

THE HAND-AXE FROM DROUWEN (PROVINCE OF DRENTE, THE NETHERLANDS) AND  
THE UPPER ACHEULIAN

Dick Stapert

CONTENTS

1. INTRODUCTION
2. THE SITE, GEOLOGY
3. THE HAND-AXE
4. THE EXCAVATION
5. COMPARISON WITH OTHER FINDS
6. SUMMARY
7. NOTES
8. REFERENCES

## 1. INTRODUCTION

It is apt that a definite publication on the hand-axe from Drouwen should appear in this issue of *Palaeohistoria*, dedicated to Prof. Dr. H. T. Waterbolk. In the first place Prof. Waterbolk gave his assistance during the investigation, for which I should like to thank him here. Moreover this find, which was discovered in 1978, could also be regarded as an additional piece of evidence with regard to a curious adventure which was largely shared by Professor Waterbolk and myself (Stapert, 1975a).

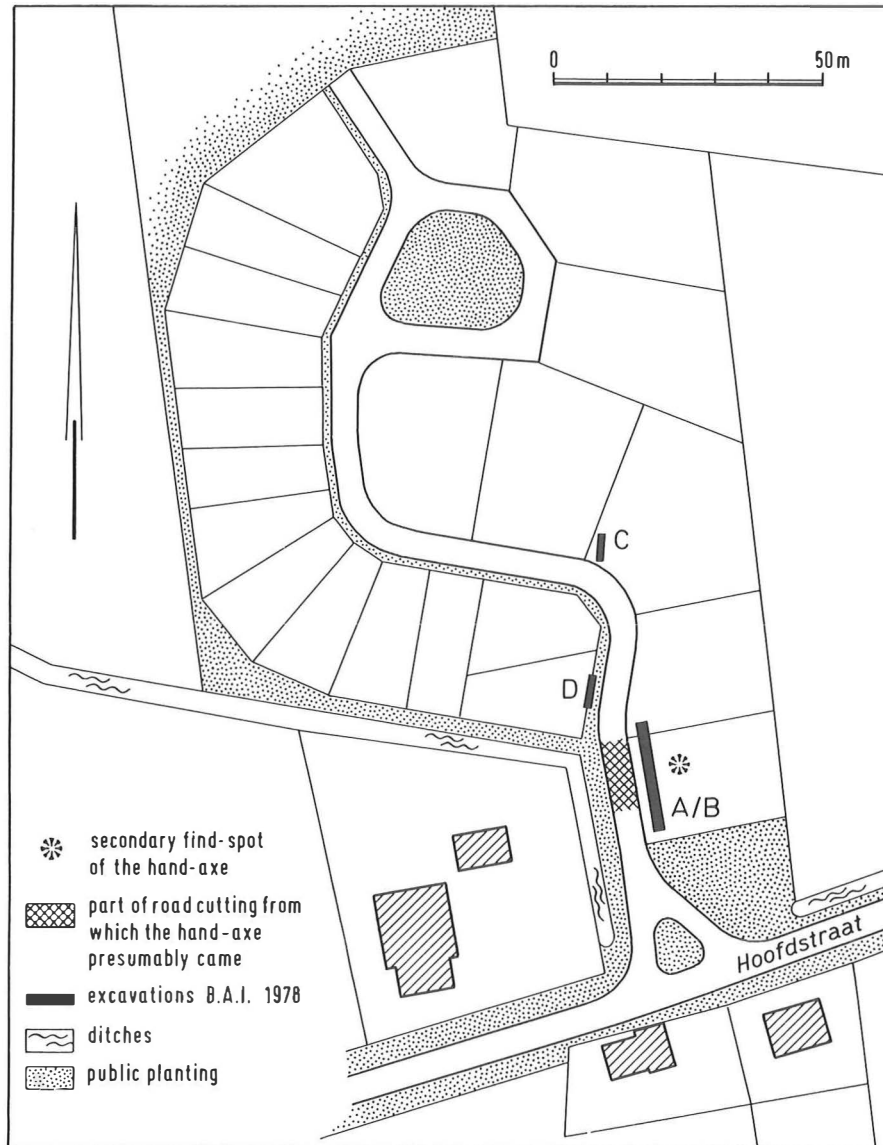
The hand-axe was found early in March 1978 by Messrs. H. and P. Kroezenga (of Gasselte), both of whom are active amateur archaeologists. They were kind enough to permit me to study the implement. In addition P. Kroezenga assisted at the excavation carried out at the spot where the find was

made. I should like to thank both of these gentlemen very much for their cooperation.

I should also like to thank the following persons who have contributed towards the realization of this article: H. R. Roelink and J. M. Smit (B.A.I.) for making most of the drawings; F. W. E. Colly (B.A.I.) for the photos of the hand-axe; the municipal authorities of Borger, for permission to carry out the excavation and for providing a ground-plan showing the proposed extension of Drouwen; Sheila M. van Gelder-Ottway for the translation into English; and Engeliën Rondaan-Veger for typing the manuscript. An interim publication on this find appeared in 1978.

Fig. 1. Map of Drouwen and surroundings. After the Hoogtekaart van Nederland, 1:10,000 (1969), sheets 12Gz and 12Hz. The small rectangular area in Drouwen is shown in fig. 2. Drawing by H. R. Roelink, B.A.I.





## 2. THE SITE, GEOLOGY

The find was made in the village of Drouwen (municipality of Borger) at a site where a road was under construction as part of a new-development scheme (see figures 1, 2). The find was made on a heap of loose soil which came from the cunette dug for the road. In view of the fact that the soil from the cunette was dumped sideways, the original find-spot can be ascertained to within a distance of 10 m (the cross-hatched area of figure 2). The coordinates of the site are as follow: 552,550/249,525 (Topographical Map of the Netherlands, 1:25,000,

Fig. 2. Map showing the-development scheme for Drouwen. The spot where the hand-axe was found is indicated, as well as that part of the cunette where the hand-axe must have come from, and the excavation trenches. Based on a map of the municipal authorities of Borger. Drawing by H. R. Roelink, B.A.I.

sheet 12G-Gieten). As is evident from figure 1, the site does not lie close to a valley fringe (as is the case with other sites where hand-axes have been found in the Northern Netherlands: see fig. 3), but is situated ca. 2 km to the west of the point where the Voorste Diep enters the Hunze valley (a melt-water valley dating from the Saalian).

