# INTRODUCTION

The Central Rhineland is a region characterised by pronounced Quaternary volcanic activity and the landscape of the East Eifel uplands, in particular, is dominated by basanitic scoria cones formed during Middle and Late Pleistocene volcanic eruptions (H.-U. Schmincke *et al.* 1983; H.-U. Schmincke & H. Mertes 1979). While it has long been known that the youngest volcanic deposits in the East Eifel, those of the Laacher See (11,000 BP 14C), have preserved important late glacial archaeological sites such as Andernach-Martinsberg (H. Schaaffhausen 1888; S. Veil 1982) and Gönnersdorf (G. Bosinski 1979), it was only much more recently that evidence for hominid presence in the Central Rhineland was found preserved in association with older volcanic activity (G. Bosinski 1983; G. Bosinski, M. Street & M. Baales 1995).

The first of these discoveries was in the Kärlich clay pit, which had been known as a Quaternary palaeontological site since the beginning of the century, but only yielded Lower Palaeolithic archaeological remains in 1980 (G. Bosinski *et al.* 1980). In the spring of 1983 the geologist H. Strunk made a new discovery at the summit of the Plaidter Hummerich volcano, where the removal of loess cover layers within the crater prior to lava quarrying had uncovered faunal remains and quartz artefacts (G. Bosinski, J. Kulemeyer & E. Turner 1983).

During the following years it became clear that the situation at the Plaidter Hummerich was by no means unique and further Middle Palaeolithic sites were discovered at other Middle Pleistocene volcanoes, most importantly at the Schweinskopf-Karmelenberg (J. Schäfer 1987, 1990a, 1990b) and Wannen volcanoes (A. Justus 1988; A. Justus *et al.* 1987), both dating to the penultimate glaciation, and the Tönchesberg (J. Tinnes 1987; N. J. Conard 1992), where the main archaeological horizon dates to the early part of the last glaciation (Fig. 1).

The four sites have often been discussed together (G. Bosinski 1986a; G. Bosinski *et al.* 1986), with the implication that they can be classed as a special category of Middle Palaeolithic volcano site unique to the Central Rhineland, or perhaps even that they reflect a conscious preference by Middle Palaeolithic hominids to occupy extinct volcanoes in this region. This is clearly not the case and the fact that the sites are located on top of volcanic deposits is probably largely irrelevant and conceivably even unrecognised by Middle Palaeolithic hominids.

It is possible that the slight depressions of the incompletely filled craters might have offered some shelter in an open periglacial landscape, or that their often elevated location served as a »lookout« point. It has also been suggested that water may have accumulated in the craters and attracted animals and hominids to the sites. However, since the topographical location of the various localities is dissimilar, the precise reasons for occupying the sites might be quite different.

It is more probable that the two major factors leading to the survival and discovery of the sites are the fact that the crater hollows formed good sediment traps for both archaeological and palaeontological material and that the underlying volcanic deposits are now subject to intensive quarrying.

Major earth moving for purposes unrelated to archaeology is often the only activity capable of discovering older and consequently deeply buried open sites. This may be during the construction of buildings (Seclin / N. France: A. Tuffreau *et al.* 1985) or railway lines (Riencourt-lès-Bapaume / N. France: A. Tuffreau 1993; A. Tuffreau *et al.* 1991).

It may also take the form of quarrying for resources such as clay (Kärlich / Rhineland: G. Bosinski *et al.* 1980; S. Gaudzinski 1994; S. Gaudzinski & J. Vollbrecht 1995), gravel (Ariendorf / Rhineland: G. Bosinski, K. Brunnacker & E. Turner 1983; E. Turner 1986), gravel or loess (Maastricht-Belvédère / Netherlands: T. v. Kolfschoten & W. Roebroeks 1985; W. Roebroeks 1988), loess and loam (Rheindah-

