THE VERMANING STONES: SOME FACTS AND ARGUMENTS

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ABSTRACT: This paper concerns a large-scale forgery affair, commonly known as the 'Vermaning affair'. An attempt is made to recapitulate the most important facts and arguments that convinced the author that the artefacts in question are forgeries.

KEYWORDS: Vermaning stones, forgeries, Middle Palaeolithic, Late Palaeolithic, Neolithic, postdepositional surface modifications, boulderclay, bouldersand, artificial gloss, traces of modern grinding.

1. INTRODUCTION

From 1965 to 1986 at any rate, Mr. T. Vermaning (Assen; deceased in 1987) sold collections of artefacts to several museums in the Netherlands. In 1975 the present author had the misfortune to discover that many of these artefacts are recent fabrications.[1] Among these are 'Middle Palaeolithic' 'collections' or 'isolated objects' (from the 'sites' of Hoogersmilde, Hijken, Ravenswoud, Eemster, Leemdijk, Blauwmeer, Voshaar, and others), parts of one 'Upper Palaeolithic' collection (from 'Norgervaart'), parts of one 'Neolithic' collection (from 'Ravenswoud'), and perhaps also parts of one 'Mesolithic' collection (from 'Appelscha'). Several preliminary articles have been published, especially about the 'Middle Palaeolithic' collections (Stapert, 1975a; 1975b; 1980; see also Stapert, 1976a; 1976b); furthermore a report (unpublished) was prepared for use in lawsuits in 1977 and 1978 (Stapert, 1976c). One or possibly two isolated authentic Middle Palaeolithic artefacts from the same Mr. Vermaning were also described (Stapert, 1985a). It should be mentioned here that Vermaning has also sold many collections of authentic artefacts to museums and collectors, mostly dating from the Late Palaeolithic and younger phases of prehistory.

It is stressed that the main falsifiable argument is of a geological nature. It is based on the observation of weathering phenomena on natural flints present in the bouldersand (the presumed find layer of the 'Middle Palaeolithic' Vermaning stones). The Vermaning stones in question do not show any kind of natural postdepositional surface modifications. Additional arguments concern the presence on many Vermaning stones of artificial gloss, and flattened ridges between flake scars which were evidently produced by the application of an electrically driven grinding machine. Such ground ridges also occur on 'Late Palaeolithic' and 'Neolithic' artefacts sold by Vermaning, while a number of 'Neolithic' ground axes (from Vermaning's 'findspot' of Ravenswoud) must have been ground also with the help of a modern grinding machine.

2. THE GEOLOGICAL ARGUMENT

It can be said that the term 'patina' is not well defined in archaeology; elsewhere I have called it a dustbin-concept (Stapert, 1976a). Phenomena such as the following have been grouped under this term: white patina, yellow/brown patina, black patina (also called 'under-water patina' or 'marsh patina') and gloss patina. The first three of these are unambiguous: their presence or absence can be established without any trouble. Gloss patina is a more problematical phenomenon in this respect (see 7 for some reasons why natural gloss patina can be difficult to demonstrate; it apparently can be confused with artificially created gloss, or with a certain smoothness created by frequent handling). Whatever the genesis of gloss patina, mechanical (soil movements) or chemical or both, it can at least be said that flint surfaces with gloss patina are smoother than they would have been if no gloss patina had developed. Of course, I am discussing only natural postdepositional surface modifications here.

Apart from patinas, several other kinds of surface modifications on flint exist. In the northern Netherlands especially, windgloss is a recurrent phenomenon. In my experience it is nearly always possible to distinguish gloss patina from windgloss. On one and the same piece, windgloss is often variable in intensity, while in most cases it is associated with 'small pits' (described in Stapert, 1976a).

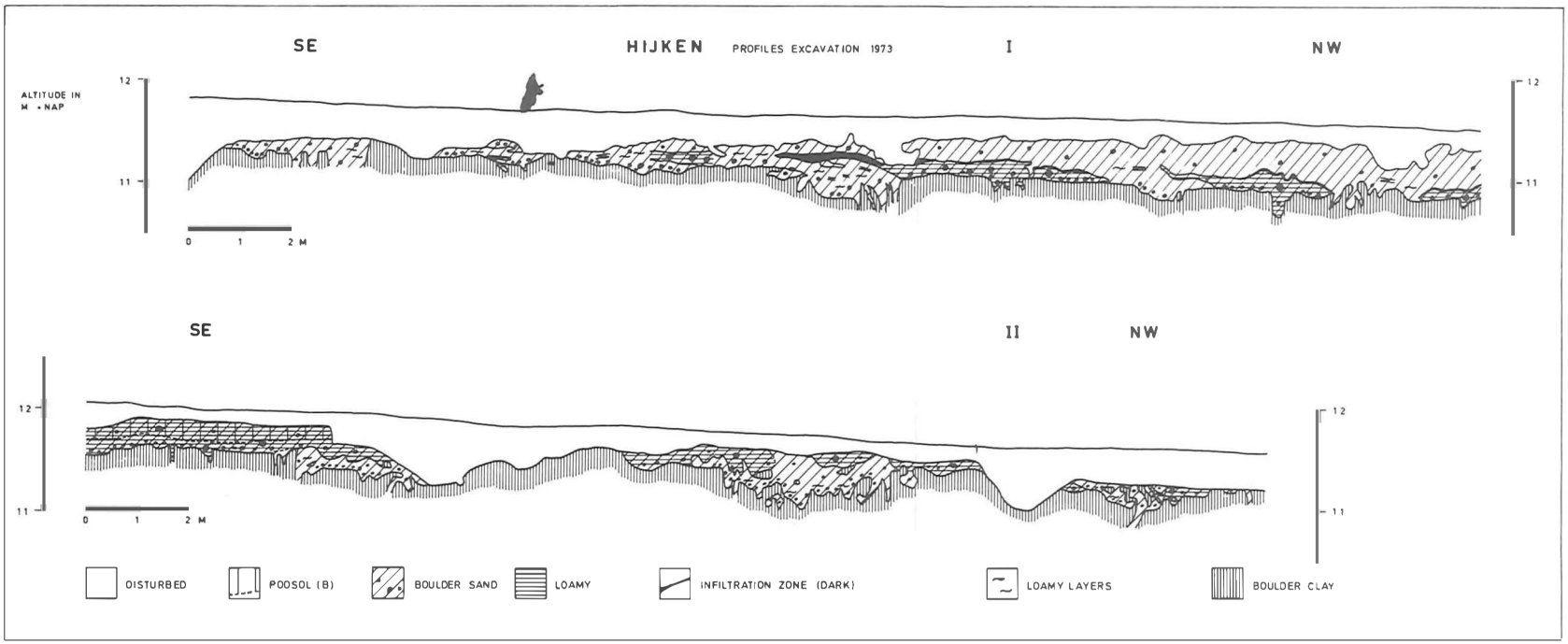


Fig. 1. Sections at the 'site' of Hijken (indicated by Vermaning), drawn during the B.A.I.-excavation in 1973. The sections are at right angles to the valley of the Vorrelveen. The vertical scale is exaggerated 2 x. The most northwestern part of section II is represented in figure 2. The stratigraphy here consists only of boulderclay and bouldersand; coversand is absent. The bouldersand is not an undifferentiated sediment, for some structure is visible. This consists of loamy and more compact layers in the bouldersand, which is otherwise fairly coarse-grained. The drawing schematically shows the following features: a. the stones in the bouldersand are most abundant at the base of this layer on top of the boulderclay. This is the case both in the coarser bouldersand and in the loamy layers where these lie immediately on top of the boulderclay. In some places one can even speak of a compact pebble layer; b. In general, larger stones occur in the loamy layers than in the coarser bouldersand; c. Contortions due to cryoturbation are especially clearly visible in the transition from boulderclay to bouldersand, though much distortion is also in evidence within the bouldersand. In some places, e.g. in the most northwestern part of section II, bands of boulderclay have been distorted together with bouldersand in a complex manner (fig. 2). The loamy layers possibly represent solifluction levels. Drawing by D. Stapert.

Other surface modifications on flint that are frequently encountered in the northern Netherlands are: frostsplitting; rounding of edges and ridges (in most cases not as a result of fluviatile rolling, but probably because of slow solution processes in the soil and/or as one of the results of the formation of windgloss); and scratches, 'pressure cones' and 'cryoturbation-retouch' as a result of cryoturbation and similar soil movements (Stapert, 1976a).

It is evident that in causing these various surface modifications several different processes are at work. Some of these alterations are the result of processes that are limited in time mainly to glacial periods, especially the phenomena produced by periglacial soil movements. Heavy windgloss also mainly arose during glacials, but it is known that windgloss can also be created in recent sanddrifts. Other modifications arose as a consequence of the flints lying at or near the surface for a long time.

Hijken and Hoogersmilde are locations indicated by Vermaning, situated on the boulderclay plateau of the province of Drenthe.[2] The stratigraphy at these sites can be summarized as follows, going from bottom to top: boulderclay (till), bouldersand (the alleged provenance of the 'Middle Palaeolithic' Vermaning stones; this deposit is also called 'cobble sands': e.g. Ter Wee, 1979), and locally a thin layer of coversand. According to Ter Wee (1966; 1979), mainly Late Glacial coversands are present on the higher parts of the plateau, as at the sites of Hijken and Hoogersmilde; only locally in depressions is older coversand found.

Bouldersand can be described as a lag deposit (weathering residue) originating from boulderclay, formed over a long period of time. Locally the bouldersand contains some coversand that was incorporated into it as a result of solifluction and similar processes. The number of stones per cubic metre of sediment is much higher in bouldersand than in boulderclay, implying that quite a thick layer of boulderclay has disappeared as a result of erosion – a reasonable estimate would be that in may places the topmost 1 to 2 m of the boulderclay was divested of its clay particles by the action of wind and water in the course of time, leaving a few dozen cm of bouldersand. Soils dating from the Eemian have disappeared as a result of later erosion (Ter Wee, 1979).

Especially the bouldersand and the top part of the boulderclay were heavily subjected to cryoturbation during the Weichselian, as could be observed during the excavation I carried out at the Hijken location in 1973 (Stapert, 1976a). Figures 1 and 2 give examples of this phenomenon seen in a profile and horizontally.

When flints occurring in boulderclay are compared with flints in the bouldersand on top of the boulderclay in the same site, a striking difference is apparent: the bouldersand flints are much more often heavily weathered than the boulderclay flints. Most bouldersand flints show phenomena such as windgloss, patinas, etc. In boulderclay severely weathered flints also occur, but these are scarce. Most boulderclay flints are not or hardly patinated (low gloss may be present), and not or hardly affected by windgloss, though many flints occurring in the uppermost 1 to 2 m of boulderclay are fragmented as a result of frostsplitting. The few heavily weathered flints in boulderclay presumably acquired their surface modifications when lying at the surface, before they were picked up by the ice-sheet. Some boulderclay flints (and, of course, bouldersand flints) show phenomena that were created during glacial transport, such as very coarse scratches and series of oblique pressure cones (Stapert, 1976a; see also fig. 4). On the majority of the bouldersand flints we see a wide range of surface alterations: a typical bouldersand flint exhibits, for example, windgloss, brown or white patina, scratches and rounding. Furthermore, bouldersand flints have on average become more fragmented as a result of frostsplitting than boulderclay flints. This has resulted in a gradual decrease in size of the flints. Larger pieces of flint show cracks due to frost action along which splitting has not yet taken place. Large, intact pieces of flint are virtually absent from bouldersand, and this has always been a problem for prehistoric flintworkers. It is known that frostsplitting of flints still took place after the end of the Upper Pleniglacial, for example during the Late Dryas Stadial (Stapert, 1982c); this resulted in new faces on flints that now will still be relatively fresh.

The conspicuous difference in weathering between the bouldersand and the boulderclay flints clearly means that the massive alteration of the bouldersand flints took place after deposition of the boulderclay, thus during the Eemian, the Weichselian and the Holocene. Surface modifications that arose during a glacial period – heavy windgloss, scratches etc. produced by cryoturbation – in most cases must have been created during the Weichselian. It is known that especially the Upper Pleniglacial of the Weichselian was a period characterized by extreme conditions: geologists speak of a 'polar desert' during this period (e.g. van der Hammen et al., 1967; Zagwijn, 1975; Kolstrup, 1980). Most ventifacts that are found in the Netherlands were formed during the Upper Pleniglacial (The Beuningen Gravel Bed: e.g. van der Hammen et al., 1967; van der Hammen & Wijmstra, 1971; Kolstrup, 1980; Meyer, 1986), and the same applies to most of the severe windgloss on flints encountered in the bouldersand; of course, during the Lower Pleniglacial and other stadials flints will also have acquired windgloss.

