# 7 Finds and sites discovered in Unit VI and a stray find of a 'Micoquian' handaxe

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## 7.1 Introduction

The Weichselian sediments in the pit have received less attention than the Unit IV-C 'Saalian' deposits, from an archaeological viewpoint but also in other respects. In order to make up for this relative neglect special attention has been paid to Unit VI from the 1986 fieldwork onwards. This is partly due to the discovery of a large Middle Palaeolithic site (Site J) in Unit VI-A deposits, a site excavated in a rescue dig in 1986. A short note on this site is given in this chapter (7.2), while the finds from a site recorded higher up in the Weichselian sediments, Site E, will also be described here (7.3). For the first time in this volume the word 'handaxe' will appear in the description of these two sites, and this is one of the reasons why it has been thought appropriate to also describe a stray find of a Micoquian handaxe in this chapter (7.4). The final paragraph gives an interpretation of the Unit VI data.

## 7.2 Site J

### 7.2.1 INTRODUCTION

In the spring of 1986 an area of 210 m$^2$ at the base of the Weichselian loess (Unit VI-A) was excavated in a rescue excavation. The site was discovered by K. Groenendijk and J.P. de Warrimont and will be published in detail elsewhere (Roebroeks *et al.*, in prep). Here, only a preliminary note on the site can be presented following Roebroeks *et al.* (1987). The important site deserves description in this volume, because its presence has some consequences for the interpretation of the Unit VI-D Site E assemblage, to be presented below (7.3).

### 7.2.2 RESEARCH METHODS

Little time was available for the excavation of Site J because in May 1986 it was discovered in the middle of the area that the Blom Company, which mines the quarry, had planned to remove next. It was decided to choose an excavation strategy that would provide information about the spatial distribution of the finds over the largest possible area (the same strategy was later also appplied at Site K). This meant that most of the finds were collected per square meter, except in an area of 23 m$^2$, where they were individually plotted three-dimensionally in order to acquire more detailed information about their horizontal and vertical distribution. Altogether approximately 210 m$^2$ was excavated. We estimate that by collecting finds per square meter we were able to excavate at least three times as much of the area than would have been possible had we plotted all finds individually. During the excavation the Blom Company removed the sediments all around the excavation area so that the site remained as an elevated platform in the middle of the quarry (see fig. 110 and fig. 3, in the introduction of this volume). The quarrying machines also cut through an important concentration of flint artefacts in the southwestern part of the site. Our information about this concentration is scanty because we recovered the artefacts while being 'chased' by the quarrying machine.

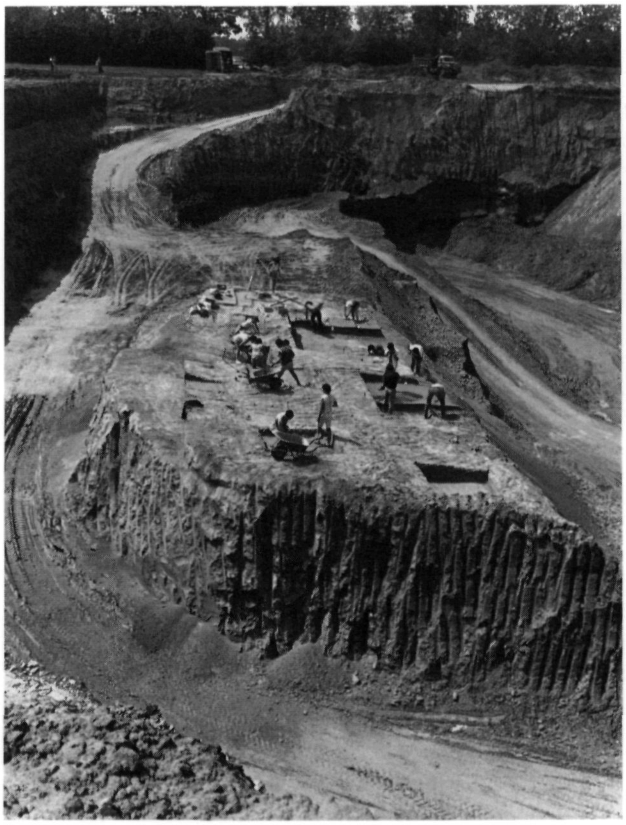

Fig. 110. Site J: the excavation in full swing. The quarrying company has excavated all around the site.

### 7.2.3 STRATIGRAPHY

Figures 111 and 112 give schematic surveys of the geological context of Site J. The finds were stratigraphically situated above an Eemian palaeosol (the 'Sol de Rocourt') and below the 'Horizon of Nagelbeek', a weakly developed soil dated to abt. 20,000 BP (cf. chapter 2). The geological matrix of Site J is the oldest Weichselian sediment found in the quarry, and has been designated Unit VI-A in the local stratigraphy (cf. chapter 2). This unit consists of light grey loess, having a maximum thickness of 20 cm, overlain by an equally thick layer of dark grey-brown loess. The light grey loess was separated from the darker loess by an erosional level, marked by the presence of isolated small (< 1 cm) pebbles. Throughout the Unit 6.1 sediments large 'biopores' (with diameters of up to 0.5 cm) were present, which were absent in the sediments above 6.1.

The two successive layers of the unit were initially (Vandenberghe *et al.* 1985) interpreted as a soil that had been formed under steppe-like conditions. They constitute a complex that has often been observed at the base of Weichselian loess profiles in northwestern Europe ('Sol de Warneton', *sensu* Paepe and Vanhoorne 1967). However, it should be stressed here that micromorphological analysis of this inferred soil complex in other parts of the Belvédère pit did not yield any evidence of 'steppe-soil formation' in this horizon (Mücher, pers.comm., 1987). A similar complex at Seclin (northern France) has been dated by means of the TL method to 70,000-100,000 BP (Tuffreau *et al.* 1985). We provisionally accept this date as the best estimate of the age of the Belvédère Unit VI-A deposits. Artefacts were distributed vertically throughout the 30-40-cm thick unit, but the majority were found on top of the erosional layer that separates the lower light brown from the upper dark brown loess. Karst-formation processes that occurred after the deposition of the Unit 6.1 sediments had led to the subsidence of the archaeological layer. In this relatively lower position the layer was protected from the subsequent erosion that completely obliterated Unit 6.1 to the west of the site (see fig. 111).

As mentioned above, Mücher's micromorphological analysis of the Unit 6.1 sediments falsified the 'steppe-soil' interpretation. The analysis, however, did show the presence of clay illuviation cutans in Unit 6.1, indicating clay illuviation from a higher horizon. In the field, however, no $B_t$ horizon could be identified in the overlying sediments, except, of course, for the Holocene soil in the top part of Unit 7. Climatic conditions which are generally considered favourable to clay illuviation are wet climates with a dry season (FitzPatrick 1971). According to Blum and Ganssen (1972), Koppen's $C_f$ climates are favourable to the formation of argillic horizons. Soils with argillic horizons are reported to have been formed in loess areas during the Atlantic (Reuter 1964; Smolikova and Lozek 1973. See also: Kwaad/Mücher 1977).

In the Weichselian of northwestern Europe such climatic conditions were limited to the Early Weichselian intersta-

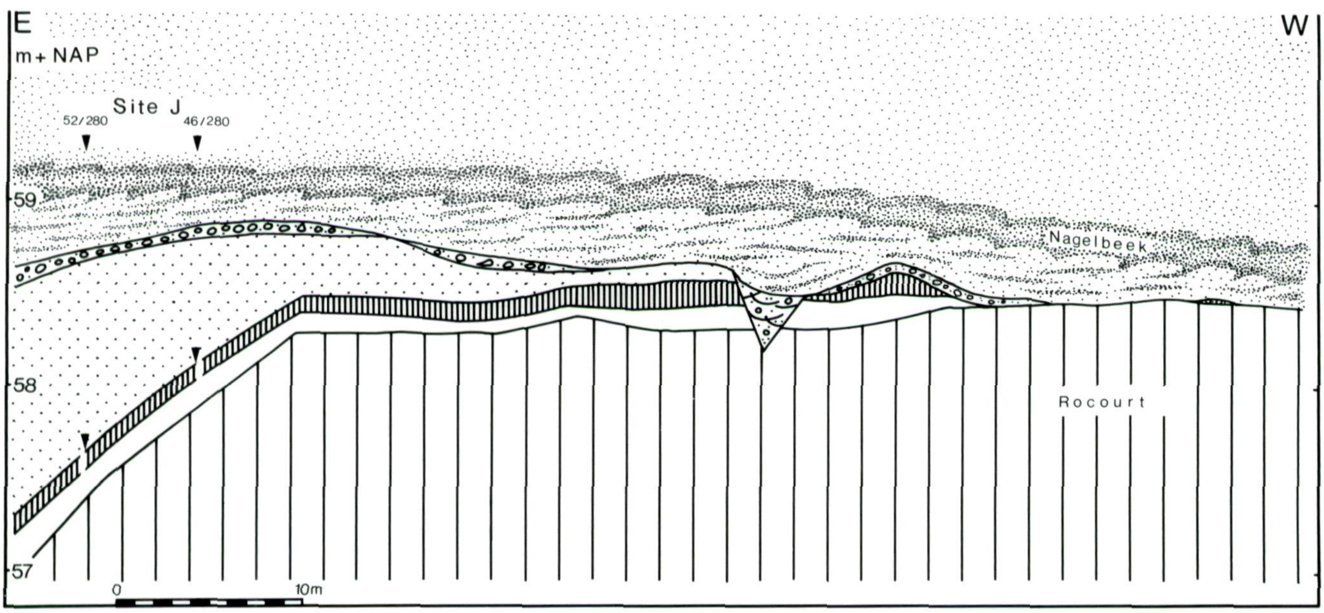


Fig. 111. Schematic profile showing the stratigraphical position of Site J. Vertical magnification 10x.

dials of Amersfoort, Brörup and Odderade (Zagwijn 1961, 1975). Pollen studies in the Netherlands have yielded evidence of these interstadials, which were characterized by a complete re-forestation of the landscape, which had been deforested in the colder Early Glacial stadials I, II and III. In the interstadials the mean July temperature will have been 15 to 17° C.

