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Mesolithic Horizons

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Edited by
Sinéad McCartan, Rick Schulting, Graeme Warren and Peter Woodman

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Recent salvage excavations in the floodplain of the Scheldt River have provided important new evidence concerning the neolithisation process of the sandy lowlands of northern Belgium, situated at the agrarian frontier of the central European loess belt. The data indicate a slow and gradual adaptation of Neolithic elements by indigenous hunter-gatherers during the fifth millennium cal BC, starting with local production of pottery and culminating in a radical change shortly before or after 4000 cal BC.

Keywords: Final Mesolithic, Early Neolithic, neolithisation process, acculturation, Scheldt Valley.

Introduction

Until recently little was known about the Mesolithic-Neolithic transition in the sandy lowlands of northern Belgium. The only evidence was a few highly disturbed dry-land sites (Meeuwen, Dilsen, Weelde, etc.) that yielded a Late Mesolithic lithic industry, small amounts of pottery (Michelberg/Hazendonk tradition) and Neolithic tools (polished axes, arrowheads, large blades in mined flint, etc.). Based on these largely surface data, several neolithisation models have been elaborated for the sandy area on the agrarian frontier in Belgium. In nearly all models, a long survival of the Late Mesolithic tradition is claimed. According to some of them, Late Mesolithic hunter-gatherers in the sandy lowlands persisted almost without any influence from the adjacent Neolithic/agrarian groups of the central Belgian loess region, until or after the arrival of the Michelsberg culture (Verhart 2000, 111–5, 231), or even until the start of the Bronze Age (Vermeersch 1990, 100–1). Some (Creemers and Vermeersch 1989) have even proposed a ‘transhumance’ model in which these native hunter-gatherers were employed by Michelsberg farmers during the first half of the fourth millennium cal BC for herding cattle in the sandy area. They even interpret the Michelsberg enclosures found at numerous locations in central Belgium as possible indications of some kind of tension between both population groups (Vermeersch 1996).

Recently, however, new and more reliable evidence, mainly from wetland sites, sheds a totally new light on this topic. Salvage research between 2000 and 2005 in the Scheldt Valley, in particular in the vicinity of Antwerp harbour, revealed at least three well-preserved wetland sites situated on relatively narrow coversand ridges. All three sites were discovered underneath thick layers of peat and alluvial clay during construction works along the Deurganck dock at Doel, on the left bank of the Scheldt (Crombé et al. 2000; Bats et al. 2003; Crombé et al. 2004; Crombé 2005). Despite the poor conditions in which the salvage excavations had to be conducted, and considering that the analysis of the finds is still in progress (Crombé 2005), the importance of these discoveries in understanding the neolithisation process of northern Belgium is already evident.

The Deurganck dock sites

The three sites – site 1 (sector B/C), site 2 (sector J/L) and
The neolithisation of the Belgian lowlands: new evidence from the Scheldt Valley

Figure 84.2. Generalised profile of the western foundation trench of the Deurganck dock, marking the sand ridge in sector B (site 1).

<table>
<thead>
<tr>
<th>Site code</th>
<th>Sector</th>
<th>Attested period</th>
<th>Excavated surface (m²)</th>
<th>Excavation period</th>
</tr>
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<tr>
<td>Site 1</td>
<td>B/L</td>
<td>Final Palaeolithic</td>
<td>3500</td>
<td>2000</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Early Mesolithic</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Final Mesolithic</td>
<td></td>
<td></td>
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<tr>
<td></td>
<td></td>
<td>Early/Middle Neolithic</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Site 2</td>
<td>J/L</td>
<td>Early Mesolithic</td>
<td>3300</td>
<td>2003</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Final Mesolithic</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Site 3</td>
<td>M</td>
<td>Early Mesolithic</td>
<td>800</td>
<td>2003</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Final Mesolithic</td>
<td></td>
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Figure 84.3. Overview of the archaeological salvage excavations conducted in the Deurganck dock at Doel.

site 3 (sector M) – were found in the western foundation trench of the Deurganck dock at a mean depth of 0.5 to 1m below the actual sea level (Figures 84.1, 84.2 and 84.3). They were covered by c. three to four metres of (peri)marine clay and peat, the latter dating back to the onset of the fifth millennium cal BC at its earliest. During the second half of the fifth millennium BC peat covering was locally interrupted by inundations of the Scheldt, which resulted in the deposition of organic clayey, brackish water sediments, Late Calais deposits. At the beginning of the fourth millennium cal BC peat formed again until the Roman period, followed by clay sedimentation due to increasing marine influence. Detailed analyses have shown that all three sand ridges were already inaccessible for human occupation at the transition from the fifth to the fourth millennium cal BC.