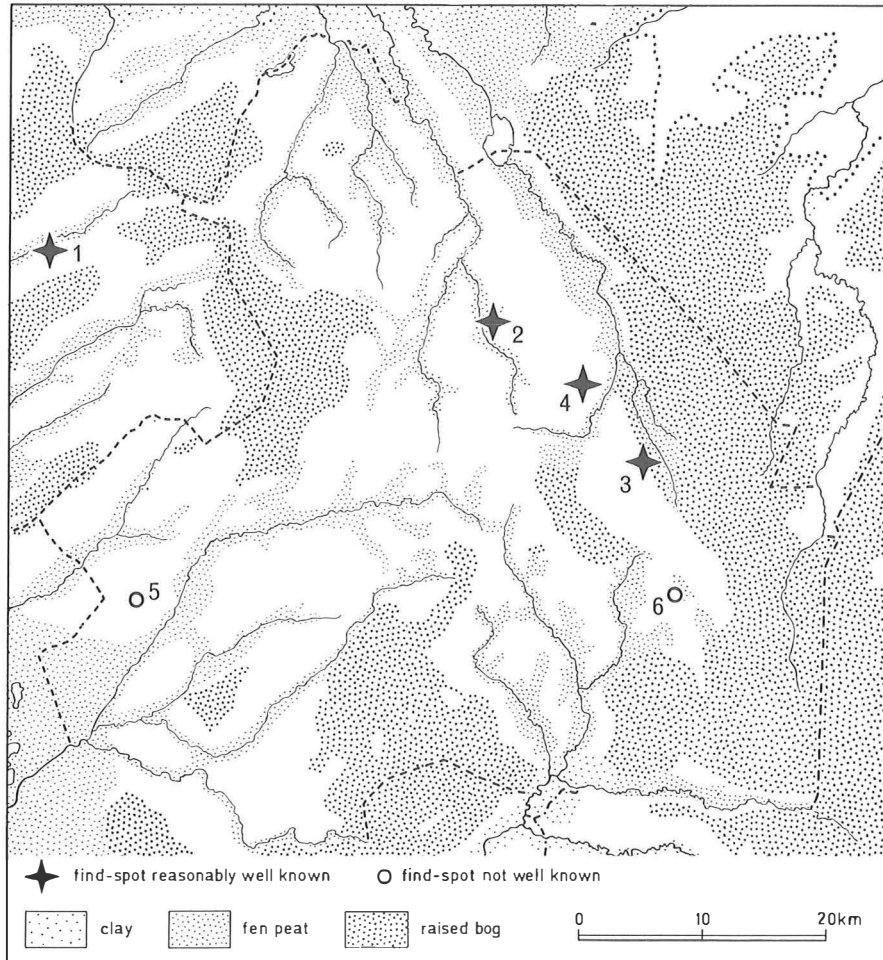


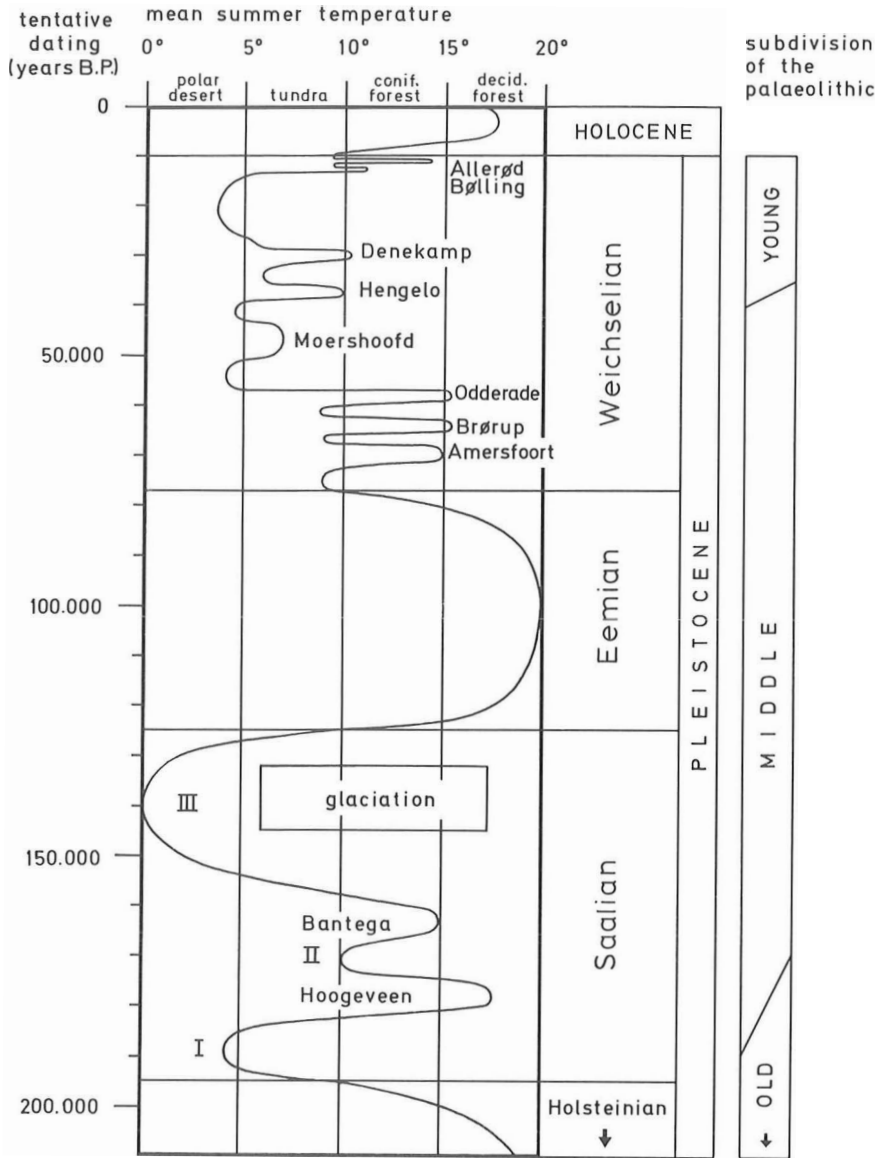
Fig. 3. The distribution of Middle Paleolithic finds in the provinces of Friesland and Drente (The find-spot of the point from Deldenerbroek, province of Overijssel, cannot be shown as its location is unknown). 1. Hand-axe from Wijnjeterp; 2. hand-axe from Anderen; 3. hand-axe from Exloo; 4. hand-axe from Drouwen; 5. point from Havelterberg; 6. side-scraper from Emmen. Drawing by H. R. Roelink, B.A.I.

At this spot boulder-clay (ground moraine from the Saalian) is present fairly close to the surface, and above it a layer of boulder-sand (out-wash residue from the boulder-clay). In digging the cunette the boulder-clay had been cut into, so that in addition to the topsoil, boulder-clay and boulder-sand ended up in the dump. The hand-axe must have come from out of the boulder-sand, in view of the natural surface-modifications present (see under 3). This also applies to the other Middle

Paleolithic finds known so far from the Northern Netherlands (Stapert, 1976a, b). Geologically it is not possible to give more accurate a date than the following: the hand-axe cannot be older than the end of the Saalian, nor younger than the Upper Pleniglacial of the Weichselian.

The Saalian has been the object of thorough study in the Netherlands, both in the field of geology (e.g. Ter Wee, 1962, 1966) and in that of pollen analysis (Zagwijn, 1973; Zagwijn and Van Staalduinen, 1975). There are known to have been three stadials during the Saalian. It was only during the last of these (III) that the northern half of the Netherlands was covered by land ice. In the Netherlands five static glaciation phases can be distinguished within this land-ice cover. The penultimate phase (d) left behind a row of ice-pushed ridges some of which are still visible in the land-

*The hand-axe from Dronwen*



scape in the southern part of the province of Drente (e.g. the Havelterberg). As for the last phase, several ice-pushed moraines which it produced are known from the extreme north-east of the Netherlands (fig. 5).

During the first part of the Saalian, sediments of the Formation of Eindhoven were deposited (locally up to 30 m thick or more, as the result of glacial pushing). These deposits are a periglacial formation dating from before the land-ice cover, and are mainly of aeolian or fluvio-periglacial origin. Pollen analysis has confirmed that they developed largely under pleni-glacial conditions, al-

Fig. 4. Climatic curve for the Late Pleistocene in the Netherlands, based on Zagwijn and Van Staalkuinen (1975). Some parts of the curve are only provisional: it is probable that in the future several small fluctuations will be discovered notably in the Saalian. Drawing by J. M. Smit, B.A.I.

though interstadial formations are also present (e.g. gyttja and loam layers). Zagwijn (1973) described 2 interstadials in the Saalian preceding the ice cover, namely the Hoogeveen interstadial and the Bantega interstadial (fig. 4).

The subdivision of the Saalian in the Netherlands as described above does not correspond to



Fig. 5. Saalian glaciation in the Netherlands, based on Zagwijn and Van Staaldin (1975) and Ter Wee (1962). 1. Maximal extent of land-ice; 2. Static phases of the front of the land-ice. The spot where the hand-axe from Drouwen was found is indicated by an asterisk. Drawing by J. M. Smit, B.A.I.

the subdivisions published by German authors. The latter speak of a “Drenthe phase” of the Saalian (ice cover) that should be placed in the first half of the Saalian (e.g. Woldstedt, 1958), while the “Warthe phase” is placed in the second half. According to the Dutch geologists the Warthe phase (when the land ice only reached as far as the surroundings of Hamburg) should be regarded as a final static phase of the land ice, which was of little importance climatologically. For it has become evident from pollen analysis that between the time when the ice receded from the Central Netherlands and the beginning of the Eemian, there were no significant climatic fluctuations (interstadials) (Zagwijn and Van Staaldin, 1975; see fig. 4).

