Notae Praehistoricae 28-2008 : 55-62

Scratching the surface
Surface scatters, armatures and forager-farmer contact in a 'frontier zone'

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Summary

In this paper a typo-technological analysis is carried out on Late Mesolithic trapezes and 'evolved' armatures from surface scatters in the southern Netherlands (Province of North Brabant and of Limburg). This study investigates the role of armatures in hypotheses of contact between Late Mesolithic foragers and Linearbandkeramik farmers.

Keywords: Prov. of North Brabant (NL), Prov. of Limburg (NL), Late Mesolithic, *Linearbandkeramik* culture, trapezes, forager-farmer contact, neolithisation.

1. Introduction

While small and seemingly unimpressive compared to other artefact classes, armatures have been cited widely over the past four decades as noteworthy evidence for contact between Late Mesolithic hunter-fisher-gatherer and *Linearbandkeramik* (LBK) populations during the 'neolithisation' (or, the incorporation of domestic agriculture into society) of Northwest Europe (Allard, 2007; Amkreutz *et al.*, in press; Belland *et al.*, 1985; Crombé, in press; Ducrocq, 1991; Gronenborn, 1990; de Grooth & van de Velde, 2005; Hauzeur, 2006; Huyge & Vermeersch, 1982; Jeunesse, 2002; Löhr, 1994; Newell, 1970; Rozoy, 1991; Thévenin, 1996). This interest has developed for two reasons: taphonomy and ethnography. Taphonomy has caused armatures to be one of the most prevalent artefact classes from which we are able to infer possible forager-LBK contact (Robinson, in press). Ethnographic studies (e.g. Wiessner, 1983) have emphasized the significance of armatures for communicating social and cultural identities. The central problem for contemporary research on the role of armatures in forager-LBK contact is the reconciliation of our archaeological reality with ethnographic data for their significance as cultural signifiers.

Amkreutz *et al.* (in press) rightly note the prevalence of top-down approaches to forager-LBK contact, where ethnographic data has determined the ways in which the archaeological record is interpreted. They argue for a bottom-up approach in which the archaeological record determines the analytical boundaries for the incorporation of ethnographic data into forager-LBK contact models. Despite their apt criticism and call for a new approach to model building, their interpretation of the role of armatures in forager-LBK contact is still dictated by ethnographic data. Amkreutz *et al.* (in press) thus interpret armatures as indicative of 'hybridisation' caused by forager-LBK contact, which led to foragers copying particular formal attributes of LBK arrowheads. While compelling, this interpretation still awaits further testing from the bottom-up approach they advocate.

A bottom-up approach requires that the researcher begin by investigating the role of armatures as signifiers of contact before attempting to interpret exactly what kind of contact they indicate. This paper seeks to contribute to this bottom-up approach by starting from the most problematic but prevalent source of our data for the role of armatures in possible forager-LBK contact: surface scatter assemblages. The primary aim of this paper is to answer the following question: Do the armatures in Late Mesolithic surface assemblages of the southern Netherlands suggest their role as evidence of forager-LBK contact during the late 6th-early 5th millennia BC?

2. Dataset and Methodology

The analytical limitations of Late Mesolithic surface assemblages in the southern Netherlands has been widely noted (Amkreutz *et al.*, in press; Arts 1989; Verhart, 2000, 2008; Verhart & Gronendijk, 2005). Post-depositional processes such as erosion and sedimentation have unfortunately made it difficult to associate armatures within precise social and technological contexts of their production. The focal point of inquiry therefore relies on the typo-technological analysis of different armatures found within these surface palimpsests. This enables a coarser understanding of the social and technological contexts of armature design.