On all three sand ridges evidence of different occupation events have been found. All sites yielded evidence of occupations dating back to the Early (Boreal) Mesolithic (c. 8000–7500 cal BC) and Final (Swifterbant) Mesolithic (c. 4500/4550–4000 cal BC). In addition, traces of a Late Glacial (Federmesser culture) and Neolithic (Michelsberg culture) occupation were recovered at site 1. All these remains were unstratified and situated in the upper parts of the coversand deposits. The Federmesser artefacts were found dispersed in the upper 0.5m of the soil, while the Mesolithic and Neolithic remains only reached down 10–20cm into the coversand matrix. The latter were mainly situated in a humiferous layer (so-called Brunifed Soil) right below the peat base. It is assumed that initially all archaeological remains were left on the top of the coversand ridges and since then migrated downwards as a result of intense bioturbation. This is corroborated by the presence of numerous fossil galleries of plant roots and animals (beetles, earthworms, etc.) in the top parts of the coversand deposits. Fortunately in horizontal levels these different occupation events mostly occurred in separated areas so that spatial overlaps are rather limited. Hence it is mostly still possible to separate the remains of the individual occupation phases. Only the Final Mesolithic and Neolithic evidence will be discussed in this paper.

The Final Mesolithic sites

Features

On all three sites the Final Mesolithic (5th millennium cal BC) remains were found exclusively on the top part of the sand ridges, indicating that the dune slopes were at that time most likely already too swampy for occupation. At site 3, for example, the Final Mesolithic occupation was restricted to a narrow strip of c. 15m on the dune top. Structural evidence in the form of features is almost completely lacking, except for one or perhaps two shallow dug-out hearths, filled with a loamy/clayey lens (site 3). Far more numerous are small clusters of burnt artefacts and ecofacts (mainly burnt bone), most likely indicating former surface hearths. On the other hand, the more than 100 deep hearth-pits found on site 1 seem to belong to an older, presumably Late Mesolithic (7th millennium cal BC), activity phase (Crombé et al. 2005a).

Lithic industry

The lithic inventory still displays clear Mesolithic affinities, both technologically and typologically (Figure 84.4). Besides some rather rudimentary flake knapping, the production of long parallel and regular blades (Montbani blades), typical of the Late Mesolithic of the seventh and sixth millennia cal BC, persists. Many of these blades are made of Wommersom quartzite, an exotic raw material originating from outcrops in central Belgium (c. 80km away), which was already frequently used in the Late Mesolithic. Clear Mesolithic affinities are also preserved in the tool kit, in particular in the projectiles. The dominant projectile type is the trapeze, which, compared to the Late Mesolithic specimens, is more irregular (symmetric or weakly asymmetric forms) and much smaller. In addition they lack an inverse basal retouch and were no longer made with the microburin technique, typical
of the Late Mesolithic trapezes. On the other hand, tool types are present which do not occur in Late Mesolithic assemblages, such as splintered pieces (pièces esquillées), i.e. flakes characterised by hinge and step fractures either unifacial or bifacial along one or more edges, presumably resulting from their use. Comparable tools, albeit slightly larger, are frequently found in Early Neolithic/LBK and Blicquy/Villeneuve-Saint-Germain assemblages (Cahen et al. 1986; Allard 2005).

Pottery

With these lithic artefacts at all three sites substantial amounts of pottery were collected. The pottery presents the same technological and morphological characteristics at all three sites (Figure 84.5). It is mainly tempered with grog and plant material, relatively thick-walled and was fired in a reduced atmosphere. Morphologically it is dominated by slightly S-shaped vessels provided with a rounded or pointed base, and to a lesser degree by bowl-shaped vessels. Decoration is very restricted and mostly consists of oblique incisions or impressions on the rim top (Randkerbung) and round or oval knobs, which are nearly always unperforated. Perforated knobs, series of small perforations underneath the rim as well as series of fingertip impressions, only occur incidentally. Typologically this pottery, in particular the S-shaped vessels with conical bases, presents close similarities with the (Early) Swifterbant pottery typical of the Netherlands (Raemaekers 1999), and to a lesser degree with the pointed-base pottery traditions of the Baltic coast (such as Ertebølle and Narva) (Timofeev 1998; Hallgren 2004). A major difference with the latter is the so far total absence of clay lamps in the Belgian assemblages. On the other hand there are also clear similarities with the pottery from Early/Middle Neolithic cultures, for example with the Grossgartach/Blicquy/Villeneuve-Saint-Germain cultures and the Rössen/Cerny cultures (Crombé et al. 2005b; Crombé, in press). These pottery traditions offer good parallels for the Randkerbung and knob decoration as well as for the morphology of the bowl-shaped vessels. Although some influence might have come from northern indigenous pottery traditions, it seems more likely that the basic knowledge of pottery manufacturing was taken over from the above-mentioned southern Neolithic traditions. The Scheldt Valley was probably an important corridor in the diffusion of ideas and technical knowledge.
**Subsistence evidence**

