Bulletin des Chercheurs de la Wallonie, hors-série n° 4 — 2011 : 399-405 — ERAUL 128

The Middle Palaeolithic Open-air Sites at Veldwezelt–*Hezerwater*

PATRICK M.M.A. BRINGMANS

1. Introduction

The successive archaeological excavation campaigns at Veldwezelt–*Hezerwater* (Lanaken, prov. of Limburg) provided us with important lithic remains of at least six separate Middle Palaeolithic valley settlements. Middle Palaeolithic humans were extracting flint, were hunting animals, were collecting wood, were lighting fires, were reducing cores and tools at this spot in the Hezerwater valley at different times:

(1) during the transition from the Late Saalian to the early Last Interglacial *s.l.* (transition M.I.S. 6/M.I.S. 5);

(2) during the late Last Interglacial *s.l.* (M.I.S. 5a);

(3) during the Middle Weichselian (M.I.S. 3).

It seems that the cyclic appearance of parallel, centripetal (Levallois) core reduction, the presence of "typical", notched, denticulated, Quina or very small tools in the lithic assemblages at the Middle Palaeolithic open-air sites at Veldwezelt–*Hezerwater* should not be seen as extraordinary events, but simply as the natural outcome of the dynamics of flint knapping. We thus could put forward the hypothesis that, at least in temperate climatic conditions, Middle Palaeolithic humans could react instrumental in creating their own adequate life-sustaining technologies and this through interactions with the environment, changes in behaviour and modifications in their lithic technology. This approach considers Middle Palaeolithic humans as active agents, rather than passive recipients of optimised environmental conditions.

2. Research History at Veldwezelt–*Hezerwater*

The stretch of land on the left bank of the now dry Hezerwater valley in the Vandersanden brickyard quarry at Veldwezelt–*Hezerwater* has been an advantageous location for Middle Palaeolithic settlement throughout the late Middle and Late Pleistocene (fig. 1.). For several years, the *Vandersanden* company exploited the loamy fill of the Hezerwater valley. The exploitation started in 1995 and came to an end in 2002 (Bringmans *et al.*, 2001, 2004; Bringmans, 2006; Bringmans *et al.*, 2006; Bringmans & Vermeersch, 2008). Over the last three decades, increasing attention has been paid by archaeologists to these open-air quarries as a means of examining Middle Palaeolithic occupation in Northwest Europe. Particularly in the European loess belt, researchers have invested much energy in excavating large portions of Middle Palaeolithic open-air sites. It was probable that also at the Vandersanden brickyard quarry Palaeolithic remains would be discovered. In order to deal with the expected archaeological finds in a structured way, Prof. Dr. Pierre M. Vermeersch (Laboratory of Prehistory – *Katholieke Universiteit Leuven* - Belgium) stepped in and started the "Veldwezelt–*Hezerwater* Middle Palaeolithic Project".

3. The Loess-soil Sequence at Veldwezelt–*Hezerwater*

The loess-soil sequence at Veldwezelt–*Hezerwater* (Bringmans, 2006), overlies the fluvial Maas terrace (Middle Pleistocene) and layers of *Hezerwater* gravel, sands and silts (probably late Middle Pleistocene). Then follow several loam and loess layers, within which several late Middle Pleistocene soils were attested. The Late Pleistocene starts with a complex of soils, which has been labelled the "Basal Soilcomplex". In a depression at Veldwezelt–*Hezerwater*, which was created by a so-called "spring-amphitheatre", the Last Interglacial "Basal Soilcomplex" starts with the formation of a sequence of soils (SRB-VLL-VLB). Then follows the PGB-soil (luvisol), which is the most striking horizon of the "Basal Soilcomplex". This massive luvisol was capped by a bleached horizon. Then follow two younger luvisols

Fig. 1
Location of the Veldwezelt–*Hezerwater* sites.

(RB & VBLB), which were each capped by a bleached and a humic horizon. This luvisol sequence, which has been labelled the "Rocourt Soilcomplex", is covered by a series of distinct humic soils, which have been labelled the "Warneton Soilcomplex". The Last Interglacial "Basal Soilcomplex" at Veldwezelt–*Hezerwater*, is overlain by relatively thick and differentiated Weichselian loess/loam layers, which were further characterised by periods of interstadial pedogenesis (e.g., TL & WFL soils). Indeed, this Weichselian loam and loess accumulation phase has been interrupted repeatedly by periods of soil formation. At the beginning of the Weichselian cycle, the formation of soils exceeds the sedimentation of loess or loam, whereas to the end of the Weichselian cycle, the deposition of pure loess prevailed.

