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MESOLITHIC PALETHNOGRAPHY

RESEARCH ON OPEN-AIR SITES BETWEEN LOIRE AND NECKAR

PROCEEDINGS FROM THE INTERNATIONAL ROUND-TABLE MEETING IN PARIS (NOVEMBER 26–27, 2010)

as part of sessions organised by the Société préhistorique française

Published under the direction of

Boris Valentin, Bénédicte Souffi, Thierry Ducrocq,
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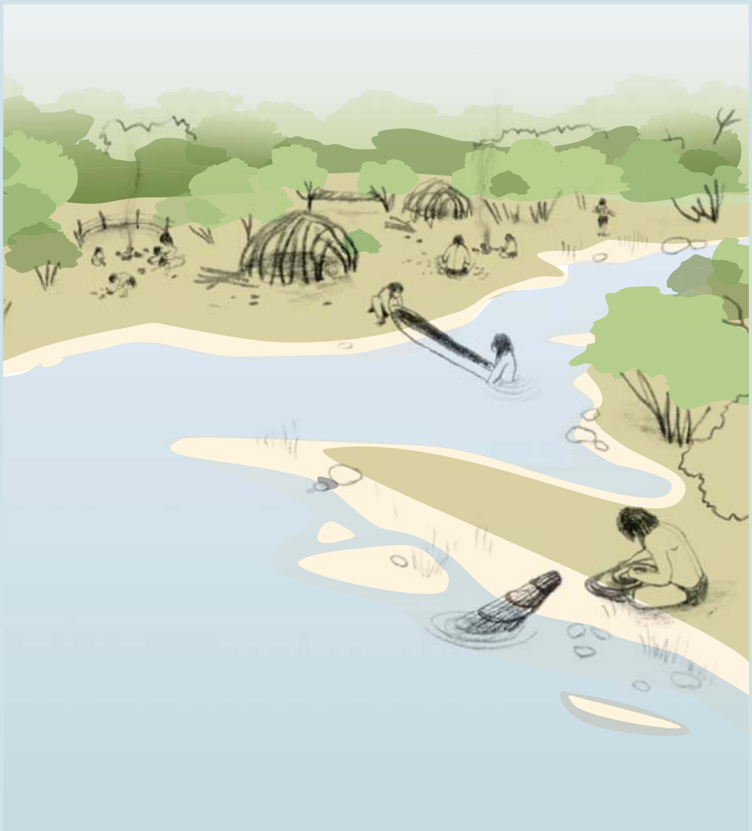

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Intrasite analysis of Early Mesolithic sites in Sandy Flanders: The case of Doel-'Deurganckdok J/L', C3

Gunther Noens

Abstract: Lithic open-air sites situated in unstratified coversand deposits are our most important source of information for the study of the Early Mesolithic in the sandy lowlands of Northern Belgium. Their poor resolution in terms of both stratigraphic and organic preservations requires the development of adapted research designs in order to make reliable inferences regarding their complex formation processes. In this article, it is argued that an accurate reconstruction of these processes is possible by including systematic refitting into our intra- and intersite research programs. Some preliminary results of such an integrated intrasite approach, including radiometric and lithic analyses (i.e. morphotypology, attribute analysis, refitting, microwear) from the Early Mesolithic site of Doel-'Deurganckdok J/L' (C3) are presented to explore both the technological aspects of this lithic assemblage as well as the formation processes of this site.

More than four decades of excavations in the sandy area of Flanders (lowland Belgium) has revealed around twenty five sites at which remains of Early Mesolithic occupation (ca. 9500-8700/8500 BP–ca. 9000-7700/7500 cal. BC: Crombé and Cauwe, 2001) were identified, based on the typological composition of the microlithic toolkit and/or by radiocarbon dating (fig. 1). Recently, large-scale archaeological and palaeo-environmental investigations have shown the large potential of the wetland areas within these lowlands for the study of the Mesolithic (i.e. Crombé, 1998b and 2005a; Crombé et al., 2009). These projects not only resulted in the discovery, mapping, evaluation and detailed reconstruction of a variety of extensive palaeolandscapes covered by Late Glacial and/or Holocene deposits (i.e. dry coversand ridges; small, sandy elevations in low lying areas; river dunes; alluvial contexts; etc.), but also included extensive and detailed rescue excavations of several (mainly Early) Mesolithic sites associated with these sealed palaeolandscapes (Crombé, 2005a; Sergant and Wuyts, 2006; Sergant et al., 2007).

Despite a number of post-excavation projects on the artefact assemblages of the wetland sites in Sandy Flanders (NW-Belgium), including radiometric (Crombé, 2005a; Crombé et al., 2009), morphotypological (Crombé, 1998b; Sergant, 2004), spatial (Crombé, 1998b; Crombé et al., 2003; Sergant, 2004; Sergant et al., 2006), functional (Beugnier, 2007; Beugnier and Crombé, 2005; Crombé et al., 2001) and/or technological approaches (Noens et al., 2006 and 2009; Perdaen, 2004; Perdaen et al., 2008a and 2008b), our general understanding of the formation processes and the variation in assemblage composition in terms of prehistoric human behaviour still remains problematic (Van Gils et al., 2010). Due to a lack of financial means in the context of these rescue excavations the inadequate understanding of this Early Mesolithic record is partly attributable to the virtual absence of detailed and extensive intrasite analyses characterised by an integration of the aforementioned analytical approaches.

In this article some preliminary results of such an integrated intrasite approach are presented, focusing on one of the two Early Mesolithic assemblages (C3) found at the site of Doel-'Deurganckdok J/L' (Bats et al., 2003; Crombé, 2005a; Jacops et al., 2007; Noens et al., 2005 and 2006). The C3 lithic assemblage, which was radiocarbon dated to the second part of the Boreal, is currently being subjected to a systematic refitting program, in combination with morphotypological attributes and microwear analyses in order to improve understanding of

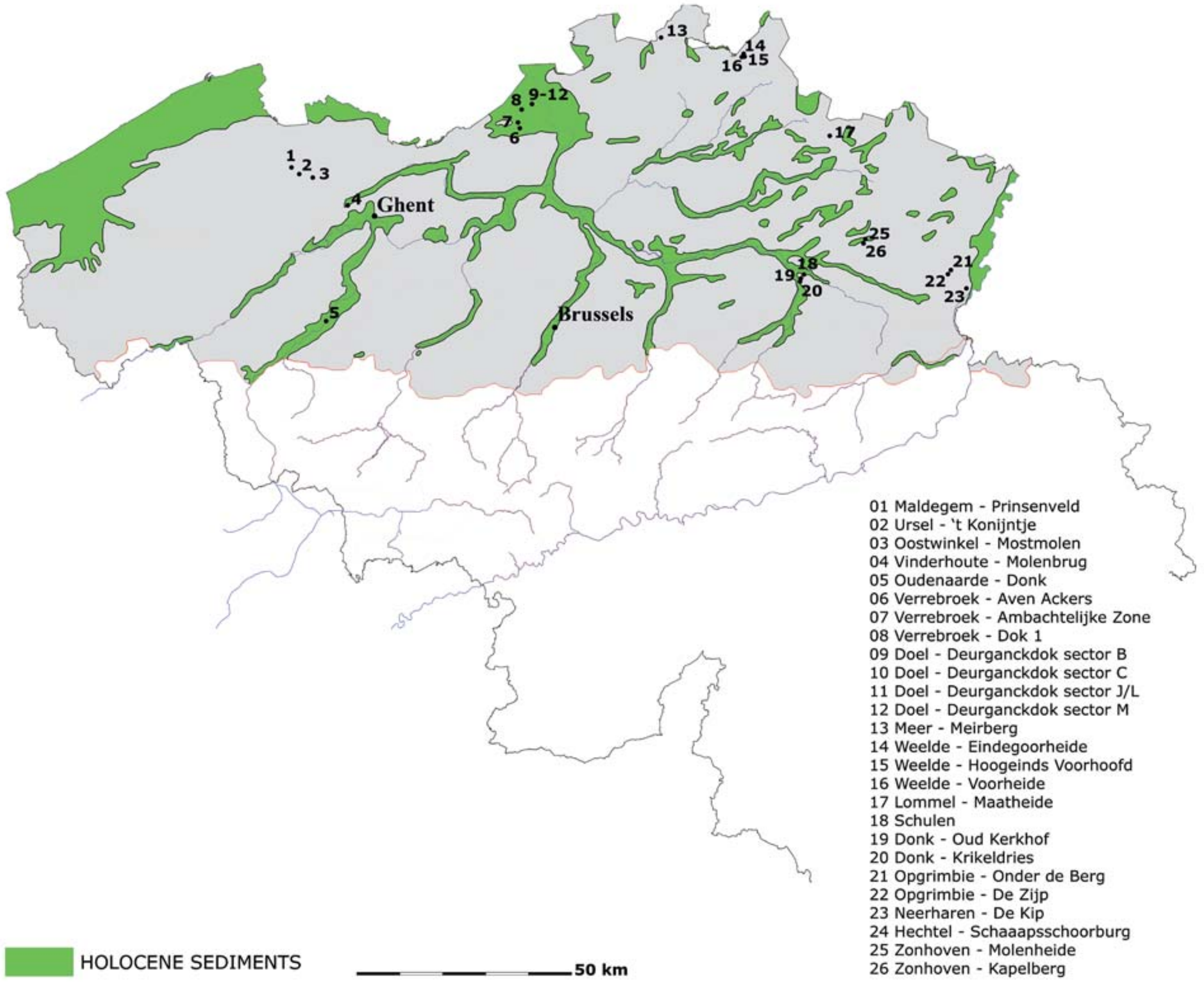

Fig. 1 – Location of the excavated Early Mesolithic sites in Flanders (lowland Belgium), with an indication of the wetland areas.

technological and functional aspects of the assemblage, and to allow a more adequate evaluation of the formation processes on an intrasite level.

