LES SÉANCES DE LA SOCIÉTÉ PRÉHISTORIQUE FRANÇAISE

Les Séances de la Société préhistorique française sont organisées deux à trois fois par an. D'une durée d'une ou deux journées, elles portent sur des thèmes variés : bilans régionaux ou nationaux sur les découvertes et travaux récents ou synthèses sur une problématique en cours dans un secteur de recherche ou une période en particulier.

La Société préhistorique française considère qu'il est de l'intérêt général de permettre un large accès aux articles et ouvrages scientifiques sans en compromettre la qualité ni la liberté académique. La SPF est une association à but non lucratif régie par la loi de 1901 et reconnue d'utilité publique, dont l'un des buts, défini dans ses statuts, est de faciliter la publication des travaux de ses membres. Elle ne cherche pas le profit par une activité commerciale mais doit recevoir une rémunération pour compenser ses coûts de gestion et les coûts de fabrication et de diffusion de ses publications.

Conforméméent à ces principes, la Société préhistorique française a décidé de proposer les actes des Séances en téléchargement gratuit sous forme de fichiers au format PDF interactif. Bien qu'en libre accès, ces publications disposent d'un ISBN et font l'objet d'une évaluation scientifique au même titre que nos publication papier périodiques et non périodiques. Par ailleurs, même en ligne, ces publications ont un coût (secrétariat d'édition, mise en page, mise en ligne, gestion du site internet) : vous pouvez aider la SPF à poursuivre ces activités de diffusion scientifique en adhérent à l'association et en vous abonnant au *Bulletin de la Société préhistorique française* (voir au dos ou sur **http://www.prehistoire.org/form/515/736/formulaire-adhesion-et-ou-abonnement-spf-2014.html**).

LA SOCIÉTÉ PRÉHISTORIQUE FRANÇAISE

La Société préhistorique française, fondée en 1904, est une des plus anciennes sociétés d'archéologie. Reconnue d'utilité publique en 1910, elle a obtenu le grand prix de l'Archéologie en 1982. Elle compte actuellement plus de mille membres, et près de cinq cents bibliothèques, universités ou associations sont, en France et dans le monde, abonnées au *Bulletin de la Société préhistorique française*.

Tous les membres de la Société préhistorique française peuvent participer :

– aux séances scientifiques de la Société – Plusieurs séances ont lieu chaque année, en France ou dans les pays limitrophes. Le programme annuel est annoncé dans le premier *Bulletin* et rappelé régulièrement. Ces réunions portent sur des thèmes variés : bilans régionaux ou nationaux sur les découvertes et travaux récents ou synthèses sur une problématique en cours dans un secteur de recherche ou une période en particulier ;

– aux Congrès préhistoriques de France – Ils se déroulent régulièrement depuis la création de la Société, actuellement tous les quatre ans environ. Leurs actes sont publiés par la Société préhistorique française. Depuis 1984, les congrès se tiennent sur des thèmes particuliers ;

– à l'assemblée générale annuelle – L'assemblée générale se réunit en début d'année, en région parisienne, et s'accompagne toujours d'une réunion scientifique. Elle permet au conseil d'administration de rendre compte de la gestion de la Société devant ses membres et à ceux-ci de l'interpeller directement. Le renouvellement partiel du conseil se fait à cette occasion.

Les membres de la Société préhistorique française bénéficient :

– d'information et de documentation scientifiques – Le *Bulletin de la Société préhistorique française* comprend, en quatre livraisons de 200 pages chacune environ, des articles, des comptes rendus, une rubrique d'actualités scientifiques et une autre sur la vie de la Société. La diffusion du bulletin se fait par abonnement annuel. Les autres publications de la SPF – Mémoires, Travaux, Séances, fascicules des Typologies de la Commission du Bronze, Actes des Congrès, Tables et index bibliographiques ainsi que les anciens numéros du *Bulletin* – sont disponibles au siège de la Société préhistorique française, sur son site web (avec une réduction de 20 % pour les membres de la SPF et téléchargement gratuit au format PDF lorsque l'ouvrage est épuisé) ou en librairie.

– de services – Les membres de la SPF ont accès à la riche bibliothèque de la Société, mise en dépôt à la bibliothèque du musée de l'Homme à Paris.

Régie par la loi de 1901, sans but lucratif, la Société préhistorique française vit des cotisations versées par ses adhérents. Contribuez à la vie de notre Société par vos cotisations, par des dons et en suscitant de nouvelles adhésions autour de vous.

ADHÉSION ET ABONNEMENT 2014

Le réabonnement est reconduit automatiquement d'année en année*.

Paiement en ligne sécurisé sur

www.prehistoire.org

ou paiement par courrier : formulaire papier à nous retourner à l'adresse de gestion et de correspondance de la SPF :

BSPF, Maison de l'archéologie et de l'ethnologie
Pôle éditorial, boîte 41, 21 allée de l'Université, 92023 Nanterre cedex

1. PERSONNES PHYSIQUES	Zone €**	Hors zone €
Adhésion à la *Société préhistorique française* et abonnement au *Bulletin de la Société préhistorique française*		
➢ tarif réduit (premier abonnement, étudiants, moins de 26 ans, demandeurs d'emploi, membres de la Prehistoric Society***)	☐ 40 €	☐ 45 €
➢ abonnement / renouvellement	☐ 75 €	☐ 80 €
OU		
Abonnement au *Bulletin de la Société préhistorique française*		
➢ abonnement annuel (sans adhésion)	☐ 85 €	☐ 90 €
OU		
Adhésion à la *Société préhistorique française*		
➢ cotisation annuelle	☐ 25 €	☐ 25 €
2. PERSONNES MORALES		
Abonnement au *Bulletin de la Société préhistorique française*		
➢ associations archéologiques françaises	☐ 110 €	
➢ autres personnes morales	☐ 145 €	☐ 155 €
Adhésion à la *Société préhistorique française*		
➢ cotisation annuelle	☐ 25 €	☐ 25 €

NOM : .... PRÉNOM : ....

ADRESSE COMPLÈTE : ....

TÉLÉPHONE : ....DATE DE NAISSANCE : _ _ / _ _ / _ _ _ _

E-MAIL : ....

VOUS ÊTES : ☐ « professionnel » (votre organisme de rattachement) : ....
☐ « bénévole » ☐ « étudiant » ☐ « autre » (préciser) :..

Date d'adhésion et / ou d'abonnement : _ _ / _ _ / _ _

Merci d'indiquer les période(s) ou domaine(s) qui vous intéresse(nt) plus particulièrement :

....

Date ...., signature :

Les chèques doivent être libellés au nom de la Société préhistorique française. Le paiement par **carte de crédit** est bienvenu (Visa, Mastercard et Eurocard) ainsi que le paiement par **virement** à La Banque Postale • Paris IDF centre financier • 11, rue Bourseul, 75900 Paris cedex 15, France • RIB : 20041 00001 0040644J020 86 • IBAN : FR 07 2004 1000 0100 4064 4J02 086 • BIC : PSSTFRPPPAR.

Toute réclamation d'un bulletin non reçu de l'abonnement en cours doit se faire au plus tard dans l'année qui suit. Merci de toujours envoyer une enveloppe timbrée (tarif en vigueur) avec vos coordonnées lorsque vous souhaitez recevoir un reçu fiscal et / ou une facture acquitée et / ou le timbre SPF de l'année en cours, et au besoin une nouvelle carte de membre.

N° de carte bancaire : _

Cryptogramme (3 derniers chifres) : _ _ _ Date d'expiration : _ _ / _ _ signature :

---

* : Pour une meilleure gestion de l'association, merci de bien vouloir envoyer par courrier ou par e-mail en fin d'année, ou en tout début de la nouvelle année, votre lettre de démission.

** : Zone euro de l'Union européenne : Allemagne, Autriche, Belgique, Chypre, Espagne, Estonie, Finlande, France, Grèce, Irlande, Italie, Lettonie, Luxembourg, Malte, Pays-Bas, Portugal, Slovaquie, Slovénie.

*** : Pour les moins de 26 ans, joindre une copie d'une pièce d'identité ; pour les demandeurs d'emploi, joindre un justificatif de Pôle emploi ; pour les membres de la Prehistoric Society, joindre une copie de la carte de membre ; le tarif « premier abonnement » profite exclusivement à des membres qui s'abonnent pour la toute première fois et est valable un an uniquement (ne concerne pas les réabonnements).

2-2

SÉANCES DE LA SOCIÉTÉ PRÉHISTORIQUE FRANÇAISE

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,
Jean-Pierre Fagnart, Frédéric Séara, and Christian Verjux

Société préhistorique française
www.prehistoire.org

2013

ISBN : 2-913745-51-2 (on-line)
ISSN : 2263-3847

The series
“Séances de la Société préhistorique française”
is available on-line at:

www.prehistoire.org

Cover drawing by Marie Jamon

Persons in charge of the “Séances de la Société préhistorique française” : Sylvie Boulud-Gazo and Jean-Pierre Fagnart
Series Editor: Claire Manen
Editorial Secretary, layout : Martin Sauvage
Webmaster : Ludovic Mevel

Société préhistorique française (reconnue d’utilité publique, décret du 28 juillet 1910). Grand Prix de l’Archéologie 1982.
Head office : 22, rue Saint-Ambroise, 75011 Paris (France)
Tel. : 00 33 1 43 57 16 97 – Fax : 00 33 1 43 57 73 95 – E-mail: spf@prehistoire.org
Web site : www.prehistoire.org

Office adress:

Maison de l’archéologie et de l’ethnologie,
Pôle éditorial, boîte 41, 21 allée de l’Université, F-92023 Nanterre cedex (France)
Tel. : 00 33 1 46 69 24 44
La Banque Postale Paris 406-44 J

This publication has been supported by the French Ministry of Culture and Communication,
the Centre national de la recherche scientifique,
the Institut national de recherches archéologiques préventives (INRAP),
and the laboratory “Ethnologie préhistorique”, UMR 7041 “ArScAn” (Nanterre).