Because the inundation of the site areas (i.e. the dune tops) occurred rather late, only carbonised plant and faunal remains have been preserved. Despite the bias caused by the burning process and extreme fragmentation, it is possible to make a general reconstruction of the subsistence of these Final Mesolithic communities. The picture derived from the analysis of the burnt ecofacts is one of a broad spectrum economy in which hunting (mainly of wild boar (Sus scrofa) and red deer (Cervus elaphus)), fishing (almost exclusively of freshwater fish, such as roach (Rutilus rutilus), Rudd (Rutilus erythruthalimus), bream (Abramis brama), etc.), and gathering of wild plants and fruit (hazelnuts (Corylus), wild apples (Malus sylvestris), sloes (Prunus spinosa), oak acorns (Quercus), berries from hawthorn (Crataegus monogyna), etc.) played an important role (Van Neer et al. 2005; Bastiaens et al. 2005). Evidence of domestication is almost completely lacking: on site 1 only a single cereal grain belonging to bread wheat (Triticum aestivum) was found.

**Environmental evidence**

The results of pollen, botanical and pedogenetic analyses point to an overall wet environment during the Final Mesolithic occupation (Bastiaens et al. 2005). Apparently the tops of the sand ridges constituted the only dry islands within an overall wet area consisting of a peat fen in the immediate vicinity of the dunes and a perimarine inundated zone further away in the direction of the Scheldt River. The absence of marine or brackish water in the immediate vicinity of the sites is also corroborated by the nearly complete absence of marine fish in the faunal assemblage of site 1. The fish remains rather suggest the presence of a landscape dominated by stagnant or slow running fresh water around the site (Van Neer et al. 2005).

The assemblage of charcoal and charred seeds recovered from the archaeological level on site 1 reveals a picture that relates very well to a modern hardwood riverside woodland, i.e. a deciduous forest with broadleaved trees that give good timber – oak, elm (Ulmus) and ash (Fraxinus). This kind of forest is typical of higher grounds within or bordering a valley of a freshwater river and inundated only a few days a year at most. According to the ecology of present hardwood riverside woodlands, the river stretch could have been within the reach of freshwater tides, while the woodland itself was not. The vegetation is dominated by oak and alder (Alnus), followed by whitebeam (Sorbus aria), ash, dogwood (Cornus sanguinea), hazel and cherry (Prunus). Also remarkable is the high frequency of ivy seeds (Hedera) that seem to occur in clusters in the archaeological level of site 1. Although ivy might have been collected on firewood and subsequently have been charred, the absence of ivy charcoal points towards the fact that the berries of common ivy (Hedera helix) were gathered deliberately and separately, perhaps for medicinal, practical (e.g. dyeing, animal fodder), or ritual purposes.

**Dating evidence**

Until now only two sites have been radiocarbon dated (Figure 84.6). Initially the Final Mesolithic occupations were radiocarbon dated on the basis of food crust samples retrieved from the inner surfaces of a series of potsherds (Van Strydonck and Crombé 2005). Five such dates gave ages between c. 4900 and 4600 cal BC, which is at first sight in agreement with the relative dating based on pottery morphology and decoration (see above). However further dating on other organic samples, such as burnt bone fragments and carbonised seeds, nutshells and charcoal, from the same stratigraphical contexts, led to a re-evaluation of these food crust dates, as the latter seem to be several hundreds of years older than the former. According to the dates on carbonised plant and faunal remains the Final Mesolithic occupation should be dated to the second half of the fifth millennium cal BC. Subsequent chemical analyses by O. Craig (2005), using bulk stable (carbon/nitrogen) isotope analysis and gas chromatography mass spectrometry (GCMS) has shown that this dating problem is due to the presence of freshwater fish in the dated food crust samples, causing a reservoir effect. The results also indicate that the dated vessels were most probably used to process a mixture of aquatic and terrestrial foodstuffs.
The Neolithic site

Site 1 also yielded evidence of a Neolithic occupation connected with the Michelsberg culture. It is dated by one radiocarbon date at around 4000–3800 cal BC. Compared to the Final Mesolithic assemblages, important differences can be observed in both the lithic and ceramic inventories. New tool types appear (Figure 84.4), such as leaf-shaped and transverse arrowheads, polished axes and broad regular blades, as well as imported high quality flint, partly originating from the flint mine sites in the loess area. At the same time, typical Final Mesolithic tools and raw materials (e.g. Wommersom quartzite) seem to have disappeared completely. Important morphological and technological changes also occur in the pottery. The Swifterbant-like pottery is replaced by Michelsberg/Hazendonk 2/3 inspired vessels made of clay tempered with mainly crushed flint. Unfortunately neither botanical nor faunal remains were preserved at this site.