LITHIC SITES IN SANDY FLANDERS

Regarding the general state of preservation and the presence of recent disturbances of prehistoric sites in the sandy areas of lowland Belgium, a distinction can be made between the intensively disturbed coversand dryland, generally characterized by very poor preservation conditions (Crombé, 2006; Vermeersch, 1999; Vermeersch and Bubel, 1997) and, on the other hand, the potentially better preserved wetland areas, like polders, river floodplains, paleolakes and paleodepressions (Crombé, 2006). In addition to the sporadic preservation of unburnt organic remains, the currently known and excavated Early Mesolithic record of both dry- and wetland areas is characterized by the presence of one or more distinctive cluster(s) of lithic artefacts, often in spatial association with charred/burnt organic remains (i.e. hazelnut shells, charcoal, bone fragments) and anthropogenic and/or biogenic soil features. Other characteristics of these sites include the non-stratified, vertical dispersion of the artefacts up to 0,5 meter and the general absence of anthropogenic structural features ('structures évidentes', i.e. structured hearths). Thus, at present most of our knowledge about the Early Mesolithic in this region is derived from lithic open-air sites situated in unstratified coversand deposits, which are characterized by their poor resolution in terms of both stratigraphic and organic preservation. Given the problematic character of absolute dating of these sites (Crombé et al., 1999; Van Strydonck et al., 1995), an extensive radiocarbon dating project was initiated in 1998 (Crombé et al., 2009; Van Strydonck and Crombé, 2005; Van Strydonck et al., 2001), focusing on single entity dating of short-lived organic materials preferably from reconstructed (latent) surface hearths (Sergant et al., 2006) as well as on charcoal from hearth-pits. In addition to the construction of a reliable regional typochronological framework for the Early Mesolithic (Crombé et al., 2009), this ongoing project provides us with a better understanding of the chronological relationships of the artefact assemblages on an inter-site as well as an intra-site level (Crombé, this volume; Crombé et al., 2006). These radiocarbon dating results indicate the

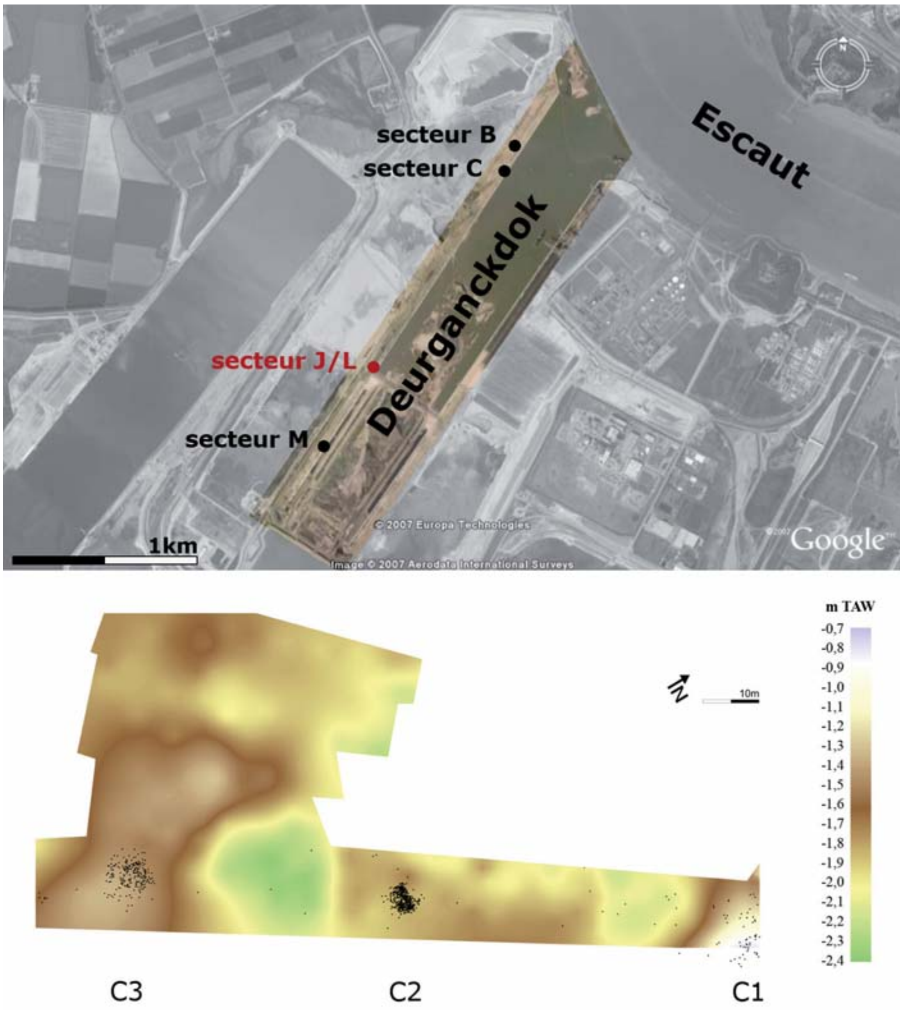

Fig. 2 – Doel-Deurganckdok. Upper: location of the site (see also fig. 1). Below: location of the three small and individual artefact concentrations within sector J/L.

omnipresence of complex palimpsest situations (*sensu* Bailey, 2007), implying severe problems of homogeneity and integrity of the larger and/or more dense artefact assemblages. Unless proven otherwise, this observation forces us to assume a potential palimpsest character for the smaller and/or less dense artefact assemblages as well (i.e. Crombé, 2002; Shott, 2010; Vermeersch, 1996 and 1999; Vermeersch and Bubel, 1997).

INTRASITE ANALYSES

An accurate reconstruction of the formation processes of lithic sites, in order to understand prehistoric human behaviour, is possible using detailed intra- and intersite research programs. However, despite recent major methodological advances, the Mesolithic in North-West Europe is still lagging behind in this respect; such detailed studies are rather exceptional and often concern a limited set of these approaches, executed on a restricted segment of the record, i.e. small, individual concentrations which are often *a priori* presumed to reflect well-preserved, single occupation sites (Crombé, 1998a). Furthermore the few Early Mesolithic intrasite studies from the lowland sandy areas of Belgium published so far *(supra)*, focus primarily on the integration of radiocarbon dating, spatial analyses based on clustering of morphotypological groups and attribute and/or microwear analyses. Detailed intra- and intersite approaches including systematic refitting to explore both the technological aspects of the lithic assemblages and the formation processes of the site as a whole, are hitherto missing. Interestingly, this lacuna relates to the fact that the entire lithic assemblage, including the unmodified (so-called 'waste') products of lithic production as an analytical unit has hardly been explored in detail, despite its good preservation condition and great abundance in the archaeological record which make it one of the primary sources of information for inferring formation processes and prehistoric human behaviour on different spatial and temporal scales (i.e. Andrefsky, 2001 and 2008; Hall and Larson, 2004; Holdaway and Stern, 2004; Rasic, 2004; Shott, 2010). Only a combination of several approaches of lithic analysis on different scales, thus reasoning along different lines of evidence, allow us to make reliable inferences on the complex formation

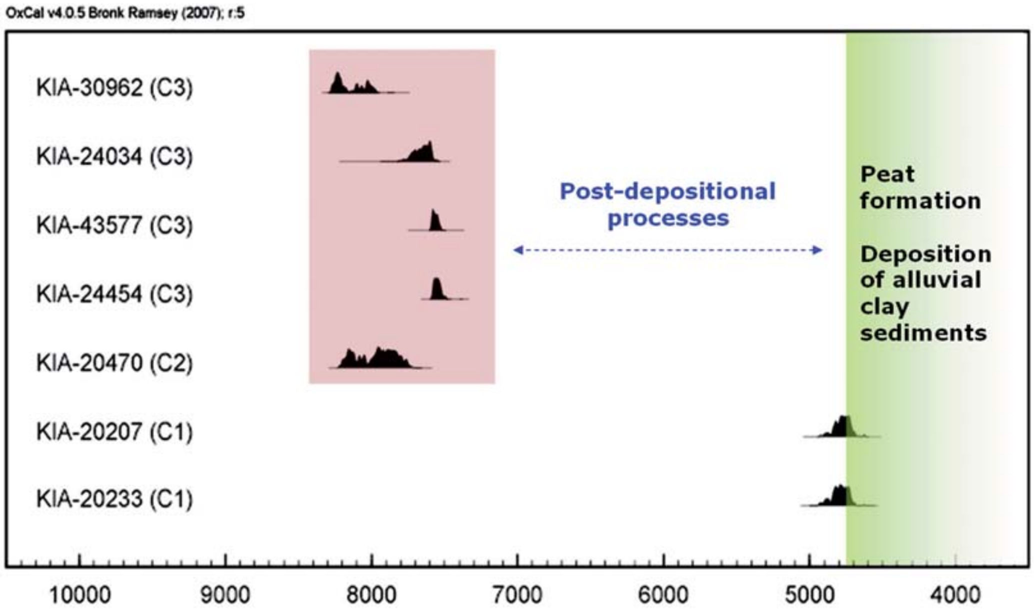

Fig. 3 – Doel-Deurganckdok. Simplified diagram showing the calibrated radiocarbon dates of sector J/L and the beginning of the peat formation and clay deposition in this region.

processes of our Early Mesolithic record. Lithic refitting holds a privileged position in this, since it is the only analytical tool providing a dynamic reconstruction by direct observation of the relative chronological and spatial links between the individual artefacts (Cziesla et al., 1990; Hofman and Enloe, 1992; Schurmans and De Bie, 2007). Furthermore, each artefact within an assemblage possesses a constellation of attributes carrying potential information about its production, use, and life history. Concentrating on (macroscopic) observable and univocal measurable characteristics, attribute analysis of artefacts in an assemblage thus allows to a large extent a reconstruction of the life cycle of each artefact. Only within the context of a combined intra- and intersite approach, both methodologies, together with lithic functional analyses, form a powerful means to study our complex Early Mesolithic record, despite their often time consuming nature.

