

A SITE OF THE TJONGER TRADITION ALONG THE SCHIPSLOOT AT EEN (*GEMEENTE* OF NORG,
PROVINCE OF DRENTHE, THE NETHERLANDS)

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1. INTRODUCTION

In the autumn of 1970 the ditch known as the Schipsloot, to the south of Een (*gemeente* of Norg), was widened in order to improve its drainage capacity. At the highest point of a cover sand ridge, intersected by the Schipsloot, P. Houtsma and J. Schilstra found in the slope a few flint artefacts, in the sand, with distinctly Upper Palaeolithic features. The coordinates of the site are: Topographical map of the Netherlands, sheet 12 A (Norg), 564. 925/222.550. For location on a map of the Netherlands, see fig. 1, for the local topographical situation, fig. 2.

From further observations made in September 1970 it became evident that the find-bearing level lay in the undisturbed C-horizon of a podsol. This level was interrupted by a basin-shaped depression I, filled with peat, loam and sand (figs. 3 and 11; and Casparie & ter Wee, this volume: fig. 2). Under the peat, at the bottom of this basin, an accumulation of flint artefacts was present. Artefacts were also found in heaps of recently dug-out sand that had been dumped on the north side of the Schipsloot.

In view of these circumstances Prof. H.T. Waterbolk (Biologisch-Archaeologisch Instituut) decided to make a more detailed investigation of the site, by means of an excavation. The excavation was carried out by the first and third author, in the periods February-October 1971 and February-May 1972. Those providing assistance included Messrs. H. ter Haagha, R. Jansen and R. Nolles.

Two lacquer peels of the largest basin (I) were made under the supervision of Mr. A. Meijer (B.A.I.), who also saw to it that the topsoil was removed from four trenches marked out by the excavators. These trenches were each 2.50 m wide and 20 m long.

The pollen analysis of some peat profiles was carried out by Dr. W.A. Casparie (B.A.I., see Casparie & ter Wee, this volume). A C14-dating for the peat from basin I was determined by Prof. W.G. Mook (Laboratorium voor Isotopenfysica, Groningen). Drs. M.W. ter Wee (Rijks Geologische Dienst, northern district)

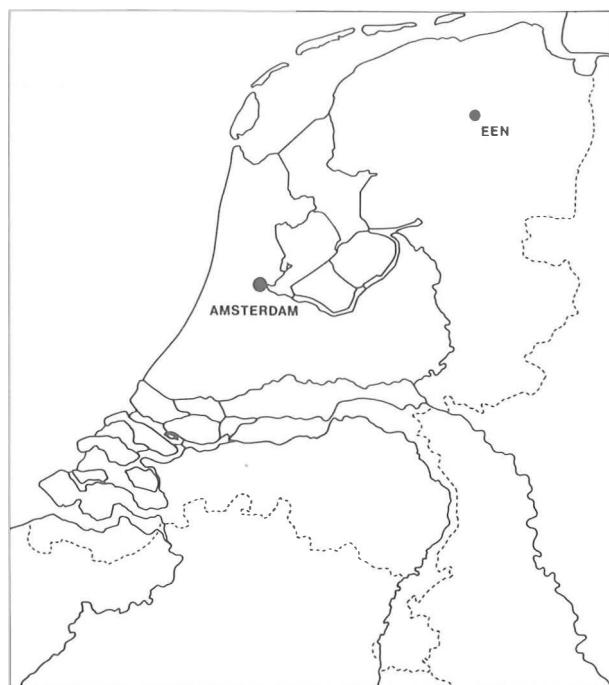


Fig. 1. Map of the Netherlands showing the location of Een.