ISSN 2263-3847
ISBN 2-913745-51-2 (on-line)

CONTENTS

CURRENT RESEARCH CONCERNING MESOLITHIC OPEN-AIR SITES

ELEMENTS OF PALETHNOGRAPHY: FUNCTIONNAL DYNAMICS OF MESOLITHIC OPEN-AIR SITES

Mesolithic Palethnography
Research on open-air sites between Loire and Neckar
Proceedings from the international round-table meeting, Paris, November 26–27, 2010
Boris Valentin, Bénédicte Souffi, Thierry Ducrocq, Jean-Pierre Fagnart,
Frédéric Séara & Christian Verjux (eds.)
Paris, Société préhistorique française, 2013
(Séances de la Société préhistorique française, 2-2)
p. 119–132
www.prehistoire.org
ISSN 2263-3847 – ISBN 2-913745-51-2 (on-line)

Microliths from 62 rue Henry-Farman, Paris (15th arrondissement): specific arrows for different types of game hunted in particular places?

Lorène Chesnaux

Abstract: This chapter presents a functional analysis of Beuronian microliths from the site of 62 rue Henry-Farman in the 15th arrondissement of Paris. The combination of use-wear and experimentation brings to light an unexpected spatio-temporal separation of hunting related activities. Points, just like triangles and crescents, were manufactured on-site and abandoned before being used. Whereas triangles and crescents, employed as barbs or point-barbs, were reintroduced into the assemblage within carcasses, 80% of which were wild boar.

This study, financed by the 'Collective Research Project' *The Final Palaeolithic and Mesolithic in the Paris Basin and its margins. Habitats, societies and environments* (dir. B. Valentin), forms part of a multidisciplinary project investigating Mesolithic occupations belonging to the Boreal period at Paris, 62 rue Henry-Farman led by Bénédicte Souffi (Souffi and Marti, 2011).

We have attempted to document the technical variability of microliths from loci 1, 2, 3 and 5 by reconstructing the final stage of their *chaînes opératoires*. These results are then integrated within a broader consideration of weapon maintenance and manufacture at Farman and their palethnographic implications.

THE FARMAN MICROLITHIC ASSEMBLAGE: NEW TYPOLOGICAL PROPOSITIONS

The analysis of 279 microliths revealed a certain variability in the way that the desired form is obtained by retouch, i.e. different shaping modes of the functioning parts.

An examination of these different modes, i.e. the shaping of the microlith's functioning part, either a type of point (all extremities having acute angles) or a cutting edge, alternatively a combination of the two, provides insights into their intended uses (Christensen and Valentin, 2004; Valentin, 2005 and 2008; Marder et al., 2006; Chesnaux, in prep.). Points may serve as the leading tip of the projectile, enabling its penetration and retention in prey, or serve as side elements, facilitating their insertion along the shaft.

The classification of microliths by their functioning parts (active or hafted) overcomes problems of traditional typologies that often rely on subjective criteria based on the general form of microliths (e.g. GEEM, 1969).

Combining the two major categories of functioning parts at Farman, points (defined as all extremities with acute angles) and cutting edges, resulted in the recognition of four different morpho-technical types (fig. 1). This identification enabled the development and testing of hypotheses concerning the role of certain forms – axial points, point-barbs or barbs — and their hafting modes — axial, disto-lateral or lateral (fig. 2):

– *Type 1*, Axial-points (and cutting edge): these are obliquely truncated points and certain points with transversely retouched bases in the traditional typology. The

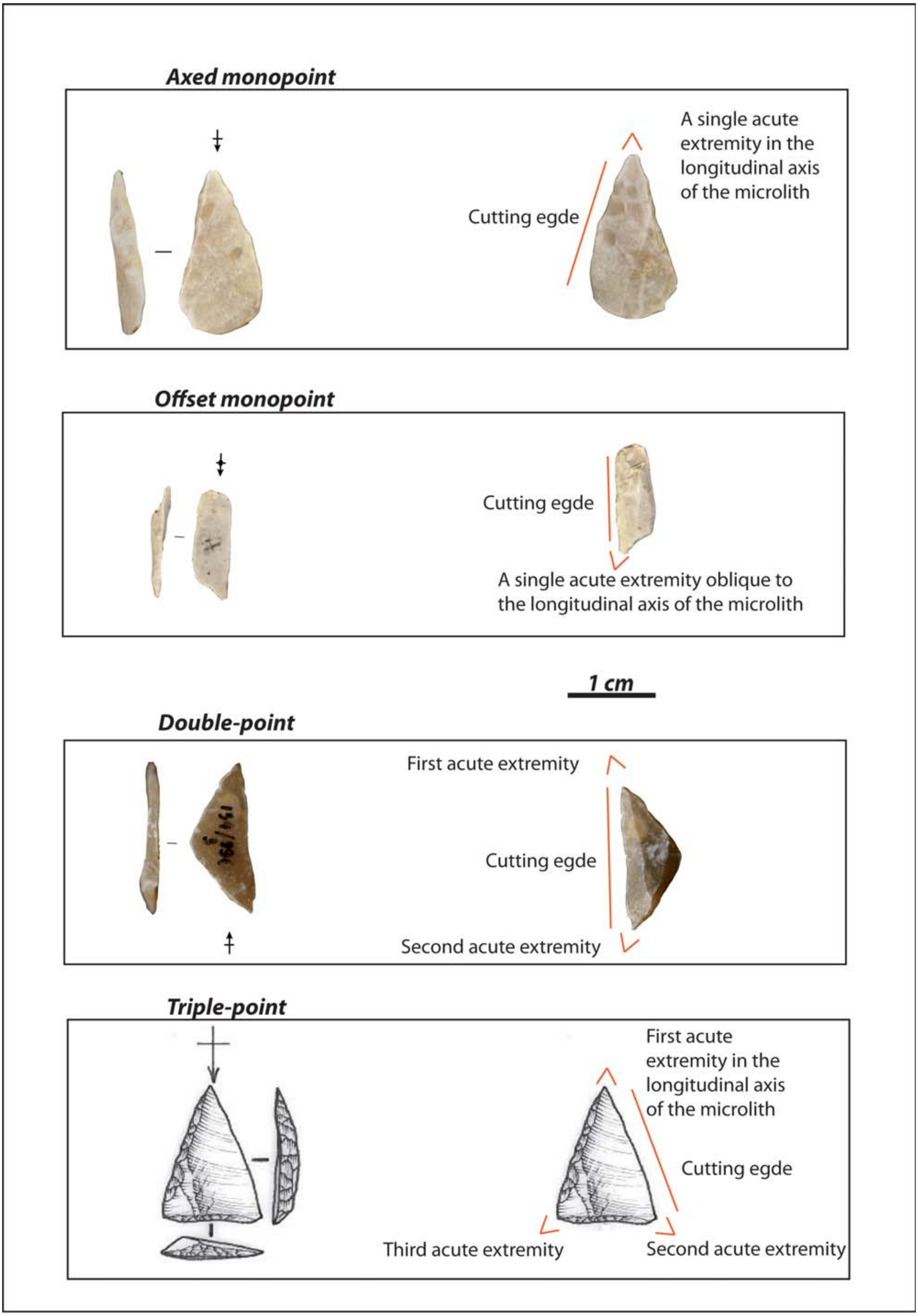


Fig. 1 – 62 rue Henry-Farman, Paris. Microlith typology based on shaping by retouch (drawings by E. Boitard-Bidaut).

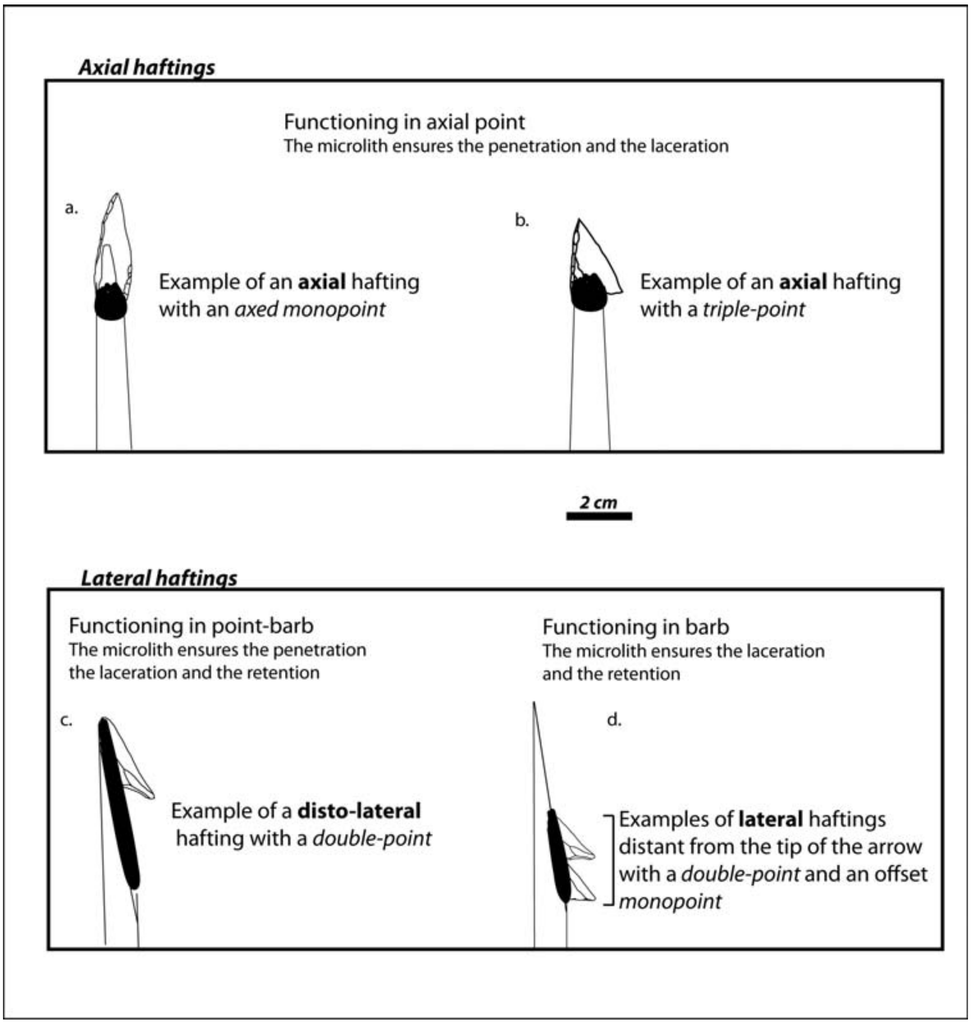


Fig. 2 – Hafting modes.

