgravingen aan de Hogeweg, in: S.N. (ed.). *Speuren, spitten, sparen. Oost-Vlaanderen archeologisch doorgelicht.* Gent, 47-53.

Verbruggen, C. 1983. Bijlage II. Pollenanalyse. *VOBOV-Info* 11, 32.

Verbruggen, F. 2012. *Waarderend onderzoek pollen en botanische macroresten Stekene, Kerkstraat*. Amersfoort: ADC ArcheoProjecten.

Verdonck, L., Simpson, D., Cornelis, W. M., Plyson, A., Bourgeois, J., Docter, R. and Van Meirvenne, M. 2009. Ground-penetrating Radar Survey over Bronze Age Circular Monuments on a Sandy Soil, Complemented with Electromagnetic Induction and Fluxgate Gradiometer Data. *Archaeological Prospection* 16/3, 193-202.

Verlot, M. 1984. De Romeinse bewoning. *VOBOV-Info* 15, 10-13.

Vermeulen, F. and Bourgeois, J. 2000. Continuity of prehistoric burial sites in the Roman landscape of Sandy Flanders, in: Pearce, J., Millet, M. and Struck, M. (eds.). *Burial, Society and Context in the Roman World.* Oxford: Oxbow Books, 143-161.

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Site	ID	Ty. Dm	AP PE	^{14}C dates: Lab ID: date ^{14}C yr BP	Cal. date 2σ (BC)	Material Context	• Comments • (Bibliography)
Aalter "Woestijne"	I	S 17	Y -	^{14}C dates not yet available.			• Excavations ongoing. Additional barrows and Middle Bronze Age settlement features have been discovered (pers. comm. M. Van De Vijver). • Van De Vijver *et al.* 2010.
	II	S 17	N -				
Beveren "Nerenhoek"	I	D 14	N N	No ^{14}C dates available.			• Diameter inner ditch: 9.5 m. Possible post circle in-between the inner and outer ditch (only partly preserved). • Van Vaerenbergh 2011; Van Vaerenbergh and Van Roeyen 2007.
Deinze "RWZI"	I	S 34	Y N	KIA-11210: 4550±35	3370-3100	CC BLD	• Very large ditch (average width: 3.2 m; average depth: 2 m beneath present-day surface). One of the earliest barrows in north-western Belgium. Probably Late Neolithic monument (cf. 14C). • De Clercq 2000a; 2000c; De Clercq and Van Strydonck 2002.
				UtC-9929: 3740±50	2300-1970		
				UtC-9930: 3730±40	2280-2020		
				UtC-9685: 3540±50	2030-1740	CC ULD	
				UtC-9684: 3400±40	1880-1530	CC ULD	
Destelbergen "Eenbeekeinde"	I	S 11	N N	Central grave ^{14}C-dated in Early Iron Age (cf. Chapter 6).			• Central monument within a Late Bronze Age/Early Iron Age urnfield cemetery. Most likely an Early Iron Age monument. • Bourgeois, J. *et al.* 1985; 1986; 1999, 45-46; De Laet *et al.* 1965; De Mulder 1994; 2010; De Mulder *et al.* 2009; De Reu *et al.* 2012.
Dendermonde "Hoogveld-J" (Figure 13)	I	S 14	N -	^{14}C dates not yet available. Only preliminary results published.			• Double row of 3 and 8 posts at the inner side of the ditch. Barrow is enclosed by a rectangular Iron Age monument (cf. Ursel "Rozestraat"). • Vandecatsye 2010; Vandecatsye and Laisnez 2009.

Table 1. Overview of the excavated Bronze Age barrows in north-western Belgium.
Abbreviations: Ty: barrow typology; S: single ditched barrow; D: double ditched barrow; M: multiple ditched barrow; PC: post circle; Dm: diameter; AP: barrow detected on aerial photographs; PE: palaeoecological research; CC: charcoal; B: bottom, U: upper, LD: layer ditch; PH: posthole; ICI: insufficient contextual information.

Site	ID	Ty. Dm	AP PE	^{14}C dates Lab ID: date ^{14}C yr BP	Cal. date 2σ (BC)	Material Context	• Comments • (Bibliography)
Erembodegem "Zuid IV"	I	S 15	N N	No ^{14}C dates available.			• Van De Vijver *et al.* 2009.
	II	S -					
Evergem "Molenhoek"	I	D 18	Y N	No ^{14}C dates available.			• Asymmetrical infilling of the ditch indicates the existence of a former mound. Diameter inner ditch: 12 m. • Bourgeois, J. *et al.* 1999, 51-53; Semey and Vanmoerkerke 1985.
Evergem "Ralingen"	I	D 26.5	Y Y	IRPA-526: 3480±60	1950-1630	CC BL(inner)D	• (I): Diameter inner ditch: 11.5 m. • Bourgeois, I. 1994; 1995; Bourgeois, J. *et al.* 1999, 51-53; Semey and Vanmoerkerke 1982; 1983; 1984; Van Strydonck 1983; Verbruggen, C. 1983.
	II	S 22	N N	No ^{14}C dates available.			
Ghent "Hogeweg" (Figure 1, B)	I	M -	Y Y	IRPA-774: 3030±90	1460-1010	CC ICI	• (I-II): Discovered by aerial photography, limited archaeological research was performed in 1983. (III): Discovered during trail trenching in 2010. Open area excavation of the whole site in 2011. Several new monuments are discovered (cf. Dyselinck 2012). Site awaits further publication, only preliminary results presented here. • Bourgeois, I. 1994; 1995; Bourgeois, J. *et al.* 1999, 54-59; Cuypers *et al.* 1984; 1985a; 1985b; Dyselinck 2012; Heyse 1984; Laloo and Blanchaert 2010; Raveschot *et al.* 1984; Vanmoerkerke 1985; 1988.
	II	D -	Y N	^{14}C dates not yet available. Only preliminary results published.			
	III	S -	N N				
Hertsberge "Papenvijvers 4"	I	S 24.5	Y N	No ^{14}C dates available.			• Sergant *et al.* 2010.

Site	ID	Ty. Dm	AP PE	^{14}C dates Lab ID: date ^{14}C yr BP	Cal. date 2σ (BC)	Material Context	• Comments • (Bibliography)
Kemzeke "Verkeerswisselaar"	I	D 30	N Y	No ^{14}C dates available.			• (I): The ditches consist of several segments separated by small sandy banks measuring a few centimetres in width. Diameter inner ditch: 16 m. • Bourgeois, I. 1994, 27-37; 1995; Bourgeois, J. *et al.* 1993; 1999, 65-67; Van Roeyen and Van Hove 1992a; 1992b.
	II	S 20	N Y	No ^{14}C dates available.			
Knesselare "Flabbaert"	I	S 12,5	Y Y	IRPA-1091: 5420±60	4370-4050	CC ULD	• Ampe *et al.* 1995, 95-99; Bourgeois, I. 1994; 1995; Bourgeois, J. *et al.* 1993.
				UtC-2750: 4340±120	3350-2650	CC BLD	
Kortemark "Koutermolenstraat"	I	D 30.5	Y N	IRPA-1033: 3030±40	1410- 1130	CC ULD	• (I): Uncertain inner ditch. Diameter of the inner ditch: undefined. • Bourgeois, I. 1994; 1995; Bourgeois, J. and Meganck 1993; Bourgeois, J. *et al.* 1993; 1998, 48-49.
				UtC-2733: 3030±90	1460-1010		
	II	S 29.5	Y Y	UtC-3187: 2680±60	980-760		
				UtC-2739: 2610±100	1000-400		
Kruibeke "Bazelstraat"	I	S 34	N N	No ^{14}C dates available.			• Site awaits further publication, only preliminary results presented here. • Bruggeman and Reyns 2011.
Kruibeke "Hogen Akkerhoek"	I	D 27	N N	No ^{14}C dates available.			• Diameter inner ditch: 10 m. • Van Vaerenbergh 2005a; 2005b; Van Vaerenbergh and Van Roeyen 2007.
Kruishoutem "Moerasstraat"	I	S 8,5	N N	No ^{14}C dates available. Chronology uncertain (Bronze Age/Iron Age?)			• Small gap in ditch. Iron Age pottery in secondary position in infilling ditch. ^{14}C-dated Middle Bronze Age flat grave nearby (KIA-38496: 3250 ± 40 BP). • Deschieter and De Wandel 2010.
Lovendegem "Brouwerijstraat"	I	S 30	Y N	No ^{14}C dates available.			• Bourgeois, J. *et al.* 1998; Semey and Vanmoerkerke 1986.
	II	S 10	N N				
Lovendegem "Vellare"	I	S 32	Y N	No ^{14}C dates available.			• Bourgeois, J. *et al.* 1999, 76-78.

Site	ID	Ty. Dm	AP PE	^{14}C dates: Lab ID: date ^{14}C yr BP	Cal. date 2σ (BC)	Material Context	• Comments • (Bibliography)
Maldegem "Burkel"	I	S 17	Y N	UtC-9036: 3280±45	1680-1450	CC BLD	• Monument located next to a Middle Bronze Age settlement (Crombé 1993; Crombé and Bourgeois 1993). • Crombé *et al.* 2005.
Maldegem "Vliegplein" (Figure 3)	I	D 45.5	Y Y	UtC-3033: 3300±70	1740-1430	CC BLD	• (I): Diameter inner ditch: 30.5 m. (III): Diameter inner ditch: 10.5 m. • Ampe *et al.* 1995, 85-94; Bourgeois, I. 1994; 1995; Bourgeois, J. *et al.* 1993; 1994.
	II	A 18	N N	UtC-3032: 2970±60	1390-1010	CC ULD	
	III	D 29.5	Y Y	No ^{14}C dates available.			
Merelbeke "Axxes"	I	S 18	N N	IRPA-1272: 3265±35	1630-1450	CC (twig) BLD	• Hilversum pottery within ditch. Pedological indications for permanent water in ditch. • De Clercq 1999; 2000b; De Clercq *et al.* 2004.
				UtC-9424: 3230±50	1620-1410	CC BLD	
				IRPA-1275: 3270±30	1630-1450		
Moortsele "Uilhoek"	II	D 42	Y N	No ^{14}C dates available.			• Very large outer ditch (max. width: 4.3 m; max. depth: 1.4 m). Diameter inner ditch: 20 m. • Bourgeois, J. *et al.* 1999, 85-86; Vanmoerkerke and Semey 1983.
Oedelem "Drie Koningen"	I	S 23	Y N	UtC-3302: 2940±80	1390-930	CC ULD	• (II): Large monument, with large ditch (average width: 4 m; average depth: 2.25 m). (III): Diameter inner ditch: 24.5 m. • Ampe *et al.* 1995, 111-113; Meganck and Fockedey 1995.
	II	S 50	Y N	No ^{14}C dates available.			
	III	D 39.5	Y N	No ^{14}C dates available.			

Site	ID	Ty. Dm	AP PE	^{14}C dates: Lab ID: date ^{14}C yr BP	Cal. date 2σ (BC)	Material Context	• Comments • (Bibliography)
Oedelem "Wulfsberge" (Figure 5; Figure 6)	I	S 20	Y N	KIA-14817: 3310±50	1740-1450	CC Grave	• (I): Indications for the presence of a mound. Grave: not a central grave (secondary burial?). Evidence of reuse, the ditch was re-dug after a certain time. (II): Hilversum pottery in the ditch. (III): 23 posts, in between distance: 1 - 1.25 m (IV): Diameter of the inner ditch: 11 m. Intentional gap (about 1 m) in both ditches. Probably two phases: inner ditch filled up when second ditch was dug. (V): Double post circle: inner circle 30 posts, 6.5 m diameter; outer circle 38 posts, 8 m diameter. In between, and younger than, monuments II and IV. ^{14}C date KIA-21494 can probably be related to Roman activities on the site. An evaluation of the ^{14}C dates allows to formulate a hypothesis concerning the internal chronology and development of the barrow cemetery. The ^{14}C evidence suggests two phases of use. Barrow I and III were built during the seventeenth and sixteenth centuries BC. Barrow IV is a bit younger, while barrow II and probably also post circle V were built in the fifteenth century BC. Several Late Iron Age ritual features (rectangular enclosures and pits) in association with the barrows form clear evidence of later reuse of the barrow cemetery. • Bourgeois, J. and Cherretté 2004; Bourgeois, J. *et al.* 2001; Cherretté and Bourgeois 2002; 2003; 2005a; 2005b; Cherretté *et al.* 2001.
				KIA-14816: 3270±40	1640-1440	CC BLD	
				KIA-21210: 3385±25	1750-1620		
				KIA-21212: 3325±30	1690-1520		
	II	S 28	Y N	KIA-14819: 3180±35	1520-1400		
	III	PC 12.5	N N	KIA-14840: 3310±35	1690-1500	CC PH	
				KIA-14841: 3230±35	1610-1420		
	IV	D 17	Y N	KIA-21217: 3320±30	1690-1520	CC BL(outer)D	
				KIA-21218: 3215±35	1610-1410		
				KIA-21222: 3295±25	1630-1500		
				KIA-21223: 3310±30	1680-1510		
	V	PC 8	N N	KIA-21492: 3015±25	1390-1130	CC PH	
				KIA-21494: 1810±25	120-320AD		
				KIA-21496: 4575±35	3500-3100		
				KIA-21497: 3240±25	1610-1430		
Oostwinkel "Veldhoek"	I	D 27.5	Y Y	UtC-3310: 3270±70	1740-1410	CC ULD	• Diameter inner ditch: 14.5 m. • Ampe et al. 1995, 115-117; Bourgeois, I. 1994; 1995.
				UtC-3311: 2950±80	1400-930	CC ULD	

Site	ID	Ty. Dm	AP PE	^{14}C dates: Lab ID: date ^{14}C yr BP	Cal. date 2σ (BC)	Material Context	• Comments • (Bibliography)
Rumbeke "Mandelstaat"	I	S 15.5	N N	No ^{14}C dates available.			• (I): Intentional gap (about 1 m) in the ditch. (II): Chronology uncertain. The ditch was filled up almost immediately after digging. (III): Chronology uncertain. Oval monument (length: 9.5 m, width: 7 m width. (IV): Asymmetrical infilling of the ditch indicates the existence of a former mound. • Demeyere and Lammens 2007.
	II	S 6.5					
	III	S 8					
	IV	S 26.5					
Sint-Andries "Refuge" (Figure 9)	I	M 25	N N	KIA-14317: 3190±30	1515-1410	CC DICI	• (I): Diameter ditches: 25, 13.5, 7 and 2.5 m. The most inner ditch has been interpreted by the excavators as a bedding trench of a post circle. Two chronological phases can be recognised. Phase 1: construction of the two inner features resulting in a single ditched monument with an inner post circle. Both features are characterised by a small, intentional, south orientated gap. Phase 2: the two outer ditches were dug and an inner mound consisting of sods of peat was built. The inner ditch was filled up and the post circle was probably removed, resulting in a double ditched monument which covered up the older monument. The 14C dates KIA-15226 et KIA-16727 are rejected by the excavators.
				KIA-15226: 6960±40	5980-5740		
				KIA-16727: 2565±30	810-550		
				KIA-16749: 3510±30	1920-1740		
				KIA-17408: 3200±25	1515-1420	CC Grave? within ditch	
	II	S 23	N N	IRPA-1365: 3070±85	1510-1050	Wood (Alnus) DICI	• Cordemans and Hillewaert 2001; Hillewaert and Hoorne 2006.
	III	S 35	N N	No ^{14}C dates available.			
Sint-Denijs-Westrem "Flanders-Expo"	I	S 17	N N	No ^{14}C dates available.			• Only shallow and partly preserved due to erosion. • Hoorne et al. 2008; 2009.

Site	ID	Ty. Dm	AP PE	^{14}C dates Lab ID: date ^{14}C yr BP	Cal. date 2σ (BC)	Material Context	• Comments • (Bibliography)
Sint-Gillis-Waas "Houtvoort"	I	S 24	N N	No ^{14}C dates available.			• Van Roeyen 1998; 1999.
	II	S 35	Y N				
	III	S 21	N N				
Sint-Gillis-Waas "Kluizemolen"	I	S 20	N Y	IRPA-1069: 3770±75	2460-1970	CC ULD	• (I): Several postholes at the inner side of the ditch with regular in between distances (possible post circle). Hilversum pottery in secondary position within the infilling of the ditch. • Bourgeois, I. 1994; 1995; Bourgeois, J. et al. 1999, 103-106; Meganck et al. 2001; Van Hove et al. 1990; Van Hove and Van Roeyen 1991; Van Roeyen 2002.
				IRPA-1070: 3350±50	1750-1510		
				IRPA-1072: 3265±55	1690-1430		
	II	S 33.5	N Y	KIA-17627: 3095±30	1440-1290	CC BLD	
Sint-Niklaas "Europark-Zuid"	I	S 21	N Y	No ^{14}C dates available.			• Asymmetrical infilling of the ditch indicates the existence of a former mound. • Bourgeois, I. 1994; 1995; Bourgeois, J. et al. 1993; 1999, 107-108; Van Hove and Van Roeyen 1993.
Stekene "Bormte"	I	D 30	N -	^{14}C dates not yet available. Only preliminary results published here.			• Diameter inner ditch: 20 m. • Van Neste 2012.
Stekene "Kerkstraat"	I	D 18.5	N Y	No ^{14}C dates available. Only preliminary results published here.			• Diameter inner ditch: 8 m. • Messiaen 2011; Messiaen et al. 2011; 2012; Verbruggen, F. 2012.
Ursel "Rozestraat" (Figure 11, Figure 12)	I	D 17	Y Y	IRPA-818: 3620±60	2200-1770	CC BLD	• Diameter inner ditch: 7.5 m. Barrow is enclosed by a rectangular Iron Age monument. 14C dates IRPA-819A and IRPA-819B related to the 2nd phase (redigging) of the outer ditch during the Early Iron Age. Hilversum pottery in secondary position within the infilling of the outer ditch. • Ampe et al. 1995, 119-124; Bourgeois, I. 1994; 1995; Bourgeois, J. 1998; Bourgeois, J. and Rommelaere 1992; Bourgeois, J. et al. 1988; 1989; Heim 1989; Langohr and Pieters 1989; Van Strydonck 1989.
				IRPA-819A: 2500±60	790-410	CC 2nd phase ditch	
				IRPA-819B: 2490±55	800-410		

Site	ID	Ty. Dm	AP PE	^{14}C dates Lab ID: date ^{14}C yr BP	Cal. date 2σ (BC)	Material Context	• Comments • (Bibliography)
Varsenare "d'Hooghe Noene"	I	S 25	N N	KIA-16723: 3330±35 KIA-16726: 3255±30	1730-1510 1620-1450	CC Grave	• Cremation grave: not a central grave (secondary burial?). • Hollevoet 2002.
Velzeke "Provinciebaan"	I	S 8.5	N N	Monument within an urnfield cemetery that is ^{14}C-dated in the Late Bronze Age and Early Iron Age.			• Monument within a Late Bronze Age/Early Iron Age urnfield cemetery. • Bourgeois, J. et al. 1999, 113-114; De Mulder and Rogge 1995; De Mulder et al. 2007.
Vosselare "Kouter"	I	D 18	Y Y	UtC-2019: 3320±70 UtC-1065: 3310±50 UtC-2017: 3260±60	1770-1430 1740-1450 1690-1420	CC UPL	• Small intentional gap in the outer ditch. Diameter inner ditch: 14.5 m. • Bourgeois, I. 1994; 1995; Bourgeois, J. and De Mulder 1992; Bourgeois, J. et al. 1999, 119-123.
Vrasene "Profruco"	I	S 25	N N	No ^{14}C dates available.			• Site awaits further publication. Only preliminary results presented here. • Unpublished.

Site	ID	Ty. Dm	AP PE	^{14}C dates: Lab ID: date ^{14}C yr BP	Cal. date 2σ (BC)	Material Context	• Comments • (Bibliography)
Waardamme "Vijvers" (Figure 4)	I	D 14	N N	KIA-28309: 3140±30	1500-1310	CC BL(outer)D	• (I): Diameter inner ditch: 7 m. (II): Diameter inner ditch: 10 m. Based on pedological observations, two chronological phases can be distinguished. Oldest phase: single ditched barrow (= inner ditch). Second phase: a new, larger ditch was dug. The first ditch was filled in with sods of grass, and covered by the new, larger mound. 14C dates KIA-28310 and KIA-28755 can probably be associated with respectively the presence of Roman graves next to the monument and Neolithic occupation on the site. (III): Diameter inner ditch: 18 m. (IV): Based on pedological observations, the ditch was dug in two phases, a first shallow ditch followed by a deepening in the second phase. (VI): Annex of monuments III and V. 14C date KIA-28283 can probably be associated with the Neolithic occupation on the site. (VII-VIII): Uncertain chronology, however, one of the monuments is sliced by an Early Iron Age outbuilding. • Demeyere and Bourgeois 2005; Demeyere et al. 2006.
				KIA-28753: 3385±25	1750-1620	CC BL(inner)D	
	II	D 18	Y N	KIA-28310: 1910±40	AD-220AD	CC BLD	
				KIA-28755: 3870±30	2470-2210	CC BLD	
	III	D 28.5	Y N	KIA-28311: 3330±40	1740-1510	CC BLD	
	IV	S 12	Y N	KIA-28754: 3060±25	1410-1260	Wood BLD	
	V	S 19.5	N N	KIA-28752: 3495±25	1890-1740	CC BLD	
	VI	A 18.5	N N	KIA-28283: 3910±30	2480-2290		
	VII	S 5	N N	No ^{14}C dates available.			
	VIII	S 3.5	N N	No ^{14}C dates available.			
Wondelgem "Lange Velden"	I	S 10	N N	No ^{14}C dates available.			• Uncertain attribution. Most likely the remains of a Medieval haycock. • De Vos and Pype 2007.
Zele "Kamershoek"	I	S 12	N Y	UtC-9696: 2960±40	1320-1030	CC BLD	• Fragments of a Hilversum/Drakenstein urn. Monument surrounded by Gallo-Roman settlement features. • De Clercq et al. 2005.
				UtC-9697: 3330±40	1740-1510		
				UtC-9698: 3190±40	1540-1390		

Part III
Zooming out:
barrows in a landscape

A HISTORY OF OPEN SPACE

Barrow landscapes and the significance of heaths – the case of the Echoput barrows

By Marieke Doorenbosch

Abstract

Barrows were built in open spaces, the origins of which are often unknown. When and how were the open spaces created and what were they used for prior to the barrow building? The palynological research on two Iron Age barrows near Apeldoorn (the Netherlands) revealed part of the history of a barrow landscape. The mounds were built in heath vegetation that was already present long before the construction of the barrows. This place was carefully chosen by prehistoric man as the location for their burials, and the mounds were probably prominent features in the landscape. The heathland was maintained, which most likely involved grazing and probably burning of heath. This heath management must have taken place already long before the barrows were built. It will be shown that the picture drawn by this research can be applied to barrows in the Netherlands in general. Especially barrow alignments must have been built in long stretched heath areas, forming small corridor-like heaths as early as the 3rd millennium BC. These ancestral passage heathlands seem to have formed a stable element in the landscape, being maintained for many centuries. Management of such vast heathlands is an intensive job that was a structural and long-lived part of the way prehistoric man dealt with the landscape. The barrow landscapes must have formed part of the economic zone of prehistoric communities. This article will show that pollen analyses of barrows can reveal important information about the barrow landscape and about the role barrows played in the everyday life of prehistoric man.

Keywords: *Pollen analysis, barrow landscape, heath, heath management*

Introduction

Analysis of ancient pollen can be a useful method for reconstructing pre- and protohistorical vegetation. Even if the surroundings of prehistoric monuments are not excavated, pollen samples can hold information on their wider environment – on the trees and herbs that grew there, and on the way in which people interfered with and used this environment. This contribution will demonstrate how it is possible to reconstruct the environment of prehistoric barrows by taking

Fig. 1. Location of Apeldoorn-Echoput in the Netherlands.

palynological samples from them. In addition to this, analyzing samples of soils underneath mounds makes it possible not only to reconstruct what the vegetation looked like when the barrow was built, but also to get an idea of the environmental history *before* the mound was built. This contribution will use the research done on two Iron Age "twin barrows" from the Echoput in Apeldoorn, the Netherlands as an example (Fig. 1; Doorenbosch 2011). One outcome of that research, the conclusion that these barrows were situated on a heath, will be discussed further, as it now seems that barrows in this part of Europe were preferably situated on man-made and managed heaths.

Some remarks on pollen research

Pollen research has a long history in prehistoric archaeology, especially in the Netherlands. It already was used to reconstruct the environment around prehistoric barrows before World War II by van Giffen and further developed by Waterbolk (1954) later on. The research of the latter, and that of van Zeist (1967), Groenman-van Waateringe and Casparie (Casparie and Groenman-van Waateringe 1980) refined research techniques and created a large database of pollen samples from Dutch barrows.

Since then, the environmental analysis of barrows has been carried out according to the routines set out by the four scientists mentioned and have yielded interesting results. Research by Casparie and Groenman-van Waateringe (1980) and Groenman-van Waateringe (2005), for example, demonstrated that barrows were built in open spaces covered with heath vegetation. Given the large number of analyses done in the past, the general feeling in the last decade has been that there was sufficient knowledge on 3rd and 2nd millennium cal BC barrows. However, this has recently been brought into question (Fontijn 2007). Unresolved issues, for example, are: how old were the open spaces in which barrows were built? Were they created for the occasion of the construction of a burial monument or were they much older than that? How large were the open spaces in which barrows were built and how do they relate to the landscape of the living?

The Echoput case study

The above mentioned questions were the starting point for my PhD project focusing on 3rd and 2nd millennium cal BC barrows from the southern and central Netherlands (Doorenbosch *in prep*.). These investigations are for an important part a re-interpretation of the rich database of pollen from Dutch barrows, but also involve new fieldwork. As a matter of fact, this fieldwork was the first done on barrows in the Low Countries in decades. One of the first fieldwork projects focused on a very small but intriguing barrow landscape: the two burial mounds crowning the top of a small, high hill in the municipality of Apeldoorn: the Echoput mounds. In the summer of 2007 these two barrows and their environment at the site Echoput were partially excavated (Fontijn *et al.* 2011). Part of this project was to find out more about the landscape in which the barrows were built: what did the landscape look like at the time? Was there indeed an open spot in the landscape before the mounds were built? What was the size of this open place, and when and with what purpose was this open space created? It is well possible that there already was an open spot long before the barrows were built. If it was already there, it is an intriguing question what the purpose of this open place was. Was it, for example, part of an economic zone of a settlement? In order to answer such questions, the vegetation that was growing in the surroundings of the open space has to be reconstructed. In this article, the research method, sampling strategy and the results will be recapitulated in order to trigger a broader discussion on the relationship between heaths and barrow landscapes in North-West Europe. The results of the Echoput research were recently published (Doorenbosch 2011).

What follows is a summary of those results that are useful for the discussion that follows. For more details, including discussion of samples taken from features other than the barrows, the reader is referred to the site publication mentioned.

Setting

The Echoput hill is one of the highest places in this part of the Veluwe (95 m + Dutch Ordnance Level = *NAP*). The hilltop is a rather small area, flanked on one side by a steep slope. Orographic precipitation creates relatively moist conditions at this high place. The hilltop is crowned by two mounds, indicated as nos 1 and 2 (Fig. 2 and 3). The first has a diameter of 22 m (originally 19 m), the second has a diameter of 14.5 m. These barrows were partially excavated (one quadrant of mound 1 and two quadrants of mound 2; Bourgeois and Fontijn 2011; van der Linde and Fontijn 2011). Both appear to be barrows built out of (well-recognizable) sods and marked by a ring ditch. Posts were placed in one segment of the ditch of mound 2. The central grave of mound 1 was not excavated and that of mound 2 was disturbed by grave robbers. The rectangular pit found in the centre of mound 2 suggests that it originally was an inhumation grave. Mound 1 had a nonstandard form: a flat top. A Late Iron Age cremation grave and remains of what might have been either pyre debris or another grave indicates that the mound was used for funerary practices after it had been constructed. Disturbances in the top of mound 2 make it unclear if this mound had a similar shape and later use. It appears that there are many similarities between mound 1 and 2 and that they were built in the same period, probably in a short time span (Fontijn *et al.* 2011). The similarities are so striking that one might speak of "twin mounds", even though this term properly speaking is incorrect as mound 1 is larger than mound 2. Before the excavation nothing was known on these barrows, which made their dating all the more surprising: the research shows that both must have been constructed in the 4th or 3rd century BC (Bourgeois and Fontijn 2011, 81; 87-88; van der Linde and Fontijn 2011, 62-63). In the Dutch chronology, this is the later part of the Middle Iron Age or the earlier part of the Late Iron Age. For this period, graves tend to be inconspicuous cremation graves without a conspicuous grave monument – the Echoput barrows, as sizeable mounds, are really exceptional in this respect.

As this is of relevance for the assessment of the pollen samples from the mounds, some information on the present environment should be given. The surrounding area is covered with mixed forest (deciduous and coniferous forest). The deciduous forest consists mainly of oak coppice (*Quercus sp.*), with an undergrowth of blueberries (*Vaccinium myrtillus*) and grasses, but also birches (*Betula sp.*) and beeches (*Fagus sylvatica*) are present. The coniferous forest consists mostly of pines (*Pinus sp.*), together with some Douglas-firs (*Pseudotsuga menziesii*) and larches (*Larix sp.*).

Fig. 2. Excavation of the Echoput as seen from the south. The excavation of mound 2 and its environment is in full swing (photograph: A.J. Louwen).

Fig. 3. The excavation of mound 1 as seen from the northeast. The sods with which the mound was built are visible at the surface and in the profiles (photograph: A.J. Louwen).

Research method

Pollen sampling and analysis

Pollen research from barrows rests on the following principles. When pollen is deposited on the surface it gets more or less evenly distributed in the topsoil. Corrosion and outwash make pollen disappear, but under normal circumstances the influx and disappearance of pollen is in balance. As a consequence, pollen in the topsoil represents the local and regional vegetation that was present. When a barrow is built, it seals off the pollen-containing topsoil from the air, preventing new pollen from depositing on the surface and reducing corrosion and outwash of the pollen present underneath the barrow. This pollen represents the vegetation of the local and regional surroundings from a time span right before the barrow construction (van Zeist 1967).