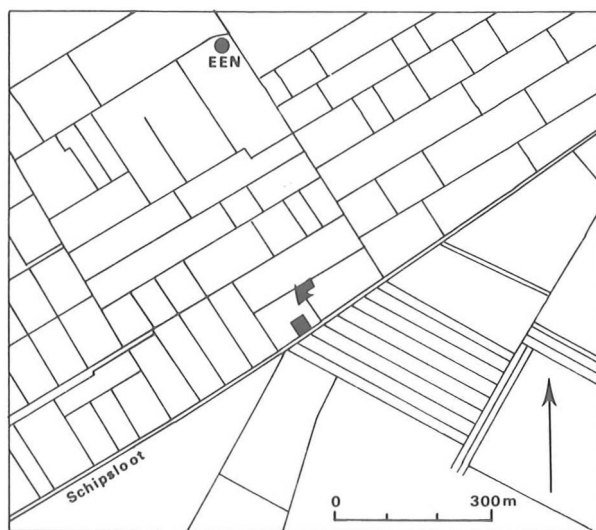


Fig. 2. Location map.

was kind enough to undertake the geological investigation of the surroundings of the site (see Casparie & ter Wee, this volume).

The owner of the parcel of land in which the flint concentration was found, Mr. R. Vunderink of Rijswijk, kindly gave permission to carry out the excavation on his property. The

local water board "Noordenveld" gave permission to continue the excavation in the upper slope of the Schipsloot.

The authors wish to express their gratitude to all those who contributed in any way to the success of the excavation and to this publication,* and to all those who have shown interest in their investigations.

2. THE EXCAVATION

The investigation began, soon after the discovery, on September 12th 1970 with the drawing of the profile exposed in the north wall of the Schipsloot, in which a cross-section of basin I was visible. The part that was drawn was 20 m long, and the most important part of this is shown in fig. 3. (The inclination of the ditch slope was ca. 45°.) On September 17th 1970 a peat profile was sampled by Dr. W.A. Casparie, from the filling of basin I, that was subsequently covered over, and from peat from the adjacent valley. The actual excavation began in February 1971 with the investigation of the first trench (20 x 2 m) immediately to the north of, and parallel to, the Schipsloot. All finds made in the culture level were drawn on a scale of 1:10. The tools, blades, cores and larger stones that were recognized during the excavation were numbered individually. A total surface area of ca. 400 m² was excavated (see the distribution map, fig. 5, in pocket). On account of the presence of an earthen wall on the NW side and of the Schipsloot on the SE

side, it was not possible to ascertain how far the flint concentration extended in those directions. The ground was carefully removed with a spade, and a hand-sieve was used where necessary.

Between the various excavation trenches profile walls 0.50 m thick were initially left intact. In these profile walls small pieces of coloured plastic were inserted to indicate the level of all artefacts found at a horizontal distance of 0.30 m or less from these profile walls, in order to give a picture of the course of the find-bearing level in profile. The culture level was 3-7 cm thick, and showed little variation in height (except for the basins, see under 3). Only a gradual slope (downwards) from north to south (about 0.20 m over a length of 15 m, i.e. about 1.3%) could be shown. In an east-west direction hardly any differences in height could be observed. At basin I the culture level was present at ca. 5.50 m + N.A.P.

In the sand immediately above and in the culture level some larger stones and a few smaller stones (up to 8 cm) are present, in addition to the flint artefacts. From a stratigraphical point of view the find-bearing level is situated at the boundary between deposits that are to be regarded as Younger Cover sand I and II. The "layer of Usselo", that one would expect to find at this level, was not visible (see also Casparie & ter Wee, this volume).

3. THE BASINS

In addition to the basin (I) found already in the NW wall of the Schipsloot, another 9 similar basins were found in the course of the excavation (numbered II-VII, VIIIA, B, C). Drawings and photos were made of cross-sections through these basins, also a number of lacquer peels. These basins are described here below (see also Casparie & ter Wee, this volume). See fig. 5 for the location of these basins within the excavation area.

Basin I

Basin I is situated in the 1 m² squares D-I,

* Ir. P. Offringa of Waskemeer measured in the horizontal position of the culture level with respect to N.A.P. (Dutch Ordnance Level). Drs. O.H. Harsema (B.A.I. and archaeological department of the Provinciaal Museum in Assen) provided technical assistance and arranged for a work-hut from the Koninklijke Nederlandsche Heidemaatschappij. This was placed on land belonging to Mr. A. Huizinga.