The coarse chronology of the Late Mesolithic in the southern Netherlands is the central challenge to a typo-technological study of armatures as evidence of forager-LBK contact. Recent work in Belgium has indicated the difficulties for interpreting Late Mesolithic trapeze industries in terms of a linear evolution between different types (Robinson, in press). While 'evolved'/'derived' armature types such as *Flèche de Belloy* (asymmetric triangle with steep dorsal retouch of the large truncation, straight small truncation morphology, and frequent flat ventral retouch of the small truncation; Fagnart, 1991), *Flèche de Dreuil* (asymmetric triangle with small truncation angle > 90°, convex large truncation, and frequent flat retouch of the small truncation; Fagnart, 1991), and *Triangle de Fère* (asymmetric triangle with 90 small truncation angle, frequent flat ventral retouch of the small truncation, and sometimes concave small truncation morphology; G.E.E.M., 1969) were introduced sometime in the later 6th millennium calBC (Ducrocq, 2001), it is currently impossible to determine whether types such as symmetric, asymmetric, *Vielle*, and *bases décalées* trapezes were abandoned in favour of these 'evolved' forms (fig. 1). However, the recent work in the lower Scheldt basin has noted that asymmetric trapezes and *trapèzes à bases décalées* were common in the later parts of the Late Mesolithic, while *Belloy*, *Dreuil*, and *Fere* types are very rare (combined, < 9 % of total armature assemblage; Robinson, in press).

Because of these chronological impediments to the precise seriation of Late Mesolithic armatures, this study selected all trapezes, 'evolved' types, and 'Danubian' armatures. The first goal of this study is the investigation of the different armature types present in surface assemblages. This is an important first level of analysis because it establishes the foundations of any forager-LBK contact hypothesis. While this study did not examine LBK assemblages, contact hypotheses can be mitigated if 'evolved' and 'Danubian' armatures are not found in Late Mesolithic contexts. The presence of 'evolved' or 'Danubian' armatures has different meanings. 'Evolved' armatures either suggest an evolutionary trajectory in artefact design internal to Mesolithic society, or the product of LBK contact and subsequent imitation of 'Danubian' armatures. On the other hand, 'Danubian'

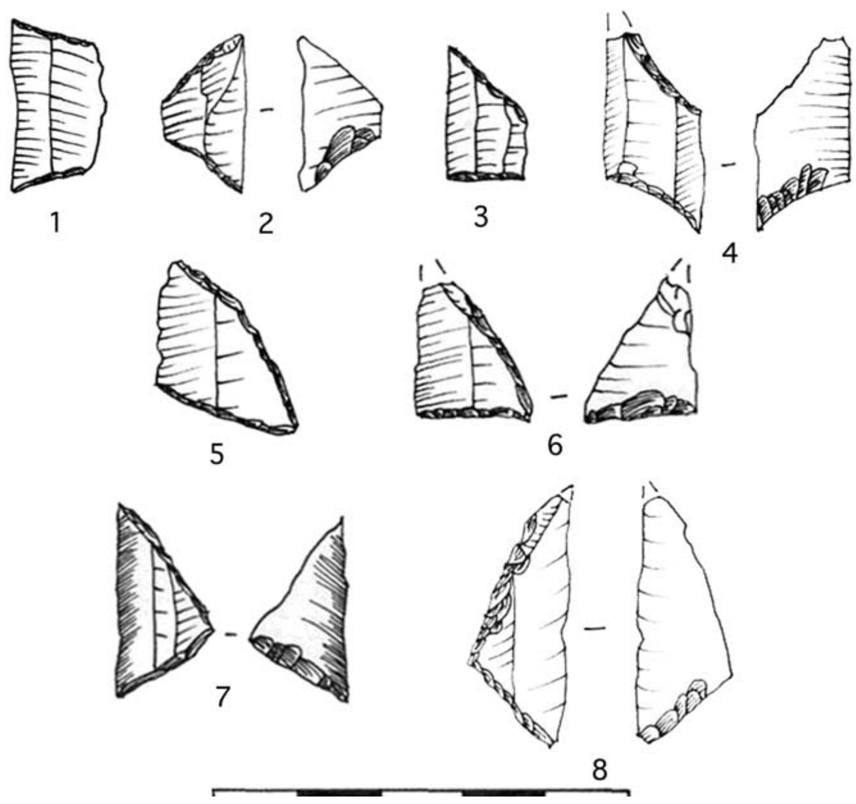

Fig. 1 — Armature types recorded for this study. 1: Symmetric trapeze; 2: Asymmetric trapeze; 3: *Trapèze de Vielle*; 4: *Trapèze à base décalée*; 5: *Flèche de Dreuil*; 6: *Triangle de Fère*; 7: *Flèche de Belloy*; 8: Danubian armature.

armatures suggest contacts such as exchange, imitation, or LBK presence in hunter-gatherer landscapes (e.g. Amkreutz *et al.*, in press; de Grooth & van de Velde, 2005; Verhart, 2000). Contact hypotheses depend on these fundamental typological inventories.