DOEL-'DEURGANCKDOK J/L', C3

The construction of the Deurganckdock in the Antwerp harbour area resulted in a number of rescue excavations between 2000 and 2003. Sealed by clay and peat deposits of several metres thickness, a number of sites dating from the Final Palaeolithic to the Middle Neolithic were discovered on three separate asand dunes (Bats et al. 2003; Crombé et al., 2000 and 2004). Sector J/L, excavated during two short campaigns in 2003 (Bats et al. 2003), consisted of three small and individual artefact concentrations (fig. 2). A small depression, characterized by the presence of several tree windthrows, separated two of these concentrations (C2 and C3). Morphotypological and radiometric data attribute these two concentrations to the Early Mesolithic, in particular to the second part of the Boreal. They are considered as potentially contemporaneous. Adversely, the third concentration (C1), situated on top of the dune, forms the periphery of a partly destroyed Final Mesolithic occupation (Swifterbant Culture).

Paleoenvironmental data (Crombé, 2005a) indicates that the peat formation in this region started between 4750 and 3680 cal. BC and was interrupted by the deposition of alluvial clay sediments (fig. 3). This relative late chro-

Fig. 4 – Doel-Deurganckdok. Excavation strategies of C2 (upper) and C3 (lower). Courtesy Department of Archaeology, University of Ghent.

nology for the inundation of the landscape could explain the absence of organic material on the Early Mesolithic sites. Furthermore, it contributes to the potential palimpsest character and the complex formation processes of the sites situated in a very active and dynamic pedological system. On the other hand, both peat and clay formation are responsible for the protection of this palaeoenvironmental and archaeological record from recent disturbances, making it a prehistoric heritage of great value for this region (Crombé, 2006).

Due to lack of time C2, which was partly disturbed by a tree windthrow, was excavated by manual shovelling (fig. 4). C3 on the other hand (ca. 50m²) was excavated in a more detailed fashion, using grid cells of 50 × 50 cm with an artificial thickness of 5 cm. These excavation units were wet sieved over 2 mm meshes. This excavation strategy permitted the recovery of a lithic assemblage (around 14.500 individual pieces of which 81% smaller than one centimeter) and a small assemblage of carbonized hazelnut shells (table 1). Furthermore, a soil feature of biogenic origin was recorded (fig. 5). The presence of roots associated with this feature indicates an origin just before or contemporaneous with the start of the peat formation, thus post-dating the Early Mesolithic occupation.

The systematic refitting programs of both concentrations (Noens et al., 2006; Jacops et al., 2007) did not result in a physical link between the two clusters. The low numbers of refits within C2 is partly attributable to the unfavourable excavation conditions (table 1). Adversely, the presence of 270 refitting units, comprising around 1,200 individual pieces (i.e. 41% of the artefacts larger than 1 cm), indicates the success of the refitting program of C3. The number of artefacts within the compositions varies between 2 and 39 (fig. 6). The current state of this refitting program does not only give us an opportunity to study the refitted sequences in detail, it also allows us to make reliable inferences about the formation processes and prehistoric activities based on the non-refitted component of the lithic assemblage.

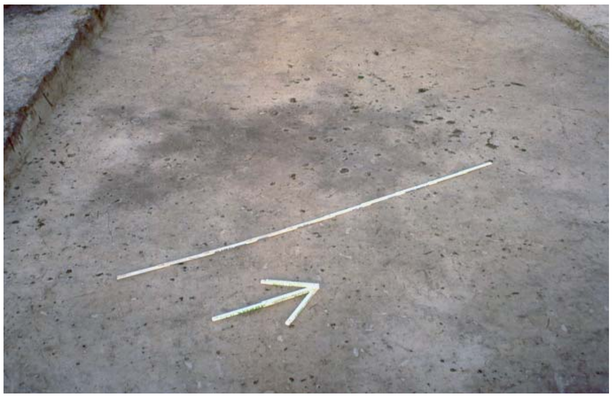

Fig. 5 – Doel-Deurganckdok. Soil feature spatially associated with C3. Courtesy Department of Archaeology, University of Ghent.

	CONCENTRATION 2 (ca. 25m²)	CONCENTRATION 3 (ca. 30m²)
POST-EXCAVATION ANALYSES	(*cf.* Crombé 2005 for palaeoenvironmental and chronological context)	
¹⁴C-dating on individual hazelnut shells	8830±45 BP	8965±45 BP 8630±60 BP 8525±40 BP 8485±40 BP
spatial analysis *morphotypological analysis* *attribute analysis*	Jacops 2007 Jacops et al. 2007	Noens et al. 2006 G. Noens, in prep.
refitting	J. Jacops & G. Noens (+ C. Guéret) 17 refitting sets N=53 artefacts 12% of assemblage > 1cm	G. Noens 270 refitting sets N=1196 artefacts 41% of assemblage > 1cm
microwear	C. Guéret, in prep.	V. Beugnier (75 artefacts) + V. Beugnier, in prep.
SITE CHARACTERISTICS		
stratigraphic position	sand dune, sealed by peat and clay deposits	
lithic assemblage	671 artefacts	ca. 14500 artefacts
charred hazelnut shells	present (a few fragments)	ca. 72 gr.
charcoal	present (a few fragments)	present – not yet analysed
soil features	1 – tree windthrow	1 - vegetation (decay *in situ*)

Table 1 – Doel-Deurganckdok. Overview of the general site characteristics of C2 and C3.

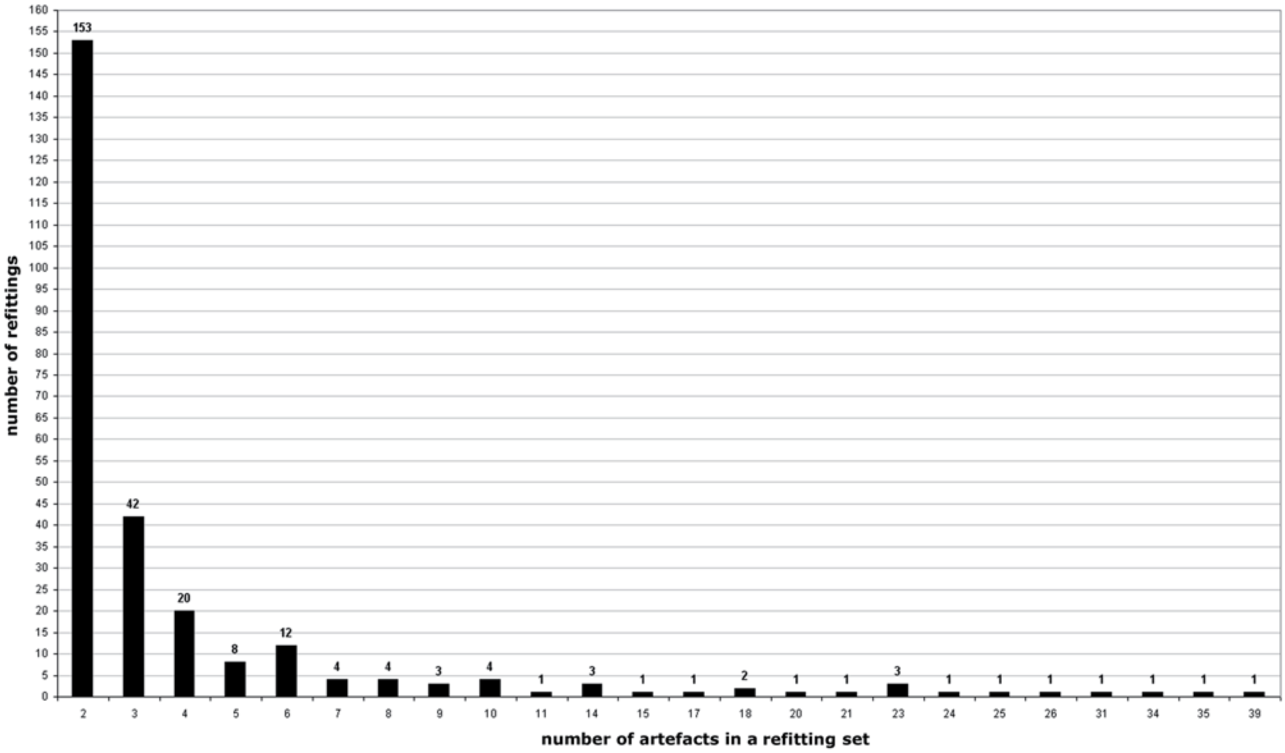

Fig. 6 – Doel-Deurganckdok. Number of refits and number of artefacts in refits.