In western Europe the Middle Palaeolithic ends

Fig. 2. Cryoturbation at the transition between boulderclay and bouldersand, seen in a horizontal plane. B.A.I.-excavation at the 'site' of Hijken, northwestern part of section II (fig. 1). Photo by D. Stapert.

40,000 to 35,000 radiocarbon years ago, thus before the beginning of the Upper Pleniglacial. The 'finds' of Hoogersmilde and Hijken should, on the basis of their typology, date from the Eemian or the first half of the Weichselian. At the sites of Vermaning, geological circumstances do not deviate locally. Therefore, it cannot be understood how the Vermaning stones should have escaped all the various weathering processes that did leave their traces on the other flints in the bouldersand. In this connection it should be noted that many (natural) flints now occurring in the bouldersand came to be part of that deposit only in the course of the Weichselian – also during the Upper Pleniglacial. Middle Palaeolithic artefacts were, all of them, already in existence before the beginning of the Upper Pleniglacial, and have, therefore, been present in the bouldersand for a longer period, on average, than the other flints now to be found in that deposit. The 'Middle Palaeolithic' Vermaning stones do not show patinas, windgloss, or other natural surface modifications (see 7, however, for a contrasting opinion on this matter of Kars and others). Therefore, they cannot have been present in the bouldersand since the Eemian or the first half of the Weichselian. Moreover, assuming they are Middle Palaeolithic artefacts, there is no other layer, at the sites indicated by Vermaning, from which they could have derived.

Of course, geological circumstances do exist in which Middle Palaeolithic artefacts could have escaped weathering processes (creating patinas, windgloss etc.), for example in loam. Except within the boulderclay, no such circumstances exist at the sites of Vermaning. It can be excluded with certainty that the Vermaning stones come from the boulderclay, however. According to Vermaning, his 'Middle Palaeolithic' artefacts were found in very small concentrations, only a few metres across (van der Waals & Waterbolk, 1973)! This cannot be explained if they were incorporated in the boulderclay, given the genesis of this type of sediment (ground moraine).

My geological argument, presented above, can be summarized in the form of a syllogism as follows:

1. The 'Middle Palaeolithic' Vermaning stones, if they are genuine artefacts, must derive from the bouldersand.

2. Given their assumed age (on the basis of their typology), and the geological circumstances prevailing in the bouldersand at the sites indicated by Vermaning, they could not have escaped a series of

weathering processes in the course of time.

3. The Vermaning stones do not exhibit any of the surface modifications produced by such processes.

4. Therefore, the Vermaning stones cannot derive from the bouldersand at the sites indicated by Vermaning, which implies that they are forgeries.

Of course, it should be stressed that this argument is only valid within one specific geological context: the boulderclay plateau, outside valleys and other depressions. In other situations my argument might not apply, or only in a modified form. It is nonsense, in my opinion, to point to unpatinated finds elsewhere, for example deriving from loess, as evidence against my arguments (e.g. Franssen, 1978), because these finds do not come from geologically comparable situations.

At the end of this section it may be of interest to note that the argument I used to prove that the Vermaning stones are forgeries, is in itself not new. Similar reasoning has been used in other forgery affairs, from as early as the 19th century. As an example I should like to point to a famous publication by G. & A. de Mortillet in 1911 (this book is a revised edition of Préhistorique by G. de Mortillet, which first appeared in 1883), in which it was stated that it is necessary to prove the authenticity of Palaeolithic finds by establishing *caractères d'authenticité* such as patinas, rounding, gloss, etc. Of course, this type of argument should be adapted to the specific geological conditions prevailing at the sites under discussion, and this is what I have endeavoured to do in 1975.

3. 'APPLES AND PEARS'

The petrologist Kars has stated on several occasions (newspaper interview; pers. comm.), that "it is a comparison of apples and pears", when 'Middle Palaeolithic' Vermaning stones are compared with natural flints deriving from the bouldersand at the sites indicated by Vermaning. By this metaphor he suggests that something nonsensical is done, geologically speaking, when these two groups of flints are compared. According to Kars it is not permitted to compare these two groups of flints; in my opinion they should be compared.

This idea has been formulated earlier by Wouters and other amateur archaeologists defending the authenticity of the Vermaning stones. To Wouters c.s. their conviction implies, that other Middle Palaeolithic artefacts from the northern Netherlands, not found by Vermaning, which are indeed

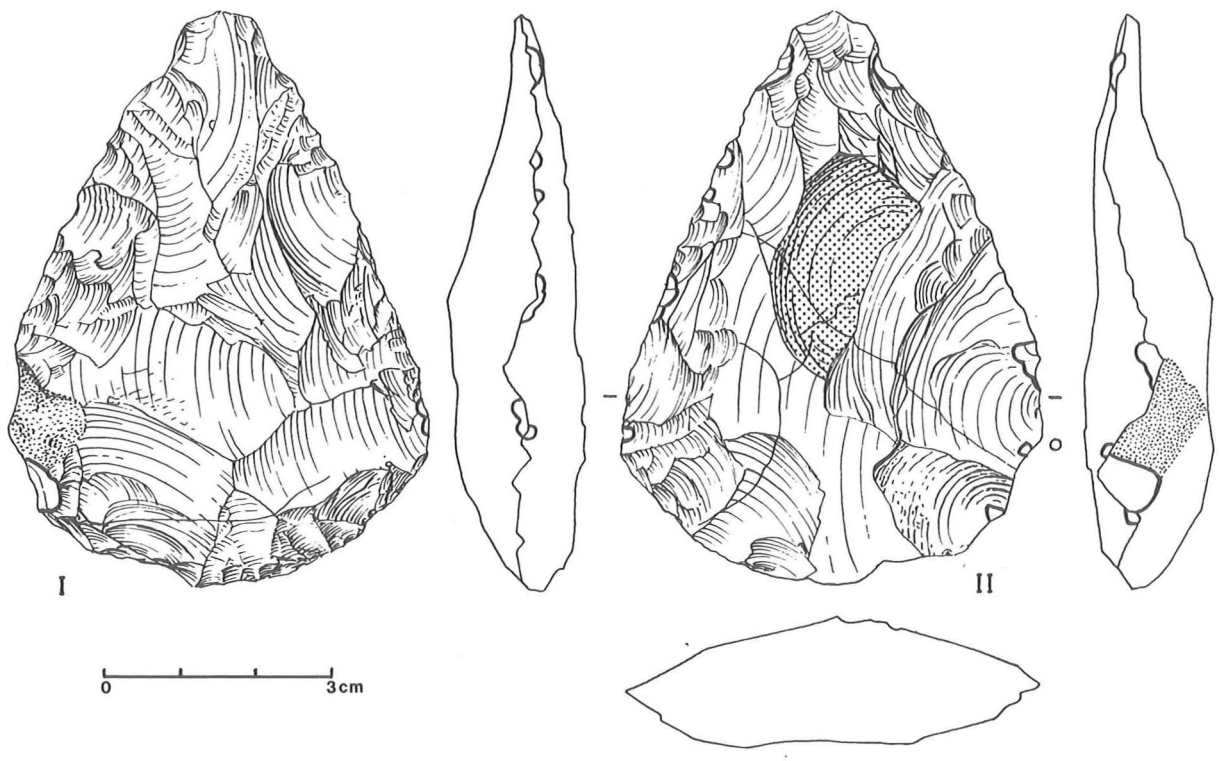


Fig. 3. The small triangular handaxe from Mander, manufactured out of a flake (Stapert, 1982a). Key: left white with a slightly thicker outline – (sub)recent damage; dense stippling – cortex; regular stippling – secondary frostsplit face; open circle – presumable position of the point of percussion of the flake. Drawing by H.R. Roelink, B.A.I.

patinated, covered in windgloss, etc. (see 4), must have been transported to this region by the ice-sheet during the Saalian. According to Wouters c.s., they had acquired their surface modifications before the arrival of the ice-sheet. The Vermaning stones, according to Wouters c.s., were left behind after the deposition of the boulderclay and therefore, still according to this theory, they could escape patination etc. (e.g. Wouters, 1980; Musch, 1980).

In itself the idea of glacial transport is worth considering. In the literature, several instances have been described of Palaeolithic artefacts incorporated in boulderclay (e.g. Baumann et al., 1983). In the Netherlands several sites are known that date from before the arrival of the Saalian ice-sheet (Rhenen: Stapert, 1981a; Belvédère: Roebroeks, 1984). Therefore, assuming that Middle Palaeolithic people also visited the northern Netherlands during the Early Saalian (of which we have no proof), the possibility exists that the ice-sheet picked up artefacts lying at the surface.

There are two remarks I want to make concerning this idea. First, I fail to understand what difference it would make to my argument presented above. Even if Wouters' theory should be correct, the Vermaning stones, if they are genuine artefacts, would have been left behind before the beginning of the Upper Pleniglacial. Therefore, my argument remains intact. Secondly, the hypothesis that the Middle Palaeolithic artefacts from the northern Netherlands that were not found by Vermaning were transported to this area by the Saalian ice-sheet seems, at least for some of these finds, very improbable from an archaeological point of view. On the basis of their typology, several handaxes, for example those from Anderen (Stapert, 1976b; 1976d), Anreep (Stapert, 1982b; Looyenga et al., 1984) and Mander (Stapert, 1982a), fit best in the Moustérien de tradition acheuléenne type A of Bordes (e.g. 1954/55; 1968), a tradition that is dated to the Early Glacial of the Weichselian – much later, therefore, than the period when the Saalian ice-sheet covered part of the Netherlands (see fig. 3 for the triangular handaxe of Mander).

In conclusion, it can be said that I agree with Kars that the Vermaning stones and natural flints from the bouldersand are 'apples and pears' when compared, meaning that they are different with respect to their surface modifications, but to my mind this difference is in need of a convincing explanation.

4. MIDDLE PALAEOLITHIC ARTEFACTS, NOT FOUND BY VERMANING

My argument, presented above, leads to the expectation that Middle Palaeolithic artefacts, when found in the same geological situation as that prevailing at the 'sites' of Vermaning (on the plateau, outside valleys or glacial basins) will show the same surface modifications, by and large, as can be observed on natural flints in the bouldersand. This is indeed the case. Apart from the handaxes of Anderen and Mander (mentioned above), we can also point to the handaxes of Wijnjeterp (Stapert, 1976b), Drouwen (Stapert, 1979) and Exloo (Stapert, 1976b), and to the points of Havelterberg and Ambt-Delden (Stapert, 1976b), as well as several dozens of other finds. It may be useful to note that we are discussing very clear phenomena here, such as white patina, brown patina and windgloss, which are present on these artefacts in, roughly speaking, the same degree and the same kinds of combinations as on natural flints occurring in the bouldersand. This also applies to finds that typologically belong to later phases of the Middle Palaeolithic, such as the small triangular handaxe (made out of a flake) from Mander. Of the handaxes from Wijnjeterp and Anderen colour photos were published, in order to give an impression of their surface modifications (in Stapert, 1976b; 1976d, respectively). It can be noted here that in Schleswig-Holstein (Western Germany), Middle Palaeolithic artefacts from surface sites show the same kinds of severe surface modifications as in the northern Netherlands (Hartz, 1986).

A circular argument could arise if I proposed the following: "in view of the existence of examples of Middle Palaeolithic tools from the northern Netherlands showing severe surface modifications, all other Middle Palaeolithic artefacts from this region have to look the same". It is possible in theory that these examples constitute a selection of some kind. Moreover, we have to face the problem that it is impossible to recognize isolated artefacts as Middle Palaeolithic solely on the basis of their typology. It is known that handaxe-like tools were also produced during the Neolithic (Stapert, 1981b), and there are more problems of the same kind. In fact, the mentioned examples of Middle Palaeolithic artefacts from the northern Netherlands have been identified as such only because they exhibit the same kind of surface modifications as seen on natural flints in the bouldersand. Again: this procedure is only valid within the geological context delimited above.