In France the Riss is also subdivided into 3

stadials, with 2 distinct interstadials in between. It is clear from sedimentological research on fill in caves and abris that in France the Riss III was extremely cold – distinctly colder than Riss I and II – and also rather dry (Laville, 1973). This is also indicated by the faunal evidence and the results of pollen analysis. In Combe-Grenal Bordes excavated 9 layers from the *Achenléen supérieur* which date from Riss III. Not only the fauna (the dominant species being reindeer) but also the pollen and sedimentological analyses indicate extreme conditions (Bordes, Laville and Paquereau, 1966; Bordes and Pratt, 1965). On the basis of these observations it would appear that the views of the Dutch geologists are not improbable, namely that there was maximal ice cover during the last stadial

of the Saalian and – at least in the Netherlands – no ice cover at all during earlier stadials.

To summarize, with regard to the *terminus post quem*, finds in Drente from the boulder-sand (thus from above the boulder-clay) cannot be older than the last part of the final stadial of the Saalian. In terms of absolute figures it can probably be said that such finds date at most from the last 5000-10,000 years or so of the Saalian. It is not inconceivable that also the deposits of the Formation of Eindhoven contain Middle Paleolithic finds, which would then date from the first part of the Saalian. No such finds have been discovered so far.

The boulder-sand can be regarded mainly as an outwash residue of the boulder-clay. In view of the abundance of pebbles in this “layer” it can be estimated that 1-2 m of the original boulder-clay deposit has disappeared (also, the presence of an “Eemian soil” on the boulder-clay has never been convincingly demonstrated). It is probable that the layer of boulder-sand now present was formed mainly during the last glacial. Deposits from the Eemian would have disappeared almost completely during a phase of severe erosion at the beginning of the Weichselian. The most probable dating for this erosion phase is the stadial between the Odderade and Moershoofd interstadials (see fig. 4) (Ter Wee, 1966 and personal communication; Stapert, in preparation). Only locally would there be any remnants, dating from the last part of the Saalian (and/or Eemian), that ended up in the boulder-sand (e.g. Maarleveld, 1960).

To summarize, it can be said in general that the boulder-sand on the plateau of Drente probably dates for the most part from the last glacial. It should be borne in mind, however, that flints dating from the end of the Saalian or the Eemian may have ended up in the boulder-sand. In general it will be probably impossible to distinguish clearly between finds dating from the Saalian, the Eemian or the first part of the Weichselian as far as the degree of patination is concerned, so for the meanwhile no more precise a date can be given than the above-mentioned. It is possible however that the presence of wind gloss on all Middle Paleolithic finds from the Northern Netherlands indicates a dating within a glacial period, and not within an interglacial<sup>1</sup>).

### 3. THE HAND-AXE (figures 6 and 7)

The hand-axe is made of semitransparent grey bryozoan flint. This type of flint is generally rather common in the boulder-clay, so there is no reason to suppose that the artefact has been transported any great distance.

The following natural surface modifications can be observed on the hand-axe: wind gloss (developed to about the same extent on both faces), small pits, brown patina, scratches and small pressure cones (both of which result from periglacial soil movements in a stone-rich matrix; these features are visible with a stereomicroscope at  $25 \times$  magnification, and are mainly present in the middle of face II), cryoturbation retouch (fairly slight), rounded ridges (not the result of fluvial action, but probably the result of solution processes in the soil), and severe secondary frost-splitting.

As a result of the last-mentioned phenomenon large fragments have disappeared from both faces, and the base is no longer present either. These secondary frost-split surfaces are shown on the drawing as grey, and with stippling. These frost-split faces are clearly patinated to a lesser degree than the rest of the surface; those on face II are more heavily patinated than those on face I, and thus may be older than the latter. Several old frost-split surfaces also present (dating from before the production of the hand-axe) are also shown as grey, but without stippling. These old frost-split faces show the same surface modifications, sometimes more intense, as those faces which originated when the hand-axe was made. Moreover cracks caused by secondary frost action can be seen in several places in the hand-axe, e.g. clearly in the middle of face II.

This pattern of surface modifications corresponds entirely to that of the other Middle Paleolithic finds from the Northern Netherlands (Stapert, 1976a, b). They indicate that the finds must originate from the boulder-sand, because in this layer (natural) flints exhibit without exception the same surface modifications, in varying combinations. Patinated flints with wind gloss are not present in the boulder-clay. The fact that wind gloss is generally present on Middle Paleolithic finds in the Northern Netherlands suggests that they were left behind during a glacial, because wind gloss (largely the result of the action of wind-blown sand) presu-



Fig. 6. The hand-axe from Drouwen. Photo by F. W. E. Colly, B.A.I. Scale 1:1.

mably develops in an environment with a wide-open type of vegetation.

The top of the hand-axe was broken off long ago. The surface of the break shows the same surface modifications as the surface of the rest of the hand-axe, indicating that these surfaces arose at about the same time. It is therefore possible that the break occurred as the result of use of the hand-axe.

In the drawing an attempt has been made to give a reconstruction of the original form of the hand-axe, although the shape of the base cannot be ascertained precisely. The reconstructed form is a symmetrical *cordiforme*, with a rounded cutting base.

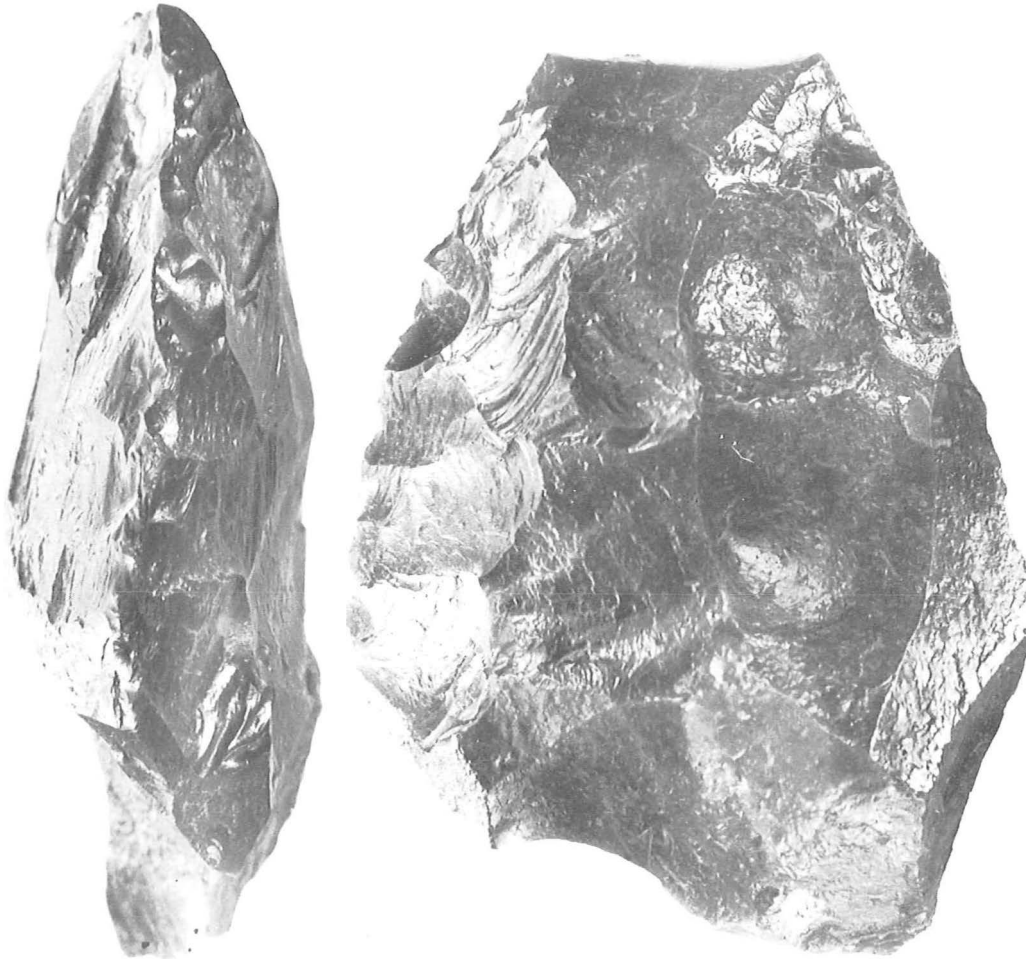
The maximum length of the hand-axe is 12.15 cm. The measurements of the *reconstructed* hand-axe