4. Overview of the Veldwezelt–*Hezerwater* Sites

4.1. Framework

All in all, twenty-four archaeological *loci* were discovered at different spots in the Vandersanden loam quarry at Veldwezelt–*Hezerwater*. Only six of the twenty-four discovered *loci* seemed to represent potential sites, which thus required further excavation. The VLL, VLB, VBLB, VBLB-S, TL and WFL lithic assemblages, which were found in geological primary contexts at Veldwezelt–*Hezerwater*, relate to important periods of soil formation (Bringmans, 2006). These soils and the associated archaeological sites (e.g., Bringmans, 2006; Bringmans & Vermeersch, 2008) seem to relate to the following Marine Isotope Stages (M.I.S.):

(1) the VLL- and the VLB-sites probably belong to the late M.I.S. 6/early M.I.S. 5e transition or alternatively (interpretation Meijs, s.d., in press) to the late M.I.S. 5e/early M.I.S. 5d transition;

(2) both the VBLB- and the VBLB-S-site can be dated to M.I.S. 5a;

(3) the TL- and WFL-sites can be dated to the middle of M.I.S. 3.

Tables 1-2 give an overview of the artefacts and the tools excavated at the Veldwezelt–*Hezerwater* sites. The technological description by Steven L. Kuhn (1995) was followed.

4.2. The VLL-Site & the VLB-Site (= the 'Lower Sites')

At the 'Lower-Sites', a small valley (width about 20 m) created two slopes, stable enough to allow the development of an incipient soil. Both the VLL and the VLB soil horizons at Veldwezelt–*Hezerwater* contained artefacts (VLL: N = 795 artefacts & VLB: N = 687 artefacts). The VLB horizon also contained numerous charcoal pieces, identified as *Pinus silvestris* (determination by F. Damblon - *KBIN* Brussels - 1998).

The excavation of the VLL soil horizon yielded about 795 artefacts. Beside several flakes, blades and amorphous cores, several small bipolar cores for blades, some with two carefully prepared striking platforms at both ends, were found. Several cortical blades could be refitted to one core. A few notched tools were also recovered. The non-Levallois direct unipolar parallel laminar debitage, the non-Levallois direct unipolar convergent laminar debitage and the non-Levallois direct bipolar laminar debitage techniques are all present at the VLL-Site. The blades were thus produced by direct non-Levallois methods with the assistance of the natural convexities of the elongated flint nodules.

The excavation of the VLB soil horizon yielded about 687 artefacts. Here several flakes, blades, amorphous cores and three cores for blades with carefully prepared striking platforms were found. A burin was also recovered from the site. The non-Levallois direct unipolar parallel laminar debitage technique is present at the VLB-Site. The blades were thus produced by a direct non-Levallois method with the assistance of the natural convexities of the elongated flint nodules. Resharpening of the striking platform of the elongated cores is attested by means of the removal of rejuvenation core flakes.

It is important to recognise that generally speaking, we are dealing in the VLL and the VLB find horizons with very similar non-Levallois flake and blade industries. The mostly small dimensions of the artefacts of the VLL-Site and the VLB-Site are clearly determined by the character of the locally available *Hezerwater* raw material used for flaking. All the artefacts from the VLL and the VLB soil horizons are not patinated and represent a 'fresh' conservation condition. Complete flint nodules, tested nodules, cores and blanks, as well as relatively large quantities of lithic waste material have been found. Only a few tools, mostly denticulated pieces, were excavated. The raw material found at these sites is of low quality. In many cases, the flint nodules show a natural elongated shape.

There is clearly evidence for a deliberate selection of raw material, because those elongated nodules were preferentially worked into cores. We think that the Middle Palaeolithic humans came here to search the gravel-bed and to pick out the elongated flint nodules. The hypothesis, that surface flint quarrying was being carried out at the Veldwezelt–*Hezerwater* 'Lower-Sites' seems to be valid. The Middle Palaeolithic humans repeatedly used this sometimes-dry gravel-bed river channel as a source of coarse flint. The flint-rich gravel-bed itself and the gently sloping banks along both sides of the river channel were an obvious location for the Middle Palaeolithic humans to manufacture their flakes, blades and tools.