As remarked, both mounds showed strong similarities in construction and soil properties. They were both built on a Moder Podzol (Dutch classification: *holtpodsol*; A horizon underneath barrow). They were constructed of still clearly visible sods, which were taken from a *holtpodsol* identical to the one they were placed on top of. The old surface was recognizable in the soil profile (Fig. 4a, b and 5). For each mound individual samples were collected from different locations in and under the barrows. These were taken from the old surface underneath the barrows on locations where the old surface was clearly visible. Also, several samples from the top (*e.g.* the old surface) of several well recognizable sods of both barrows were taken. This was done to see if the sods were cut from the same environment as the one on which the mound was built (sods could also have been cut somewhere else and brought to this location). Samples were also taken from the bottom of the ditch fill around mound 1 and from the fill of a small pit that was found underneath mound 1 to find possible indications about the origin of the pit. For sampling, about 10 cm^3 of soil was collected by taking a piece of soil out of about 1 cm high, 5 cm wide and 2 cm deep. From these samples a selection was made to analyse, based on the quality (colour and texture) of the soil. Table 1 provides an overview of analysed samples. The location of the analysed samples in the barrows is shown in figure 4a and 4b.

A new approach in the palynological research of barrows was applied in this investigation: a series of samples were taken also from a section of the soil profile underneath the barrows, of which the samples from underneath mound 2 were analysed. About 10 cm^3 of soil was collected every centimetre over a depth of 30 cm, containing the A and most of the B horizon (Fig. 4b and 5). Pollen that is present in this profile is presumed to represent the vegetation *development* in the period preceding the barrow building, which is shown in a pollen diagram. Sediments which consist of an accumulation of material, like peat or lake sediments, with pollen representing the vegetation of a certain period of time in each accumulated layer, is ideal for reconstructing vegetation development. Although such accumulation processes do not take place in mineral soils, pollen in them is still believed to show enough vertical distribution to represent consecutive periods of vegetation compositions (Havinga 1963). The interpretation of mineral

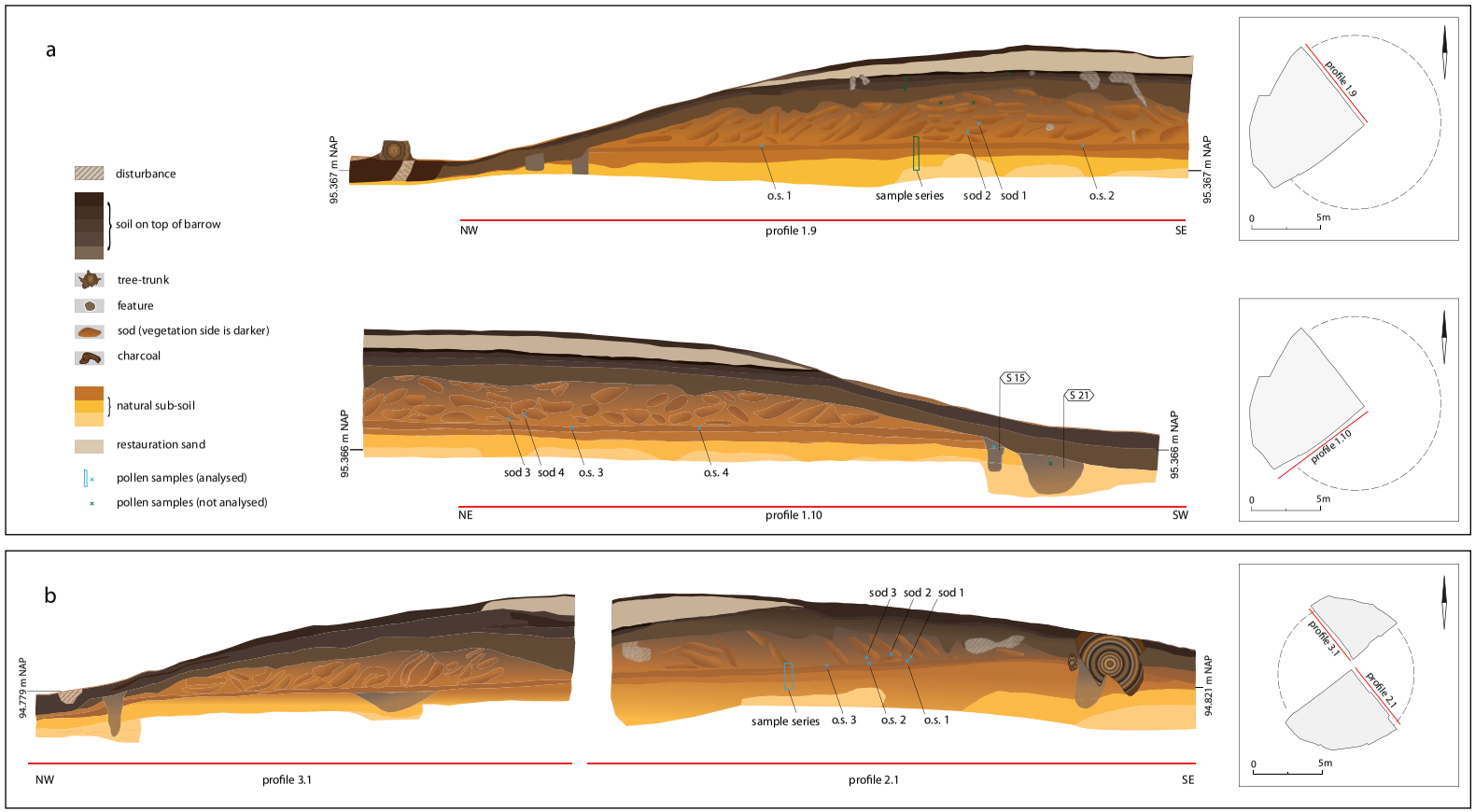


Fig. 4a-b. Profile sections of mound 1 (a) and mound 2 (b) with the location of the pollen samples indicated (figure 4a after van der Linde and Fontijn 2011, figure 2.17 and 2.18 with changes; figure 4b after Bourgeois and Fontijn 2011, figure 3.8 A with changes).

Fig. 5. Profile section through mound 1 (view to the southeast, profile no. 10; after van der Linde and Fontijn 2011, figure 2.4).

Sample location			Sample name
Barrow 1	Profile 1.9	Sod samples	A1.9 sod 1
			A1.9 sod 2
		Old surface samples	A1.9 o.s. 1
			A1.9 o.s. 2
	Profile 1.10	Ditch samples	A1 ditch
		Sod samples	A1.10 sod 3
			A1.10 sod 4
		Old surface samples	A1.10 o.s. 3
			A1.10 o.s. 4
	Level 1.10	S 17	VNR 267
Barrow 2	Profile 2.1	Soil profile series	1-24
	Profile 2.1	Soil profile series	25-29
	Profile 2.1	Sod samples	A2.1 sod 1
			A2.1 sod 2
			A2.1 sod 3
		Old surface samples	A2.1 o.s. 1
			A2.1 o.s. 2
			A2.1 o.s. 3

Table 1. Overview of the analysed samples taken from the barrows. The marked samples contained no or not enough pollen. For the exact location of the analysed samples, see figure 4a and 4b.

soil pollen diagrams will be discussed in the section regarding the pre-barrow landscape.

To extract the pollen, the sediments were treated with potassium hydroxide and heavy liquid (specific gravity 2.0) and finally they were acetolysed. Grains were identified with the aid of the keys of Faegri *et al.*(1989), Moore *et al.* (2001), Punt *et al.* (1976-2009) supplemented by Reille (1992; 1995; 1998), several lists set up by van Geel (published by van Hoeve and Hendrikse 1998) and the reference collection of the Faculty of Archaeology of Leiden University. To calculate pollen spectra a pollen sum of ∑AP–*Betula* (van Zeist 1967) has been applied. A minimum of 300 arboreal pollen grains (excluding *Betula*) per sample have been counted.

Results

In what follows, the results published in more detail in Doorenbosch 2011 are recapitulated. From mound 1 three old surface samples and four sod samples appeared to be suitable for analysis, from mound 2 three samples of the old surface and three sod samples were analysed. For both mounds pollen spectra are shown in figure 6. From the pollen series that was taken, the soil profile underneath mound 2 results could be obtained from sample 1 through sample 25 (Fig. 7).

Pollen from the old surface underneath the mounds and from the sods

Samples from the old surface beneath mound 1 and 2 yielded very similar results and will be discussed together (Fig. 6). Also, no differences were found between pollen in samples from the old surface and pollen in samples from the vegetation part of the sods. For both mounds this implies that sods were taken from an environment with vegetation similar to what was growing at the location where both mounds were built. Lithology features further indicate that the sods are from a soil with the same characteristics as the top of the Echoput hill (Bourgeois and Fontijn 2011, 75; van der Linde and Fontijn 2011, 47). The sods therefore must have been cut in the immediate surroundings of the mounds.

For the old surface (under the mound and in the top of the sods), the percentage of non arboreal pollen (NAP) exceeds the percentage of arboreal pollen (AP) in all samples. Especially heath (*Calluna vulgaris*) pollen shows high percentages, followed by Poaceae. The most abundant tree pollen types are *Alnus* (35-70%), *Quercus* (15-40%) and *Corylus* (15-25%). The presence of *Carpinus* in some of the spectra should be noted. Anthropogenic indicators (following the definition by Behre (1986)) are present in all the samples, with *Plantago lanceolata* and Asteraceae tubuliflorae as the most dominant. Non-pollen palynomorphs were mostly represented by *Sphagnum* and moss features, but also *Debarya glyptosperma* and *Zygnema* type 314 (van Hoeve and Hendrikse 1998) are notable.

Pollen from the soil profile underneath mound 2

The zones described below are based on palynological changes in the diagram (Fig. 7).

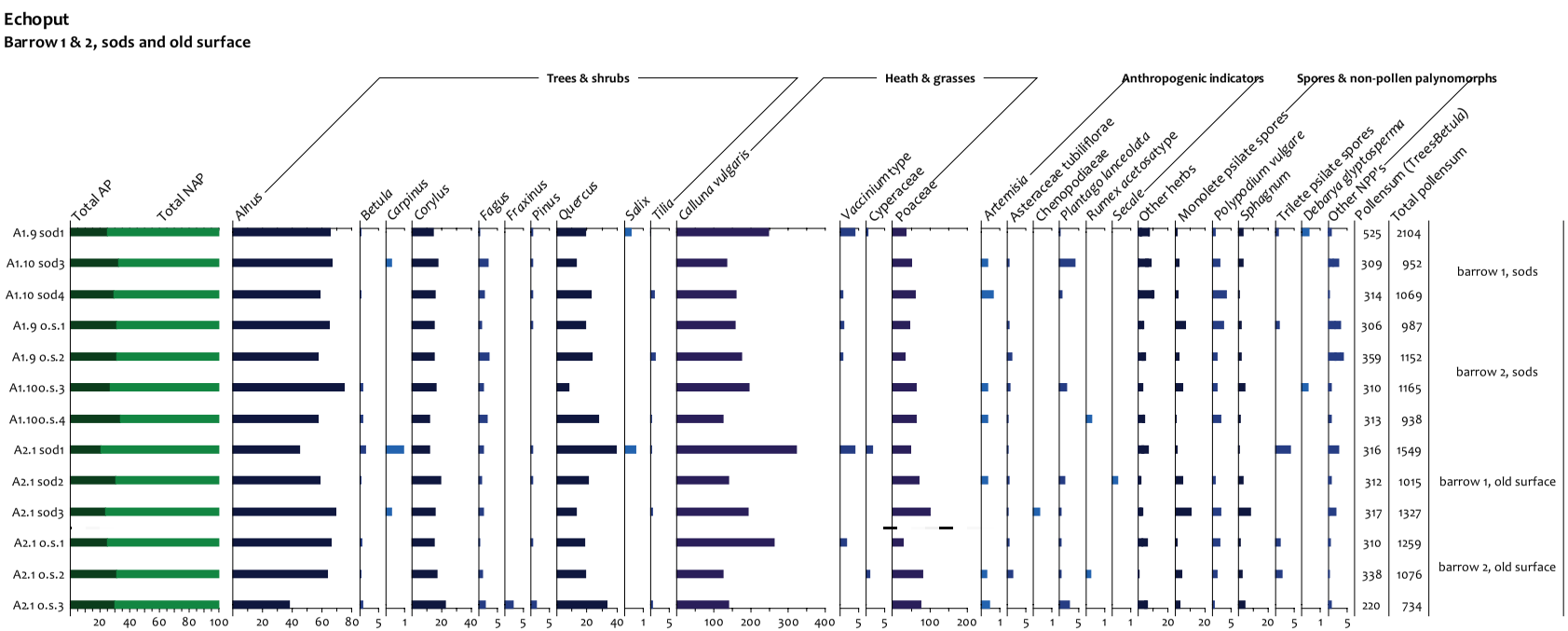


Fig. 6. Pollen spectra from the sod and old surface samples taken from mound 1 and 2. Spectra are given in % based on a tree pollen sum minus Betula pollen (see text for an explanation). In the total AP (= arboreal pollen) Betula is included. In the total NAP (= non arboreal pollen) spores are included, non pollen palynomorphs are excluded (after Doorenbosch 2011, figure 5.1 with changes).

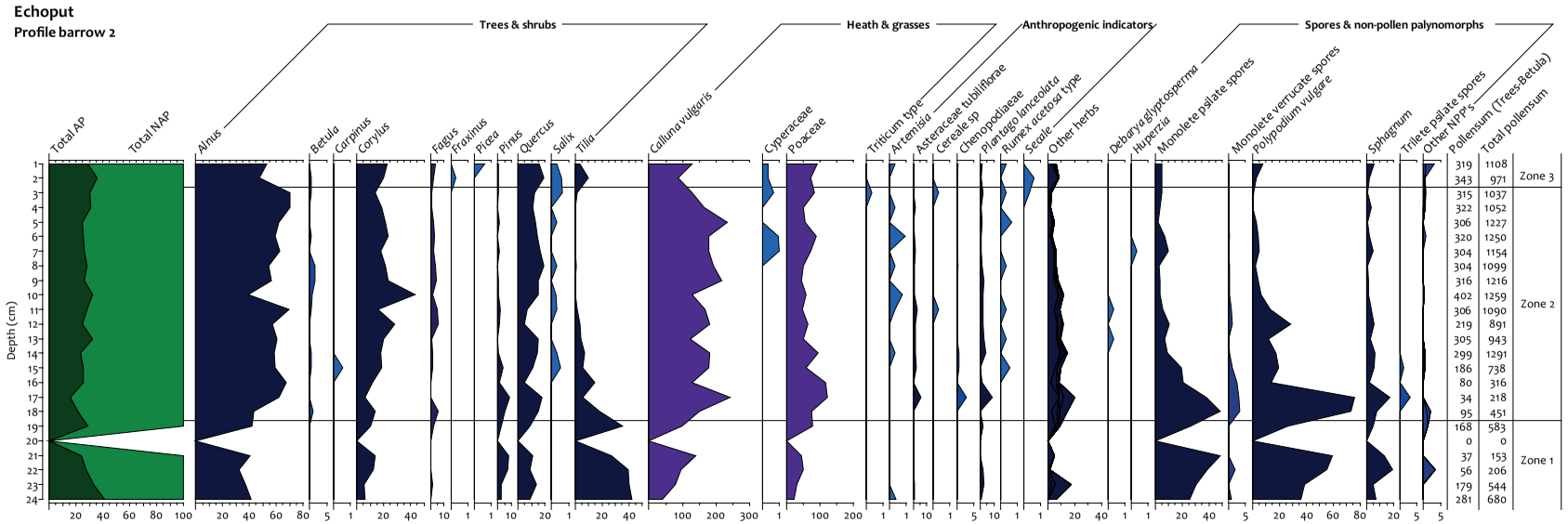


Fig. 7. Pollen diagram derived from the series of samples taken from underneath mound 2. A percentage diagram is shown, with % based on a tree pollen sum minus Betula. In the AP (= arboreal pollen) Betula is included. In the total NAP (= non arboreal pollen) spores are included, non pollen palynomorphs are excluded (after Doorenbosch 2011, figure 5.2 with changes).

Zone 1

In this oldest part of the diagram a decrease of tree pollen from 40% to 20% indicates that forest cover declined. The forest at the beginning of this period consisted mainly of *Tilia*, *Quercus* and *Alnus.* A decline of *Tilia* pollen is notable in this zone, as well as the appearance of *Fagus* pollen. The percentage of *Alnus* pollen shows an increase as well. Heath pollen, on the other hand, shows an increase, indicating that heath cover expanded, as well as Poaceae. Anthropogenic indicators, like *Plantago lanceolata*, *Artemisia* and Asteraceae tubuliflorae are present in low amounts.

Zone 2

In zone 2 *Tilia* decreases further until almost no *Tilia* pollen was found anymore. *Corylus* pollen increases and the other tree species remain quite stable. *Calluna vulgaris* fluctuates between 100 and 200%, Poaceae between 50 and 100%. Anthropogenic indicators are present in higher amounts than in zone 1. The percentages of ferns and mosses have decreased, as well as *Sphagnum*.

Zone 3

Zone 3 shows a peak of *Tilia* pollen and a decrease of *Calluna vulgaris*. This zone is based on the top samples taken from the soil profile, and it is very well possible that part of the sod above the old surface is included in these samples. This sod also contains a soil profile, similar to the soil profile underneath the barrow. As a consequence it is likely that these samples do not represent the youngest vegetation composition in this diagram, but older vegetation composition, comparable to part of zone 2 in the diagram.

Charcoal particles were found in all soil profile samples.

Discussion

The strong similarities between pollen samples from the two barrows fit in well with the archaeological dating evidence for their contemporaneity. The occurrence of *Carpinus* confirms the Iron Age dating of both mounds (cf. Janssen 1974). The presence of Secale (mound 2, sod 2) was not expected for this period as this cereal species (rye) was not yet commonly introduced in the Netherlands during the Iron Age. However, some early Iron Age finds have been reported for northern and western Europe (van Zeist 1976).

The barrow landscape

The pollen spectra of the old surfaces and the sods of both mounds indicate that they were built in an environment where herbal vegetation was more abundant than forest. Heath (e.g. *Calluna vulgaris*) and less, but still in considerable amounts, grasses (e.g. Poaceae) were the dominant species. Heath pollen tends not to spread far from its source (De Kort 2002), implying that the Echoput barrows were built in an open spot that was covered mainly with heath vegetation. Non-pollen palynomorphs such as *Debarya glyptosperma* and *Zygnema* type 314 (van

Hoeve and Hendrikse 1998) suggest the presence of some water at the site, at least during part of the year, conditions which still exist in present times. The presence of human activity at the Echoput hill is indicated by anthropogenic indicators like *Plantago lanceolata* and Asteraceae. This is confirmed by archaeological evidence in the form of pottery sherds and flint fragments found in the old surface and sods (Louwen *et al.* 2011). However, the pollen percentages of anthropogenic indicators are too low to conclude that the site was a settlement area or that there were (former) arable fields nearby. This is consistent with the data from the excavations in the close surroundings of the barrows. No traces of Iron Age settlement were found around the mounds (Valentijn and Fontijn 2011).

The forest in the surroundings of the mounds, indicated by the arboreal pollen component, was dominated by *Alnus*, *Quercus* and *Corylus. Alnus* pollen most likely comes from alder carr that was probably present in the stream valleys, where the soil was more saturated with water. The dominance of *Alnus* pollen within the total arboreal pollen content is suggestive of an open landscape in which the alder pollen was free to travel without for a sizable forest blocked its way. *Corylus* probably surrounded the heathland area at the edge of a forest or was part of an open forest, as it would not have been able to grow in the reduced light conditions of a closed forest. Also, *Corylus* requires mostly, but not truly, wet conditions. The same is true for *Quercus* (Weeda *et al*. 1985). Both trees were probably part of the forest on the slopes around the Echoput hill. So summing up, we get the following picture for the Echoput. The hilltop of the Echoput was a clearance as indicated by the open vegetation in the surroundings of the barrows. This is in contrast to the wetter stream valleys below where there was an alder carr. However, the clearance of the hilltop must have taken place long before the barrows were built. This is indicated by the diversity of the herbal vegetation at the hilltop. Such diversity needs some time to develop.

Sod cutting and how it changed the environment

The barrows were built in an open place dominated by heath, but how large was this open space? Its minimum size can be estimated by calculating the number of sods required to build the mounds and the surface of heath that had to be stripped for this. We can reasonably work from a number of premises. The first is that the excavation results show that the barrows were built in the same period, either at the same time or one relatively quickly after the other. The second is that the similarities between pollen from sods and the old surface underneath the mound and in lithology of sods and the Echoput hill top all imply that the sods were cut from the small Echoput hill top and not from the hill flanks. A third premise to work from is that the soil profile shows that the surface beneath both barrows was not used for sod cutting (Bourgeois and Fontijn 2011, 70; van der Linde and Fontijn 2011, 40). Regeneration of heath after sod cutting takes a period of about 5-40 years (Gimingham 1988). It is well possible but cannot be proven that mound 1 and 2 are contemporary or that one was built not long after the other (Fontijn 2011, 153). Assuming that the period between the construction of the first and the second burial mound had been too short for the heath vegetation to regenerate, the open space had to be large enough to cut sods for building

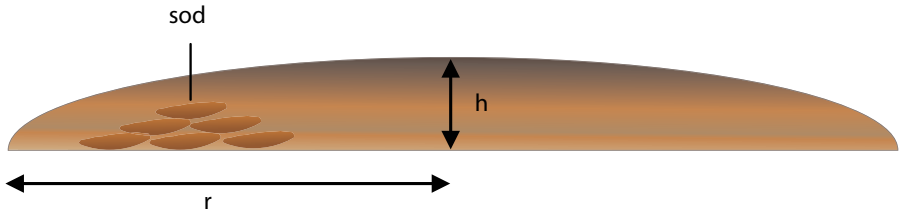


Fig. 8. A schematic drawing of a barrow. To calculate the minimum area that has been used for sod cutting to build a barrow, a barrow can be seen as a smoothly shaped spherical segment, which has been built with uniform sized sods (after Doorenbosch 2011, figure 5.6).

two barrows. Knowing the height and the diameter of the mounds and the sods, the minimum size of the open area that was needed can be calculated. For this calculation the assumption has to be made that the barrows were smoothly shaped spherical segments (Fig.8).

The volume of this spherical segment can be calculated with the following formula:

$$Vss = 1/6 \cdot \pi \cdot h \cdot (3r^2+1h^2)$$

Vss = Volume spherical segment
h = height of the barrow
r = radius of the barrow

Knowing the height of the sods, the necessary area per 1 m^3 can be calculated.

The measurements of the mounds are:
Mound 1: r = 9.5m (d = 19m), h = 1.08m
Mound 2: r = 7.25m (d = 14.5m), h = 1.0m
Sods: average h = 0. 25 m

The calculated area to be stripped for mound 2 is 332 m^2. For mound 1 a correction should be made, because this barrow was not completely spherical, but had a flattened top. Taking this into account, the stripped area for mound 1 was 902 m^2. A total area of 1234 m^2 was used for sod cutting. This implies that a minimum area of 1683 m^2, the surface beneath the mounds included, consisted of open vegetation (see Fig. 9). To put this into perspective: the amount of heath that has to be stripped to create truly monumental mounds such as the Early Iron Age "chieftain's grave" of Oss (d = 53 m) is 15000 m^2 (De Kort 1999). Another conspicuous, large Early Iron Age barrow in Oss, mound 3 (d = 30 m) from the Zevenbergen barrow group, an estimated 2350 m^2 had to be stripped (De Leeuwe 2007, 214). For mound 7 (d = 36m), another monumental Early Iron Age mound from Oss-Zevenbergen, this is at least 815 m^2 (Bakels and Achterkamp *in press*). The Echoput mounds are clearly not at the top of energy expenditure in the Iron Age barrows, but when compared with their contemporary graves which are

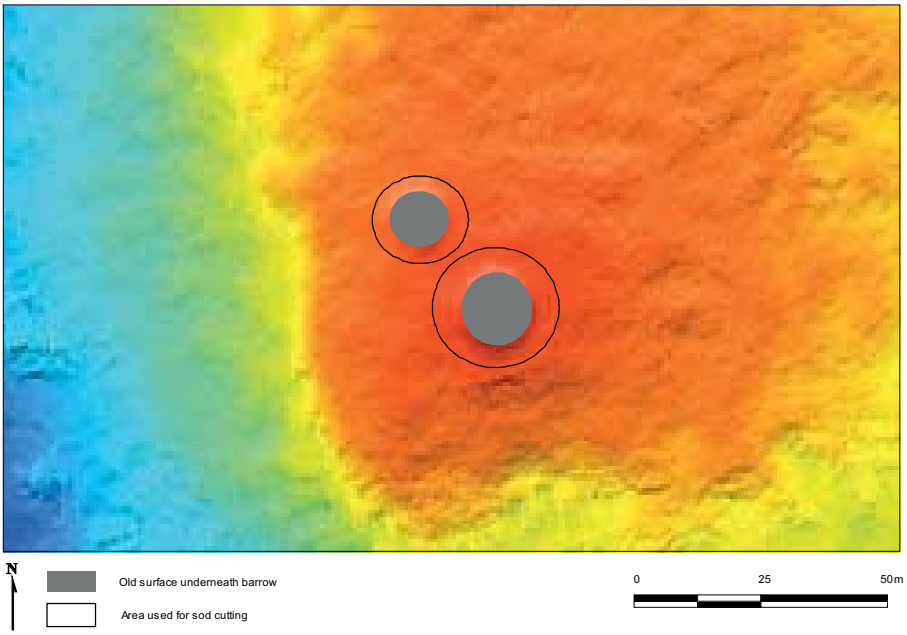


Fig. 9. View of the Echoput hill with the two excavated barrows, based on digital elevation model of the AHN (copyright AHN). Around each barrow the minimum area that had to be used for sod cutting has been pointed out (after Doorenbosch 2011, figure 5.7).

mainly flat graves or have very small mounds, it is clear that quite some effort was invested in making these particular two barrows.

The barrows, already located on a relatively high place in the environment, were then probably even more prominent in the landscape, knowing that the direct surroundings were cleared from the topsoil, creating a bare, vegetation-free environment. This will have increased their visibility in the surrounding landscape.

The landscape before the mounds

The question if it is possible to compile a pollen diagram from a mineral soil has been the subject of many discussions (Dimbleby 1961; 1985; Havinga 1963; 1984; van Mourik 2003). The process of pollen distribution in a mineral soil has been correlated to soil development and the activity of soil fauna by various researches. Van Mourik (2003), for example, has shown that the pollen sequence in a 70 year old mineral soil underneath planted *Larix* and *Fagus* forest reflect the transition from a former heath to the present planted forest. In the same research he showed that pollen in a mineral soil are protected from decay and distributed in the soil through soil fauna activity. The processes of pollen distribution are not entirely clear. A sequence of pollen samples from bottom to top, however, represents a pollen diagram that matches with general vegetation development (Havinga 1963; van Mourik 2003). When a burial mound is constructed, pollen no longer deposits on the soil that is now covered by the mound. In addition to this, the process of pollen distribution through the buried soil practically stops.

The position of the pollen grains underneath the barrow is captured, enabling the reconstruction of vegetation development in the time span leading up to the barrow building. So, the pollen diagram derived from the soil under mound 2 represents the vegetation development of a certain period before the barrow was built. Questions remain about the length of this period. A suggested downward movement rate of 30 years per cm (Dimbleby 1985) would imply a vegetation development of approximately 700 years. This, however, cannot be confirmed. The previously mentioned 70 year old soil investigated by van Mourik (2003) had a depth of 10 cm, implying a rate of 7 years per cm. The so-called Dimbleby-factor obviously cannot be applied to every mineral soil and the vegetation development that will be discussed below cannot be placed exactly in time. In Doorenbosch (*in prep*.) the discussion about pollen diagrams derived from mineral soils will be further explored.

The pollen diagram shows that the heath vegetation was already relatively dominant in the open place where later on the barrows were built. Forest cover was probably higher. Alder carr was present in the wetter areas, while *Quercus* and *Tilia* dominated the drier sites. A decline of *Tilia* is indicated by decreasing *Tilia* pollen percentages. At the same time, an increase of *Fagus* pollen has taken place. Such developments in forest cover is presumed to have taken place generally in the Netherlands as has been shown by several pollen analyses of lake and peat sediments (Fanta 1995; Jansen 1974; van Geel 1978). The increase in percentages of *Alnus* pollen could indicate an expansion of alder carr, although this increase could also be primarily related to the decrease of *Tilia* pollen. The reduction of total forest cover seems to be accompanied by expansion of the heath vegetation. At the time the barrows were built the vegetation was, at least locally, dominated by heath. The pollen diagram does not reveal how the open place was created nor what it was used for before the barrows were built. Indications of human activities at the site in several periods before the barrows were built, are evidenced by finds from below and beyond the mounds, although they certainly do not hint at a very intensive use of this site in the Bronze Age or Early Iron Age (Fontijn *et al*. 2011). The absence of cereal pollen grains and high amounts of arable weeds like *Artemisia vulgaris* in the diagram demonstrate that the location had not been used for crop cultivation. As already shown, the size of the heathland can be estimated. The minimum size of the heath must have been 1396 m^2 based on the amount of sods that was used to build the barrows, which corresponds to a hypothetical circular open spot with a radius of about 21 m (the shape of the heathland is unknown). However, based on the ratio of arboreal pollen versus non arboreal pollen, the size of the open space is estimated at around 200 m radius expanding to around 300 m radius at the moment the barrows were built (Doorenbosch *in prep*.). To maintain the heath, the landscape must have been managed. Methods of heath management can involve sod cutting, mowing, grazing and burning. Sods were cut in the area to construct the Echoput barrows, but could also have been cut for other purposes. During sod cutting the soil is usually stripped of all vegetation. Plants are entirely removed and recovery of the vegetation is dependent on re-establishment by seeds that were present in the deeper soil layers or by expansion of surrounding vegetation. Recovery of the heath vegetation after sod cutting

takes 5-40 years, depending on the thickness of the sods that were removed. Thin sods, preferably containing only the A horizon of the soil, were traditionally used as fuel or as bedding in stables. Regeneration after cutting thin sods takes only 5-8 years (Pape 1970). When thicker sods were cut, containing the A and E horizon, regeneration takes up to 40 years. Such sods were for example used as construction material (Stoutjesdijk, 1953; *cf*. Bakels and Achterkamp *in press*). Of the estimated size of the open space (see above, r = 200 to 300 m), only a part needed to be stripped for building the barrows. Consequently, sod cutting for the purpose of building the barrows cannot explain the presence of the heath vegetation in the area. Large scale sod cutting in heathland areas is mainly known from the Medieval Period into the 19th century, when the sods were used in stables to catch animal dung and subsequently were used on arable fields as fertilizer. Small scale practising of this way of farming may have taken place at the time the Echoput barrows were built. However, there are no indications of such arable fields in the environment. In addition, manual sod cutting is quite labour-intensive, and it is not likely that this heath area was managed solely by sod cutting.