point is created in the distal or proximal end of the blank, parallel to the *longitudinal axis* of the microlith (hypothetical axial hafting: fig. 2a).

– *Type 2*, Offset-points (and cutting edge): several crescents and scalene triangles having a single point formed either in the microlith's distal or proximal part. The point is *offset to the longitudinal axis* of the microlith (hypothetical lateral hafting, fig. 2d). Although rare at Farman, this type is well-represented in the early phases of the Sauveterrian in southeastern France, notably at Grande Rivoire (Chesnaux, 2010).

– *Type 3*, Double-points (with or without a cutting edge): this type is represented at Farman by the majority of crescents and scalene triangles, all isosceles triangles and certain points with transversely retouched bases. These microliths have two opposed points in the blank's mesial section, perpendicular to the transversal axis of the piece. All scalene triangles and certain crescents have a point in the microlith's longitudinal axis and another, sharper point, offset to this axis (hypothetical disto-lateral hafting as point-barbs or laterally as barbs: fig. 2c and fig. 2d).

– *Type 4*, Triple-points (and cutting edges): certain pieces with retouched bases (a concave basal truncation) with a point created in the blank's distal or proximal part, parallel to the microlith's axis, and two opposed basal points (hypothetical axial hafting: fig. 2b).

The distribution of these different types by locus can be found in tables 1 and 2. This variability may be explained by successive occupations and an evolution of weaponry at Farman. B. Souffi has also noted that locus 3, containing both obliquely truncated points and isosceles triangles, can be attributed to an earlier occupation dated to the Preboreal / Boreal transition that is earlier than the other loci (Souffi and Marti, 2011). However, given the absence of a dated micro-stratigraphy it is difficult to precisely reconstruct the different stages of occupation. Therefore we have chosen to explore this variability in functional terms by reconstituting the different uses of microliths based on observable damage patterns.

MICROLITH BREAKAGE PATTERNS: AN EXPERIMENTAL MODEL

An experimental protocol was established in order to formally identify impact damage connected to

	Locus 1	Locus 2	Locus 3	Locus 5	Total
Triple-points					40
PTRB	9	6	0	19	
Scalene triangles	0	0	0	6	
Double-points					142
Crescents	12	22	3	33	
Scalene triangles	22	6	6	20	
Isoscele triangles	1	3	5	1	
PTRB	2	2	2	2	
Offset monopoints					14
Crescents	0	2	0	0	
Scalene triangles	2	2	2	6	
Axed monopoints					60
PTRB	3	2	3	7	
OTP	8	8	7	12	
Undetermined	0	1	3	6	
Undetermined	1	9	2	11	23
Total	60	63	33	123	279

PTRB : **Points with transversely retouched bases**
OTP : **Obliquely truncated points**

Table 1 – 62 rue Henry-Farman, Paris. Shaping by retouch according to locus (numerically).

	locus 1	Locus 2	Locus 3	Locus 5	Total	%
Axed monopoints	18%	16%	39%	20%	59	21%
Triple-points	15%	9,5%	0	20%	40	15%
Double-points	62%	52,5%	49%	46%	142	51%
Offset monopoints	3%	8%	6%	5%	15	5%
Undetermined	2%	14%	6%	9%	23	8%
				Total	279	100%

Table 2 – 62 rue Henry-Farman, Paris. Shaping by retouch according to locus (percentages).

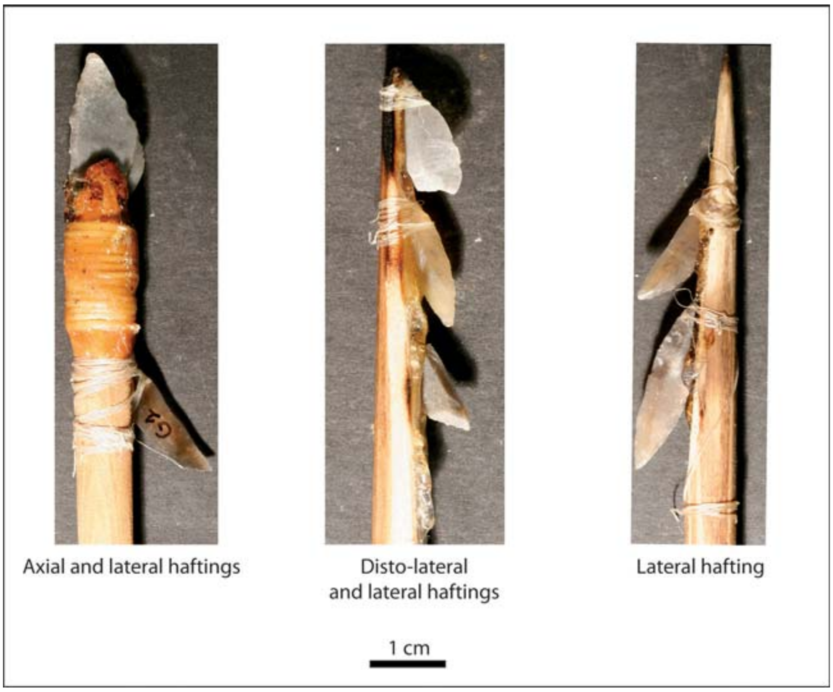


Fig. 3 – Experimentation. Arrows with three different types of haft settings.

the use of microliths as projectile elements, compared to those produced during manufacture or trampling. This protocol was built on the work of M. O'Farrell (2004) and the TFPPS study group (see notably Geneste and Plisson, 1986 and 1989). A second aim of this study is to distinguish breakage patterns which are characteristic of the microlith's position on the shaft as Crombé et al. (2001), Philibert (2002) or Yaroshevitch et al. (2010) have done. The originality of this study lies in the fact that we have sought to identify patterns of microlith damage and dispersal according to three precise haft settings (axial, disto-lateral or lateral, figs. 2a, 2c, 2d, 3) and to understand the factors underlying these patterns (position of the microlith on the shaft, adhesive type, contact with bone, anatomical zone impacted).

We have employed the terminology published by the *Ho Ho Nomenclature Committee* (1979) and updated by Fischer et al. (1984) to describe different fracture types observed on lithic material. Microscopic observations were carried out according to the accepted protocol based on the work of S. Semenov (1964), L. Keeley (1980) and H. Plisson (1985).

Breaks during manufacture

One hundred microliths manufactured from 122 bladelets and lamellar flakes were tested (fig. 4). The majority of the 22 knapping accidents were produced by an overly penetrating retouch gesture that led to a transverse bending/torsion fracture, sometimes in the form of a Krukowski microburin. In 15 of the 22 accidents, fracture negatives have a flat (or smooth) morphology or clearly show a well-defined lip. The seven other cases correspond to smooth, coned spin-off or bending fractures whose lengths do not exceed 1.8 mm.

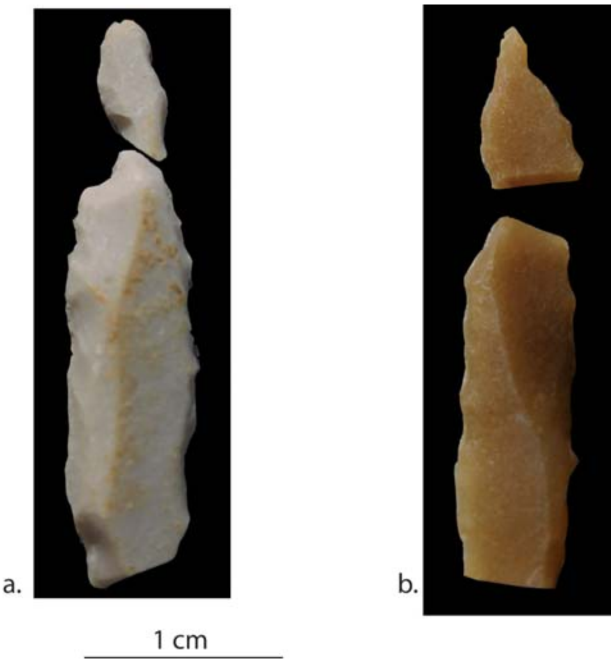


Fig. 4 – Experimentation. Two microliths fractured during manufacture. a: Krukowski microburin; b: clean transverse bending fracture.