The second goal of this study is the examination of possible patterns in the specific formal attributes that comprise each armature type. Attribute composition analyses are the only precise means of solving problems of formal similarity or stylistic differentiation, for example, between *flèches de Belloy* and 'Danubian' armatures. The former are subtlety separated from the latter by the presence of either oblique retouch of the large truncation or a concave morphology of the small truncation on Danubian armatures (Robinson, in press). This distinction is central to the construction of contact hypotheses, as Belloy and Danubian armatures can be easily confused, which subsequently obscures their different social meanings. Furthermore, attribute composition analyses enable the analysis of supposed 'stylistic' attributes such as flat ventral retouch of the small truncation and lateralization. The relative frequencies of these attributes, and the possibility of their association with particular armature types, gives key insights on the various subtleties of armature design in the Late Mesolithic.

While the methodology records thirty-four attributes as diverse as raw material, presence/absence of burning or breakage, and incidences of secondary retouch on each edge, this short paper allows the time for analysis of six attributes: lateralization, presence/absence of piquant-trièdre, raw material, small truncation morphology, ventral retouch of small truncation, and dorsal retouch of large truncation.

The dataset comprised 255 armatures from eighteen surface sites. These eighteen sites were located by three amateur archaeologists (H. Heijmans, T. Schippers, P. van Gisbergen) during systematic fieldwalking (> 25 years) within nine microregions (fig. 2). Seven microregions are located in the Kempen region, along the Gender and Reusel valleys, whereas two were located in the Northwestern corner of Limburg, just to the north of the Tungelrooyse Beek. During selection of samples significant variability was noted in the size of surface assemblages, where probable site clusters such as ZH1, ZH2, and ZH3 comprised much larger palimpsested data than from other sites such as P4 or HGV. Sample sizes show significant variability ranging from one to forty-seven. Eleven sites had between fourteen and twenty-three armatures. This does not seem to diverge much from excavated material in the region. For example, at Merselo-*Haag*, Verhart (2000: 109) recorded a total of twenty-three trapezes, 'LBK-like', and triangular armatures. Unfortunately, time for the selection of armatures for this study did not permit an assessment of other chronologically diagnostic material that would allow for some prediction regarding general period of site use.

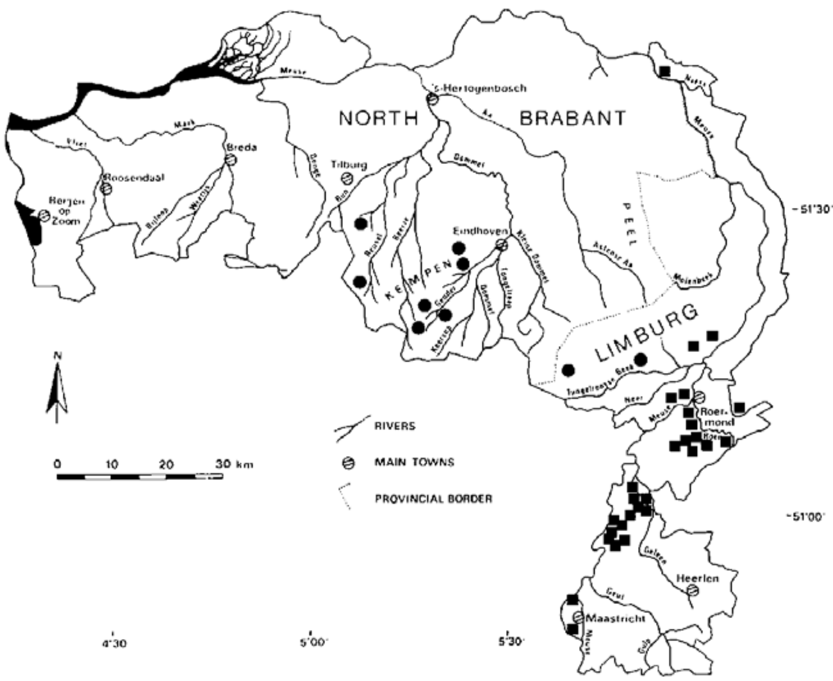

Fig. 2 — Late Mesolithic surface assemblages recorded (circles) and LBK sites (squares) (Map after Arts, 1989; LBK data after Verhart, 2000).