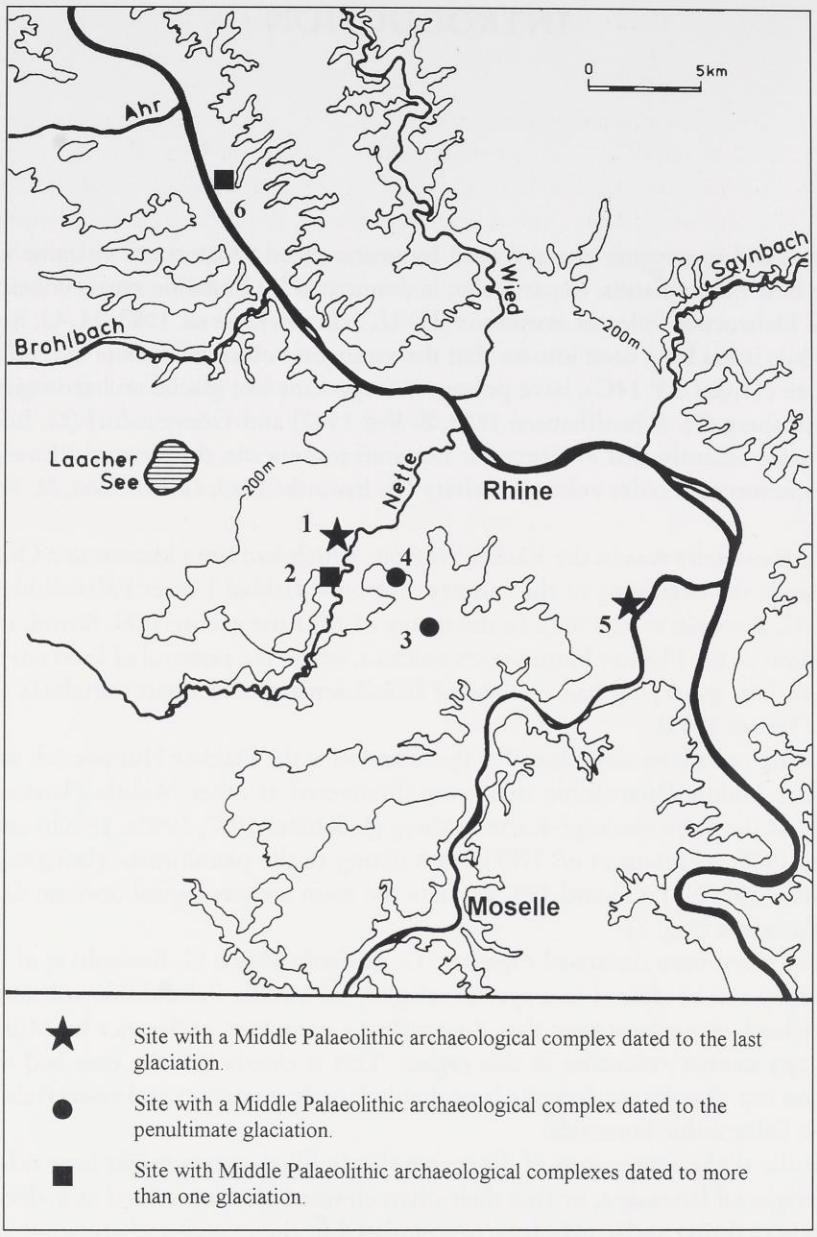



Fig. 1 Selected Middle Palaeolithic sites in the Central Rhineland. – 1 Plaidter Hummerich; 2 Tönchesberg; 3 Schweinskopf-Karmelenberg; 4 Wannen and Wannenköpfe (hominid cranial fragment); 5 Koblenz-Metternicht; 6 Ariendorf.

len / Rhineland: G. Bosinski *et al.* 1966; H. Thieme 1977, 1978, 1983; J. Thissen 1986, 1988) or lignite (Neumark-Nord: D. Mania & M. Thomae 1988; D. Mania *et al.* 1990; Schöningen: H. Thieme *et al.* 1993; H. Thieme & R. Maier 1995). In view of this background, the discovery of archaeological sites at intensively exploited lava quarries is unsurprising.