Trampling Fractures

One hundred microliths, buried within and spread across the surface of a silty-clay matrix containing abundant blocks of limestone between 1 and 10 cm in length, were trampled. Only 19 microliths were damaged, however only 12 edges were recovered with chipped or micro-chipped edges (barely visible to the naked eye), 9 had snap terminating transverse bending fractures (fig. 5) or with lips that did not surpass 1.5 mm in length of which 3 also displayed 1 mm long dorsal spin-off fractures. Finally, one example portrayed a 1.7 mm long burin-like removal originating from the pointed extremity (fig. 6).

Diagnostic Impact Damage

Whether occurring during manufacture or trampling, no lip or spin-off fracture exceeding 1.8 mm was observed. During the four experimental archery sessions (see below) the same types of fractures were obtained, in addition to fractures where the lip or spin-offs did surpass 1.8 mm. We therefore considered these latter fractures types, never replicated during manufacture or trampling, as diagnostic of microliths used as projectile elements and to increase confidence, we raised the fracture cut-off from 1.8 mm to 2 mm.

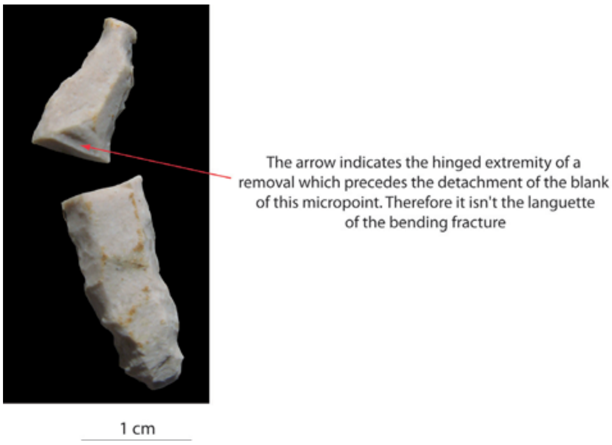


Fig. 5 – Experimentation. Micropoint bearing a transverse bending fracture with a snap termination from trampling.

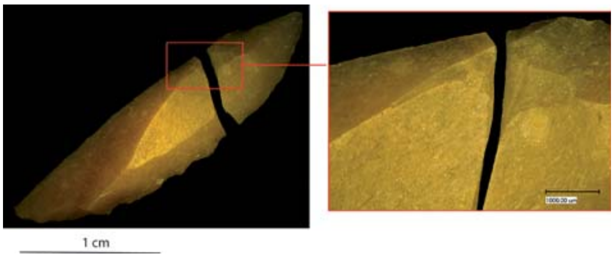


Fig. 6 – Experimentation. Crescent with a transverse bending fracture with a snap termination from trampling, including the formation of a spin-off on the dorsal surface (right-hand insert).

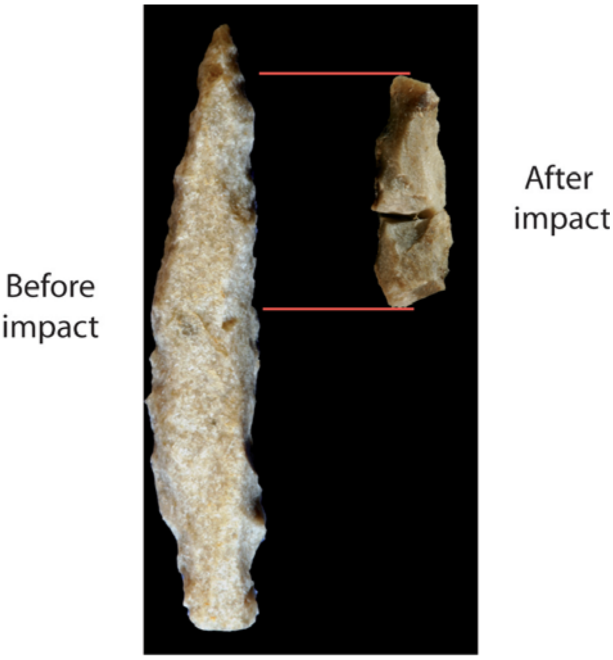


Fig. 7 – Experimentation. Axially hafted point broken into at least four parts on impact.

Fig. 8 – Experimentation. One of the rare examples of a lipped transverse fracture on a disto-laterally hafted triangle.

During the experiments, two other damage types were also produced (solely along the cutting edges of the microliths) that did not occur during manufacture or trampling: tiered (Gassin, 1996) or hinged terminations perpendicular or oblique to the cutting edge. These scar types were also considered diagnostic of microliths hafted as projectile weaponry elements.

Damage and microlith shaft position

During the four experimental shooting sessions involving the carcasses of recently killed sheep and wild boar, it became clear (*contra* Yaroshevitch et al., 2010) that impact damage types and frequencies do not directly depend on the microlith's shape, but rather its exposure to impact and thus position on the shaft.

One hundred and forty three arrows were fired at distances of 10 and 15 m from simple 40 and 45 pound bows. The effects were noted on 66 *axial-points* hafted in the axis of the piece (obliquely truncated points or points with transversely retouched bases, Sauveterre points and pointed backed bladelets), 45 *double-* and *triple-points* hafted disto-laterally forming barbed points (points with retouched bases, scalene and isosceles triangles and crescents) and on 293 *double-points* and *offset-points* hafted laterally as barbs (of a total of 484 microliths tested, 80 were not recovered).

After a single shot we noted, regardless the type of microlith:

1) That axially hafted microliths suffered the full force of the impact resulting in a fracture frequency of 52% (35% of which were diagnostic). The damage was mostly in the form of transverse fractures (47% of all points observed, breakage in more than two parts was frequent, fig. 7), but also very occasionally (5%) long, burin-like fractures originating from the distal extremity (> 4mm). These percentages are comparable with other experiments that tested axially hafted microliths (notably Fischer et al., 1984; Crombé et al., 2001).

2) The disto-laterally hafted microliths were less frequently fragmented (27%) and seldom diagnostic (13%). It seems that the lithic element was subjected to a less violent impact as the force was distributed between the microlith and the shaft. As with axial microliths, the damage noted on the two pointed extremities of the disto-laterally hafted microliths was transverse and/or burin-like (fig. 8).

3) On the other hand, it is rare for microliths hafted laterally, away from the piercing end of the arrow, to fracture transversely. The frequency of damage is 21% (14% with edge damage, 5 % with a burin-like removal — fig. 9 — and 2% presenting both edge damage and transverse fractures). Only 8% of this damage (burin-like fractures and chipping only) was diagnostic.

Disto-lateral haft settings present qualitatively similar damage to axial settings, but in similar proportions

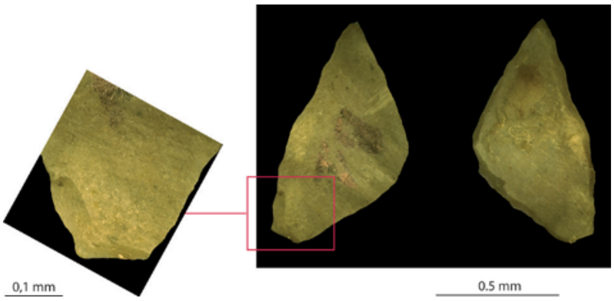


Fig. 9 – Experimentation. Diagnostic burin-like impact removal on a laterally hafted crescent.

as the laterally hafted microliths. While no single damage type alone is indicative of the microlith's position on the shaft, the representation of burin-like and transverse damage in the assemblage may indicate the function(s) of the microlithic component (table 3). Even if chipping is sometimes diagnostic of impact, it is inconsequential for recognising the microlith's position on the shaft. In fact, chipping can occur all along the unmodified cutting edge of a microlith no matter its position on the shaft.

Performance and dispersal of microliths

When axially hafted microliths broke (52%), the proximal fragment remained almost systematically in the shaft (48% of cases), while one or several distal fragments became lodged in the carcass. In three rare occurrences (n = 3), dislodged points were recovered intact in the carcass. This dispersal model for axially hafted points is therefore very similar to the one proposed by Chadelle et al. (1991), whereby upon returning from the hunt proximal parts of microliths were introduced to the site still intact in the arrow shafts, while mesial or distal fragments were lodged in the game.

Experimental microliths hafted disto-laterally and laterally had a different trajectory. Indeed, having been hafted along the arrow's shaft and not in its axis, they easily became dislodged and were either lost in the carcass or fell to the ground when the arrow was removed (similar to what was observed by Crombé et al., 2001). A second mechanical aspect may explain the dislodgement of these microliths: the wave produced by the arrow's impact was transmitted through the shaft and induced a shock that brought about the detachment of the microlith. During the penultimate experiment employing sheep carcasses, including the careful examination of the skeleton and the viscera, of the 111 laterally hafted microliths, 52 were recuperated in the carcasses (viscera, muscles and bones), amongst which 21 (or 38% of the detached microliths) were damaged and 32 remained intact.

The disto-laterally and laterally hafted microliths damaged upon impact were often recovered within the animal. As a general rule, the lateral microliths seldom broke, but frequently detached within the carcass.