The amount of grasses (*Poaceae*) together with *Plantago lanceolata*, *Asteraceae liguliflorae*, *Succisa* and *Galium* type could be an indication that the heathland has been grazed (Hjelle 1999). Mowing and grazing are comparable, they both keep the plants down. Grazing is more selective than mowing, while animals have a preference for certain species. Sheep prefer young *Calluna* heath and grass and herb vegetation in between the heath vegetation. They are not very fond of older *Calluna* plants (Elbersen *et al*. 2003). Cattle are less selective than sheep. They eat mainly grasses, although *Calluna* plants can form part of their diet, especially in winter (*cf*. Lake *et al*. 2001, 31). Bone evidence from several excavations suggests that prehistoric farming communities kept mainly sheep and cattle (Brinkkemper and van Wijngaarden-Bakker 2005, 493). Both sheep and cows are used in present times to maintain heathland areas by grazing. Historical data show that during the Medieval Period, grazing by only sheep was sufficient to maintain heathland vegetation. A stocking rate of one sheep per ha is assumed (Piek 1998). Also in present heathlands several studies mention that an average of one sheep per ha per year should be sufficient to manage the heathland (Elbersen 2003; Verbeek *et al*. 2006). The stocking rate of cattle in the past is not clear, although it is clear that cattle grazing in Dutch heathlands occurred on a large scale before the 18th century (Bieleman 1987). Bokdam and Gleichman (1989) investigated the influence of grazing cattle on the development of *Calluna* heath. A stocking rate of 0.2 livestock unit per ha per year appeared to be inadequate against invasion by grasses and tree growth. Natuurmonumenten, a Dutch organization that protects and manages nature reserves in the Netherlands, has over 30 years of experience with grazing in heathland areas. They experienced that in dry heathland areas one head of cattle per 5-6 ha is sufficient to prevent grasses from becoming dominant in heathland areas (Siebel and Piek 2001). This, however, is in present environmental circumstances with a higher deposition of nutrients, and it is likely that in the past fewer cattle would have been adequate for maintaining heathland vegetation. To calculate the amount of livestock needed to maintain heathlands, an average of one sheep per ha and/or one head of cattle per 6 ha will be used. At

the Echoput, based on the ratio of arboreal versus non arboreal pollen grains, the area that was covered with heath vegetation at the time the barrows were built is estimated at 28 ha, implying a livestock of about 28 sheep and/or 4-5 cattle.

Regular burning is also a traditional way of heath management, which destroys the upper part of the plants. When heath is burned every 10-12 years the heath vegetation is rejuvenated (Mallik and FitzPatrick 1996; Yallop *et al*. 2006). A combination of burning and grazing is nowadays often applied and seems to be very effective. Small scale burning generates young vegetation which is more nutritious to the grazing stock. Often particles of charcoal are found during excavations of barrows and in soil samples that were taken for palynological analyses (Karg 2008). The remains of charcoal found in all the pollen samples from the Echoput barrows may be an indication that humans burned the heath vegetation. A combination of grazing and burning and perhaps some sod cutting seems a plausible method of heath management at the Echoput area.

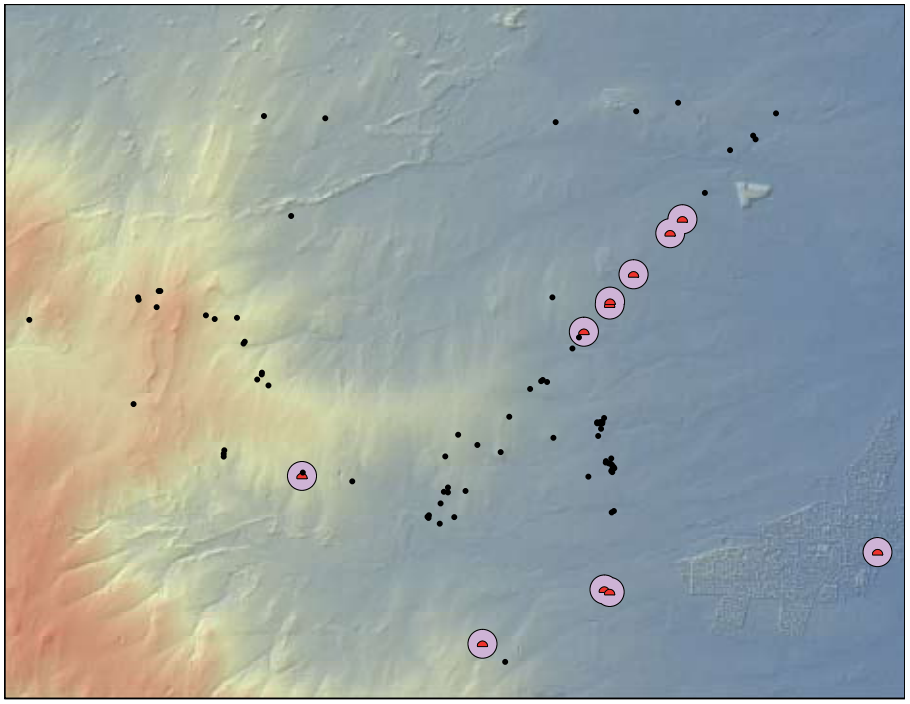
The Echoput

Clearings in a forest are generally accepted as the setting in which barrows were built. However, the origins of these clearings are hardly known. This research has shown the vegetation history of such an open space. Forest clearing was shown to have taken place long before the barrows were built, although the exact origin still remains unclear. The open spot was already present at the beginning of this vegetation development, covered with heath vegetation mixed with grasses and other herbs. The open space, surrounded by a forest of *Tilia* and *Quercus*, had been used during at least some centuries by prehistoric man. This is indicated by the find of several features, dating to the Middle Bronze Age period (Valentijn and Fontijn 2011). The activity of prehistoric man is also confirmed by the presence of anthropogenic indicators in the pollen spectra. Mesolithic and Bell Beaker features have also been found, though it is not known if the forest already had been cleared by then. Although no traces of Bronze Age or Iron Age settlements were found, it is clear that the area was used by prehistoric man. It is very likely that it was included in the economic zone of farming communities as grazing grounds, keeping the vegetation open. Based on the high percentage of pollen from Poaceae, in combination with the presence of *Plantago lanceolata*, Asteraceae liguliflorae, *Succisa* and *Galium* type (Hjelle 1999), the use of this open spot as pasture is very plausible. Also, regular burning of heath could have taken place, indicating heath management was applied to keep the area open. The amounts of charcoal found in the pollen records indicate the use of fire. Before the barrows were built, the open area seems to have been used solely as a place for the living, since no indications have been found that people were buried there. This changed when the burial mounds were constructed in the later Middle Iron Age or early Late Iron Age. The vegetation in the area had changed by then: *Tilia* had declined and forest with a more open character, dominated by *Quercus* and *Corylus*, was now present. Heath vegetation at the top of the Echoput hill had expanded. Human related activities, like burning and cattle grazing were the main cause of this vegetation development. The upper surface of a large part of the heathland at the Echoput hill was stripped in order to get sods for the construction of the

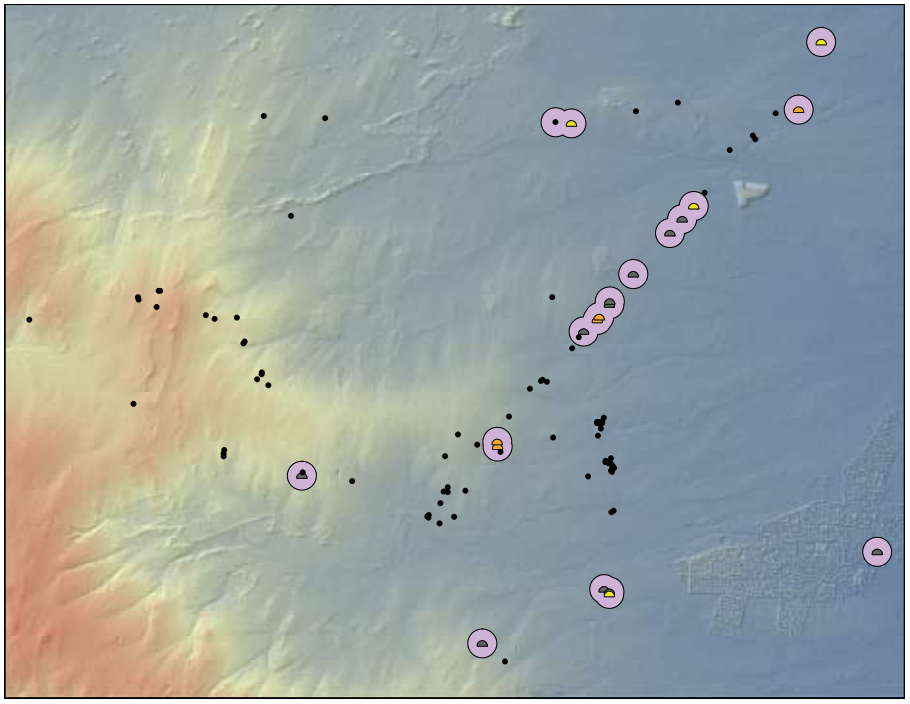
barrows, except for the surface where the barrows were to be constructed. The two barrows must have been quite pronounced features in the landscape, placed on one of the highest locations in the area, cleared of surrounding vegetation. It is unknown whether the surrounding landscape was kept open after the barrows were built. Mound 1 has been re-used for numerous burial activities, relatively soon after its construction, indicating that the barrow landscape remained in use (van der Linde and Fontijn 2011, 44-46).

Barrows and heath management

The story of the Echoput shows that barrows were integrated into the everyday life of prehistoric man and yet formed a special place that was selected for burying their dead. The barrows were situated in a landscape that needed constant management to maintain. The Echoput is not an isolated case in the Netherlands. In the central and southern Netherlands pollen data of over 100 barrows dating to the Late Neolithic, the Bronze Age and Iron Age have shown that they were *all* built in heath (Doorenbosch *in prep*.). The conventional image of barrows in the Neolithic is that they were situated on man-made open places in the forest, but how these fit in the landscape organization at large is unclear. For the Bronze Age, it has long been thought that barrows were located close to houses (Roymans and Fokkens 1991). How do the heaths fit in such models? In the Late Neolithic A phase (2800–2450 BC) barrows were sometimes constructed in long alignments that could be several kilometres long (Bourgeois *in prep*.). Figure 10a shows the area of Epe-Niersen with an alignment of barrows that were dated to the Neolithic A. Pollen analyses have shown these barrows were built in a heath. An estimation of the size of these heath areas based on the ratio arboreal versus non arboreal pollen gives a radius of 100-200 m (Doorenbosch *in prep*.). The distance of these barrows to each other is on average around 400 m which makes it very likely that these heath areas were connected to each other, creating a long alignment of heath with a length of at least 1.6 km. This is even more obvious in the next phase when additional barrows were built (Fig. 10b). Another example is given in figure 11a-b, showing the barrow alignment of Renkum at two consecutive phases. Although the heath areas were probably smaller in this alignment (50-100 m in radius) it is still likely that a long alignment of heath vegetation was present when the barrows were built, with a length of approximately 4.5 km. This alignment was probably already present some time *before* the first barrows were built, since the heath vegetation would have taken some time to develop. This shows that as early as the early 3rd millennium BC there were small, corridor-like heaths in the landscape. These ancestral passage heath landscapes were probably managed and maintained for many centuries. For the barrow complex of Oss-Zevenbergen and immediate surroundings, for example, the earliest known barrows were probably built in heath as early as the Late Neolithic B, while the youngest mounds were erected in the Iron Age (Bakels and Achterkamp *in press*). It can be assumed that heath occurred during the entire period, being a very stable element in the landscape, implying intense involvement of prehistoric man for many generations (Doorenbosch *in prep*.). Also the Echoput case shows that in the Iron Age such heathland areas were still in use. Although not comparable yet with the enormous


Unexcavated or undated mounds
LN A barrows
Modelled heath area
m NAP
80 m
0 m
0
1000
2000 m

a


Unexcavated or undated mounds
Older barrows
LN A or B barrows
LN B barrows
Modelled heath area
m NAP
80 m
0 m
0
1000
2000 m

b

Fig. 10a-b. (left) Barrow alignments of Epe-Niersen at two consecutive phases Late Neolithic A and Late Neolithic B. The modelled heath area around each barrow is indicated. Based on digital elevation model of the AHN (copyright AHN; figure by Q. Bourgeois and M. Doorenbosch).

heathlands that expanded when agricultural activities were intensified in historical times, it still requires extensive management to create and maintain such stretched areas of heath. It is likely that at the Echoput grazing was involved. This implies that the following numbers of animals must have been used. An alignment of 2 km with a width of about 200 m gives an area of 40 ha, indicating a livestock of about 40 sheep and/or 6-7 cattle. For the Middle Bronze Age it has been argued that a livestock of 30 animals could be kept per household (Fokkens 2005, 427). For the Iron Age, estimated numbers are (much) lower (Brinkkemper and van Wijngaarden-Bakker 2005). Examples of open areas of 4.5 km (width 50-100 m) indicate that both in the Bronze Age and Iron Age, in order to keep this heath open, cooperation between households was necessary on a structural basis. For the case of the Echoput, on the other hand, we can think of maintenance by a smaller group (just one household?).

Grazing could have been combined with burning of heath. However, many barrows were surrounded by wooden posts, which would be destroyed by fire. This makes at least large scale burning unlikely (Bakels and Achterkamp *in press*). This implies two things. The first is that management of such vast heaths was an intensive job that was a structural and long-lived part of the way prehistoric farming communities dealt with the landscape. The second thing is that barrows, because they were situated on those heaths, must have been part of the economic zone of prehistoric man. However, it is not clear where these people lived. There is hardly any evidence of settlements close to these barrow alignments like those of Epe-Vaassen or Renkum. In addition, the palynological results yield hardly any indications of arable fields in the environment. The conventional image of barrows situated close to the houses therefore cannot be supported for these cases. Also for the Iron Age mounds of the Echoput, there are no indications that people lived in the immediate surroundings (Fontijn 2011). So, with regard to the questions on the role of barrows in the landscape: they played an important role in the daily life of prehistoric people. Since barrows were built in long alignments it can hardly be denied that visibility must have played an important role (Bourgeois *in prep.*). They did not just bury their dead, but they created highly visible monuments. Not only were they pronounced features in the landscape with possibly highly sentimental value as monuments for their ancestors, they also formed part of a landscape that was kept under constant pressure by human activities to preserve the openness of the vegetation. Barrows were re-used and new barrows were added to the alignments, all in the same heath vegetation that must have been present for hundreds of years, assuming the activity of man. In later periods, from the Late Neolithic B onwards they also started building their barrows outside these alignments (Fig. 10b and 11b). These barrows too were built in heath vegetation. Why this happened is unclear (*cf.* Bourgeois *in prep.*). We also do not know if

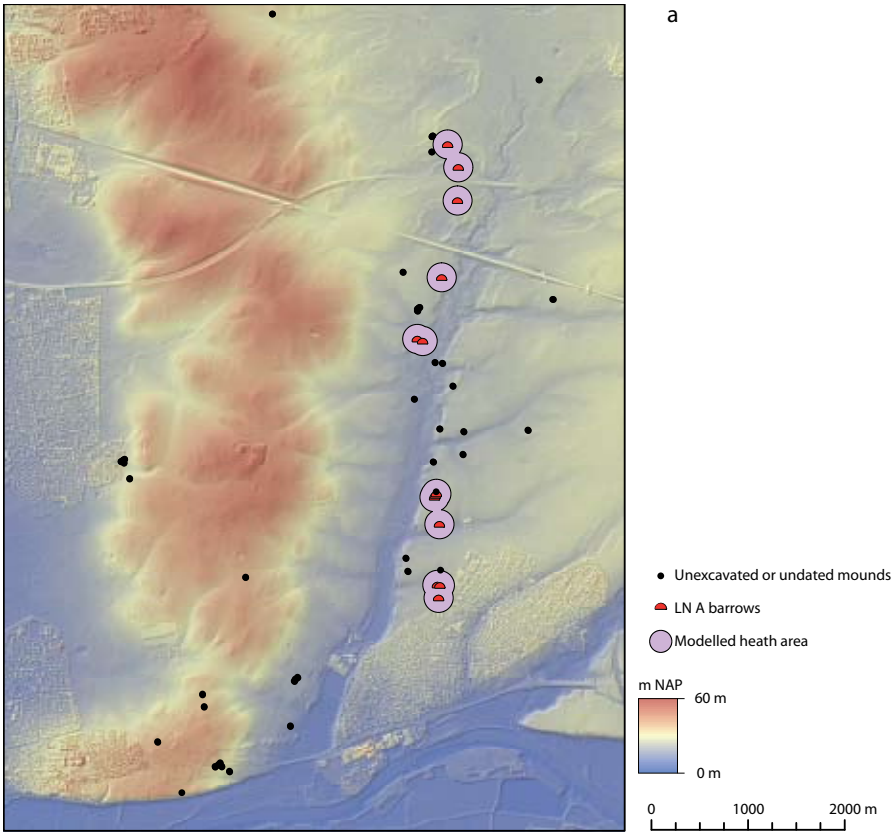
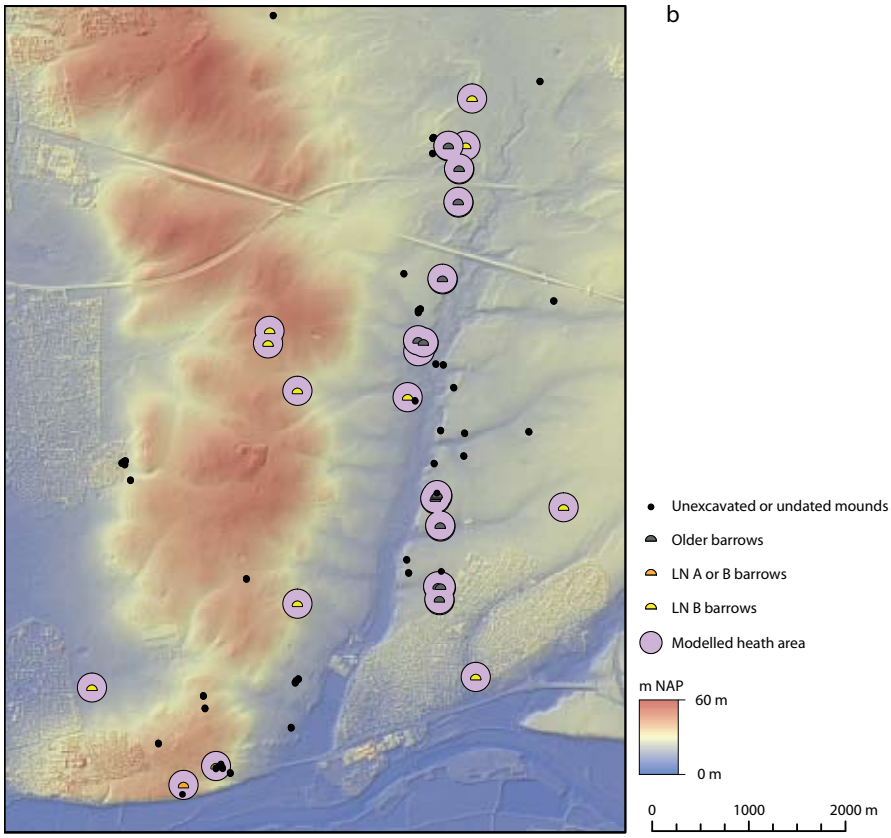


Fig. 11a-b. (above and right) Barrow alignments of Renkum at two consecutive phases Late Neolithic A and Late Neolithic B. The modelled heath area around each barrow is indicated. Based on digital elevation model of the AHN (copyright AHN; figure by Q. Bourgeois and M. Doorenbosch).

these off-alignment heaths were already there for a long period of time and if they were connected to the alignment heaths. Perhaps they were more isolated and/or more "private places"?

Conclusion

It has been suggested that visibility played an important role in the building regime of barrows. The mounds of the Echoput were most likely prominent features in the landscape. This certainly must have been the case for these kilometres long alignments of barrows of Epe-Niersen and Renkum built in such vast open areas. The open areas that were chosen to build barrows in already had a long history of openness. When and how these open spaces were created is unknown. Constant pressure of man must have been involved in the maintenance of this openness,



while, as has been suggested in the case of the *Echoput* barrows, using the area as pasture possibly combined with regular small scale burning. In the Late Neolithic period they decided to turn these areas into monumental areas while building highly visible barrows in long alignments in a relatively short period of time. Also barrows that were not built in such alignments were placed in managed heath areas. Altogether people preferred to bury their dead at ancestral grounds. Summing up, heaths were not just places for the living, but just as much places for the dead.

This article has shown that the use of palynology can provide very useful knowledge about the landscapes in which barrows were constructed and reveal information about the role barrows played in the landscape and in the everyday life of prehistoric man. Yet, there are still many questions unanswered. Extensive excavations like the one that has been carried out at the Echoput could provide valuable information about the history of a barrow landscape. And studying the wider environment of barrows could enhance our understanding of where and how people lived in relation to the barrows.

Acknowledgements

I would like to thank David Fontijn and Sasja van der Vaart for their critical reading of this article, Corrie Bakels for her support, guidance and discussion during this study and Wim Kuijpers for his help in the laboratory. This study resulted from the project "Ancestral Mounds" at the Leiden University, funded by NWO, Netherlands Organization for Scientific Research.

Bibliography

Bakels, C.C. and Achterkamp, Y. In press. The local vegetation at the time of the construction of the Oss-Zevenbergen mounds 7 and 6. In: Fontijn, D.R., Vaart, van der S.A., Jansen, R. (eds). *Transformation through Destruction. A monumental and extraordinary Early Iron Age Hallstatt C barrow from the ritual landscape of Oss-Zevenbergen.* Leiden: Sidestone Press.

Behre, K.-E. 1986. *Anthropogenic indicators in pollen diagrams*. Rotterdam/Boston: A.A. Balkema.

Bieleman, 1987. *Boeren op het Drentse zand 1600-1910. Een nieuwe visie op de 'oude' landbouw*. PhD thesis, Wageningen Agricultural University.

Bokdam, J. and Gleichman, J.M. 2000. Effects of grazing by free-ranging cattle on vegetation dynamics in a continental north-west European heathland. *Journal of Applied Ecology* 37, 415-431.

Bourgeois, Q.P.J. In prep. *The formation of the barrow landscape throughout the 3rd and 2nd Millennium BCE (provisional title).* PhD thesis, University of Leiden.

Bourgeois, Q. and Fontijn, D. 2011. Antiquarian leftovers- Mound 2. In: Fontijn, D., Bourgeois, Q., Louwen, A. (eds.). *Iron Age Echoes. Prehistoric land management and the creation of a funerary landscape- the "twin barrows' at the Echoput in Apeldoorn.* Leiden: Sidestone Press, 65-90.

Brinkkemper, O. and Wijngaarden van- Bakker, L. 2005. All-round farming. Food production in the Bronze Age and the Iron Age. In: Louwe Kooijmans, L.P., Broeke, van den P.W., Fokkens, H., Gijn, van A.L. (eds). *The prehistory of the Netherlands.* Amsterdam: Amsterdam University Press, 491-512

Casparie, W. A. and Groenman - van Waateringe, W., 1980. Palynological analysis of Dutch barrows. *Palaeohistoria* 22: 7-65.

Dimbleby, G.W. 1961. Soil pollen analysis. *European Journal of Soil Science* 12/1, 1–10.

Dimbleby, G. W. 1985. *The palynology of archaeological sites*. London: Academic Press.

Doorenbosch, M. 2011. An environmental history of the Echoput barrows. In: Fontijn, D., Bourgeois, Q., Louwen, A. (eds.). *Iron Age Echoes. Prehistoric land management and the creation of a funerary landscape- the "twin barrows' at the Echoput in Apeldoorn.* Leiden: Sidestone Press, 111-128.

Doorenbosch, M. In prep. *An environmental study of barrows (working title)*. PhD Thesis, University of Leiden.

Elbersen, B.S., Kuiters, A.T., Meulenkamp, W.J.H., Slim, P.A. 2003. *Schaapskuddes in het natuurbeheer.* Alterra-rapport 735. Wageningen: Alterra, Research Instituut voor de Groene Ruimte.

Faegri, K. and Iversen, J. 1989. *Textbook of Pollen Analysis*. 4th ed. by Faegri, K., Kaland, P.E., Krzywinski, K. Chichester: John Wiley and sons.

Fanta, J. 1995. Beuk *(Fagus sylvatica* L.) in het Nederlandse deel van het nw-Europees diluvium. *Nederlands Bosbouw Tijdschrift* 1995, 225-234.

Fokkens, H. 2005. Longhouses in unsettled settlements in Beaker period and Bronze Age. In: Louwe Kooijmans, L.P., Broeke, van den P.W., Fokkens, H., Gijn, van A.L. (eds). *The prehistory of the Netherlands.* Amsterdam: Amsterdam University Press, 407-428

Fontijn, D. R.. 2007. Ancestral Mounds. The social and ideological significance of barrows, 2900-1100 BC. Project Proposal N.W.O. – programmatic research. Leiden.

Fontijn, D.R. 2011. The genesis and history of the Echoput barrows. In: Fontijn, D., Bourgeois, Q., Louwen, A. 2011 (eds.). *Iron Age Echoes. Prehistoric land management and the creation of a funerary landscape- the "twin barrows' at the Echoput in Apeldoorn.* Leiden: Sidestone Press, 149-161.

Fontijn, D., Bourgeois, Q., Louwen, A. 2011 (eds.). *Iron Age Echoes. Prehistoric land management and the creation of a funerary landscape- the "twin barrows' at the Echoput in Apeldoorn.* Leiden: Sidestone Press, 1-173.

Geel, van B. 1978. A palaeoecological study of holocene peat bog sections in Germany and The Netherlands, based on the analysis of pollen, spores and macro- and microscopic remains of fungi, algae, cormophytes and animals. *Review of Palaeobotany and Palynology* 25, 1-120.

Gimingham, C.H. 1988. A reappraisal of cyclical processes in *Calluna* heath. *Vegetatio* 77, 61-64.

Groenman- van Waateringe, W. 2005. Barrow research and palynology, in: Louwe Kooijmans, L.P., Broeke, van de P.W., Fokkens, H., van Gijn, A.L. (eds.). *The Prehistory of the Netherlands*. Amsterdam: Amsterdam University Press, 455-458.

Havinga, A.J. 1963. A palynological investigation of soil profiles in cover sand. *Mededelingen Landbouwhogeschool Wageningen* 1962/1, 11-93.

Havinga, A.J. 1984. A 20-year experimental investigation into the differential corrosion susceptibility of pollen and spores in various soil types. *Pollen et spores* 26, 541-558.

Hjelle, K.L. 1999. Modern pollen assemblages from mown and grazed vegetation types in western Norway. *Review of Palaeobotany and Palynology* 107, 55-81.

Hoeve, van M.L. and Hendrikse, M. 1998 (eds.). *A study of non-pollen objects in pollen slides. The types as described by Dr. Bas van Geel and colleagues*. Utrecht (unpublished).

Janssen, C.R. 1974. *Verkenningen in de palynologie*. Utrecht: Oosthoek, Scheltema & Holkema.

Karg, S. 2008. Direct evidence of heathland management in the early Bronze Age (14th century B.C.) from the grave-mound Skelhøj in western Denmark. *Vegetation History and Archaeobotany* 17, 41-49.

Kort, de J.W. 1999. *Een reconstructie van de vegetatie rond het Vorstengraf van Oss in de Vroege IJzertijd*. MA-thesis, Leiden University.

Kort, de J.W. 2002. Schapen op de heide. Een vegetatiereconstructie van de omgeving van het vorstengraf van Oss in de vroege ijzertijd. In: Fokkens, H. and Jansen, R. (eds.). *2000 jaar bewoningsdynamiek*. Leiden: Leiden University, 341-353.

Lake, S., Bullock, J.M., Hartley, S. 2001. The impacts of livestock grazing on lowland heathland in the UK. *English Nature Research Reports* 422, 1-143.

Leeuwe, de R. 2008. Twee grafheuvels in het prehistorische dodenlandschap van Oss-Zevenbergen. In: Jansen, R. and Louwe Kooijmans, L.P. (eds.). *Van contract tot wetenschap. Tien jaar archeologisch onderzoek door Archol BV, 1997-2007.* Leiden: Archol BV, 205-220.

Linde, van der C. and Fontijn, D. 2011. Mound 1- A monumental Iron Age barrow. In: Fontijn, D., Bourgeois, Q., Louwen, A. (eds.). *Iron Age Echoes. Prehistoric land management and the creation of a funerary landscape- the "twin barrows' at the Echoput in Apeldoorn.* Leiden: Sidestone Press, 33-64.

Louwen, A., Fontijn, D., Valentijn, P., Linde, van der C., Verbaas, A. 2011. Finds. In: Fontijn, D., Bourgeois, Q., Louwen, A. (eds.). *Iron Age Echoes. Prehistoric land management and the creation of a funerary landscape- the "twin barrows' at the Echoput in Apeldoorn.* Leiden: Sidestone Press, 129-142.