3. Results

This study yielded some interesting results regarding armature typology, armature dimensions, piquant-trièdre, lateralization, ventral basal retouch, and the utilization of Wommersom quartzite. As expected of surface palimpsests, the study yielded little insight concerning intersite variability. Thus, intersite variability will only be discussed briefly for the typological results, while all other attributes are assessed at the level of the regional assemblage.

Results for armature typology suggest subtle intersite variability. This variability is indicated by the differential presence of evolved armatures on just eight of the eighteen total sites. However, when they do occur, these armatures do not occur in high enough frequencies (< 5 %) to make distinctions between the different sites where they are found. Furthermore, the armature assemblages of each site are comprised of a majority of at least two of the four most common trapeze types in the Late Mesolithic of this region (e.g. symmetric, asymmetric, *Vielle*, and *bases décalée* trapezes), which also do not seem to occur in variable frequencies between sites.

Noteworthy results were obtained for armature typology within the larger context of the regional assemblage (tab. 1). Possible earlier types such as symmetric and *Vielle* trapezes comprise 19 % and 10 % of the total armatures respectfully. The most predominant types are made up of *bases décalée* (33 %) and asymmetric (30 %) trapezes. The most significant result from this study regards the lack of evolved armatures (*Belloy*, *Dreuil*, and *Fère* points) and the total absence of Danubian armatures in the region. *Belloy*, *Dreuil*, and *Fère* types comprised just 6.7 % of the total regional dataset. The small frequencies of evolved and Danubian armatures have major implications for the construction of forager-LBK contact hypotheses in this region. These implications will be discussed below, as it is important that we frame them in the context of our results for particular attributes.

	N	%
Symmetric Trapeze	50	19.6
Asymmetric Trapeze	77	30.2
Trapèze de Vielle	26	10.2
Trapèze à bases décalées	85	33.3
Flèche de Dreuil	3	1.2
Flèche de Belloy	13	5.1
Triangle de Fère	1	0.4
Total	*255*	*100*

Tab. 1 — Recorded armature types.

Studied on their own, armatures possess few attributes which allow them to be contextualized within earlier stages of the *chaîne opératoire*. Knapping techniques and proficiency can only be understood in a rather coarse manner, for instance, if bulbs of percussion are preserved or armature dimensions are recorded. Results for armature dimensions indicate variability according to type. Certain types such as *Belloy* and *Vielle* armatures appear to have strict dimensional requirements, whereas asymmetric and *bases décalées* types have a wide range of dimensions. Despite these wide dimensional requirements, the majority of asymmetric trapezes were made on the smallest blades/bladelets, whereas most *bases décalée* trapezes were made on the largest.

Besides blade/bladelet production, armatures also give insights on their reduction. The blade reduction strategy of the 'microburin technique' (Rozoy, 1968) is indicated by the presence of 'piquant-trièdre' on the dorsal side of the armature. By recording the frequencies of piquant-trièdre on armatures we are able to gain insight on the prevalence of the microburin technique for their manufacture. This study found that 37.7 % of all armatures had indications of a piquant-trièdre. While the microburin technique is represented on all types, this study indicates that it was preferred for the production of evolved (present on 100 %) and *bases décalée* (present on > 50 %) types. These results are promising, but await further testing and verification in the future. It is difficult to determine the relative predominance of the microburin technique in Late Mesolithic technology as a whole by referencing just one artefact class. However, this study suggests that the microburin technique might have been utilized in more specific production contexts than has previously been noted (e.g. Rozoy, 1968).

Lateralization of armatures has been noted by as evidence of stylistic differentiation between different Late Mesolithic social groups (Gendel, 1984). This interpretation has been extended to the acculturation of Mesolithic foragers by LBK populations (Löhr, 1994; Jeunesse, 2002). This study confirms earlier work that indicated the predominance of right lateralization in the Late Mesolithic between the Seine and Rhine/Meuse Delta. Eighty-eight percent of armatures recorded in this study were lateralized to the right. Nevertheless, the significance of this attribute for forager-farmer contact and acculturation is still unclear, as recent studies from the Hesbaye LBK has revealed 30 % left lateralization of armatures (Robinson, in press). The interpretive potential of this attribute will be examined in relation to others below.