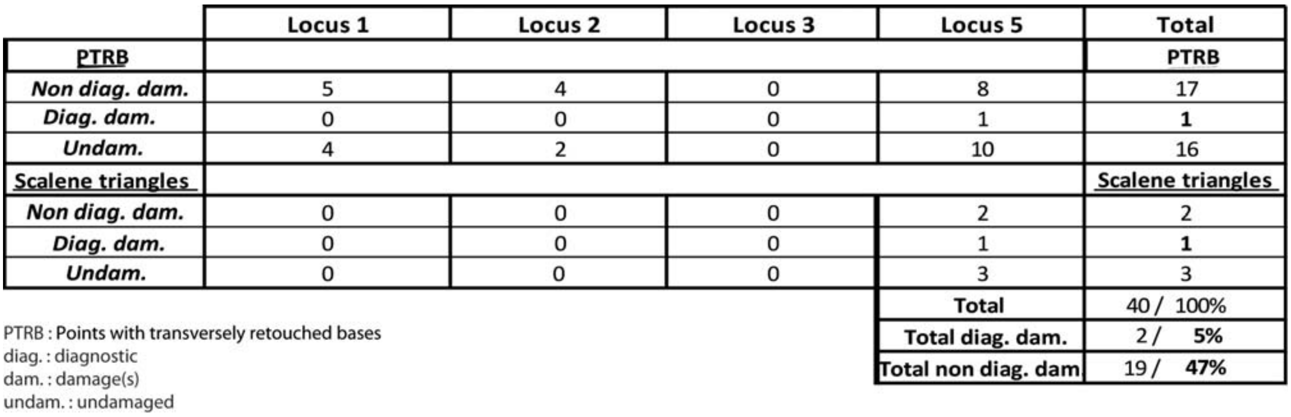
MICROLITH DAMAGE AT FARMAN

The entirety of damage incurred by the microliths from Farman was compared with the experimental reference collection (see above). Diagnostic and non-diagnostic impact damage by microlith type can be found in tables 4, 5, 6, 7 and 8.

Generally speaking, total diagnostic damage is low: 5% (n = 2) for *triple-points* (points with transversely retouched bases and scalene triangles), 6% (n = 4) for *axial-points* (points with transversely retouched bases or obliquely truncated points) and 11% (n = 15) for *double-points* (crescents and triangles). *Offset-points* presented no traces of diagnostic impact. Non-diagnostic damage is more frequent across all microlith types: 47% (n = 19) for *triple-points* and 43% (n = 26) for *axial-points* (points with transversely retouched bases or obliquely truncated points), 53% (n = 75) for *double-points* and 14% (n = 2)

	POSITION ON THE SHAFT		
DIAGNOSTIC DAMAGES	AXIAL	DISTO-LATERAL	LATERAL
Transversal fractures	+++	++	-
Burin-like fractures	+	++	++
PERCENTAGE OF THE DIAGNOSTIC DAMAGES	35%	13%	8%

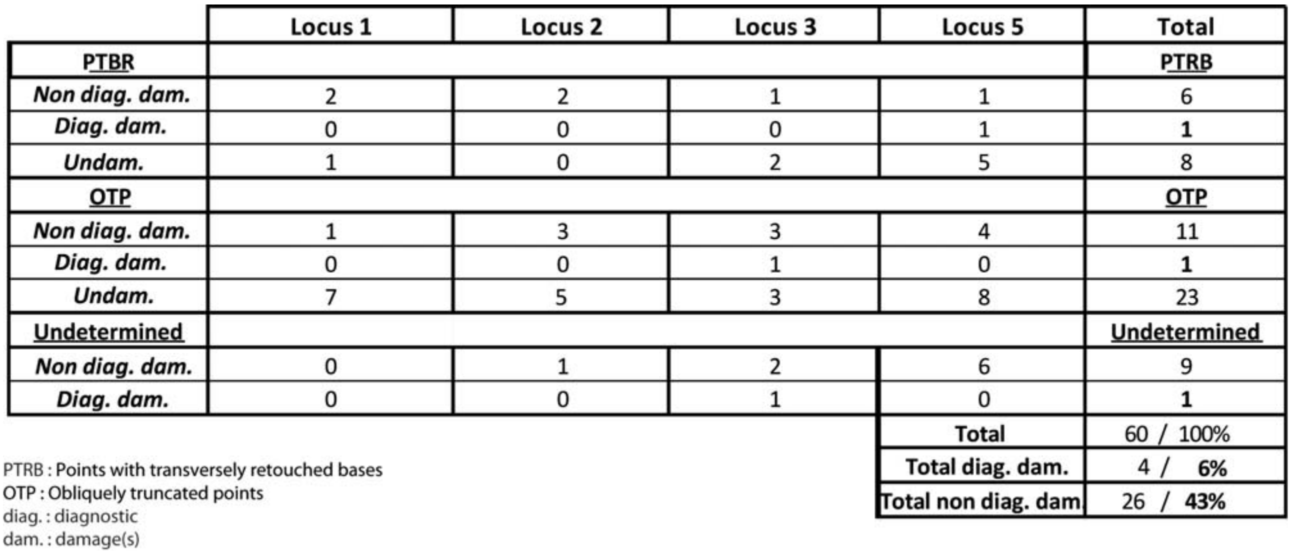
Table 3 – Experimentation. Burin-like and transversal impact damage according to the microlith's position on the shaft.



	Locus 1	Locus 2	Locus 3	Locus 5	Total
PTRB					PTRB
Non diag. dam.	5	4	0	8	17
Diag. dam.	0	0	0	1	**1**
Undam.	4	2	0	10	16
Scalene triangles					Scalene triangles
Non diag. dam.	0	0	0	2	2
Diag. dam.	0	0	0	1	**1**
Undam.	0	0	0	3	3
				Total	40 / 100%
				Total diag. dam.	2 / **5%**
				Total non diag. dam	19 / **47%**

PTRB : Points with transversely retouched bases
diag. : diagnostic
dam. : damage(s)
undam. : undamaged

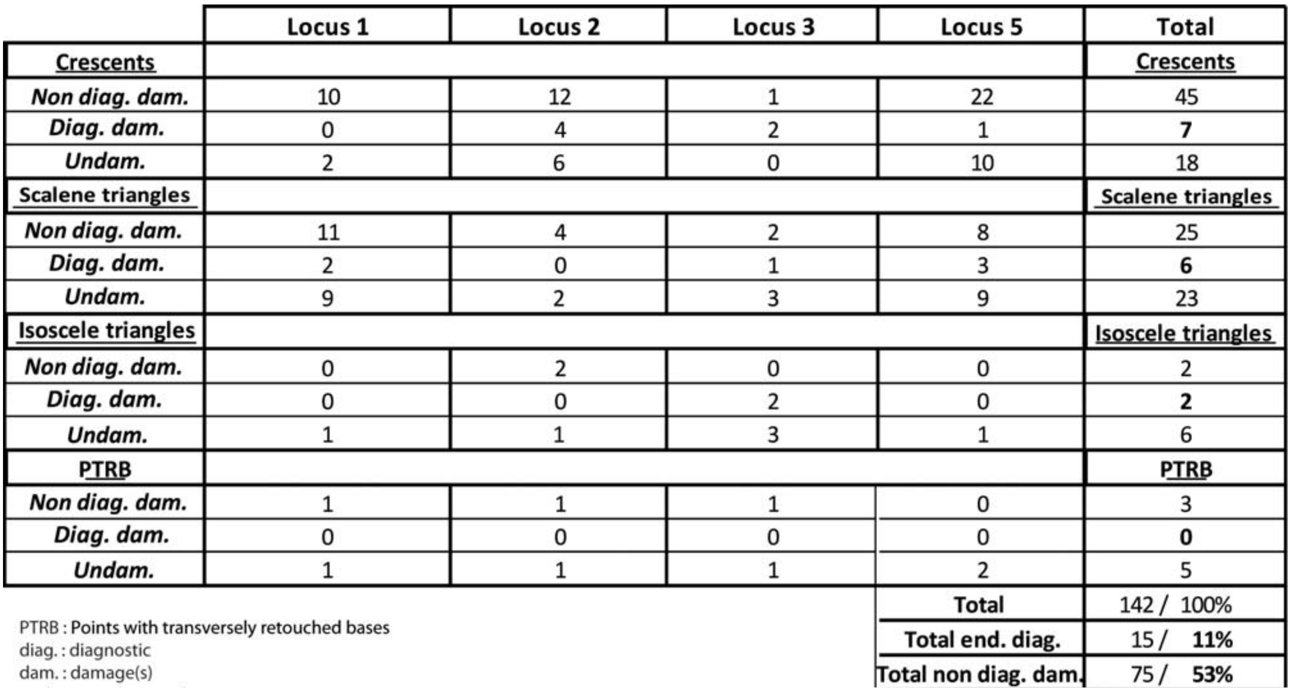
Table 4 – 62 rue Henry-Farman, Paris. Breakage of triple-points.



	Locus 1	Locus 2	Locus 3	Locus 5	Total
PTBR					PTRB
Non diag. dam.	2	2	1	1	6
Diag. dam.	0	0	0	1	**1**
Undam.	1	0	2	5	8
OTP					OTP
Non diag. dam.	1	3	3	4	11
Diag. dam.	0	0	1	0	**1**
Undam.	7	5	3	8	23
Undetermined					Undetermined
Non diag. dam.	0	1	2	6	9
Diag. dam.	0	0	1	0	**1**
				Total	60 / 100%
				Total diag. dam.	4 / **6%**
				Total non diag. dam	26 / **43%**

PTRB : Points with transversely retouched bases
OTP : Obliquely truncated points
diag. : diagnostic
dam. : damage(s)

Table 5 – 62 rue Henry-Farman, Paris. Breakage of axial-points.