Mallik, A.U. and FitzPatrick, E.A. 1996. Thin section studies of *Calluna* heathland soils subject to prescribed burning. *Soil Use and Management* 12/3, 143-149.

Moore, P.D., Webb, J.A., Collinson, M.E. 1991. *Pollen analysis.* 2nd ed. Oxford: Blackwell Scientific Publications.

Mourik, van J.M. 2003. Life cycle of pollen grains in mormoder humus forms of young acid forest soils: a micromorphological approach. *Catena* 54, 651-663.

Pape, J.C. 1970. Plaggen soils in the Netherlands. *Geoderma* 4/3, 229-255.

Piek, H. 2000. *30 jaar begrazing bij Natuurmonumenten*.Unpublished.

Punt, W., Blackmore, S., Clarke, G.C.S. 1976–2009. *Northwest European pollen flora*. Volumes 1 (1976), 2 (1980), 3 (1981), 4 (1984), 5 (1988), 6 (1991), 7 (1995), 8 (2003), 9 (2009). Amsterdam: Elsevier.

Reille, M. 1992. *Pollen et spores d'Europe et d'Afrique du Nord.* Marseille: Laboratoire de Botanique Historique et Palynologie..

Reille, M. 1995. *Pollen et spores d'Europe et d'Afrique du Nord*. Supplement 1. Marseille: Laboratoire de Botanique Historique et Palynologie.

Reille, M. 1998. *Pollen et spores d'Europe et d'Afrique du Nord*. Supplement 2. Marseille: Laboratoire de Botanique Historique et Palynologie.

Roymans, N. and Fokkens, H. 1991. Nederzettingssporen uit de bronstijd and de vroege ijzertijd op de Kraanvensche Heide te Loon op Zand. In: Fokkens, H. and Roymand, N. (eds.). *Nederzettingen uit de bronstijd en de vroege ijzertijd in de Lage Landen.* Nederlandse Archeologische Rapporten 13, 111-127. Amersfoort: Rijksdienst voor het Oudheidkundig Bodemonderzoek.

Siebel, H. and Piek, H. 2001. Veranderde inzichten over begrazing bij natuurbeheerders. *Vakblad Natuurbeheer* 4, 45-49.

Stoutjesdijk, P. 1953. Vegetatiekundig onderzoek van de Veluwse heidevelden. In: Heemsbergen, H. (ed.). *Heeft onze heide nog toekomst?*Arnhem: De studiekring voor de Veluwe, 15-32.

Valentijn, P. and Fontijn, D. 2011. Excavating the surroundings of the barrows. In: Fontijn, D., Bourgeois, Q., Louwen, A. (eds.). *Iron Age Echoes. Prehistoric land management and the creation of a funerary landscape- the "twin barrows' at the Echoput in Apeldoorn.* Leiden: Sidestone Press, 91-110.

Verbeek, P.J.M., Graaf, de M., Scherpenisse, M.C. 2006. *Verkennende studie naar de effecten van drukbegrazing met schapen in droge heide. Effectgerichte maatregel tegen vermesting in droge heide.* Ede: Directie Kennis, Ministerie van Landbouw, Natuur en Voedselkwaliteit.

Waterbolk, H.T., 1954. *De praehistorische mens en zijn milieu. Een palynogisch onderzoek naar de menselijke invloed op de plantengroei van de diluviale gronden in Nederland*. PhD Thesis, University of Groningen. Assen: van Gorkum

Weeda, E.J., Westra, R., Westra, T. 1985. *Nederlandse Oecologische Flora. Wilde planten en hun relaties* 1. Hilversum: KNNV uitgeverij.

Yallop, A.R., Thacker, J.I., Thomas, G., Stephens, M., Clutterbuck, B., Brewer, T., Sannier, C.A.D. 2006. The extent and intensity of management burning in the English uplands. *Journal of Applied Ecology* 43/6, 1138-1148.

Zeist, van W. 1967. Archaeology and palynology in the Netherlands. *Review of Palaeobotany and Palynology* 4, 45-65.

Zeist, van W. 1976. Two early rye finds from the Netherlands. *Acta Botanica Neerlandica* 25, 71-79.

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Ways of Wandering

In the Late Bronze Age Barrow Landscape of the Himmerland-area, Denmark

By Mette Løvschal

Abstract

Throughout prehistory and up to this present day, roads have played a crucial role in the exchange of knowledge and ideas, as well as resources. In the Bronze Age they formed part of a general landscape discourse where the communication lines were materially manifested and anchored by the barrows and conversely, where the erection and reuse of barrows were crucially dependent on roads and access. In this way certain linear structures emerged and became a very dominant characteristic of the landscape. This paper proposes that the relationship between roads and barrows not only existed as a large-scale spatial structure, but that it also played a crucial role in ideological navigation and genealogical contextualization.

The case study presents an analysis of possible mobility lines and barrow distributions in the Himmerland area, Denmark. It points towards the fact that barrows with a central position in the mobility complexes maintained an active mnemonic role in the landscape during the Late Bronze Age. It further argues that barrows and roads probably existed as two mutually dependent landscape components playing very different roles in both a collective and at the same time a very individual remembrance and contextualization. The road as a basis for a bodily experience to understand and remember more complex phenomena attached to the barrow landscape such as myths, genealogical time, individual biographies etc. – and vice versa. The barrows served as collective material anchors and fixations of movement. Together their mutual dependency constituted axial lines through the landscape which were actively used to maintain memories but also induced oblivion in a long-term perspective.

Keywords: *Late Bronze Age, barrow lines, roads, landscape perception, memory, mobility, topographical mind.*

Introduction

Throughout the Bronze Age, a strong emphasis on travel and long-distance mobility can be observed in a number of contexts, such as iconographic depictions of ships and wheels, rich metal depositions and grave equipment with parts of wagons, mountings, cheek pieces, and harness (Jacob-Friesen 1970; Madsen 1872; Thrane

1963; 1984). These and many more examples indicate that movement probably played a central role in ideological conceptualisation and narrative compositions. However, roads and wayfaring have for a long time only been a rather insignificant part of the explanatory models of the organisation of the Bronze Age landscape and knowledge traditions (cf. Johansen *et al.* 2004). Reflections on their ideological significance and wider socio-religious impact (for example Rudebeck 2001; 2002) have yet not been considered in a Danish context. Instead, roads are often treated as a purely functional, economic feature and as a more or less passive precondition for contact between settlements or groups of people. While this is certainly an important part of their use and origin, it also reflects a rather specific theoretical and methodological way of approaching archaeological landscape phenomena. This approach often implicitly relies on a metric, Euclidian space that can be read directly off the landscape and that requires a somehow intact and unaltered memory. This means a landscape with conceptually and spatially well defined and separate landscape domains, constructed according to binary oppositions such as sacral/profane, nature/culture, centre/periphery etc. In this way we often end up with a static picture of the landscape where the variations in the distribution patterns are either overlooked or explained as anomalies.

I wish to propose another view that presupposes a dynamic dialectic between mobility and fixation, experience and reference, remembrance and oblivion. I will set out with a brief introduction to the empirical data, which consists of a 20 by 15 km area on the outer edge of south-western Himmerland, Denmark. Subsequently it will be discussed how movement on the one hand works as a very basic, individual, tactile process, and on the other hand how a number of descriptions tied to movement and wayfaring rely on collective principles. In this way wayfaring involves a complex relationship between the individual actor and his/her spatial and semantic surroundings. Based on some simple parameters for the position of the roads, I will attempt to identify potential Late Bronze Age trackways and focus on how these hypothetical principles relate to other archaeological features. Finally I will discuss the different knowledge components that are embedded in the barrows and the roads and how the landscape can be actively used to maintain memories but also to induce oblivion.

Late Bronze Age barrow landscapes

The praxis of erecting barrows over the dead can in South Scandinavia be traced back as far as to Corded Ware Culture (2900–2350 BC). As for the Early Bronze Age this tradition included a set of large-scale practises that periodically assembled an otherwise relatively dispersed population. Many of these barrows constituted focal points for the subsequent organisation of the landscape and the erection of new barrows, which in a number of cases resulted in the successive construction of linear arrangements. In Denmark, these linear patterns are particularly evident on the Jutish peninsula and particularly in the western and southern parts. Further east and on the northern side of the Limfjord, the barrow distributions are more unclear and dispersed.

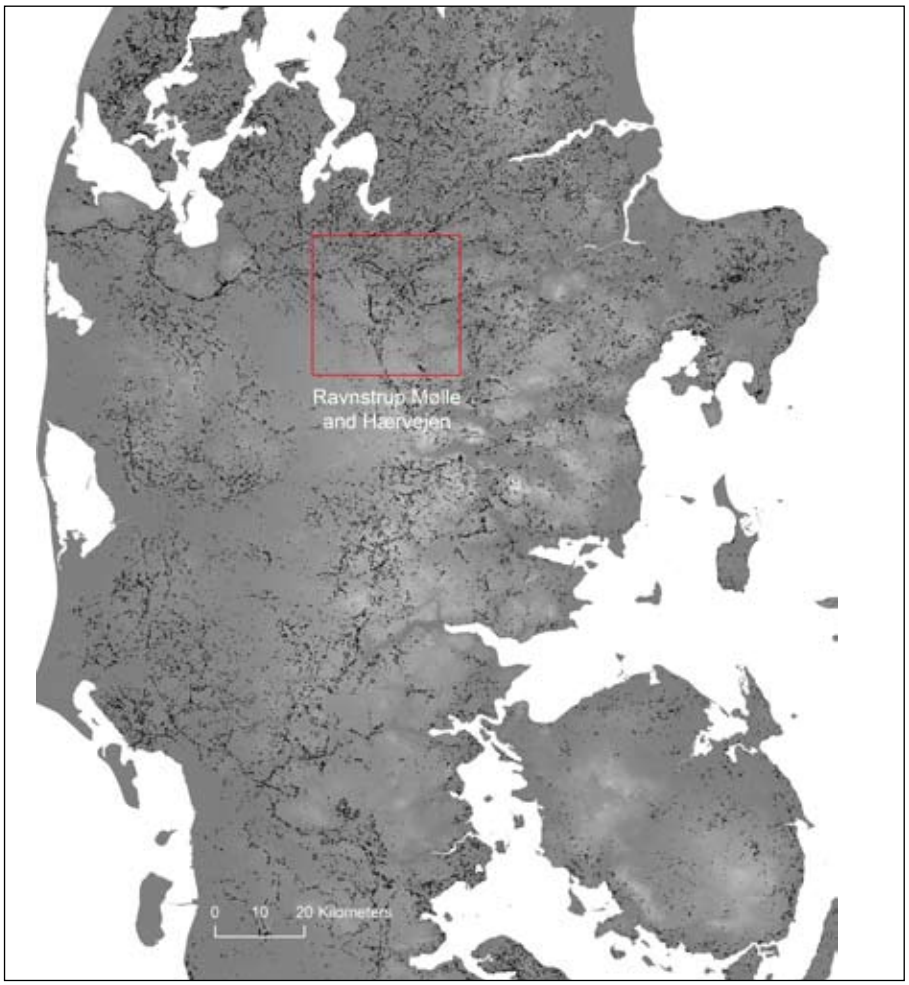

Fig. 1. The distribution of barrows in Jutland. Used as a background map is dtm501, © KMS.

Around the beginning of the Danish Late Bronze Age (c. 1100 BC) the cremation praxis had gained a general acceptance in the whole region. The most dominant practice was urn graves buried in older barrows, often only containing very few or no grave goods. Besides, cairns and flat graves including (urned) cremation burials and pits containing burnt bone and pyre remains are also known from Himmerland. Therefore, from this period and onwards only comparably few barrows were erected.

At a very early stage in archaeological research history, a conspicuous coincidence was noticed between barrows and places well suited for frequent traffic (Müller 1897; 1904, 5; see also Hansen and Nielsen 1979, 72; Johansen *et al.* 2004). The barrows are often placed along the top of ridges and tend to lie scattered over flat plateaus (Müller 1904, 11-14). The main thoroughfares appear as broad traffic corridors also recognizable by belts of wheel tracks, sometimes several hundred metres wide that have gradually accumulated (Egeberg 2004, 46-47; Jørgensen 2001, 5-7; Samuelsson 2001, 178). However, in narrow passages

or at fords where traffic was likely to have been more fixed, the barrows are similarly placed in more dense clusters or lines. The barrow lines can also be detected along watersheds together with systems of sunken roads and wheel tracks. Furthermore, barrow lines often can be seen along stretches of historical main roads (Lundbye 1920, 434) and examples exist on tracks in connection to and under burial mounds (Egeberg 2004, 46-49; Hansen and Nielsen 1979, note 7).[1] Therefore it is very likely that the barrow distribution on a general level reflects more or less maintained mobility patterns in the landscape.

In this paper, the terms roads and trackways are not used in a modern sense as well-defined roads or material constructions per se. Instead, many prehistoric communication lines should probably be understood as trails, tracks and broad communication corridors consisting of individual courses, dislocations, stagnant periods etc. – without necessarily leaving any maintenance constructions other than the repetitive movement along them. In this sense, a road is first of all considered as certain *praxis*, as certain movement traces and recognizable or predictable routes between places.[2]

Only few cases of concrete traces of roads are known from the Late Bronze Age. This can to a certain degree be explained by preservation conditions: trackways can be very difficult indeed to identify in excavations; they are erased quickly by ploughing and in many places threatened by modern building works. However, their scarcity is probably also due to more practical reasons. Road constructions were established first and foremost at impassable places where the traffic would also have been more permanent such as very hilly stretches, river crossings, and wetland areas (Winkler 2001, 47). In such areas, a few examples are known from Himmerland, *e.g.* the plank built road from Skalsådalen (Jørgensen 1982, 146; Thorvildsen 1973) and the plank and later stone built Kvorning-road leading out into the Nørreå river valley (Iversen 1996; Jørgensen 1996,

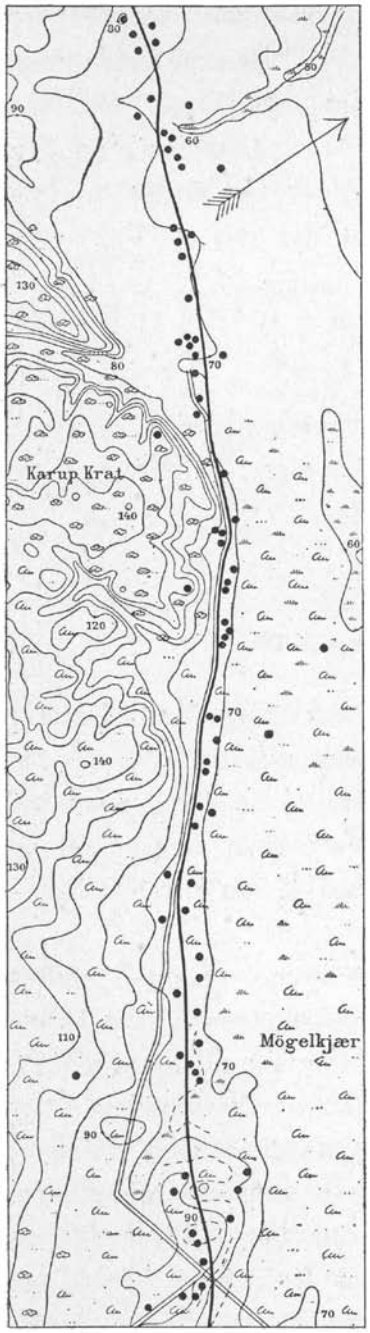

Fig. 2. Barrow line noticed by Sophus Müller in 1904 at Ravnstrup Mølle (here termed 'Mögelkjær'; Müller 1904, fig. 11, 16).

1 See *e.g.* Ejstrup Storgård, Henne and Lundshøj (Thovildsen and Kehler 1966, 401).
2 One should probably also consider sailing to be an equally important way of travelling at this point in time.

50). There is, however, no reason to suppose that these cases are neither representative nor the norm for the actual road system.

Most often, no relative stratigraphic relationship exists; samples for datings are normally not being taken and even when they are, it is very hard to determine what is actually being dated. Hence it is only rarely possible to ascertain a road as being prehistoric. However, only 12 km from the study area, a large barrow with more than 40 Late Bronze Age reburials was excavated in the autumn of 2010.[3] Ahead of the excavation, various hydro and distribution maps were generated and estimated that, in all probability, a trackway had been running closely past the barrow (Løvschal 2011). During the excavation a set of wheel tracks was identified running in an east-west direction, only *c*. 2-3 m north of the rim stones, and with an approximate 1.1 m width of the axle.[4] A sunken road could also be observed on Orto photos. However, most interestingly, when the barrow was fully excavated, underneath the outer kerb stones another wheel track was found, running parallel to the sunken road and thereby certain to predate the outer rim. These relative stratigraphic observations make it possible not just to establish *some kind of* relationship between barrow and trackway, but to ascertain that the barrow was erected in close connection to a road and that this road was possibly moved when the barrow was further enlarged.

When mind becomes matter

The above overall observations point towards the fact that there was a clear spatial connection and causality between the roads and barrows in the Late Bronze Age. Before we turn to the case studies, a short introduction to the concept of topographic conceptualisation and memory will be given as a potential approach to this relationship.

Spaces of reference

Within the last 15 years an increasing critique from various disciplines has been directed towards the classical cognitivist essentially brain bound understanding of cognition (cf. Bruner 1990; Fodor 1983; Rumelhardt and McClelland 1986). Instead, a much broader perspective on cognition is now being evoked within a range of academic disciplines.[5] Here, cognition is not solely considered as something that takes place within the skull but rather grounded, embedded, and distributed across a number of relations and processes in the wider surroundings (Hutchins 1995; Malafouris and Renfrew 2010; Sutton 2008; Sutton et al. 2010).

Contemporary cognitive research stresses how the majority of cognitive functions are crucially attached to the body (Barsalou 1999, 580; 2008, 620; Barsalou *et al.* 2005, 22ff.; also see Wilson 2002, 632; Zlatev 2005). When we

3 VSM 09641, Nøragergård Høje II, Parish of Viskum, Viborg amt.

4 This correlates with other datings of axles of carriage with an average width of 1.1 m (Schovsbo 1987, 112).

5 Disciplines such as social anthropology, political geography philosophy, studies of religion, neuroscience etc. (Casey 2001; Hastrup 2005; Malafouris and Renfrew 2010; Sheets-Johnstone 1999).

think of something or commemorate earlier experiences, these processes are deeply dependent on the condition and motion of the body (Barsalou *et al.* 2003, 52; Barsalou *et al.* 2005, 26). Consequently, when we recall something, a number of modal simulations are activated which potentially take place in the entire sensomotoric system. And vice versa: by affecting or structuring the body in certain ways, certain cognitive propensities are likely to be induced. In other words: we *think with* the body. Likewise human conceptualisation involves, not just the body, but also the interaction with our social surroundings, material artefacts, and the landscapes we live in and move within (Clark and Chalmers 1998, 12-13; Malafouris 2004, 58ff.). These different elements are being drawn upon constantly in our everyday life in a so-called "cognitive offloading" so that we can use our cognitive resources for something else (Day 2004, 109ff.). To take an example, facilitating roads with road signs makes it possible to find a given route without having to remember every turn or when to adapt to certain behavioural descriptions, *e.g.* to lower the speed or be particularly attentive towards something. By actively navigating by means of these collective cues, we are using our surroundings to *think with*: they enable certain thoughts, memories, and behaviours which were otherwise not possible and concurrently contribute to a stabilisation of the conceptual integration (also see Berthoz 2000, 10; Glenberg 1997; Sutton 2009; Turnbull 2007).

The involvement of the immediate geographical, social and historical surroundings, including our own bodies, thus takes an active position in cognitive anchoring, establishing perceptual categorisations and representations, and as a basic frame of reference. - Wayfaring is an example of such a process that involves both our bodies and our surroundings.

Topographic memory

The above section has drawn attention to the fact that the human being holds a number of cognitive models that are constantly being re-embedded and remodelled in the surroundings. This takes place on several cognitive and topographical levels: partly when using concrete spatial cues to navigate with, partly when using more abstract conceptions of space to think with (Christensen and Østergaard 2010). The model of topographic mind expresses this relationship (see Fig. 3; Hastrup 2005; Østergaard 2011). The model contains three semantic domains: the individual, materiality and historicity. These domains are unified in a fourth domain of experience and remembrance or what can be termed *topographic mind*. In this study, this analytic terminology will work as a schematic account that links the individual together with his/her topographical and historical setting. The geographical space refers to the existing, concrete world that can be physically experienced such as monuments, a given topographic element etc. Symbolic space refers to the conceptual reproduction of this space or its referential meaning. Hence, this schematization, in a quite visual way, deals with the fact that there are fundamental conceptual and mnemonic differences in whether one simply refers to a mythic narrative on an abstract level (*e.g.* by means of storytelling) or if one, on a more concrete level, experiences an engagement or interaction with them

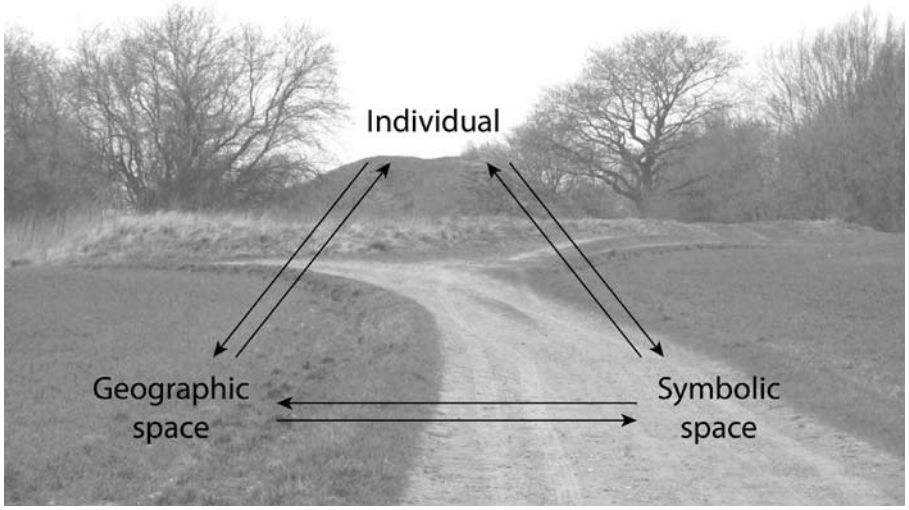

Fig. 3. Schematic account of the model of topographic memory.

(*e.g.* by means of navigation). This dialectics between physical experience and inference has been discussed elsewhere (Bernardini 2004; Hodder 1994) and can be seen as supplementary to the domains of geographical and symbolic space.

The model further argues that the locative coupling between geographic and symbolic space, between present and past, experience and reference, takes place on a very concrete level when an individual moves through a given semiotic landscape. When navigating in a landscape, the actor actively uses various topological properties and cultural elements as an active part of his/her wayfinding and memory processes. In this way, navigation in a concrete landscape also becomes navigation in a semantic landscape. The coupling of the above three domains is something that reoccurs in a number of other theoretical and empirical models (Gill 1998; Malafouris 2004). And in principle, it is very similar to the previously mentioned idea that the human being uses various concrete elements and experiences such as movement or spatial relations to comprehend more abstract phenomena, such as time, emotions, myths etc. (Boroditsky and Ramscar 2002; Lakoff and Johnson 1999, 34-35). However, the expounding of this model is tuned more towards a specific emphasis on movement and wayfaring as the main vehicle for the association of the individual with his/her historical context. Here the body and the motions of the body are crucial for the experience of a number of common principles and traditions. By structuring movement such as tempo, perspective, access etc., it is also potentially possible to induce a certain cognitive focus. Furthermore, the active use of the landscape to "move with" is crucial for the anchoring of socio-cultural memories and genealogical principles.

During wayfaring both the bodily space as well as the geographical space outside the body, constitute a basic frame of reference and define a number of spatial competences such as recognition and inference, sense of direction, navigation, geographical orientation and so on (Casey 2001; Levinson 2003, 9). These processes take place by means of both inscription and materialisation. On

a concrete topographical level, repeated navigation according to the same focal signatures will naturally result in specific routes and trails that appear as being more natural than others (Hastrup 2005, 145; Snead 2009). On the level of the individual, when the body moves through a meaningfully constructed landscape, the mnemonic activation is essentially bound to each agent since emotions as well as memories are anchored in the kinaesthetic apparatus. In this way memories are temporary, dynamic constellations attached to the bodily and spatially anchored emotions and therefore open to modifications and new situations (Connerton 1989, 72-104; Sinha and de López 2000, 28). On the other hand, movement and wayfaring will always entail an assimilation of generalized knowledge and values, because faring also is connected to deeply socially and culturally dependent rules and descriptions. These appear implicitly in the very layout of the road but also as explicit markings such as bumps, road signs, gates, landmarks etc. that crucially affect the way in which movement is configured. In this way, one is expected to adjust one's behaviour and move very differently depending on which social context one is in. Consequently, one has to be precautious not to presuppose a constant, unequivocal, and definitive balancing between individual, geographic, and symbolic space. Instead, one should probably understand the various focal signatures as material anchors (cf. Hutchins 1995, 2005) and common reference points rather than fixed symbolic "storages" (cf. Donald 1991). These anchors can be used, understood, and remembered in very different ways just as inconsistencies between spatial configurations, praxis and meaning contents are likely to occur (also see Boyer 1990; Sutton 2008, 41). By studying how memories are maintained and manipulated in different ways by means of meaningful actions in the landscape it is potentially possible to get a further insight into this multivocality.

It is my claim that roads and wayfaring played a central role in the organization of the Late Bronze Age landscape and worked as a fundamentally conceptual and mnemonic tool in the intersection between the individual actor and his/her geographical and symbolic surroundings. Not only did the barrow lines constitute a visually very prominent and extensive spatial structure that made orientation easier, but their linear experience was also essentially linked to movement, succession and accumulation. In this light the movement of the body played a central role in the conceptualisation of the world, just as roads entailed an ordering and maintenance of the social-ideological narratives attached to the barrows and the landscape.

Thus by focusing on wayfaring and communication lines it is potentially possible to get an insight into how the individual might have gained a contextual understanding of his/her surroundings in the Late Bronze Age.

Method

Methodologically, the study of Bronze Age roads is anchored in one of the oldest Danish archaeological research problematics and over time there have been various opinions on whether or not barrows can be used as reliable indications of communication networks (cf. this article, p. 233, see also La Cour 1927; Lundbye 1919; 1920; Mathiassen 1948). This paper, however, holds as a basic assumption that the barrow lines *did* to a large degree reflect traffic lines. It also holds as a

premise that these road/barrow complexes did not develop by chance (Gansum 1999) or reflect a random distribution, but rather that they emerged according to both local topographical and more general socio-ideological principles. Following this, it argues that the construction of the barrows, their reuse combined with the travel along them must have led to an increasing fixation of the mobility complex and a significant change of the surrounding landscape.

The area of investigation counts a 15 km long stretch from Ravnstrup Mølle and down to Havredal plantation where the barrow belt parts into two. The dataset consists of a collection of sites, based on various databases (*e.g.* The National Sites and Monuments Record), catalogues and publications (*e.g.* Aner and Kersten 2008; AUD; Broholm 1946; Freudenberg 1989; Frost 2008; Lidegaard 1983; 1992). The methodological approach is a three step process. First a mapping of all Late Bronze Age sites is carried out, including barrows, secondary burials, cooking pit lines and all other finds. Culture historical factors are added such as main roads and fords, traces of constructions etc. Secondly a number of natural variables such as hydrology and steepness are modelled (Schneider 2003). This part is hence very similar to least-cost path analyses that are frequently carried out in archaeological settings (Conolly and Lake 2006, 254). Third, I will carry out an analysis of the distribution of the barrows and an identification of the various linear structures. In this mapping, a main distinction is made between barrow lines and corridors. Barrow lines are defined according to a nearest-neighbour analysis with at least five barrows within a plausible line of sight and at a maximum distance of 500 m. When situated in several parallel, linear courses these can appear in broad so-called 'belts'. Barrow lines situated along a topographically plausible trackway are indicated with a thin black line. Minor isolated or less dense barrow lines are not included in the mappings but will be considered in the discussion. The corridors are possible main trackways that are defined in up to 500 m broad zones. Their actual extent, however, probably has been considerably broader. Corridors are defined by more extensive stretches either in direct connection with a barrow line or along a watershed. In this way, they both include large main lines that can continue for several kilometres and shorter more narrowly defined and locally used barrow lines.

Hence, the courses of the roads are identified according to three overall parameters: 1) obvious landscape conditions, 2) distributions of barrows, 3) archaeologically and historically known roads. Furthermore, viewshed-analyses have been carried out with an offset in a number of points that are related differently to the mobility complex such as at the foot and on top of barrows, random distributions with various distances to the corridors etc.

Because barrows are used as a main indication of roads, the roads are subject to many of the same source critical problems as the barrows. This means first of all a significant fragmentation problem due to patterns of modern land use, lacking registrations and datings etc. As previously mentioned, the barrow lines are expected to reflect a long-term fixation of a mobility pattern, but their actual date and length of use is predominantly unknown. At the same time, depending on which spatial scale one is analysing, different structures become evident. On one scale, say 1:2 000 000, an almost continuous and passacaglic structure appears

quite well-defined and visible. However, on a more local scale, say 1:20 000 this structure might not be identifiable at all on either maps or in the landscape. Hence the very extraction and definition of barrow lines is highly difficult to do in a formalised way. GIS-programmes with this specific purpose do exist, however, the structures that appear are still essentially crucially dependent on which spatial scale one is operating on (Conolly and Lake 2006, 41; Johansen *et al.* 2004, 41). By using barrow lines as guidelines for mobility lines, it is also a quite specific selection of roads that is being recognized in the material. In particular, identifying the smaller roads can be difficult because of their often shorter use span and equally weaker manifestation (Bakker 1976, 66; Rudebeck 2001, 96-97). Essentially, this provides a problem for the unscrambling of different types of roads, their different meaning and function, when and how they actually emerge, their intensity of use and how fixed in the landscape they really were. In this way, there are clear limitations to the quality and explanatory value of the material just as there is a risk of ending up with a circular argument between roads and barrows. However, I hope to overcome some of these provisos by comparing the different culture variables with nature variables and by focusing on the relationship between direct and referentially experienced elements.