Other Upper Pleistocene records yielded essentially the same data. The La Grande Pile peat bog in northeastern France revealed a succession of organic muds overlying a Saalian till. The pollen record shows the environmental changes during the last interglacial/glacial cycle in detail. Three forest episodes interrupted by invasions of grass and herbs were attested at the base of the (Eemian) section. The lowermost forest layer was the most pronounced and its pollen diagram resembles diagrams of the last interglacial as defined in its type area in northwestern Europe. The three forest episodes correspond well to the low ice-volume substages of Oxygen Isotope Stage 5 (Woillard 1978, 1980; Woillard/Mook 1982).

The loess record in the area around Prague and Brno (Czechoslovakia) shows that the last 'interglacial' there was separated from two later forest periods by what Kukla

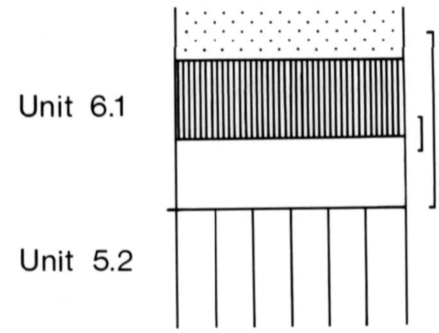


Fig. 112. Schematic profile of Site J in lithostratigraphical Unit VI-A, showing the maximum vertical extension of the artefact distribution in the unit, and how the majority of the artefacts is concentrated vertically.

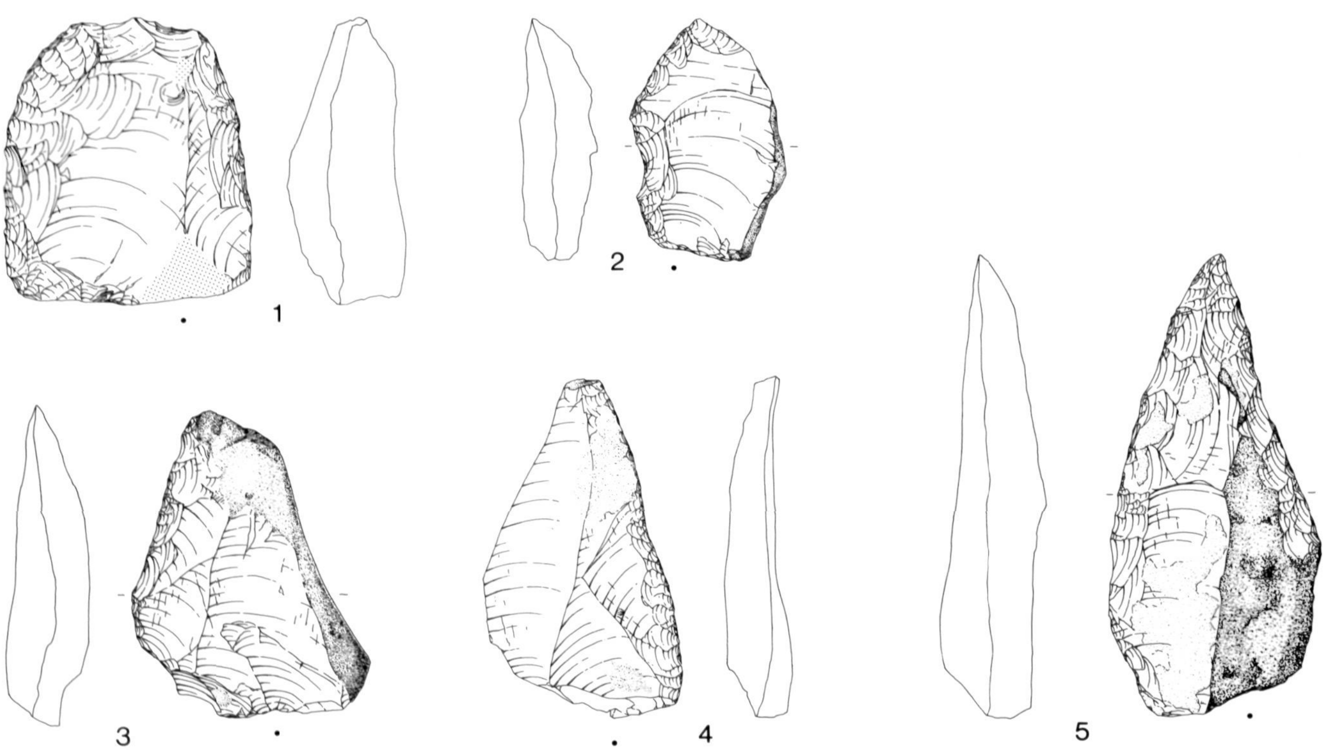


Fig. 113. Site J: 1-4: various scraper forms, 5: Mousterian point. Scale 2:3.

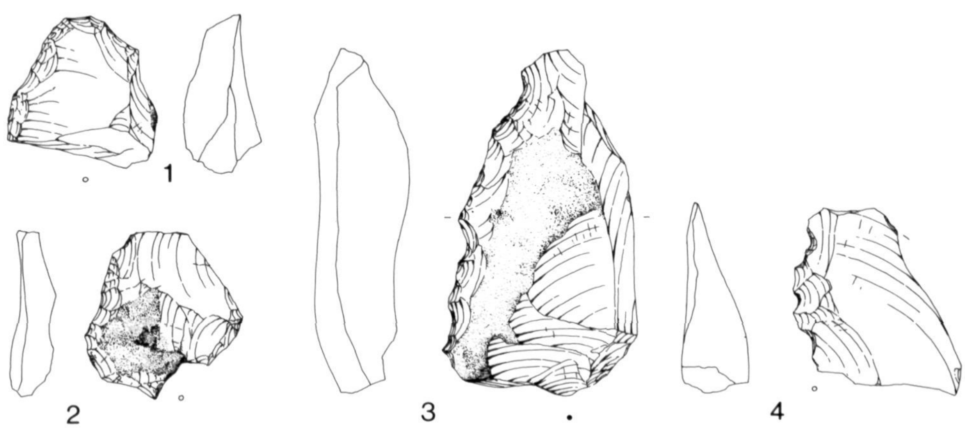

Fig. 114. Site J: 1-2: scrapers, 3-4: denticulates Scale 2:3.

(1977) calls a period with 'normal loess steppe'. Under these conditions loess sediments were formed, which show a reversed magnetic polarity. This period is correlated with the Blake event, about 110 ka (Kukla 1977).

To conclude, these data seem to indicate that the Unit VI-A sediments were deposited in the Early Weichselian. Additional support for this 'Early Weichselian' interpretation is given by the fact that the Unit VI-A and VI-B sediments were affected by a major period of permafrost conditions, which Vandenberghe *et al.* (1985) have dated to the Weichselian Lower Pleniglacial (cf. chapter 2).

### 7.2.4 SITE J FINDS

The finds of Site J consist of flint artefacts, a few fragments of charcoal and some poorly preserved molars. On the basis of their oblong shape and the variation in enamel thickness, the molars were identified as molars of *Mammuthus primigenius* (Van Kolfschoten, pers.comm., 1987).

Approximately 2,800 artefacts were collected, 116 of which came from the southwestern part of the site (see fig. 117) and were rescued from right in front of the quarrying machine. The flint material has not yet been studied systematically. We can therefore only provide some preliminary remarks on the technological and typological characteristics of the assemblage. The quantitative data presented here, however, are somewhat different from those presented in the paper on this site by Roebroeks *et al.* (1987), because in the meantime more work has been done on the Site J assemblage.

The raw material of almost all artefacts is a rather coarse-grained, grey-blue flint with a very rounded, dirty-white cortex. The naturally fractured surfaces exhibit a brown patination and water-rolled edges. Therefore, we assume that the raw material was collected from the riverbed exposed nearby at the time when the site was occupied.

The worked surfaces of the artefacts have no patination and have a fresh appearance.

During the Belvédère Site J excavation two flint scatters were identified, both consisting mainly of the waste from flake- and tool-production. As debris from all flint-working stages (from decortication flakes to small cores) was found, the conclusion seems justified that in this case (at least the greater part of the) tool-manufacturing took place at Site J.

It is remarkable that none of the flakes seem to have been produced with 'the' Levallois technique. Almost all flakes were detached by hard-hammer percussion and it looks as if no systematic core-reduction procedure was followed. The flakes are thick and rather heavy and in many cases some of the outer surface of the flint nodule is still visible on the dorsal side.

Most of the cores (n=22) are small and have irregular shapes (fig. 116). There are almost no blades or tools made from blades.

There is evidence that tools were maintained and resharpened at the site, although probably not on a very large scale. This was done partly by means of the 'long sharpening technique' which involved the production of a longitudinal flake along a scraper- or cutting-edge, and resulted in a sharp tool edge. Evidence of frequent use of this technique has been noted for the later Saalian industries at la Cotte de St.Brelade (Jersey, Great Britain), particularly those found in layer A (Cornford 1986).

The waste products of this technique recovered at Site J include several renewal flakes ('long sharpening flakes' or 'LSF') and two flake tools bearing negatives of such flakes. Evidence of other tool-rejuvenation techniques found in the site assemblage includes the removal of flakes along working-edges by a series of hard percussion blows and probably also the reduction of tools by continuous retouching, especially in the case of some steeply retouched scrapers (cf.

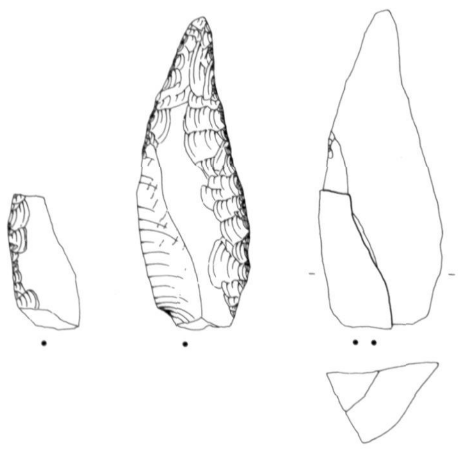

Fig. 115. Site J: 'Quinson' point-like tool with a conjoined ('resharpening') flake. Scale 2:3.

