Notae Praehistoricae 21-2001 : 7-17

The Middle Palaeolithic Valley Settlements at Veldwezelt-Hezerwater (Limburg – Belgium) Excavation Campaign 2001

Patrick M. M. A. BRINGMANS, Pierre M. VERMEERSCH, Albert J. GROENENDIJK, Erik P. M. MEIJS, Jean-Pierre DE WARRIMONT & Frans GULLENTOPS

1. Introduction

The Veldwezelt-Hezerwater sites are located in the Vandersanden brickyard quarry, which exploits the loess deposits of the south-east facing side of the Hezerwater Valley. The research of the quarry by the Laboratory for Prehistory at the *Katholieke Universiteit Leuven*, in collaboration with the Institute for the Archaeological Heritage (*IAP*) of the Flemish Community and the Provincial Gallo-Roman Museum of Tongeren, started already in 1995 and is still on going. (Gullentops *et al.*, 1998; Bringmans, 2000; Bringmans *et al.*, 2000; Vermeersch, 2001; Bringmans, 2001).

From July 16 until August 24, 2001 a fourth excavation campaign took place at the sites of Veldwezelt-Hezerwater. This year's excavation team included students from the *Katholieke Universiteit Leuven* (Belgium), the *Universiteit Gent* (Belgium), the *Open Universiteit* (Belgium), the *Universiteit Leiden* (The Netherlands), the *Rijksuniversiteit Groningen* (The Netherlands), Corpus Christi College - University of Cambridge (United Kingdom), University College London (United Kingdom) and from Michigan State University (United States of America).

2. Context and Aims of the Research at Veldwezelt-Hezerwater

High rates of sedimentation at the multi-level site at Veldwezelt-Hezerwater resulted in a very detailed chronostratigraphic record. This sequence of loess, loess-derived sediments and palaeosoils, in which the archaeological sites of Veldwezelt-Hezerwater are situated (fig. 1), has been preserved from erosion only because it was deposited in a concave topography (Gullentops, 1998). The complex succession of sediments and palaeosoils, which can be observed at Veldwezelt-Hezerwater, is due to the fact that past climates fluctuated with rapid shifts of temperature and precipitation.

Research of Palaeolithic open-air settlements is often hindered by the poor visibility of the sites and the relatively low absolute artefact density (Conard, 2001). Another problem is the fact that many of the Middle Palaeolithic sites have been affected by two important postdepositional processes; namely cryoturbation and bioturbation. The result is a vertical spreading of the artefacts (Vermeersch, 2001), both upward by cryoturbation and downward by bioturbation. Strict contemporaneity of the archaeological material found at most of these Middle Palaeolithic open-air sites is consequently difficult to demonstrate. But, within individual find horizons refitting has been used effectively as an analytical tool for establishing contemporaneity (Cziesla *et al.*, 1990).

The multi-level site at Veldwezelt-Hezerwater (Limburg - Belgium), which is now being excavated, discloses significant botanical (charcoal), faunal and lithic remains of at least 5 different Middle Palaeolithic valley settlements, separated by thick stratigraphic units. These Middle Palaeolithic settlements, situated in the Valley of the Hezerwater, tributary of the River Maas, were occupied at different times during the late Saalian (Marine Isotope Stage (MIS) 6), the late Last Interglacial *s.l.* (MIS 5) and the Middle Weichselian (MIS 3).

The main aims of this year's excavation campaign focused on the study of the intrasite settlement dynamics at the different Middle Palaeolithic settlements at Veldwezelt-Hezerwater. During the Campaign 2001, about one hundred m² were excavated. The excavation of the sites is organised using the checkerboard system, thus creating continuous profiles every two metres both north-south and east-west, which has proven essential as the sedimentological and the pedo-stratigraphical context of the artefact assemblages is very complex. The results of the preliminary findings of the Excavation Campaign 2001 are outlined in the report that follows.

3. Principal Elements of the Stratigraphy

The Vandersanden pit exploited the fill of the asymmetrical Hezerwater dry valley. The final exploitation wall was graciously preserved by the Vandersanden Firm and put at the disposal of the Laboratory for Prehistory for adequate excavations,

because several archaeological levels had been located. The actual wall is slightly oblique to the valley and gives excellent exposures of the contact between the erosion in the valley side and the fill.

The steep valley-side is made up of 4 m of Maas gravel (fig. 1), which belongs to a younger terrace of the Lanaken Formation. It is overlain by a thin layer of reworked marine gravel and sand; the first alluvial fan of the Hezerwater. Next follows an incision of this small tributary over at least 6 m, the base being not yet reached.

The actually deepest gravel is badly sorted, with coarse elements from the terrace. It is covered by more than a metre of stratified alluvial silts with numerous small sand lenses. These are not simple overbank deposits but represent individual threads of snowmelt-water, probably under snow cover. Laterally occurs against the valley-side a lens of aeolian silts with sand laminae blown in from this alluvial plain. Aggradation continues with a new gravel spread, locally overlain by a disordered mass of terrace gravel. It represents a rock-fall from a frozen block of Maas gravel from the nearby terrace-wall. This produced shock-waves with small thrust-planes in the underlying alluvium. The debris was finally obliterated by water-lain aeolian silts.

A small depression is cut into the previous aggradation and fixed by an incipient soil (VLL-VLB) under temperate conditions (fig. 1). The horizon contains artefacts and *Pinus* charcoal pieces. The depression is first filled by coarse silts with discontinuous laminae granules (GSL) denoting colluvial activity, followed by loessic silts. These are weathered into at least two separate orange-brown horizons with stagnic overprinting. The upper one (VBLB) contains artefacts and *Betula* charcoal. They converge on the terrace in a deeply weathered polygenetic soil.