Conclusions

The data discussed in this paper clearly contradict the current neolithisation models, as they prove that the cultural habits of indigenous hunter-gatherers in the sandy lowlands of Belgium were already changing during the fifth millennium cal BC, albeit slowly and gradually, partly as a result of contact and interaction with agrarian communities living in the adjacent loess area. One of the most important changes was in the local production of pottery, a technique most probably taken over from Neolithic neighbours around the middle of the fifth millennium cal BC at its latest (Crombé, in press). As far as can be deduced from the scant subsistence data, the indigenous economy did not undergo major changes during the fifth millennium cal BC. The single cereal grain found at site 1 is not sufficient evidence for claiming local agriculture, particularly in light of the Neolithic component at the site.

In addition it is very questionable whether the site environment was suitable for agriculture, given the wet conditions and the limited size of the available dry land. Arable fields might have been situated in nearby locations outside the peat fen, but these have not yet been located. However, it is questionable whether the pottery-producing hunter-gatherers of the fifth millennium cal BC also occupied the dry coversand area of northern Belgium. So far there is no clear evidence which points in that direction. According to some scholars (Raemakers 1999), the absence so far of Swifterbant sites in the dry coversand landscape might be a result of taphonomic factors, such as the poor preservation of weakly fired pottery in acid coversands, or the absence of diagnostic lithic artefacts within the flint industry of the Swifterbant culture. The latter, however, is not valid, because the Belgian sites that are discussed in this paper yielded typical small trapezes that differ considerably from Late Mesolithic ones. An important argument against an intense occupation and exploitation of the dry coversand area during the second half of the fifth millennium cal BC is the observed trend towards a decreasing number of sites from the middle of the eighth millennium cal BC, combined with a concentration along major river valleys. Compared to the Early Mesolithic there is much less evidence for inland occupation and exploitation during the Middle and Late Mesolithic. This pattern has been observed quite convincingly in the north-western part of Belgium (the area of Sandy Flanders), and could be related to major environmental and/or social changes (Crombé et al., in press). In the Campine area a similar shift in site location pattern was observed and could be linked with climatic and hydrological changes during the Early Holocene period. Rivers only became reliable water sources from the Boreal period onwards (Vanacker et al. 2001).

Another possibility regarding the origin of the bread wheat is that it was obtained through exchange with contemporaneous Neolithic farming communities further upstream of the Schelde. Agro-pastoral groups belonging to the Epi-Rössen and Michelsberg cultures were already present from 4300 cal BC in the loamy upland as far as the border with the coversand area. Interaction between both communities must have been at least temporarily possible between c. 4300 and 4000 cal BC (Crombé and Vanmontfort 2007).

The most radical changes must have occurred near the end of the fifth, or the start of the fourth millennium cal BC, presumably due to the increased influence from, or colonisation by, the Michelsberg culture. Shortly before or after 4000 cal BC major changes occurred in the material culture, resulting in a total and presumably definitive disappearance of Mesolithic traces. It is surprising to note that similar changes took place with remarkable synchronicity in other north-western European countries, for example in southern Scandinavia (Fischer 2002), and northern Germany (Hartz et al. 2002; Hartz and Lübke 2005).

References


Craig, O. 2005. Organic analysis of ‘food crusts’ from sites in the Schelde Valley, Belgium: a preliminary evaluation, in P. Crombé (ed.), The last hunter-gatherer-fishermen in sandy...
Crombé, P. and Vanmontfort, B. 2007. The neolithisation of
Crombé, P., Perdaen, Y., and Sergant, J. (in press). Le Mésolithique
Crombé, P., Perdaen, Y., and Sergant, J. 2005a. Features: Archaeo-
Crombé, P. (in press). Early pottery in hunter-gatherer societies of
Crombé, P., Perdaen, Y. and Sergant, J. 2005b. La néolithisation
Creemers, G. and Vermeersch, P. M. 1989. Meeuwen-
Fagnart, B. Souf
Hallgren, F. 2004. The introduction of ceramic technology around the Baltic Sea in the 6th millennium, in H. Knutsson (ed.), Coast to Coast – Arrival. Results and Reflections. Proceedings of the Final Coast to Coast Conference 1–5 October 2002 in Falköping, Sweden, 123–42. Coast to Coast Project. Uppsala, Department of Archaeology and Ancient History, University of Uppsala.