## RESEARCH HISTORY AT THE SITE

The Plaidter Hummerich is a volcanic scoria cone of Middle Pleistocene age located between the villages of Plaidt, Kruft and Kretz (Fig. 1). At a height of 274 m above sea level, the summit of the Hummerich rose some 150 m above the surrounding landscape and commanded an excellent view of the region (K. Kröger 1987, 1995; M. Street 1995). It has been suggested that this may have been one reason for the Middle Palaeolithic occupation of the crater (but see above). The volcano originally had two low peaks between which lay the crater, with a diameter of approximately 100 m, within which the main investigations took place. In spring 1983, removal of superficial layers of sediment during lava quarrying at the Hummerich uncovered quartz artefacts and bones, the significance of which was recognised by H. Strunk. After preliminary prospecting, test drilling and excavation of test pits (G. Bosinski, J. Kulemeyer & E. Turner 1983) it was decided to investigate a large area of the south-eastern crater fill. Between the discovery of the site in 1983 and the summer of 1986, when the loess cover layers dating to the last two glacial cycles were destroyed by quarrying, a total of 463 m² in the crater (Fig. 2) and a number of smaller areas outside had been excavated (K. Kröger 1987, 1995), yielding a large number of faunal remains and approximately 2,000 lithic artefacts. It is estimated that the original distribution of archaeological material must have covered at least one hectare (K. Kröger 1987).

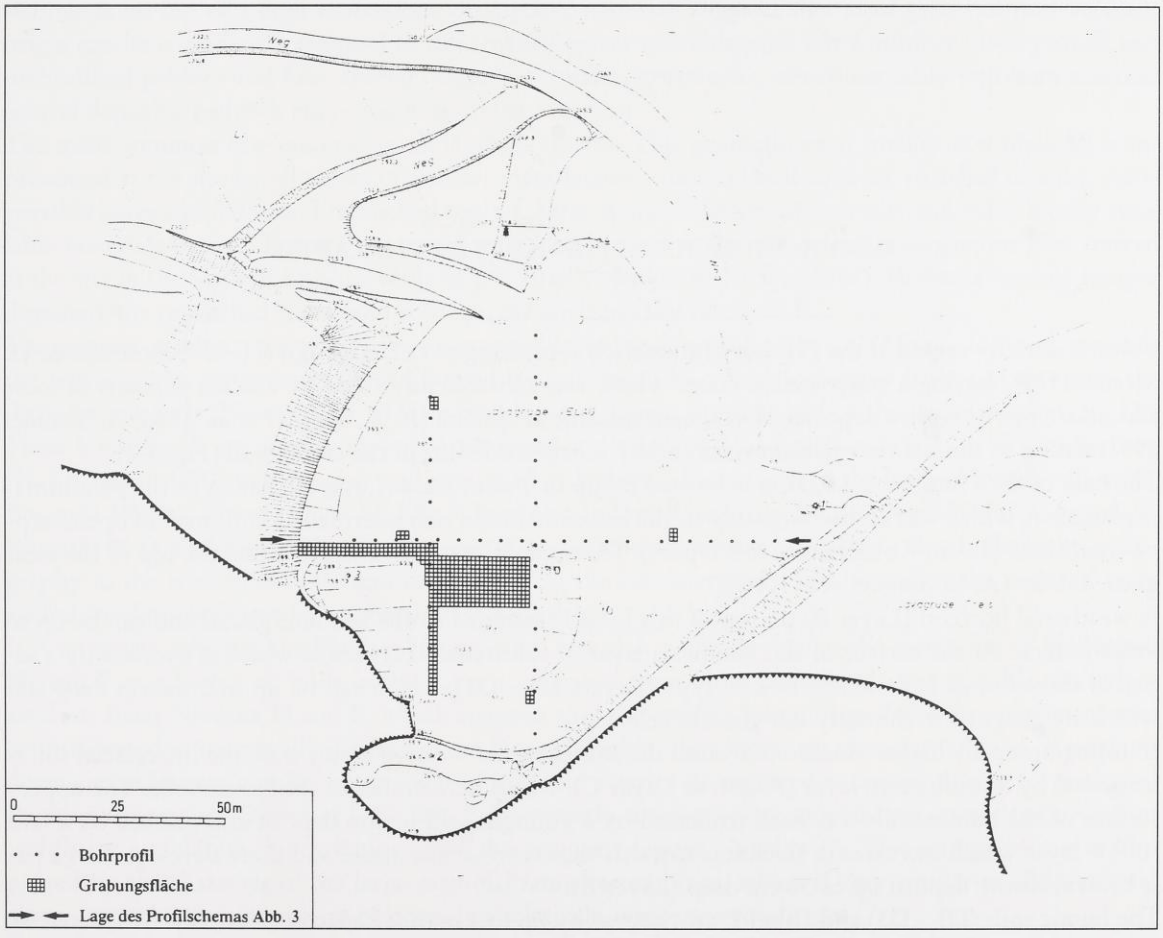



Fig. 2 Plan of the Hummerich excavation with the location of test pits and boreholes.