Sections 1 - 4 of this article were written by P.H. and J.S., sections 5.2.2, 5.2.3 and 6 by P.H., and the remaining sections by Drs. J.J. Roodenberg; Drs. D. Stapert provided assistance in editing the text. Mrs. Sh. van Gelder-Ottway translated the text into English. The drawings were made by Messrs. W.J. Dijkema and J.M. Smit (B.A.I.). Mrs. E. Rondaan-Veger (B.A.I.) typed the manuscript. The photos 13-17 were made by W.A. Casparie and the first author.

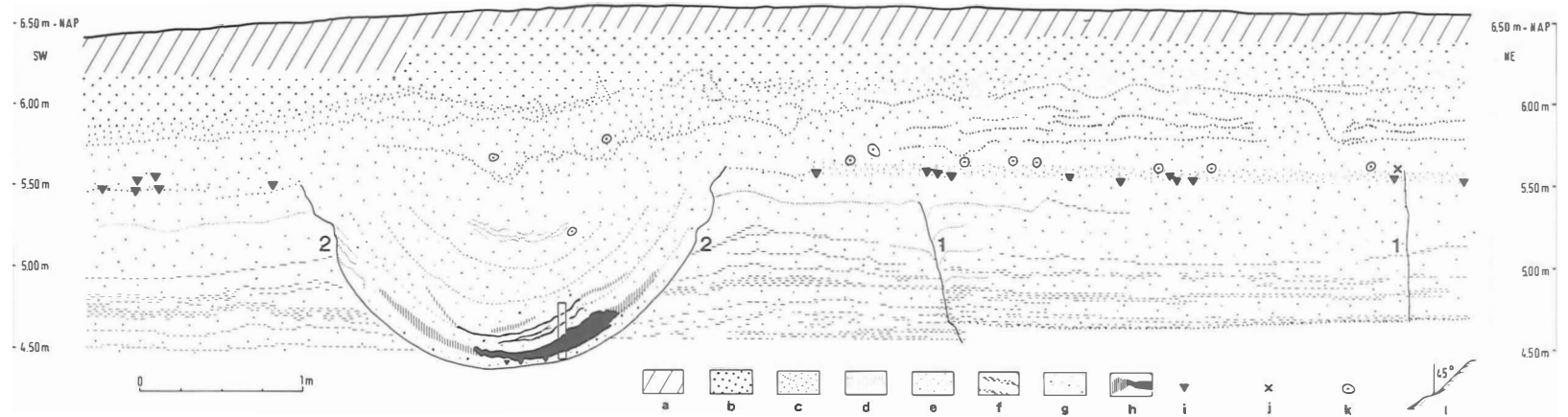


Fig. 3. SW-NE profile through basin I. Legend: a) disturbed and/or transported soil; b) Younger Cover sand II, A-horizon of the podzol; c) Younger Cover sand II, B-horizon of the podzol, with fibres; d) Younger Cover sand I, slightly paler layer (+ level of the Tjonger finds); e) Younger Cover sand I; f) loam and very loamy sand; g) coarse sand, sometimes with fine gravel; h) gyttje (left) and peat; i) artefacts; j) bone fragment; k) fine gravel; l) indication of the angle of inclination of this section; Continuous lines: 1. frost cracks; 2. contour of basin I.

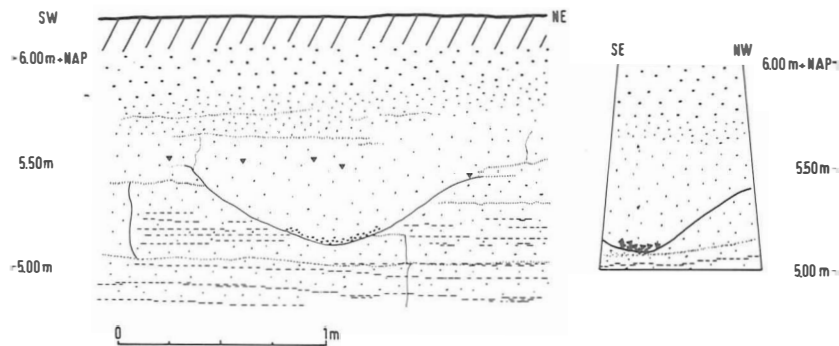


Fig. 4. Sections through basin II. Left: SW-NE profile with artefacts above the basin. Right: SE-NW profile with artefacts at the bottom. For legend see. fig. 3.