are as follow:

maximum length (L.)	:	15.2 cm
maximum width (m)	:	9.6 cm
maximum thickness	:	4.3 cm
width in the middle (n)	:	8.8 cm
width at $\frac{1}{4}$ distance from the top	:	5.8 cm
width at $\frac{1}{4}$ distance from the base	:	8.9 cm
distance between the point of max. width and the base (a)	:	5.8 cm
angles of the side-edges (measured in the middle across 1 cm),		
left (of face I)	:	ca. 65°
right	:	ca. 65°

This gives the following indices (according to





Bordes, 1961):

L/a : 2.62  
n/m × 100: 92.05  
L/m : 1.59

According to Bordes the hand-axe can therefore be classified as a *cordiforme allongé*, although it borders closely on the *cordiformes vrais* (into which category it would fall if the reconstruction had been slightly less oblong).

Although the hand-axe is fairly thick, it has been worked rather regularly. The side-edges are straight as viewed from the side. Most of the flake negatives are fairly flat, without deep percussion-bulb impressions, so probably a soft percussion

technique was used, in any case in the finishing-off stage. The hand-axe is certainly not made out of a flake, in view of the presence of cortex remains or old frost-split surfaces on both faces.

The hand-axe has not been worked over the whole surface: on face II on the left near the base a cortex remnant has been preserved, while on the right larger parts of old frost-split surfaces are still present. Also near the base on face I a small fragment of an old frost-split surface is visible. It is therefore certain that the base was partly unworked, and likewise part of the left side (of face I). In view of the presence on face II of flake negatives and retouch, coming from the base, a cutting base was nevertheless decided upon in making the reconstruction.

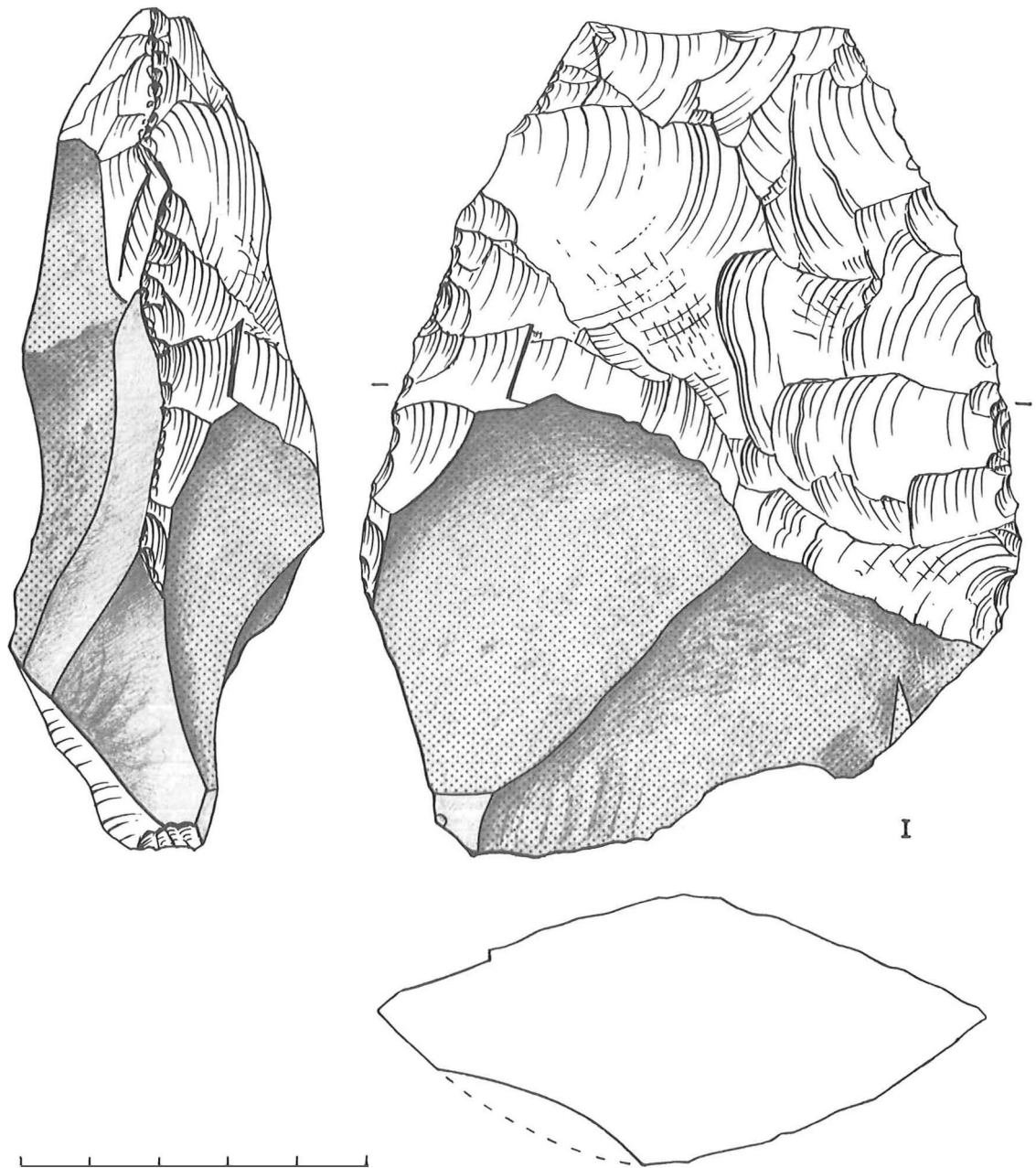
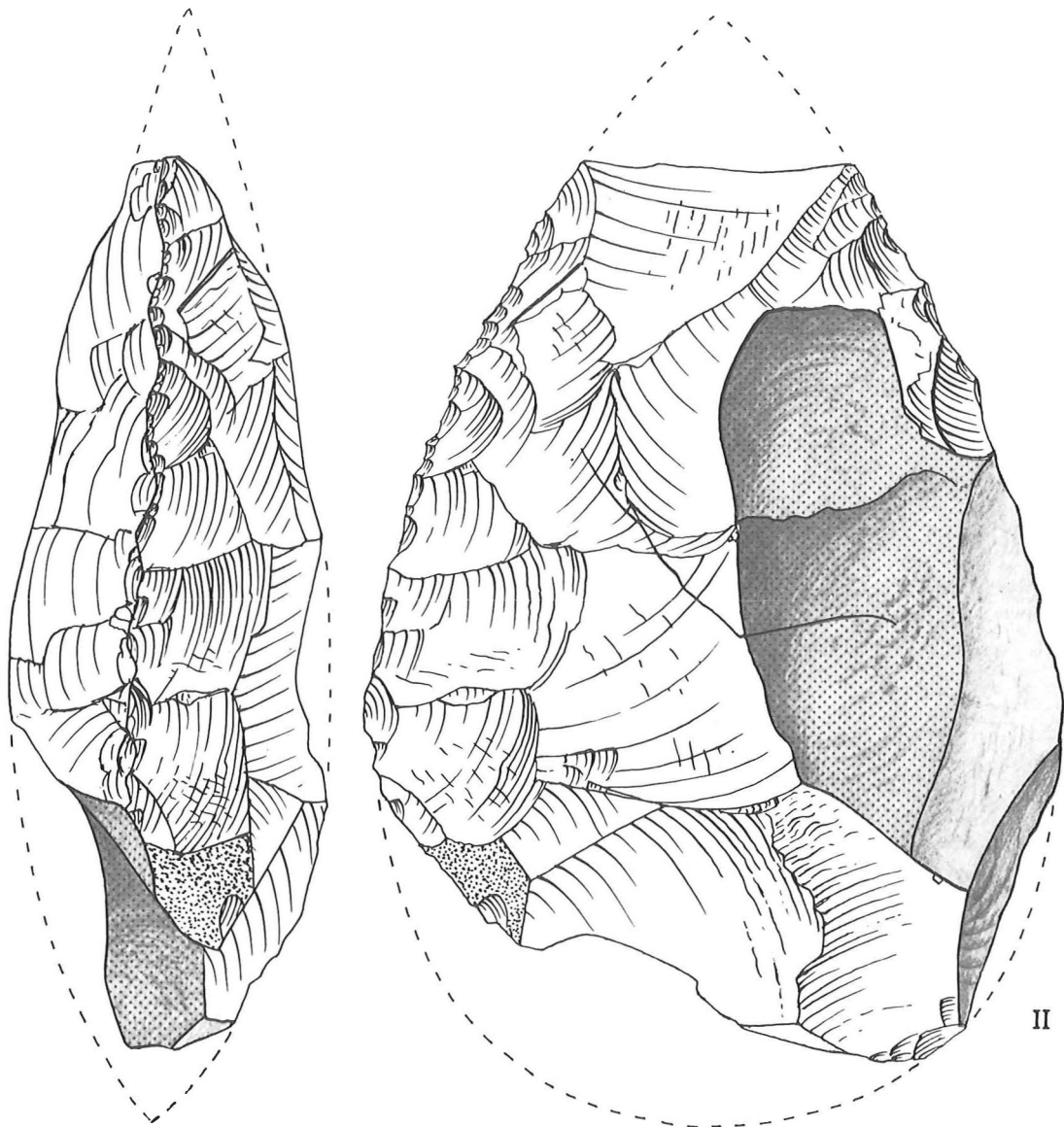