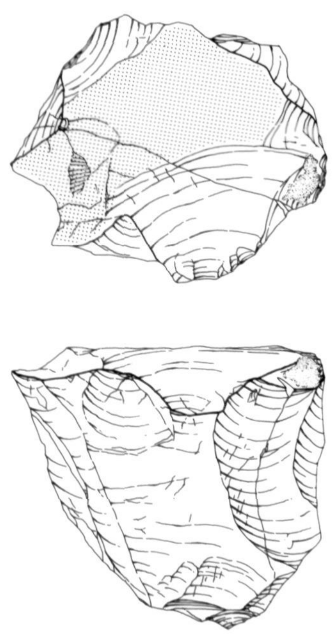

Fig. 116. Site J: core, scale 2:3.

Dibble 1987a, 1987b).

There are three small flakes in the Site J assemblage that differ from the rest of the artefacts in raw material as well as in technical aspects. They are made from light brown-grey flint with inclusions and were produced by soft-hammer percussion. What remains of their striking platforms indicates that these flakes were struck off during the resharpening of a bifacial tool ('handaxe resharpening flakes'). The flakes were found close together in the northwestern part of the excavation. Although these flakes seem to be handaxe resharpening flakes, no waste was found from the initial stages of the production of the biface and no handaxe appears to have been discarded at the site. Therefore, we assume that a bifacial artefact was transported to and from the site. Possibly the handaxe in question is the one found about 150 m away, at Site E (see below, 7.3).

Table 16 gives a survey of the 'tools' found at Site J. The intentionally retouched pieces of the assemblage include 33 complete tools and 46 broken tools and tool-fragments.

Approximately 50% (n=40) of the essential tools consists of various scraper types, including straight, convex and concave side scrapers, two small, scraper-like tools (*raclettes*), one scraper made from a core and several double-sided scrapers (figs. 113 and 114). The tools classified as 'Mousterian point' and 'Quinson point' (figs. 113-5 and 115, respectively) may, alternatively, also be seen as representing double scrapers.

The retouching of the scraper working edges is generally steep and irregular; only very rarely is it flatter and scalariform. Only a few examples, for instance a flake with transverse scraper retouching, bear the characteristics of stepped 'Quina'-like retouching.

Another dominant group (n=32, abt. 40% of the essential tools) consists of denticulates (figs. 114-3 and 114-4).

Handaxes and other bifacially worked tools are entirely absent in the assemblage. That bifacial tools were however, part of the 'toolkit', can be inferred from the presence of the 'handaxe resharpening flakes' discussed above.

The 46 broken tools (in essential count) include both scraper- and denticulate-fragments, as shown in table 16. The rather low ratio of complete and broken tools (abt. 0.7) suggests an intensive use of tools at the site, as does the occurrence of tool-rejuvenation flakes mentioned above. The complete/broken ratio is 0.5 for the denticulates, and 0.7 for the scrapers.

Among the artefacts showing no signs of intentional retouching are 37 complete flakes bearing traces of use retouch. This group also includes some naturally backed knives. The complete/broken ratio, which is about 3.4, is rather high in comparison with that of the 'essential' tools.

### 7.2.5 PROVISIONAL INTERPRETATION OF THE LITHIC ASSEMBLAGE

Perhaps the most striking feature of the Site J assemblage is the total absence of evidence of the Levallois core-preparation technique. In Roebroeks *et al.* 1988 we gave an explanation for the presence/absence of evidence of the 'Levallois' core-preparation method and for the technological differences between sites in terms of Middle Palaeolithic hunter-gatherer mobility.

We assume that prepared cores and/or their flake products were regularly transported in the Middle Palaeolithic,

Table 16: Survey of the Site J tool assemblage.

| type | complete | | incomplete | | total | |
|---|---|---|---|---|---|---|
| | n | % | n | % | n | % |
| denticulates | 11 | 15.7 | 21 | 36.8 | 32 | 25.2 |
| scrapers – simple | 8 | 11.5 | 14 | 24.5 | 22 | 17.4 |
| – double | 3 | 4.2 | - | - | 3 | 2.4 |
| – other | 6 | 8.6 | 9 | 15.9 | 15 | 11.8 |
| Mousterian 'point' | 1 | 1.4 | 2 | 3.5 | 3 | 2.4 |
| 'Quinson' point | 1 | 1.4 | – | – | 1 | 0.8 |
| burins | 3 | 4.2 | – | – | 3 | 2.4 |
| subtotal 'essential tools' | 33 | 47.0 | 46 | 80.7 | 79 | 62.4 |
| flakes with signs of use | 37 | 52.9 | 11 | 19.4 | 48 | 37.7 |
| total | 70 | 99.9 | 57 | 100.1 | 127 | 100.1 |

and that this was done to ensure the availability of cutting edges for future needs. In this respect we assume that the use of core-preparation techniques reflects 'economizing behaviour', except at lithic raw material procurement sites, such as Baker's Hole (Great Brittain, Roe 1981; Robinson 1986) where the Levallois technique *sensu stricto* was used for the production of only one or a few flakes per core.

This interpretation of prepared cores and their end products as transported items is based on evidence from several Middle Palaeolithic sites. Transport of lithics in the form of Levallois cores, for instance, has been demonstrated for the Maastricht-Belvédère sites C and G (see this volume, chapter 4) and can also be inferred from the compositions of the assemblages of Lehringen (Thieme/Veil 1985) and the Rheindahlen 'Westwand-Fundschicht' (Bosinki 1966; Thieme 1983a). Another example is the Schweinskopf volcano site in the Neuwied Basin, where transported flint flakes were found in association with debris of local quartz material (Bosinski, pers.comm., 1986). Further examples are Sclayn (Otte *et al.* 1983) and Vollezele-Congoberg (Vynckier *et al.* 1986) in Belgium (see chapter 9.3). In a technological study of the Mousterian in the French Perigord region, Geneste (1985) noticed a dichotomous relationship between a Levallois assemblage type manufactured

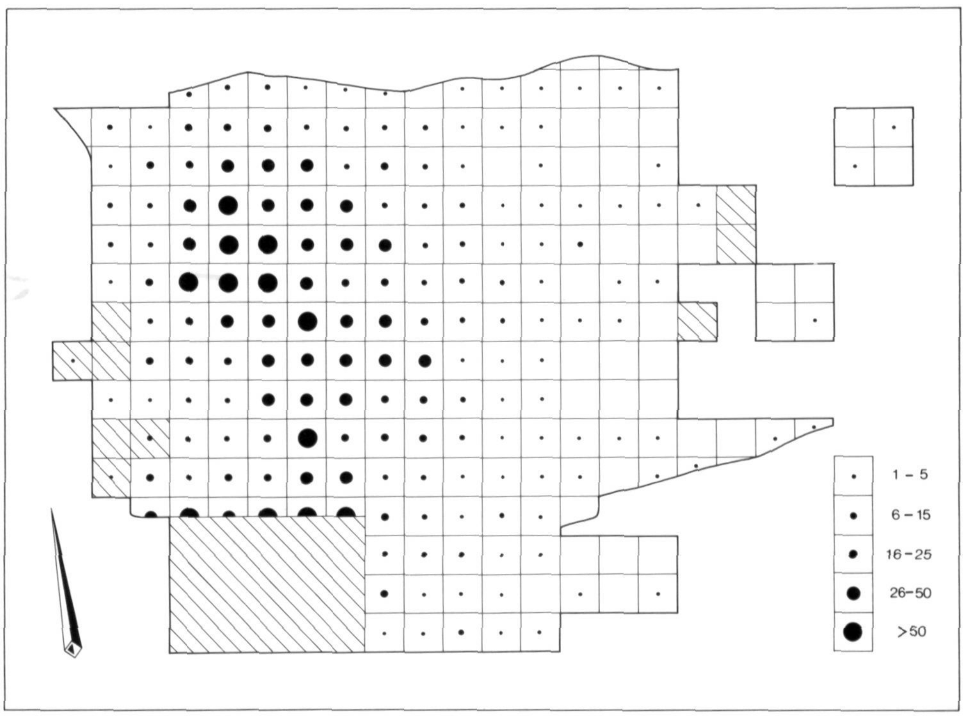


Fig. 117. Map of the Site J excavation area, showing the number of artefacts per square meter. The shaded areas were not systematically excavated.

Fig. 118. Site E: the rescue dig in front of the quarrying machines. Photograph taken from the west side of the site.

from transported raw material and a non-Levallois type, made out of locally available flint. This and other observed dichotomous patterns have led Binford (1986) to conclude that, in general, Middle Palaeolithic technologies were characterized by the production of *transported toolkits* for 'planned' uses and *expedient toolkits* intended for use 'on the spot'. We will return to this topic in more detail in chapter 9.

In the context of this discussion, the Site J assemblage could be interpreted as having been intended for occasional or 'situational' use. A plausible explanation could be that the tasks to be performed at Site J were largely unforeseen or 'unexpected' (cf. Binford 1986); another explanation could be that it was simply not necessary to use the transported cores and/or tools and that cost-benefit considerations resulted in the manufacture of tools from the locally available stone rather than use of the transported toolkit.