D-II, E-I, E-II, F-I, F-II (figs. 3, 5, 11 and 12; and Casparie & ter Wee, this volume: figs. 2 and 7). Lacquer peels and drawings were made of the SW-NE and the SE-NW cross-sections. Horizontally the culture level (outside the basin) was present at ± 5.50 m +N.A.P. As the basin was situated in the oblique ditch-slope, only part of it was preserved; the rest had been removed by the dragline.

Close to the basin a proportion of the artefacts was present a few centimetres higher than in the culture level, a short distance away, so that it seemed as though the basin had been surrounded by a small earthen wall. This was best visible on the east side; on the west side the sand was more or less disturbed by decayed tree roots.

On the inner slope of the basin, there were few artefacts, while at the bottom of the basin artefacts were relatively abundant. The depth of the basin was ± 0.90 m. The flint material had evidently slipped down the slope, and was found in a layer of coarse sand that showed up clearly against the almost horizontally layered fine sand outside the basin. The filling of the basin consisted of fairly loose coarse sand, alternating with thin layers of loam, with here and there a small piece of charcoal or small pebble, and at the bottom brown peat. For this peat a C14-dating was determined: GrN-6341 : $10,495 \pm 60$ B.P. (= 8545 B.C.). Among the artefacts that were present in the coarse sand under the peat was a backed blade. As these tools are characteristic of the Tjonger tradition, this shows that the finds from the bottom of the basin belong to the same tradition as the finds from the culture level, in which similar tools are also present.

We have tried to ascertain the dimensions of the entire basin by reconstruction. The basin must have had an east-west diameter of 2.70-3.00 m, a north-south diameter of 2.50-2.70 m and a depth of 0.90 m. So the basin was not exactly round.

Basin II

Basin II is situated in the squares C-2, C-3,

D-2, D-3 (figs. 4, 5 and 13; and Casparie & ter Wee, this volume: fig. 9a). Lacquer peels of the SW-NE cross-section and of part of the SE-NW cross-section were made, as well as a drawing of the perimeter of the basin, seen in a horizontal plane at 5.45 m +N.A.P., and two profile drawings (see fig. 4).

In the horizontal plane both basin I and basin II became visible at the culture level, that was present near basin II at ± 5.45 m +N.A.P.

At this level the east-west diameter was ± 1.70 m, the north-south diameter ± 1.50 m. The depth was ± 0.45 m. The artefacts, apart from a few that had sunk down along the slope of the basin, were present at two levels: firstly at the top, at the culture level proper, that here extended over the basin undisturbed, and secondly right at the bottom. This could be an indication of the presence of (at least) two occupation phases. In contrast to basin I no loam or peat was present.

In the case of basin I it was conceivable that this basin had originated shortly after the occupation period and that the artefacts had slid down together from the culture level. The basin had been filled with water, in which plant and animal life developed, and later became filled by cover sand and loess-like material.

In the case of basin II it appears more likely that this basin became filled up during the occupation period, or between two different occupation phases. Evidently there was insufficient time for peat formation. During the first occupation phase artefacts could have ended up at the bottom, after which the basin became filled up with sediment, and in a second occupation phase new artefacts would then have come to lie above the basin, that had already been filled up. This second phase can be dated somewhere in the first centuries of the Late Dryas period, immediately after the formation of the basins.

Basin III

Basin III is situated in the squares J-I, J-1, K-I, K-1 (figs. 14-15). A lacquer peel was made of the NE-SW cross-section through basin III.