The upper bleached horizon (BHB), which developed into a typical white silt, devoid of any clay, is always overlain by a dark humic layer (OHZB), with *Pinus* charcoal and in which the important enstatite tephra is present. This succession of mature soils

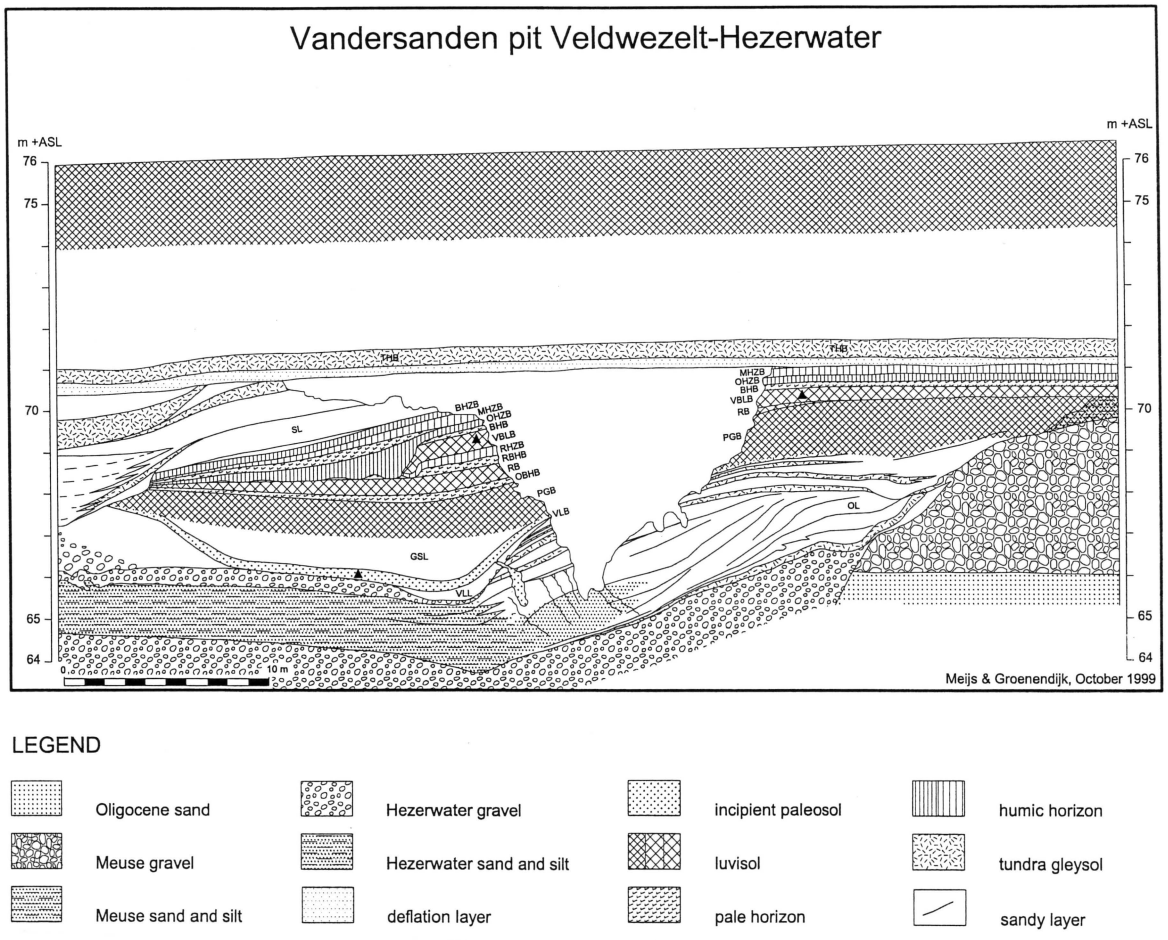

Fig. 1 – Veldwezelt-Hezerwater: Detail of the West Profile at the Vandersanden Brickyard Quarry - stratigraphical position of the GRA, VLL, VLB and VBLB archaeological levels.

denotes a long period of temperate climates with different forest covers. It is interpreted as giving a fairly complete image of the climatic fluctuations of the long Last Interglacial, corresponding to MIS 5.

Between this humic horizon and the upper characteristic Brabantian loess with at its base the typical erosive "Kesselt Suite", the very diversified Hesbayan Member can be seen (fig. 1). In the valley fill