	Locus 1	Locus 2	Locus 3	Locus 5	Total
Crescents					Crescents
Non diag. dam.	10	12	1	22	45
Diag. dam.	0	4	2	1	**7**
Undam.	2	6	0	10	18
Scalene triangles					Scalene triangles
Non diag. dam.	11	4	2	8	25
Diag. dam.	2	0	1	3	**6**
Undam.	9	2	3	9	23
Isoscele triangles					Isoscele triangles
Non diag. dam.	0	2	0	0	2
Diag. dam.	0	0	2	0	**2**
Undam.	1	1	3	1	6
PTRB					PTRB
Non diag. dam.	1	1	1	0	3
Diag. dam.	0	0	0	0	**0**
Undam.	1	1	1	2	5
				Total	142 / 100%
				Total end. diag.	15 / **11%**
				Total non diag. dam.	75 / **53%**

PTRB : Points with transversely retouched bases
diag. : diagnostic
dam. : damage(s)

Tabl. 6 – 62 rue Henry-Farman, Paris. Breakage of double-points.

	Locus 1	Locus 2	Locus 3	Locus 5	Total
Crescents					Crescents
Non diag. dam.	0	1	0	0	1
Diag. dam.	0	0	0	0	0
Undam.	0	1	0	0	1
Scalene triangles					Scalene triangles
Non diag. dam.	1	0	0	0	1
Diag. dam.	0	0	0	0	0
Undam.	1	2	2	6	11
				Total	14 soit 100%
				Total diag. dam.	0
				Total non diag. dam.	2 soit 14%

diag. : diagnostic
dam. : damage(s)
undam. : undamaged

Tabl. 7 – 62 rue Henry-Farman, Paris. Breakage of offset-points.

Undetermined	Locus 1	Locus 2	Locus 3	Locus 5	Total
Non diag. dam.	1	8	2	10	21
Diag. dam.	0	1	0	1	2
				Total	23 / 100%
				Total diag. dam.	2 / 9%
				Total non diag. dam.	21 / 91%

diag. : diagnostic
dam. : damage(s)

Tabl. 8 – 62 rue Henry-Farman, Paris. Breakage of indeterminate microliths.

for *offset-points*. Finally, while 23 microliths were far too damaged to be attributed to a type, two were however definitely broken on impact.

All of the material was also observed microscopically (× 100 and × 200). Despite the flint's sometimes heavily altered microtopography, wear associated with a non-identifiable grainy micro-polish at the interface of the backed edge and ventral surface was noted on 10 *double-points* from locus 2 (fig. 10). It is possible that this wear, having smoothed over the protuberances produced by the proximal retouch negatives, represents a technical action.

Non-Diagnostic impact damage

Non-diagnostic impact damage is generally very difficult to interpret given its equivocal nature (see below). Nevertheless, a portion of the Farman microliths demonstrating snap terminating transverse bending fractures or having a lip of a non-diagnostic length were certainly damaged during manufacture, which we know took place on-site given the significant number of microburins present in all loci (Souffi and Marti, 2011).

Diagnostic impact damage: different traces for different types of microliths

Diagnostic impact damage differs (tables 9 and 10) between double-points (triangles and crescents) or triple-

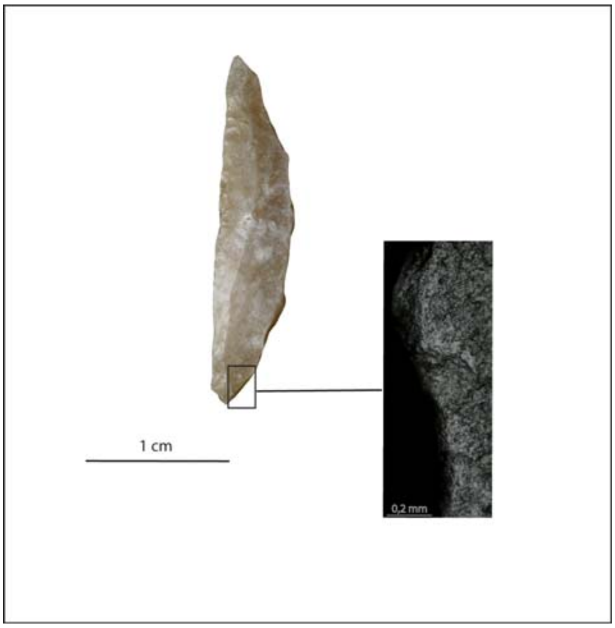


Fig. 10 – 62 rue Henry-Farman, Paris. Crescent with detail of the worn ventral edge representing a faded grainy micropolish.

	TRADITIONAL TYPES				
DIAGNOSTIC DAMAGES	CRESCENTS	TRIANGLES	POINTS WITH TRANSVERSELY RETOUCHED BASES	OBLIQUELY TRUNCATED POINTS	TOTAL
Transversal fractures	1	2	2	1	6
Burin-like fractures	6	4	1	0	11
Edge damages	0	3	0	1	4

Table 9 – 62 rue Henry-Farman, Paris. Diagnostic damage by traditional types of microliths.

	MORPHOTECHNICAL TYPES			
DIAGNOSTIC DAMAGES	AXED MONOPOINTS	TRIPLE-POINTS	DOUBLE-POINTS	OFFSET MONOPOINTS
Transversal fractures	2	1	3	0
Burin-like fractures	0	1	10	0
PERCENTAGE OF THE DIAGNOSTIC DAMAGES	5%	6%	11%	0

Table 10 – 62 rue Henry-Farman, Paris. Burin-like and transversal diagnostic impact damage by major morpho-technical categories.

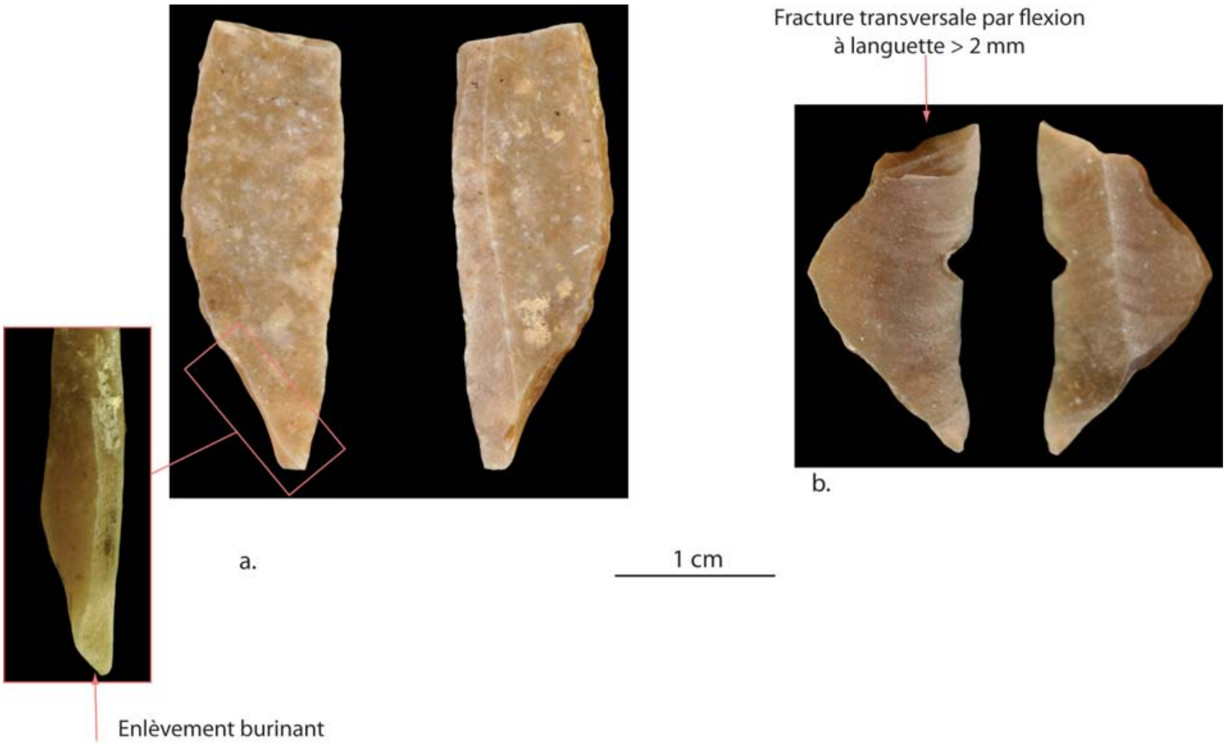


Fig. 11 – 62 rue Henry-Farman, Paris. Two examples of diagnostic impact damage on double-points. a: crescent with a burin-like removal along the backed edge originating from an extremity; b: triangle fractured transversely by bending with a lip greater than 2 mm.