Ventral retouch of the small truncation ('base') is a second attribute which has received considerable emphasis as an indicator of forager-LBK contact (Allard, 2007; Crombé, in press; Jeunesse, 2002; Rozoy, 1991; Thévenin, 1996). However, like lateralization, there are significant deviations between Mesolithic and LBK armatures (e.g. Robinson, in press). Ventral retouch of the small truncation appears to be much more predominant in the LBK than in the Mesolithic. This study noted just 15 % of armatures with ventral basal retouch. It must be noted though that samples can skew the analysis of this attribute, as ventral retouch is hardly ever found on symmetric or *Vielle* trapezes, which comprise just below 30 % of the dataset. Despite this, ventral basal retouch is present on all evolved armatures in the dataset. Thus far, interpretations of this attribute as evidence of forager-LBK contact have been supported by analyses which consider style separately from function. This unnecessary dichotomy has a negative impact on interpretation, as it does not allow for a more integrative approach which can test whether the attribute was acquired by the independent evolution of armature design, or from contact and imitation.

Two attributes used in the typological demarcation of Danubian armatures were recorded in this study: small truncation morphology and dorsal retouch of the large truncation. The central diagnostic division between Danubian and *Belloy* armatures is based on the fact that Danubian armatures have a concave base and/or oblique retouch of the large truncation (Robinson in press). This study confirms this demarcation, as just 9 % of armatures had concave bases and 1 % had oblique dorsal retouch of the large truncation.

The last noteworthy result was provided by the utilization of Wommersom quartzite (WQ). This does not give much insight into possible forager-LBK contact, but it does highlight the complexities of armature design during the Late Mesolithic. WQ comprised 26 % of the dataset, which confirms earlier work by Gendel (1984) on the regional frequencies of this raw material compared to flint. This study found that over 30 % of all piquant-trièdre's in the dataset were made in WQ. Interestingly, this contradicts Huyge and Vermeersch's (1982) finding that WQ was not preferred for the microburin technique. Typologically, WQ is preferred for the manufacture of asymmetric and *Vielle* trapezes. Two rare finds of *flèche de Belloy* in WQ confirmed recent hypotheses that this raw material was not used for the production of evolved armatures (Robinson, in press). This has significant implications for our understanding of Late Mesolithic social complexity. These results suggest that WQ was structured within a specific design strategy independent of the possible social meaning of evolved armatures.

5. Discussion

The aim of this paper has been the investigation of the analytical role of Late Mesolithic armatures found in surface assemblages of the southern Netherlands for forager-LBK contact models. From the outset I have argued that a bottom-up approach to model building requires the researcher to question the resolution of armatures as indicators of contact before creating hypotheses for the specific kind of contact they suggest. The typo-morphological analyses of this study produced some important results concerning armature design, which has significant implications for contact hypotheses based on an assumed similarity between Danubian armatures and Late Mesolithic evolved armatures and associated attributes.

This study found that evolved armatures (*Belloy*, *Fère*, and *Dreuil* types) were very rare (< 7 %), and Danubian armatures were totally absent from the dataset (tab. 1). Furthermore, diagnostic attributes of Danubian armatures – such as concave basal morphology and oblique dorsal retouch of the large truncation – do not appear to have comprised a significant role in Late Mesolithic armature design. Results for lateralization do not shed much further light on the meaning of this attribute, as they confirm other studies attesting the predominance of right lateralization throughout the region (Arts, 1989; Gendel, 1984; Löhr, 1994; Robinson, in press; Verhart, 2008). The most widely cited attribute of similarity between Late Mesolithic and LBK armatures, flat ventral retouch of the small truncation, appears on just a small frequency of the samples studied here (15 %). Interestingly, results for this attribute indicate its presence on all Late Mesolithic armatures except symmetric trapezes.

The results of this study suggest that the similarities between Danubian armatures and Late Mesolithic evolved armatures and associated attributes have been over-exaggerated, which has obscured clear divergences in armature design between both societies. These findings contradict both the acculturation (e.g. Jeunesse, 2002) and hybridisation/imitation (Amkreutz *et al.*, in press) hypotheses for the role of armatures in forager-LBK contact models.