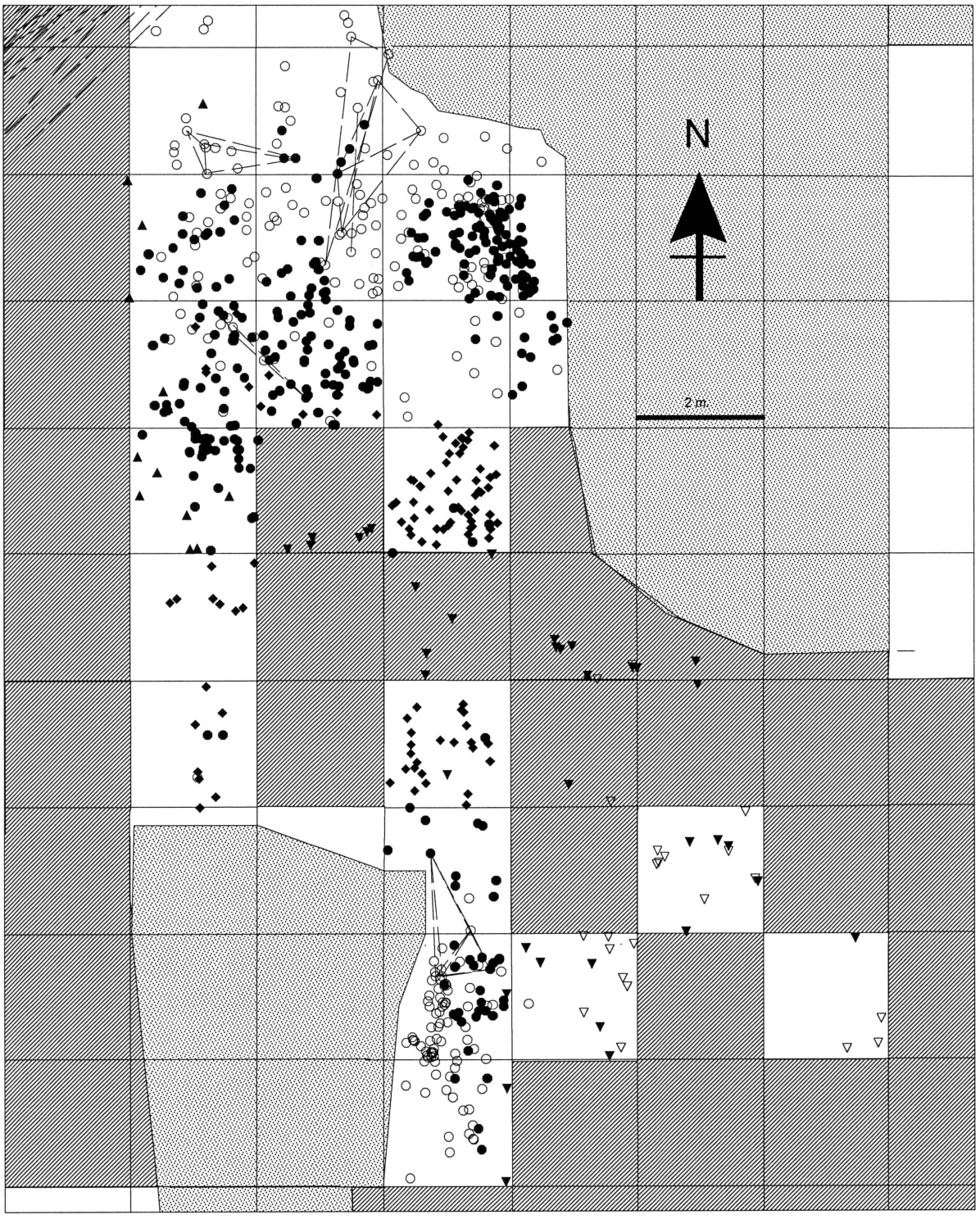

Fig. 2 – Veldwezelt-Hezerwater: Horizontal distribution of the artefacts of the GRA-Level and the VLL and VLB Sites (Legend: see fig. 4).

a complex stratigraphy could be established with numerous erosional hiatuses. The actual section gives considerable detail of these erosional phases, of which five can be seen.

The first erosion occurs immediately after the enstatite-humus with deep solifluction scoops in which, then frozen lumps of the humus flowed down. In the valley fill they were found covering the interglacial fluvial sand. They indicate the first cold push with which started the last glacial. It is followed by a grey dust cover, which is fixed by a thin meadow soil. After a thin second dust cover follows typical stratified soil colluvium with erosion products of the interglacial luvisols. Other ravines are transformed by solifluction of their sides. From the final horizon (WFL) of one gully-fill, artefacts and an important number of mammalian remains have been recovered, with horse, woolly rhinoceros and mammoth as most typical.

The most crucial erosion is materialised by chest-shaped gullies: torrential cross-bedding undercuts frozen vertical walls and are filled with angular frozen blocks. We assist in the development of a thermokarst, when a permafrost degrades and the melt-waters carve the surface along the ice-wedges of original tundra polygons. All these phenomena show wet, snow-rich conditions, too cold for a forest vegetation, but often rich in life. Only once, short deep permafrost transformed the landscape and the special erosion of the thermokarst when it melted and demonstrated the enormous power of these phases on soft rock scenery.

4. Archaeological Material

4.1. The Lower Site (the GRA-Level and the VLL & VLB Sites)

A small valley (fig. 1) created two slopes, stable enough to allow the development of an incipient soil. Both the VLL and the VLB soil horizons contain artefacts (fig. 2) and the VLB horizon especially, contains numerous charcoal pieces, identified as *Pinus silvestris* (determination by F. Damblon, *KBIN* Brussels - 1998). Just as during last year's excavation campaign many artefacts were also excavated just on top of the underlying gravel. These latter artefact concentrations should probably be seen in relation with the VLL find horizon. But, this year it became clear that in the underlying gravel itself many artefacts are present (GRA-Level). We are presumably dealing here with several occupation moments. According to the most probable working hypothesis, this sequence belongs to the late Saalian and represents consequently the terrestric equivalent of Marine Isotope Stage (MIS) 6.

In the gravel of this valley we found until now about 150 artefacts, probably not *in situ*. The matrix, filling the pores between the larger rocks, is composed of pebbles and loam. You can in fact see a layering of the gravel and the more loamy sediments. Some cores, a few denticulated tools (fig. 3) and some sidescrapers were excavated in the gravel find complex (GRA-Level). The gross of the artefacts are flaked according to non-Levallois debitage techniques. But one Levallois flake, one Levallois core and one Levallois point were also excavated. The Levallois core and point and one chip, which was found underneath the core, all belong to the same raw material unit (RMU). It is very interesting to see that all these Levallois products were found in deeper positions than the non-Levallois products. So, one might argue that the Levallois products are older than the non-Levallois products found at the GRA-Level of the Lower Site at Veldwezelt-Hezerwater.

This year, the excavation of the VLL soil horizon on the south facing valley-side of the Lower Site yielded about 130 artefacts (fig. 2). Beside several flakes and blades, five small bipolar cores for blades (fig. 3), some with two carefully prepared striking platforms at both ends, were found. Several cortical blades could be refitted to one core, suggesting a restricted artefact movement. A few notched tools were excavated as well (fig. 3). In order to establish the westward artefact spread, last year a deep pit was dug on the Upper Site in order to reach the level of the Lower Site. At a depth of 2,5 m under the level of the Upper Site a few small blades were found, but no artefact concentration was encountered. It is now clear that these artefacts (OVL-Level) belong in fact to the VLL find horizon. It is important to recognise that generally speaking, we are dealing in the VLL and the VLB find horizons with very similar non-Levallois blade and bladelet industries. They are probably the result of at least two different occupation moments, because until now no refits have been established between these two artefact assemblages.

About 110 artefacts have also been found near the contact between the VLL and the VLB soil horizons of the north facing valley-side (fig. 2). This concentration comprises a core, several small flakes and about one hundred chips. Several pieces out of the VLL and VLB find horizon on the north facing valley-side could be refitted. This is clearly an *in situ* knapping spot. The relation between the artefact assemblages from the south and north facing valley-sides is not clear yet, because the artefacts out of the VLL and VLB find horizons found on the south facing gully-side could not be refitted until now.