Taking this into account, I do not consider Middle Palaeolithic tools from this region with severe surface modifications as proof for my argument; they illustrate my argument, and prove that Middle Palaeolithic artefacts with such surface alterations exist in this region. My conclusion that the 'Middle Palaeolithic' Vermaning stones are forgeries cannot be falsified by finding unpatinated handaxes if it cannot be proved independently that these handaxes are indeed Middle Palaeolithic in age. It is evident, therefore, and I want to make this

clear, that my argument is based only on the geological circumstances prevailing at the sites indicated by Vermaning. Basing myself on observations of surface modifications occurring on natural flints in bouldersand at these sites, I contend that Middle Palaeolithic artefacts from the bouldersand should show traces of the same weathering processes, because they could not have escaped all of these processes simultaneously. I at any rate fail to understand how they possibly could, seeing that they are manufactured from the same kinds of flint, and have been in exactly the same situation, for long periods in both cases. It is perhaps useful to state again that I am using this argument only for places on the plateau, outside valleys or glacial basins in which fine-grained sediments might be present (for some notes concerning the circumstances prevailing in glacial basins and valleys, see Stapert, 1985b; 1986).

I would gladly subject my conclusions to tests aimed at falsification (Popper, 1959). In my opinion, my conclusions can be falsified only by locating a spot on the boulderclay plateau where the flints in the bouldersand are not more frequently heavily altered than the flints in the boulderclay below. Personally, I have never come across such a situation, and until I am shown such a spot I maintain that my conclusions are not falsified. I repeat for the sake of clarity that we are concerned with very clear phenomena in this connection, such as windgloss and white or brown patinas.

The argument I used is independent of the existence of Middle Palaeolithic artefacts in the northern Netherlands showing severe surface alterations. It is certainly gratifying that they do exist, because they illustrate my argument. If they should not be known, my argument would remain intact, though devoid of examples. Similarly, it would be nice if we had more knowledge than we do concerning the precise nature and mode of origin of the various surface modifications that can be observed on flints in bouldersand, but my argument is in principle independent of such knowledge: it is only based on the empirical observation that these modifications took place on flints in bouldersand after the deposition of the boulderclay.[3]

5. ANOTHER GEOLOGICAL ARGUMENT

There are other arguments that independently lead to the same conclusion, viz. that the 'Middle Palaeolithic' Vermaning stones are forgeries. The main argument, presented above, is of a geological nature: it is based on the observation of weathering phenomena on flints in bouldersand. In this section I intend to discuss the consequences of a further characteristic of bouldersand. It is clear that this deposit was formed over a long period as an erosion residue of boulderclay, in many places under the influence of solifluction processes, among other factors. These soil movement processes are at work even on very gentle slopes during glacial periods (e.g. French, 1976). I observed possible indications of solifluction when studying sections on the 'site' of Hijken (fig. 1), during the excavation (unproductive, as far as the Middle Palaeolithic was concerned) that I carried out there in 1973 (Stapert, 1976a; 1976c). At the Middle Palaeolithic site of Mander it was observed that the several dozens of finds were scattered over a wide area, at least 250 m in diameter. This scattering is likely to be the result of solifluction over a long period, after the artefacts had been left behind (Stapert, 1982a).

'Concentrations' of Middle Palaeolithic artefacts in the bouldersand within sloping areas in the province of Drenthe, with diameters of 3.10 x 2.00 and 2.15 x 1.20 m (Concentrations A and B respectively of Vermaning's 'findspot' Hoogersmilde: van der Waals & Waterbolk, 1973), seem to me unthinkable for this reason, even with gentle slopes. In view of the genesis of bouldersand, original concentrations of artefacts would have become scattered considerably in the course of several tens of thousands of years after their deposition. Again, this argument is in principle independent of finding occurrences of scattered Middle Palaeolithic artefacts, as at Mander. Besides, although it is likely that the artefacts from Mander belong together as the residue of a single occupation, this cannot be proved with absolute certainty.

6. TYPES OF FORGERIES

If one should carefully read the existing literature on forgeries (e.g. Vayson de Pradenne, 1932), probably many different types of forgeries could be defined. For practical purposes, forgeries are divided into four major groups here:

1. Newly made objects.
2. 'Findspot forgeries'; these concern authentic artefacts that are falsely claimed to have been found at the site indicated by the finder or owner (for a probable example, see Lanting, 1977).
3. Recently modified, authentic artefacts; for example recently retouched prehistoric flakes.
4. 'Compositions'; for example the recently created combination of a mandible of giant deer with an authentic Tjonger point (Stapert, 1977).[4]

In the above I concluded that the 'Middle Palaeolithic' Vermaning stones are forgeries. In principle they could be forgeries of types 1 or 2. In my opinion there are good reasons for assigning them to type 1, i.e. newly made objects. Indications in this respect are the following: the presence of artificial gloss (see 7), the presence of traces of modern grinding (see 8), the improbable composi-

tion of the various collections in terms of the types of handaxes that are represented (Stapert, 1975b), and the technically crude workmanship of many artefacts. This last indication in my opinion is the strongest; it was also mentioned by McBurney (letter to Waterbolk, d.d. May 5th, 1969), and by Bosinski (1976) in his report for the lawsuits.

7. GLOSS

The petrologist Kars has claimed that the Vermaning stones "certainly possess patina" (newspaper interview; pers. comm.). This patina in his opinion mainly consists of a low, silky, gloss, but brown patinas are also present according to Kars. This opinion was formulated earlier by Wouters, during the court hearings, and by others (e.g. Franssen, 1978; Dijkstra, Musch & Wouters, 1986).

In 1975 I concluded that the Vermaning stones had been treated on purpose with substances that create artificial gloss (Stapert, 1975a; 1975c). I was able to wash away these gloss-producing substances by using water and soap, after which, as far as I could see, unpatinated surfaces remained (fig. 4). Together with Dr. G. Boom (Laboratory of Physical Metallurgy, University of Groningen) I tried to analyse these substances chemically, but due to the method used (EDAX) this attempt failed (Boom, 1976). However, we did establish the presence, apart from the artificial gloss, of many elements that were most probably deposits left behind by the hands of the many people who handled the Vermaning stones in the course of time: perspiration and skin-fats, etc. Moreover, the pieces had been marked with numbers and drawn. Draughtsmen commonly use crayon and other materials in their work. Attempts at refitting had been carried out with the larger 'Middle Palaeolithic' collections of Vermaning, involving the use of glue.

Furthermore, I have often stated that the mere fact that the pieces have been handled in many different ways for more than 10 years, has necessarily resulted in a certain surface modification that is not reversible. It is very well possible that this modification could be described as a 'silky gloss'. We know from use-wear analyses that repeated contact with meat and other soft materials produces irreversible gloss on flint (e.g. Keeley, 1980; Moss, 1983). Therefore, I am convinced that the Vermaning stones in the meantime have duly acquired a surface modification that cannot be

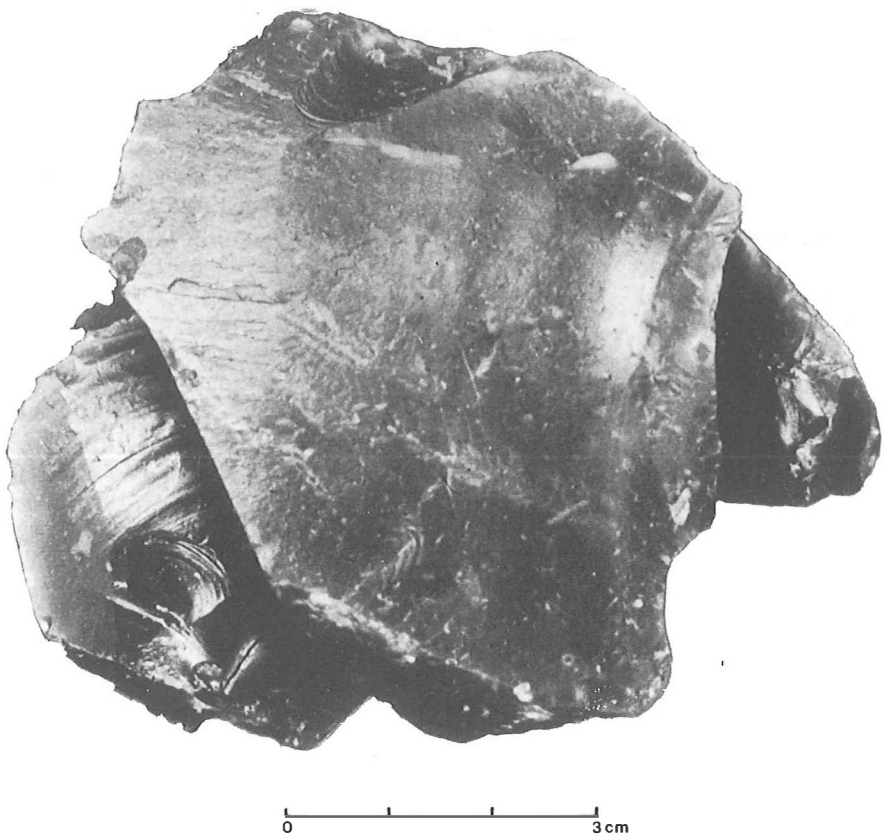


Fig. 4. Some refitted artefacts from the Hijken collection. The uppermost face is an old frostsplit face (dating from before the production of the artefacts), showing severe scratching (which probably resulted from glacial transport) and windgloss. Below this face, part of the ventral surface of a flake is visible (at the left), exhibiting gloss. The left half of this surface was cleaned by me using water and soap. This resulted in disappearance of the gloss, and a non-patinated surface remained. The Juridical Laboratory performed a similar test on this surface (using 'Vim'), with the same result (Witte, Verburgt & Groeneveld, 1976). Photo B.A.I.

removed completely. However, to my mind this has nothing to do with patinas. In my opinion the term patina, although not well defined, should only be used for natural surface modifications that can be clearly identified – even if their origin is not understood precisely.

In short, in my opinion the Vermaning stones show the following surface alterations that could perhaps be confused with gloss patina: a) artificial gloss (see also below); b) skin-fats and many other recent deposits as a result of repeated manipulation; c) a certain smoothness as a result of frequent handling. None of these I consider as natural surface modifications. I should like to add that a chemical analysis of the multifarious contaminations now present on the Vermaning stones seems to me a senseless undertaking after all these years.

Returning to the artificial gloss that could be easily washed away, the Juridical Laboratory analysed two Vermaning stones in this respect (report of August 22nd, 1975 by Witte, Verburgt & Groeneveld). A handaxe from Hijken was analysed by pyrolysis-gaschromatography, and

> ... it was concluded that a polyester-product, i.e. a modern artificial substance, was present. Therefore, an artificial substance has been sprayed on the handaxe.

Another citation from this report:

> A handaxe from the Hoogersmilde collection exhibited a gloss that was caused by a clearly visible fat-like substance, attached to the surface. An infra-red chemical analysis showed that this substance consisted of Vaseline. [Vaseline is a kind of petroleum jelly]

In itself, the presence of artificial gloss does not prove that the Vermaning stones are forgeries. It is possible that genuine artefacts were treated with gloss-creating substances, or worked with a modern grinding machine – examples of such behaviour do exist (for a possible instance, see Stapert, 1985a). Of course this proves swindling, but not necessarily that the objects in question were made recently, though in the case of the Vermaning stones this clearly seems to be the case.

8. TRACES OF GRINDING

Almost all the 'Middle Palaeolithic' Vermaning stones show a peculiar alteration of the ridges between flake scars, and sometimes of edges. In these cases the ridges appear to be somewhat rounded, but on close inspection it can be seen that in fact they mostly display 'facets' – the ridges have been truncated and present themselves as small level planes (for examples, see figs 5 and 6). There are several reasons why I interpreted these rounded or flattened ridges as the result of grinding with the help of a modern grinding machine (Stapert, 1976c; 1980). In the first place it can be noted that this is a partial phenomenon. On one and the same piece not all the ridges are altered: one finds very much flattened ridges close to unaltered ridges that have remained fresh and sharp. Furthermore, in several cases it can be seen that not only the most protruding ridges have been affected; these have sometimes remained sharp while less protruding ones have been levelled off, on the same piece. In a few cases within the flattened parts scratches can be observed that are strictly parallel. However, sets of parallel scratches occur more often just beside the flattened ridges.