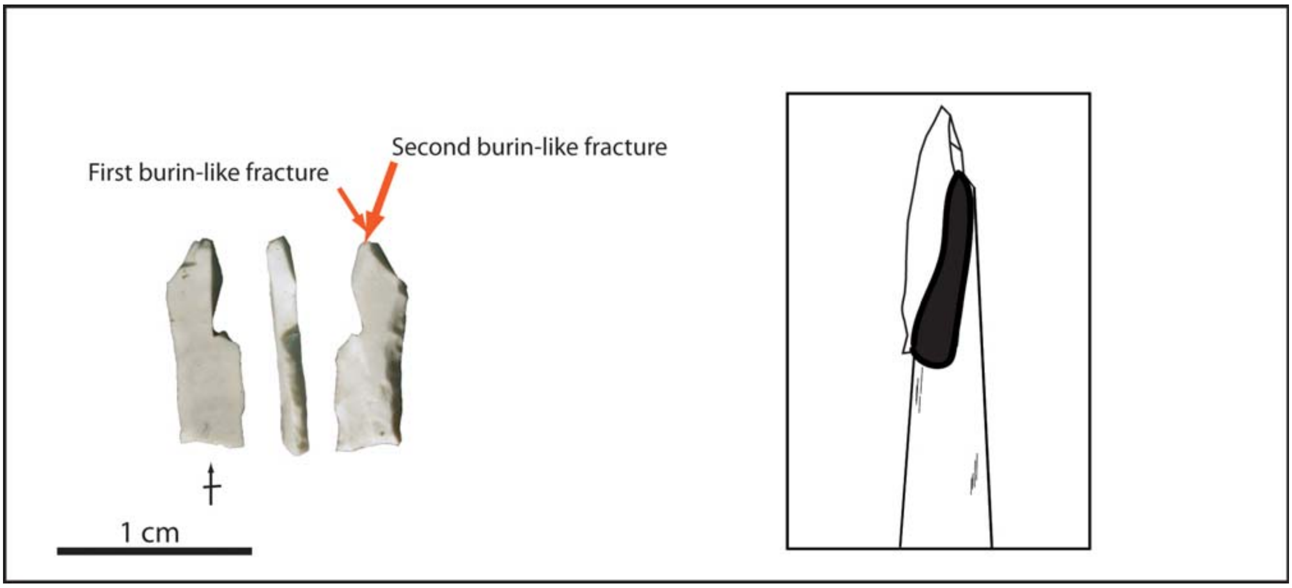


Fig. 12 – 62 rue Henry-Farman, Paris. Diagnostic impact damage on a triangle which could indicate hafting on the distal part of the shaft (see insert).

points / axial-points (points with transversely or obliquely truncated bases).

Of the 15 double-points (7 crescents, 6 scalene triangles and 2 isosceles triangles) damaged on impact, most (n = 10) incurred burin-like fractures (fig. 11a) with transverse impact damage found only on two triangles and a crescent (fig. 11b). In comparison with our experimental model (cf. table 3), the over-representation of burin-like fractures compared with transverse fractures on double-points from Farman, as well as the under-representation of diagnostic impact damage, argues in favour of the majority being hafted laterally on the shaft as barbs. Nevertheless, the presence of double-points with transverse fractures and diagnostic lips indicative of violent impact (similar to the burin-like fracture on a triangle from Farman: fig. 12) and absent from experimental barbs suggests that at least several double-points were hafted distolaterally as part of barbed points.

On the other hand, the majority of diagnostic damage observed on axial-points and triple-points (n = 3) demonstrates a haft setting at the end of the shaft (fig. 13). Had axial-points and triple-points from Farman functioned in the same way as double-points, therefore as barbs, they would have presented higher frequencies of burin-like damage. Moreover, three of them bear damage referable to violent shocks (transverse fractures with a diagnostic lip) and are therefore indicative of hafting on the tip of the shaft as either barbed or axial-points. Given the shape of these microliths, their axial hafting is almost certain.

This being the case, the percentage of impact damage observable on experimental axial-points is much more significant (35%) than that seen with axial (5%) and triple-points (6%) from Farman. Given the small number bearing traces of impact (returned from the hunt) and the significant number of complete abandoned pieces (manufacture defaults?), it appears that points manufactured at the site were designed to hunt game, which was for a large part not brought back and processed at Farman.

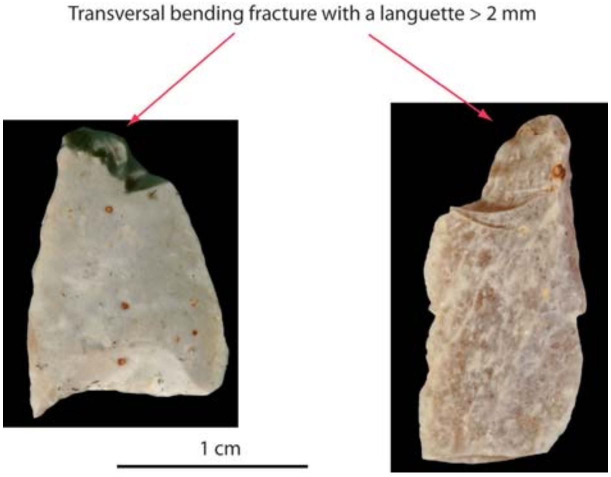


Fig. 13 – 62 rue Henry-Farman, Paris. Diagnostic impact damage on a triple point (left, point with a transversely retouched base) and on an axial point (right, obliquely truncated point).

DISCUSSION

Manufacture and use of microliths at Farman: an assessment

At Farman, double-points (triangles and crescents) were not uniquely mounted as barbs, but also as part of point-barbs. This demonstration contradicts the model proposed by A. Thévenin (1990) in which crescents and

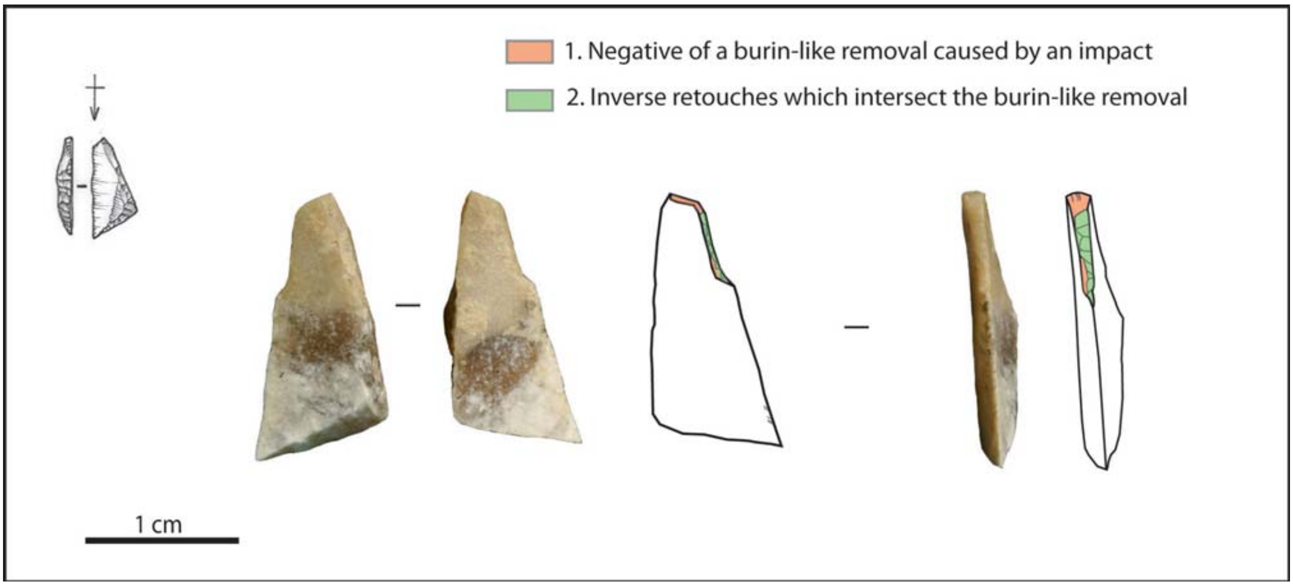


Fig. 14 – 62 rue Henry-Farman, Paris. Triangle having been repaired after its use (drawing after E.Boitard-Bidaut).

triangles served as barbs for arrowheads, whereas points with transversely retouched bases or obliquely truncated points constituted elements of axial tips (see Loshult arrowheads; Rozoy, 1978). The double-points appear instead to have been hafted as a lateral alignment of barbs beginning from the distal extremity of the arrow (see fig. 3, middle). Of course, it cannot be excluded that certain triangles and crescents may also have been designed to be hafted on the same shaft as axial-points (points with transversely retouched bases or obliquely truncated points, see fig. 3, left).

Furthermore, triangles and crescents appear to have functioned in a very similar manner and grouping them together based on intended use (double points) seems entirely justified as only their method of retouch differs.

Manufacture and use of triangles and crescents: unity of time and place

Double-points were manufactured at each locus, used on-site or in the vicinity of the site, and ultimately reintroduced to the site in the unprocessed carcasses of game (Leduc and Bridault, 2009) or on the shafts of arrows according to our dispersal model for laterally hafted microliths. This is illustrated by the refitting of an isosceles triangle damaged upon impact and its microburin by B. Souffi at locus 3. This microlith, hafted as a barb or part of a point-barb, was reintroduced to the assemblage upon return from the hunt in either a carcass or still hafted on the shaft of an arrow. As the microlith was too badly damaged, it was abandoned at the site. A triangle and a crescent (see double-points), probably used to rearm an arrow on-site, were also repaired. Both had suffered diagnostic burin-like fractures originating from one of the two points, continuing 4 mm along triangle's edge and 3 mm along the crescent's truncation. These two burin-like removals were then partially retouched by a semi-abrupt inverse backing on their third edge. This type of repair attests to the care taken in maintaining hunting weapons, as has already been demonstrated in the completely different context of the Magdalenian (Q31) at Étiolles (Christensen and Valentin, 2004).

Manufacture and use of axial-points and triple-points: a spatio-temporal segmentation

These microliths, designed to serve as axial-points, were manufactured on-site and were exported on the shafts of arrows to be used in an unidentified location; if damaged, they rarely returned to Farman. Were their blanks produced from the same debitage sequences as those of crescents and triangles? In the future it would be interesting to explore the precise implications of the different locations where these artefacts were used vis-à-vis the *chaîne opératoire* of their production.

Specific arrows for different game hunted in particular places?