This profile was formed by the southern wall of trench I, that happened to run precisely through the middle of basin III. On the lacquer peel it can clearly be seen that the basin shows up already at 5.60 m +N.A.P., while the culture level begins only at 5.50 m +N.A.P. This basin thus came into being after the occupation period. How much later it cannot be said, as we do not know the rate at which these 0.10 m of sand were deposited. A frost crack ran through the basin (this was also the case with basin VIII-C). We could follow this crack horizontally over the entire breadth (15 m) of the excavation (see fig. 5). In square J-4 of trench 2 we found in the culture layer a piece of granite (no. 833a and no. 833b) more than 0.30 m long, 0.10 m wide and 0.07 m thick. This piece of granite lay transversely over the frost crack, and was broken in the middle precisely at that point (figs. 16-17). This illustrates the tremendous forces that are exerted in the formation of such cracks, that may extend to a length of tens of metres, and are sometimes more than a metre deep.

We assume that the formation of such deep and long cracks took place for the last time in the Late Dryas period. The frost cracks are secondary with respect to the basins III and VIII-C. If our assumption concerning the dating of these cracks is correct, then it follows that these two basins must have been formed at any rate during the Late Glacial, which is confirmed by the C14-dating of the peat in basin I.

A lacquer peel was also made of the horizontal plane at 5.50 m +N.A.P. This is the height of the culture level. At this level the east-west diameter was 1.30 m, the north-south diameter 1.20 m and the depth 0.30 m. Artefacts were present only on the inner slope of the basin and at the bottom.

Finally another lacquer peel was made of the NW-SE cross-section of basin III from 5.50 m +N.A.P. to 4.75 m +N.A.P.

The loam layer in this basin, that is characteristic of some of these basins, showed "worm-holes" with which we are familiar elsewhere in the "layer of Usselo".

Basin IV

Basin IV is situated in the squares Q-3 and R-3. Lacquer peels of NE-SW and NW-SE cross-sections. Drawing of horizontal plane 5.48 m +N.A.P. (the culture level). East-west diameter at this level 0.85 m, north-south diameter 0.65 m, depth 0.30 m.

As in the case of basin III here too the artefacts have sunk downwards. A humous loam layer was present here also. It was not clearly visible at which level the basin had originated. It was our impression that it was approximately at the culture level; however, it may have been slightly higher.

Basin V

Basin V is situated in the squares P-3 and Q-3. This basin was noticed too late: hence no lacquer peels. This small basin was situated right next to basin IV. No artefacts were present at the bottom of this basin.

Approximate dimensions at the culture level (5.50 m +N.A.P.): east-west 0.56 m, north-south 0.50 m, depth 0.20 m.

Basin VI

Basin VI is situated in the squares G-2, G-3, H-2, H-3. This basin was noticed too late: hence no lacquer peels. The periphery is drawn horizontally at 5.33 m +N.A.P., i.e. ± 0.15 m below the culture level.

At 5.33 m +N.A.P. the dimensions were as follows: east-west diameter ± 0.80 m, north-south diameter ± 0.70 m, depth ± 0.20 m.

At the bottom an accumulation of 45 artefacts was found. No loam layer was found in this basin.

Basin VII

Basin VII is situated in the squares D-7, D-8, E-7, E-8. This basin begins to show up in the NW-SE profile (lacquer peel) at 5.60 m +N.A.P., i.e. about 0.10 m above the culture level, that is present here at about 5.47 m +N.A.P.

The east-west diameter is unknown, the north-south diameter is ± 0.90 m. The depth is ± 0.25 m. The artefacts have sunk down about 0.07 m. No loam layer was present. The basin must have originated after the occupation period.

Basin VIII-A

Basin VIII-A is situated in the squares U-5, U-6, V-5, V-6. East-west diameter ± 0.90 m, north-south diameter ± 0.70 m. Depth ± 0.20 m. This basin is clearly younger than the artefacts; the culture layer continues undisturbed under the basin.

Basin VIII-B

Basin VIII-B is situated in the squares D-13, D-14, E-13, E-14. No lacquer peels; this basin was noticed too late. This basin was visible 0.05-0.10 m above the culture level and therefore originated after the occupation period.