4.3. The VBLB-Site (= the 'Upper Site')

The cores and the cortical flakes present in the lithic assemblage of the VBLB-Site, in the upper Bth soil

Overview of the Number (N) of Artefacts at the Primary Context Sites						
A. Cores	**VLL**	**VLB**	**VBLB**	**VBLB-S**	**TL: R/GF/W**	**WFL**
"Centripetal" Cores	0	2	2	0	1 0 0	3
["Levallois" Cores]	[0]	[2]	[2]	[0]	[1] [0] [0]	[3]
"Parallel" Cores	7	3	0	0	0 1 0	1
"Opportunistic" Cores	9	2	0	0	0 1 0	0
Total Cores	**16**	**7**	**2**	**0**	**1 2 0**	**4**
B. Artefacts	**VLL**	**VLB**	**VBLB**	**VBLB-S**	**TL: R/GF/W**	**WFL**
Total Cores	16	7	2	0	1 2 0	4
Primary Decortication Flakes	25	15	6	0	0 1 0	7
Partially Cortical Flakes	160	119	53	5	11 1 7	10
Flakes	277	215	184	29	22 18 21	73
Blades	30	11	4	2	0 0 0	1
Crested Blades	3	0	1	0	0 0 0	0
Points	0	0	0	0	0 0 0	0
"Levallois" Flakes	0	2	17	0	0 0 0	2
"Levallois" Blades	0	0	0	0	0 0 0	0
"Levallois" Points	0	0	0	0	0 0 1	0
Tools s.s.	9	3	4	0	1 3 0	3
Hammer-stones	9	7	4	0	1 2 0	4
Chips (<1 cm)	251	301	70	39	21 0 0	29
Debris	15	7	5	0	0 0 0	0
Total Artefacts	**795**	**687**	**350**	**75**	**57 27 29**	**133**
C. Artefact Sizes	**VLL**	**VLB**	**VBLB**	**VBLB-S**	**TL: R/GF/W**	**WFL**
Artefacts > 10 cm	1	0	0	1	3 2 1	1
Artefacts > 9 cm & < 10 cm	1	2	1	0	0 0 2	2
Artefacts > 8 cm & < 9 cm	3	1	3	0	1 1 0	1
Artefacts > 7 cm & < 8 cm	2	1	2	1	1 1 0	3
Artefacts > 6 cm & < 7 cm	7	4	3	1	4 0 4	6
Artefacts > 5 cm & < 6 cm	20	7	5	1	2 2 7	11
Artefacts > 4 cm & < 5 cm	70	55	15	5	5 2 7	21
Artefacts > 3 cm & < 4 cm	101	73	39	4	8 9 7	17
Artefacts > 2 cm & < 3 cm	124	103	68	9	5 7 1	21
Artefacts > 1 cm & < 2 cm	215	140	144	14	7 3 0	21
Chips < 1 cm	251	301	70	39	21 0 0	29
Total Artefacts	**795**	**687**	**350**	**75**	**57 27 29**	**133**

Tabl. 1
Overview of the number (N) of artefacts at the primary context sites at Veldwezelt–*Hezerwater*.

horizon of the "Rocourt soil complex", show rolled cortex, which seems to indicate that the flint nodules were probably found in the nearby terrace of the River Maas. The raw material ranges from high quality dark flint to grey or even dark brown course grained flint with some impurities and is mostly speckled or even dotted. Although some imported raw materials may be present, one can argue that the majority of lithic artefacts were flaked from local raw material. Most artefacts of the VBLB-Site are of a remarkably fresh nature. The artefact edges are always very sharp and undamaged.

Overview of the Tool Frequencies (N) at the Primary Context Sites						
Blank	**VLL**	**VLB**	**VBLB**	**VBLB-S**	**TL: R/GF/W**	**WFL**
Tools on Flake Blank	4	1	4	0	1 3 0	3
Tools on Blade Blank	5	2	0	0	0 0 0	0
Tools on Levallois Blank	0	0	0	0	0 0 0	0
Total Tools	**9**	**3**	**4**	**0**	**1 3 0**	**3**
Retouch	**VLL**	**VLB**	**VBLB**	**VBLB-S**	**TL: R/GF/W**	**WFL**
Tools with Ordinary Retouch	5	0	2	0	1 0 0	0
Tools with Quina Retouch	0	0	0	0	0 3 0	2
Tools with Bifacial Retouch	0	0	0	0	0 0 0	0
Notched and Denticulated Tools	1	2	0	0	0 0 0	1
Combination Tools	3	1	0	0	0 0 0	0
Bifacial Tools	0	0	2	0	0 0 0	0
Handaxes	0	0	0	0	0 0 0	0
Total Tools	**9**	**3**	**4**	**0**	**1 3 0**	**3**

Tabl. 2
Overview of the tool frequencies (N) at the primary context sites at Veldwezelt–*Hezerwater*.