The zooarchaeological analysis demonstrates that the faunal spectrum from each locus is dominated by wild boar brought whole to site. The kill was then initially processed and certain parts exported from the site (Leduc and Bridault, 2009). These results are in general agreement with our model for the use of triangles and crescents. Can we perhaps deduce that the occupants of Farman preferentially hunted wild boar with arrows equipped with these sorts of microliths? This hypothesis invites comparison with similar collections from northern France where sites with wild boar are well-represented (notably Les Closeux, in the Hauts-de-Seine: Lang et al., 2008; Saleux in the Somme: Fagnart et al., 2008; Bignon et al., this volume or Warluis in the Oise: Ducrocq et al., 2008). Another question emerges: what happened to the axial-points manufactured at Farman? Did they essentially serve to hunt other species besides wild boar? Were these other species, which were not processed at Farman, brought to another location in the territory after the hunt?

CONCLUSION

The traditional typology of Mesolithic microliths based on simple morphometric criteria cannot alone provide answers to the economic questions we pose today. Such a typology may actually be at an impasse as it classifies microliths simply by their general shape and not the intention underlying it. A classification that takes into account shaping by retouch seems to constitute the essential first step for a functional analysis of microliths as it aims to identify intentions based on their use. This theoretical model, in conjunction with the compilation of experimental traces, informs our interpretations of microlith breakage patterns.

At Farman, two distinct contexts of microlith use were reconstructed; only triangles and crescents were used (and re-used) on-site, whereas axial-points were mostly manufactured at the site.

This differential treatment of projectile weaponry elements, whose possible recurrence elsewhere ought to be investigated, opens new perspectives for our conception of Beuronian microliths and the organisation of Mesolithic hunting practices.

Acknowledgments: I would like to thank Boris Valentin for financing this study, Bénédicte Souffi and Sylvain Griselin for providing access to the material and for the rewarding discussions we shared. Finally, I am grateful to Jean-Pierre Fagnart and Boris Valentin for corrections and improvements brought to this article.

REFERENCES

Ducrocq T., Bridault A., Coutard S. (2008) – Le gisement de Warluis (Oise), in J.-P. Fagnart, A. Thévenin, T. Ducrocq, B. Souffi and P. Coudret (eds.), *Le début du Mésolithique en Europe du Nord-Ouest*, porceedings of the round-table (Amiens, 9-10 October 2004), Paris, Société préhistorique française (Mémoire, 45), p. 85-106.

Chadelle J.-P., Geneste J.-M., Plisson H. (1991) – Processus fonctionnels de formation des assemblages technologiques dans les sites du Paléolithique supérieur. Les pointes de projectiles lithiques du Solutréen de la grotte de Combe Saunière (Dordogne, France) », in *25 ans d'études technologiques en Préhistoire, Bilan et perspectives*, proceedings of the XIth Rencontres internationales d'archéologie et d'histoire (Antibes, 18-20 October 1990), Juan-les-Pins, APDCA, p. 275-287.

Chesnaux L. (2010) – Conception et fonctionnement des microlithes sauveterriens des niveaux D à B3 (fouilles 1986-1994 et coupes stratigraphiques S36 et S37), in P.-Y. Nicod and R. Picavet (eds.), *Fouilles archéologiques de la Grande Rivoire à Sassenage (Isère), rapport de fouille 2006-2009*, Grenoble, conseil général de l'Isère, p. 143-153.

Christensen M., Valentin B. (2004) – Armatures de projectiles et outils, de la production à l'abandon, in N. Pigeot (ed.), *Les derniers Magdaléniens d'Étiolles : perspectives culturelles et paléohistoriques (l'unité d'habitation Q31)*, Paris, CNRS (Supplément à *Gallia Préhistoire*, 37), p. 107-160.

Crombé P., Caspar J.-P., Perdaen Y., Sergant J. (2001) – Wear Analysis on Early Mesolithic microliths from the Verrebroek Site, East Flanders, Belgium, *Journal of Field Archaeology,* 3-4, p. 253-269.

Fagnart J.-P., Coudret P., Souffi B. (2008) – Les occupations mésolithiques du gisement de Saleux (Somme), in J.-P. Fagnart, A. Thévenin, T. Ducrocq, B. Souffi and P. Coudret (dir.), *Le début du Mésolithique en Europe du Nord-Ouest*, porceedings of the round-table (Amiens, 9-10 October 2004), Paris, Société préhistorique française (Mémoire, 45), p. 107-134.

Fischer A., Wemming Hansen P., Rasmussen P. (1984) – Macro- and Microwear Traces on Lithic Projectile Points, Experimental Results and Prehistoric Examples, *Journal of Danish Archaeology*, 3, p. 19-46.

Gassin B. (1996) – *Évolution socio-économique dans le Chasséen de la grotte de l'Église supérieure (Var). Apport de l'analyse fonctionnelle des industries lithiques*, Paris, CNRS (Monographie du CRA, 17), 328 p.

GEEM (1969) – Épipaléolithique-Mésolithique, Les microlithes géométriques, *Bulletin de la Société préhistorique française*, 66, 1, p. 355-366.

Geneste J.-M., Plisson H. (1986) – Le Solutréen de la grotte de Combe Saunière 1 (Dordogne), première approche palethnologique, *Gallia préhistoire*, 29, 1, p. 9-27.

Ho Ho Nomenclature Committee (1979) – The Ho Ho Classification and Nomenclature Committee Report, in B. Hayden (ed.), *Lithic Use-wear Analysis,* New-York, Academic Press, p. 133-135.

Keeley L.H. (1980) – *Experimental Determination of Stone Tool Uses: A Microwear Analyse*, Chicago - London, The University of Chicago Press, , 212 p.

Lang L., Sicard S. (2008) – Les occupations mésolithiques des Closeaux à Rueil-Malmaison (Hauts-de-Seine), in J.-P. Fagnart, A. Thévenin, T. Ducrocq, B. Souffi and P. Coudret (eds.), *Le début du Mésolithique en Europe du Nord-Ouest*, proceedings of the round-table (Amiens, 9-10 October 2004), Paris, Société préhistorique française (Mémoire, 45), p. 65-84.

Leduc C., Bridault A. (2009) – *Étude archéozoologique des niveaux mésolithiques du site Paris-Farman*, unpublished analysis report, 29 p.

Marder O., Valentin B., Valla F., Pelegrin J. (2006) – Reconstructing Microliths Shaping: Archaeological and Experimental Observations about Early and Final Natufian Lunates at Eynan (Ain Mallaha), Israel, *Eurasian Prehistory*, 4, 1-2, p. 99-158.

O'Farrell M. (2004) – Les pointes de la Gravette de Corbiac (Dordogne) et considérations sur la chasse au Paléolithique supérieur ancien, in P. Bodu and C. Constantin (eds.), *Approches fonctionnelles en Préhistoire*, porcceedings of the XXVth Congrès préhistorique de France (Nanterre 24-26 November 2000), Paris, Société préhistorique française, p. 121-138.

Plisson H., Geneste J.-M. (1989) – Analyse technologique des pointes à cran solutréennes du Placard (Charente), du Fourneau du Diable, du Pech de la Boissière et de Combe Saunière (Dordogne), *Paléo*, 1, p. 65-106.

Plisson H. (1985) – *Étude fonctionnelle d'outillages lithiques préhistoriques par l'analyse des micro-usures* : *recherche méthodologique et archéologique*, PhD thesis, université Paris 1, 357 p.

Rozoy J.-G. (1978) – *Les derniers chasseurs. L'Épipaléolithique en France et en Belgique. Essai de synthèse*, Charleville, Société archéologique champenoise (special issue of *Bulletin de la Société archéologique champenoise*), 3 vols., 1256 p.

Semenov S. A. (1964) – *Prehistoric Technology. An Experimental Study of the Oldest Tools and Artifact from Traces of Manufacture and Wear*, London, Cory, Adams & Mackay, 211 p.

Souffi B., Marti F. (2011) – *Paris 15^e^ arrondissement, 62 rue Henry-Farman. Évolution culturelle et environnementale d'un site stratifié en bord de Seine, du Mésolithique au premier âge du Fer*, final excavation report, INRAP Centre – Île-de-France, service régional de l'Archéologie d'Île-de-France, 4 vol., 1337 p.

Thévenin A. (1990) – Du Dryas III au début de l'Atlantique : pour une approche méthodologique des industries et des territoires dans l'Est de la France, *Revue archéologique de l'Est*, 41, p. 177-212.

Valentin B. (2005) – La fabrication des armatures et des outils en silex des couches aziliennes 3 et 4, in A.Chollet and V. Dujardin (eds.), *La Grotte du Bois-Ragot à Gouex (Vienne), Magdalénien et Azilien. Essais sur les hommes et leur environnement*, Paris, Société préhistorique française (Mémoire, 38), p. 89-182.

Valentin B. (2008) – *Jalons pour une Paléohistoire des derniers chasseurs (XIV^e^-VI^e^ millénaire avant J.-C.)*, Paris, Publications de la Sorbonne (Cahiers archéologiques de Paris 1, 1), 325 p.

Yaroshevich A., Nuzhnyi D., Bar-Yosef O., Weinstein-Evron M. (2010) – Design and Performance of Microlith Implemented Projectiles during the Middle and the Late Epipaleolithic of the Levant: Experimental and Archaeological Evidence, *Journal of Archaeological Science*, 37, p. 368-388.

Lorène Chesnaux
PhD student at université Paris 1, UMR 6130,
UMR 7041 « Ethnologie préhistorique »,
Maison René-Ginouvès,
21 allée de l'Université,
92023 Nanterre cedex, France.

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,
Jean-Pierre Fagnart, Frédéric Séara, Christian Verjux

'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.

ISBN 2-913745-51-2 (on-line)
ISSN : 2263-3847

ISBN: 2-913745-51-2
9 782913 745513

MESOLITHIC PALETHNOGRAPHY

SÉANCES SPF

2-2