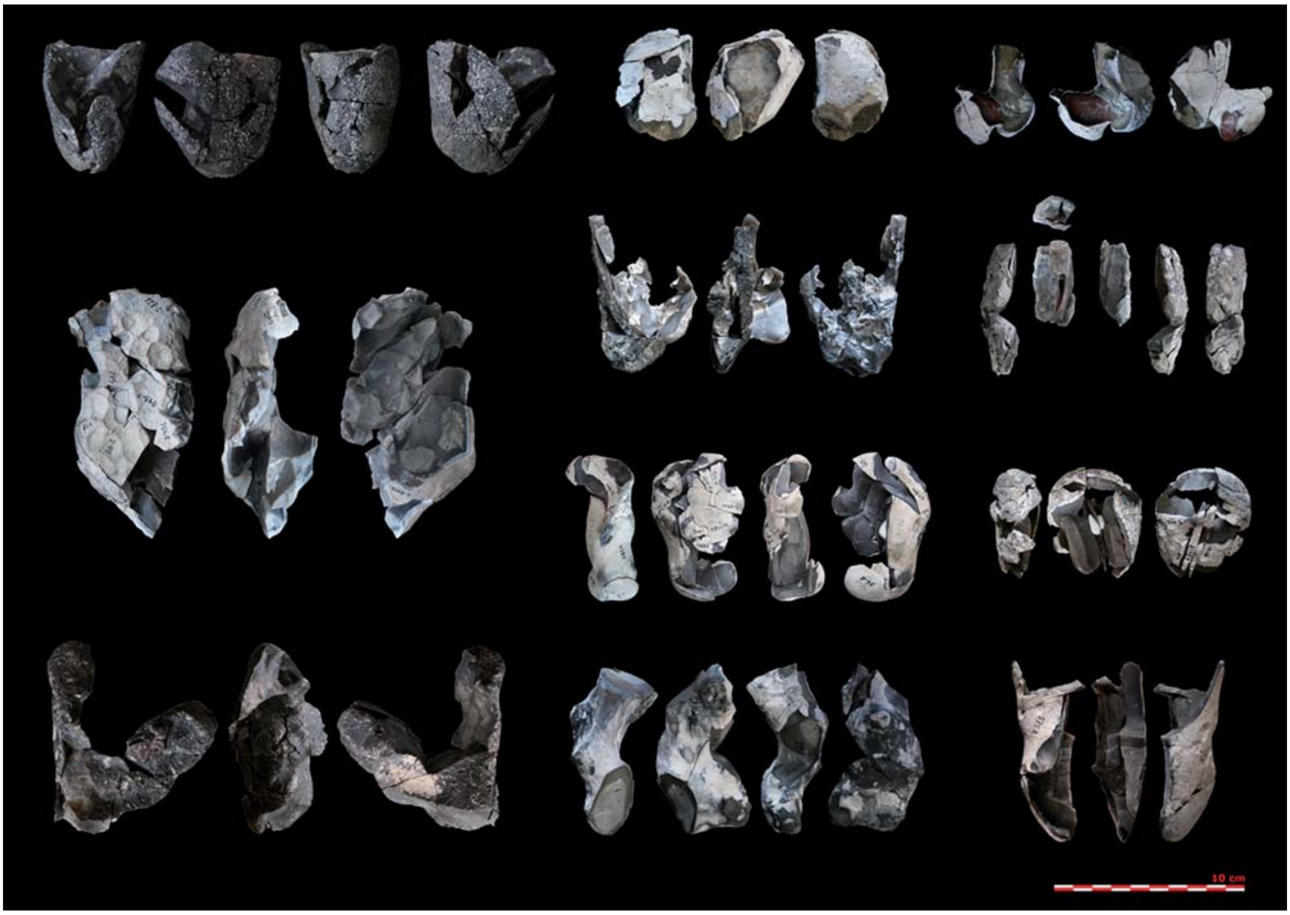

Fig. 7 – Doel-Deurganckdok. Some of the refits that give an idea of the irregular morphology and limited dimensions (i.e. 10-15 cm) of the original nodules.

THE ARTEFACT ASSEMBLAGES, SOME GENERAL CHARACTERISTICS

With a few exceptions, the assemblage consists almost uniquely of flint artefacts, characterized by a large variation in morphology, dimensions, colours and quality (i.e. texture, inclusions, etc.). A number of refits gives us an idea of the irregular morphology and limited dimensions (i.e. 10-15 cm) of the original nodules (fig. 7). The presence of distinct spatial clusters is evident in the cases where different raw material variants can be attributed to individual nodules. Furthermore, the overlap between the small cluster of carbonized hazelnut shells and a cluster of (heavily) burnt lithic artefacts in the centre of the locus indicates the presence of a (latent) surface hearth (fig. 8). The considerable number of artefacts in the assemblage can partly be attributed to the meticulous excavation techniques, but to a certain extent also reflects the high degree of fragmentation. This is exemplified by two refitting units (fig. 9), one of a fragment of a burnt burin (with burin spall) consisting of 20 refitted pieces, the other of a fragment of a small nucleus. Another characteristic of the assemblage is the small dimension of the artefacts (fig. 10), which might also relate to the degree of fragmentation. However, refitting of these fragments confirms their small original dimensions. In addition, a recurrent element is the presence of two or more cores in the same flint variants. Refitting demonstrates that a number of nodules were fractured in the initial stages of production, often along existing frost fissures (fig. 11). The resulting fragments were then further reduced creating multiple cores in the same flint variants. Elements of the entire production and use sequences are present (i.e. tested nodules, exhausted cores, products of preparation and rejuvenation, secondarily modified and unmodified products with or without microscopic use wear, knapping accidents, microburins, esquilles, bulbar flakes, etc.). A microwear analysis by V. Beugnier (Beugnier, 2006 and 2007) on 75 pieces indicates a mediocre state

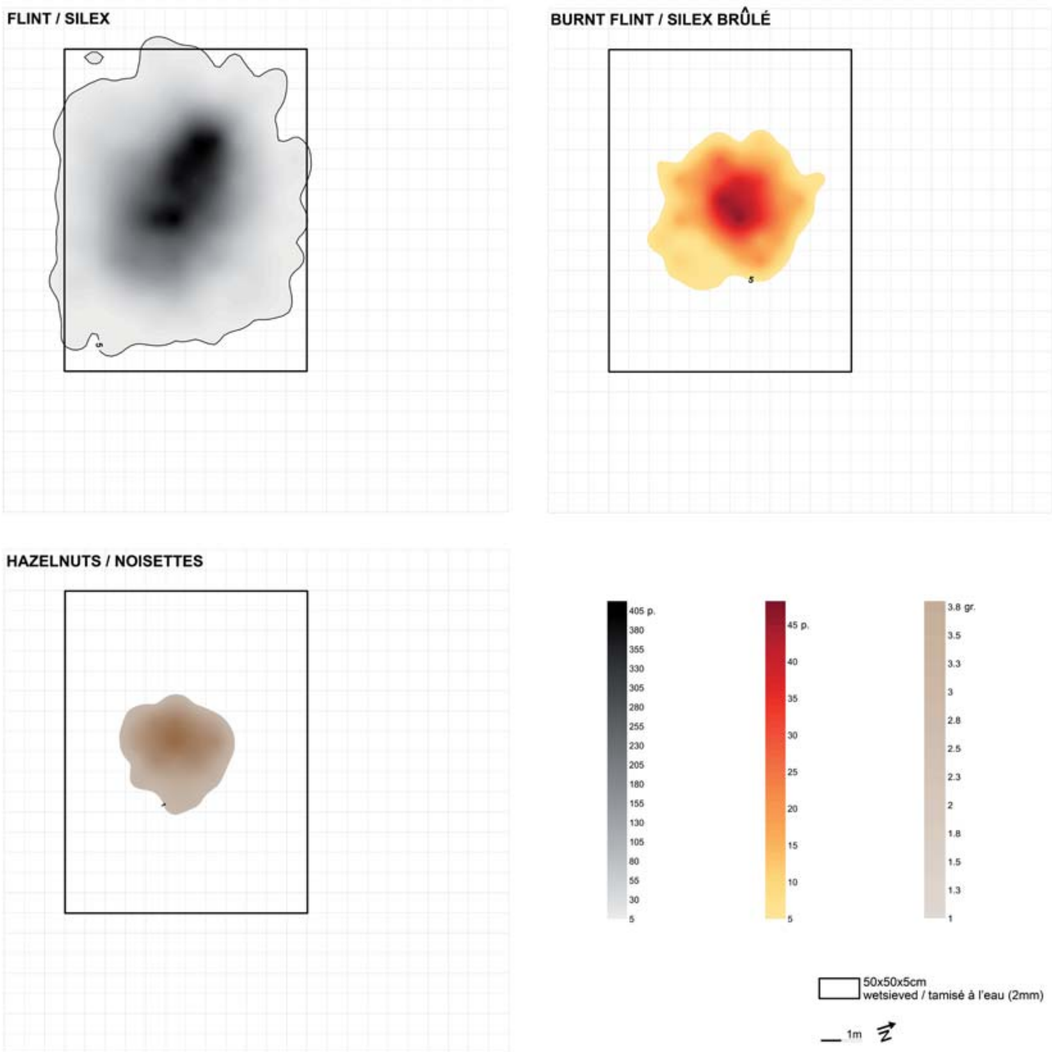

Fig. 8 – Doel-Deurganckdok. Horizontal distribution of all the lithic artefacts (in numbers; lower boundary = 1 artefact), the burnt lithic artefacts (in numbers; lower boundary = 5 artefacts) and the carbonized hazelnut shells (in grams; lower boundary = 1 gram). A clear spatial overlap between burnt lithics and hazelnut shells indicates the presence of a (latent) surface hearth.