The lithic assemblage (N = 350) of the VBLB-Site is primarily characterised by the predominance of the Levallois technique. The lithic material comprises one Levallois core, used as a side-scraper and one recurrent centripetal Levallois core with several refits. Several larger Levallois flakes (> 5 cm) and several smaller Levallois flakes (< 5 cm) were also found. Some larger non-Levallois flakes were present in the lithic assemblage as well. The toolkit is made up of two single side-scrapers, one *déjeté* side-scraper, one notched piece, one bifacial single convex side-scraper and one bifacial foliate. None of these tools seem to have been produced on Levallois blanks.

On the basis of the macroscopic properties of the individual artefacts, such as cortex, texture, inclusions and colour it appears that the lithic material of this area clearly belongs to a single Raw Material Unit (RMU). The VBLB-Site also contains numerous charcoal pieces, identified as *Betula sp*. (determination by F. Damblon – *KBIN* Brussels – 1998).

4.4. VBLB-South-Site (= the 'Rocourt-Island-Site')

The pedo-stratigraphical situation at the VBLB-S-Site is more or less comparable with the situation at the VBLB-Site, which is also situated in the upper Bth soil horizon of the "Rocourt soil complex". However, the vertical artefact distribution, from the overlying bleached horizon just under the humic horizons, down to the top of the PGB, amounts to more than 75 cm. This could be seen as a result of the postdepositional processes like bioturbation and cryoturbation. Most of the larger artefacts were excavated in the upper part of the find horizon.

The lithic assemblage (N = 75) is primarily characterised by the dominance of the Levallois knapping method. Several Levallois flakes, a few small blades, several core-edge flakes and some pseudo-Levallois points have been excavated. No Levallois cores and no tools were found. The raw material ranges from dark grey flint to course grained chert.

4.5. The TL-R-Sites

The loess, loess-derived sediments and the many intercalating fossil soils overlying the "Rocourt soil complex" and the "Warneton soil complex" belong to the Weichselian *s.s.* representing the terrestrial equivalent of M.I.S. 4, 3 and 2. Here a complex stratigraphy has been established, with several horizons containing microfauna and abundant mollusc shells. The TL-R-Site, TL-GF-Site and the TL-W-Site are situated on the east facing valley-side of a Middle Weichselian Hezerwater valley. In the TL-Scarp several arc-shaped side-gullies are preserved. The excavated artefacts are related to the fill of this gully-system and not to the erosional process.

The artefacts (N = 57) of the TL-R-Site include one irregular core, one Levallois core (14 cm), several flakes (of which two refit), some chips and a small hammer stone. Some fragmentary faunal remains (N = 25) have also been excavated.

The lithic assemblage (N = 27) of the TL-GF-Site found at three distinct levels, comprises one hammer stone, a large core (15 cm), several smaller flakes and two large retouched flakes, but chips are nearly lacking. A typical Quina transverse side scraper has also been excavated on this site. Some fragmentary faunal remains (N = 11) have as well been excavated.

The artefacts (N = 29) of the TL-W-Site comprised no cores and no tools, but only flakes, cortical flakes and one point. A few faunal remains were also found on this site.

4.6. The WFL-Site

4.6.1. Lithics

At the WFL-Site, in an incipient brown soil of Middle Weichselian age (M.I.S. 3), several artefacts (N = 133) and an important number of mammalian remains (N = 350) have been recovered. The lithic material is made up of unipolar lineal and bipolar recurrent Levallois cores, two Quina side scrapers, several flakes, blades and chips.