The small dimensions of the artefacts of the Lower Site are clearly determined by the character of the locally available Hezerwater raw material used for

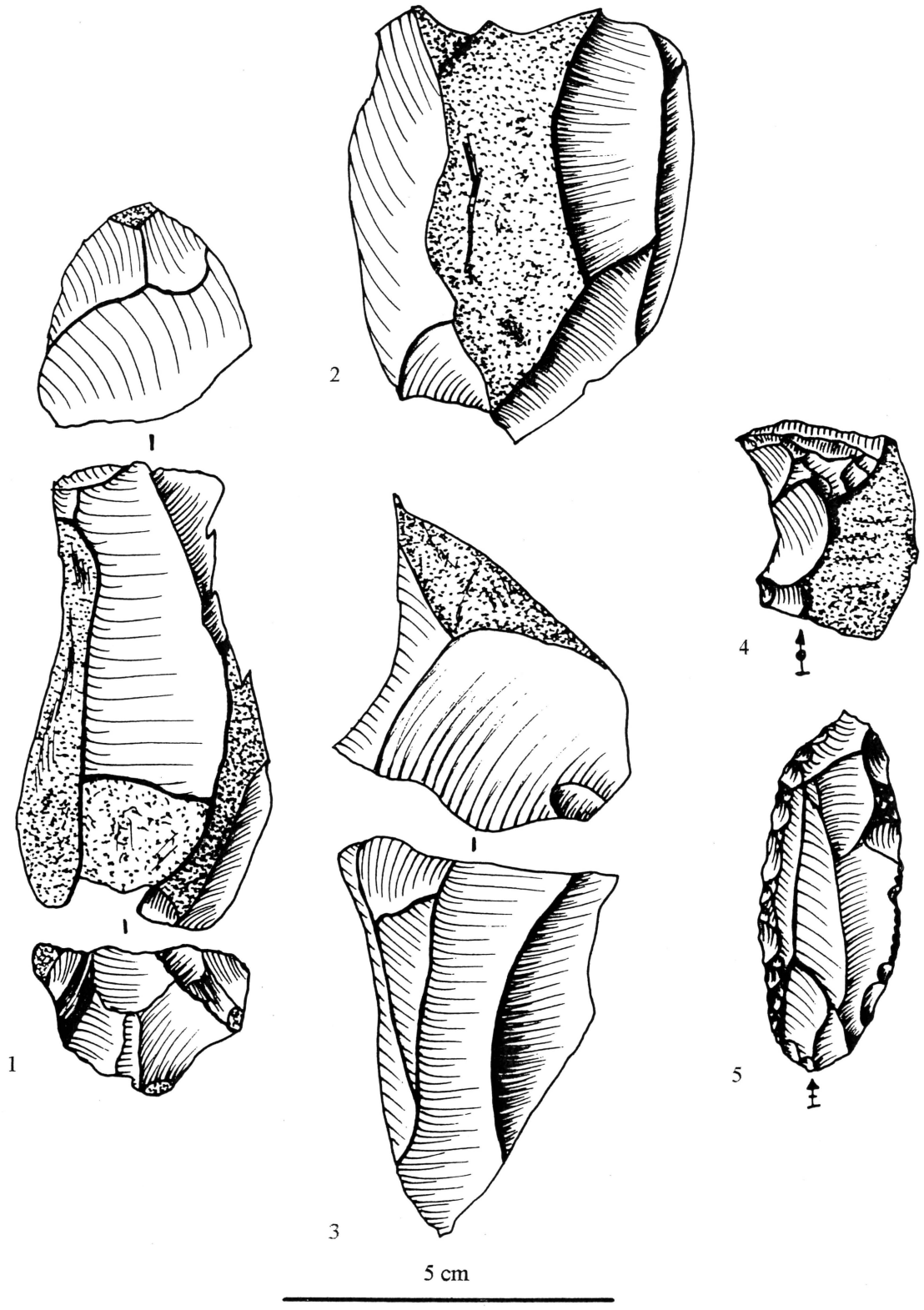

Fig. 3 – Veldwezelt-Hezerwater: VLL-Site: 1. Core for blades with two opposite striking platforms and two refitted cortical blades; 2. Core for blades with two opposite striking platforms; 3. Core for blades; 4. Notched piece; GRA-Level: 5. Denticulated piece (Drawings: Bringmans, 2001).

flaking. All the artefacts out of the VLL and the VLB soil horizons, but also those artefacts, which come out of the gravel (GRA-Level), are not patinated. Especially the artefacts out of the VLL and the VLB soil horizons represent a fresh conservation condition. Most of the artefacts found in the gravel (GRA-Level) are also rather fresh, which suggests that they have not been rolled over long distances, but are still near the place where they have been discarded by prehistoric man.

On the VLL and VLB Sites we found complete flint nodules, tested nodules, cores and blanks, as well as large quantities of lithic waste material. Only a few tools, mostly denticulated pieces, were found. The raw material found at these two sites is of low quality and sometimes frost-cracked. In many cases, the flint nodules show an 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 prehistoric man came here to search the gravel and to pick out