Fig. 9 – Doel-Deurganckdok. Illustration of the high degree of fragmentation of the lithic artefacts caused by heat alteration. Left: fragment of a burin (with fragment of the burin spall) which consists of 20 individual fragments. Right: fragment of a core (in orange), together with a number of products; the core fragment itself consists of 12 individual fragments.

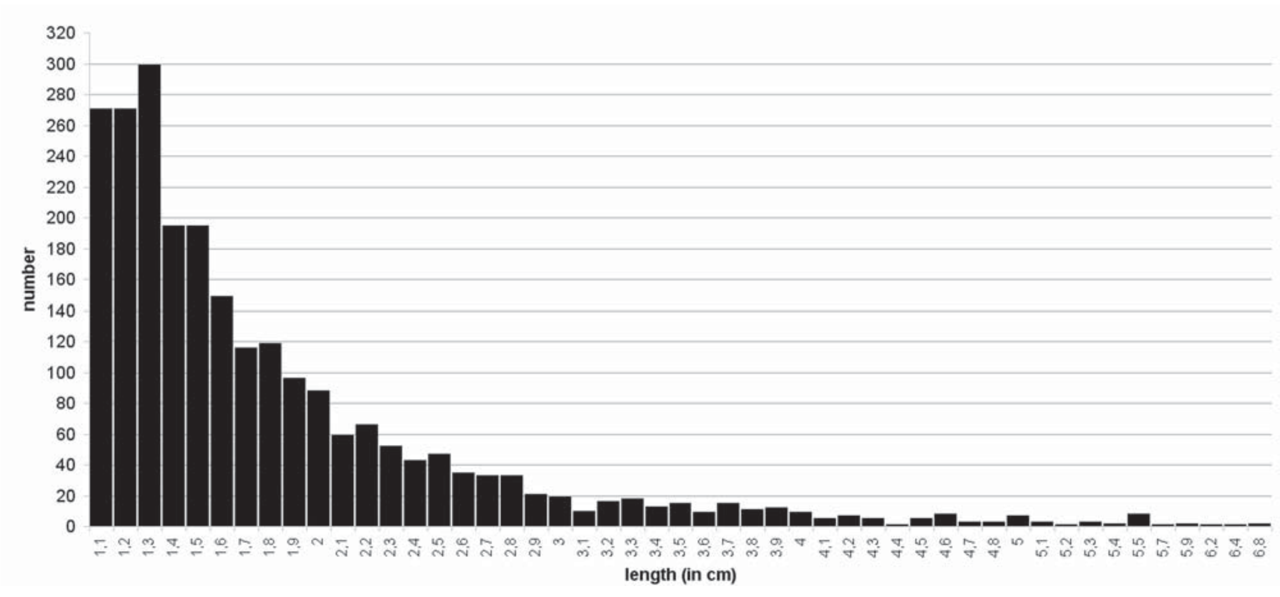

Fig. 10 – Doel-Deurganckdok. Graph showing the maximum length of the artefacts > 1 cm.

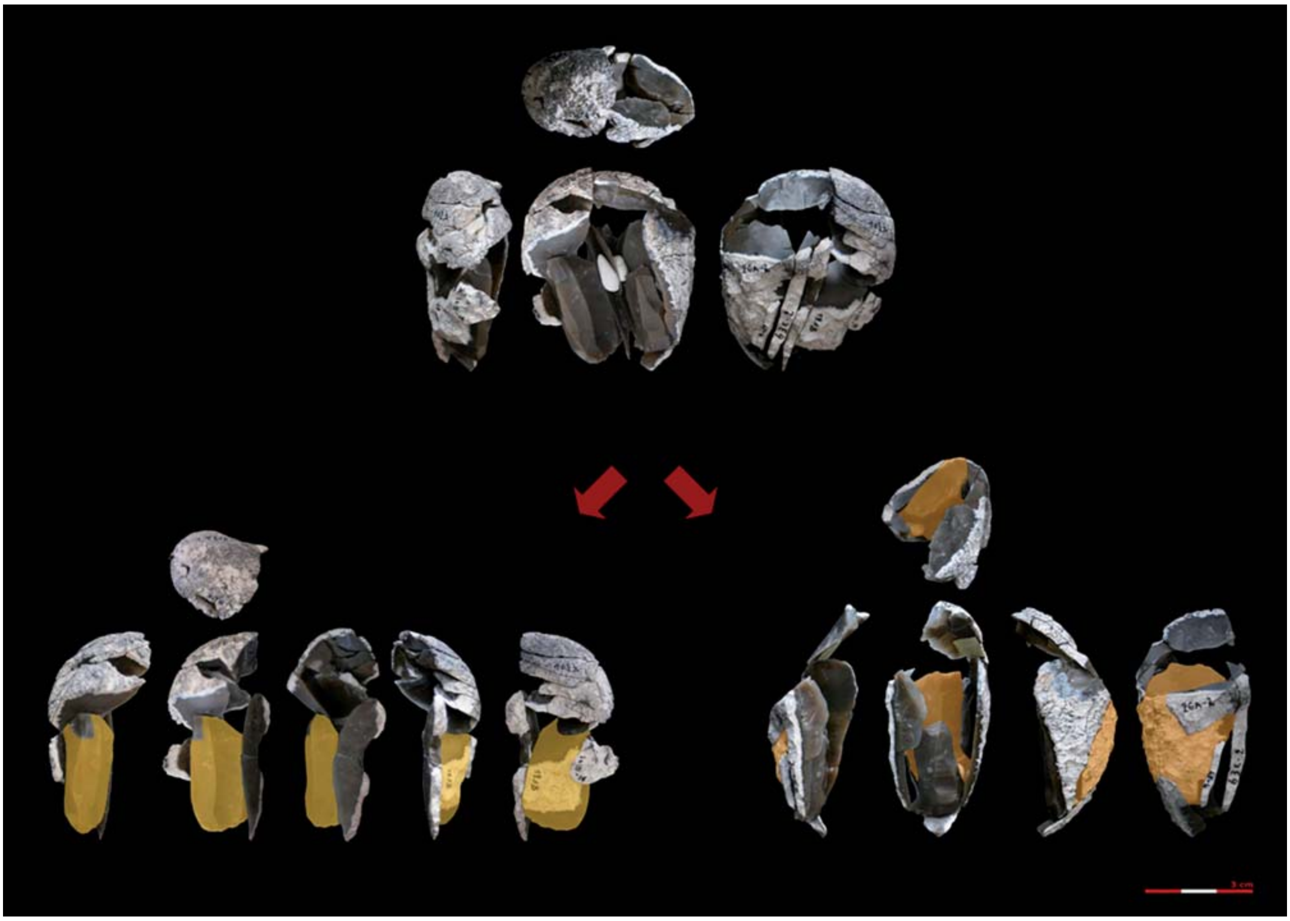

Fig. 11 – Doel-Deurganckdok. Fragmentation of a nodule during the early stages of the production process, and the subsequent reduction of each of the fragments, resulting in (at least) two different cores (in orange and yellow) in the same flint variant.

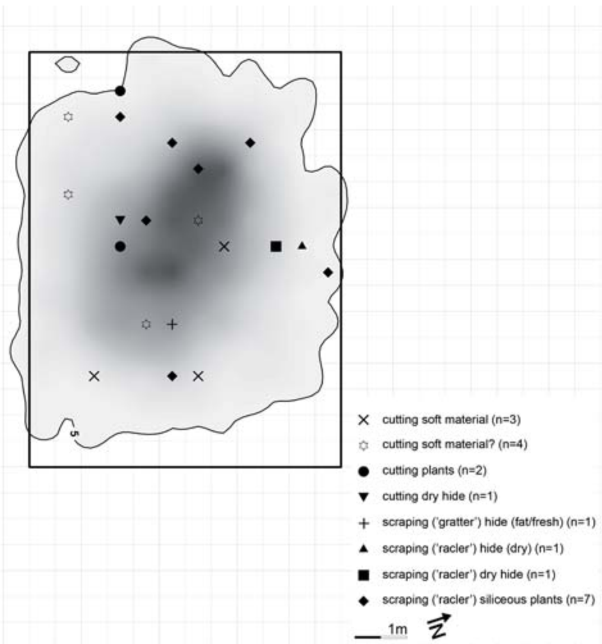

Fig. 12 – Doel-Deurganckdok. Horizontal distribution of the lithic artefacts showing microscopic traces of use, with indications of the material worked (microwear analysis by V. Beugnier).

of preservation. A number of taphonomic traces might have obliterated some of the traces of use, notably the most discrete of them. Traces of use were observed on 33 pieces, with a dominance of plant working, followed by hide working. The restricted number of this sample does not yet allow a reliable understanding of the spatial distribution of activities (fig. 12). However, it seems that the majority of artefacts without observable traces are situated in the north-western -part of the locus.