The following sections present a brief summary of the placement of the roads in the two case study areas.

Late Bronze Age Himmerland

The landscape of south-western Himmerland is characterized by a fairly rolling terrain, divided by wetland areas, rivers and watercourses. Going 3000 years back in time, the area was dominated by an intensive cultural influence. In connection with the excavation of the Kvorning road, a number of borings and pollen samples were collected and analysed (Aaby 1993; see also Malmros 1993, 9-10). The pollen diagrams show a landscape where the vegetation was characterized by an increasingly open pasture land characterised by herbs, grasses, scattered hassle trees and bushes and areas of cultivation. They further show very high values for plantain red sorrel (*rumex acetosella*) and heather (*calluna vulgaris*), both indicating high pressure on the landscape due to grassing. This picture fits very well with the general picture of the rest of Denmark (Odgaard and Rasmussen 2000). The area also is known for a very high degree of Bronze Age settlement, probably comparable to that of Thy[6] (Jensen 1977). Furthermore, the landscape includes several intensively used ritual areas with scattered metal depositions and cooking pit lines which also correlate with central crossings and communication points (Frost 2008, 101-103). Thus, in Late Bronze Age the area accommodated various activities that must have attracted people and objects from far away, but also in itself was quite densely populated.

6 Also see Trandersbakkeøen (hill island) in Northern Jutland (Runge 2009).

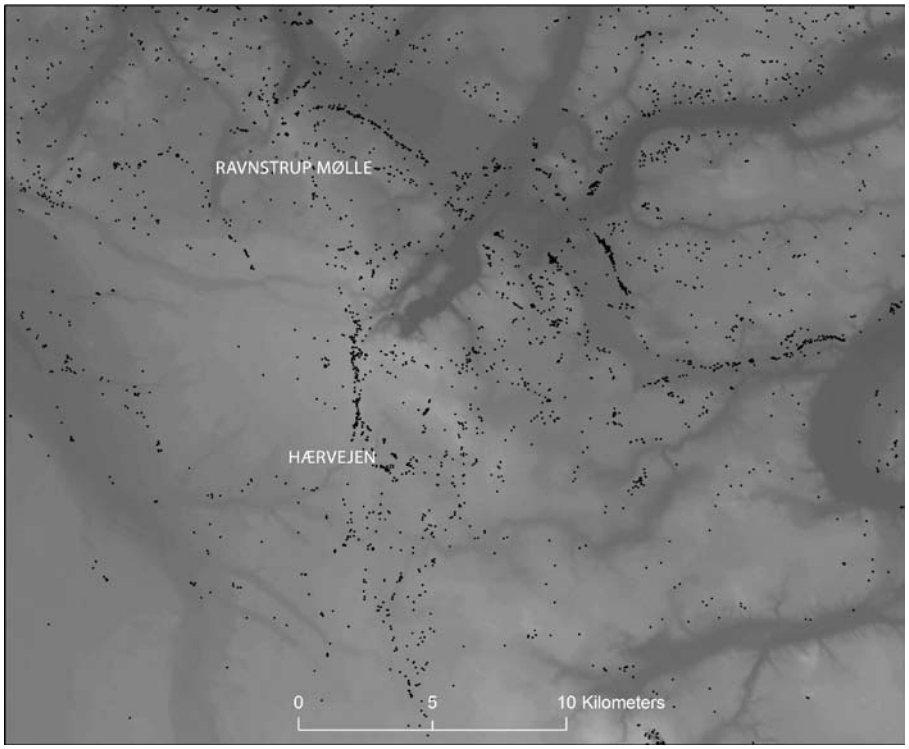

Fig. 4. The linear distributions of barrows within in the two case study areas. Used as a background map is dtm501, © KMS.

Ravnstrup Mølle and Hærvejen

Ravnstrup Mølle is located just off a central communication corridor called *Hærvejen*[7] (Fig. 4) – an old historical network of sunken roads and trackways running all the way from Viborg in the northern part of Jutland down to Bremen in Germany (Mathiessen 1930). It is marked by clusters of barrows and broad barrow belts that run more or less continuously down through the peninsula along the main water divide.

At Ravnstrup Mølle, two distinct barrow lines can be identified. They were first noticed back in the beginning of the 20th century by Sophus Müller who saw them as evidence of ancient roads (see Fig. 2). The first barrow line is situated right at the border between a wetland area and a hillside. Here the barrows quite precisely follow the 25 m contour line parallel to a modern day main road and mark exactly where it has been possible to move dry shod. Further west, the barrow line curves and runs across the plateau which is thought to indicate the course of an associated trackway. The other barrow line runs further to the south on the plateau and almost parallel to the lower lying barrow line. Both of these lines adjoin further to the east.

7 or alternatively called *The Oxen Road* or *Ochsenweg*.

Finally, a barrow line can be detected by the historical ford just west of Ravnstrup. Several Late Bronze Age depositions are concentrated at this place. Further south, the barrow line thins out, but then, where the landscape becomes flatter, it adjoins the barrow belts along Hærvejen. Here it is characterised by a very broad corridor, consisting of several barrow lines that run more or less continuously through the landscape. Also, by far the greatest number of Late Bronze Age barrow reburials commit to these linear structures and are centrally placed on evident barrow lines. A few Late Bronze Age flat graves in the northern part of Ravnstrup Mølle have a more dispersed position. Most of these are connected to settlement areas. These observations indicate a quite complex distribution where the majority of barrows, including barrows from the Single Grave Culture, are situated in connection to roads. At most places, they conclude in narrow lines of singular barrows that succeed each other with an even spatial distribution.

At other places the barrow lines become very broad and more extensive, so-called belts, often with three or four barrows and sometimes more along side each other. These distributions sometimes can be detected only on a large spatial scale such as that seen along Hærvejen south of Ravnstrup Mølle. This group also includes scattered distributions such as barrows on plateaus where, apparently, people have been travelling over a much broader area and where the roads would have been much less well-defined and not always marked in an explicit way. These barrow distributions are associated with the roads in (at least) two different ways. Either they work as *direct manifestations* of the road such as seen at Ravnstrup Mølle, where the barrows quite precisely follow an apt topographical stretch, or they predominantly work as *reference points*, placed in a more scattered way along the communication corridors as singular barrows or as broad belts such as seen along Hærvejen.

Furthermore a number of other find groups are somehow connected to the roads which also can be seen at the Nørreå river valley situated just a few km east of Ravnstrup Mølle. Settlement sites are typically found within a distance of 500 m or less from the communication lines, however, typically only two to four barrows are visible. This correlates with the observation that the Late Bronze Age secondary barrows appear to be situated in clusters within the barrow lines and points towards the fact that in these specific cases, one has probably used the local barrows in the vicinity of the settlement areas. Furthermore, cooking pit alignments seem to be connected to communication lines such as figure 5 and the several alignments in connection with the Fårdal-site.[8] These consist of one to three strings, up to several hundred meters long, and thus emphasize a general wish to maintain some simple linear principles and ideals. Finally, the metal depositions are also clearly attached to important places for transport and communication *e.g.* the metal depositions near the possible ford at Gammelbyvad (Broholm 1946, M86, 202), at Løvskal (Thrane 1967) and the deposit of a neck ring at Vigstrupgaarde (Kristiansen 1980, 87, fig. 1).

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8 This phenomenon has also been observed at a number of Swedish sites such as Fosie VI (Björhem 2001), Fjälkestad (Björk 1998) and Stretered (Nordqvist 2001; see also Rudebeck and Ödman 2000, 215).

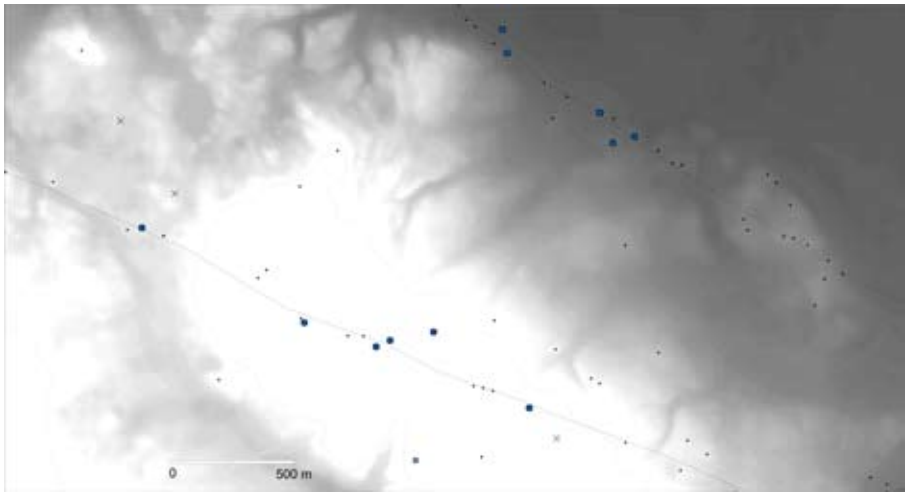

Fig. 5. Part of the southern barrow line at Ravnstrup Mølle. Black dots represent barrows. Blue dots represent barrows with Late Bronze Age reburials. And crosses represent concentrations or alignments of cooking pits. Used as a background map is dtm501, © KMS.

These various distributions may reflect different types and conceptualisations of roads that are likely to have been far more complex than today. On a practical level, the mobility lines must have been associated with very diverse functions, use intensities, scales, frequencies, continuities and time spans. Such as high frequently travelled main roads for obtaining raw materials, exchanging cattle and goods, accessing pasture land, seasonal or functional specific roads (*e.g.* leading out into settlement, ritual or resource areas) or more ritually evident, low frequent roads, procession roads, or roads that end in a cul-de-sac in the wet lands[9] etc.

However, examples also exist that demonstrate no apparent nexus. Instead the barrows are concentrated in distinct groups or clusters, at topologically impassable locations, or much more widely scattered in the landscape without any distinct pattern. Especially the very broad routes where one has been travelling over a far larger area cause a more blurred picture. Others again are used as an accentuation of certain topographic elements that do not seem to relate to communication corridors. These are *e.g.* shorter barrow lines in very hilly or humid terrain or cooking pit lines that show no clear connection to roads. These examples point towards the fact that there are some principles of the line that are copied or used in other semantic contexts but not necessarily directly associated with or dependent on roads. Within this group some main characteristics can be identified:

- Most of the burials without any evident connection to road stretches are flat graves and cremation pits, often found in connection to settlement areas.
- These graves have no or very little physical manifestation in the landscape and do not have nearly the same long-term mode of expression as the barrows.
- When these graves appear as reburials in barrows, they show a significantly shorter use period and most often contain only one or two burials.

9 See *e.g.* Jørgensen 2001, 9.

Thus, although there is a clear tendency towards emerging linear structures, a significant variation exists in the different principles for the way in which the barrows and roads are visually and semantically connected. The distribution maps are clearly an accumulation of all of these different spatial tenets, where some barrows clearly are connected to central communication lines whilst others are placed further away and cannot be connected directly to the same causality. However, these patterns reflect an "old design" in the sense that they are all erected in the Early Bronze Age or earlier. If we shift our focus to the Late Bronze Age, a somehow clearer pattern appears in the relationship between burials and possible movement patterns where by far most of the burials are found in close connection to barrow lines and communication corridors. Thus most of the barrows worked as a direct manifestation of the roads, others whose linearity was only visible in terms of movement along the roads and others again could not be identified as any clear structures. The significant routes appear either as narrow, linear courses or as broad belts or corridors that would have been relatively stable in the landscape and point to the fact that people did not just adopt new roads, but instead participated in a constant fixation and continuity in their use. To explain these distributions further lets for a moment return to the model of topographical mind.

Discussion

Reference and experience

In Scandinavia, the Late Stone Age and Early Bronze Age are characterized by an overwhelming boom in barrow construction. This phenomenon probably involved the activation of very large networks of people participating in the different actions connected to the barrow building. That is, people are likely to have been more or less directly involved in the construction of one or several barrows during a lifetime (Holst and Rasmussen *in press*). These collective, meaningful actions and events ensured a frequent renegotiation and maintenance of a number of socio-ideological principles. However, around 1400 BC the barrow building praxis appears to have reached its peak, and at the beginning of the Late Bronze Age it must have been a very rare activity. Therefore the previous more or less direct and experiential engagement with the barrows and in the construction of a collective past changed into a completely different form. In the open pasture land the barrows had become an increasingly dominating visual factor. Also, some barrows show signs of phases of extensions, additions of kerb stones etc.; however, increasingly, the barrows came to act as reference points in the landscape rather than as a locus for direct, participatory experience. This meaning fixation must have created uncertainty in that a number of elements and details were probably forgotten, simplified, modified etc.[10]

As noticed in the summative exposition, barrows with a very long use span, the barrows that were commemorated and that people attached themselves and their dead to, were the barrows that would have been connected to central linear

10 For similar observations of an Iron Age settlement landscape, see Loney and Hoaen 2005, 369.

road stretches that were travelled by people over a very long time. Therefore, in all probability, *roads* and *movement* became increasingly important. By means of movement, discontinuous, imagistic and abstract elements were made continuous, logical and doctrinaire. By frequently passing the barrows, it made something otherwise used low frequently, high frequent (Whitehouse 2002). And by means of spatial proximity between barrows and roads, something previously intangible and passive became highly experiential and participatory. Therefore roads and axes of movement were likely to have gained an increasingly important role in this period. Although many barrows possibly worked as road markers right from the beginning of their construction (Thrane 1998, 274) there appears a growing emphasis on this relationship – where people increasingly confirmed the mobility structures by burying their dead in close connection to them. But how did this syntax actually work and how did it play out in a local context? What determined the interplay between barrows and roads? And why do we also see distributions that are much more blurred and inscrutable?

Lines of movement, lines of thinking

Presumably each individual barrow referred to a specific biography, individual ontological and biological status and equally represented a unique affiliation with the landscape (Holst and Rasmussen *in press*): barrows were erected by particular people, at a certain time, in a certain place, with particular intentionalities. Concurrently, the roads worked as a far more abstract, common knowledge conduct and a socio-spatial filter whereby the individual biographies were placed in larger, extensive narratives and semiotic connections. Here the very narrowly defined stretches such as the northern barrow line at Ravnstrup (Fig. 6) would clearly have exposed certain barrows and outlined a certain perspective on the landscape.

If you step just 20 m to the side, the overview is heavily reduced. This constellation and its interplay with the topography induce that one's visual field is specifically directed forward and out over the wetland area. No panoramic overview exists from any of the barrows. Instead, when moving in an east-west direction, you would have been able to see six to nine barrows, often at least 200 m ahead at a time. These circumstances would, to a very high degree, define a cognitive and spatial focus and at the same time induce a significant selection in the common, spatially distributed knowledge. In such complexes, the road served as an essential cognitive offloading where the very layout and properties of the barrow lines constituted a perceptually salient structure. In many cases, this would have meant that each individual would not necessarily have had to remember all the material references because the route and spatial emphasis on the narrative sequence were already given. This example shows that the road appeared as a dynamic, semiotic probe that would outline a very specific fixation, sequence, different tempos, perspectives and structures from the religious narratives.

This is also evident, though by means of a different kind of movement, at the broad stretches and barrow zones/belts that are placed on the top of ridges along the land and waterways. This phenomenon can *e.g.* be seen further south along Hærvejen (see Fig. 7).

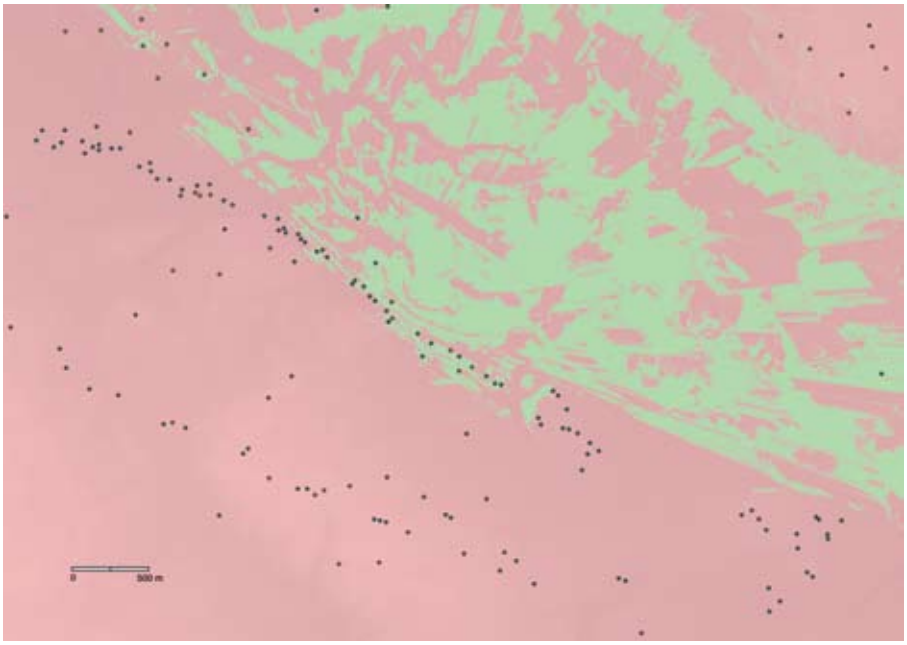

Fig. 6. Viewshed carried out from a centrally placed barrow with Late Bronze Age secondary burials within the northern barrow line at Ravnstrup Mølle.

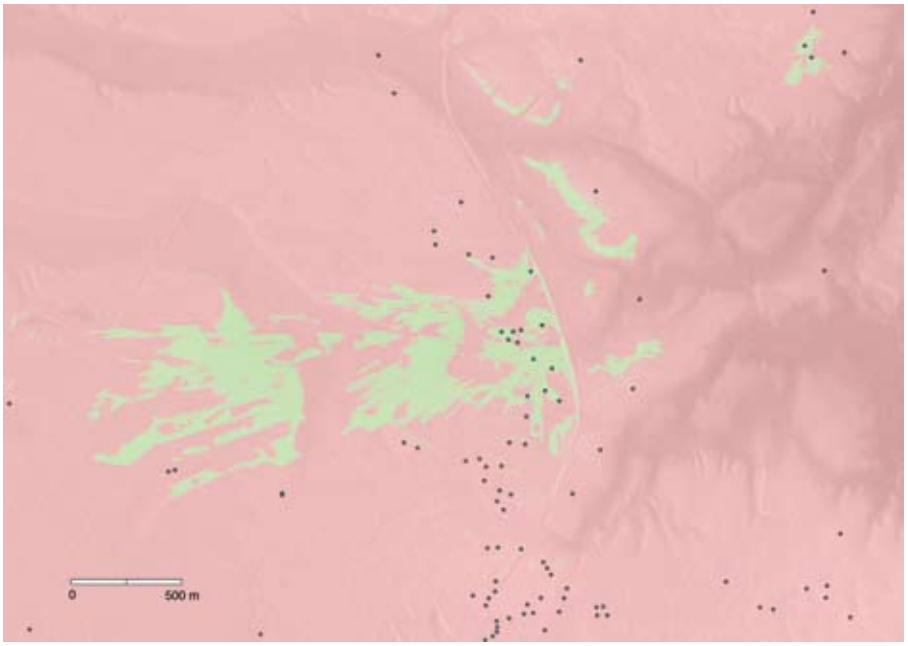

Fig. 7. Viewshed carried out from a centrally placed barrow within the barrow belts along Hærvejen at Skjelhøj, south of Ravnstrup Mølle.

These examples indicate a much broader and more loosely defined road stretch than that at Ravnstrup Mølle with a larger degree of individuality in the separate courses. Here the experience of linearity is often interrupted by depressions and variations in the terrain, the vista is often broader and a proper outline of the stretch only can be gained punctuated. However, one gets a much clearer view of the linearity by actually walking besides the barrow belt and some 500 m to the side of it, the barrow line appears as a very clear and prominent feature of the landscape. This vista decreases dramatically after 600 m and at 900 to 1000 m, at some points, you can only see very little of it.

A somewhat supplementary example can be found at the south facing slope of the Nørreå tunnel valley (Løvschal 2011). The area counts a very large number of Stone Age and Bronze Age barrows and is well-known for the discovery of the Kvorning-road from 1000 BC that runs north-south into the wetland area for almost 150 m (Iversen 1996). A broad barrow belt is placed at the top of and down the edge of a ridge; thus the barrows are situated in a rolling terrain with an equally low accessibility, but with a fairly prominent position in the landscape, where one would have been able to see them when travelling both along the plateau and the river. Topographically, the watershed runs further up the plateau, indicating the driest and flattest part of the landscape and therefore also the most likely stretch for the road to run. And this is exactly where by far the most secondary burials from the Late Bronze Age are located. Barrows with a very long continuity and up to 50-60 reburials are located predominantly centrally within these linear structures. An example is the previously mentioned Nøragergård Høje II.

These examples draw a picture of some very common structures that existed on a fairly large scale; systems, where the material anchoring essentially was bound down to some very strong spatial structures that entailed a large degree of homogenisation. However they also point to the fact that these spatial structures did not essentially exist as complete "maps" in the mind – but rather as deeply embedded in more experiential and visual couplings. The configuration of the topography and the position of the barrows entail, that one single panoramic, Euclidian overview of the landscape would not have existed. Rather, the experience of linearity would only have been possible by means of physical movement through the landscape.

Topographical mind

According to the model of topographic mind, movement through a semantic landscape involves a constant semiotic mediation between the domains of the individual, geographical space and symbolic space (cf. this article, p. 230-231). When walking along different geographical elements such as barrows, the individual could actively use this socio-spatial topography to conceptualise the mythical narratives that were connected to each one of them. In this way different various elements and episodes would have been joined together into "true", narrative sequences that were constantly being incorporated into an individual meaning context. Thus the road provided an intelligible, graspable structure that could be used intuitively to understand the historical configuration of the landscape.

Also, as these meaning coherences were physically and conceptually coupled, they were crucially, individually anchored and thereby subject to a number of different choices and points of reference.

At the same time, on a larger social scale, the roads must have ensured that the barrows were included in a common commemoration of the landscape. The roads for the dead somehow also became roads for the living. Just like the topography of the landscape was used to give some barrows a strong visual prominence, equally this socio-ideological infrastructure could be used to give them a strong social mnemonic prominence. The roads also insured that, although with time the individual biographies and narrative attached to each barrow were forgotten, they would still have been part of a very strong common socio-topographical syntax. As a result the roads acted as a fundamental mnemonic tool and as a way of maintaining and manipulating conceptual integration by exposing certain barrows and directing a certain perspective on the landscape (see also Lidegaard 1992, 16). In this way, the road-barrow complex constituted a recognizable structure connected to a number of more or less explicit descriptions.

These observations point towards the fact that barrows and mobility lines worked as two mutually dependent landscape components that played very different roles in both individual and collective memory and sensory perception. Where, on the one hand, the road worked as a central landscape structure and a basic mnemonic device that connected different landscape elements and ensured commemoration. On the other hand, the barrows served as conceptual and material anchors for the roads – either as clear accentuations of the linear structure or as focal reference points.

In the dynamic interplay between roads and barrows, the barrows did not just represent a specific person, social group or event. Rather, as suggested earlier, most of the individual components were sustained via a referential, homogenous meaning where the reburials would have served as an ongoing confirmation of the given order or tradition. This implies a conversion from concrete to general, and to a certain degree also a reduction of the specific genealogic memory attached to the individual barrows (see also Gosden and Lock 1998). And when a given barrow fell out of use, such as those on figure 8 or just north of the northern barrow line at Ravnstrup Mølle, one would have kept on passing it when moving along the trackways. At the same time, this syntax entails that a number of more scattered barrows fell out of use and became neglected. Because of the fact that they were not incorporated in the road-barrow syntax and one did not necessarily pass them, they were more likely to pass into oblivion and fall out of use much faster.

In this way, parts of the mobility complex appear very homogenous and strongly structured and many places indicate a quite strong wish to retain some simple linear principles and common spatial traditions. Other parts appear much more individualized and localised and hint at a far larger complexity than we are currently able to understand.

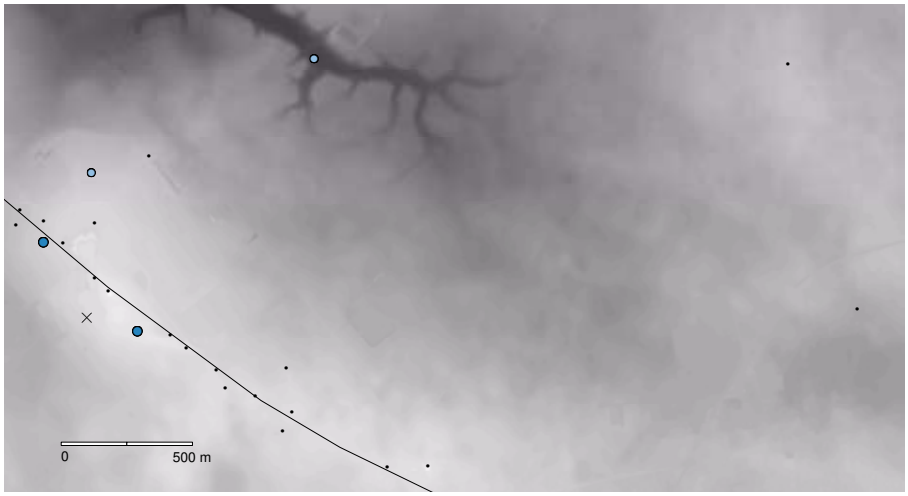

Fig. 8. Barrow line with secondary graves, a burial site, a cooking pit alignment, and two dispersed flat graves in the Nørreå river valley. Used as a background map is dtm501, © KMS.

Concluding thoughts

These considerations point to the fact that roads and barrow lines were not purely functional or economical elements neither did they only represent by-products of certain use patterns. The roads rather appear to have been a dominating organisational structure and a landscape principle that was actively maintained and used to legitimize a common knowledge tradition and praxis. Similar examples are known from several Scanic sites such as Pile and Käglingevägen where Bronze Age barrows constitute a main axis on stretches of roads, and where the flat graves are situated both in connection to them and further away (Jansen 2006; Rudebeck and Ödman 2000; also see Samuelsson 2001, 179, fig. 2). Even far into the Iron Age, the tradition of burying the dead along roads continues, and a vast number of burial sites are placed along old trackways, such as those known from Western Jutland (Rindel 1999), Southern Britain (Fleming 1971, 162) and Sweden (Andersson 1997, 7; Wennersten 1991).

The above observations suggest that the roads, on the one hand, were part of a common, ideological meaning system, contingent on consensus, and on the other hand as a way of maintaining a substantial differentiation, individualization, and complexity in the narratives and spatial relations. In both cases, the roads appeared as a central conceptual resource for mnemonic offloading and either meant that you had to remember very little or in fact that you could remember very much. I argued that not only did the conceptual anchoring of this system take place in the landscape, but just as much in the body itself. Although a significant part of the experience and memory was directed by the barrow lines, the very cognitive stability was essentially dependent on movement along the roads, which

in themselves were not a very physically marked feature.[11] The construction and experience of linearity in the barrows was not necessarily a characteristic for the whole Bronze Age but increasingly emphasised during the later part of the period. In this way, the individual probably came to play an increasingly important role in his/her own semiotic surroundings.

Acknowledgements

I am very thankful to Mads Kähler Holst for useful comments and discussions of the text and to Lise Frost (Moesgård Museum), Martin E. Mikkelsen (Viborg Stiftsmuseum), and Helga Schütze (The National Museum) for facilitating some key materials.

Bibliography

Aaby, B. 1993. Naturvidenskabelige undersøgelser i dalen ved Kvorning, Viborg amt, og deres udsagn om naturforholdene omkring et vejanlæg for yngre bronzealder –ældre jernalder. *NNU rapport* 1993(11).

Aner, E. and Kersten, K. 2008. *Die Funde der älteren Bronzezeit des nordischen Kreises in Dänemark, Schleswig-Holstein und Niedersachsen.* Bd. 12: Viborg Amt. Copenhagen, Neumünster: Nationalmuseet, Wachholtz.

Andersson, M. 1997. *Vägars kulturvärden*. Riksantikvarieämbetet: Riksantikvarieämbetet.

Bakker, J.A. 1976. On the Possibility of Reconstructing Roads from the TRB Period. *Berichten van de Rijksdienst voor het Oudheidkundig Bodemonderzoek* 26. Amersfoort, 63-91.

Barsalou, L.W. 1999. Perceptual symbol systems. *Behavioural and Brain Sciences* 22, 577-660.

Barsalou, L.W. 2008. Grounded cognition. *Annual Review of Psychology* 59, 617-45.

Barsalou, L.W., Niedenthal, P.M., Barbey, A.K. and Ruppert, J.A. 2003. Social Embodiment, in: Ross, B.H. (ed.). *The psychology of learning and motivation: Advances in Research and Theory 43*. San Diego (C.A.): Academic Press, 43-92.

Barsalou, L.W., Barbey, A.K., Simmons, W.K. and Santos, A. 2005. Embodiment in Religious Knowledge. *Journal of Cognition and Culture* 5(1-2), 14-57.

Bernardini, W. 2004. Hopewell geometric earthworks. *Journal of Anthropological Archaeology* 23(3), 331-356.

Berthoz, A. 2000. *The Brain's Sense of Movement*. Cambridge (Mass.): Harvard University Press.

11 Such as *e.g.* proposed in the cognitive storage metaphor (Donald 1991; Renfrew and Scarre 1998). This is somehow another way of understanding external stability than what is most frequently evoked by theories such as the extended mind etc.

Björhem, N. 2001. En (för)historisk väg, in: Larsson, L. (ed.). *Kommunikation i tid och rum*. Report Series No. 82. Lund: University of Lund, 61-72.

Björk, T. 1998. Härdar på rad. Om spåren efter en kultplats från bronsåldern. *Fornvännen* 93, 73-9.

Boroditsky, L. and Ramscar, M. 2002. The roles of body and mind in abstract thought. *Psychological Science* 13(2), 185-9.