If the assumption of the acculturation hypothesis is correct, then Danubian armatures should have clear typological and attribute compositional foundations in Late Mesolithic armature industries. Recent work in the Hesbaye region has shown how the key design features noted by Jeunesse (2002) – evolved armatures, right lateralization, and ventral basal retouch – deviated significantly from the Late Mesolithic to the LBK (Robinson, in press). Results from the current study make it difficult to argue for an antecedent design template in the Late Mesolithic that was transmitted through to generations that were acculturated by LBK society. First, the appropriate antecedent types are rare in the dataset from North Brabant and the western edge of Limburg. Second, particular attributes common to the LBK – such as flat ventral basal retouch, concave basal morphology, and oblique dorsal retouch of the large truncation – appear in a seemingly stochastic manner between armature types, sites, and regions. This stochastic variability still awaits future statistical work. Third, the acculturation hypothesis fails to explain the clear divergences in blade production and reduction between the Late Mesolithic and LBK (Allard, 2005; Cahen *et al.*, 1986), which has been confirmed by this study. In order for the subtle similarities between Late Mesolithic and Danubian armatures to have meaning for the expression of Mesolithic social identity within LBK society, advocates of the acculturation hypothesis must explain why secondary retouch signifies social identity more than the entire *chaîne opératoire*.

The hybridisation hypothesis of Amkreutz *et al.* (in press) interprets the presence of evolved types and ventral basal retouch in Late Mesolithic armature assemblages as the Mesolithic imitation of LBK armature design. Results from this study suggest that if imitation did occur, then it was rare and stochastic. As stated above, the meaning of this stochastic variability requires future analysis. Nevertheless, the frequencies discussed here demonstrate that two central problems must be addressed in order to legitimate the hybridisation hypothesis for armatures. First, why did Late Mesolithic society imitate just a single artefact class, and not other typo-technological features of LBK chipped stone industries (e.g. borers, sickle blades)? Second, if Mesolithic societies had some sort of social incentive to copy LBK armature types and attributes, then why did they produce imitated attributes such as flat ventral basal retouch on types different from those that provided the original template (e.g. Danubian armatures)?

This paper has aimed primarily to answer the following question: Do the armatures in Late Mesolithic surface assemblages of the southern Netherlands suggest their role as evidence of forager-LBK contact during the late 6^{th}-early 5^{th} millennia BC ? The results presented here show that armatures do have a role as evidence of forager-LBK contact, yet as an indication of divergences in armature design, rather than similarities based on emulation and/or inter-generational filiation of design templates. These results suggest that contact likely had little impact on the intercultural transmission of knowledge for armature design, which enables a richer understanding of the complexities of possible forager-LBK social interaction.

The little impact that armatures did have during the course of these interactions can be attributed greater anthropological significance in the future by closer scrutiny of the possible meanings of specific attributes that seem to be similar in both societies. The design approach undertaken in this study allows for a fuller appreciation of the various nuances that comprise the process of armature manufacture. In the near future we must begin to ask more 'why' questions concerning the specific reasons for these divergences in armature design. These questions will not be answered with a banal and dichotomous assessment of 'style' versus 'function', but with an integrative approach to armature design (*cf.* Nelson, 1997), which considers the interplay of social and ecological forces on changes in chipped stone technology.

6. Conclusion

Despite the well-noted taphonomic impediments to our knowledge of forager-LBK contact in the southern Netherlands, the typo-technological investigation of Late Mesolithic armatures from surface assemblages yields important information on the analytical role of armatures in the construction of contact models. This study found that the role of armatures in these models should not be rejected, but refined. Armatures were not isolated media for the expression of Late Mesoltihic or LBK social identities, but were bound within larger structures of cultural transmission that were constantly being renegotiated by the dynamic relationships between ecology, social organization, and the differential expression of social identities. Because they were integrally placed within such dynamic systems of cultural reproduction, armatures must be understood in their broader technological perspectives (e.g. Allard, 2005). The divergences in armature design between the Late Mesolithic and LBK must not be seen as an impediment to the construction of contact models, but an enrichment of their analytical potential for understanding the complex evolutionary trajectories that comprised neolithisation processes in the lower Rhine/Meuse basins.