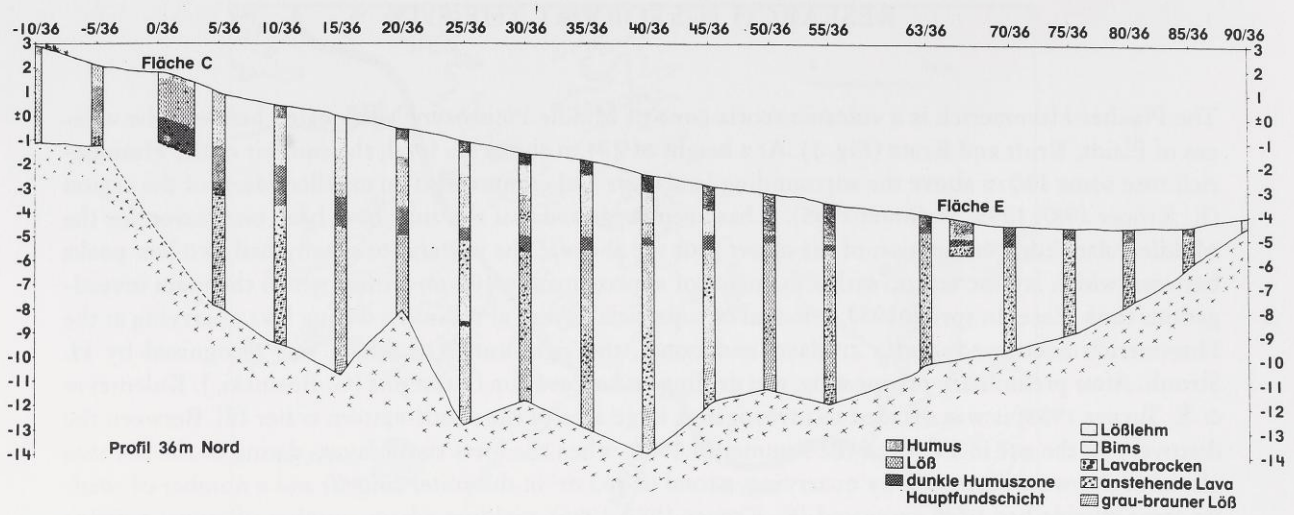



Fig. 3 Reconstruction of the stratigraphy of the Plaidter Hummerich on the basis of boreholes along axis y = 86 m (see Fig. 2).

## GEOMORPHOLOGY AND STRATIGRAPHY

Volcanic activity ceased at the Plaidter Hummerich something over 200 ky ago (H.-U. Schmincke & H. Mertes 1979), leaving a steep-walled crater which was subsequently filled by aeolian deposits of loess and, more rarely, tephra deposits of younger volcanic eruptions (A. K. Singhvi *et al.* 1986; A. Semmel 1991) dating to the last two glacial cycles and by scoria eroded from the crater wall (Fig. 3-4).

The base of the Hummerich section is formed by up to 9 m of loess (Layer A) dating to the penultimate glaciation, which was archaeologically sterile but contained a rich microfauna indicative of open, steppe conditions (T. van Kolfschoten, this report). Thermoluminescence analysis dated the top of the loess to ca. 135 ky (A. K. Singhvi *et al.* 1986).

A weathered horizon (Layer B) on top of this loess is assigned to the last interglacial and can be up to 1 metre thick. At the surface of this soil lies a layer of calcareous lava rubble which is overlain by a series of three humic soils of chernozem type (Layers D1 - D3), which can be up to 2 metres deep and which are assigned to the early last glacial cycle.