In general, the production processes often seem to have a non-standardised, *ad hoc* character, and are primarily directed towards the production of small irregular bladelets. However, and despite the reduced dimensions of the nodules, several elements indicates a more elaborate preparation of the cores (fig. 13). The most striking examples of this are different decortication sequences, superimposed core tablets and (unilateral) crested bladelets. Other indications of elaborate preparation are the regular occurrence of products with negatives of knapping accidents on their dorsal surfaces, as well as some presumably intentional *outrepassages*. It is remarkable that none of the refitted sequences contains all the elements of the *chaîne opératoire* (fig. 14). In cases where cores are incorporated into a sequence, large parts of the reduction sequences are absent; in other cases the cores themselves are missing. For an interpretation of these

Fig. 13 – Doel-Deurganckdok. Examples of some elaborate preparation and reduction of the cores: multiple superimposed tablets, a decortication sequence, (unilateral) crested bladelets, and (presumably intentional) 'outrepassées' bladelets.

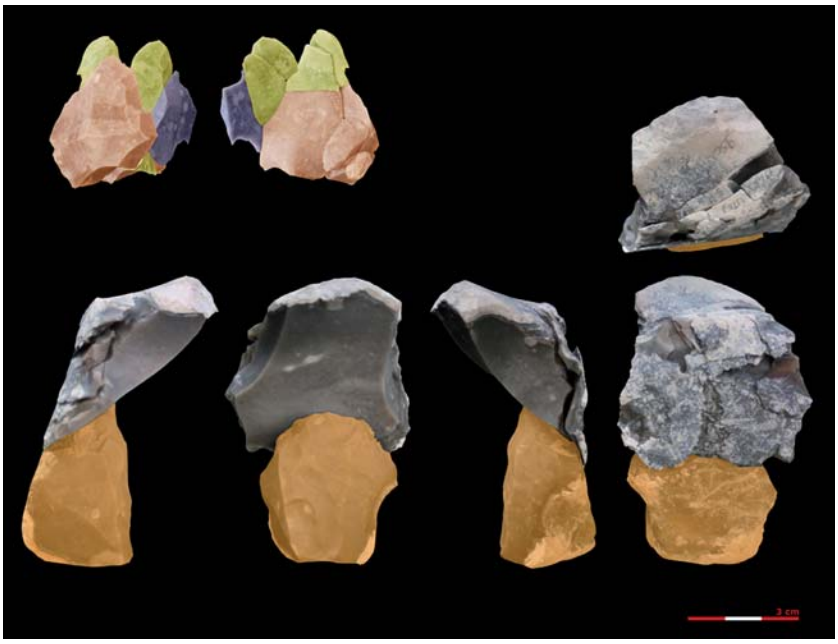

Fig. 14 – Doel-Deurganckdok. Illustration of the presence of partial reduction sequences; either the core (above, left), or a large part of the reduction sequence (below) are missing. Both observations suggest a highly complex and mobile pattern of technological organization.

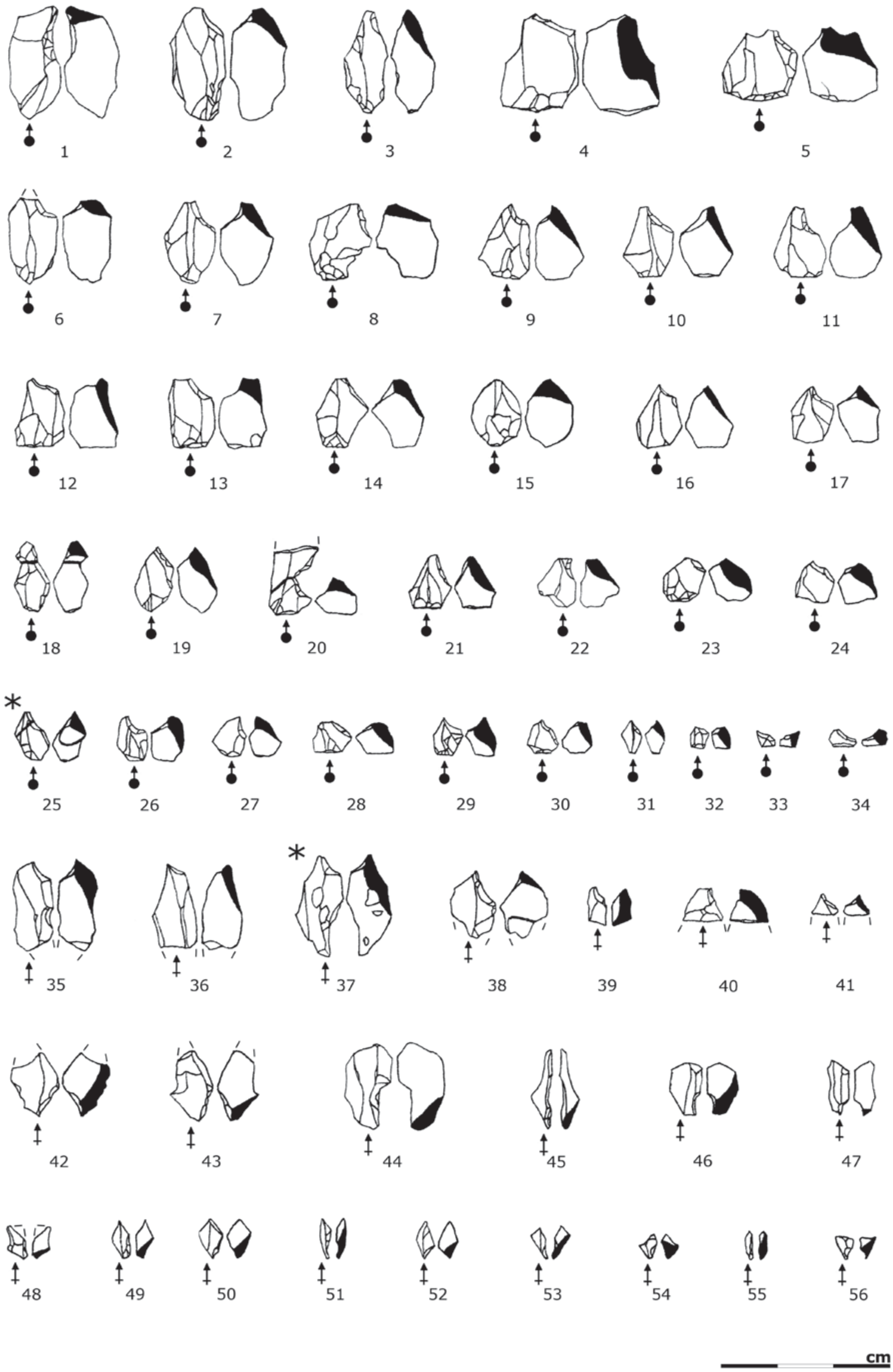

Fig. 15 – Doel-Deurganckdok. Selection of microburins. No. 20 was the only one that could be refitted onto a retouched fragment (star indicates burning).