### 7.2.6 FUTURE RESEARCH

Future research will concentrate mainly on reaching the following goals:

1. While processing finds, we found that it was possible to fit a number of flakes together. After the microwear analysis has been completed, P. Hennekens will make a systematic attempt to refit the artefacts collected during the excavation. The results of this investigation will not only be used for spatial analysis of the site and technological analysis of the artefacts. They will also be used to measure the amount of horizontal displacement of the materials in order to make inferences about post-depositional processes. An interpretation of the spatial distribution of the finds has not yet been attempted. The horizontal distribution of the flint artefacts recorded in the excavation is shown in figure 117.
2. The study of post-depositional processes must be considered a necessary prelude to the testing of hypotheses on site functions. Of course the results of microwear analysis play an important role in the formulation and testing of such hypotheses. Currently, A. van Gijn is examining a sample of the artefacts to determine if, and to what extent, microwear analysis can contribute towards a functional interpretation of the materials. Our first theory on the function of the site, based on the preliminary results of our research, is that Site J was an area where specialized activities were performed.
3. A third important goal for future research will be a comparison of Site J with other sites in northwestern Europe that are more or less of the same age, such as Rheindahlen-Westwand/B1 (Bosinski 1966; Thieme 1983a; This-

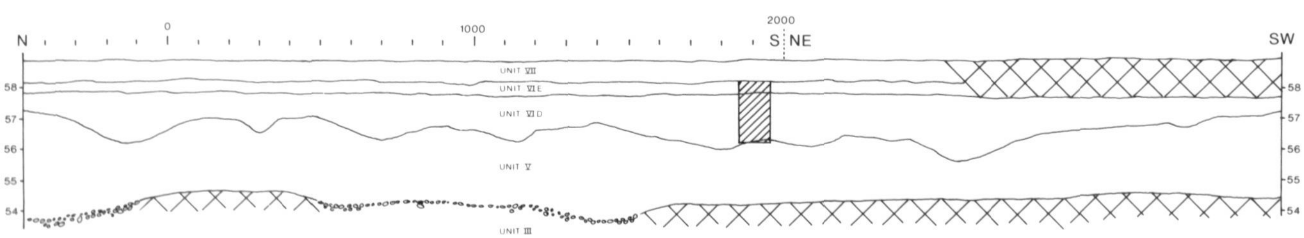


Fig. 119. Site E: schematic section of the western boundary of the excavated area and the adjacent sampled profiles; indicated are the main lithostratigraphical units. The rectangle in the centre of the figure shows the section illustrated in greater detail in figure 120.

sen 1986), Rocourt (Cahen/Haesaerts 1984) and Seclin (Tuffreau *et al.* 1985). This comparison will concentrate on the explanation of the technological differences between the flint assemblage of Site J and those of other sites.

## 7.3 Site E

### 7.3.1 INTRODUCTION

In order to obtain data on the development of *Arvicola* in the Belvédère sequence, K. Groenendijk sieved large amounts of sediments collected at the base of the Weichselian loess deposits. On November 13th, 1982, during the fieldwork, he and J.P. de Warrimont discovered several larger bone fragments and flint artefacts lying together in the eastern part of the pit. This discovery was followed by a relatively small-scale rescue excavation which took place in the second half of November and the first days of December 1982, under bad weather conditions and with a small crew (fig. 118).

From the beginning it was evident that the artefacts and bone fragments were not situated in a primary archaeological context, but had been displaced, probably over a short distance. For this reason, and because of the lack of time, we decided to collect as many samples as possible and to study the stratigraphical context of the finds. First, the finds were collected from a north-south section. Later, the deposits overlying the find layer were removed mechanically, down to a few dm above the find layer.

In total, an area of about 60 $m^2$ was excavated. Most flints were recorded three-dimensionally, whereas only the positions of the larger bone fragments were recorded. However, the distribution map of the finds recovered in this way is of limited value because of the varying attention given to the individual squares in the area sampled.

### 7.3.2 STRATIGRAPHY

The top part of the Unit V Saalian sediments at Site E had subsided as a result of karst processes, and formed a local depression in which Unit VI was more than 2 m thick. In the southern part of the sampled area small gullies, which had cut into the Unit V Saalian sediments, formed sediment traps for Unit VI. On top of these 'sediment traps' lay a practically levelled Horizon of Nagelbeek (Haesaerts *et al.* 1981). As can be seen in figure 120, the sediments between the top part of Unit V and the Nagelbeek Horizon are extremely laminated, especially at their bases. We are dealing mainly with a calcareous yellowish-brown silt loam with brown loamy and sandy lenses (*Schwemmlöss*). At the base of the laminated sequence was a calcareous brownish sandy loam containing gravel, (partly reworked tertiary) molluscs, mammal fossils and artefacts (see fig. 120). This loam had an average thickness of 10 cm, its maximum thickness being 25 cm. This subunit, which varied considerably in thickness and composition laterally, formed the

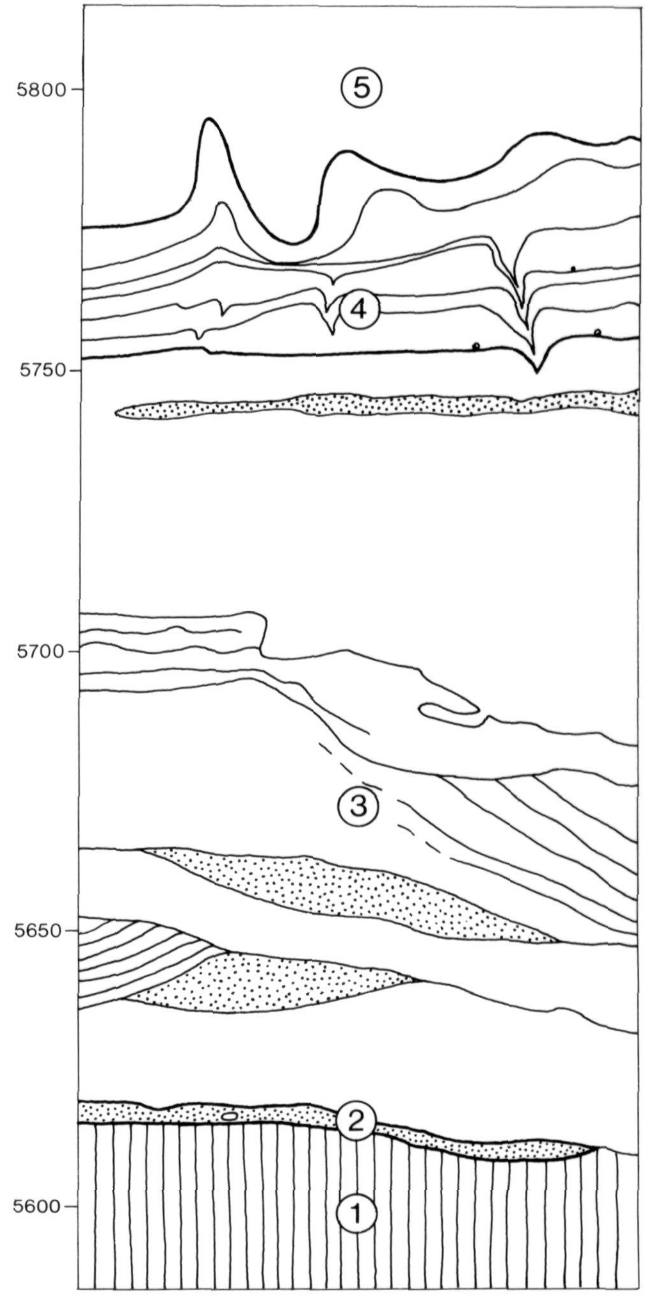


Fig. 120. Site E: detail of the section shown in figure 119.
1 homogeneous silt loam (7.5 YR 5/6) with a massive structure (Unit 5.2/V-B)
2 sandy silt loam, calcareous, reddish-brown, containing gravel, faunal remains and artefacts (the base of Unit 6.5/VI-D)
3 a sequence of laminated calcareous silt loam (10 YR 6/3), alternated with more coarsely grained lenses of reddish-brown sandy loam (stippled in the figure).
4 pale brown (10 YR 6/3) laminated silt loam with thin reddish brown loamy lenses with frost cracks (Unit 6.5/VI-D)
5 silt loam (2.5 Y 6.5/3) containing rust mottles (unit 6.4/VI-E, Nagelbeek Horizon).

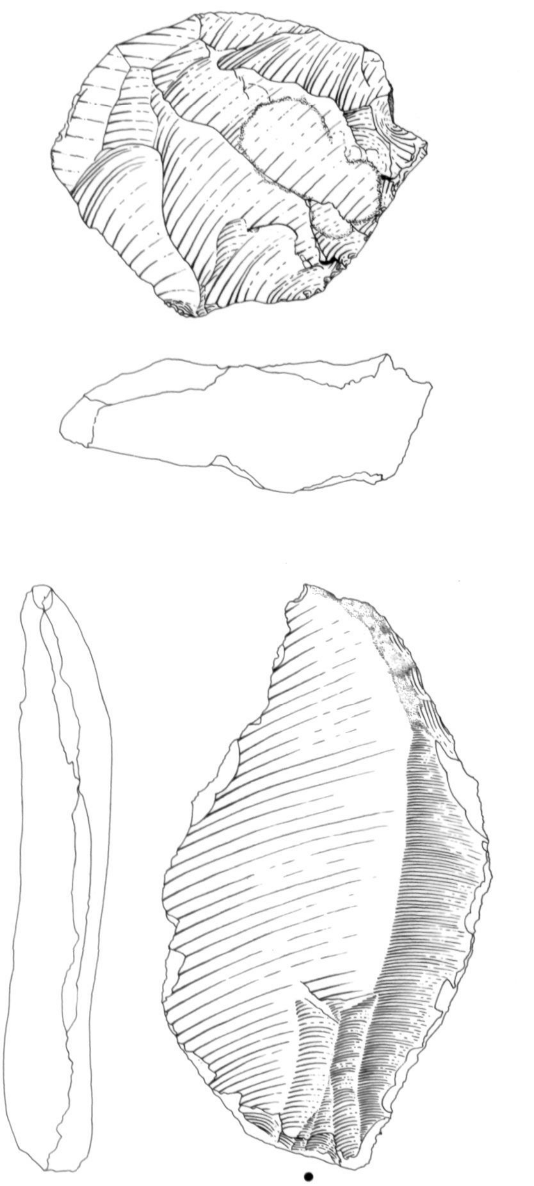

Fig. 121. Flint artefacts from above the main level at Site E (see the text).

matrix of the archaeological assemblage. The find-bearing unit was identified as subunit 6.5, i.e. lithostratigraphical Unit VI-D.

Four severely weathered flints (very glossy and with rounded ridges and edges) were collected from an erosional level immediately beneath the Horizon of Nagelbeek, at a higher position in the Unit 6.5 sequence (fig. 121).