Boyer, P. 1990. *Tradition as truth and communication: A cognitive description of traditional discourse.* Cambridge: Cambridge University Press.

Broholm, H.C. 1946. *Danmarks Bronzealder bd. 3.* Copenhagen: Nyt Nordisk Forlag.

Bruner, J. 1990. *Acts of Meaning*. Cambridge M.A.: Harvard University Press.

Casey, E.S. 2001. Between Geography and Philosophy: What Does It Mean to Be in the Place-World? *Annals of the Association of American Geographers* 91(4), 683-93.

Christensen, D.R. and Østergaard, J. 2010. Walking towards oneself: Authentification of Place and Self, in: Knudsen, B.T. and Waade, A.M. (eds.). *Re-investing authenticity*. Tourism and Cultural Book Series. Leeds: Leeds Met, 241-253.

Clark, A. and Chalmers, D. 1998. The extended mind. *Analysis* 58(1), 7-19.

Connerton, P. 1989. *How Societies Remember.* Cambridge: Cambridge University Press.

Conolly, J. and Lake, M. 2006. *Geographical Information Systems in Archaeology*. Cambridge: Cambridge University Press.

Day, M. 2004. Religion, Off-Line Cognition and the Extended Mind. *Journal of Cognition and Culture* 4(1), 101-21.

Donald, M. 1991. *Origins of the Modern Mind. Three Stages in the Evolution of Culture and Cognition*. Cambridge (Mass.); London: Harvard University Press.

Egeberg, T. 2004. Høje og hjulspor i tusindvis – færdsel i det vestjyske landskab. *FRAM* 2004, 44-51.

Fleming, A. 1971. Bronze Age agriculture on the marginal lands of north-east Yorkshire. *Agricultural History Review* 19, 1-24.

Fodor, J. 1983. *The Modularity of Mind.* Cambridge: MIT Press.

Freudenberg, M. 1989. *Studien zu vertikalen sozialen Strukturen: eine Analyse der Grabfunde der jüngeren Bronzezeit in Dänemark* (Bd. I-II). BAR international series 524. Oxford: B.A.R.

Frost, L. 2008. *Depotfundene i Himmerlands yngre bronzealder i et landskabsarkæologisk perspektiv*. PhD thesis, Aarhus University, Section for Prehistoric Archaeology.

Gansum, T. 1999. Veier uten forbindelse? Positivisme og sosialteori i veiforskningen. *META* 1, 24-37.

Gill, S. 1998. Territory, in: Taylor, M.C. (ed.). *Critical Terms for Religious Studies*. Chicago: The University of Chicago Press, 298-313.

Glenberg, A.M. 1997. What Memory is for. *Behavioral and Brain Sciences* 20(1), 1-55.

Gosden, C. and Lock, G. 1998. Prehistoric histories. *World Archaeology* 30(1), 2-12.

Hansen, V. and Nielsen, H. 1979. Oldtidens veje og vadesteder belyst ved nye undersøgelser ved Stevns. *Aarbøger for Nordisk Oldkyndighed og Historie* 1977, 72-117.

Hastrup, K. 2005. Social anthropology. Towards a pragmatic enlightenment? *Social Anthropology* 13(2), 133-49.

Hodder, I. 1994, Architecture and meaning: the example of Neolithic houses and tombs, in: Pearson, M.P. and Richards, C. (eds.). Architecture and Order: approaches to social space. London: Routledge, 73-86.

Holst, M.K. and Rasmussen, M. *in press*. Combined Efforts: The cooperation and coordination of barrow-building in the Bronze Age, in: Jessen, M.D., Johannsen, N.N., and Jensen, H.J. (eds.). *Excavating the Mind: Cross-sections through culture, cognition and materiality.* Aarhus: Aarhus University Press.

Hutchins, E. 1995. *Cognition in the Wild*. Cambridge, MA: MIT Press.

Hutchins, E. 2005. Material anchors for cognitive blends. *Journal of Pragmatics* 37, 1555–1577.

Iversen, M. 1996. Fund fra Kvorning-vejen, in: Vellev, J. (ed.). *P.S. 2. Postscriptum til kulturhistoriske undersøgelser på Viborg-egnen*. Højbjerg: Forlaget Hikuin, 7-16.

Jacob-Friesen, G. 1970. Skjerne und Egemose. Wagenteile südlicher Provenienz in skandinavischen Funden. *Acta Archaeologica* 40, 122-57.

Jansen, J. 2006. Vägar och kommunikation ur arkeologisk synsvinkel – en presentation av ett pågående projekt, in: Qviström, M. (ed.). *Gångna landskap: möten mellan väghistoria och landskapshistoria*. Rapport 06:1. Alnarp: Institutionen för Landskapsplanering Alnarp, 56-62.

Jensen, S. 1977. Byhøjene i Thy og aspekter af samfundsudviklingen i ældre jernalder. *MIV* 6, 64-77.

Johansen, K.L., Laursen, S.T. and Holst, M.K. 2004. Spatial patterns of social organization in the Early Bronze Age of South Scandinavia. *Journal of Anthropological Archaeology* 23, 33-55.

Jørgensen, M. S. 1982. To jyske bronzealderveje – og en ny metode til arkæologisk opmåling. *Nationalmuseets arbejdsmark* 1982, 142-53.

Jørgensen, M. S. 1996. Oldtidens veje i Danmark. *Braut* I, 37-62.

Jørgensen, M. S. 2001. Forhistoriske veje. Nogle problemer og perspektiver med udgangspunkt i dansk materiale, in: Larsson, L. (ed.). *Kommunikation i tid och rum*. Report Series No. 82. Lund: University of Lund, 3-14.

Kristiansen, K. 1980. To forsvundne depotfund fra den yngre bronzealder fundet på Viborgegnen. Et bidrag til bronzealderdepoternes fundhistorie i Viborg amt. *MIV* 10, 86-96.

La Cour, V. 1927. *Sjællands ældste Bygder: En Arkæologisktopografisk Undersøgelse*. Copenhagen: H. Aschehoug.

Lakoff, G. and Johnson, M. 1999. *Philosophy in the Flesh: The Embodied Mind and its Challenge to Western Thought*. New York: Basic Books.

Levinson, S.C. 2003. *Space in language and cognition: explorations in cognitive diversity*. Language, culture, and cognition 5. New York: Cambridge University Press.

Lidegaard, M. 1983. *Hærvejen i Himmerland.* Copenhagen: Schultz.

Lidegaard, M. 1992. *Hærvejen fra Limfjorden til Dannevirke*. Copenhagen: Nyt Nordisk Forlag.

Loney, H. and Hoaen. A. 2005. Landscape, memory and material culture: interpreting diversity in the Iron Age. *Proceedings of the Prehistoric Society* 71, 361-378.

Lundbye, J. T. 1919. Vejenes Udviklingshistorie i Danmark. *Fortid og Nutid* 2, 129-43.

Lundbye, J. T. 1920. Vejenes Udviklingshistorie i Himmersyssel. *Fra Himmerland og Kjær Herred* 1920, 417-45.

Løvschal, M. 2011. Mellem høj og hjulspor: landskabsarkæologiske perspektiver på vejene i Viborg-området i yngre bronzealder, in: Boddum, S., Mikkelsen, M. and Terkildsen, N. (eds.). *Depotfund i yngre bronzealders lokale kulturlandskab*. Yngre bronzealders kulturlandskab vol. 1. Viborg: Viborg Stiftsmuseum & Holstebro Museum, 81-96.

Madsen, A.P. 1872. *Afbildninger af danske Oldsager og Mindesmærker. Bronzealderen II.* Copenhagen: H.H. Rasmussen.

Malafouris, L. 2004. The Cognitive Basis of Material Engagement: Where Brain, Body and Culture Conflate, in: DeMarais, E., Gosden, C. and Renfrew, C. (eds.). *Rethinking Materiality: the engagement of mind with the material world.* Cambridge: McDonald Institute for Archaeological Research, 53-62.

Malafouris, L. and Renfrew, C. 2010. The Cognitive Life of Things: Archaeology, Material Engagement and the Extended Mind, in: Malafouris, L. and Renfrew, C. (eds.). *The cognitive life of things: Recasting Boundaries of the Mind*. Cambridge: McDonald Institute Monographs, 1-12.

Malmros, C. 1993. Analyse af træ fra bronzealdervejen ved Kvorning, Viborg amt. *NNU rapport* 1993(8).

Mathiessen, H. 1930. *Hærvejen: En tusindaarig vej fra Viborg til Danevirke.* Copenhagen: Gyldendal.

Mathiassen, T. 1948. *Studier over Vestjyllands Oldtidsbebyggelse*. Copenhagen: Gyldendal.

Müller, S. 1897. *Vor Oldtid: Danmarks forhistoriske Archæologi.* Copenhagen: Nyt Nordisk Forlag.

Müller, S. 1904. Vei og bygd i sten- og bronzealderen. *Aarbøger for Nordisk Oldkyndighed og Historie* 1904, 1-64.

Nordqvist, B. 2001. En kultplats vid Stretered, in: Flodin, L. and Modig, A. (eds.). *Möten med forntiden. Arkeologiska fynd år* 2000. Stockholm: Riksantikvarieämbetets förlag, 45-7.

Odgaard, B.V. and Rasmussen, P. 2000. Origin and temporal development of macro-scale vegetation patterns in the cultural landscape of Denmark. *Journal of Ecology* 88, 733-748.

Renfrew, C. and Scarre, C. 1998 (eds.). *Cognition and Material Culture: The Archaeology of Symbolic Storage*. Cambridge: MacDonald Institute for Archaeological Research.

Rindel, P.O. 1999. Development of the village community 500 BC-100 AD in west Jutland, Denmark, in: Fabech, C. and Ringtved, J. (eds.). *Settlement and Landscape: a conference on landscape and settlement archaeology, Århus, Denmark May 4-7 1998*. Højbjerg: Jysk Arkæologisk Selskab, 79-99.

Rudebeck, E. 2001. Vägskel, vägkorsningar och vadställen – liminala platser och arkeologi, in: Larsson, L. (ed.). *Kommunikation i tid och rum*. Report Series No. 82. Lund: University of Lund, 93-112.

Rudebeck, E. 2002. Vägen som rituell arena, in: Jennbert, K., Andrén, A. and Raudevere, C. (eds.). *Plats och Praxis - studier av nordisk förkristen ritual*. Lund: Nordic Academic Press, 167-200.

Rudebeck, E. and Ödman, C. 2000. *Kristineberg – en gravplats under 4500 år*. Malmöfynd 7. Malmö: Stadsantikvariska avdelingen, Kultur Malmö.

Rumelhardt, D.E. and McClelland, J.L. 1986. *Parallel Distributed Processing: Explorations in the Microstructure of Cognition.* I: Foundations. Cambridge: MIT Press.

Runge, M. 2009. *Nørre Hedegård: en nordjysk byhøj fra ældre jernalder*. Jysk Arkæologisk Selskabs skrifter 66. Højbjerg: Jysk Arkæologisk Selskab.

Samuelson, B.-Å. 2001. Kan gravar spegla vägars ålder och betydelse? Ett eksempel från Söderslätt i Skåne, in: Larsson, L. (ed.). *Uppåkra. Centrum i analys och rapport*. Uppåkrastudier 4. Acta Archaeologica Lundensia, Series in 8° ; 36. Stockholm: Almqvist & Wiksell, 177-84.

Schovsbo, P.O. 1987. *Oldtidens vogne i Norden: arkæologiske undersøgelser af mose- og jordfundne vogndele af træ fra neolitikum til ældre middelalder*. Frederikshavn: Bangsbomuseets forlag.

Schneider, B. 2003. *Surface Networks: Extensions of the Topology and Extraction from Bilinear Surface Patches* (Online). Available at: http://www.geocomputation.org/2003/Papers/Schneider_Paper.pdf

Sheets-Johnstone, M. 1999. *The Primacy of Movement.* Advances in consciousness research 14. Amsterdam: John Benjamins.

Sinha, C. and de López, K.J. 2000. Language, culture and the embodiment of spatial cognition. *Cognitive Linguistics* 11(1-2), 17-41.

Snead, J.E. 2009. Trails of tradition: movement, meaning, and place, in: Snead, J.E., Erick, C.L. and Darling, J.A. (eds.). *Landscapes of Movement: Trails, Paths, and Roads in Anthropological Perspective:* Philadelphia: University of Pennsylvania, University Museum Press, 42-60.

Sutton, J. 2008. Material Agency, Skills and History: Distributed Cognition and the Archaeology of Memory, in: Knappett, C. and Malafouris, L. (eds.) *Material Agency: towards a non-anthropocentric approach*. New York, London: Springer, 37-55.

Sutton, J. 2009. Remembering, in: Robbins, P. and Aydede, M. (eds.). *Cambridge Handbook of Situated Cognition.* Cambridge, New York: Cambridge University Press, 217-35.

Sutton, J., Harris, C.B., Keil, P.G. and Barnier, A.J. 2010. The psychology of memory, extended cognition, and socially distributed remembering. *Phenomenology and the Cognitive Sciences* 9(4), 521-560.

Thorvildsen, K. 1973. En gammel vej – en ny datering. *MIV* 3, 80-1.

Thorvildsen, K. and Kehler, S. 1966. *Med arkæologen Danmark rundt*. Copenhagen: Politikens Forlag.

Thrane, H. 1963. De første broncebidsler i Mellem- og Nordeuropa. *Aarbøger for nordisk Oldkyndighed og Historie*, 50-99.

Thrane, H. 1967. Hoards of the Danish Bronze Age (Mont. 4). Set 2, DK 5 - DK 10 (12 cards), in: Becker, C.J. (ed.). *Inventaria archaeologica: corpus des ensembles archeologiques.* Bonn: Rudolt Habelt.

Thrane, H. 1984. *Lusehøj ved Voldtofte - en sydvestfynsk storhøj fra yngre broncealder*. Fynske studier 13. Odense: Odense Bys Museer.

Thrane, H. 1998. The Effects of the Bronze Age on the Environment and Culture in Scandinavia, in: Hänsel, B. (ed.). *Mensch und Umwelt in der Bronzezeit Europas*. Kiel: Oetker-Voges Verlag, 271-280.

Turnbull, D. 2007. Maps Narratives and Trails: Performity, Hodology and Distributed Knowledges in Complex Adaptive Systems – an Approach to Emergent Mapping. *Geographical Research* 45(2), 140-9.

Wennersten, M. 1991. Vägarna och gravfältet: Tre vägar vid Annelund, in: Österholm, I. (ed.). *Ur den gotländska jorden: Glimtar från arkeologiska undersökningar*. Arkeologiska skrifter från Riksantikvarieämbetets Gotlandsundersökningar 1991:1. Visby: Riksantikvarieämbetets Gotlandsundersökningar, 20-2.

Whitehouse, H. 2002. Modes of religiosity: Towards a cognitive explanation of the socio-political dynamics of religion. *Method & Theory in the Study of Religion* 14(3-4), 293-315.

Wilson, M. 2002. Six Views of Embodied Cognition. *Psychonomic Bulletin & Review* 9(4), 625-36.

Winkler, M. 2001. Vägen från Södra Sallerup, in: Larsson, L. (ed.). *Kommunikation i tid och rum*. Report Series No. 82. Lund: University of Lund, 41-9.

Zlatev, J. 2005. What's in a schema? Bodily mimesis and the grounding of language, in: Hampe, B. (ed.). *From Perception to Meaning: Image Schemas in Cognitive Linguistics.* Berlin: Mouton de Gruyter, 313-342.

Østergaard, J. 2011. *The Topographic Mind*. PhD dissertation. Department of the Study of Religion, Aarhus University.

Web-pages

AUD:
www.kulturarv.dk/publikationer/publikation/artikel/arkaeologiske-udgravninger-i-danmark/

The National Sites and Monuments Record:
www.kulturarv.dk/fundogfortidsminder/

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Part IV
Monument building
an evolutionary approach

The Bet-Hedging Model as an Explanatory Framework for the Evolution of Mound Building in the Southeastern United States

By Evan Peacock and Janet Rafferty

Abstract

Recent work in eastern North America has demonstrated that mound building first occurred in the mid-Holocene, as much as 6000 years ago, when human groups practiced a hunting-gathering lifestyle. Early (Archaic-period) mounds are concentrated in areas where environmental conditions show high-amplitude fluctuations over time. Under such conditions, evolutionary theory predicts that population-leveling activities (bet-hedging) would be selected for, a hypothesis first suggested for Archaic mound building by Hamilton (1999). Contrary to recent assertions, existing data on paleoclimate and the timing of mound construction in the Lower Mississippi Valley (LMV) do not falsify Hamilton's hypothesis. Bet-hedging also explains why early mounds are more common in the southern LMV, where environmental conditions are particularly variable and where sedentary settlement patterns had evolved by the mid-Holocene. A south-to-north pattern in the inception of mound building is noted which may also be related to underlying environmental patterns. This successful application of evolutionary theory has implications for understanding construction of monumental architecture and other "wasteful" human activities in many settings around the globe.

Keywords: *Mounds, Archaic period, evolutionary theory, bet-hedging, southeastern United States, Lower Mississippi Valley*

Introduction

One of the most important breakthroughs in American archaeology in recent decades has been the demonstration that mound building occurred in some parts of what is now the southeastern United States as much as 6000 years ago (Kidder and Sassaman 2009). Not only did this discovery effectively double the known antiquity of monumental earthen architecture in North America north of Mexico, but multiple occurrences show that the practice of mound construction was common to many Middle (6000–3500 BC) and Late (3500–500 BC) Archaic-period societies in Florida and the Lower Mississippi River Valley (approximately

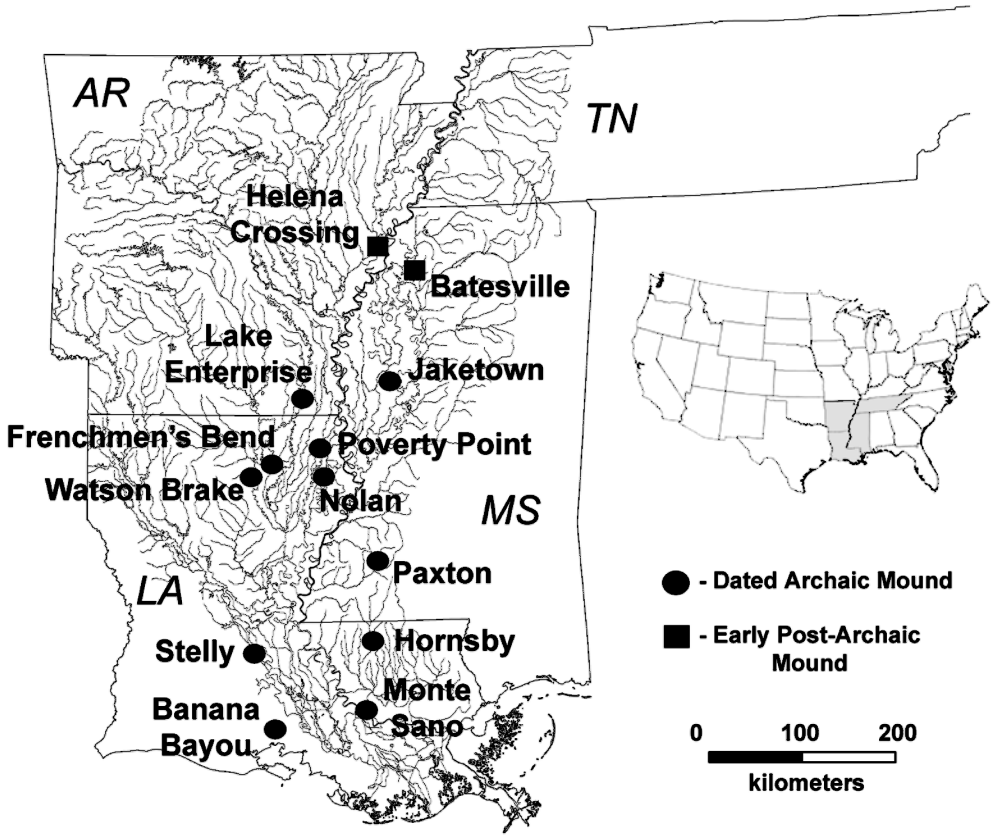

Fig. 1. Study area and securely dated early mound sites in the Lower Mississippi Valley (LMV).

the southernmost 800 km of the Mississippi River Valley, from the confluence of the Ohio River at Cairo, Illinois, to the Gulf of Mexico, henceforth LMV) (Fig. 1).

The uses to which Archaic mounds were put is uncertain and likely was variable. Very few seem to have been burial mounds. Artifacts from some mound layers are similar to those found at associated off-mound habitation areas (Peacock *et al.* 2010) and at non-mound habitation sites (Kidder and Sassaman 2009). Agriculture was not practiced during the Middle or Late Archaic periods in the area in question, where dependence on maize-based agriculture did not evolve until well into the 2nd millennium AD.

The recognition that Middle Archaic mounds exist presented a severe challenge to the theory of progressive cultural evolution (Anderson 2004; Peacock *et al.* 2010; Russo 1994a; 1994b; 1996; Saunders, J. 2010a), a faulty paradigm deeply entrenched in the practice of Americanist archaeology. As traditionally formulated, Archaic "band-level" societies were not culturally complex enough to build mounds. The famous *c.* 3500 year old Poverty Point site in northeastern Louisiana, which has mounds and earthworks but little pottery, had already strained the progressive paradigm but was accommodated by treating it as intermediate in complexity between the Archaic and the later pottery-bearing and mound-building Woodland period (Willey 1966, 291), even if it was somewhat "evolutionarily" precocious (*e.g.*, "America's First Chiefdom" - Gibson 1974).

Progressive cultural evolution never made sense from a Darwinian evolutionary perspective (Dunnell 1988; 1989; Leonard and Jones 1987), but archaeologists have largely avoided Darwinian theory, despite the on-going development of a robust body of theory, methods, and case studies showing its utility around the globe (*e.g.*, Allen 2004; Aranyosi 1999; Dunnell and Greenlee 1999; Hamilton 1999; Hunt and Lipo 2001; Kornbacher 1999; Madsen 2001; Madsen *et al.* 1999). This reluctance likely relates to the fact that many archaeologists are committed to an essentialist metaphysic (as embodied in traditional artifact types, culture-historical phases, and progressive stages like band, tribe, chiefdom, state) that cannot be accommodated by Darwinian archaeology; indeed, essentialism is inimical to the study of variability and change that lies at the heart of evolutionary understanding (Dunnell 1989). Evolutionary archaeology also has mistakenly been said to be limited to "artifact physics" (Watson 1986, 445-446) or to be non-anthropological, "removing people from the picture" (*e.g.*, Ceci 1980) because it eschews behavioral reconstruction as a meaningful goal. Whatever the reason(s) for avoiding the explicitly scientific approach offered by Darwinian archaeology, "early" mound building presented American archaeologists leery of a truly evolutionary approach with a problem: what framework to employ to explain cultural change, if not progressive theory?

Recent explanations for Archaic mound building are based on several non-scientific or non-testable approaches. One is common sense ideas derived from contemporary culture (*e.g.*, mounds provided elevated surfaces above low, wet ground (White 2004, 19) or marked ritual gatherings that occurred'*to cover the openings [sand blows] created by earthquake events*' (Thomas *et al.* 2004, 124-125)). A second involves structuralist analyses, which impose idealized units of measure or geometric forms on mound sites and then equate these with social hierarchy (Clark 2004; Russo 2004; Sassaman 2005a; Sassaman and Heckenberger 2004) or maintain that mound-building reveals ideational purposes such as the "symbolic incorporation" of time- and space-transgressive social geographies (Sassaman 2005b). A third kind of explanation relies on vitalism or orthogenesis (*e.g.*, '*striving for control of power and differential social status is an underlying inherent trait of human beings*' (Widmer 2004, 235)). A fourth depends on ethnographic analogy (*e.g.*, Crothers' (2004, 88-90) discussion of hunter-gatherer mobility and property rights).

A common element in such arguments is that mounds are "signs of power" (Gibson and Carr 2004), *i.e.*, that they are symbols reflecting leaders' differential access to social power and thus are indicative of societal complexity (Sassaman and Heckenberger 2004, 214; Trigger 1990). This kind of argument has been critiqued by Neiman (1997, 269) on the grounds that it '*does not explain why the energy expenditure that denotes power is wasteful*', as mound and monument building appears to be. Arguments about monumental architecture representing complexity also tend to be circular (Saunders, J. 2004, 147), as when mounds are assumed to reflect social inequality and social inequality is then invoked to "explain" mounds.

A notable contrast to such interpretive explanations is provided by Hamilton's (1999) application of a bet-hedging model as an explanation for Middle Archaic-period mound building in the LMV. In this paper, we build on Hamilton's hypothesis, with discussion of the concepts of wasteful advertising (costly signaling) and bet-hedging, which are derived from evolutionary theory. We briefly describe landscape evolution as related to the geographical and temporal distribution of "early" mounds in the LMV, showing how Hamilton's hypothesis cannot be falsified with the available data. Key to understanding the mound-building phenomenon is the evolution of a sedentary settlement pattern, which we argue was in place in the study area during the times in question. We close by discussing the implications of this successful application of evolutionary theory for understanding monumental architecture and other "culturally complex" features elsewhere in the world.

Costly Signaling, Bet-Hedging, and Archaeology

Concepts deriving from evolutionary theory in biology have seen increasingly prominent use in evolutionary archaeology. Among these are wasteful advertising or the handicap principle (Zahavi 1979), often called costly signaling by archaeologists, and bet-hedging. Both involve energy use that is not directed toward survival or reproduction and that therefore can be characterized as wasteful. As Neiman (1997, 269) states it, such energy use '*is wasteful because it represents fitness costs that, unlike the time and energy expended in foraging, have no apparent compensatory fitness benefits*'. In order for the existence of these apparently wasteful activities to be understood, the fitness benefits of both costly signaling and bet-hedging must be elucidated.

Costly signaling involves expending energy on an activity that is sub-optimal in terms of resource return but which can be understood as enhancing fitness in ways that are beneficial to both the sender and receiver of the signal. An archaeological example is Neiman's (1997) analysis of Mayan end-date stelae. Through costly signaling, the signaler provides honest evidence (honest because it is costly and therefore not easily faked) of having plentiful resources, a large number of allies or followers, or other measures that indicate likely success in contests with potential competitors. This serves to attract mates or more followers, while discouraging rivals from likely-fruitless confrontations. Costly signaling usually is held to evolve in stable or favorable environments (Aranyosi 1999).

Bet-hedging involves actions that also divert (and thus "waste") energy from resource-maximizing activities. Because they dampen population growth, such actions are advantageous over the long term in areas where environmental conditions fluctuate considerably in amplitude from mean carrying capacity (Dunnell 1989; 1999; Simons 2011) (Fig. 2). It has been shown by simulation studies that, in such situations, the geometric mean of population growth will be larger in wasteful than in non-wasteful populations, thus demonstrating that wasteful activities can be fixed in a population via selection (Madsen *et al.* 1999). Non-wasteful populations tend to grow rapidly and then crash during environmental downturns when carrying capacity temporarily decreases, while populations practicing waste have a less variable trajectory. A similar effect occurs

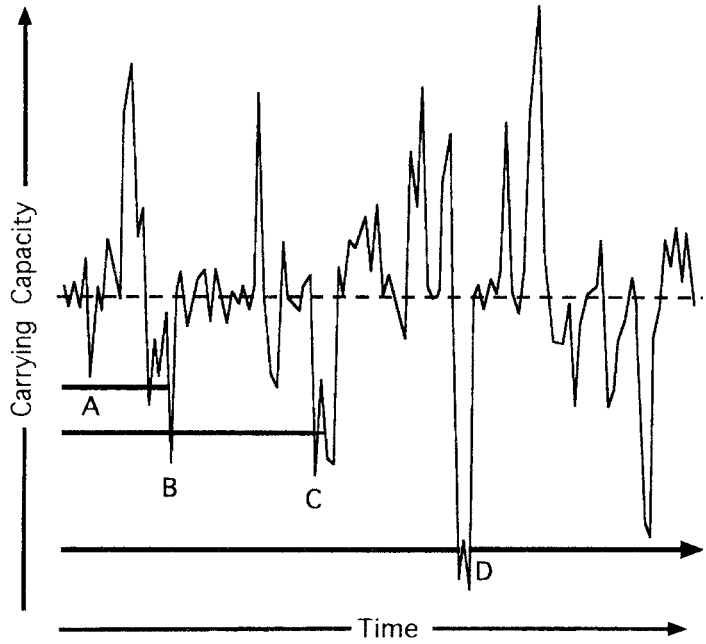

Fig. 2. "Waste" model (from Dunnell 1989, fig. 4.2). The dashed line is average carrying capacity in a fluctuating environment. The three heavy bars represent populations held at different levels; different population levels are negatively impacted by differing amplitudes of environmental shortfalls (A-D).

in marginal environments, where smaller fluctuations in carrying capacity can have drastic effects on a population (*e.g.*, Aranyosi 1999). Groups practicing bet-hedging have a greater likelihood of successfully surviving through downturns; thus, such "wasteful" behavior can be selected for in highly variable and/or marginal environments.

A critique by Garth Sampson of Hamilton's (1999) use of bet-hedging to explain Middle Archaic mounds in Louisiana shows how misunderstanding of theory can lead to incorrect conclusions. Hamilton proposed that climate-driven flooding in the LMV met the conditions for a temporally variable environment required by the bet-hedging model, and that mound building (*e.g.*, Fig. 3) could be seen as wasteful activity selected for in such an environment. Conversely, Sampson declared that the expectations of bet-hedging are not met by the temporal distribution of Archaic mounds. This was argued briefly in a 2005 *American Antiquity* article on the Watson Brake mound and earthwork complex in northeastern Louisiana (Saunders, J. *et al.* 2005), which stated that the bet-hedging hypothesis '*calls for mound-building activity* during *the ENSO [El Nino-Southern Oscillation] pulses, and perhaps immediately following pulses … We propose that the mounds were built during stable conditions, not unstable ones*' (Saunders, J. *et al.* 2005, 664; emphasis added). Sampson elaborated on this critique in a later (2008) publication in which he presented detailed paleoclimatic data juxtaposed with dates from Archaic mounds (Fig. 4). He noted that '*…nearly all [Archaic] mound dates fall within climatically calm intervals [and] several dates fall within quiescent centuries with no ENSO activity at all*' (Sampson 2008, 139).