Experiments I carried out with a corundum grindstone, electrically driven, showed that exactly the same kind of flattened ridges could be produced in this way (fig. 7). These experiments also showed that in most cases no scratches were created within the altered parts – in general these presented surfaces reminiscent of emery-paper, when seen through a stereomicroscope. Scratches sometimes occurred just outside the ridges, if for a moment the worked flint had accidentally slipped aside on the grindstone.

Perhaps more important than the results of these experiments is the observation that flattened ridges similar to those on the Vermaning stones do not at all occur on natural flints in the bouldersand at the sites indicated by Vermaning. I saw thousands of such flints from the bouldersand at the site of Hijken during the excavation I carried out there in 1973. Wouters and other defenders of the Vermaning stones (e.g. Dijkstra, Musch & Wouters, 1986), and also Kars (pers. comm.), explained the altered ridges on the Vermaning stones as being the result of cryoturbation or similar processes, but never offered an explanation for the fact that they are absent on natural flints in the bouldersand.

An interesting case in point is presented by the material of 'Ravenswoud'. This collection of 'Neolithic' artefacts was sold by Vermaning to the Fries Museum in Leeuwarden in 1968. Among other objects, this collection includes a number of ground axes and several so-called 'spearheads'. These 'spearheads' are unknown from other prehistoric collections from the Netherlands; they could be described as enlargements (scale approximately 4:1) of Neolithic arrowheads (figs 8 and 10). These grotesque 'spearheads' show exactly the same flattened ridges, in some cases accompanied by parallel scratches (figs 9 and 11), as the 'Middle Palaeolithic' Vermaning stones (Stapert, 1975a; 1976c). I also concluded, on the basis of observations with a stereomicroscope (figs 12-16), that a number of the polished axes from Ravenswoud had been ground with the help of a modern grinding machine. A few other ground axes from Ravenswoud are indeed genuine Neolithic artefacts, but have probably been

Fig. 5. A handaxe from the Hoogersmilde collection (1965/X-48). The length of the specimen is c. 10 cm. In many spots flattened ridges (between flake negatives) can be seen. Some clear examples have been marked. Note also that in several places unaffected ridges occur right beside extremely flattened parts. Photo B.A.I.

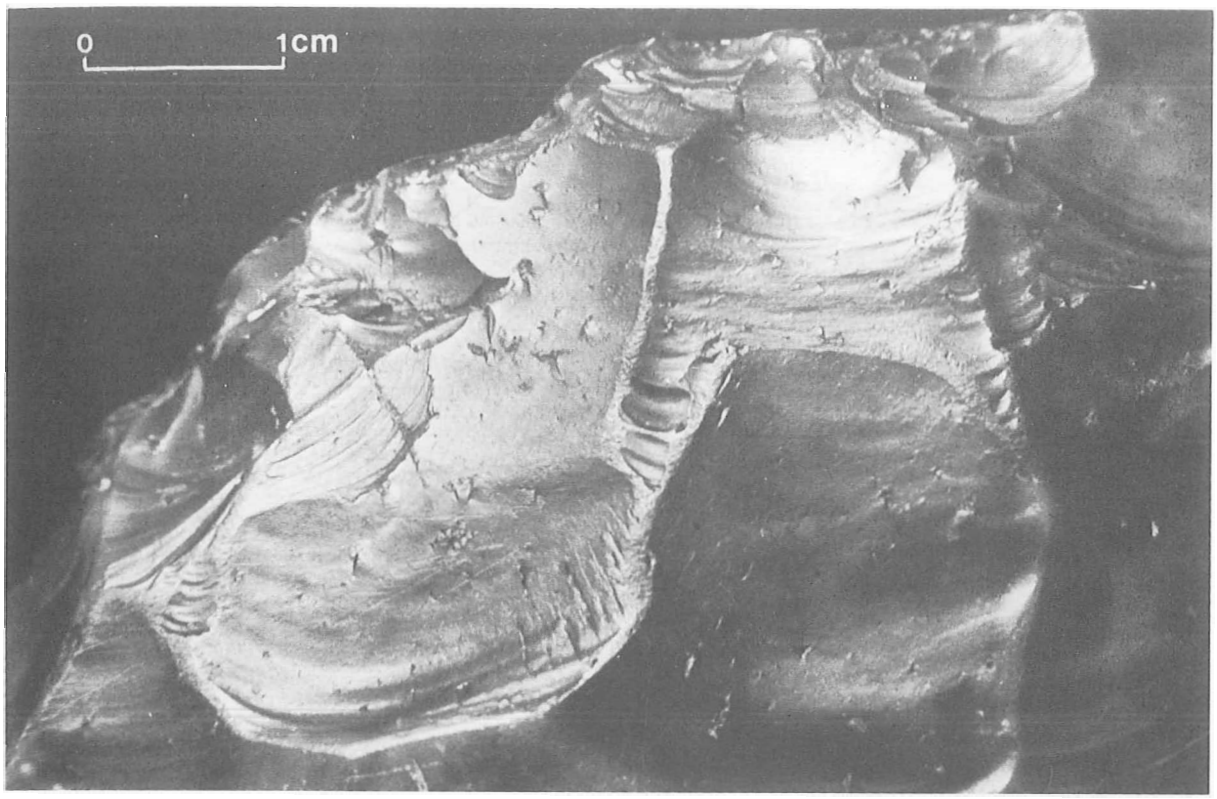


Fig. 6. Part of the surface of the 'Leemdijk handaxe', manufactured from brown flint. Flattened ridges are clearly in evidence; some scratches are also visible. In this case the altered parts are coloured red, presumably due to the circumstance that the flattened ridges were produced with the help of an electrically driven grinding machine (see text under 8). Photo B.A.I.

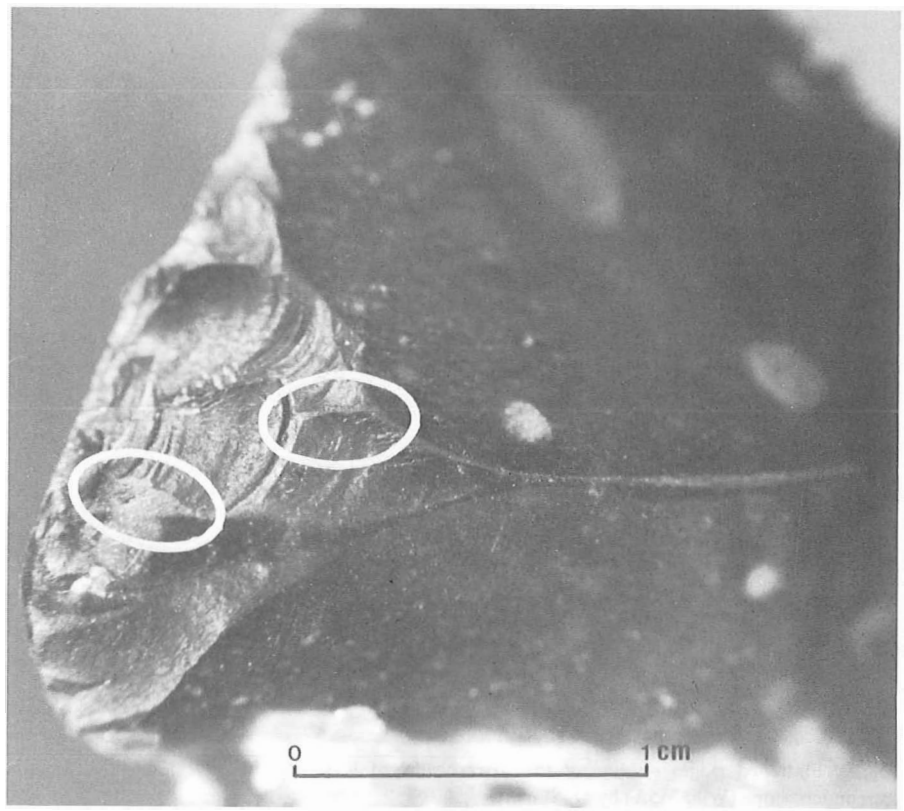


Fig. 7. Flattened ridges produced experimentally by using an electrically driven grinding machine on a freshly-struck piece of flint. These ground ridges are very similar to the flattened ridges occurring on the Vermaning stones. Some clear examples have been marked. Scale in cm. Photo B.A.I.

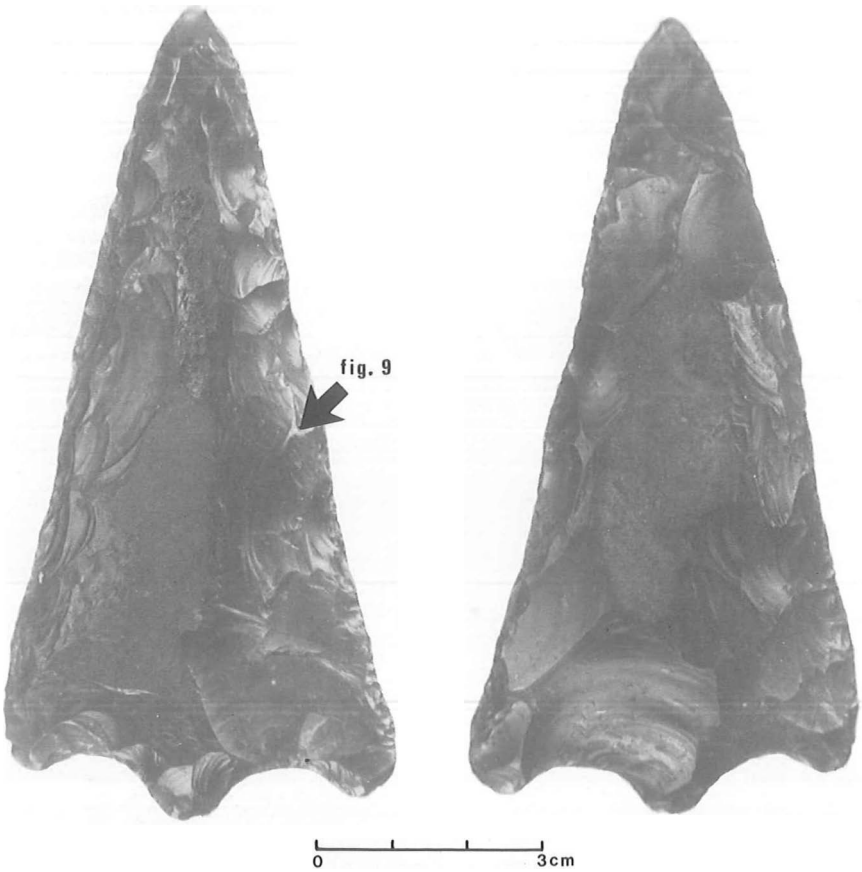


Fig. 8. One of the 'spearheads' of the 'Neolithic' collection of Ravenswoud (FM 1968-1-18). An arrow indicates the place where the photo shown in figure 11 was taken. Scale in cm. Photo B.A.I.

Fig. 9. Flattened ridges on one of the 'spearheads' of Ravenswoud (FM 1968-1-18, see fig. 8). Photo made by means of a stereomicroscope (Wild M5A) by D. Stapert.

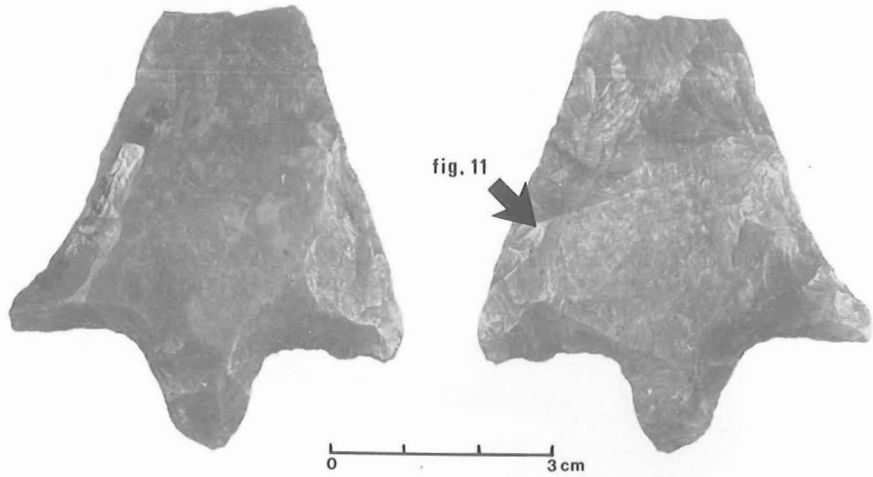


Fig. 10. One of the 'spearheads' of Ravenswoud (broken: FM 1968-1-22). An arrow indicates the place where the photo shown in figure 11 was taken. Scale in cm. Photo B.A.I.