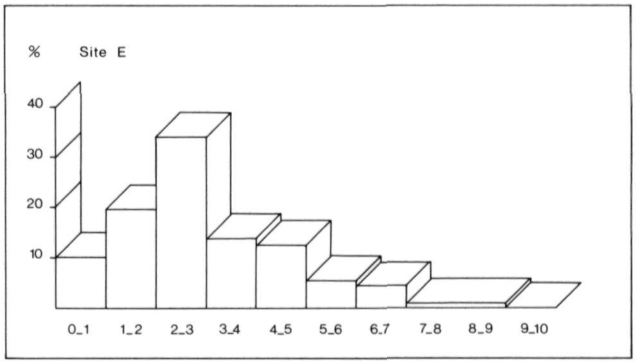


Fig. 122. Site E: size distribution of the assemblage, based on maximum dimensions, in cm.

### 7.3.3 THE FINDS

#### 7.3.3.1 The flint assemblage

A total of 95 flint artefacts was recovered at Site E, the overall majority consisting of non-retouched flakes. Most of these flints have a 'fresh' appearance, the odd one having a blue-white patina. Some pieces display a light gloss. None of the flints showed evidence of frost action, while only one (non-artificial) piece was burnt (WG 53).

The majority of the flints may be attributed to at least five different flint nodules, including 'Rullen' and 'Rijckholt' flint, and were probably collected from Maas sediments.

Figure 122 gives the size distribution of the flint artefacts from Site E. In comparison with the flint assemblages from Site C and F the small number of flakes smaller than 2 cm is striking. This is certainly a result of the rather rough way in which the site had to be excavated, while the geological processes responsible for the deposition of the matrix of the finds may have removed the finer debris also.

The flint assemblage, which consisted mainly of waste material, included only a few regular flakes, among others the retouched Levallois flake WG 30 (see fig. 123-1). The only other retouched pieces are a fragment of a steep scraper (WG 3) (fig. 123-2) and the top part of a handaxe (WG 42) (fig. 123-3). The assemblage also included a flint hammerstone (WG 21).

A. van Gijn (Institute of Prehistory, Leiden University) studied several artefacts from Site E for microwear traces. Despite the fresh appearance of the pieces, no clear traces of use were found. According to Van Gijn (pers.comm., 1983), the tip of the handaxe showed no visible traces of use. Although this does not mean that the tool had not been used (see: Unrath *et al.* 1986) it is possible that the artefact was broken by shock during manufacturing or resharpening.

Six flakes were refitted to two groups of three flakes (WG 32-59-101 and WG 55-56-57) (fig. 124). Their horizontal distribution is indicated in figure 125.

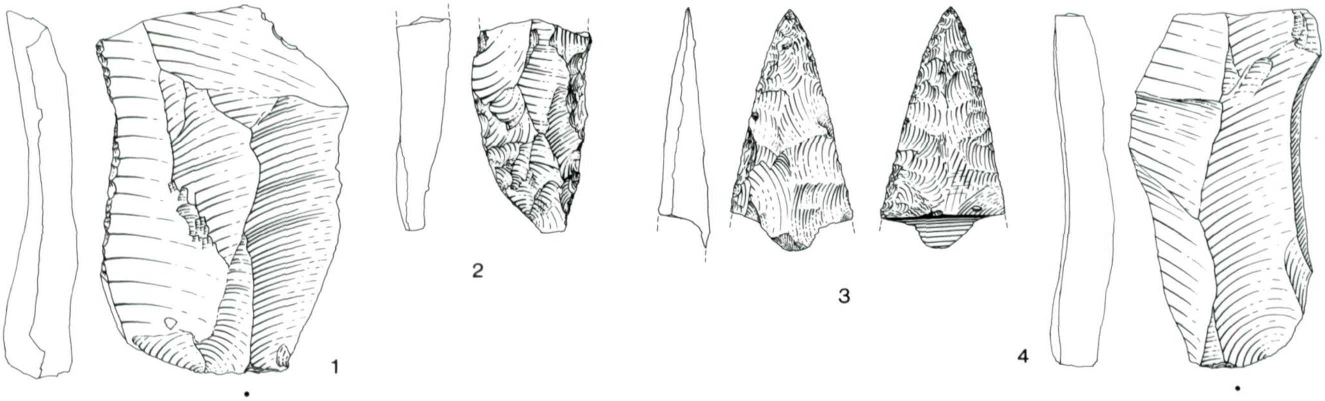


Fig. 123. Site E: artefacts 1,4 flakes, 2 basal fragment of a double scraper (WG 3), 3 tip of a handaxe (WG 42). Scale 2:3.

As yet, the handaxe tip from Site E is the only handaxe (fragment) found in a geological context in the seven years of fieldwork in the pit, leaving out of consideration the handaxe resharpening flakes from Site J. A stray find of a handaxe is described in paragraph 7.4 of this chapter.

#### *7.3.3.2 Mammal fossils*

The remains of small mammals collected in the excavation and by sieving about 0.5 $m^3$ of sediment will be discussed in paragraph 7.3.6. The remains of larger mammals found at Site E have been described *in extenso* by Van Kolfschoten (1985), on whose publication this paragraph is based. On the whole, the mammal remains do not show any signs of transport. Judging by their physical appearance, lateral displacement must have been limited. Van Kolfschoten identified the remains of mammoth, horse, woolly rhinoceros, red deer, reindeer, a large deer of the size of a giant deer and aurochs/bison. Table 17 shows the identified faunal remains found at Site E per species.

A molar fragment of a young mammoth was identified, while at least two horses were represented by several large bone fragments and two milk molars. According to Van Kolfschoten, the remains had belonged to a heavily built horse. The woolly rhinoceros remains consist of skull fragments (some of which could be joined together) and some teeth. The skull fragments and the unworn molars were found close to each other and had probably belonged to the same young individual. The presence of red deer is attested by an antler fragment and a radius, while reindeer was represented by several bones, an antler fragment of a young individual and a slightly worn milk molar. The molar of a large bovid had also belonged to a young individual.

#### *7.3.3.3 Molluscs*

The molluscs collected during the research at Site E have been published by Kuijper (1985), and will be reviewed in paragraph 7.3.6.

### 7.3.4 HORIZONTAL AND VERTICAL DISTRIBUTION OF THE FINDS

The area sampled is without any doubt only a part of a larger find scatter which extended probably to the south and the west of the excavated area. What were in all probability the richest parts of the distribution -west of Site E- had already been destroyed before the discovery of the site.

As for the horizontal distribution of the flint artefacts and the remains of larger mammals (fig. 125), it can be said that most finds were recovered from the area where Unit 6.5 was thickest, i.e. in the centre of the 'sediment-trap' depression in the western part of the sampled area. On the whole, the areas with many bone fragments also provided many flint artefacts and vice versa, because the majority of the finds were recovered from natural depressions in the Unit 5.2 sediments.

As for the vertical distribution of the finds, flint artefacts were found all through the matrix but mainly at its base, while larger bone fragments were frequently found in the upper part of the matrix described above, beneath the yellowish-brown laminated loess. Several pieces of bone and flint artefacts were found 'cemented' to each other, for instance a rhinoceros molar and artefact WG 76. One of two refitted flakes was found at the base of the find unit, while the other was recovered from the top part of the layer, just beneath the loess.

### 7.3.5 THE RELATION BETWEEN THE FLINT ARTEFACTS AND THE FAUNAL MATERIAL

The spatial association of flint artefacts with the remains of larger mammals as recorded during the Site E rescue operations was clearly caused by geological processes that had

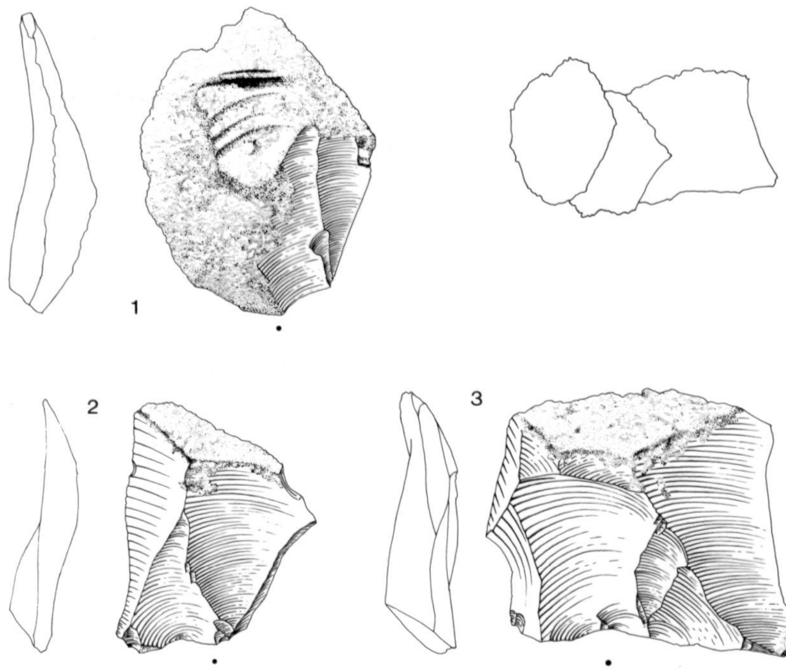


Fig. 124. Site E: conjoined flakes.
Scale 2:3.

shifted material over a very limited distance. The sections studied and the structure and composition of the matrix embedding the Site E finds indicate that the enclosed material must have been affected by some reworking due to fluvial activity, probably in a low-energy environment, as is suggested by the micromorphology of the deposits (Mücher, pers.comm., 1983).

The tertiairy shells found in the Site E matrix point to the presence of small streamlets, which transported these fossils from Oligocene deposits a short distance west of Belvédère (Kuijper 1985).

Unlike the tertiairy shell material, the Pleistocene molluscs recovered from the Site E matrix are in an excellent state of preservation, which indicates that these shells can only have been transported over short distances, that is, if they were transported at all (Kuijper 1985). The same goes for the vertebrate faunal remains (Van Kolfschoten 1985), while the flint material shows no signs of transport whatsoever. Investigation of the flakes for surface modifications showed that the material was in mint condition, while several flakes could be fitted together providing further -and independent- evidence of only limited reworking of the flint assemblage.