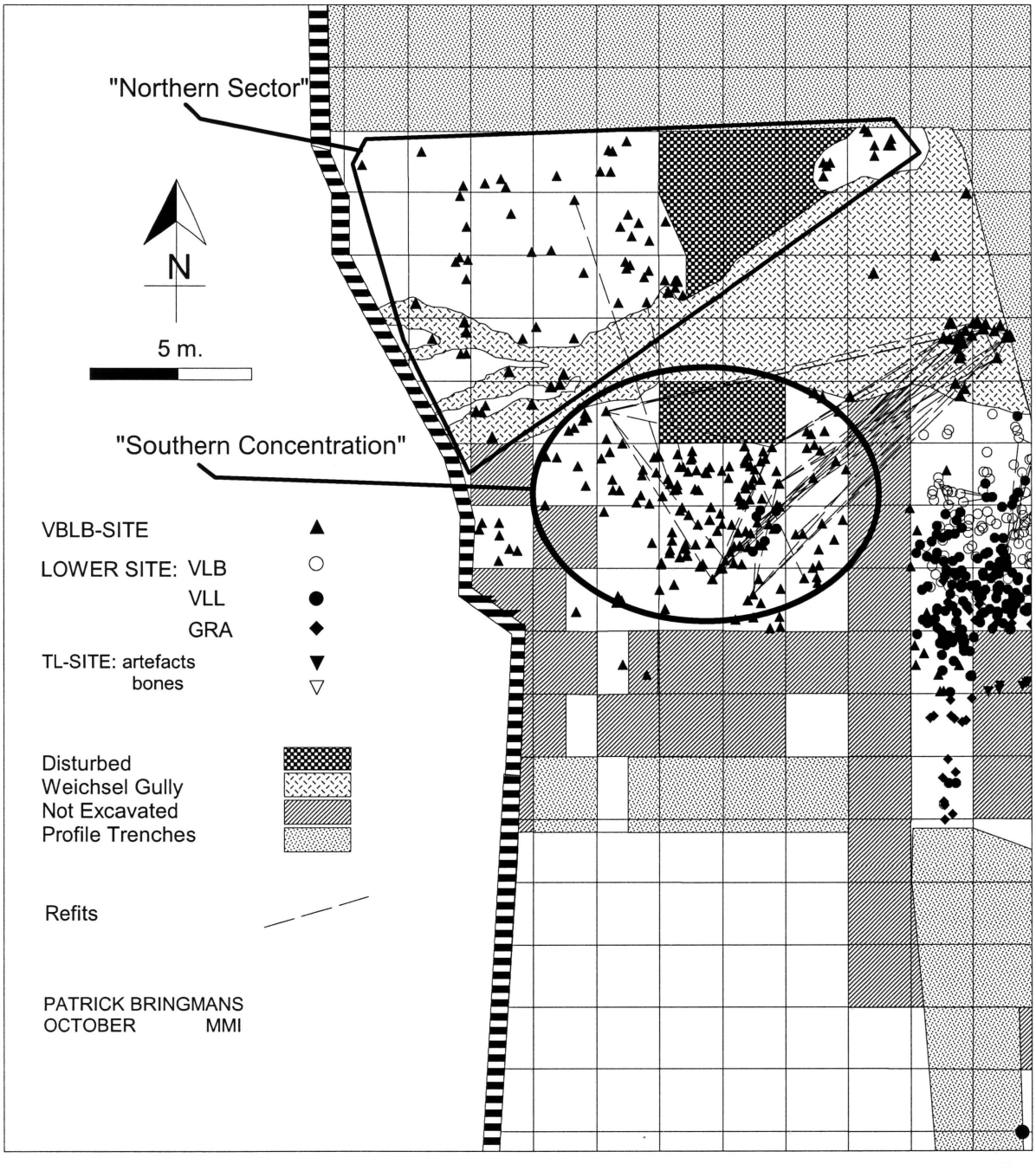

Fig. 4 – Veldwezelt-Hezerwater: Horizontal distribution of the artefacts at the VBLB-Site.

preferentially, elongated flint nodules, which were to be found here in the Hezerwater gravel. The hypothesis, that surface quarrying was going on at the VLL and the VLB Sites at Veldwezelt-Hezerwater, seems to be valid.

4.2. The Upper Site (the VBLB-Site)

A succession of several B-horizons separated by bleached and humic zones can be observed (fig. 1). Only the VBLB B-horizon contains artefacts and many charcoal pieces, identified as *Betula sp.* (determination by F. Damblon, *KBIN* Brussels - 1998). The dark humic zone (OHZB) contains the expected volcanic minerals with enstatite. This very detailed succession of mature soils and humic horizons, representing the Rocourt soil covered by the Warneton soil complex, gives a fairly complete image of the complex terrestric climatic fluctuations during the Last Interglacial *s.l.* (MIS 5).

This year we finished the excavations at the VBLB-Site (fig. 4). Some flakes, a Levallois core, a notched piece and a Levallois core-edge flake were excavated (fig. 5). The artefacts of the VBLB Site were excavated in the upper B-horizon (fig. 1) of the Rocourt Soil (MIS 5) with a maximal vertical artefact distribution of less than 30 cm. The lithic assemblage of the VBLB-Site (n = 350), which was excavated during this and the previous campaigns, is primarily characterised by the predominance of the Levallois knapping technique. The lithic material comprises one Levallois core, used as a sidescraper and one discoidal core, with several refits, which is in fact a totally exhausted Levallois core. Ten larger Levallois flakes and several smaller flakes were also found. Some larger non-Levallois flakes were present in the lithic assemblage as well. The toolkit is made up of two single sidescrapers, one *déjeté* side scraper, one notched piece, one bifacial single convex sidescraper and one bifacial foliate. None of these tools seem to have been produced on Levallois blanks.

An important feature that blurs our image of the horizontal artefact distribution is the deep Weichselian gully (fig. 1, 4) that cuts through the centre of the VBLB-Site. It is now clear that most of the artefacts found in this gully belong to the VBLB lithic assemblage. All long-distance refits (fig. 4), mostly the larger Levallois flakes of the relatively poor "northern sector" of the VBLB-Site are connected with the relatively rich "southern concentration" of the VBLB-Site, whereas all the short-distance refits were established within the "southern concentration" and none in the "northern sector". It is important to note that several long-distance refits were established with artefacts found in the Weichselian gully (fig. 4). These refits should not be considered as being "meaningful", because these "gully-artefacts" were of course not found *in situ*. Nevertheless, for the "northern sector" we could make out that all the retouched tools, the larger Levallois flakes and the larger non-Levallois flakes were found in relation with each other. For the "southern concentration" we could notice that the core, the cortical flakes, the small Levallois preparation