Fig. 7. The hand-axe from Drouwen. Drawing by H. R. Roelink, B.A.I. Scale 1:1.



#### 4. THE EXCAVATION

From April 24th-28th 1978 an excavation was carried out at the site where the find was made (persons taking part: A. L. van Gijn (student), D. Kielman (student), A. Meijer, W. A. B. v. d. Sanden (student), D. Stapert, J. H. Zwier (all B.A.I.); J. Beuker (Provincial Museum, Assen), P. Kroezenga, E. Ameling, W. Mencke). Alongside the cunette, near the (secondary) find-spot of the hand-axe, a trench was cut 17 m long by 2 m wide (A/B on fig. 2). Only part of this area (11 m by 2 m)

could be investigated, as the remaining part had been recently disturbed to a depth below the top of the boulder-clay.

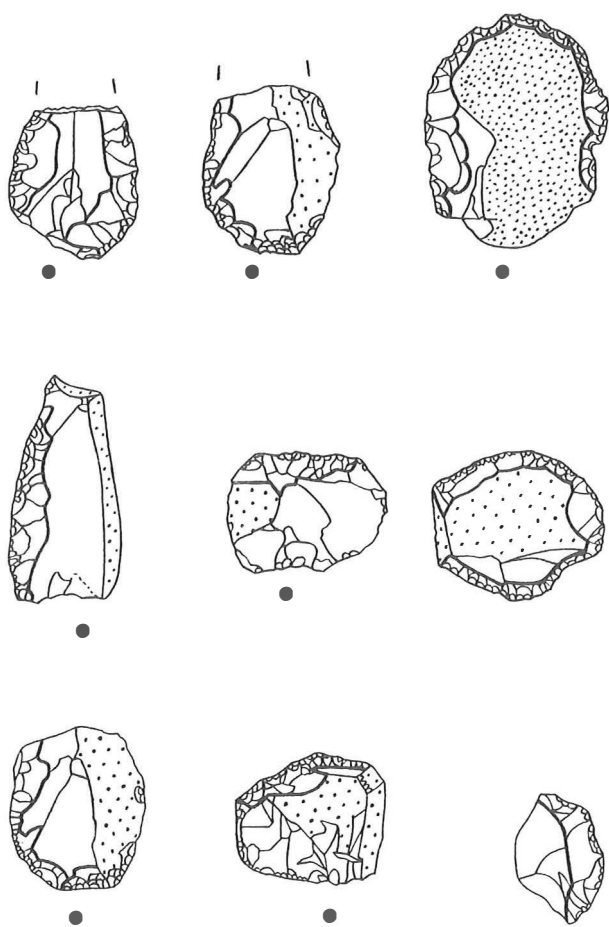
The observed stratigraphy was as follows (going downwards):

loose soil	
from elsewhere	0- 40 cm under the surface
topsoil	40-100 cm under the surface
boulder-sand	100-125 cm under the surface
boulder-clay	125-deeper than 150 cm under the surface.

The boulder-sand was solidified here as the result of iron infiltration (B-horizon of a heath podsol), so this sediment was very hard. In the boulder-sand there were very many pebbles of granite and similar material, and remarkably few (natural) flints, which were moreover fairly small in general. Evidently the proportion of granite to flint in the boulder-clay varies from place to place. It is thus unlikely that the hand-axe was made at the spot where it was found, as it would have been difficult to find large and intact pieces of flint in the immediate surroundings.

Nothing was found in the excavation trench that could possibly be identified as Paleolithic. Nor were there any Paleolithic finds in two small test trenches located elsewhere in the same area (C and D in fig. 2).

Many flint artefacts, probably dating from the



0 2 cm

Drouwen 1978

Late Neolithic or the Early Bronze Age, were found scattered over the whole new-development area, but especially in the north-western part. Large numbers of small flake-scrapers were especially present, as often is the case at sites of that period (fig. 8). As for two other flint finds from the area (found by P. Kroezenga and H. D. Veen), one supposedly a flake and the other a scraper-like frost-split piece of flint, it is by no means certain in my opinion that these are artefacts; several features of these pieces of flint indicate that they may be pseudo-artefacts.

In view of the negative results of the excavation, and of the fact that very few large pieces of flint occur in the boulder-clay at this spot, the hand-axe can probably be regarded as an isolated find, without any "accompanying" industry. Similarly at several other sites where hand-axes have been found (Anderen, Wijnjeterp) no other finds came to light, despite repeated searching. We must therefore assume, provisionally, that isolated hand-axes constitute a separate category of finds. It is possible that the hand-axe from Drouwen was left behind by its owner because the point broke off during use. This could indicate that hand-axes were sometimes carried around by their owners, probably on hunting trips. In this connection it is interesting to note, that on 2 Acheulian hand-axes from Hoxne Keeley (1977) found traces of use which are characteristic of butchering implements.

##### 5. COMPARISON WITH OTHER FINDS

According to Bordes (1961) *cordiformes vrais* occur in France from the *Acheuléen moyen* on, in the *Acheuléen supérieur* and especially (sometimes in large numbers) in the *Moustérien de tradition acheuléenne* (M.T.A., dating from the first half of the last glacial). The hand-axe from Drouwen is however rather large and thick (reconstructed length 15.2 cm). The *cordiformes* of the M.T.A. are mostly smaller and rather flat, and often appear to have been made out of flakes (see e.g. Pech de l'Azé – Bordes, 1954 and 1955; 1972; Le Moustier – Bosinski,

Fig. 8. Small scrapers of late Neolithic or early Bronze-Age date, collected from the new-development area in Drouwen. Drawing by D. Stapert, B.A.I. Scale 1:1.