In topographically higher situations around the southern and western crater wall, the interglacial soil is truncated by a solifluction layer (*Fließerde* Layer C), which here underlies the humic soils. The upper surface of the humus soils was itself truncated by a younger solifluction deposit and marked by a lava rubble layer which increases in thickness towards the centre of the crater and there develops into a pale brown, loamy deposit up to 30 cm deep (Layer E).

The humic soils (D1 - D3) and Layer E are covered by up to 3 m of last glacial loess (Layer F), dated by thermoluminescence to 23 ky (A. K. Singhvi *et al.* 1986). The stratigraphic sequence is closed by a soil development of Allerød age, pumice deposits of the Laacher See eruption and postglacial deposits.

## EXCAVATION AND CONTEXT OF THE LITHIC AND FAUNAL ASSEMBLAGES

Lithic and faunal material recovered during excavation was recorded on plans and in lists and each piece given its own designation consisting of the one metre square unit in which it was found and an individual number assigned consecutively within this unit. All finds were measured in three dimensions. Material was excavated by the removal of a series of sediment spits, each of which was designated a »Plan«, and numbered consecutively from the top, beginning with Plan 1. Each find was assigned to one of these artificial units. The excavation progressed by removal of strips of sediment 2 metres in width, ensuring that details of the geology could be recorded in section drawings at two metre intervals.

Subsequent to the excavation, material was assigned to a geological layer (»Niveau«) by the excavation director, Karl Kröger, on the basis of the three-dimensional co-ordinate of the find and the information on geological boundaries recorded in section drawings. In view of the irregular nature of the geological boundaries and the visible presence of major disturbances (e.g. loess-filled crotovinas) and the possible presence of other, similar but unrecognised features, the attribution of material to a particular layer must be regarded as probable but by no means certain. This has implications for the interpretation of refitted material which apparently transcends geological boundaries.

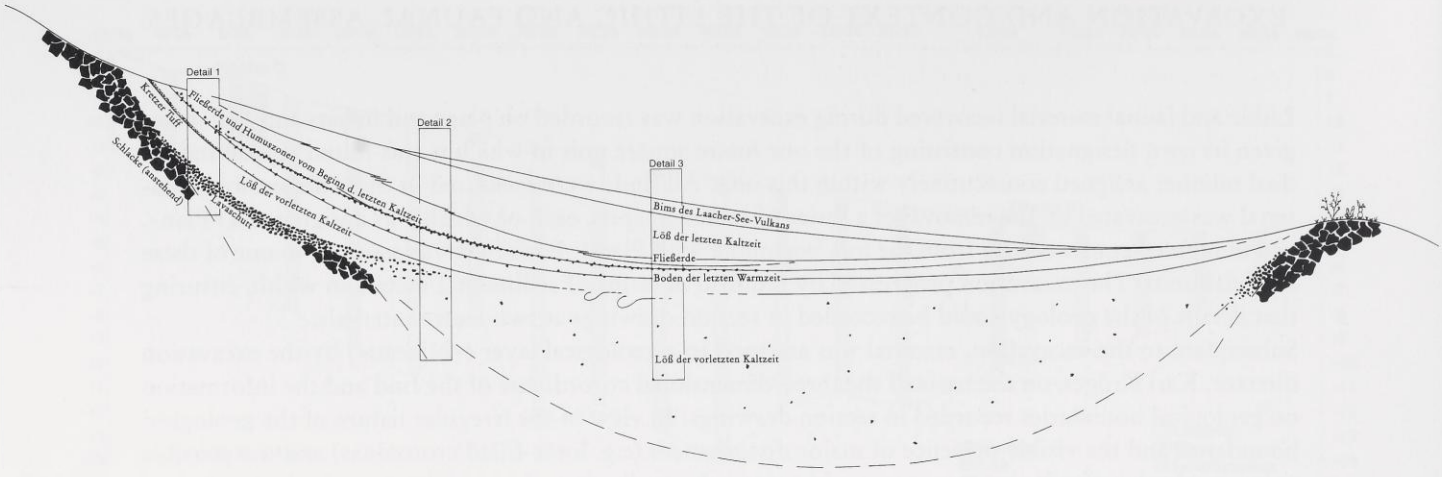
Middle Palaeolithic lithic artefacts are present in all layers at the Plaidter Hummerich except the loess of the penultimate glaciation (Niveau A) and that of the last glacial (Niveau F). In some cases it is difficult or impossible to recognise the artificial character of lithic finds; the context of the assemblage, in aeolian sediments on top of a high scoria cone of volcanic material, suggests that most pieces of non-volcanic origin can be confidently assigned to the archaeological assemblage(s), but a number of very small and unmodified pebbles and heat-altered fragments (quartz, graywacke, schist) certainly represent material (gravel deposits, bedrock etc.) caught up in the eruption.