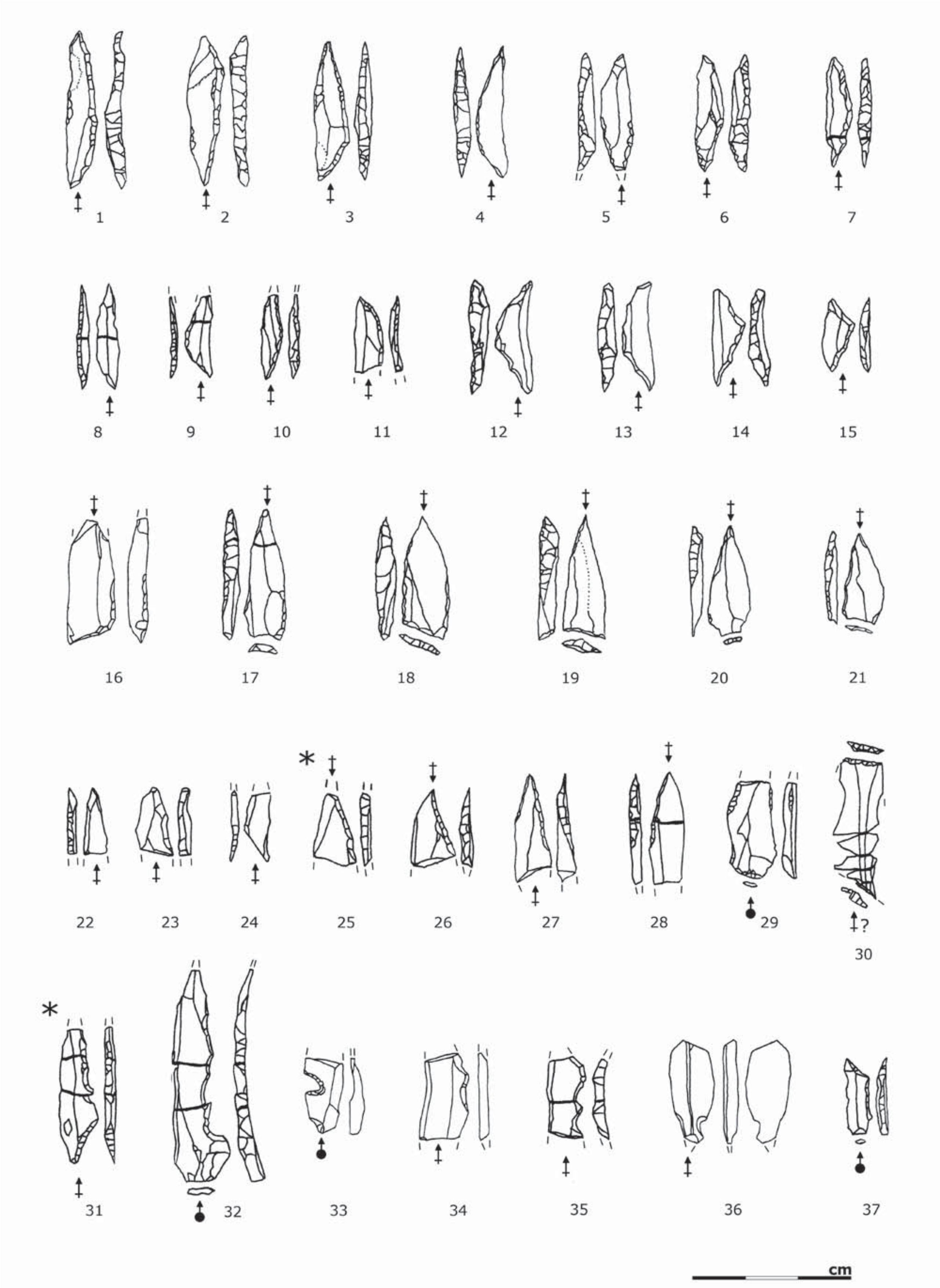

Fig. 16 – Doel-Deurganckdok. Selection of microliths (and 'technical pieces'), including refitted fragments. No. 16 was refitted into a reduction sequence; the refitted fragment of no. 30 was made from Wommersom Quartzite (star indicates burning).

partial sequences the limited extent of the excavation has, however, to be taken into account. Nevertheless, the recurrent nature of this observation suggests that this factor provides only a partial and limited explanation. It seems therefore that the presence of these partial sequences not only indicates a temporal and spatial fragmentation of the lithic *chaînes opératoires*, but also reflects a highly complex and dynamic mobile pattern of the technological organization.

With more than 100 pieces, microburins constitute an important element (fig. 15). The majority of these are made from well represented flint variants; some of them could be refitted into reduction sequences. With one exception, they cannot be related to the microliths within the assemblage, although several *piquant trièdres* were observed on the microliths. Only one microlith (fig. 16) was refitted in a reduction sequence, although several others are made from well represented flint variants as well. On the other hand, some of the microliths were made from variants that were otherwise totally absent in the assemblage. The majority of the microburins cluster in the south-eastern part of the concentration, together with fragments of microliths for which the complementary fragments are missing (fig. 17). Furthermore, complete and refitted fragments of microliths concentrate in the south-western sector, clearly separated from the microburins and non-refitted microliths fragments. Together, these observations suggest that the production and reparation of arrowheads occurred on this site, presumably in the southern sector of the excavated area. The dominance of microburins, together with the microliths, as well as the limited number of other retouched artefacts (i.e. endscrapers, burins, etc.) and the small dimension of the lithic concentration all suggested that this assemblage represents the remains of a small, presumably single occupation hunting camp (Crombé, 2005b).

In the majority of the cases where cores or artefacts with traces of use wear are incorporated into refitted sequences, these artefacts are predominantly situated in the immediate vicinity of the other elements of the sequence. This is indicative of production, (re)use and discard 'on the spot'. On the other hand, a number of artefacts, mostly larger bladelets, do not fit into any sequence, and they seem to be imported to this site. Furthermore, refits suggest that a number of artefacts for which typological determination was problematic and which were often made from very small nodules, appear to be burins (fig. 18). In order to confirm this hypothesis an additional microwear analysis is currently being undertaken on these (and other) artefacts.

Beyond any doubt, the elements presented so far reflect (spatial) regularities linked to human activities. However, an interpretation of this site is far from straightforward. These difficulties relate primarily to the dating of the site. At present, it is unclear whether this small concentration represents one or more visit(s). The morphological variability of the microliths (i.e. a dominance of segments associated with points with retouched base and some triangles) does not univocally fit in the regional typochronological framework (Crombé et al., 2009). This might indicate a palimpsest situation. Conversely, it might also suggest a larger typochronological variability of microlith assemblages than currently recognized. The microlith assemblage of C3 matches the Group of Hangest-sur-Somme which is currently recognized in northern France (Ducrocq, 2009) and could also be interpreted as a late development within the regional Group of Ourlaine (Crombé et al., 2009) where points with retouched base become more important. Radiocarbon dating poses further problems, as the four available radiocarbon dates for C3 (fig. 3), all obtained from individual fragments of carbonized hazelnut shells from the centre of the reconstructed surface hearth (fig. 8), indicate at least two distinct burning episodes in the second half

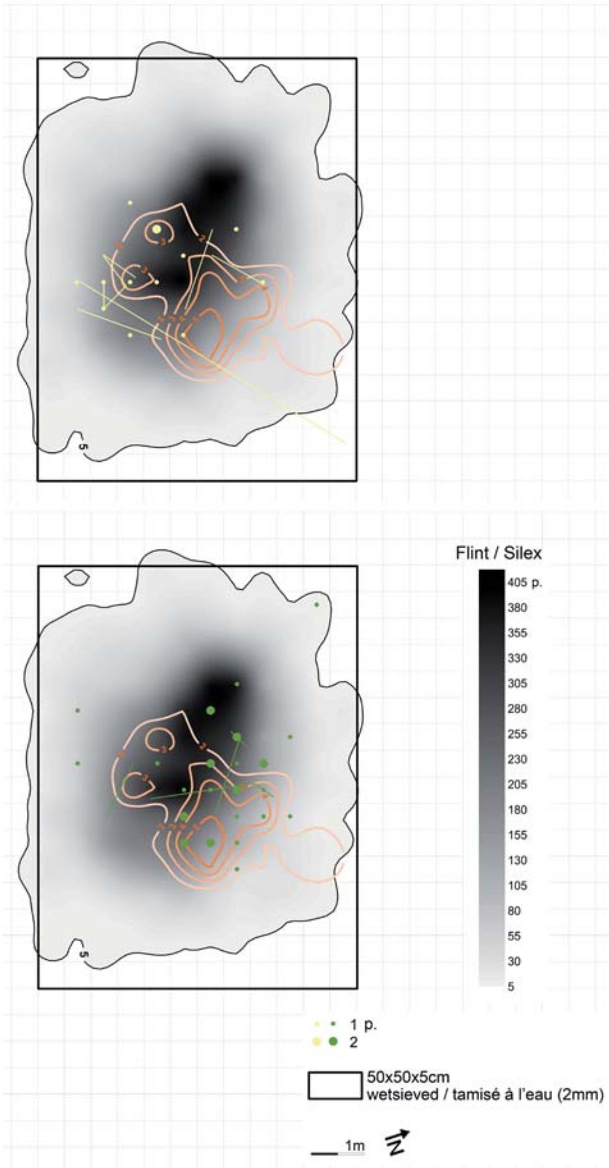

Fig. 17 – Doel-Deurganckdok. Horizontal distribution of microburins (orange contour lines), complete and refitted fragments of microliths (yellow dots with refitting lines) and fragments of microliths for which the complementary fragments are missing (green dots with refitting lines).

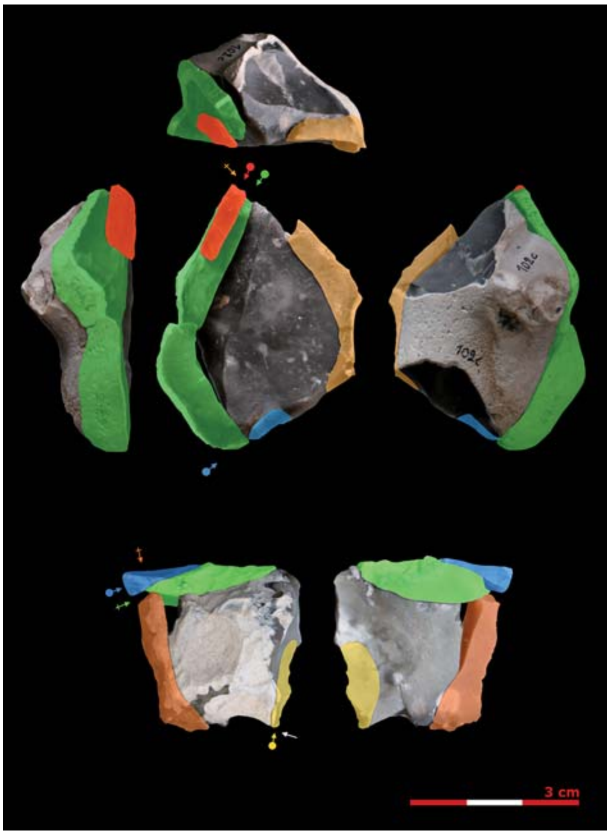

Fig. 18 – Doel-Deurganckdok. Two refitting units including artefacts for which the typological determination was problematic (burins?) and which were often made from very small nodules.

of the Boreal. There is no reason to doubt the reliability of these dates. Neither the vertical dispersion of the artefacts, up to 45 cm, nor the patination observed on different artefacts confirm the presence of multiple phases of occupation. The confrontation of the refit results and the raw material analyses with the vertical distribution of the artefacts does support the post-depositional character of the artefact displacement. Numerous refits of patinated with non-patinated fragments, as well as the frequent inclusion of patinated pieces within non-patinated sequences (fig. 19), suggest that patination does not form a chronological indicator for multiple occupation phases.