4.6.2. The Macro and Meso Faunal Assemblage of the WFL-Site (determination by Jean-Marie Cordy – *Université de Liège* – 2001)

It is clear that the remains of Perissodactyls (horse and woolly rhino) are the most abundant (nearly 70%). The horse (*Equus caballus*) is the most prevalent species (nearly 43%), followed by the woolly rhino (*Coelodonta antiquitatis*) at more than 25% of all identified fragments. The hypothetical presence of the European ass (*Equus hydruntinus*) is based on a single mandibular molar tooth.

The remains of Artiodactyls are less frequent than those of Perissodactyls. Among the former, the remains of the Bovids are best represented (nearly 10% of the assemblage). Only the presence of the steppe bison (*Bison priscus*) is attested (7%), whereas the aurochs (*Bos primigenius*) seems to be absent. The remains of Cervids are very rare and only the reindeer (*Rangifer tarandus*) was recognised (nearly 2%).

The mammoth (*Mammuthus primigenius*) is also represented by six osseous or dental remains (more than 5 % of the assemblage).

The remains of carnivores are few in number (little more than 10% of the assemblage), but relatively diverse (at least four species corresponding to four different families). The presence of the cave hyena (*Crocuta crocuta spelaea*) is well demonstrated (more than 6% of the assemblage), whilst the cave lion (*Panthera leo spelaea*), the arctic fox (*Alopex lagopus*) and the badger (*Meles meles*) reach each almost 1% of the total faunal assemblage. Hare (*Lepus sp.*) is also present (almost 2%).

The calculation of the minimum number of individuals (MNI) conveys little additional information, since the vertebrate remains are relatively few in number. It is, however, necessary to note the importance of the horse, and the relative importance of the woolly rhino, the steppe bison and the cave hyena. This fauna, dominated by the large Ungulates (hoofed mammals), corresponds in its composition to a typical steppe fauna. The development of large deforested spaces, characterised by the expansion of herbs during summer, allowed the development of herds of large herbivores. In such a context, the cave hyena and the cave lion represent the most adapted super-predators.

With regard to climate, the presence of the badger is very instructive. The present most northern distribution of the badger is limited to the southern part of Scandinavia and Finland. Its presence is thus related to a climate that was not too rigorous. The discovery of several bones of the mole (*Talpa europaea*) at the WFL-Site at Veldwezelt–*Hezerwater* confirms this inter pretation. Thus, we can conclude with some certainty that this period of continental climate did not correspond to a pleniglacial, but to a period of ameliorating glacial climate.

The indubitable presence of a hyena den in the immediate surroundings of the WFL-Site is indicated by the simultaneous presence of corroded and/or partially digested bones, by the remains of a coprolite and by the presence of some bones and teeth of the hyena. In the latter case, it is significant to note that practically all the excavated remains belong to very young individuals (proven by the presence of unfused long bones and milk teeth). They were probably still-born individuals, or they died in the first weeks after birth. These data thus imply that the place of parturition (i.e., the hyena den) is very close.

5. Discussion: The Link between the Lithic Raw Material Availability and the Core and Tool Reduction Strategies at Veldwezelt–*Hezerwater*

It seems that a number of trends concerning the use of particular sorts of lithic raw material and the production of specific artefacts characterise the lithic assemblages that were excavated at Veldwezelt–*Hezerwater*.

At Veldwezelt–*Hezerwater*, Levallois products (Bringmans, 2006) have usually been made of fine-grained lithic raw materials (e.g., VLB, TL & WFL sites). It has been noticed that Levallois core reduction strategies tended to produce relatively large, broad flakes that were comparatively thin and light for their size. Levallois products thus usually tend to maximise the length of the cutting edge per unit weight (e.g., Brantingham & Kuhn, 2001). The specific technical characteristics of Levallois products thus seem to offer a relatively straightforward explanation in so-called "transport-energy" terms for the general tendency that Levallois products were preferentially made of "exotic", fine-grained lithic raw materials, which would imply that they are more likely to have travelled greater distances relative to the initial lithic raw material source. However, it seems that at the VBLB site, Levallois products have been flaked of locally available raw materials.

The blades at Veldwezelt–*Hezerwater* (Bringmans, 2006) usually provide the maximum of cutting edge per

unit weight. Blades would thus seem to represent the most "economical" or the "cheapest" stone artefacts. Where the appropriate data exist, it has often been observed that blades are the artefacts most likely to have been made of "exotic", fine-grained raw materials (e.g., Bar Yosef & Kuhn, 1999). However, at the VLL and VLB sites at Veldwezelt–*Hezerwater*, blades and blade-like flakes were clearly made of locally available raw materials, which were not really fine-grained lithic raw materials. It seems that at the VLL and VLB sites, the crucial factor was the morphology of the initial flint nodules, rather than the quality of the nodules. Indeed, the Veldwezelt–*Hezerwater* blades and blade-like flakes were produced in an opportunistic fashion. Nevertheless, these blades were made by typical parallel/prismatic core reduction strategies.