Acknowledgements

This paper would not have been possible without the kind help of many people. First and foremost, I would like to thank H. Heijmans, T. Schippers, and P. van Gisbergen for granting permission to study their collections. I would also like to thank M. Bats, J. Deeben and J. Schreurs for introducing me to H. Heijmans, T. Schippers, and P. van Gisbergen, and the invaluable knowledge I gained from them concerning regional archaeological contexts. I would like to thank J. Barrett, P. Crombé, and J. Sergant for comments on earlier drafts. Any mistakes are my own.

Bibliography

ALLARD P., 2005. *L'Industrie lithique des populations rubanées du Nord-Est de la France et de la Belgique*. Rahden, Marie Leidorf.

ALLARD P., 2007. The Mesolithic-Neolithic Transition in the Paris Basin: A Review. In: A. WHITTLE & V. CUMMINGS (eds), *Going Over: The Mesolithic-Neolithic Transition in North-West Europe*. Oxford, Oxford University Press, Proceedings of the British Academy, 144: 211-223.

AMKREUTZ L., VANMONTFORT B., & VERHART L., in press. Diverging trajectories: Forager-farmer interaction in the southern part of the Lower Rhine Area and the applicability of contact models. In: D. HOFFMAN & P. BICKLE (eds), *New Advances in Central European Neolithic Research*.

ARTS N., 1989. Archaeology, environment, and the social evolution of later band societies in a lowland area. In: C. BONSALL (ed.), *The Mesolithic in Europe: Papers presented at the 3rd International Congress of the Mesolithic. Edinburgh 1985*, Edinburgh, Edinburgh University Press: 291-312.

BELLAND G., BLOUET V. & LEESCH D., 1985. Éléments Mésolithique et Néolithiques moyen de la station d'Himeling (commune de Puttelange-les-Thionville, département de Moselle, France). *Bulletin de la Société Préhistorique Luxembourgeoise*, 7: 91-102.

DE GROOTH M. & VAN DE VELDE P., 2005. Colonists on the loess? Early Neolithic A: the Bandkeramik culture. In: L. P. LOUWE KOOIJMANS, P. W. VAN DEN BROEKE, H. FOKKENS, A. L. VAN GIJN (eds), *The Prehistory of the Netherlands*, vol. 1, Amsterdam, Amsterdam University Press: 219-241.

CAHEN D., CASPAR J.-P., & OTTE M., 1986. *Industries lithiques danubiennes de Belgique*. Liège, ERAUL, 21.

CROMBÉ P., 2008. Contacts et échanges entre chasseurs et agriculteurs durant le 6ème et 5ème millenaire avant J.-C. dans l'ouest de la Belgique. In : L. BURNEZ-LANOTTE, M. ILETT & P. ALLARD (eds), *Fin des traditions danubiennes dans le Néolithique du Bassin parisien et de la Belgique (5100-4700 BC). Autour des recherches de Claude Constantin, Actes du Colloque international de Namur (24-25 novembre 2006)*, Paris, Mémoire de la Société Préhistorique Française, 44.

DUCROCQ T., 1991. Les armatures du Mésolithique final et du Néolithique ancien en Picardie: héritage ou convergence ? In: *Mésolithique et Néolithisation en France et dans les régions limitrophes*, Strasbourg, 1988, actes du 113e Congrès national des Sociétés savantes: 425-436.

FAGNART J.-P., 1991. La fin du Mésolithique dans le Nord de la France. In: *Mésolithique et Néolithisation en France et dans les régions limitrophes*, Strasbourg, 1988, actes du 113e Congrès national des Sociétés savantes: 437-452.

G.E.E.M., 1969. Épipaléolithique-Mésolithique. Les microlithes géométriques. *Bulletin de la Société Préhistorique Française*, 66: 355-366.

GENDEL P. A., 1984. *Mesolithic Social Territories of Northwest Europe*. Oxford, Archaeopress, BAR International Series, 218.

GRONENBORN D., 1990. Mesolithic-Neolithic interactions. The lithic industry of the Earliest Bandkeramik Culture site at Friedberg-Bruchenbrücken (West Germany). In: P. M. VERMEERSCH & P. VAN PEER (eds), *Contributions to the Mesolithic in Europe. Papers Presented at the Fourth International Symposium 'The Mesolithic in Europe', Leuven 1990*, Leuven, Leuven University Press: 173-182.