1967; Marcoing – Tuffreau, 1971; the Seine valley – Bordes, 1953; the Somme valley – Commont, 1914). Nevertheless in the publication of Bordes (1961) large *cordiformes* (but without *arête torsée*) are ascribed to the M.T.A. (e.g.: Saint-Just-en-Chaussée (61,2), L: 14,5 cm; Trou de l'Abîme (62,3), L: 16 cm; Issigeac (75,4), L: 15 cm). Some very large triangular hand-axes, ascribed to the M.T.A., are also illustrated by Bordes.

*Cordiformes allongés* also occur in France from the *Achenléen moyen* on, but far more frequently in the *Achenléen supérieur* than in the M.T.A. Those which do belong to the M.T.A. are mostly again rather small.

From a typological viewpoint the hand-axe from Drouwen fits best, according to the French authors, into the *Achenléen supérieur*, seeing that many larger *cordiformes allongés* occur especially within this period. It seems far less likely that the hand-axe belongs to the M.T.A., although this possibility cannot be excluded. In the north of France the *Achenléen supérieur* occurs in loess profiles at the base of the last *limon ancien*, i.e. Riss III (Bordes, 1953; Bordes et Fitte, 1949; Tuffreau, 1976). In south-western France too the *Achenléen supérieur* is dated in the 3rd stadial of the Riss (e.g. Combe-Grenal: Bordes *et al.*, 1966). Also the (rarer) finds from the Eemian in France are attributed to the *Achenléen supérieur*, while there appears furthermore to be some evidence for an *Achenléen final*, at the end of the Eemian or the beginning of the Würm, that shows great similarities typologically with the M.T.A. (Tuffreau, 1976).

In Germany the *Jungachenléen* was defined by Bosinski (1976), mainly on the basis of the finds from the Salzgitter-Lebenstedt excavation (Tode *et al.*, 1953). Additional important groups of finds include: Hannover-Döhren (Jacob-Friesen, 1949; Bosinski, 1967), Rethen (*op. cit.*) and Herne (Kahrs, 1925; Bosinski, 1967). For Salzgitter-Lebenstedt a C<sub>14</sub>-dating was established in an early phase of the Weichselian (GrN-2083: 55,600 ± 900); also dating from the same time geologically, according to Preuil (1953), are the fluviatile deposits in which the finds occur. Yet, after initial hesitation (1963, 1967), Bosinski (1975, 1976) concluded that the finds probably date from the Saalian as is the case with the finds from Markkleeberg (Grahmann, 1955).<sup>2</sup> Bosinski's opinion is based partly on finds

from layer B<sub>5</sub> in Rheindahlen (Thieme, 1978), which have been dated to the beginning of the Saalian. The finds from this layer are however so few in number that they cannot be ascribed with certainty to Bosinski's *Jungachenléen* (Bosinski, 1975, 1976). Klaus Grote (1978), who carried out a re-excavation in Salzgitter-Lebenstedt, is however more inclined towards a dating in the early Weichselian. The new C<sub>14</sub>-datings yet to be established may provide a solution to this important problem.

Characteristic *Leitformen* for Bosinski's *Jungachenléen* include *langgestreckter Faustkeile*, *massive Faustkeile*, *blattförmige Schaber*, larger Levallois points and also Levallois cores for blades. *Massive Faustkeile* are all hand-axes that are longer than 10 cm, excepting *Micoquekeile* and *langgestreckter Faustkeile*; they are often more or less triangular, and are mostly better finished only at the point and along the sides. In my opinion this very broad type can obscure sometimes essential differences between various sites. The hand-axe from Drouwen falls within this category, and could thus be attributed to Bosinski's *Jungachenléen*.

According to Bosinski (1967) the M.T.A. is hardly represented in Central Europe. The finds from Achenheim IV are attributed to this tradition. Small and flat hand-axes, mainly *cordiformes* and *triangulaires*, are characteristic of the tradition (especially in an early phase). In a later phase there are fewer hand-axes (*cordiformes*) but more backed blades and also "Upper Paleolithic" types, such as scrapers (sites with a comparable typological development in France include Peche de l'Azé and Le Moustier; see also Bordes, 1968). In general the M.T.A. appears to have a westerly distribution, in flat and low-lying regions (see the distribution map in Collins, 1970, who discusses an M.T.A. site in England at Oldbury; see also Mellars, 1974). The M.T.A. appears to be represented in Belgium, too, and there (as the Northern France) the M.T.A. cannot always be easily distinguished from the *Achenléen supérieur* or *final* (Ulrix-Closset, 1975). Sites attributed to the M.T.A. include that of Sainte-Walburge. The site of Grotte de l'Hermitage is placed within the *Achenléen supérieur*, but typologically appears to represent a "transition industry" between this industry and the M.T.A.

The *Micoquien*, as defined by Bosinski (1967; 1970) does not occur in the North-European low-

land plain (nor does the *Monstérien* or the Altmühl group), but rather further to the south and especially further to the east. The northern limit appears to be formed by the 200 m contour to the north of the central European mountain ranges (see also Schwabedissen, 1970). Here there is a contrast with regard to the finds attributed to the *Jungachbeuléen*, which are distributed rather abundantly in the North-European lowland plain. Evidently the wide valley systems of braided rivers constituted attractive hunting-grounds; many finds have come from river sediments, e.g. in the Leine valley (Jacob-Friesen, 1949; Zedelius-Sanders, 1978), and also near Bremen in the Weser valley (Schwabedissen, 1956 – these finds cannot be attributed with certainty to any tradition however). The *Jungachbeuléen* finds nearly always come from open-air sites (except for the cave Balve I), in contrast to e.g. the *Micoquien* (Bosinski, 1967; Schwabedissen, 1970).

Turning our attention to the material available from the Northern Netherlands, it can be seen that two finds fit best typologically within the *Jungachbeuléen* (the hand-axe from Drouwen and that from Wijnjeterp – Stapert, 1976b); on the other hand a number of finds can be placed more appropriately in the M.T.A. (especially the flat triangular hand-axe from Anderen, but possibly also the hand-axe from Exloo – Stapert, 1976b).

The problem then arises that the M.T.A. appears to be hardly represented in the neighbouring country of Germany. The situation is however probably different in reality. Indications are steadily increasing that there are more M.T.A. sites in Central Europe than was supposed until a decade ago. It is thus possible that various isolated finds of smaller hand-axes can be attributed to this tradition. In this connection Bosinski (1975, 1978) mentions e.g. the hand-axe from Mönchengladbach-Eicken (illustrated in Bosinski, 1967). Also the finds from Selm-Ternsche (illustrated in Bosinski, 1967) could well belong to this tradition, as Bosinski himself suggests (Bosinski, 1967, 1975). Two hand-axes were found, both regularly and almost completely worked, of which one is a small and flat *cordiforme* (l. ca. 9 cm), and the other approximately triangular and also quite flat (l. ca. 11 cm). A flat triangular hand-axe has also been found in Rethen (Dürre, 1973). The small quartzite hand-axe from layer A<sub>3</sub> of Rheindalen has also been ascribed to

the M.T.A. (Thieme, 1978) and so have the two small quartzite hand-axes from Scheden (Schön and Schweitzer, 1978). The quartzite finds from Lenderscheid (including flat triangular hand-axes) have often been mentioned as possibly belonging to the M.T.A. (Bosinski, 1975; Gunther, 1970). Also various finds in the Southern Netherlands are attributable to the M.T.A. (e.g. the Bakel hand-axe – Stapert, 1975b; the Mill hand-axe – Stapert, 1977). Günther (1970) discusses new finds from the Rhine-Herne canal. These finds include a small *cordiforme* (l: 6.8 cm) of which the base is worked for the most part, and which could well be attributed to the M.T.A. In this connection Günther also mentions the small *cordiforme* hand-axe from Balve I (Günther, 1964 – l: ca. 8.7 cm), and the finds from Selm-Ternsche, as well as triangular hand-axes from Nollheide and Dankelshausen. Mention should also be made here perhaps of the flat *cordiforme* from Woltersdorf (Voelkel, 1970; for new finds from this region: Dürre, 1978).