So here we have a situation in which the archaeological association of two find categories is the result of geological processes, while on the other hand the evidence also indicates that the processes that resulted in this find complex may have disturbed an original primary association, because

Table 17: Site E: identified faunal remains of larger mammal species (based on: Van Kolfschoten 1985).

*Mammuthus primigenius* (mammoth)
- fragment of a lower molar
*Equus* sp. (horse)
- DP2 sin.
- fragment of an upper (pre)molar
- fragment of a lower (pre)molar
- humerus in. (distal part)
- unciform dext.
- metacarpus III dext.
- metacarpus III sin.
- metacarpus IV sin.
- anterior third phalange
*Coelodonta antiquitatis* (woolly rhinoceros)
- skull fragments
- M3 sin.
- ectoloph of an upper (pre)molar
*Cervus elaphus* (red deer)
- antler fragment
- radius dext. (prox.part)
*Cervidae* indet. (large deer)
- part of an upper molar

*Rangifer tarandus* (reindeer)
- dext.lingual part of an upper molar
- antler fragment
- metacarpus fragment
- metatarsus fragment

*Bos primigenius/Bison priscus* (aurochs/bison)
- M 1/2 dext.

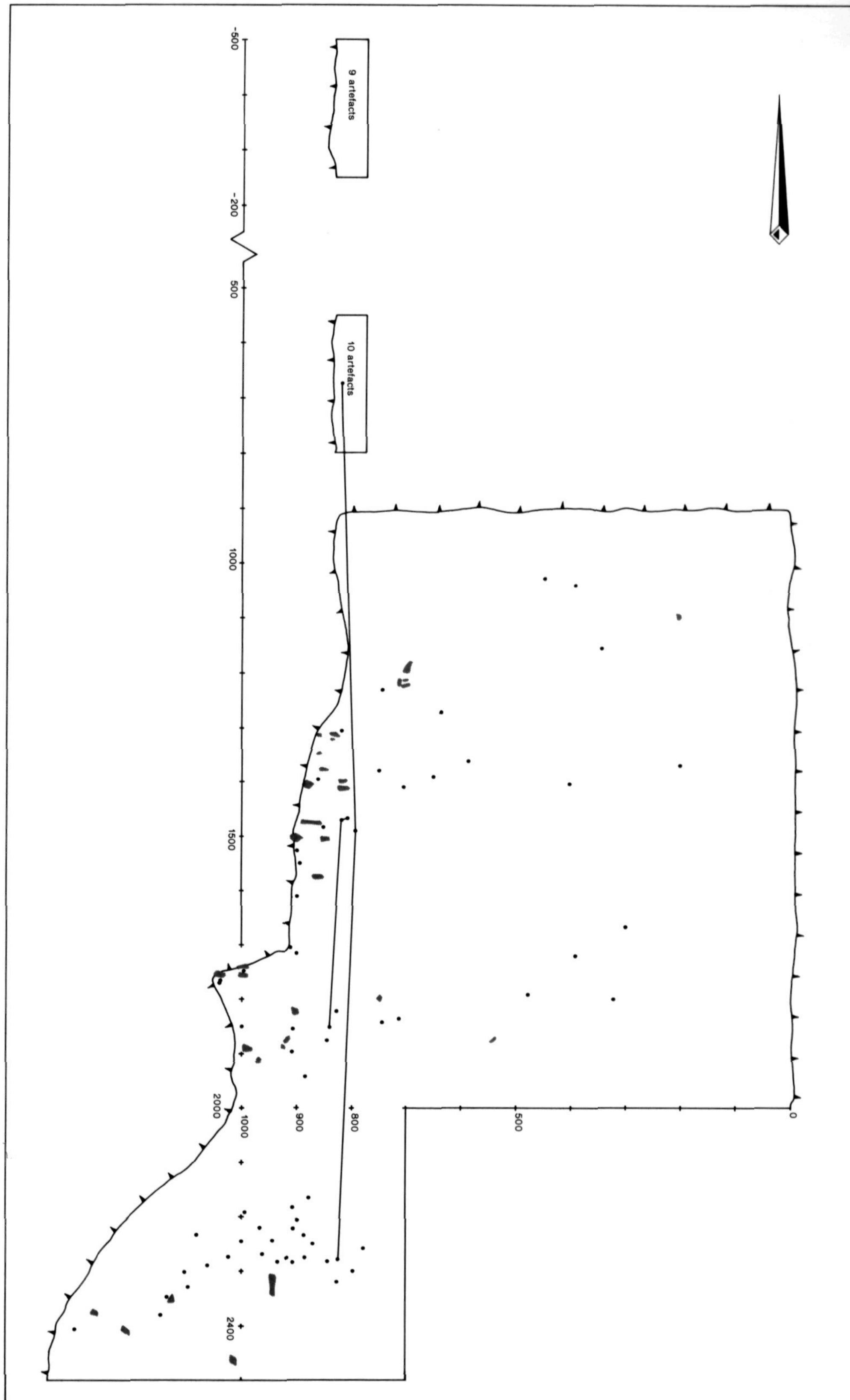


Fig. 125. Site E: horizontal distribution of recorded flint artefacts and (in grey) bone fragments. The lines connect the contact surfaces of refitted artefacts. Reference grid in metres.

both find categories seem to have been reworked over very short distances only. Four points seem to be important in the evaluation of this hypothesis of an 'earlier association', which boils down to the problem whether we can attribute the concentration of the Site E mammal fossils described here to natural processes.

1. In a first approach to the problem it is worth mentioning that -in contrast to the 'lower' Unit IV sites- the excavated area was *not* a waterside site at the time of the formation of the Site E assemblage, i.e. roughly in the 'Early Weichselian' (see 7.3.7). Whereas the Unit IV sites were all situated in the alluvial plain of the late Middle Pleistocene Maas, Site E was situated at the border of the Middle Terrace plateau, overlooking the valley of the Maas, which at that time flowed at least 5-10 m below Site E. Therefore it is highly unlikely that a considerable background fauna accumulated at this site, as must be assumed to explain a natural presence of the bone material at the site.
2. The total absence of gnawing marks on the Site E material indicates that non-hominid predators did not play an important role in the formation of the assemblage.
3. The small assemblage is dominated by remains of skulls and lower limbs. Cutmarks are absent, and so is evidence of breakage of the bones for marrow.
4. Two horses and a reindeer were represented by several identified skeletal remains (see table 17). As is the case with all macromammal remains found at Site E, we are dealing with young individuals (Van Kolfschoten 1985). The large number of young individuals over the limited area sampled was seen by Van Kolfschoten (1985) as a clear indication of hominid involvement in the formation of the faunal assemblage.

Points two and three would usually be interpreted as being the result of transport of meat-yielding bones away from the site of the initial butchering of the animals concerned (cf. Binford 1985). The absence of gnawing marks seems to exclude the possibility that carnivores were the collecting agents of the meat-yielding bones. This leaves us with two possibilities: the hunting of unexperienced individuals or the scavenging of young animals dying of attritional causes (see chapter 9). If the assumption made in point 1 above is correct -but how can it be evaluated?- and the situation of the site at the edge of the Middle Terrace 'plateau' indeed makes it difficult to explain the presence of carcasses, part of the Site E fauna can be interpreted as the remains of initial butchering by hominids of animals hunted for their meat.

### 7.3.6 ENVIRONMENT AND CLIMATE DURING THE FORMATION OF THE SITE E ASSEMBLAGE

Above the data have been presented for the inference that the flint artefacts and at least some of the larger mammal remains found at Site E are to be regarded as constituting

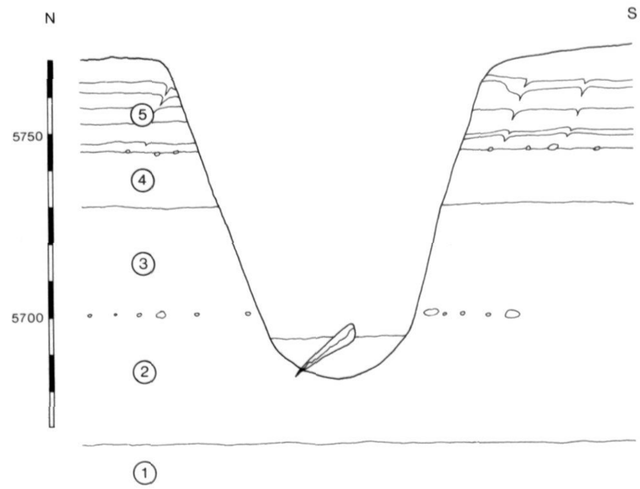


Fig. 126. Maastricht-Belvédère: section through the 'handaxe channel' (coordinates 175326/319964).
1 fine sands (10 YR 6/2) with intercalated gravel layers
2 silt loam, fine sandy (10 YR 5/6)
3 silt loam (10 YR 5/6) with common very pale brown (10 YR 7/4) mottles and very little gravel. At its base is a thin gravel layer, containing stones of up to 5 cm
4 silt loam (10 YR 5/6) with a few Fe and Mn concretions
5 pale brown (10YR 6/3) laminated silt loam, with small frost cracks, calcareous

an archaeological assemblage. According to Van Kolfschoten (1985), the fossils of the large and small mammals of Site E have to be regarded and treated as representing one single fauna. The molluscs found at Site E (Kuijper 1985) are also part of the same faunal association.

#### *7.3.6.1 The molluscan evidence*

Kuijper's (1985) analysis of the well-preserved Pleistocene shells from Site E indicates the combined presence of seven terrestrial and eight aquatic species in the matrix of the archaeological assemblage. The land snail *Pupilla muscorum* is the most dominant species. Together with *Limacidae* and *Trichia hispida* it forms the major part of the faunal remains. The rather large number of freshwater species led Kuijper to conclude that the faunal association was formed in an open area with a low vegetation. Shallow pools and marshes, which periodically dried out, were abundant. The fauna indicates periglacial conditions, comparable to those of the present-day tundras in northern Europe.