DISCUSSION AND CONCLUSIONS

Given the complex formation processes of the lithic sites in Sandy Flanders, the importance of developing adapted research designs (i.e. Holdaway and Stern, 2004, p. 93) should deserve our primary attention. Taking

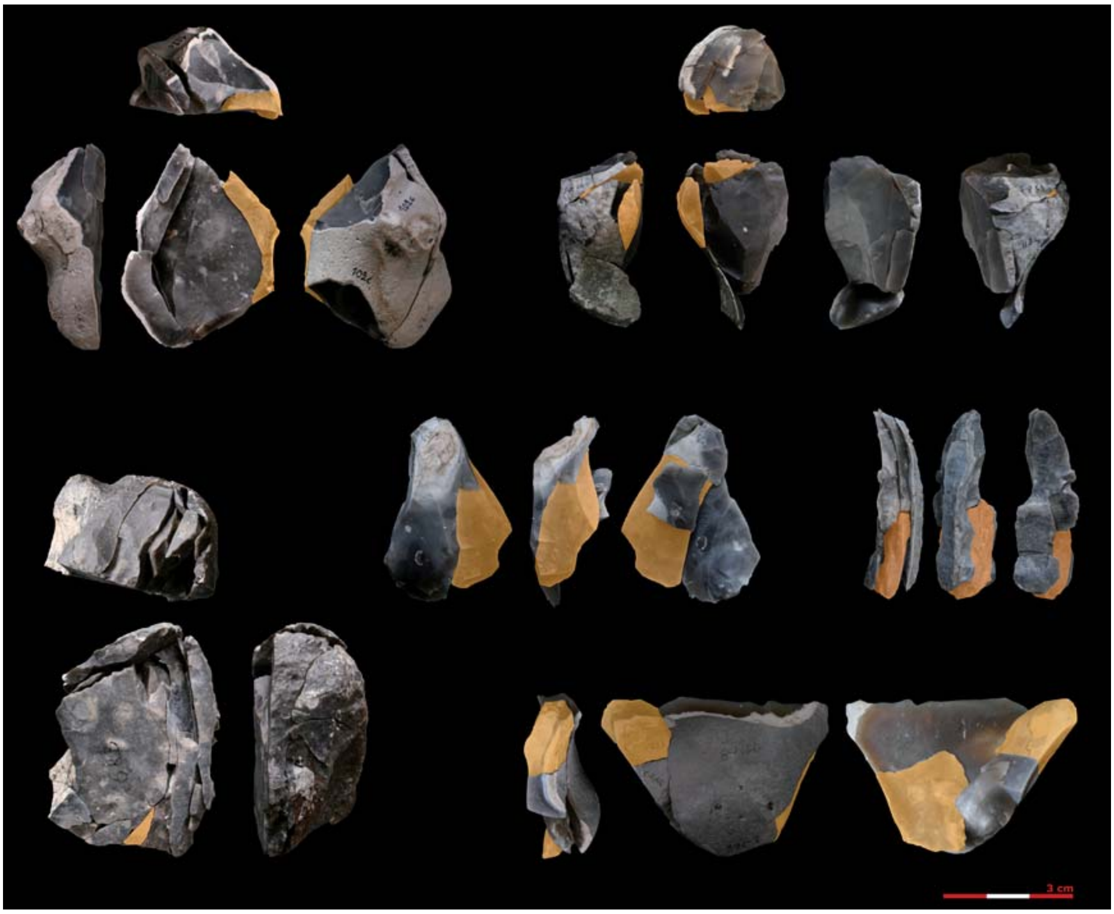

Fig. 19 – Doel-Deurganckdok. Refitting of patinated with non-patinated fragments, as well as the frequent inclusion of patinated pieces within non-patinated sequences. Patinated artefacts are indicated in orange.

into account our current state of knowledge, an integrated intra- and intersite approach, including detailed technological studies of entire artefact assemblages, still seems to be our best option for an adequate understanding of this record. Such an approach, for which detailed, consistent and large-scale excavations (beyond the boundaries of individual artefact clusters) are an absolute prerequisite, is not only characterised by the application of a wide variety of lithic analytical approaches, but also demands extensive and well-considered radiometric analyses of associated organic remains (Crombé, this volume). Given the potential palimpsest nature of the assemblages, lithic analyses within these research frameworks should take into account different scales: that of specimen attributes, individual artefacts as well as incomplete or entire assemblages with a specific focus on technological, functional, spatial and contextual characteristics of the remains. Furthermore, the spatial and temporal relationships between separate artefact clusters, as well as 'empty' zones or low density areas (i.e. off-site phenomena), have too often been neglected and should be included in our research programs. Given the partial destruction of Doel-'Deurganckdok J/L', this site offers only limited potential in this regard.

Currently, active expertise on lithic technology as well as a general framework for the study of Early Mesolithic technology is largely missing in Flanders. Despite a few technological studies (table 2), many aspects of Early Mesolithic lithic technology have not been explored in detail. For the development of a reliable technological framework, systematic refitting, which has been practised on a number of Early Mesolithic sites in lowland Belgium (table 2), seems to be an essential tool. Unfortunately, none of these studies have been published so far. On the other hand, most of the published technological studies used a quantitative analysis of various technological attributes of individual artefacts on the level of whole assemblages or samples thereof and have focused on a Late-Glacial/Early Holocene diachronic perspective rather than a synchronic Early Mesolithic perspective. However, a quantitative analysis of technological attributes remains a haphazard enterprise, due to the potential palimpsest character of the assemblages and the difficulties in the selection, measuring and interpretation of (technological) attributes. In this regard, constant evaluation of the usefulness of selected attributes by confronting these with the detailed information gained from refitting, can result in a significant contribution of technological research to our understanding of the archaeological record in this region. Not only will it provide a better characterization of Early Mesolithic technological organization, it will also give us a more solid base for inter-assemblage comparisons on a broader

SITE	METHODOLOGY	REF. ([...]= unpublished)
Meer – *Meirberg* (IV)	refitting	[Vreysen-Van Durme 1984] [Nijs 1986: 33-39]
Verrebroek - *Ambachtelijke Zone*	attribute analysis	[Van Roeyen 1990]
Schulen	attribute analysis	De Bie 1999
Neerharen - *De Kip*	refitting (limited?) attribute analysis	Lauwers & Vermeersch 1982 De Bie 1999
Verrebroek - *Dok 1* (C6, C16, C23, C70)	attribute analysis (+ limited refitting)	[Perdaen 2004] Perdaen, Crombé & Sergant 2004 Perdaen, Crombé & Sergant 2008a Perdaen, Crombé & Sergant 2008b Noens, Perdaen & Ryssaert 2009
Doel - *Deurganckdok sector J/L* (C3)	attribute analysis refitting	Noens *et al* 2005 Noens *et al* 2006 Noens, Perdaen & Ryssaert 2009 [Noens, in prep.]
Doel - *Deurganckdok sector J/L* (C2)	attribute analysis refitting	[Jacops 2007] Jacops, Noens & Crombé 2007
Oudenaarde – *Donk* (C1, C2, C3)	attribute analysis refitting	[Lombaert 2007] Lombaert, Noens & Ameels 2007 Lombaert 2009
Weelde – *Eindegoorheide* (loci 12 & 13)	attribute analysis	[De Wilde 2007] De Wilde, Verbeek & De Bie 2007 De Wilde 2009
Zonhoven - *Kapelberg*	refitting	unpublished, see Vermeersch 2008
(Zonhoven – *Molenheide*)	refitting	unpublished, see Vermeersch 2008

Table 2 – Doel-Deurganckdok. Overview of the most important technological studies on Early Mesolithic lithic assemblages in lowland Belgium.

geographical scale and in a syn- and diachronic perspective. Furthermore, it can contribute to a refinement of our typochronological frameworks and to more detailed insights into the formation history of our archaeological record. The examples mentioned in this article are only a first, discrete step in this direction, and our lithic technological approaches are in urgent need of further refinements, constant evaluation and a better integration in our research frameworks. In this respect, it is worth noting that lowland Belgium, and more particularly the wetland areas, still offer a huge unexplored potential. The sites of Verrebroek-'Dok 1' and Verrebroek-'Aven Ackers', where large surfaces were excavated in more favourable conditions than was the case in Doel, are a good example of this. In particular Verrebroek-'Dok 1', where different aspects of the intrasite approach already have advanced considerably, is a major case in point. Furthermore, a focus on other regions where the archaeological record is less problematic and/or technological frameworks already well established might result in a fruitful confrontation of methods and results.

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MESOLITHIC PALETHNOGRAPHY

RESEARCH ON OPEN-AIR SITES BETWEEN LOIRE AND NECKAR

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'Mesolithic Palethnography…': part of this volume's title represents a sort of methodological and theoretical mission statement designed to convey the idea that research concerning the last hunter-collectors is today in desperate need of this type of insight. Since the beginning of the 1990s, a spectacular crop of occasionally vast open-air sites has emerged, one of the notable contributions of preventive archaeology. Several long-term excavations have also added to this exponentially increasing body of information that has now come to include a growing number of well-preserved sites that have allowed us to address palethnographic questions. This volume represents a first step towards revitalising Mesolithic research. Here we have focused on occupations from the 8th millennium cal BC, currently the best documented periods, and limited the scope to Northern France and certain neighbouring regions. The first part contains several preludes to monographs highlighting potential future studies as well as various patterns in the structuring of space and the location of camps. These, as well as other complementary discoveries, provide material for the second part of the volume dedicated to new data concerning the functional dynamics of Mesolithic camps.

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