Fig. 3. Middle Archaic-period mounds on Louisiana State University campus (LSU Campus Mounds, 16EBR6) (photo: Fran Hamilton, February 25, 2012).

We do not question the results of Sampson's analysis, which were obtained from extensive research and which are well presented. The lack of correspondence between periods of major ENSO activity and mound building seems incontrovertible. But his logic reflects a misunderstanding of the waste model. While waste, such as mound-building, will be selected for in unstable environments, it is expected to cease during periods of greatest instability, as people turn their energy to increased resource acquisition or intensification rather than to wasteful activities. As Dunnell pointed out, '*The role of waste in coping with environmental perturbation is twofold: 1) the use of energy itself necessarily lowers the birthrate...; and 2) it provides,* through its temporary abatement*, a reservoir of time that an organism can devote to subsistence and/or reproduction* in difficult conditions' (Dunnell 1989, 45; emphasis added; see also Dunnell and Greenlee 1999). This also can occur with costly signaling, as in the case of Maya stelae, the making of which ceased when the environment deteriorated sufficiently (Neiman 1997).

For bet-hedging to be selected, there must be enough environmental variability to make it advantageous; this does not have to be the most extreme variability that the environment ever has generated or ever can generate. Sampson's (2008) data (Fig. 4) show that smaller scale perturbations did occur before the beginning of Middle Archaic mound building and, as will be discussed below, "stability" is very much a relative term where the LMV is concerned. In any case, evolutionary theory clearly posits that mound building, once established, can be a successful bet-hedging strategy *only if it occurs during relatively stable periods*. These are the times when non-bet-hedging populations grow and consequently are subject

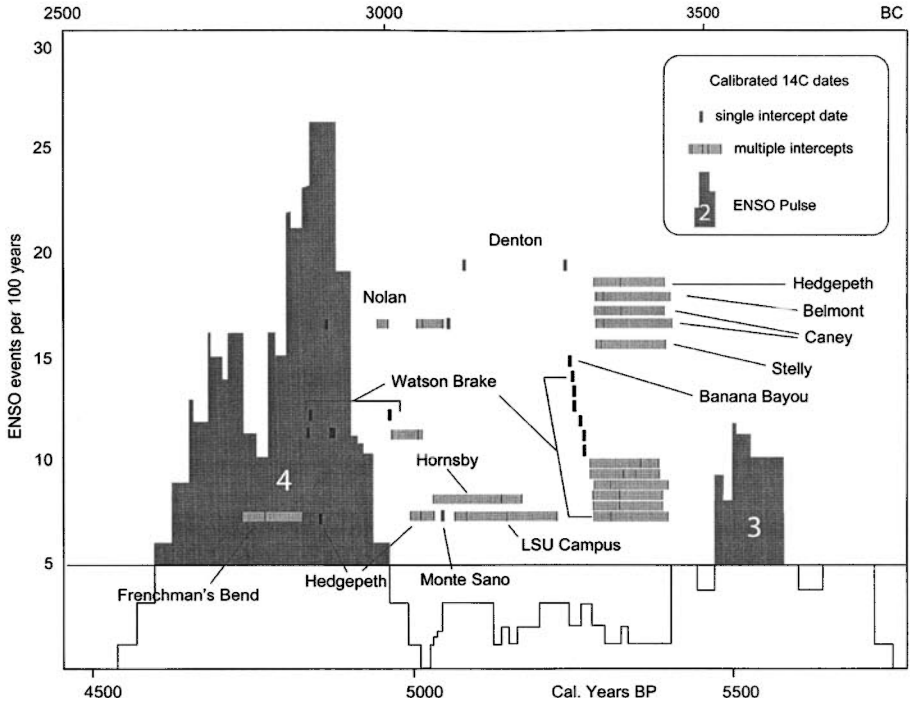

Fig. 4. Radiocarbon dates from purported Middle Archaic-period mounds and ENSO pulses (from Sampson 2008, Fig. 7).

to extinction or dramatic decrease when a drastic enough episode of instability occurs. Populations practicing bet-hedging, in contrast, are more able to survive such unstable periods because they have sunk energy into waste, rather than into growing their population, during more stable periods.

In this scenario, mound building could appear at any time at a low level, become more visible when selected for, and diminish or cease in the most extreme circumstances, when energy is turned toward subsistence instead. It may reappear in the same region, or it may not. Mound building and other possibly wasteful traits, while passed to others via cultural transmission, do not appear continuously in an area solely because of cultural transmission (*i.e.*, they are not stylistic, *sensu* Dunnell 1978); rather, they are seen as functional traits (Dunnell 1978), ones that are selected for under appropriate conditions. The current understanding of mound building through time in the LMV well reflects this expected distribution. A paper recently authored by Joe Saunders (2010b) shows three distinct periods of mound building, in the Middle Archaic, Late Archaic, and later prehistoric periods (Fig. 5), an episodic pattern consonant with a functional trait.

Landscape Evolution in the LMV as Related to Bet-Hedging

An issue in applying bet-hedging as an explanation is whether the amount of energy that was wasted was sufficient to give a selective advantage. This can be tested best by looking at population age structures, which will differ between bet-hedging and non-bet-hedging populations (Madsen *et al.* 1999). In the absence of

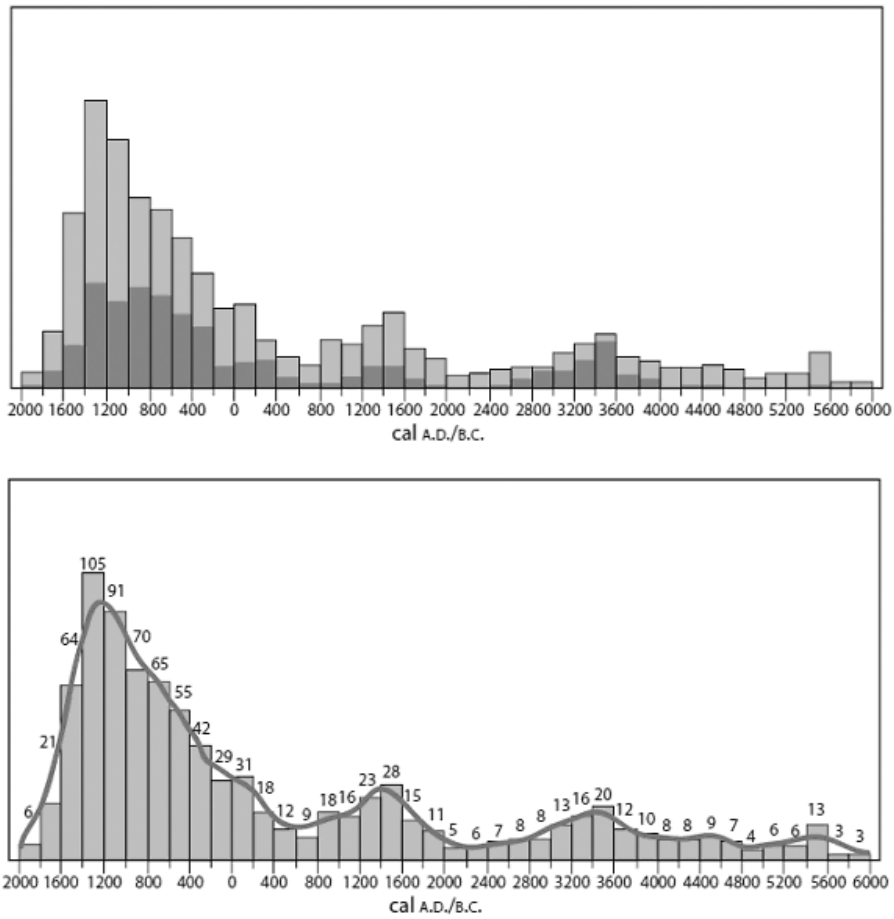

Fig. 5. LMV radiocarbon dates showing episodes of mound construction (from Saunders (2010b: Figure 12.2; courtesy of The American Museum of Natural History).

such data, wasteful activity can be inferred from the geographic distributions of the archaeological phenomena in question, as they would be expected to appear most commonly in marginal or environmentally unstable areas, and by their temporal distributions, as they would be expected to relate to resource fluctuations or other environmental instabilities over time. This is in contrast with costly signaling, which would tend to occur in long-term stable situations, where waste can provide immediate, rather than delayed, fitness benefits.

The Archaic mounds discussed by Hamilton and others lie within or adjacent to the LMV. By happenstance, this geophysical province is particularly well suited for a study of the evolution of wasteful behavior due to environmental instability related to climate, as discussed above, and a number of other geophysical factors. This was briefly discussed by Peacock *et al.* (2010, 364), who note the striking geographic pattern of known Archaic-period mounds being restricted to '*the lower Gulf Coastal Plain or in the relatively low-lying troughs of river valleys leading up from the coast*.' The last two decades have seen a major shift in thinking about

geological and climatic controls and Holocene fluvial processes in the LMV. Earlier conceptions (*e.g*, Fisk 1944; Saucier 1974) focused primarily on eustatic changes and consequent base-level fluctuations. Under this scenario, during the late Pleistocene, sea levels were lower due to precipitation being trapped in the polar ice sheets. High gradients meant that the Mississippi River and its tributaries were downcutting, leading to stream entrenchment, valley degradation, and narrow floodplains. With Holocene warming came melting of the glaciers and sea level rise. The consequent lowered gradient caused the Mississippi River to begin developing a meandering regime, which was manifested in a northward direction over time, similarly affecting tributaries as it went.

While the role of sea-level change is still acknowledged (Saucier 1994), recent detailed, fine-scale geomorphological investigations emphasize a number of other controls (upstream variations in discharge and sediment load, substrate composition, local-scale slope ratios, avulsions, channel reoccupations, tectonic warping) that contribute to a very complex history of landscape evolution in the valley (Aslan *et al.* 2005; Autin and Aslan 2001), which we briefly recap here.

The terminal Pleistocene was a time of low human populations in the LMV, due to flooding resulting from meltwater pulses and relatively low biodiversity/richness of faunal and floral resources (Kidder *et al.* 2008, 1258). Meandering began somewhere between about 12900 cal BP and 11200 cal BP (Rittenour *et al.* 2007, 601; Saucier 2001), with sea level rising to near its present position by *c*. 7000–5000 years ago (Kidder *et al.* 2008; Rittenour *et al.* 2007). However, major effects of sea-level change were limited to the southern LMV (*e.g.*, Aslan *et al.* 2005; Autin and Aslan 2001; Rittenour *et al.* 2007; Saucier 1981): estimates vary from about 250 km to 650 km north of the present-day shoreline (Rittenour *et al.* 2007; Saucier 1981; 1994), or as far north as the latitude of Memphis, Tennessee. Most estimates put the distance at about 300 km (Aslan and Autin 1999, 800; Rittenour *et al.* 2007, 588; Saucier 1994). As reiterated by Peacock *et al.* (2010), these effects were time-space transgressive; as Rittenour *et al.* (2007, 603) note, '*eustatic controlled incision and aggradation… dissipate[d] in the upstream direction*.'

In the southern LMV, Mississippi River flow during the Lower Holocene (before about 5900 cal BP) was divided into several channels in small floodplains (Kidder *et al.* 2008; Saucier 1994; 2002) in an anastomising state (Aslan and Autin 1996). Hydrology was heavily influenced by sediment loads, tectonic warping, and other local controls (Rittenour *et al.* 2007). This mosaic-type landscape of "*shallow lakes, poorly drained backswamps, and multichannel streams*" (Aslan and Autin 1999, 800) influenced human settlement: as Kidder *et al.* (2008, 1262) note, '*Many of the resources that would have attracted people to the floodplain, such as fish, game animals, birds, and nut trees, would have been spatially patchy and their distribution temporally incongruent*.' While resources were patchy, over time they became increasingly rich and abundant overall, "as many of the ecological zones, such as backswamp and floodplain lake environments, have significant productive potential" (Kidder *et al.* 2008, 1262). The rich resource base provided by warmer estuarine, lacustrine, and riverine conditions included fish, shellfish, migratory

birds, turtles and other reptiles, crustaceans, small and large mammals, and edible aquatic plants (Fritz 2008; Jackson 2008).

At *c*. 5900 cal BP, an apparently rapid environmental shift related to stabilization of sea level took place. Multiple channels still were in flow (Saucier 1994; 2001; 2002), but lateral accretion of thick sand sheets indicates full development of a meandering regime, with improved floodplain drainage and pedogenesis reflecting greater overall landscape stability (Aslan and Autin 1996). As Kidder *et al.* (2008, 1262-1263) note, this environmental shift broadly coincides with '*construction of many mound sites throughout northeast Louisiana*.' More stable environmental conditions led to human population growth in the river valleys, something that may have been augmented by population influxes from adjacent highlands, a traditional conception of the response of upland populations to more arid mid-Holocene conditions in the Southeast (*e.g.*, Kidder *et al.* 2008, 1260-1261; Peacock 1988; Schuldenrein 1996, 24; but see Alvey 2005). Fishing apparently was an important economic pastime (Jackson and Scott 2001; Sheffield 2003). Despite general landscape stability, flooding remained a source of environmental unpredictability in the LMV.

Kidder (2006; Kidder *et al.* 2008, 1263) argues for renewed landscape instability *c*. 4800–3800 cal BP. There is considerable evidence for massive flooding episodes and sediment aggradation in the LMV (*e.g.*, Arco *et al.* 2006), while regional climate was wetter and colder, with increased Gulf storm frequency and amplitude (Adelsberger and Kidder 2007; Kidder 2006 and references therein). Kidder (2006) has argued that changes in fluvial systems could have negatively affected biotic resources available for humans; *e.g.*, that increased flooding would have led to flushing of still-water bodies and increased turbidity in streams; however, this is not supported by the limited case studies available (*e.g.*, Jackson and Scott 2001). While Joe Saunders (2010a; 2010b) illustrates a "sudden end" in mound building at this time (Fig. 5), settlement continued, as evidenced by occupations that post-date the end of Middle Archaic mound construction but predate Poverty Point (Saunders, J. 2010a, 75-76).

Amelioration of climate-driven instability between 3800 and 3000 cal BP saw extensive settlement in the LMV (Adelsberger and Kidder 2007, 86), as '*people associated with the Late Archaic Poverty Point culture rapidly colonized topographically elevated, well-drained natural levees*' (Kidder *et al.* 2008, 1264). A second spate of mound building corresponds with this period (Saunders, J. 2010b) (Fig. 5).

Another period of instability marked by large-scale, climate-driven flooding and a "hyperactive" period of hurricane activity occurred between about 3000–2500 cal BP, during which Late Archaic mound building (Saunders, J., 2010b) and trade networks were disrupted, coastal shell rings ceased to accumulate, and large areas of the LMV possibly were depopulated (Adelsberger and Kidder 2007; Kidder 2006; 2010). Following this period of instability, human occupation of the valley and subdeltas at the mouth of the river (Adelsberger and Kidder 2007, 85; Törnquist *et al.* 1996) again became common, as did mound construction (Saunders, J. 2010b).

To explore finer-scale spatio-temporal patterns in Archaic mound construction as they relate to environmental parameters, we amassed available information on absolute dates derived from mound contexts in the LMV. Other researchers have done this (*e.g.*, Gibson 1994; Sampson 2008), but our survey of the literature revealed several glaring errors in this regard. Many of the dates commonly proffered as evidence of Archaic mound construction cannot be assigned to actual mound contexts with confidence or suffer from other problems. For example, many dates claimed to represent Archaic mounds are, in fact, derived from sub-mound samples. While these dates ideally represent a *terminus ante quem* for the initiation of mound construction, we have not included them here, as a large number of variables (depth of sample in horizon, infiltration of water-soluble fulvic acids, different and inconsistent results from different organic matter fractions, decomposition of old carbonates in soils, contamination by rootlets, erosion or artificial leveling of topsoil prior to mound construction, pre-mound translocation of organic matter via podzolization, etc. – see Martin and Johnson 1995; Wang *et al.* 1996) can affect the dating of buried soils, one result being that the same samples routinely return different results from different labs (Martin and Johnson 1995). These problems make associations between humate dates and the initiation of mound construction tenuous, at best.

In some cases, dates from within mounds are out of stratigraphic sequence, suggesting the redeposition of earlier anthropogenic materials. Other dates are derived from suspect contexts. For example, radiocarbon dates from the Denton site (22QU522) in Quitman County, Mississippi, have been uncritically accepted as representing the ages of Archaic mounds at the site (*e.g.*, Sampson 2008). In fact, there are no published data verifying that either of the "high spots" recorded at the site was a mound, and, in any case, the dated materials are from midden deposits, not from either of the purported mounds (Connaway 1977; Connaway 2010, *pers. comm.*).

To avoid such problems, we used a strict set of criteria in choosing dates (Table 1). Radiocarbon dates on charcoal were the only ones employed, due to complicating factors currently associated with luminescence (OSL) and oxidizable carbon ratio (OCR) dates in the study area. Dates were not used if they did not follow stratigraphic order (see also Kidder 2006). If multiple dates were available from a particular site, we used only the earliest date from mound contexts, on the basis that it would be the one closest to the inception of mound building there. Once all acceptable dates were tabulated, we graphed the results to investigate the inception of mound building across space and time. To avoid the "swamping effect" of thousands of years of mound construction in the LMV, we began with the earliest mound date we could find near Memphis, Tennessee. We then added dates from further south as long as they were progressively earlier, until we reached the Gulf of Mexico. While this procedure seems bound to produce a south-to-north pattern in the inception of mound building, it will do so only if such is actually the case: *i.e.*, there is no *a priori* reason why the earliest mounds could not have been located in the northern LMV.

Site Name	Site Number	State	Earliest Mound Date RCYBP	Calibrated 2-sigma range BP	Probability value	Lab #	Reference
Helena Crossing	3PH11	AR	2100±75	1920-2210	0.832	M-1197	Ford 1963
Batesville	22PA500	MS	2190±80	2000-2340	1.000	Beta- 104356	Johnson *et al*. 2002; Sims and Connaway 2000
Hornsby	16SH21	LA	2930±180	2730-3490	0.989	RL-1270	Manuel 1983; Russo 1994a
Lake Enterprise	3AS379	AR	2970±40	3000-3270	0.986	Beta- 169320	Jeter 2010
Jaketown	22HU505	MS	3350±40	3480-3650	0.901	Beta- 157421	Saunders and Allen 2003
Poverty Point	16WC5	LA	3386±49	3480-3730	0.958	WK-1284	Ortmann 2010
Nolan	16MA201	LA	4372±30	4860-4980	0.892	AA-55460	Arco *et al*. 2006
Paxton	22LI504	MS	4630±40	5290-5470	0.991	Beta-265164	Peacock *et al*. 2010
Banana Bayou	16IB24	LA	4560±260	4520-5760	0.986	O-1846	Gagliano 1963
Watson Brake	16OU175	LA	4660±110	5040-5600	0.997	Beta-80792	Saunders *et al.* 2005
Stelly	16SL1	LA	5260±70	5910-6210	0.989	Beta-63982	Russo 1994a
Frenchmen's Bend	16OU259	LA	5530±140	6000-6630	1.000		Saunders *et al.* 1994
Monte Sano	16EBR17	LA	6570±60	7420-7580	0.967	NSRL-2667	Hays 1995

Table 1. Radiocarbon dates from secure Archaic-period mound contexts in the LMV drainage.[2]

The results (Fig. 6) show that the earliest mounds began far to the south in the LMV, and that mound building seems subsequently to have spread north.[1, 2] This south-to-north pattern in early mound construction likely does reflect time- and space-transgressive changes in environmental conditions that led to the spread of wasteful behavior. More fine-scale work such as that done by Kidder and his colleagues may shed light on the nature of the relevant environmental parameters needing consideration in this regard, while the acquisition of more dates from controlled contexts would, of course, be very helpful.

In summary, the LMV can readily be characterized as an environment that always is unstable to some extent, especially where flooding is concerned, a situation that has persisted throughout the Holocene (Adelsberger and Kidder 2007; Brown *et al.* 1999; Kidder *et al.* 2008; Muller and Willis 1978). What changes over time is the degree of instability. As noted above, mound building in this variable environment occurred during periods of relative stability and declined or disappeared altogether during periods of the most severe environmental downturns, exactly as predicted by the bet-hedging model. The obvious concentration of Archaic mounds in the

1 This analysis employs an early date from the Monte Sano mounds (16EBR17) because it met our criteria; as Joe Saunders (2010a, 67) notes, early dates from the site are not universally accepted, and the mounds may date to the early 4th millennium BC. Using our method, this would not violate the south-north spread of mound building over time, but would result in the removal of the Frenchmen's Bend site from our graph.

2 Two of the sites shown, Helena Crossing and Batesville, are not Archaic-period, but meet our criteria for selecting mound dates.

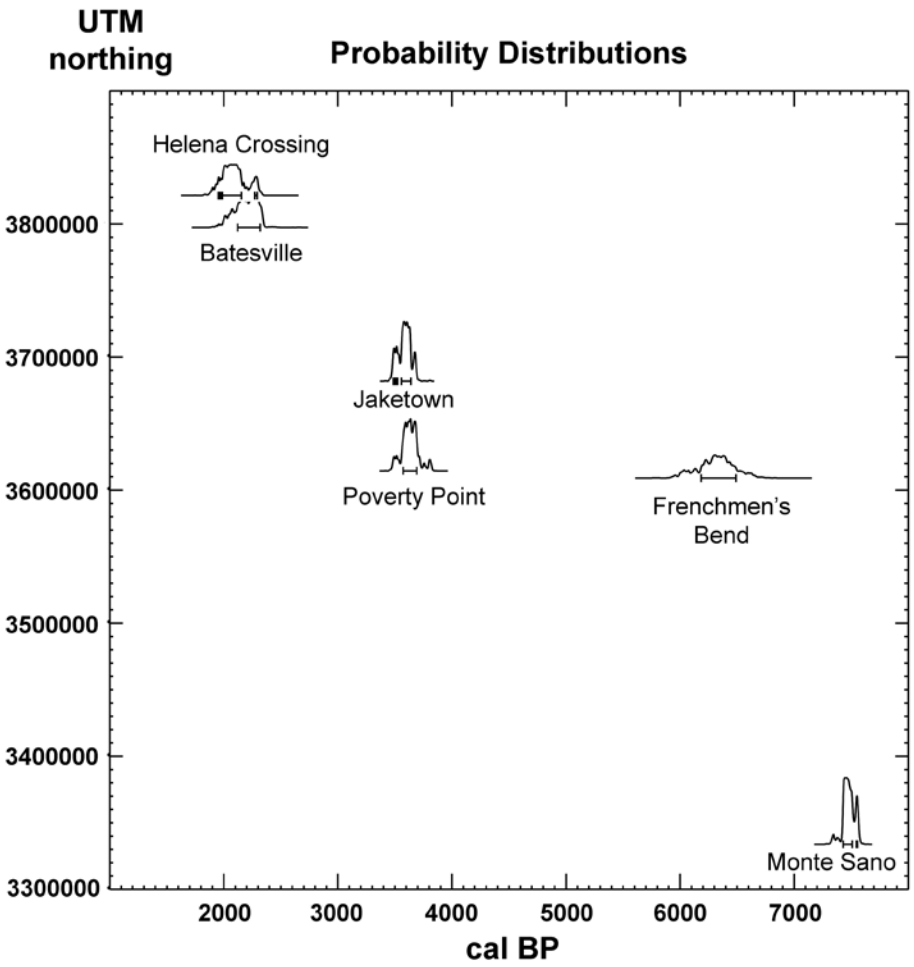

Fig. 6. Radiocarbon dates from secure mound contexts in the LMV vs. Universal Transverse Mercator (UTM) grid northing.

southern part of the LMV (Fig. 1; see also Gibson 1994, Figure 1; Kidder and Sassaman 2009, Figure 18.2; Saunders, R. 1994, Figure 1; Saunders, J. *et al.* 1994, Figure 1) also meets predictions of the bet-hedging model, as a number of physical factors (fluvial geomorphology, proximity to Gulf storms, etc.) combine to make this area the least stable part of the drainage and arguably the most unstable landscape in prehistoric eastern North America. Thus, an otherwise inexplicable spatial pattern in prehistoric features can be readily explained via reference to evolutionary theory. Later (post-Archaic) mounds are far more widespread and abundant, but relating this last phase of mound building to environmental factors is complicated by the use of domesticated plants, which raises environmental carrying capacity, and widespread sedentariness, both of which change the parameters of the waste model.

Settlement Patterning as a Co-variant in Bet-Hedging Populations

Beyond establishing a correlation with environmental variables, there are several other issues that arise in applying the waste concept to mound building. Understanding settlement patterning as a contingent variable is crucial in helping explain why bet-hedging occurs and the form it may take in particular contexts. Madsen *et al.* (1999) have shown that bet-hedging is less likely to evolve if populations have an opportunity to move to another area during periods of environmental stress. For situations in which settlement is sedentary, this option usually is removed. Data derived from archaeological survey are important to establish this, though such data are rarely employed in the excavation-driven, site-by-site approach still dominant in the study area.

Middle and Late Archaic and subsequent Woodland-period hunter-gatherer settlement patterns often have been characterized using a series of terms, such as "increasing sedentism" (sic), semi-sedentary, and quasi-sedentary that reflect a reluctance to commit to one or the other side of a mobile-sedentary dichotomy. If one views sedentariness (Rafferty 1985) as a qualitative state, with sedentary settlement patterns being those that include any sites that were used year-round, then sedentariness can be treated as an evolutionary outcome, not as a process. This approach precludes giving the impression, as progressive cultural evolutionary models do, that sedentariness was inevitable. We see sedentariness as a density-dependent phenomenon, which will be selected for as a region becomes packed with people who use a given technology and resource exploitation pattern. When this occurs, it is no longer possible for groups to move seasonally, because all areas already are inhabited. In this situation, sedentary settlement can evolve only if diets are broadened or resource use is intensified. Once sedentariness has evolved, populations often grow more rapidly (Rafferty 1985). This causes continued pressure on resources and may create strong selection for bet-hedging, especially in a variable environment.

Turning to the settlement patterns of which Archaic mounds were a part, Jon Gibson (2006; 2007; 2010) has made the most concerted effort to argue that sedentariness characterized the Late Archaic Poverty Point culture. This cultural period saw construction of six large concentric ridges at the type site, Poverty Point, in northeast Louisiana. The site also has six earthen mounds, with the largest, Mound A (Figures 7 and 8), containing 238,500 m^3 of earth (Kidder *et al.* 2009). We and others (*e.g.*, Adelsberger and Kidder 2007, 93) agree with Gibson's assessment, which is based partly on earthwork scale at the Poverty Point site. Gibson (2006) argues that the rapid and large-scale earthmoving evident at Poverty Point (Kidder *et al.* 2009; Ortmann 2010) is evidence that the mounds and earthworks could not have been built without effort being expended over multiple seasons, therefore indicating that people lived year-round at the site. The ridges are composed partly of midden containing habitation debris, including quantities of fired clay cooking balls (Poverty Point objects), along with stone tools, flakes, and some potsherds. At other locales, including the non-mound J. W. Copes site (Jackson 1981), are found seasonal floral and faunal indicators which show that Poverty Point period occupations spanned all four seasons, most parsimoniously

Fig. 7. Mound A at the Late Archaic period Poverty Point site (16WC5), view from the east looking up the lower platform of the mound (photo: Alisha Wright, courtesy of the Poverty Point Station Archaeology Program).

Fig. 8. Mound A at Poverty Point, view from the northwest. The mound contains nearly 240000 m^3 of sediment. Note the mature oak trees near the mound for scale (photo: Alisha Wright, courtesy of the Poverty Point Station Archaeology Program).

Fig. 9. Archaeologists in apparent ceremonial procession up a mound at the multi-mound Middle Archaic-period Watson Brake site (16OU175) (photo: Fran Hamilton, February 8, 2012).

explained by sedentary settlement. The only site with a large population aggregate is Poverty Point; J. W. Copes and similar occupations properly are seen as hamlets, small settlements dispersed over the landscape.

When Gibson (2006) turns to the preceding Middle Archaic period, he argues that mound construction layers at some sites (Hedgepeth, LSU Campus, and Stelly) contain too much dirt to have been moved in one season, so the settlements there also must have been sedentary. Stelly, for example, has a building stage in one mound that comprises more than 2500 m^3 of dirt (Gibson 2006, 318). Gibson tends to view the multiple-mound Watson Brake site (Fig. 7) as representing a sedentary settlement as well, as floral and faunal evidence from there shows four seasons of occupation (Saunders, J. *et al.* 2005). He concludes, though, that other Middle Archaic mounds in Louisiana were built by people following a mobile way of life. This is mostly based on the relatively small amount of dirt (200-400 m^3) used in mound construction episodes at these sites.

This idea, that sedentary and non-sedentary groups can make the same kinds of artifacts, exploit the same resources, and intermingle in time and space, does not make sense. Of course, in agricultural contexts a mutualistic relationship can evolve between sedentary crop agriculturalists and nomadic pastoralists. People organized this way are not competing for the same resources, as mobile and sedentary hunter-gatherers would be. If sedentariness is selected for among hunter-gatherers by population packing, then it cannot coexist in virtually the same places and times with non-sedentary settlement patterns.

There is evidence from sites other than Watson Brake that Middle Archaic habitation sites were used in all four seasons, had a high density of habitation debris, or both. Joe Saunders (2010a) mentions several non-mound sites in Louisiana, including Conly, Cowpen Slough, and Plum Creek, that yielded such evidence. By 6000 cal BC, Conly displayed dark midden deposits, large pits, and burials (Girard *et al.* 2005). The floral, faunal, and fish otolith remains from the site indicate it was used in four seasons (2005, 64). Other mound sites, among them Frenchman's Bend, Caney, Hedgepeth, Stelly, Lower Jackson, Banana Bayou, Hornsby, King George Island (Saunders, J. 2010a), and Paxton (Peacock *et al.* 2010) also saw intense residential use. Such occupations occurred on Pleistocene terraces overlooking relict channels or on relict Pleistocene braided stream surfaces in the valley proper (Kidder *et al.* 2008).