The datings available clearly indicate a later phase within the Middle Paleolithic. Balve I has been placed at the end of the Eemian, the finds from Selm-Ternsche, the Rhine-Herne canal and Rheindahlen (A<sub>3</sub>) in the early Weichselian.

To summarize, it seems not impossible to Günther that in the late Eemian/early Weichselian an industry can be placed that typologically forms a transition between the *Jungachbeuléen* and the typical M.T.A. as it is known from France (just as there is perhaps also an older phase of the *Jungachbeuléen* that resembles in some respects the *Achenléen moyen* – Zedelius-Sanders, 1978). As mentioned previously, in Belgium and Northern France there also appear to be indications of such a transitional industry (e.g. the *Achenléen final*).

As a provisional hypothesis I would here suggest that the hand-axe from Drouwen belongs to this transitional tradition – especially in view of the fact that a dating in the early Weichselian seems more probable geologically than an older dating (see under 2), and furthermore in view of the typology of several other finds from the same region, notably the hand-axe from Anderen.

Unfortunately however there is no evidence at all to suggest that the various finds from the Northern Netherlands are more or less contemporaneous. On the basis of typology we therefore

cannot conclude with certainty any more than what can safely be deduced from the stratigraphy as regards a dating for the hand-axe from Drouwen: the end of the Saalian, the Eemian or the first half of the Weichselian.

## 6. SUMMARY

This article describes the hand-axe from Drouwen, found in March 1978. The site where the find was made lies in the village of Drouwen, ca. 2 km to the west of where the Voorste Diep enters the Hunze valley. In view of the natural surface modifications present on the hand-axe (brown patina, wind gloss, small pits, scratches, pressure cones, cryoturbation retouch, rounded ridges and secondary frost-splitting), it must have come from out of the boulder-sand (outwash residue of the ground moraine from the penultimate glacial). Geologically this indicates the following dating for the hand-axe: the end of the Saalian, the Eemian or the first half of the Weichselian. It is probable, however, that the boulder-sand was formed mainly during the last glacial. As a result of the secondary frost-splitting, considerable parts of the surface of the hand-axe, as well as the base, have disappeared. The original shape of the hand-axe can be reconstructed as a large (l. ca. 15 cm) symmetrical *cordiforme allongé*, with possibly a cutting base.

In the course of an excavation at the site no additional finds were made, so it is fairly probable that the hand-axe represents an isolated find at this spot. The point of the hand-axe was broken off long ago, possibly as the result of use. Typologically the hand-axe falls within the *Achenléen supérieur* of the French authors, or the *Jungachenléen* of Bosinski. There is some slight evidence to suggest that the hand-axe could date from a younger phase within this tradition. In this connection various finds from elsewhere are discussed finally, in a preliminary attempt to establish more clearly the position of the scarce Middle Paleolithic material from the Northern Netherlands.

## 7. NOTES

<sup>1</sup> A dating has been given by Musch and Wouters (1978) for the hand-axes from Anderen, Wijnjeterp and Drouwen in the "Eem I", after which in the middle of the Eemian there was supposedly a period of severe cold lasting 500 years

(allegedly responsible for such phenomena as wind gloss); this dating is however a fanciful imagination on the authors' part (see e.g. Zagwijn and Van Staalduinen, 1975; fig. 4).

<sup>2</sup> Collins (1969) assumes that a number of Upper Acheulian sites, notably Bakers Hole, Hundisbug and Markkleeberg (his Northfleet I, II stages), dated to Riss I, possibly lay very close to the edge of the ice sheet ("only a few miles away"). This is difficult to understand from an ecological point of view (the site of Markkleeberg lies even ca. 30 km within the line of maximum extent of the ice). If Markkleeberg does indeed date from Riss I (thus from the first half of the Saalian – this is based mainly on the occurrence of *Elephas trogontherii* in the gravels in which the finds were made), and we assume that the maximal extent of ice must be placed in the third (last) stadial, as in the Netherlands, then the problem seems to be solved for the most part. It is indeed certain that the finds (for the most part) belong in a cold period, in view of the cold fauna, and the occurrence in the gravel layers of a clay layer with remains of tundra plants; the small amount of pollen indicated even a treeless tundra (Grahmann, 1955). It therefore seems most probable that we are here dealing with occupation in one of the first two stadials of the Saalian, or in both, when the ice perhaps only extended as far as the north of Germany. The finds from Hundisbug were dated first in the first half of the Saalian (Toepfer, 1961), but later in the Warthe phase (Toepfer, 1970 – according to Zedelius-Sanders, 1978).

## 8. REFERENCES

- BORDES, F., 1953. *Les limons quaternaires du bassin de la Seine*. Arch. de l'Inst. de Paléont. Hum., Mém. 26. Paris.
- BORDES, F., 1954 & 1955. Les gisements du Pech-de-l'Azé (Dordogne); I – Le Moustérien de tradition acheuléenne. *L'Anthropologie* 58, pp. 401-432; 59, pp. 1-38.
- BORDES, F., 1961. *Typologie du Paléolithique ancien et moyen*. Bordeaux.
- BORDES, F., 1968. *Le Paléolithique dans le monde*. Paris.
- BORDES, F., 1972. *A tale of two caves*. New York.
- BORDES, F., H. LAVILLE & M.-M. PAQUEREAU, 1966. Observations sur le Pleistocène supérieur du gisement de Combe-Grenal (Dordogne). *Actes de la Soc. Liméenne de Bordeaux* 103, série B, no. 10, pp. 3-19.
- BORDES, F. & F. PRAT, 1965. Observations sur les faunes du Riss et du Würm I en Dordogne. *L'Anthropologie* 69, pp. 31-46.
- BOSINSKI, G., 1963. Eine mittelpaläolithische Formengruppe und das Problem ihrer geochronologischen Einordnung. *Eisz. und Geg.* 14, pp. 124-140.
- BOSINSKI, G., 1967. *Die mittelpaläolithischen Funde im westlichen Mitteleuropa*. Fundamenta A/4. Köln/Graz.
- BOSINSKI, G., 1970. Bemerkungen zu der Grabung D. Peyronys in La Micoque. In: K. Gripp, R. Schüttrumpf & H. Schwabedissen (eds.), *Frühe Menschheit und Umwelt I* (Festschrift A. Rust). Fundamenta A/2, pp. 52-56. Köln/Wien.
- BOSINSKI, G., 1975. Arbeiten zur älteren und mittleren Stein-