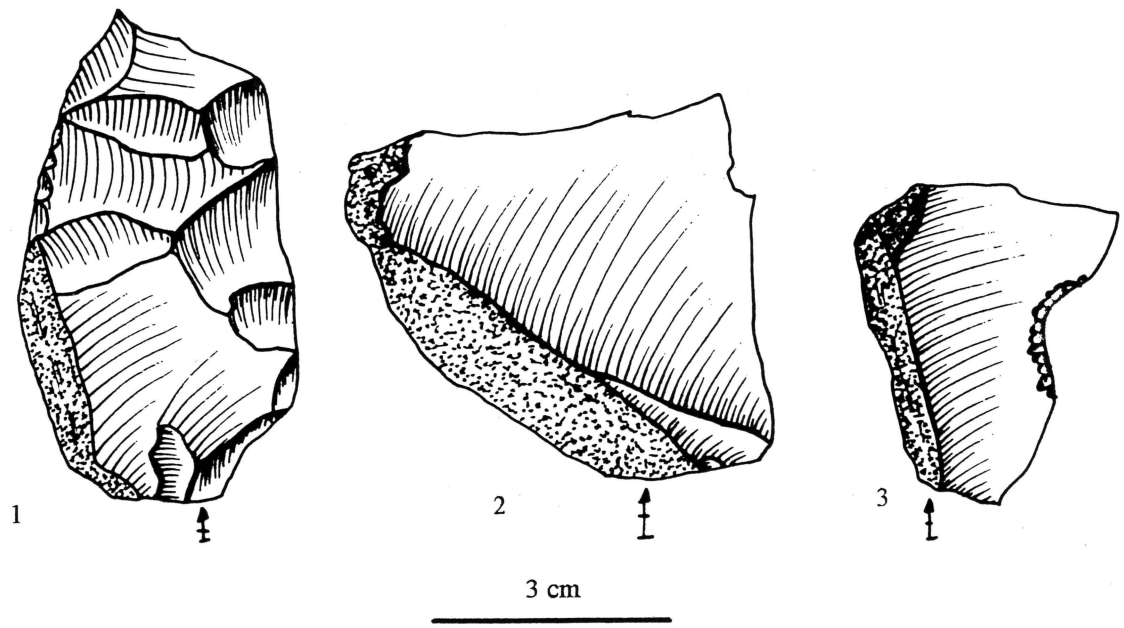

Fig. 5 – Veldwezelt-Hezerwater: VBLB-Site: 1. Levallois core-edge flake; 2. Cortical flake; 3. Notched piece (Drawings: Bringmans, 2001).

flakes, the chips and the knapping waste were also found in relation with each other.

We thus can distinguish a "rich" and a "poor" area on the VBLB-Site at Veldwezelt-Hezerwater. For the "rich area" one RMU with many short and long-distance refits is attested and at the "poor area" at least 14 RMUs with only long-distance refits are present. At the "rich area" the Neanderthals were beyond any doubt aiming to manufacture large Levallois blanks, while the "poor area" is where the Neanderthals utilised their tools *s.l.* in a variety of tasks. The "southern concentration" could therefore be interpreted as a

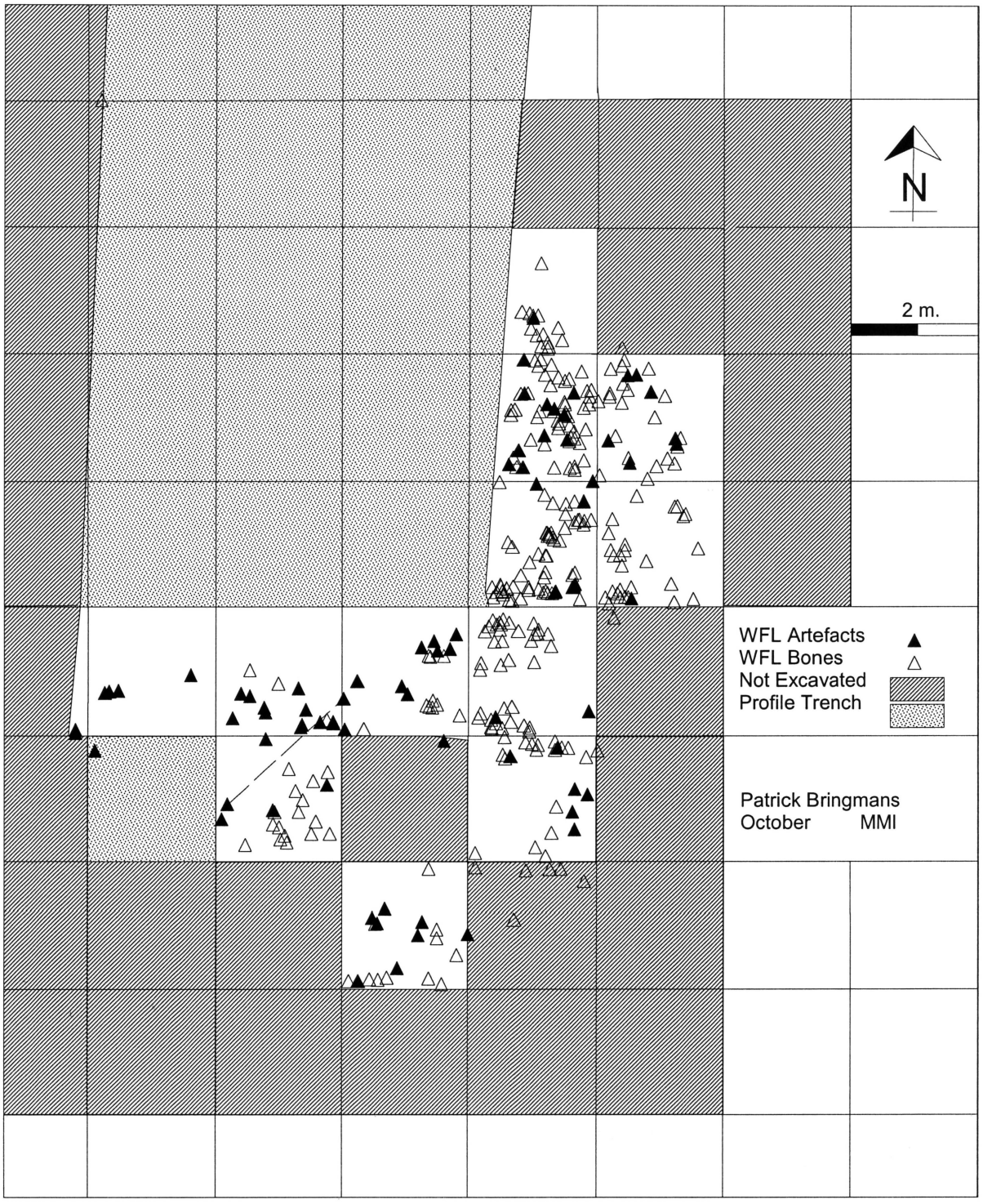

Fig. 6 – Veldwezelt-Hezerwater: Horizontal distribution of the artefacts and bones at the WFL-Site.

knapping workshop, whereas the "northern sector" could be explained as the "tool utilisation zone", where the presence of numerous pieces of charcoal also indicated the proximity of a hearth.