If one acknowledges that sedentary settlement patterns characterized the Middle and Late Archaic of Louisiana and nearby parts of Mississippi, bet-hedging via mound building makes more sense. A very similar scenario is set up by Russo's (1996; 1998) discussions of Middle and Late Archaic shell rings in Florida, especially given his convincing evidence for sedentariness there. We suggest that the evolution of sedentary settlement patterns in the study area followed a south-to-north pattern similar to that seen in the inception of mound construction, as expected if the two are related.

The question of whether constructing mounds was wasteful may itself be contentious if it is argued that mound construction took little energy. As mentioned above, Gibson (2006, 318) points out that a number of the construction stages in Middle Archaic mounds are relatively small, although many of the mounds display multiple stages. It might be argued that, instead of representing waste, mounds served an integrative function in communities. That is why the waste model is framed as a hypothesis, as other evolutionary processes may be at work in any specific case. And, of course, while mounds are visible archaeological features, any amount of non-archaeologically-visible wasteful activity may have been associated with their construction, so mound volume cannot be accepted as the sole measure of energy input.

Evolutionary processes work on whatever situation is current, so mound building had to be in existence in order to be selected. The application of evolutionary theory in archaeology is not dependent upon understanding the origin of traits, as the theory is concerned with the differential persistence of variability, regardless of how that variability arose. The generation of variability in cultural traits, by innovation or individual learning or copying errors, is best seen as independent of selection (Rindos 1989). A danger does exist that an artifactual trait present at low levels prior to selection may be dismissed as incorrectly dated because its age does not fall within the trait's "acceptable" date range. When a few mounds were identified as older than the earliest ones from the Poverty Point period, it took decades for this to gain acceptance: several Middle Archaic mounds were investigated and dated in the 1960's, but they were not accepted as having valid pre-5000 BP ages until the mid-1990's (Gibson 1994; Russo 1994b; Saunders, J. 2010a, 65-67; Saunders, J. *et al.* 1994). Of course, without considerable archaeological work, a trait present at low levels may not be represented at all in the known archaeological record.

Conclusions

As stated earlier, we do not wish to imply that wasteful behavior is a universal explanation for the spread of mound construction or other "monumental" architecture. We do, however, suggest that evolutionary theory, which provides testable hypotheses, is appropriate for scientific analysis of the phenomena in question. We say "phenomena" not only because there is considerable variability in the size, age, layout, and artifact contents of known Archaic-period mound sites (Gibson 2006; Saunders, J. 2010a), but also because mounds are not the only phenomena needing explanation. There are sites in the LMV, such as Poverty Point in Louisiana and the Slate site in Mississippi (Lauro and Lehmann 1982), that contain vast quantities of raw materials imported from hundreds of kilometers away. The area was home to a remarkable Middle Archaic-period zoomorphic bead industry (*e.g.*, Connaway 1982; see also Johnson 2000; Saunders, J. *et al.* 2005), requiring an as-of-yet poorly understood technology for drilling, shaping, and polishing hard chert pebbles (Carr 2008, 217-218). Poverty Point was the location of a later, equally elaborate, lapidary industry (Webb 1982; see also Johnson 1993). That such apparently wasteful activities also were concentrated in the lower LMV surely is more than coincidence.

Another power of evolutionary theory is that it can provide globally applicable models as opposed to locally contingent "histories". Mouth-to-headwater direction in the evolution of wasteful behavior might be expected in many places where rising sea levels led to the formation of meandering river regimes, for example. As shown by the example of Archaic mounds, evolutionary theory can provide explanations for what thus far are unexplained phenomena. For example, Force (2008) noted a correlation between tectonically active environments and "ancient civilizations" (which archaeologists typically define by the presence of monumental architecture), a pattern he was unable to explain but which may make sense from a waste perspective.

Another phenomenon that deserves attention is the scale of construction undertaken. Mounds at most Middle Archaic sites are small enough to have been built by household groups, seating selection at the individual level. At Poverty Point, as pointed out by Gibson (2006), there is a many-fold increase in the amount of dirt moved (750000 m^3), some of it quite rapidly (Ortmann 2010). As noted above, Poverty Point also shows large quantities of energy invested in obtaining exotic stone (Gibson 2007). Most recently, the plaza area there has been investigated by geophysics and small-scale excavation, revealing that this putative open area actually contained many massive circular post structures, far too large for domiciliary architecture, that show evidence of multiple rebuilding episodes (Greenlee *et al.* 2010). The amount of waste at Poverty Point is so much larger than at earlier or contemporary sites as to suggest a change in the scale of selection for bet-hedging, from the individual/household to the community, representing an instance of group selection (Mayr 2000, 131-132). Gibson (2006) has noted this also, although he has not explained it in these terms. Such a shift in the scale of selection has been proffered by Dunnell (1996) as a scientifically robust, evolutionary alternative for explaining the appearance of what traditionally is referred to as "the rise of complex societies."

Finally, we are compelled to point out that evolutionary theory does not invoke human intentionality except as a source of variability upon which selection can act (Dunnell 1988). Archaeologists working in a behavioral reconstruction mode consistently fail to understand the difference in analytical scale provided by evolutionary analysis. As an example, Joe Saunders *et al.* (2005, 664) state that, '*…bet hedging does not explain mound-building [at the Middle Archaic-period Watson Brake site], unless folk memory of past calamities or fear of future ones was invoked to get it started. In our view, this is an untestable proposition*.' We agree that their statement is an untestable proposition, just as all appeals to prehistoric agency ultimately are untestable. It contains, however, a misconstrual of evolutionary theory: the suggestion that bet-hedging was a deliberate action is nonsensical, as people cannot see into the future (Peacock *et al.* 2010, 356). Actions do not have to be prescient to be selected for. The reasons behind the actions of Archaic-period groups who built mounds are not, and indeed cannot be, known: we cannot excavate cognition. Acknowledging that we cannot know proximate reason frees us to seek ultimate cause, and allows archaeology to achieve insights about the human condition that are unavailable to other disciplines.

Acknowledgements

We thank David Fontijn for inviting us to participate in the stimulating symposium that gave rise to this volume. We also thank Marian Kunetka of the Arkansas Archeological Survey for providing information on site locations, Fran Hamilton for providing photographs, and John Connaway for verifying our assessment of the Denton site radiocarbon dates. Jay Johnson responded to several queries regarding the Batesville Mounds, while Marvin Jeter and Keith Baca provided some recent site literature. Ryan Shears created the base map used for Figure 1.

Bibliography

Adelsberger, K.A. and Kidder, T.R. 2007. Climate change, landscape evolution and human settlement in the Lower Mississippi River Valley, 5 500 – 2 400 cal BP, in: Wilson, L., Dickinson, P. and Jeandron, J. (eds.). *Reconstructing human-landscape interactions*. Newcastle: Cambridge Scholars Publishing, 84-108.

Allen, M.A. 2004. Bet-hedging strategies, agricultural change, and unpredictable environments: historical development of dryland agriculture in Kona, Hawaii. *Journal of Anthropological Archaeology* 23, 196-224.

Alvey, J.S. 2005. Middle Archaic settlement organization in the Upper Tombigbee drainage: a view from the uplands. *Southeastern Archaeology* 24, 199-208.

Anderson, D.G. 2004. Archaic mounds and the archaeology of Southeastern tribal societies, in: Gibson, J.L. and Carr, P.J. (eds.). *Signs of power: the rise of cultural complexity in the Southeast*. Tuscaloosa: University of Alabama Press, 270-299.

Aranyosi, E.F. 1999. Wasteful advertising and variance reduction: Darwinian models for the significance of nonutilitarian architecture. *Journal of Anthropological Archaeology* 18, 356-375.

Arco, L.J., Adelsberger, K.A., Hunt, L., and Kidder, T.R. 2006. Alluvial geoarchaeology of a Middle Archaic mound complex in the Lower Mississippi Valley, U.S.A. *Geoarchaeology* 21, 591-614.

Aslan, A. and Autin, W.J. 1996. Depositional and pedogenic influences on the environmental geology of Holocene Mississippi River floodplain deposits near Ferriday, Louisiana. *Engineering Geology* 45, 417-432.

Aslan, A., and Autin, W.J. 1999. Evolution of the Holocene Mississippi River floodplain, Ferriday, Louisiana: insights on the origin of fine-grained floodplains. *Journal of Sedimentary Research* 69, 800-815.

Aslan, A., Autin, W.J., and Blum, M.D. 2005. Causes of river avulsion: insights from the Late Holocene avulsion history of the Mississippi River, U.S.A. *Journal of Sedimentary Research* 75, 650-664.

Autin, W. J. and Aslan, A. 2001. Alluvial pedogenesis in Pleistocene and Holocene Mississippi River deposits: effects of relative sea-level change. *Geological Survey of America Bulletin* 113, 1456-1466.

Brown, P., Kennett, J.P., and Ingram, B.L. 1999. Marine evidence for episodic Holocene megafloods in North America and the northern Gulf of Mexico. *Paleoceanography* 14, 498-510.

Carr, P.J. 2008. Through the lens of the lithic analyst: the organization of Mississippi Delta chipped-stone technologies, in: Rafferty, J. and Peacock, E. (eds.). *Time's river: archaeological syntheses from the Lower Mississippi River Valley*. Tuscaloosa: University of Alabama Press, 201-222.

Ceci, L. 1980. Comment on "Symbiosis, instability, and the origins and spread of agriculture," by Rindos, D. *Current Anthropology* 21, 766.

Clark, J.E. 2004. Surrounding the sacred: geometry and design of early mound groups as meaning and function, in: Gibson, J.L. and Carr, P.J. (eds.). *Signs of power: the rise of cultural complexity in the Southeast*. Tuscaloosa: University of Alabama Press, 162-213.

Connaway, J.M. 1977. *The Denton site: a Middle Archaic occupation in the northern Yazoo Basin, Mississippi*. Mississippi Department of Archives and History Archaeological Report 4. Jackson: Mississippi Department of Archives and History.

Connaway, J.M. 1982. The Keenan bead cache: Lawrence County, Mississippi. *Louisiana Archaeology* 8, 57-71.

Crothers, G.M. 2004. The Green River in comparison to the Lower Mississippi Valley during the Archaic: to build mounds or not to build mounds?, in: Gibson, J.L. and Carr, P.J. (eds.). *Signs of power: the rise of cultural complexity in the Southeast*. Tuscaloosa: University of Alabama Press, 86-96.

Dunnell, R.C. 1978. Style and Function: A Fundamental Dichotomy. *American Antiquity* 35, 305-319.

Dunnell, R.C. 1988. The concept of progress in cultural evolution, in: Nitecki, M.H. (ed.). *Evolutionary progress?* Chicago: University of Chicago Press, 169-194.

Dunnell, R.C. 1989. Aspects of the application of evolutionary theory in archaeology, in: Lamberg-Karlovsky, C.C. (ed.). *Archaeological thought in America*. Cambridge: Cambridge University Press, 35-49.

Dunnell, R.C. 1996. Natural selection, scale, and cultural evolution – some preliminary considerations, in: O'Brien, M.J. and Lyman, R.L. (eds.). *Evolutionary archaeology*. Salt Lake City: University of Utah Press, 24-29.

Dunnell, R.C. 1999. The concept of waste in an evolutionary archaeology. *Journal of Anthropological Archaeology* 18, 243-250.

Dunnell, R.C. and Greenlee, D.M. 1999. Late Woodland period "waste" reduction in the Ohio River Valley. *Journal of Anthropological Archaeology* 18, 376-395.

Fisk, H.N. 1944. *Geological investigations of the alluvial valley of the Lower Mississippi River*. U.S. Army Corps of Engineers, Mississippi River Commission, Publication 52. Vicksburg: U.S. Army Corps of Engineers.

Force, E.R. 2008. Tectonic environments of ancient civilizations in the Eastern Hemisphere. *Geoarchaeology* 23, 644-653.

Ford, J.A. 1963. *Hopewell Culture burial mounds near Helena, Arkansas*. Anthropological Papers 50/1. New York: American Museum of Natural History.

Fritz, G.J. 2008. Paleoethnobotanical information and issues relevant to the I-69 overview process, northwest Mississippi, in: Rafferty, J. and Peacock, E. *Time's river: archaeological syntheses from the Lower Mississippi River Valley*. Tuscaloosa: University of Alabama Press, 299-343.

Gagliano, S. 1963. A survey of preceramic occupations in portions of south Louisiana and south Mississippi. *The Florida Anthropologist* 16/1, 105-132.

Gibson, J.L. 1974. Poverty Point, the first North American chiefdom. *Archaeology* 27, 96-105.

Gibson, J.L. 1994. Before their time? Early mounds in the Lower Mississippi Valley. *Southeastern Archaeology* 13, 162-186.

Gibson, J.L. 2006. Navels of the Earth: sedentism in early mound-building cultures in the Lower Mississippi Valley. *World Archaeology* 38, 311-329.

Gibson, J.L. 2007. "Formed from the earth at that place": the material side of community at Poverty Point. *American Antiquity* 72, 509-523.

Gibson, J.L. 2010. Poverty Point redux, in: Rees, M.A. (ed.). *Archaeology of Louisiana*. Baton Rouge: Louisiana State University Press, 77-96.

Gibson, J.L. and Carr, P.J. 2004. Big mounds, big rings, big power, in: Gibson, J.L. and Carr, P.J. (eds.). *Signs of power: the rise of cultural complexity in the Southeast*. Tuscaloosa: University of Alabama Press, 1-9.

Girard, J.S., Heller, N., Dering, J.P., Scott, S.L., Jackson, H.E., and Stringer, G.A. 2005 Investigations at the Conly site, a Middle Archaic period settlement in northern Louisiana. *Louisiana Archaeology* 39, 5-77.

Greenlee, D., Peacock, E., Hargrave, M.,Clay, B. and Dalan, R. 2010. Preliminary results from excavations in the plaza at Poverty Point. Paper presented at the 75th Annual Society for American Archaeology meeting, St. Louis, Missouri.

Hamilton, F. 1999. Southeastern Archaic mounds: example of elaboration in a temporally fluctuating environment. *Journal of Anthropological Archaeology* 18, 344-355.

Hays, C. 1995. *1995 Annual report for Management Units IV and V*. Baton Rouge: Regional Archaeology Program, Museum of Natural Science, Louisiana State University.

Hunt, T.L. and Lipo, C. 2001. Cultural elaboration and environmental uncertainty in Polynesia, in: Stevenson, C.M., Lee, G., and Morin, F.J. (eds.). *Pacific 2000: proceedings of the Fifth International Conference on Easter Island and the Pacific, Hawai'i Preparatory Academy, Kamuela, Hawai'i, August 7-12, 2000*. Los Osos: Eastern Island Foundation, 103-115.

Jackson, H.E. 1981. Recent research on Poverty Point-Period subsistence and settlement systems: test excavations at the J. W. Copes site in northeast Louisiana. *Louisiana Archaeology* 8, 73-86.

Jackson, H.E. 2008. Faunal research in the Yazoo Basin and Lower Mississippi Valley: setting parameters for future research in the I-69 corridor, Mississippi, in: Rafferty, J. and Peacock, E. (eds.). *Time's river: archaeological syntheses from the Lower Mississippi River Valley*. Tuscaloosa: University of Alabama Press, 274-298.

Jackson, H.E. and Scott, S.L. 2001. Archaic faunal utilization in the Louisiana bottomlands. *Southeastern Archaeology* 20, 187-196.

Jeter, M.D. 2010. ARF-funded AMS date confirms age of "the oldest little mound in Arkansas." *Field Notes: Newsletter of the Arkansas Archeological Society* 354, 3-5.

Johnson, J.K. 1993. Poverty Point Period crystal drill bits, microliths, and social organization in the Yazoo Basin, Mississippi. *Southeastern Archaeology* 12, 59-64.

Johnson, J.K. 2000. Beads, microdrills, bifaces, and blades from Watson Brake. *Southeastern Archaeology* 19, 95-104.

Johnson, J.K., Aleo, G.M., Stuart, R.T., and Sullivan, J. 2002. *The 1996 excavations at the Batesville Mounds: a Woodland Period platform mound complex in northwest Mississippi*. Mississippi Department of Archives and History Archaeological Report No. 32. Jackson: Mississippi Department of Archives and History.

Kidder, T.R. 2006. Climate change and the Archaic to Woodland transition (3000-2500 Cal B.P.) in the Mississippi River Basin. *American Antiquity* 71, 195-231.

Kidder, T.R. 2010. Trend, tradition, and transition at the end of the Archaic, in: Thomas, D.H. and Sanger, M.C. (eds.). *Trend, tradition, and turmoil: what happened to the Southeastern Archaic*? American Museum of Natural History, Anthropological Papers 93, 23-32.

Kidder, T.R., Adelsberger, K.A., Arco, L.J., and Schilling, T.M. 2008. Basin-scale reconstruction of the geological context of human settlement: an example from the Lower Mississippi Valley, USA. *Quaternary Science Reviews* 27, 1255-1270.

Kidder, T.R., Arco, L.J., Ortmann, A.L., Schilling, T.M., Boeke, C., Bielitz, R., Adelsberger, K.A. 2009. Poverty Point Mound A: Final Report of the 2005 and 2006 Field Seasons. Louisiana Division of Archaeology and the Louisiana Archaeological Survey and Antiquities Commission, Baton Rouge, Louisiana.

Kidder, T.R. and Sassaman, K.E. 2009. The view from the Southeast, in: Emerson, T.E., McElrath, D.L., and Fortier, A.C. (eds.). *Archaic societies: diversity and complexity across the midcontinent*. Albany: State University of New York Press, 667-698.

Kornbacher, K.D. 1999. Cultural elaboration in prehistoric coastal Peru: an example of evolution in a temporally variable environment. *Journal of Anthropological Archaeology* 18, 282-318.

Lauro, J. and Lehmann, G.R. 1982. *The Slate site: a Poverty Point lapidary industry in the southern Yazoo Basin, Mississippi*. Mississippi Department of Archives and History Archaeological Report 7. Jackson: Mississippi Department of Archives and History.

Leonard, R.D. and Jones, G.T. 1987. Elements of an inclusive evolutionary model for archaeology. *Journal of Anthropological Archaeology* 6, 199-219.

Madsen, M.E. 2001. Evolutionary bet-hedging and the Hopewell cultural climax, in: Hunt, T., Lipo, C.P., and Sterling, S.L. (eds.). *Posing questions for a scientific archaeology*. Westport; Bergin and Garvey, 279-304.

Madsen, M.E., Lipo, C.P., and Cannon, M. 1999. Fitness and reproductive trade-offs in uncertain environments: explaining the evolution of cultural elaboration. *Journal of Anthropological Archaeology* 18, 251-281.

Manuel, J. 1983. The Hornsby site – 16SH21: an Archaic occupation in St. Helena Parish, Louisiana. Ms. on file, University of Southwestern Louisiana, Regional Archaeological Program Management Unit III, Lafayette, Louisiana.

Martin, C.W. and Johnson, W.C. 1995. Variation in radiocarbon ages of soil organic matter fractions from Late Quaternary buried soils. *Quaternary Research* 43, 232-237.

Mayr, E. 2000. *What evolution is*. New York: Basic Books.

Muller, R.A. and Willis, J.E. 1978. Climatic variability in the Lower Mississippi River Valley. *Geoscience and Man* 19, 55-63.

Neiman, F.D. 1997. Conspicuous consumption as wasteful advertising: a Darwinian perspective on spatial patterns in Classic Maya terminal monument dates, in: Barton, C.M. and Clark, G.A. (eds.). *Rediscovering Darwin: evolutionary theory and archaeological explanation*. Archaeological Papers of the American Anthropological Association 7, 267-290.

Ortmann, A.L. 2010. Placing the Poverty Point mounds in their temporal context. *American Antiquity* 75, 657-678.

Peacock, E. 1988. Benton settlement patterns in north-central Mississippi. *Mississippi Archaeology* 27, 1-18.

Peacock, E., Carr, P.J., Price, S.E., Underwood, J.R., Kingerly, W.L, and Lilly, M. 2010. Confirmation of an Archaic Period mound in southwest Mississippi. *Southeastern Archaeology* 29, 355-368.

Rafferty, J.E. 1985. The archaeological record on sedentariness: recognition, development, and implications, in: Schiffer, M.B. (ed.). *Advances in archaeological method and theory, vol.* 8. New York: Academic Press, 113-156.

Rindos, D. 1989.Undirected variation and the Darwinian explanation of cultural change, in Schiffer, M.B. (ed.) *Advances in archaeological method and theory*, *vol.* 1. New York: Academic Press, 1-45.

Rittenour, T.M., Blum, M.D., and Goble, R.J. 2007. Fluvial evolution of the Lower Mississippi River Valley during the last 100 k.y. glacial cycle: reponse to glaciation and sea-level change. *Geological Survey of America Bulletin* 119, 586-608.

Russo, M. 1994a. A brief introduction to the study of Archaic mounds in the Southeast. *Southeastern Archaeology* 13, 89-93.

Russo, M. 1994b. Why we don't believe in Archaic ceremonial mounds and why we should: the case from Florida. *Southeastern Archaeology* 13, 93-108.

Russo, M. 1996. Southeastern mid-Holocene coastal settlements, in: Sassaman, K.E. and Anderson, D.G. (eds.). *Archaeology of the mid-Holocene Southeast*. Gainesville: University Press of Florida, 177-199.

Russo, M. 1998. Measuring sedentism with fauna: Archaic cultures along the southwest Florida coast, in: Rocek, T.R. and Bar-Yosef, O. (eds.). *Seasonality and sedentism: archaeological perspectives from Old and New World sites*. Cambridge: Harvard University, Peabody Museum of Archaeology and Ethnology, Peabody Museum Bulletin 6, 143-164.

Russo, M. 2004. Measuring shell rings for social inequality, in: Gibson, J.L. and Carr, P.J. (eds.). *Signs of power: the rise of cultural complexity in the Southeast*. Tuscaloosa: University of Alabama Press, 26-70.

Sampson, C.G. 2008. Middle Archaic earth mounds in the American Southeast and the onset of mid-Holocene El Nino/ENSO Events: is there a connection? in: Sulsastawski, Z. and Tamaszerski, A.J. (eds.). *Man-millenia-environment: studies in honor of Romauld Schild*. Warsaw: Polish Academy of Sciences, 133-141.

Sassaman, K.E. 2005a. Structure and practice in the Archaic Southeast, in: Pauketat, T.R. and DiPaolo, D. (eds.). *North American archaeology*. Oxford: Blackwell Publishers, 79-107.

Sassaman, K.E. 2005b. Poverty Point as structure, event, process. *Journal of Archaeological Method and Theory* 12, 335-364.

Sassaman, K.E. and Heckenberger, M.J. 2004. Crossing the symbolic Rubicon in the Southeast, in: Gibson, J.L. and Carr, P.J. (eds.). *Signs of power: the rise of cultural complexity in the Southeast*. Tuscaloosa: University of Alabama Press, 214-233.

Saucier, R.T. 1974. *Quaternary geology of the Lower Mississippi Valley*. Fayetteville: Arkansas Archeological Survey Research Series No. 6.

Saucier, R.T. 1981. Current thinking on riverine processes and geologic history as related to human settlement in the Southeast. *Geoscience and Man* 22, 7-18.

Saucier, R.T. 1994. *Geomorphology and Quaternary geologic history of the Lower Mississippi Valley* I. Vicksburg: U.S. Army Corps of Engineers, Waterways Experiment Station.

Saucier, R.T. 2001. History of archaeology in the Midsouth: geoarchaeology, in: Rolingson, M.A. (ed.). *Historical perspectives on Midsouth archaeology*. Fayetteville: Arkansas Archeological Survey Research Series 58, 59-72.

Saucier, R.T. 2002. Paleogeography and geomorphology in the Lower Mississippi Valley, in: Tushingham, S., Hill, J., and McNutt, C.H. (eds.). *Histories of Southeastern archaeology*. Tuscaloosa: University of Alabama Press, 51-60.

Saunders, J. 2004. Are We Fixing to Make the Same Mistake Again? in: Gibson, J.L. and Carr, P.J. (eds.). *Signs of power: the rise of cultural complexity in the Southeast*. Tuscaloosa: University of Alabama Press, 146-161.

Saunders, J. 2010a. Middle Archaic and Watson Brake, in: Rees, M.A. (ed.). *Archaeology of Louisiana*. Baton Rouge: Louisiana State University Press, 63-76.

Saunders, J. 2010b. Late Archaic? What the Hell happened to the Middle Archaic? in: Thomas, D.H. and Sanger, M.C. (eds.). *Trend, tradition, and turmoil: what happened to the Southeastern Archaic*? American Museum of Natural History, Anthropological Papers 93, 237-243.

Saunders, J.W. and Allen, T. 2003. Jaketown revisited. *Southeastern Archaeology* 22, 155-164.

Saunders, J.W., Allen, T., and Saucier, R.T. 1994. Four Archaic? mound complexes in northeast Louisiana. *Southeastern Archaeology* 13, 134-153.

Saunders, J.W., Mandel, R.D., Sampson, C.G., Allen, C.M., Allen, E.T., Bush, D.A., Feathers, J.K., Gremillion, K.J., Hallmark, C.T., Jackson, H.E., Johnson, J.K., Jones, R., Saucier, R.T., Stringer, G.L., and Vidrine, M.F. 2005. Watson Brake, a Middle Archaic mound complex in northeast Louisiana. *American Antiquity* 70, 631-668.

Saunders, R. 1994. The case for Archaic Period mounds in southeastern Louisiana. *Southeastern Archaeology* 13, 118-134.

Schuldenrein, J. 1996. Geoarchaeology and the mid-Holocene landscape history of the greater Southeast, in: Sassaman, K.E. and Anderson, D.G. (eds.). *Archaeology of the mid-Holocene Southeast*. Gainesville: University Press of Florida, 3-27.

Sheffield, M.W. 2003. Archaic faunal exploitation in the Lower Mississippi Valley: analysis of faunal remains from Plum Creek Archaic (16OU89). Unpublished M.A. thesis, Department of Anthropology and Sociology, University of Southern Mississippi, Hattiesburg.

Simons, A.M. 2011. Modes of response to environmental change and the elusive empirical evidence for bet hedging. *Proceedings of the Royal Society B* 278, 1601-1609.

Sims, D.C. and Connaway, J.M. 2000. Updated chronometric database for Mississippi. *Mississippi Archaeology* 35, 208-269.

Thomas, P.M., Jr., Campbell, L.J., and Morehead, J.R. 2004. The Burkett site (23MI20): implications for cultural complexity and origins, in: Gibson, J.L. and Carr, P.J. (eds.). *Signs of power: the rise of cultural complexity in the Southeast*. Tuscaloosa: University of Alabama Press, 114-128.

Törnquist, T., Kidder, T.R., Autin, W.J., van der Berg, K., deJong, A.F.M., Klerks, C.J.W., Snijders, E.M.A., Storms, J.E.A., van Dam, R.L., and Wiemann, M.C. 1996. A revised chronology for Mississippi River subdeltas. *Science* 273, 1693-1696.

Trigger, B. 1990. Monumental architecture: a thermodynamic explanation of symbolic behavior. *World Archaeology* 22, 119-131.

Wang, Y., Amundson, R., and Trumbore, S. 1996. Radiocarbon Dating of Soil Organic Matter. *Quaternary Research* 45, 282-288.

Watson, P.J. 1986. Archaeological interpretation, 1985, in: Meltzer, D.J., Fowler, D.D., and Sabloff, J.A. (eds.). *American Archaeology Past and Future*. Washington, D.C.: Smithsonian Institution Press, 439-457.

Webb, C.H. 1982. The Poverty Point culture. *Geoscience and Man* 17. Baton Rouge: Louisiana State University School of Geoscience.

White, N.M. 2004. Late Archaic fisher-foragers in the Apalachicola-Lower Chattahoochee Valley, northwest Florida-south Georgia/Alabama, in: Gibson, J.L. and Carr, P.J. (eds.). *Signs of power: the rise of cultural complexity in the Southeast*. Tuscaloosa: University of Alabama Press, 10-25.

Widmer, R.J. 2004. Explaining sociopolitical complexity in the foraging adaptations of the Southeastern United States, in: Gibson, J.L. and Carr, P.J. (eds.). *Signs of power: the rise of cultural complexity in the Southeast*. Tuscaloosa: University of Alabama Press, 234-253.

Willey, G.R. 1966. *An introduction to American archaeology, vol.* 1, *North and Middle America*. Englewood Cliffs, New Jersey: Prentice-Hall, Inc.

Zahavi, A. 1979. Mate selection – a selection for a handicap. *Journal of Theoretical Biology* 53, 205-214.

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Beyond Barrows

Europe is dotted with tens of thousands of prehistoric barrows. In spite of their ubiquity, little is known on the role they had in pre- and protohistoric landscapes. In 2010, an international group of archaeologists came together at the conference of the European Association of Archaeologists in The Hague to discuss and review current research on this topic. This book presents the proceedings of that session.

The focus is on the prehistory of Scandinavia and the Low Countries, but also includes an excursion to huge prehistoric mounds in the southeast of North America. One contribution presents new evidence on how the immediate environment of Neolithic Funnel Beaker (TRB) culture megaliths was ordered, another one discusses the role of remarkable single and double post alignments around Bronze and Iron Age burial mounds. Zooming out, several chapters deal with the place of barrows in the broader landscape. The significance of humanly-managed heath in relation to barrow groups is discussed, and one contribution emphasizes how barrow orderings not only reflect spatial organization, but are also important as conceptual anchors structuring prehistoric perception. Other authors, dealing with Early Neolithic persistent places and with Late Bronze Age/Early Iron Age urnfields, argue that we should also look beyond monumentality in order to understand long-term use of "ritual landscapes".

The book contains an important contribution by the well-known Swedish archaeologist Tore Artelius on how Bronze Age barrows were structurally re-used by pre-Christian Vikings. This is his last article, written briefly before his death. This book is dedicated to his memory.

Sidestone Press

Bestelnummer:SSP120500001

ISBN: 978-90-8890-108-9

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