- zeit in der Bundesrepublik Deutschland 1949-1974. *Ausgrabungen in Deutschland* 1, pp. 3-24. Mainz.
- BOSINSKI, G., 1976. L'Acheuléen en Europe centrale du Nord. *Coll. X, IXe Congrès U.I.S.P.P.*, Nice (prétirage), pp. 52-64.
- BOSINSKI, G., 1978. Übersicht über das Alt- und Mittelpaläolithikum. In: St. Veil (ed.), *Alt- und Mittelsteingzeitliche Fundplätze des Rheinlandes*. Köln, pp. 36-38.
- COLLINS, D., 1969. Culture traditions and environment of early man. *Curr. Anthropol.* 10, pp. 267-316.
- COLLINS, D. & A., 1970. Excavations at Oldbury in Kent; cultural evidence for last glacial occupation in Britain. *Bull. of the Inst. of Arch., London* 8/9, pp. 151-176.
- COMMENT, V., 1914. Les hommes contemporains du renne dans la vallée de la Somme. *Mém. de la Soc. d'Antiq. de Picardie* 14, pp. 211-638.
- DÜRRE, W., 1978. Mittelpaläolithische Funde von Lübbow-Woltersdorf, Landkreis Lüchow-Dannenberg. *Archäol. Korrespondenzblatt* 8, pp. 163-168.
- GRAHMANN, R., 1955. *The Lower Palaeolithic site of Markkleeberg and other comparable localities near Leipzig*. Transact. of the Am. Philos. Soc., N.S., vol. 45, part 6. Philadelphia.
- GROTE, K., 1978. Die Grabung 1977 in der mittelpaläolithischen Freilandstation Salzgitter-Lebenstedt. *Archäologisches Korrespondenzblatt* 8, pp. 155-162.
- GÜNTHER, K., 1964. *Die altsteingzeitlichen Funde der Balver Höhle*. Bodenalt. Westf. VIII. Münster.
- GÜNTHER, K., 1970. Neue Funde der mittleren Altsteinzeit aus dem Rhein-Herne-Kanal. In: K. Gripp, R. Schüttrumpf & H. Schwabedissen (eds.), *Frühe Menschheit und Umwelt, I. Fundamenta A/2*. Köln/Wien, pp. 114-117.
- JACOB-FRIESEN, K. H., 1949. *Die altsteingzeitliche Funde aus dem Leinetal bei Hannover*. Hildesheim.
- KAHRS, E., 1925. Palaeolithische Funde aus dem Diluvium des Emschertales. *Praehist. Zeitschr.* 16, pp. 93-95.
- KEELEY, L. H., 1977. The functions of paleolithic flint tools. *Scientific American* 237, pp. 108-126.
- LAVILLE, H., 1973. *Climatologie et chronologie du Paléolithique en Périgord: étude sédimentologique de dépôts en grottes et sous abris*. Thèse, Bordeaux.
- MAARLEVELD, C. G., 1960. Glacial deposits in the Netherlands transformed under periglacial conditions. *Biul. Perygl.* 8, pp. 13-20.
- MELLARS, P. A., 1974. The Palaeolithic and Mesolithic. In: C. Renfrew (ed.), *British Prehistory*. London, pp. 41-99.
- MUSCH, J. E. & A. WOUTERS, 1978. Tentoonstelling "Stenen getuigen". *Archeol. Ber.* 3. Drouwen.
- PREULL, F., 1953. Die geologische Bearbeitung des paläolithischen Fundplatzes bei Salzgitter-Lebenstedt. *Eisz. und Geg.* 3, pp. 149-154.
- SCHÖN, D. & I. SCHWEITZER, 1978. Paläolithische Funde aus der Gemarkung Scheden, Kr. Göttingen. *Göttinger Jahrbuch* 26, pp. 5-22.
- SCHWABEDISSEN, H., 1956. Funde der mittleren Altsteinzeit aus der Weser bei Bremen. In: P. Zijlmann (ed.), *Zur Ur- und Frühgeschichte Nordwestdeutschlands* (Festschrift Jacob-Friesen), pp. 85-96. Hildesheim.
- SCHWABEDISSEN, H., 1970. Zur Verbreitung der Faustkeile in Mitteleuropa. In: K. Gripp, R. Schüttrumpf & H. Schwabedissen (eds.), *Frühe Menschheit und Umwelt I* (Festschrift A. Rust). Fundamenta A/2, Köln/Wien, pp. 61-98.
- STAPERT, D., 1975a. Preliminary notes on the "Early and Middle Palaeolithic" finds of Mr. T. Vermaning. *Palaeohistoria* 17, pp. 7-8.
- STAPERT, D., 1975b. Paleolithicum. In: G. J. Verwers (ed.), *Noord-Brabant in pre- en protohistorie*. Oosterhout, 19-38.
- STAPERT, D., 1976a. Some natural surface modifications on flint in the Netherlands. *Palaeohistoria* 18, pp. 7-41.
- STAPERT, D., 1976b. Middle Palaeolithic finds from the Northern Netherlands. *Palaeohistoria* 18, pp. 43-72.
- STAPERT, D., 1977. De vuistbijl van Mill (N.-Br.) en de verspreiding van midden-paleolithische vondsten in Noord-Brabant. In: N. Roymans et al. (eds.), *Brabantse oudbeden* (Festschrift G. Beex), Bijdr. St. Br. Heem XVI, pp. 9-18.
- STAPERT, D., 1978. Drouwen (gem. Borger). *Bulletin K.N.O.B. (Archeologisch Nieuws)* 77, pp. 197-199.
- STAPERT, D., in preparation. Early Weichselian wood from Zwolle. Manuscript.
- TER WEE, M. W., 1962. The Saalian glaciation in the Netherlands. *Meded. Geol. St. N.S.* 15, pp. 57-77.
- TER WEE, M. W., 1966. *Toelichtingen bij de Geologische Kaart van Nederland 1:50.000, Blad Steenrijk Oost (160)*. Rijks Geol. Dienst, Haarlem.
- THEIEME, H., 1978. Rheindahlen, Krfr. St. Mönchengladbach. In: St. Veil (ed.), *Alt- und Mittelsteingzeitliche Fundplätze des Rheinlandes*. Köln, pp. 56-69.
- TODE, A., et al., 1953. Die Untersuchung der paläolithischen Freilandstation von Salzgitter-Lebenstedt. *Eisz. und Geg.* 3, pp. 144-220.
- TOEPFER, V., 1961. Die alt-paläolithischen Feuersteinwerkzeuge von Hundisburg. *Jahresschr. f. mitteld. Vorgesch.* 45, pp. 35-69.
- TUFFREAU, A., 1971. Quelques aspects du Paléolithique dans le Nord de la France. *Bull. de la Soc. de Préh. du Nord* 8 (num. spéc.).
- TUFFREAU, A., 1976. Acheuléen et industries apparentées dans le Nord de la France et le bassin de la Somme. *Coll. X, IXe Congrès U.I.S.P.P.*, Nice (prétirage), pp. 93-109.
- ULRIN-CLOSSET, M., 1975. *Le Palaeolithique moyen dans le bassin mosan en Belgique*. Wetteren.
- VEIL, S. (ed.), 1978. *Alt- und Mittelsteingzeitliche Fundplätze des Rheinlandes*. P., Nice (prétirage), pp. 93-109.
- ULRIN-CLOSSET, M., 1975. *Le Palaeolithique moyen dans le bassin mosan en Belgique*. Wetteren.
- VEIL, S. (ed.), 1978. *Alt- und Mittelsteingzeitliche Fundplätze des Rheinlandes*. Köln.
- VOELKEL, G., 1970. Ein Faustkeil aus der Gemarkung Woltersdorf, Kreis Lüchow-Dannenberg. In: K. Gripp, R. Schüttrumpf & H. Schwabedissen (eds.), *Frühe Menschheit und Umwelt I* (Festschrift A. Rust). Fundamenta A/2, Köln/Wien, pp. 156-157.
- WOLDSTEDT, P., 1958. *Das Eiszeitalter, II*. Stuttgart.
- ZAGWIJN, W. H., 1973. Pollenanalytic studies of Holsteinian and Saalian Beds in the Northern Netherlands. *Meded. Rijks Geol. dienst* N.S., 24, pp. 139-156.
- ZAGWIJN, W. H. & C. J. VAN STAALDUINEN (eds.), 1975. *Toelichting bij geologische overzichtskaarten van Nederland*. Rijks Geol. Dienst, Haarlem.
- ZEDELIUS-SANDERS, M., 1978. *Die paläolithischen Funde aus dem Leinetal bei Jemsen*. Materialhefte z. Ur- und Frühgesch. Niedersachsens, Heft 14. Hildesheim.