4.3. The Rocourt Island Site (the VBLB-South Site)

This year we did not excavate at the VBLB-South Site. Last year we were able to recover most of the larger artefacts of the VBLB-South Site in the upper part of the Rocourt Soil (MIS 5). The lithic assemblage (n = 55) is primarily characterised by the dominance of the Levallois knapping technique. Several Levallois flakes, blades, core-edge flakes and some Pseudo-Levallois points have been excavated.

4.4. The TL-R and the TL-GF Sites

The loess, loess-derived sediments and the many intercalating fossil soils overlying the Rocourt soil and the Warneton soil complex belong to the Weichselian *s.s.*, representing the terrestric equivalent of MIS 4, 3 and 2. Here a complex stratigraphy (fig. 1) has been established, with several horizons containing microfauna and abundant mollusc shells. The TL-R and the TL-GF Sites are situated on the east facing valley-side of a Middle Weichselian Hezerwater valley (MIS 3). The excavated artefacts are related to the fill of this gully-system and not to the erosional process.

The TL-R Site was partly excavated two years ago and last year's research concentrated on the TL-GF Site. This year's excavation campaign focussed on both sites. Several artefacts and some fragmentary faunal remains have again been excavated, but chips are nearly lacking. The most interesting piece found at the TL-GF Site was a large core. At the TL-GF Site artefacts, including Levallois products and Quina sidescrapers, are found at three distinct levels.

4.5. The WFL-Site

In the WFL-horizon, an incipient brown soil of Middle Weichselian age (MIS 3), several artefacts and an important number of mammalian remains have been recovered (fig. 6). The lithic material is made up of unipolar lineal and bipolar recurrent Levallois cores, Quina side scrapers, several flakes and chips. One of the highlights of this year's excavation campaign at the WFL-Site was the recovery of another Quina sidescraper with a faceted butt (fig. 7).

The faunal assemblage of the WFL-Site comprises, based on preliminary assessments, cold period fauna including species such as horse, woolly rhino and mammoth. Gnawing marks of hyena have been observed (personal communication J.-M. Cordy, *Université de Liège* - 2001). Although no cut marks have been identified on the bones at present, evidence for the anthropogenic origin of these finds is provided by systematic bone cracking, probably for extracting marrow.

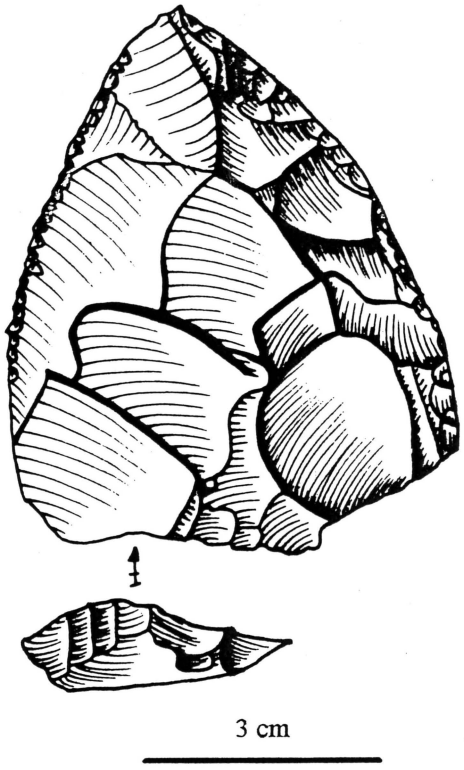

Fig. 7 – Veldwezelt-Hezerwater: WFL-Site: Quina side-scraper (Drawing: Bringmans, 2001).

4.6. The Patina Layer

In the Patina Layer, which is the orange horizon of the "Kesselt Suite" (THB: fig. 1), 59 reworked and heavily wind glossed and white patinated artefacts have been found. Finally, the characteristic "Kesselt Suite" was covered by up to 5 meters of aeolian Brabantian loess (fig. 1), in which the Holocene soil developed.

5. Conclusions

The Veldwezelt-Hezerwater Excavation Campaign 2001 disclosed further remains of at least five different Middle Palaeolithic valley settlements. It is amazing to realise that at the multi-level site of Veldwezelt-Hezerwater, humans were living and producing their tools at different times during the late

Saalian (MIS 6), the late Last Interglacial *s.l.* (MIS 5) and the Middle Weichselian (MIS 3).

The oldest occupation phase present at the base of the Hezerwater gravel (GRA-Level) at the Lower Site seems to have been influenced by the Levallois technology. Throughout the Hezerwater gravel (GRA-Level), one sees the presence of a non-Levallois flake technology. These artefacts are likely not *in situ*. But, the younger occupation phase at the Lower Site at Veldwezelt-Hezerwater, found on top of the Hezerwater gravel and in the VLL find horizon, generally characterised by non-Levallois blade and bladelet industries, may indeed be *in situ*. The same goes for the artefact assemblage of the VLB find horizon, which is very similar to the lithic assemblage of the VLL find horizon. Both the VLL and VLB Sites at Veldwezelt-Hezerwater could be interpreted as surface flint extraction sites with several knapping workshops. It is still difficult to tell something about the absolute chronology of these different find horizons, because the time resolution is still not detailed enough. But, on stratigraphical grounds, we think that it is safe to say that they all should be dated into a late Saalian context (MIS 6). This hypothesis is stressed by the presence of charcoal (*Pinus silvestris*), which suggests that the climate during this Pre-Eemian occupation stage was temperate or even cool.