At Veldwezelt–*Hezerwater*, Quina tools (Bringmans, 2006) actually appear to be the most intensively retouched pieces of all Middle Palaeolithic tools. These Quina tools have been excavated at the TL and WFL sites. However, it is often said that Quina tools were frequently made of lithic raw materials of "inferior" quality (e.g., Turq, 1989, 1992). According to some researchers (e.g., Rolland, 1988; Dibble & Rolland, 1992), lithic assemblages with Quina tools are more often associated with relatively cool climatic conditions. The assumption is that during relatively cool periods Middle Palaeolithic humans were more tethered to their caves. In spending more time in these places, they tended to recycle previously discarded tools. In this scheme, a lack of mobility goes hand in hand with the heavy modification and reuse of "inferior" quality flint tools. However, it is important to note that Quina tools were also made of "exotic", fine-grained lithic raw materials, as is the case at Veldwezelt–*Hezerwater*. Within toolkits, "exotic" Quina tools usually are even more intensively retouched and modified than Quina implements, which were made of "inferior" quality flint (e.g., Turq, 1989, 1992). In our view however, the presence of Quina tools shows that another factor also seems to have influenced the intensity of tool rejuvenation, namely the "nature" of the activities in which these tools were employed.

6. Conclusions

The archaeological excavation campaigns at Veldwezelt–*Hezerwater* provided us with important lithic remains of at least six separate Middle Palaeolithic valley settlements. Middle Palaeolithic humans, who wanted to make a living at Veldwezelt–*Hezerwater* in a particular climatic setting, had to respond to that setting. This fact of course led to adaptation in terms of migrational, technological and "cultural" behaviour, which in turn affected their clothing, shelter, mobility, meat procurement and butchery methods, and thus their lithic technology. We and other researchers (e.g., Dibble, 1988; Bisson, 2000; Moyer & Rolland, 2001; Clark, 2002[a, b]) believe that "culture" and "cultures" are relatively unimportant restraints on the character of core and tool reduction strategies, being overridden in most contexts by mechanical constraints and socio-economic and ecological processes. It seems that Middle Palaeolithic core and tool reduction strategies constituted a whole range of technological options, which were invoked differently according to context.

References

Bar Yosef, O. & Kuhn, S. L., 1999. « The Big Deal about Blades: Laminar Technologies and Human Evolution ». *American Anthropologist*, 101 : 322-338.

Bisson, M. S., 2000. « Nineteenth Century Tools for Twenty-First Century Archaeology? Why the Middle Paleolithic Typology of François Bordes Must Be Replaced ». *Journal of Archaeological Method and Theory*, 7 : 1-48.

Brantingham, P. J. & Kuhn, S. L., 2001. « Constraints on Levallois Core Technology: A Mathematical Model ». *Journal of Archaeological Science,* 28 : 747-761.

Bringmans, P. M. M. A., 2006. *Multiple Middle Palaeolithic Occupations in a Loess-Soil Sequence at Veldwezelt–Hezerwater, Limburg, Belgium*. Doctoral thesis, Katholieke Universiteit Leuven, Faculteit Letteren, 418 p.

Bringmans, P. M. M. A. & Vermeersch, P. M., 2008. « Veldwezelt–*Hezerwater*. Een eerste beschermd midden-paleolithisch monument in Vlaanderen ». *Monumenten, Landschappen & Archeologies*, Januari-Februari 2008 : 4-20.

Bringmans, P. M. M. A., Vermeersch, P. M., Groenendijk, A. J., Meijs, E. P. M., de Warrimont, J.-P. & Gullentops, F., 2001. *Preliminary Report on the Excavations of the Middle Palaeolithic Valley Settlements at Veldwezelt–Hezerwater (Belgium)*. In P. M. M. A. Bringmans (éd.), *Stratigraphy and Prehistory of the River Maas Valley in Limburg – Belgium. Excursion guide. XIVth Congress of the International Union of Prehistoric and Protohistoric Science – U.I.S.P.P. 2-8 September 2001, Liège – Belgium* : 21-29.