The most common raw material in all layers is quartz. This generally poor quality raw material is represented at the site by all stages of artefact manufacture – unmodified cobbles, smashed chunks, recognisable cores and flakes and retouched tools. Coarse-grained Devonian quartzite and other locally available materials (lydite, Tertiary quartzite) were also worked at the site, whereas exogenous flint arrived at the site in the form of finished tools or pre-struck blanks (K. Kröger 1987). Various forms of scraper dominate the retouched forms and some pieces are bifacially retouched.

The greatest numbers of artefacts were recovered from the deepest humus soil (Niveau D1) and, towards the centre of the crater, from the soliflucted layer (Niveau E), which is derived from and truncates the three humus soils (Niveaux D1 - D3) which formed during the first half of the last glaciation (Fig. 4). These humus soils are more completely preserved at the nearby Middle Palaeolithic site of Tönchesberg (N. J. Conard 1992) and are also well preserved at Koblenz-Metternich in the lower Moselle valley (G. Bosinski 1986b), where a small Middle Palaeolithic industry was recently discovered (N. J. Conard, G. Bosinski & D. S. Adler 1995). The Plaidter Hummerich assemblage is therefore clearly dated by stratigraphy to the later Middle Palaeolithic, following the last interglacial but preceding the onset of truly stadial conditions shown by renewed loess deposition.

It is uncertain whether the Plaidter Hummerich was also occupied during the formation of soliflucted Niveau E or whether all finds in this layer are derived from older contexts. It was possible to conjoin artefacts from Niveaux D and E, which suggests that the artefact assemblages from these layers cannot be interpreted as temporally distinct units. More probably, they represent the accumulation of artefacts during an unknown number of episodes of hominid activity on repeated occasions during formation of the humus horizons (Niveaux D1 - D3). Subsequently, artefacts were moved by a number of processes (solifluction, ablation, bioturbation) into the younger deposit (Niveau E). This interpretation is supported by the character of the large mammal faunal assemblage, which is very similar in all layers and always contains species typical of open, but relatively temperate conditions.

Faunal remains occur in all layers containing artefacts and, as in the case of the lithic assemblage, conjoined bone fragments show that material recovered from more than one stratigraphic layer originates