On the VBLB-Site at Veldwezelt-Hezerwater situated at the top of the Rocourt soil, which is the terrestric equivalent of the late Last Interglacial *s.l.* (MIS 5), we can distinguish a "rich" and a "poor" area. For the "rich area" one RMU with many short and long-distance refits is attested and at the "poor area" several RMUs with only long-distance refits are present. At the "rich area" the Neanderthals were beyond any doubt aiming to manufacture large Levallois blanks, while the "poor area" is where the Neanderthals utilised their tools *s.l.* in a variety of tasks. The "southern concentration" could therefore be interpreted as a knapping workshop, whereas the "northern sector" could be explained as the "tool utilisation zone", where the presence of numerous pieces of charcoal also indicated the proximity of a hearth.

The loess, loess-derived sediments and the many intercalating fossil soils overlying the Rocourt soil and the Warneton soil complex belong to the Weichselian *s.s.*, are representing the terrestric equivalent of MIS 4, 3 and 2. The TL-R, the TL-GF and the WFL Sites can all be dated to the Middle Weichselian (MIS 3) and they all reveal the presence of lithic material in connection with the remains of large mammals. The lithic assemblage of those three sites is clearly characterised by the presence of Levallois products in association with Quina sidescrapers.

6. Acknowledgements

The Veldwezelt-Hezerwater Excavation Campaign 2001 has been a great success thanks to the generous support of all the scientific institutions involved. We especially would like to thank Prof. Dr. Guy De Boe, Director of the Institute for the Archaeological Heritage (*I.A.P.*) of the Flemish Community, the Province of Limburg (Belgium), the Province of Limburg (The Netherlands), the communities of Lanaken and Riemst and the City of Maastricht.

We also wish to thank the excavators for all their hard work; Jitske Blom, Drs. Edward Calthrop, Dr. Marc Coenen, Pauline Costrop, Evy Cuypers, Caroline Decoster, Peter Goyvaerts, Allan Coolen, Peter Hautekiet, Ir. Jacques Herlant, Jasper Huis in 't Veld, Caroline Janssens, Elsa Kleine, Elke Manshoven, Rachael Muszkiewicz, Drs. Marcel Niekus, Jüri Pino, Karen Pino-Hellendoorn, Sandra Robijns, Geoff Smith, Griet Van Heddeghem, Marlies Van Kruining, Johnny Vliegen, Jeanne-Marie Vroomans and Inger Woltinge.

We are very grateful to all people who have helped with the preparation of this article; Drs. Marcel Niekus (A.R.C. – Groningen), Peter Hautekiet, Elly and Albert Bringmans-Jans, Wilfried and Francesca Bringmans-Scola (M.M.H. - Edinburgh), Drs. Tim Vanderbeken (*Laboratorium voor Prehistorie*) and Prof. Dr. Marc De Bie (*V.U.B.* and *I.A.P.*).

We would also like to thank Prof. Dr. Marcel Otte (*Université de Liège*) and Dominique Bonjean (*Grotte Scladina et Centre Archéologique* – Sclayn) for the organisation of the excursions to the sites of Veldwezelt-Hezerwater during the XIVth Congress of the International Union of Prehistoric and Prothistoric Sciences – U.I.S.P.P. (Liège – Belgium) on Wednesday, 5 September 2001.

7. References

BRINGMANS P. M. M. A., 2000. *De Midden-Paleolithische bewoning van Veldwezelt-Hezerwater in een Noordwest-Europese context*. Licence Dissertation. K.U.Leuven.

BRINGMANS P. M. M. A., 2001. The Veldwezelt-Hezerwater Project (Belgium). *Prehistoria 2000. Journal of the International Union for Prehistoric and Protohistoric and Protohistoric Sciences U.I.S.P.P.*, 1 (1): 180.

BRINGMANS P. M. M. A., BUBEL S., GROENENDIJK A. J., MEIJS E. P. M., DE WARRIMONT J.-P. & GULLENTOPS F. & VERMEERSCH P. M., 2000. The Middle Palaeolithic Valley Settlements at Veldwezelt-Hezerwater, Belgian Limburg: Excavation Campaign 2000. *Notae Praehistoricae*, 20: 7-19.

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 (ed.), *Stratigraphy and Prehistory of the River Maas Valley in Limburg – Belgium. Excursion Guide. XIVth Congress of the International Union of Prehistoric and Protohistoric Sciences – U.I.S.P.P. Member of the International Council for Philosophy and Human Studies UNESCO. 2 – 8 September 2001 Liège - Belgium*. Leuven: 21-29.

CONARD N. J., 2001. River Terraces, Volcanic Craters and Middle Paleolithic Settlement in the Rhineland. *In* : N. J. Conard (ed.), *Settlement Dynamics of the Middle Paleolithic and Middle Stone Age*. Tübingen: 221-250.

CZIESLA E., EICKHOFF S., ARTS N. & WINTER D., (eds), 1990. *The Big Puzzle: International Symposium on Refitting Stone Artefacts. Studies in Modern Archaeology*, 1. Bonn.

GULLENTOPS F., 1998. Geomorphological Expression of the Last Interglacial in the Belgian Loess Region. *INQUA-SEQS Symposium. The Eemian. Local Sequences, Global Perspectives. Volume of Abstracts.* Kerkrade: 31.

GULLENTOPS F., GROENENDIJK A. J., MEIJS E. P. M., MÜCHER H. J., VERMEERSCH P. M. & DE WARRIMONT J. P., 1998. Preliminary Report of an Exceptional Catena of the Last Interglacial in the Loess Area of Belgian Limburg near Veldwezelt. *INQUA-SEQS Symposium: The Eemian. Local Sequences, Global Perspectives. Excursion Guide*. Kerkrade: 35-39.

VERMEERSCH P. M., 2001. Middle Paleolithic Settlement Patterns in West European Open-Air Sites: Possibilities and Problems. *In* : N. J. Conard (ed.), *Settlement Dynamics of the Middle Paleolithic and Middle Stone Age*. Tübingen: 395-417.

Patrick M. M. A. Bringmans, Pierre M. Vermeersch,
Albert J. Groenendijk, Erik P. M. Meijs,
Jean-Pierre de Warrimont & Frans Gullentops
Laboratorium voor Prehistorie
Katholieke Universiteit Leuven
Redingenstraat 16
B - 3000 Leuven
Patrick.Bringmans@geo.kuleuven.ac.be