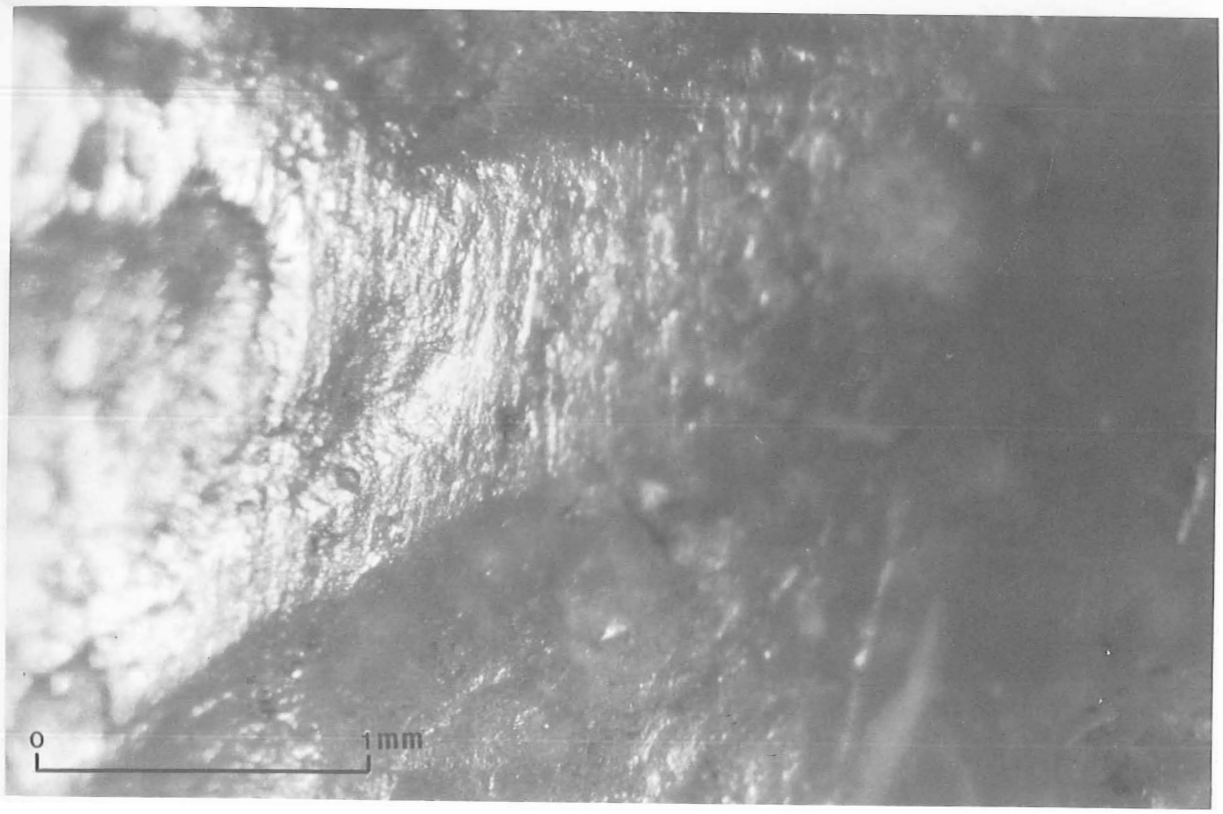


Fig. 11. Flattened ridges with parallel grinding scratches on one of the 'spearheads' from Ravenswoud (FM 1968-1-22, see fig. 10). Photo made by means of a stereomicroscope by D. Stapert.

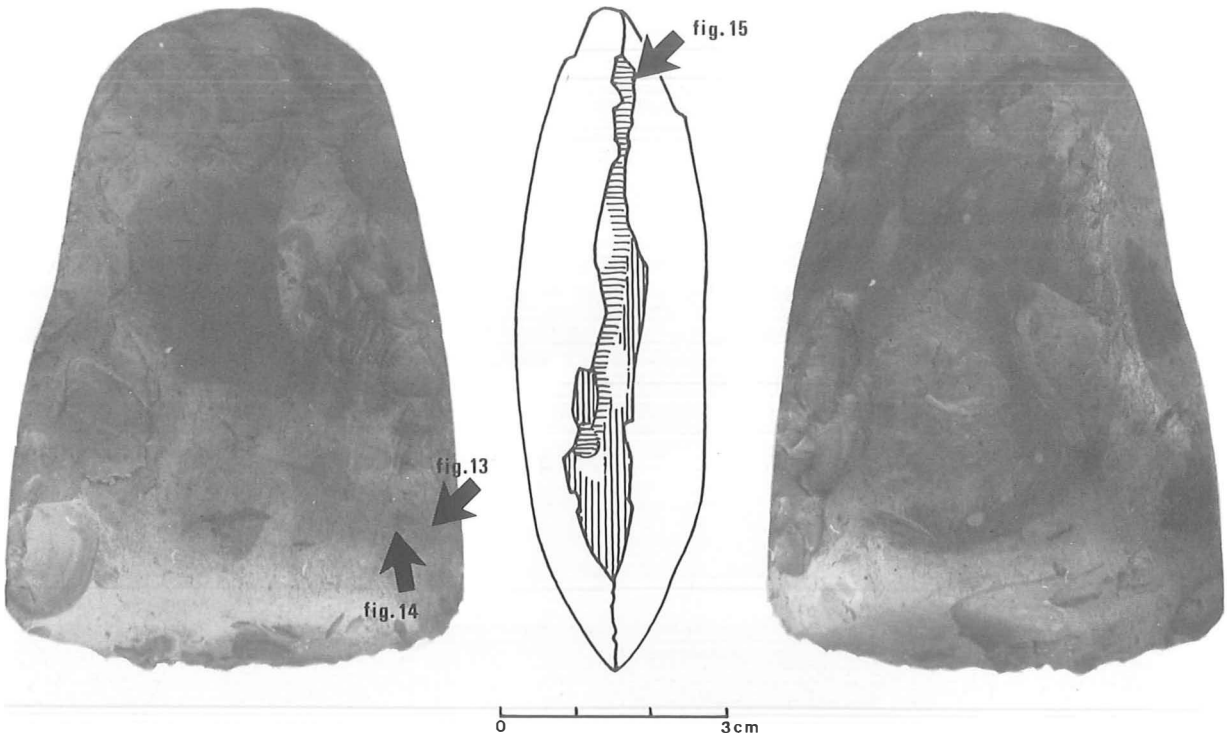


Fig. 12. One of the ground axes of Ravenswoud (FM 1968-1-8). The side-view shows the direction of grinding scratches present on that side. Arrows indicate the places where the photos shown on figures 13, 14, and 15 were taken. Scale in cm. Drawing by H.R. Roelink, photos B.A.I.

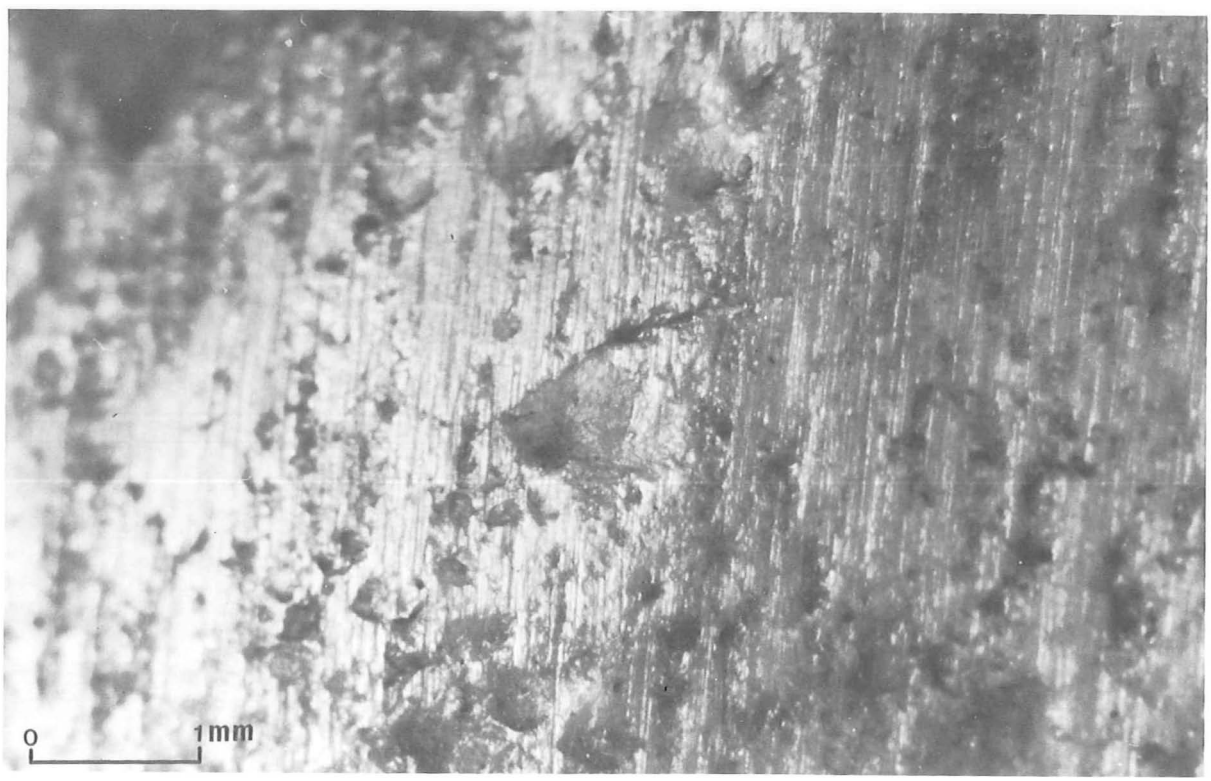


Fig. 13. Grinding scratches on one of the faces of an axe from Ravenswoud (FM 1968-1-8, see fig. 12). The scratches are very regular and strictly parallel, indicating that they were produced with the help of an electrically driven grinding machine. Photo taken by means of a stereomicroscope by D. Stapert.

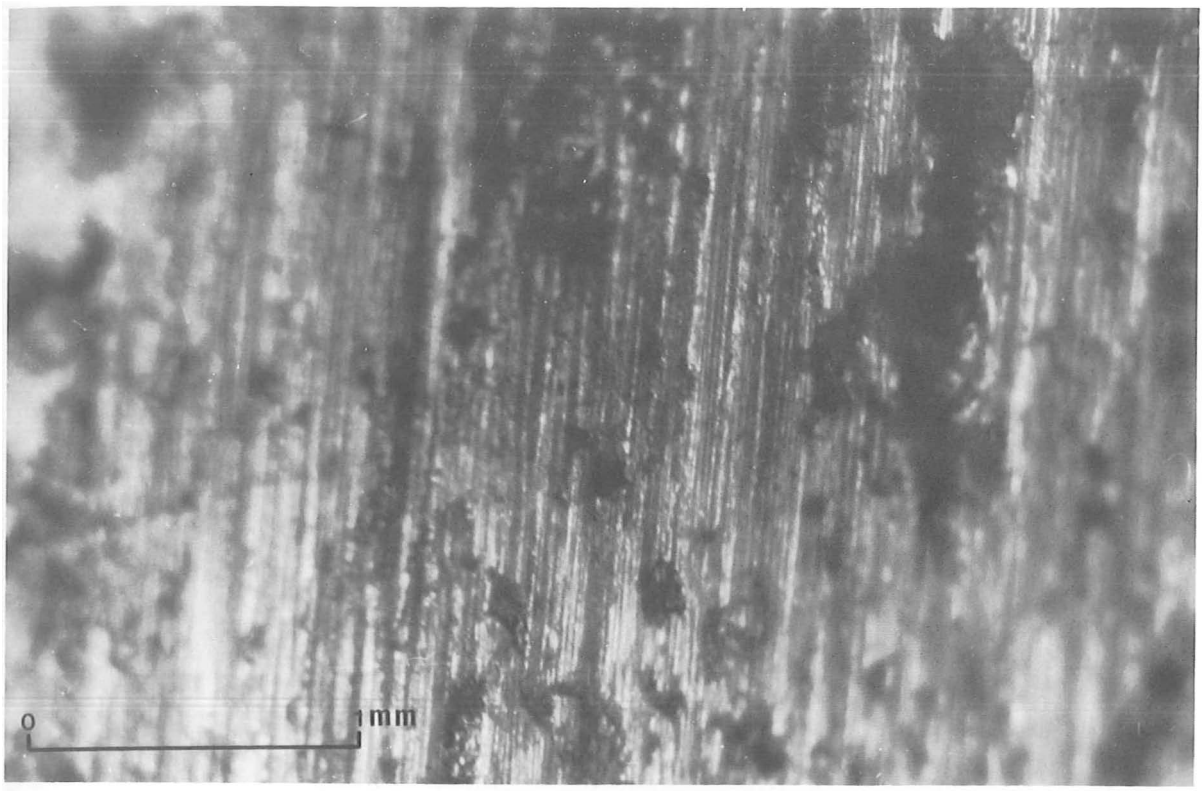


Fig. 14. Grinding scratches on one of the sides of an axe from Ravenswoud (FM 1968-1-8, see fig. 12). This photo is taken at a higher magnification than that shown in figure 13; it shows the same characteristics of grinding with an electrically driven grinding machine. Photo taken by means of a stereomicroscope by D. Stapert.