Bringmans, P. M. M. A., Vermeersch, P. M., Groenendijk, A. J., Meijs, E. P. M., de Warrimont, J.-P. & Gullentops, F., 2004. *The Late Saalian Middle Palaeolithic "Lower-Sites" at Veldwezelt–Hezerwater (Limburg - Belgium)*. In P. Van Peer, P. Semal & D. Bonjean (éds), *Actes du XIV[e] Congrès de l'UISPP, Université de Liège, Belgique, 2-8 septembre 2001. Section 5. Le Paléolithique moyen. Sessions générales et*

posters, BAR International Series, 1239, Oxford, Archaeopress : 187-195.

Bringmans, P. M. M. A., Vermeersch, P. M., Gullentops, F., Meijs, E. P. M., Groenendijk, A. J., de Warrimont, J.-P. & Cordy, J.-M., 2006. *Levallois, Quina and Laminar Reduction at Veldwezelt–Hezerwater.* In *Neanderthals in Europe. Proceedings of the International Conference held in the Gallo-Roman Museum in Tongeren (September 17-19th 2004)*, Études et Recherches Archéologiques de l'Université de Liège - ATVATVCA, 117 – 2, Liège – Tongeren, Service de Préhistoire de l'Université de Liège - Gallo-Roman Museum Tongeren : 104-114.

Clark, G. A., 2002[a]. « Neandertal Archaeology – Implications for Our Origins ». *American Anthropologist*, New Series, 104 : 50-67.

Clark, G. A., 2002[b]. *Observations on paradigmatic bias in french and american paleolithic archaeology.* In *The role of American archeologists in the study of the European upper paleolithic. Proceedings of the XIVth UISPP Congress held in Liège (2-8 septembre, 2001)*, BAR International Series, 1048, Oxford, Archaeopress : 19-26.

Dibble, H. L., 1988. *The interpretation of middle Paleolithic scraper reduction patterns*. In L. Binford & J.-P. Rigaud (éds), *L'Homme de Néandertal. Actes du colloque international de Liège (4-7 décembre 1986). Volume 4. La Technique*, Études et Recherches Archéologiques de l'Université de Liège, 31 Liège, Service de Préhistoire de l'Université de Liège : 49-58.

Dibble, H. L. & Rolland, N., 1992. *On Assemblage Variability in the Middle Paleolithic of Western Europe*. In H. L. Dibble & P. Mellars (éds), *The Middle Paleolithic : Adaptation, Behaviour and Variability*, Univerity Museum Monographs, 72, Philadelphia, University of Pennsylvania : 1-28.

Meijs, E. P. M., s.d. *Archeogeolab. Palaeolithic and Quaternary Research in the European Loess Belt. Version 22-06-2011*, www.archeogeolab.nl.

Meijs, E. P. M., in press. *The Veldwezelt site (province of Limburg, Belgium), environmental and stratigraphical interpretations*. In J. W. M. Jagt, E. A. Jagt-Yazikova & W. J. H. Schins (éds), *A tribute to the late Felder brothers – pioneers of Limburg geology and archaeology*, Journal of Geosciences, 90.

Moyer, C. C. & Rolland, N., 2001. « Understanding the Middle Palaeolithic assemblage typology ». *Antiquity*, 75 : 39-43.

Rolland, N., 1988. *Observations on some Middle Paleolithic time series in southern France*. In H. L. Dibble & A. Montet-White (éds), *The Upper Pleistocene Prehistory of Western Eurasia*, University Museum Monograph, 54, Philadelphia, University of Pennsylvania : 161-180.

Turq, A., 1989. *Exploitation des matières premières lithiques et occupation du sol : l'exemple du Moustérien entre Dordogne et Lot*. In H. Laville (éd.), *Variations des paléomilieux et peuplement préhistorique. Actes du colloque "Relations entre les variations des paléomilieux, le peuplement préhistorique et l'occupation du sol" organisé par le Comité français de l'I.N.Q.U.A. (Talence, 3-4 Mars 1986)*, Cahiers du Quaternaire, 13, Paris, éditions du CNRS : 179-204.

Turq, A., 1992. *Le Paléolithique inférieur et moyen entre les vallées de la Dordogne et du Lot*. Thèse de doctorat, Université de Bordeaux I, 780 p.