#### *7.3.6.2 The vertebrate evidence*

Table 18 lists the vertebrate faunal remains found at Site E. The most striking feature in the fauna is the abundant presence of the arctic lemming *Dicrostonyx torquatus*, which is predated by tundra birds of prey like the snowy owl *Nyctea scandiaca*, also represented in the remains. This owl might be reponsible for the abundant remains of small mammals at Site E (Van Kolfschoten 1985). The mammal assemblage also included the remains of watervole *Arvicola terrestris*. Of the larger mammals mammoth, woolly rhinoceros and reindeer preferred a cold climate and open areas. The red deer *Cervus elaphus*, which nowadays prefers woodland, seems to have been a very adaptive species, as discussed by Van Kolfschoten (1985). According to Van Kolfschoten, the habitats of the extant species and the composition of the fauna indicate a tundra/steppe environment with a cold and rather dry climate. According to Stuart (1982), the presence of *Cervus elaphus* may point to the absence of heavy snowfalls.

### 7.3.7 THE AGE OF THE SITE E ASSEMBLAGE

The combination of the stratigraphical data and the palaeoenvironmental and taphonomical data presented above (clearly) shows that the finds have to be dated to a cold phase post-dating the foundation of the interglacial palaeosol correlated with the Eemian 'Sol de Rocourt' (see also 7.5).

Heavy-mineral-analysis of the find-bearing layer led Meijs (1985) to the conclusion that the sedimentation of the find matrix took place in the Middle Weichselian.

According to Van Kolfschoten's (1985) palaeontological assessment of the faunal assemblage of Site E, however, the fauna is of an Early Weichselian date.

To reconcile these two differing views, it could be assumed that the faunal assemblage formed in the Early Weichselian was reworked and finally deposited in the Middle Weichselian.

A provisional ESR age determination of a woolly rhinoceros tooth fragment yielded a very rough estimate of its age; ages of 135-165 ka and 105-120 ka were obtained for two pieces of the same tooth fragment, which result in an average age of 110-140 ka (Grün/Katzenberg, pers.comm., 1985). The environmental dose of the dated samples had not been measured but inferred from the stratigraphical position of the assemblage. TL capsule measurements in a comparable section near Site E, however, confirmed the soil estimate that had been used before.

The burnt flint WG 53, which is not an artefact, was submitted to the Oxford Research Laboratory for Archaeology and the History of Art for a TL age determination. The environmental dose was the same as for the ESR age determination: according to J. Huxtable (pers.comm., 1986), the burning took place some 145 ± 15 ka ago. The 'absolute' ages obtained in the ESR and TL determination were higher than we had expected on the basis of the stratigraphical position of the assemblage.

The small number of dated elements, however, means that these dates have to be used carefully. The composition of the fauna and its taphonomy already exclude a pre-Weichselian age, because late Saalian faunal remains in Unit V-B would very probably have decomposed during the Eemian soil-formation processes.

Furthermore, a problem with the dated material may be the disturbance of the finds when they were redeposited: the Unit 6.5 matrix, which contained the assemblage, included many stones, which may have enlarged the environmental dose received by the dated samples.

Table 18: Composition of the Unit VI-D Site E fauna (Fauna 5 in: Van Kolfschoten 1985).

| Fauna of Site E: | | minimum number of individuals |
|---|---|---|
| birds: | | |
| *Nyctea scandiaca* | snowy owl | 1 |
| Mammals: | | |
| *Talpa europea* | mole | 1 |
| *Spermophilus (Urocitellus) cf.undulatus* | ground squirrel | 1 |
| *Cricetus migratorius* | grey hamster | 1 |
| *Dicrostonyx torquatus* | arctic lemming | 39 |
| *Arvicola terrestris* | watervole | 2 |
| *Microtus gregalis* | narrow-skulled vole | 1 |
| *Microtus oeconomus* | | 12 |
| *Mammuthus primigenius* | mammoth | 1 |
| *Equus* sp. | horse | 2 |
| *Coelodonta antiquitatis* | woolly rhinoceros | 1 |
| *Cervus elaphus* | red deer | 1 |
| *Rangifer tarandus* | reindeer | 1 |
| Cervidae indet. | (large deer) | 1 |
| *Bos primigenius/ Bison priscus* | aurochs/bison | 1 |

## 7.4 A 'Micoquian' handaxe from the Belvédère pit

On February 20th, 1981 the author found a large Micoquian-type handaxe in the pit, at the bottom of a recent erosional gulley that had been cut by rain- and meltwaters flowing off a larger artificial plateau, consisting of a complete Unit III-V sequence, covered by a few decimetres of a remnant of Unit VI-D. Figures 127 and 128 illustrate the artefact, while figure 126 gives a schematic survey of the stratigraphy in the erosional gulley, which was situated about 70 m southeast of Site A. The handaxe was found at the bottom of the small channel, 5 cm below a thin gravel layer that formed the base of a silt loam (10 YR 5/6) with greyish (10 YR 7/4) specks, i.e. what we would now call either Unit IV-C-III or Unit V-A. Theoretically, therefore, the handaxe may have come from any of the find levels from Unit IV-C-III upward. It was not possible to determine its position with greater accuracy because the base of

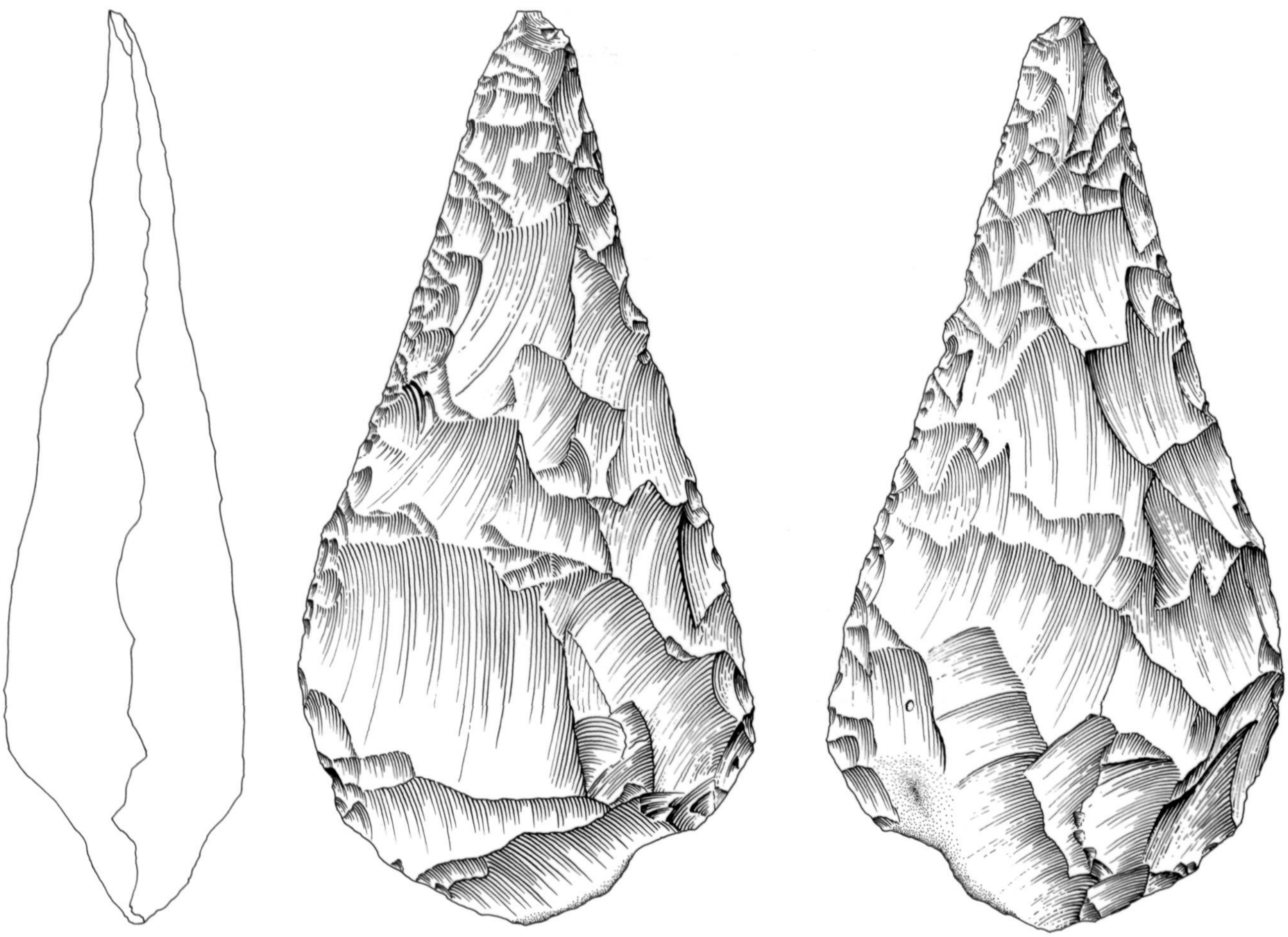

Fig. 127. The Micoquian handaxe, scale 2:3 (drawing by L.B.M. Verhart).

the channel contained clearly reworked material, like brick fragments and pieces of plastic collected by the water that had run off the surface of the plateau.

In order to try to establish its original position in the channel section, an area of abt. 5 m² was excavated from the top of the Weichselian loess remnants to the level where the handaxe was found in the days following the discovery. No artefacts were encountered in this excavation. During the fieldwork at Site A, in March 1981, a flake was found in the 'mottled zone' 5 m to the southwest of the handaxe. This flake, however, displayed surface modifications different from those observed on the handaxe. We therefore simply have no sound evidence of the original geological matrix of the handaxe: sediment scraped off the surface of the handaxe proved to be calcareous, but the bottom of the erosional gulley of course also contained reworked calcareous Weichselian loess. Sediment present in small quantities in the negative scars of the handaxe did not react at all to HCl, which may indicate that its original matrix was pre-Weichselian sediment. Another indication of its original geological matrix may be the surface modifications visible on the handaxe. One side of the artefact displays wind-gloss, which, as yet, is known only from artefacts collected from an erosional level in the upper part of Unit 6.5 (VI-D), below the Nagelbeek Horizon mentioned above in 7.3.2 (see fig. 121). Pieces collected from this level, however, show signs of severe abrasion and weathering, while the handaxe is in mint condition, apart from the wind-gloss observed on one side.