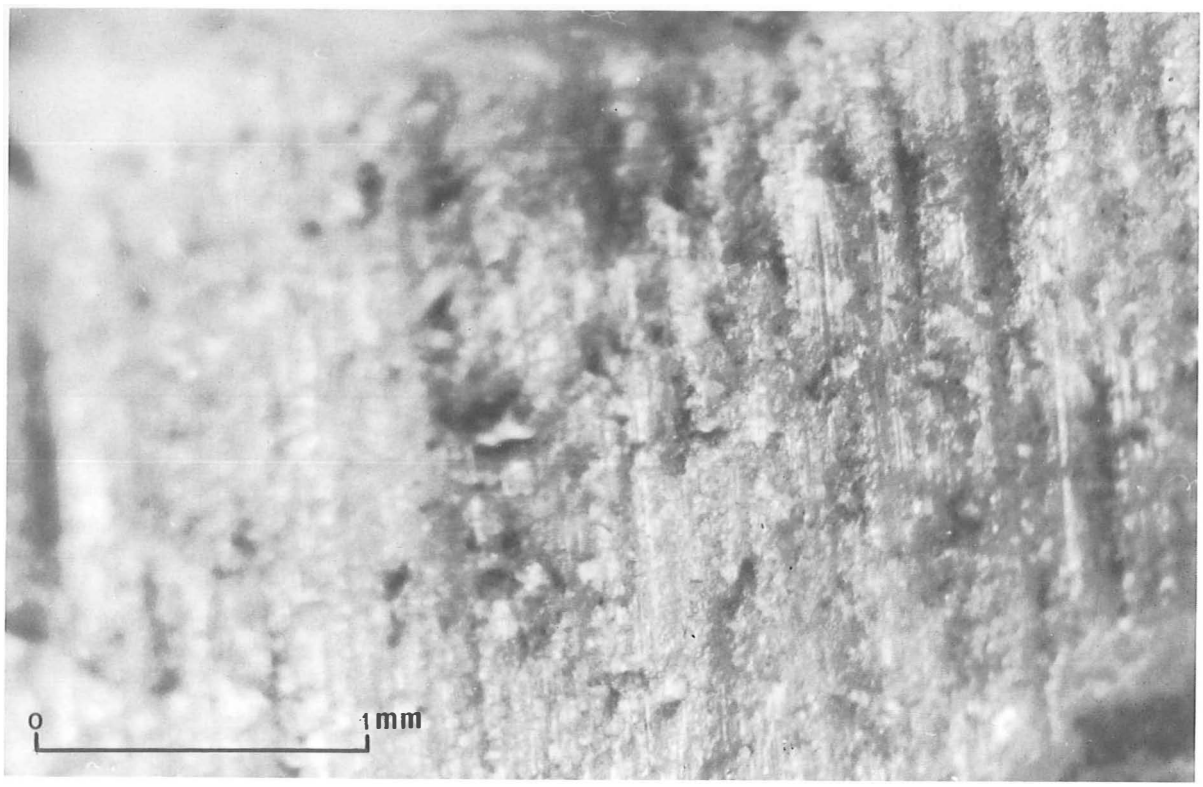


Fig. 15. Grinding scratches on one of the sides of an axe from Ravenswoud (FM 1968-1-8, see fig. 12). This part of the side of the axe has been ground *transversely*, i.e. at right angles to the longitudinal axis of the axe (see fig. 12). The scratches are similar to those on the faces of this axe shown in figures 13 and 14. Photo taken by means of a stereomicroscope by D. Stapert.

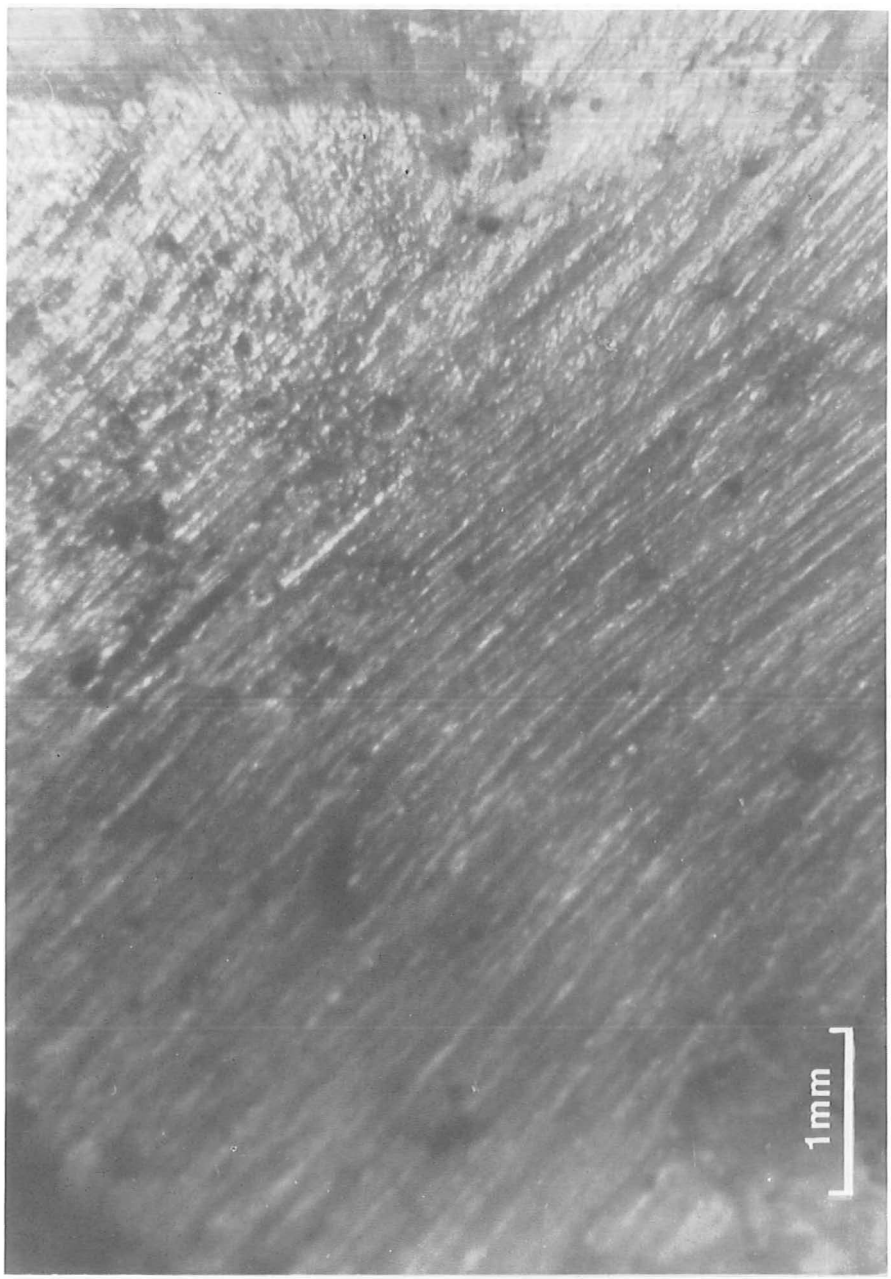


Fig. 16(a). One of the ground axes from Ravenswoud (FM1968-1-5). Scale in cm. Photo B.A.I. (b) Scratches on one of the faces of this axe, showing the characteristics of grinding with the help of an electrically driven grinding machine. Photo taken by means of a stereomicroscope by D. Stapert.

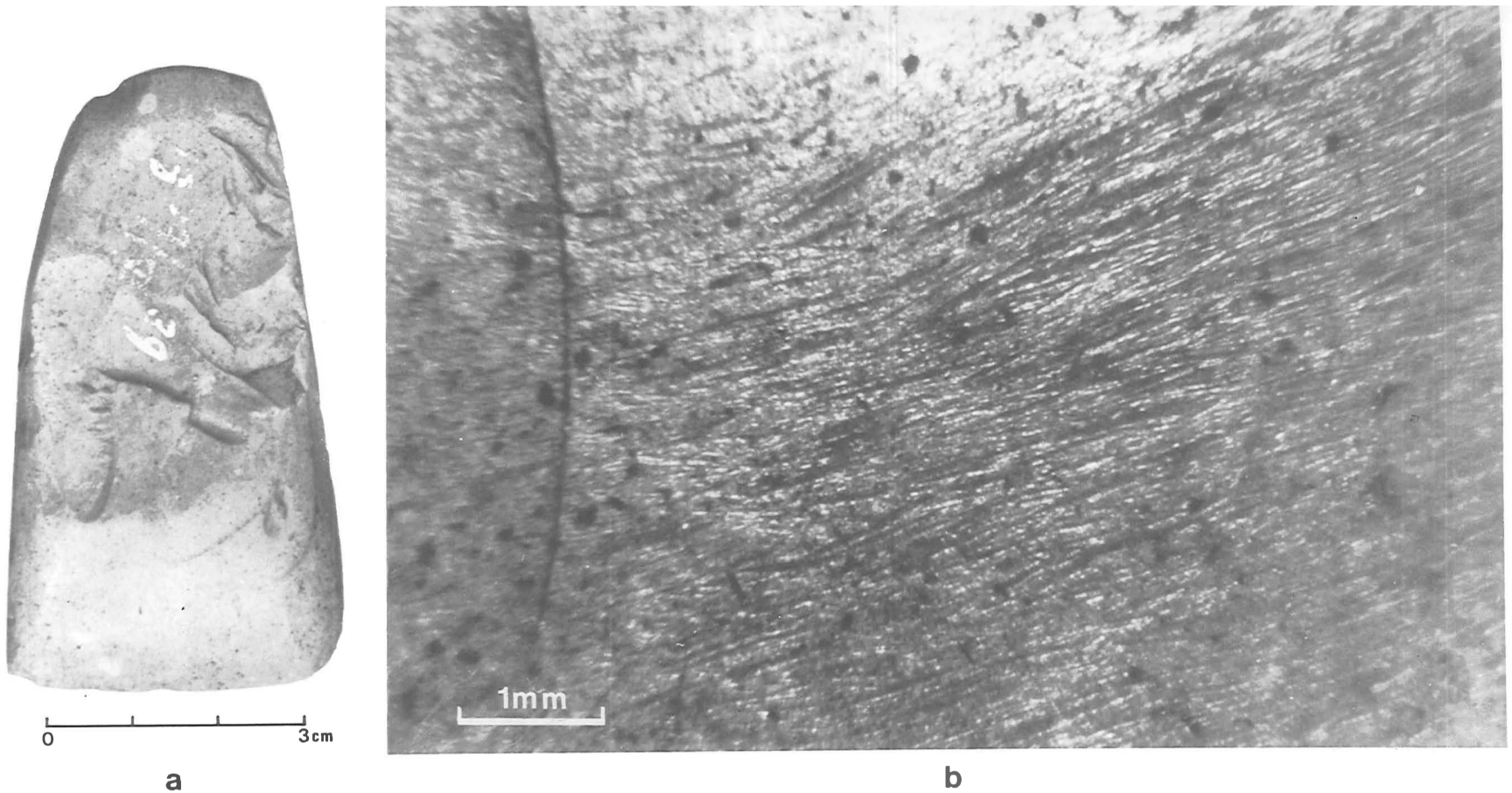


Fig. 17(a). Neolithic polished axe from a grave near Havelte, excavated by the B.A.I. (B.A.I. collection 1969/VI-39). (b) Scratches on one of the faces of this axe. These scratches are irregular and not strictly parallel, therefore clearly produced by hand. Compare with figures 13-16. Photo taken by means of a stereomicroscope by D. Stapert.