HAUZEUR A., 2006. *Le Rubané au Luxembourg. Contribution à l'étude du Rubané du Nord-Ouest européen*. Luxembourg-Liège, Dossiers d'Archéologie du Musée National d'Histoire et d'Art, X, ERAUL, 114.

HUYGE D. & VERMEERSCH P. M., 1982. Late Mesolithic settlement at Weelde-Paardsdrank. In: P. M. VERMEERSCH (ed.), *Contributions to the Study of the Mesolithic in the Belgian Lowland*, Tervuren, Studia Praehistorica Belgica, 1: 116-209.

JEUNESSE C., 2002. Armatures asymétriques, régionalisation, acculturation. Contribution à l'Étude des relations entre le Rubané et la composante autochtone dans l'ouest de la sphère danubien. In: M. OTTE & J. KOZLOWSKI (eds), *Préhistoire de la Grande Plaine du Nord de l'Europe. Les échanges entre l'Est et l'Ouest dans les sociétés préhistoriques. Actes du Colloque Chaire Francqui interuniversitaire, Université de Liège, le 26 juin 2001*, Liège, ERAUL, 99: 147-165

LÖHR H., 1994. Linksflüger und Rechtsflüger in Mittel-und Westeuropa. Der Fortbestand der Verbreitungsgebiete asymmetrischer Pfeilspitzformen als Kontinuitätsbeleg zwischen Meso-und Neolithikum. *Trierer Zeitschrift*, 57: 9-127.

NELSON M. C., 1997. Projectile points: Form, function, and design. In: H. KNECHT (ed.), *Projectile Technology*, New York, Plenum: 371-84.

NEWELL R. R., 1970. The flint industry of the Dutch Linearbandkeramik. In: P. J. R. MODDERMAN (ed.), *Linearbandkeramik aus Elsloo und Stein*, Leiden, Analecta Praehistorica Leidensia, 3: 144-183.

ROBINSON E. N., in press. The evolution of trapeze industries and the role of armatures in neolithisation models for Northwest Europe: A systematic approach. In: P. CROMBÉ & M. VAN STRYDONCK (eds), *Chronology and Evolution of the Mesolithic in Northwest Europe*, Cambridge, Cambridge Scholars Publishing.

ROZOY J.-G., 1968. L'étude du matériel brut et des microburins dans l'Épipaléolithique (Mésolithique) franco-belge. *Bulletin de la Société Préhistorique Française*, 65: 365-390.

ROZOY J.-G., 1991. Nature et conditions de la Néolithisation. La fin de l'Épipaléolithique ("Mésolithique") au nord de la Loire. In : *Mésolithique et Néolithisation en France et dans les regions limitrophes*, Strasbourg, 1988, actes du 113e Congrès national des Sociétés savantes: 403-423.

THÉVENIN A., 1996. Mésolithique récent et Mésolithique final entre Bassin parisien et Alpes et perspectives sur les processus de Néolithisation. In: P. DUHAMEL (ed.), *La Bourgogne entre les Bassins, rhénan, rhodanien, et parisien: carrefour ou frontière*, 14e supplément, *Revue Archéologique de l'Est*: 9-27.

VERHART L., 2000. *Times Fade Away: The Neolithisation of the southern Netherlands in an anthropological and geographical perspective*. Leiden, ASLU, 6.

VERHART L., 2008. New developments in the study of the Mesolithic of the Low Countries. In: G. BAILEY & P. SPIKINS (eds), *Mesolithic Europe*, Cambridge, Cambridge University Press: 158-181.

VERHART L. & H. GROENENDIJK, 2005. Living in abundance: Middle and Late Mesolithic. In: L. P. LOUWE KOOIJMANS, P. W. VAN DEN BROEKE, H. FOKKENS & A. L. VAN GIJN (eds), *The Prehistory of the Netherlands*, vol. 1, Amsterdam, Amsterdam University Press: 161-178.

WIESSNER P., 1983. Style and social information in Kalahari San projectile points. *American Antiquity*, 48: 253-276.

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