The handaxe in question is a typical example of Bosinski's (1967) *wechselseitig gleichgerichtete Kantenbearbeitung*. Its thick base consists partially of a rounded cortex. The Belvédère handaxe shows a striking resemblance to the *Micoque-Keil* from find level B2 at Rheindahlen (Thieme *et*

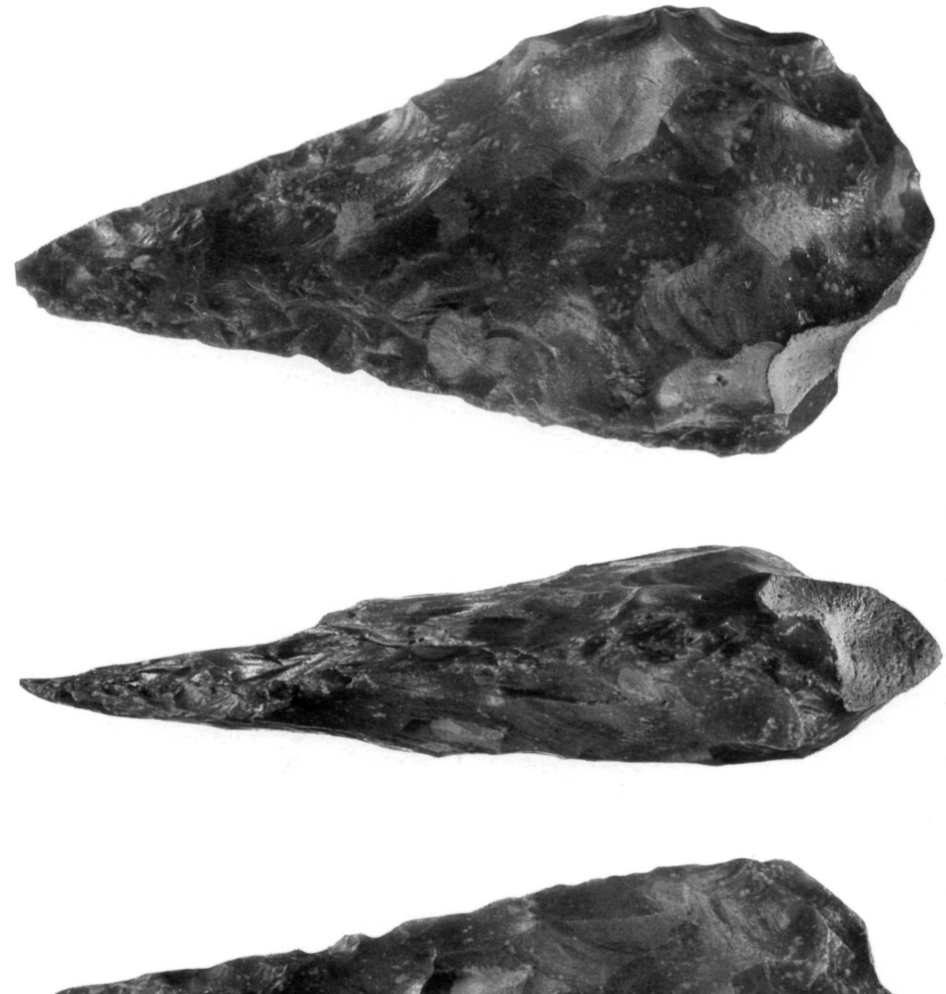

Fig. 128. The Micoquian handaxe, scale 2:3.

*al.* 1981; Thieme 1983a), which is said to have been found in the 'Eemian' parabrownearth, i.e. in the upper part of the Saalian loess. But it is very difficult to date artefacts by means of archaeological comparisons. All we can say about the Belvédère Micoquian handaxe is that its stratigraphical position is unclear and that therefore it cannot provide any evidence for the discussion on the chronostratigraphy of the 'Micoquian' in northwestern Europe (see: Bosinski/Brunnacker 1969; Löhr 1972; Thieme 1983a: 125-126). Once again we seem to be facing an isolated find of a handaxe, which is often the case with this kind of find category (see: Stapert 1979b; Keeley 1980). We will return to this topic in more detail in chapter 9 (see also: Roebroeks *et al.* 1988).

### 7.5 Interpretation of the Unit VI finds

Isolated artefacts have occasionally been found all over the Belvédère pit at the base of Unit VI. In 1983, K. Groenendijk and J.P. de Warrimont found seven flint artefacts concentrated at the base of Unit 6.5, in a Site C section through the centre of a karst depression.

As stated above, the Site E find scatter must have been part of a larger distribution, representing the material remains of early Weichselian human activities, preserved only locally by the presence of sediment and artefact 'traps'.

A site comparable to Site E was discovered in 1983 by K. Groenendijk and E. Meijs of the Belvédère working group at Kesselt (Belgium), 4 km west of Belvédère. The site was discovered in a systematical inspection of the loess exposure created during the reconstruction of the Albert Canal. The site, situated in a loess plateau on top of (Caberg) Middle Terrace gravels, was subsequentely excavated by the Laboratory of Prehistory of the Catholic University of Leuven. At Kesselt the find distribution was also limited to a depression, namely a gulley that had cut into the Saalian loess sediments. The Middle Palaeolithic assemblage found at this site, consisting of abt. 700 artefacts including 44 'tools', was stratigraphically associated with a faunal assemblage comparable to that of Site E. According to a preliminary report (Lauwers/Meijs 1985), this faunal assemblage included remains of *Coelodonta antiquitatis*, *Mammuthus* cf. *primigenius*, *Equus* sp., *Rangifer tarandus*, and probably also *Bison priscus*. Both the flint and the faunal assemblage of Kesselt show more signs of alteration than the Belvédère Site E assemblage. At Kesselt, for instance, many artefacts had been damaged by frost.

As far as its stratigraphical position and the contents of the (macro)faunal assemblage are concerned, the Kesselt site shows a striking resemblance to Site E at Belvédère. The dating evidence for the Kesselt site, however, is as yet rather scarce and its stratigraphical position between the 'Eemian' soil and the Horizon of Nagelbeek (Haesaerts *et al.* 1981) gives a large time range for the formation of the flint and faunal assemblages. For the time being we must await the results of the analysis of the few remains of small mammals from the site and the absolute dating work.

The quarry site Langweiler in West Germany, about 50 km east of Maastricht, is another example of a site comparable to Site E at Belvédère (Löhr 1972).

The dating evidence for the Belvédère site E has been presented in the previous section, where it was suggested that the archaeological assemblage formed in the Early Weichselian was reworked and finally deposited in the Middle Weichselian. In the light of the data obtained from Site J (7.2) it now seems very well possible that the Site E assemblage was originally situated in Unit 6.1. In the Middle Weichselian the material was eroded from its original matrix, which may have been comparable with that of Site J. Like the sites at Kesselt and Langweiler, Site E can, in the author's opinion, be interpreted as a kind of 'container' filled with remains of earlier Weichselian human activities, which have been preserved locally in a primary archaeological context, for instance in the Early Weichselian 'humic' zones. There are many sites attesting these two kinds of preservation: in northwestern France the 'limons humifères', for instance, included the typical Mousterian 'Atelier Kelley' at St.Just-en-Chaussée (Tuffreau 1977), while the assemblage of Seclin mentioned above (7.2) had a similar (loess-) stratigraphical position. At other sites the industries were found inside a *cailloutis* which had reworked the humic horizons (Marcoing, Busigny, Catigny: cf. Tuffreau 1979).

Data of relevance in determining the relationship between Site E and Site J were obtained in a preliminary analysis of the Site J flint material. As stated above, the Site J flint assemblage contained three thin small 'soft-hammer' flakes, curved towards the dorsal surface along the butt-to-tip axis and having lipped butts. They were interpreted as handaxe resharpening/finishing flakes. The three flakes were of a very light-brown/grey flint with small (< 1 mm) dots, which is rare at Belvédère. The only other example of this flint is the top part of a pointed handaxe found at Site E (fig. 123-3). The resharpening spalls could not be fitted to this fragment, but the technological aspects and the properties of the raw material suggest that the three Site J flakes were struck from the Site E handaxe.

These data point to a relation between the two lithic assemblages recovered about 150 m from each other. We must, however, stress the fact that 'Early Weichselian' humic horizons, in the Belvédère pit as well as in other parts of northwestern Europe, usually contain very little bone material in a state of preservation resembling that of the Site E faunal assemblage. At Belvédère the humic horizon (Unit 6.1) has so far produced only one poorly preserved bone fragment and very fragmentary remains of mammoth molars. At most of the archaeological sites no bone material had been preserved in this 'humic horizon'

(Rheindahlen Westwand/B1: Bosinski 1966; Thieme 1983a; Rocourt: Cahen/Haesaerts 1984; Seclin: Tuffreau *et al.* 1985; Saint-Just-en-Chausseé: Tuffreau 1977). This may indicate that the Site E faunal assemblage was originally situated at a higher, calcareous level, together with part of the Site E flint material. We do have some faint indications of the presence of such a 'higher' level: in 1985 a fragment of mammoth bone was recorded above the Unit VI-A 'humic horizon' near Site H (not discussed in this volume), while a fresh flint flake was found at the same level, at abt. 10 m from the bone.

In the discussion of the Site E flint material we stated that the flint assemblage showed no signs of having been transported over considerable distances. Combining this assessment with the data presented here, the author suggests that

1. the handaxe resharpening flakes found at Site J indicate that the people responsible for the creation of the Site J assemblage were in one way or another involved in the formation of the Site E artefact assemblage.
2. the Site E faunal and lithic assemblage probably contains the palimpsest remains of different human activities separated in time, the 'faunal output' of which could only survive because it was embedded in a calcareous matrix, deposited after the formation of Unit 6.1.

It is however also possible that the total Site E flint-faunal assemblage was formed in a relatively short time by the same group of people. In this scenario the faunal elements owe their state of preservation to the local presence of calcareous sediments within Unit 6.1. In view of the taphonomy of the site the author prefers the 'palimpsest scenario' for the interpretation of Site E.