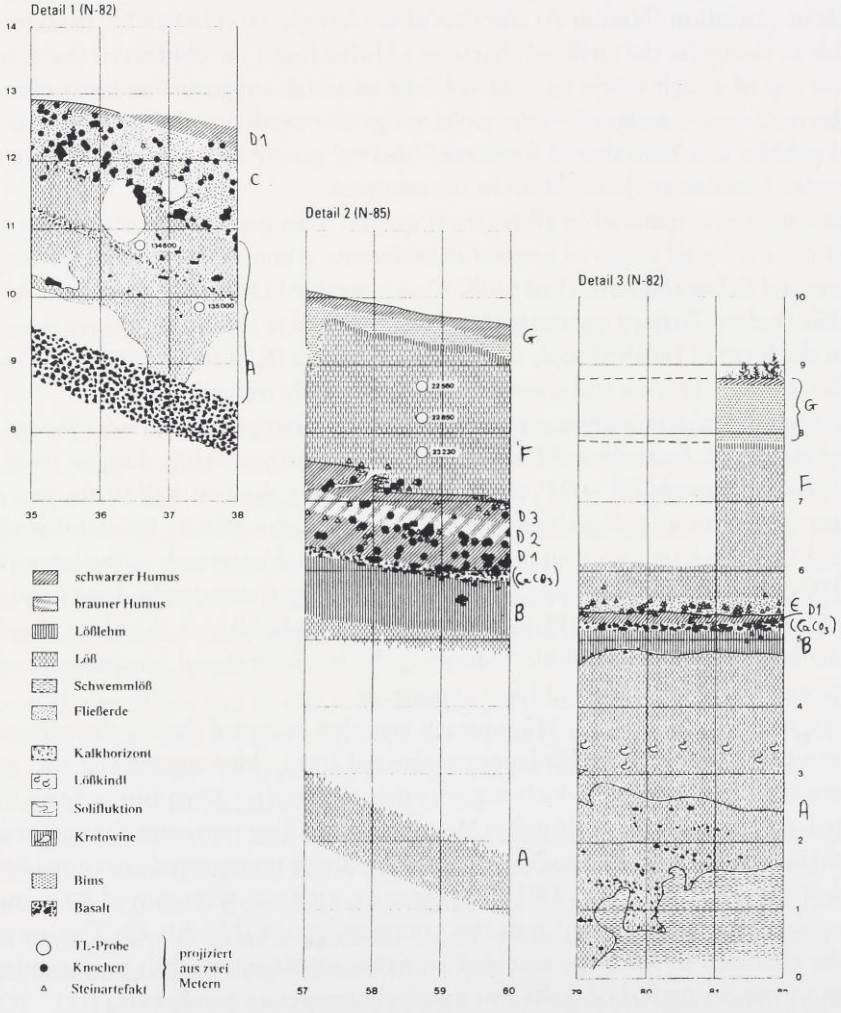




Fig. 4 Details of the stratigraphy of the Plaidter Hummerich.

from the same episode. In the case of the fauna it was demonstrated that some material derived from the *Fließerde* (C) in a topographically higher position close to the crater rim has been incorporated into the younger, lower lying humus soil layers (D1 - D3).
Since reworking can also be shown to have affected the lithic assemblage it is impossible to differentiate the Hummerich archaeological material by stratigraphic criteria. This is underlined by the faunal spectra of the different layers, which are practically identical. Species indicative of colder conditions (arctic fox, reindeer, woolly rhinoceros, mammoth) are extremely rare or totally absent in all layers, whereas species indicative of warmer / more woodland conditions (roe deer, fallow deer), are present in several horizons, showing that the fauna accumulated under open, but far from arctic, conditions.
The small mammal fauna is also similar in all layers except in the archaeologically sterile loess layer A (T. van Kolfschoten, this report). The number of specimens of value for an ecological reconstruction is small, but species with widely differing ecological preferences (e. g. lemmings, dormice) were found in the same layer (D1). This may be due to the demonstrated reworking of material from its original context, or a true reflection of short-term ecological differentiation during the total period of accumulation of the humus layers.
The commonest large mammal species, with a similar number of fragments of bone and teeth, are horse and a large bovine. A large number of specimens identified as red deer mainly comprises antler fragments; the majority of diagnostic specimens were shed antlers. Other species are less commonly represented, in some cases by only one or two fragments.
A few bone fragments of several species have impact scars due to deliberate fracture, although cut marks were not present, while a number of bones with carnivore gnawing shows that both human and animal activity have contributed to the final condition of the recovered assemblage.
Bone preservation is generally poor, with consequences for the interpretation of the faunal remains. Frequencies of body parts (e.g. the under-representation of vertebrae, ribs, other cancellous bone etc.) are probably due to differentiated destruction by weathering, and not selection by humans or even scavenging activities by carnivores. This means that interpretative models based on quantitative data from studies of recent assemblages (human or carnivore accumulated) are of no help in determining the role of man in the formation of the faunal assemblage.
In summary, it can be demonstrated by refitting that, due to post-depositional disturbances and poor definition of geological boundaries, artefacts and fauna recovered from different sedimentological units may possibly derive from the same episode of occupation. Neither spatial distribution nor refitting allow the identification of discrete concentrations of lithic material from single, clearly defined episodes of occupation. In the absence of clear indications for either spatial or temporal grouping of artefacts the lithic industry is therefore quantified in this study both separately by sedimentological unit and synthetically. Although spatial patterning shows that some faunal units have remained in articulation (despite the other evidence for transport and reworking), a certain association of the Plaidter Hummerich faunal and lithic assemblages cannot be demonstrated.