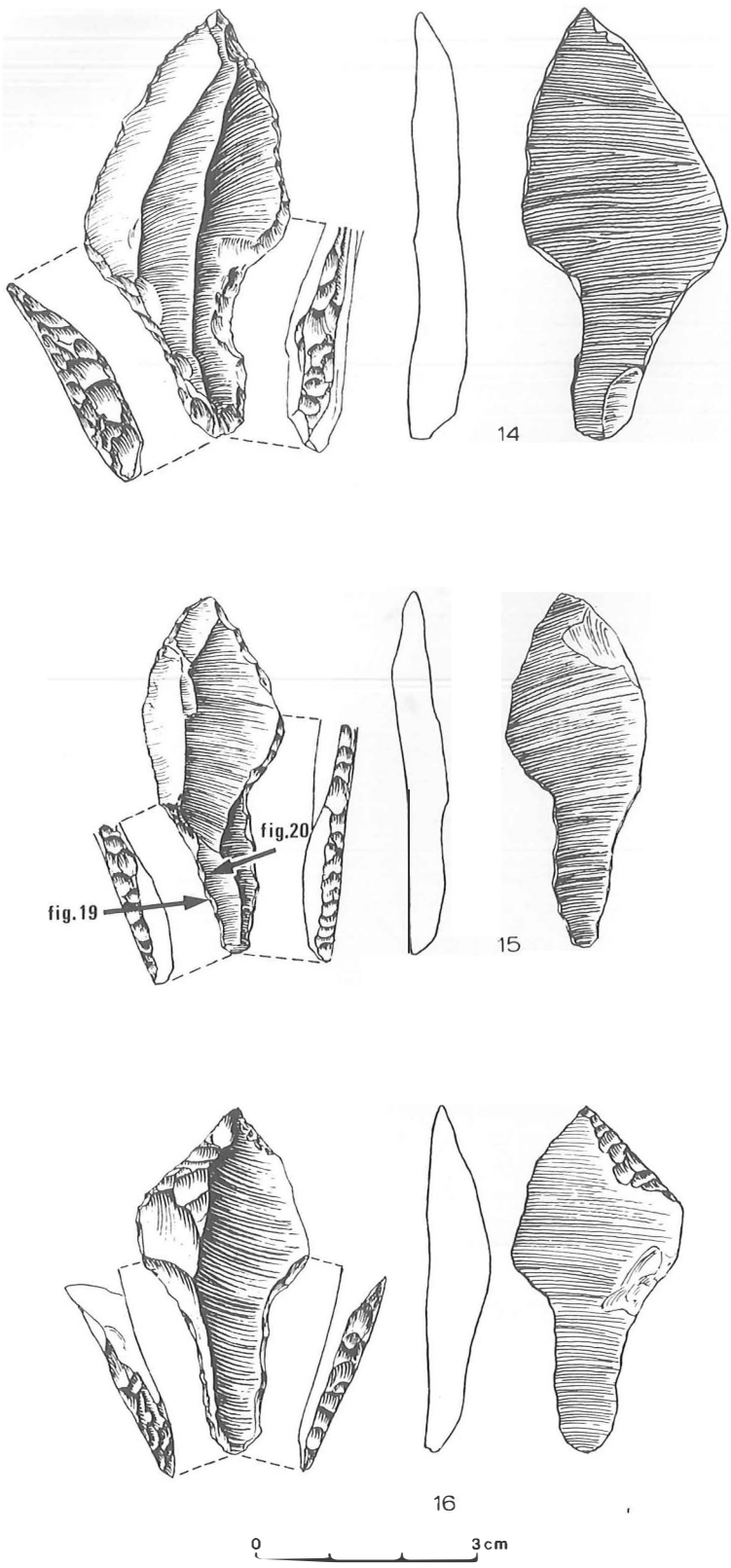


Fig. 18. The three tanged points from the *Federmesser* collection of 'Norgervaart' (from Paddayya, 1973). Arrows indicate the places on piece No. 15 where the photos shown in figures 19 and 20 were taken. Drawing B.A.I.

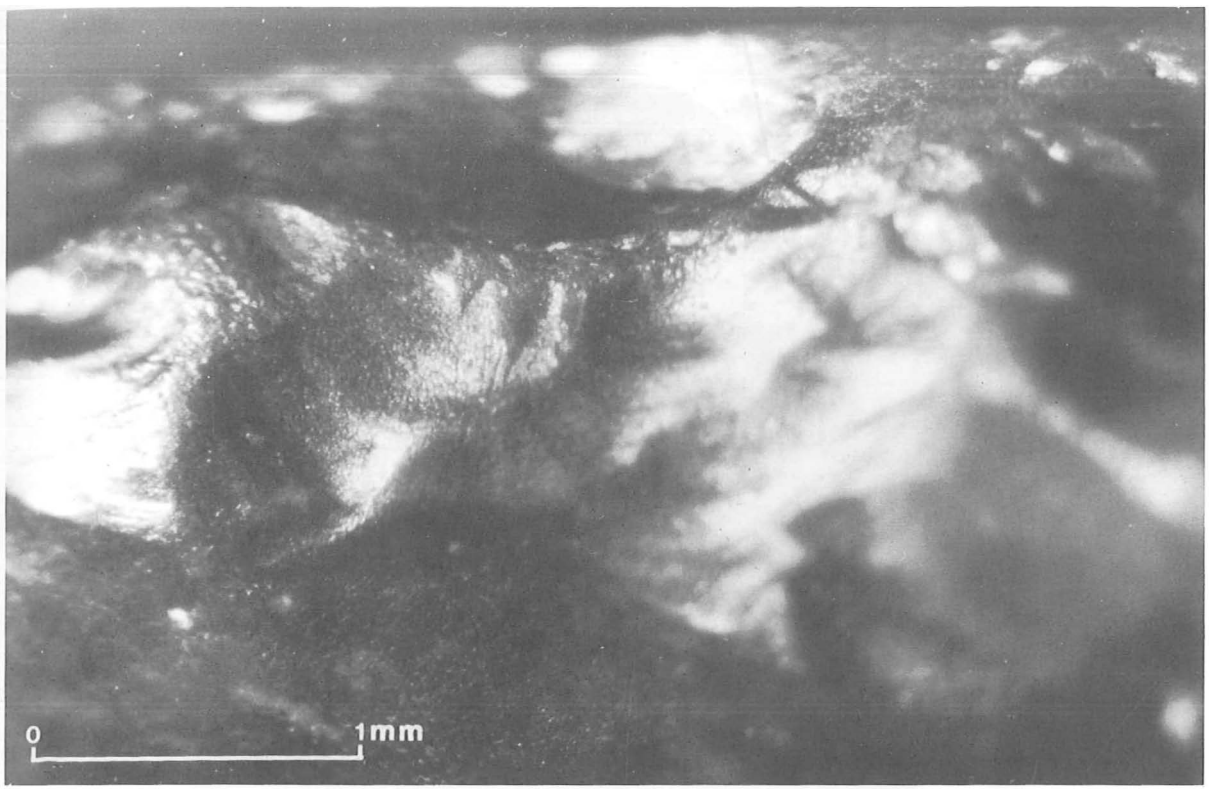


Fig. 19. Flattened ridges on one of the tanged points from Norgervaart (No. 15, see fig. 18). These flattened ridges are very similar to those occurring on 'Middle Palaeolithic' Vermaning stones and on the 'spearheads' of Ravenswoud. Photo taken by means of a stereomicroscope by D. Stapert.

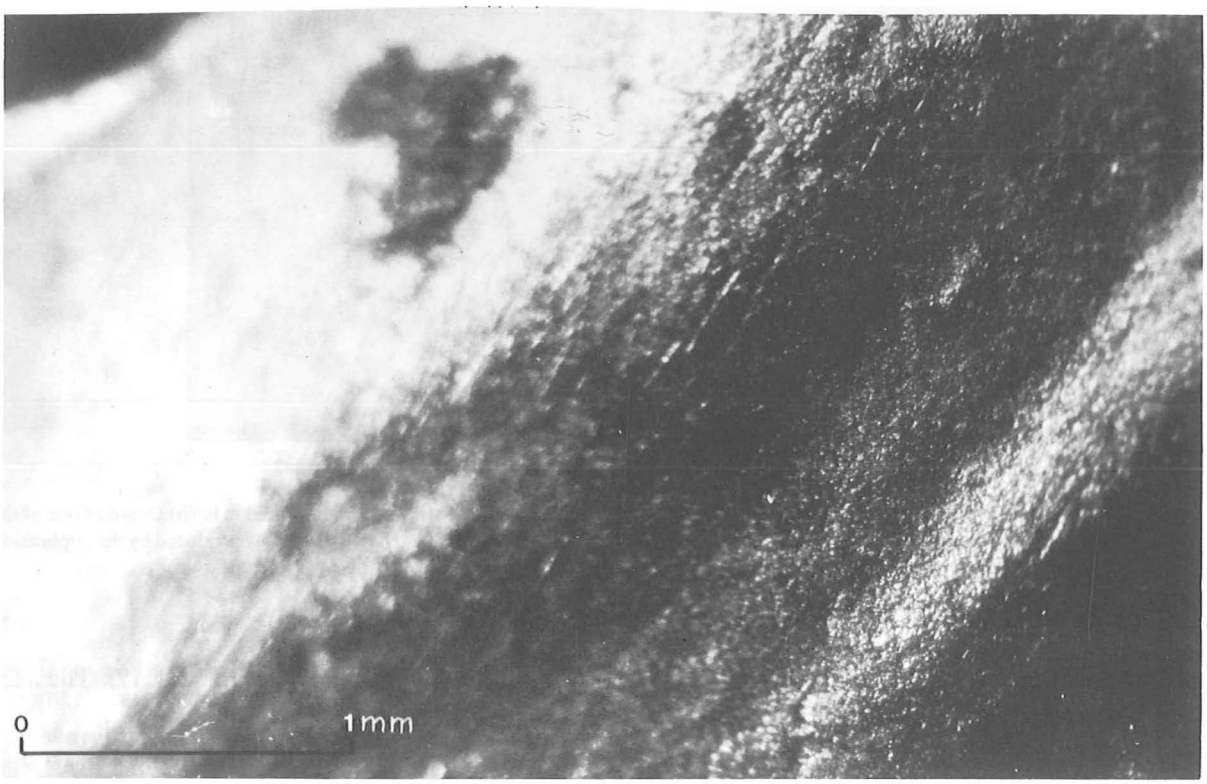


Fig. 20. Scratches occurring on one of the tanged points from Ravenswoud (No. 15, see fig. 18). These scratches are close to some flattened ridges, shown in figure 19. In several cases scratches of the same type occur near flattened ridges on 'Middle Palaeolithic' Vermaning stones. Photo taken by means of a stereomicroscope by D. Stapert.

Fig. 21(a). The 'handaxe from Blauwmeer'. Scale in cm. The rectangle shows the part that is represented in b. (b) Detail of one of the faces of this handaxe. Almost the whole surface of this handaxe is densely covered in scratches, presumably produced by the application of some hard type of emery-paper. Photos B.A.I.

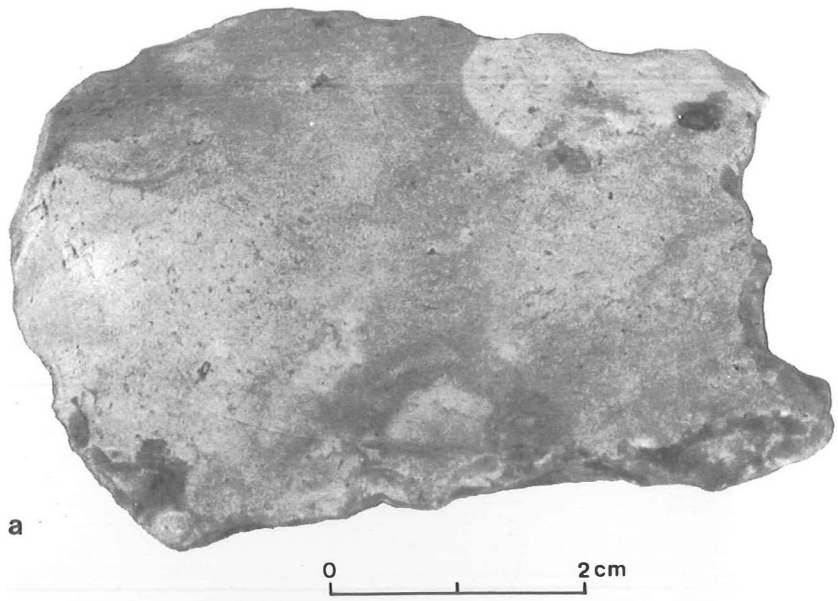
imported from Denmark (van der Waals, pers. comm.).

Genuine Neolithic polished axes, when studied with the help of a stereomicroscope, show grinding scratches with the following characteristics: the scratches are never strictly parallel, they often taper towards one end, and they are variable in coarseness and depth (see for example fig. 17). The axes from Ravenswoud that in my opinion have been ground with an electrically driven grinding machine show scratches that are strictly parallel over relatively large distances, and very homogeneous in terms of coarseness and depth, as can be seen in the microscope photos. Furthermore, their ground

b

surfaces show different sets of scratches with different directions.

A 'Late Palaeolithic' (*Federmesser*) collection from 'Norgervaart', sold by Vermaning to the Provincial Museum of Drenthe in Assen, was published by Paddayya (1973). Especially striking within this collection are three rather broad tanged points (fig. 18), that are in general uncommon with *Federmesser* material. These are forgeries of type 3: recently retouched authentic blades. The retouches break through the patination (this is evident especially with No. 16, which possessed a brown patina prior to the retouching), and must therefore have been recently created. In 1986 I studied these



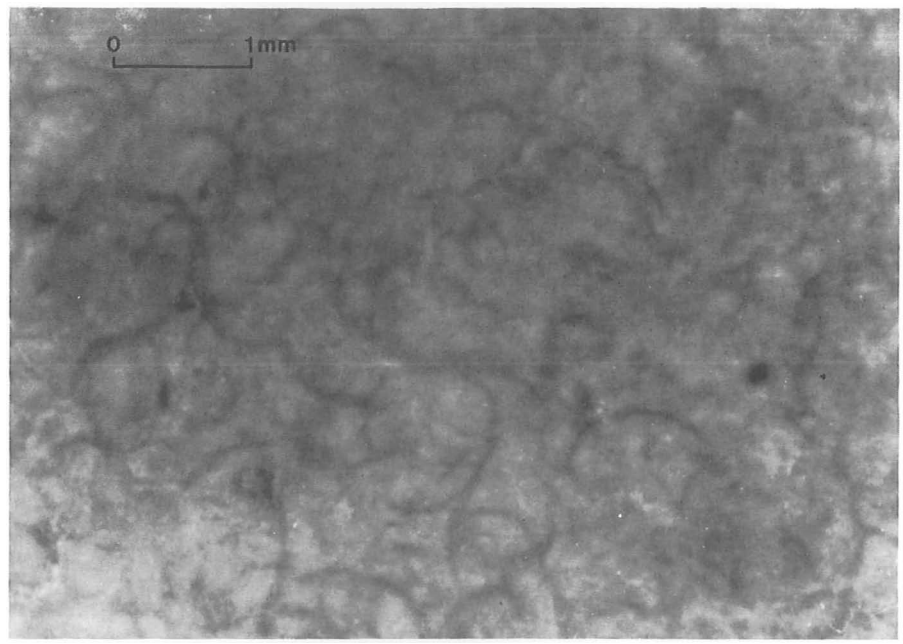


Fig. 22(a). One of the large rolled flakes in the museum 'It Bleekerhûs' in Drachten, said to come from 'Weperpolder'. See note 4. Photo Frisian Museum, Leeuwarden. (b) Many collision cones in the surface of this flake. Photo made by means of a stereomicroscope by D. Stapert.

pieces with the help of a stereomicroscope, and observed the same kind of flattened ridges and scratches (figs 19 and 20) as present on the 'Middle Palaeolithic' Vermaning stones and on the 'spear-heads' of Ravenswoud.

A special case is presented by the 'handaxe from Blauwmeer' (fig. 21), sold by Vermaning in 1973 (Stapert, 1976c). This piece does not show the flattened ridges that are so characteristic of most of the 'Middle Palaeolithic finds' of Vermaning. Almost the whole surface of the handaxe from Blauwmeer is densely covered in scratches (fig. 21b). In this case it is evident from the distribution of the scratches that they were not produced by an electrically driven grinding machine. It is very probable that this massive scratching was produced

by the application of some very hard type of emery-paper, or suchlike. Apart from the myriads of scratches the piece does not show any kind of surface modification, let alone natural modifications. Flints having been suction dredged and collected at the site, did not show this massive scratching.

If my interpretation of the flattened ridges is not accepted, one has to offer another theory, which will also have to explain the fact that they are not present on natural flints in bouldersand. Furthermore, it must be taken into account that not only 'Middle Palaeolithic' pieces show these flattened ridges, but also 'Late Palaeolithic' and 'Neolithic' ones. It might also be a good idea to offer an explanation for their only seeming to occur on material sold by Vermaning.

The Juridical Laboratory carried out interesting research concerning these flattened ridges (Witte, Verburgt & Groeneveld, report of March 18th, 1976). There are a few brown 'Middle Palaeolithic' Vermaning stones: the handaxe from 'Leemdijk' (fig. 6), and a scraper from 'Hijken'. These pieces do not possess brown patina, but are manufactured out of brown flint. The Juridical Laboratory observed that in these cases the flattened ridges were coloured red, and was able to produce such red-coloured ridges experimentally by grinding brown flints with an electrically driven corundum grindstone. A few quotations from the report follow:

> When brown flints are pressed gently against the grindstone, then no red discoloration occurs. Only when strong pressure is applied, with the result that the flints start to spark, and therefore have become very hot at the ground surface, the typical red discoloration is produced. The flint starts to 'bleed', so to speak. ... We assume that the red discoloration is caused by the high temperature produced in the grinding process, possibly resulting in water being extracted irreversibly from built-in iron-hydroxides, so that red iron-oxides are formed.

In the report of the Juridical Laboratory also one ground axe from 'Ravenswoud' is described as possessing traces of 'undoubtedly' mechanical grinding (with the help of an electrically driven grinding machine) on one of the sides – the parallel grinding scratches there do not run longitudinally, as is normal on genuine Neolithic axes, but across (see also Witte, Verburgt & Groeneveld, 1975) (figs 12 and 15).

As stated above, I do not consider the presence of traces of modern grinding on the 'Middle Palaeolithic' pieces of Vermaning as proof of their being newly made, but only as one of the indications. The ground ridges and artificial gloss must have been meant to make the implements look 'weathered', and therefore older than they are.

9. SOME CONCLUDING REMARKS

In this article my main concern has been to formulate some facts and arguments that in my opinion are indispensable if a realistic understanding of the Vermaning affair is striven for, and to show that my basic argument is of a geological nature. Of course, many of the issues raised could be reported upon in greater detail; for some aspects this has already been done (Stapert, 1976a; 1976b; 1982a), and for some others only in Dutch (Stapert, 1976c). Some aspects which to my mind are less important I have not considered worth going into (for example the absurd arguments used by Professor D. Goosen (Enschede) during the court hearings: he explained the ground ridges as the result of mudstreams that according to him deposited the boulderclay). For an overview of the Vermaning history, reference can be made to Waterbolk (1980). To my mind, the arguments I presented above must lead to the conclusion that the Vermaning stones dealt with in this article are forgeries.

10. ACKNOWLEDGMENTS

Thanks are due to Xandra Bardet (Groningen) for improving my English text and making an excellent job of it, to H.R. Roelink (B.A.I.) for technical assistance with the illustrations, and to Dr. H. Kars (R.O.B., Amersfoort) for critically reading a first draft of the manuscript.

11. NOTES

1. Since the discovery of the forgeries in 1975, a number of amateur archaeologists (especially P. Dijkstra, C.J.H. Fransen, J.E. Musch and A.M. Wouters, but many others also) have opposed my conclusions; their objections are formulated in a spate of articles, which can be found in their journal *Archeologische Berichten*. Most journalists chose to take the side of Vermaning; some of them wrote books on the affair (Hulst, 1975; Vermeulen, 1980; Terpstra, 1986). Very few Dutch colleagues outside Groningen have made public statements on the Vermaning stones. One of these is the archaeo-petrologist Dr. H. Kars of the *Rijksdienst voor het Oudheidkundig Bodemonderzoek* in Amersfoort (see e.g. *Drentse en Asser Courant*: September 13th, 1986; *Nieuwsblad van het Noorden*: October 22nd, 1987); he made it clear that he is of the opinion that my arguments are erroneous. His opinion is shared by Mr. A. Bruijn of the R.O.B. Several other colleagues have supported my conclusions: the late Professor C.B.M. McBurney, the late Professor F. Bordes (for example in a letter to Wouters, dated February 5th, 1981, of which he sent a copy to the Biological Archaeological Institute), Professor G. Bosinski (Cologne), Professor H.T. Waterbolk (Groningen), Professor J.D. van der Waals, and the geologist Professor G.J. Boekschoten (*Vrije Universiteit*, Amsterdam).
2. The finds of Hoogersmilde and Hijken are manufactured out of northern moraine flints. Within the material of Eemster, of which I could only study a small part, flints of other sources seem to be present; one flake probably consists of

Meuse flint (opaque, dark-coloured with small white spots).

3. Kars (pers. comm.) is of the opinion that my arguments are based on an 'axioma' that is incorrect (in a newspaper interview he speaks about my 'dogma'). He suggests that the existence of the Vermaning stones, which lack windgloss, should be taken as an indication that the bouldersand is not everywhere on the plateau characterized by the circumstance that most flints in it show windgloss (and other modifications). However, my arguments are based on empirical observations made also at sites indicated by Vermaning himself, for example at Hijken (Stapert, 1976a). Therefore, Kars' reasoning is unclear to me. In 1987 I visited sections at Hijken and in a quarry near Emmen (Griendsveen), studied by Kars. Again, it was clear that at both sites bouldersand flints were much more often heavily weathered than boulderclay flints.
4. In the Museum 'It Bleekerhûs' in Drachten (province of Friesland) several 'Middle Palaeolithic finds' of Vermaning are exhibited since 1987. One of these finds is a handaxe, said to come from 'Ravenswoud' (prov. of Friesland). This handaxe is comparable in all essential aspects with the material from 'Hoogersmilde' and 'Hijken', discussed in this paper (no patina or windgloss, but instead traces of working with the help of a modern grinding machine are present).
   More interesting are 5 other finds, said to have been found by Vermaning at various findspots in Friesland (Fochtelo 2 x, Weperpolder, Ravenswoud, Haule). Most of these finds were in 1984 offered for sale to the Frisian Museum in Leeuwarden (in 1984 the collection consisted of 6 pieces: 1 pseudo-artefact, and 5 large flakes, said to come from: Ravenswoud 3 x, Appelscha/Fochtelo, Weperpolder). These pieces were described in an unpublished report (D. Stapert, 1984. Kort verslag betreffende zes vuurstenen, door Vermaning in 1984 aan het Fries Museum te koop aangeboden. Groningen, unpublished).
   The material in the Museum in Drachten comprises 3 or 4 large white-patinated flakes, which are heavily rounded due to rolling (fig. 22a shows one of these flakes). These artefacts possess myriads of large collision cones (up to 1.5 mm in diameter), that cover the whole surface (fig. 22b). In all probability these flakes derive from a gravelly beach, where they must have been repeatedly subjected to surf action. Such finds are known, for example, from the eastern coast of Denmark, where many Neolithic finds are to be found. It can be excluded that such finds could be collected on the boulderclay plateau of Friesland, which is where they are said to have been found by Vermaning. It is obvious, therefore, that we are dealing here with findspot forgeries, a category not represented by other Vermaning stones, as far as I am aware.

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