The maximum width was about 1.50 m, the maximum length 2.30 m. In contrast to the other basins this one was not oval but pear-shaped. A loam layer was clearly visible. The depth was approximately 0.15 m. There were few artefacts; these had sunk slightly downwards.

Basin VIII-C

Basin VIII-C is situated in the squares R-13, R-14, S-13, S-14. No lacquer peels. This basin was visible at the culture level (5.56 m +N.A.P.). East-west diameter ± 1.50 m, north-south diameter ± 1.70 m, depth c. 0.30 m.

At the bottom of the basin there were more than a hundred artefacts. Two (secondary) frost cracks ran through the basin. Once again loam had been deposited.

As for the age of this basin the same applies as for basin III: in any case not younger than the Late Dryas period.

Although basins I, II and VIII-C only became clearly visible at the culture level, this does not

mean that they could not have originated a couple of centimetres higher. This was often difficult to ascertain accurately. With the exception of basin II, that must have originated during the occupation period, all the other basins could have been formed after the occupation period. This can be said with certainty for basins III, VII, VIII-A and VIII-B.

With regard to the time of origin, the Late Dryas period is the only possibility. For the extensive frost cracks, that run right through the excavation, begin at the same level as most of the basins, i.e. 0.05-0.07 m above the culture level.

It is evident that these basins are not artificial pits or anything similar, but rather a periglacial phenomenon. Their origin is perhaps connected with man-made hearths.

4. THE HORIZONTAL DISTRIBUTION OF THE FINDS

In fig. 5 the finds are mapped insofar as they were classified during the excavation. In addition the basins and frost cracks described above are indicated in this figure. In the culture level scattered fragments of charcoal were found (too few for a C14-dating), but no hearth(s). The question arises whether the material may have been moved secondarily by geological processes. The answer could be that this is probably hardly the case, at least in a horizontal direction. The presence of some heavy pieces of granite (brought to the spot by Palaeolithic people) in the middle of the flint concentration is not indicative of shifting caused by any such external process. It is possible, however, that vertical shifting may well have taken place.

Finally, it is fortunate that in the deposits above the culture level there were no finds dating from the Mesolithic or Neolithic, so it is certain that all the mapped finds are of Upper Palaeolithic age.

Seeing that there are indications that we may be concerned here with two occupation phases, there seems to be little sense in trying to analyze the distribution map in detail.

5. THE FLINT ARTEFACTS

5.1. Artefacts other than tools

Given below is a description of the 8785 flint artefacts that were collected during the excavation. The typological nomenclature is for the most part taken from Schwabedissen (1954), Bohmers (1956) and Taute (1963).

The overall composition of the material is as follows:

| | number | % of total |
|---|--------|---------------------------------|
| tools (see 5.2.) | 871 | 10.1 |
| artefacts other than tools | 7914 | 89.9 |
| | | % of artefacts other than tools |
| flakes | 4665 | 59.0 |
| blades | 1279 | 16.2 |
| flake cores | 228 | 2.9 |
| blade cores | 183 | 2.3 |
| core preparation pieces and core renewal pieces | 406 | 5.1 |
| blocks | 982 | 12.4 |
| burin-spalls | 170 | 2.2 |
| "microburin" (notch remnant) | 1 | 0.1 |

The flint used varies in colour from light grey to dark brown, and is of local origin (namely from the Saalian boulder-clay). The quality of the flint is not especially good, as is also evident from the relatively small number of blades. Generally speaking this is fairly characteristic of sites associated with the Tjonger traditon; this may have something to do with the vegetation cover that predominated during the Allerød interstadial, in which most of the sites of this tradition can be dated.

5.2. The tools

5.2.1. Overview

The tools (871 in total) can be divided as follows:

| | number | % of tools |
|---------------------------------------|--------|------------|
| points (and probable point fragments) | 50 | 5.7 |
| backed blades | 51 | 5.9 |
| triangles | 2 | 0.2 |
| rectangle | 1 | 0.1 |
| borers | 37 | 4.2 |
| scrapers | 406 | 46.7 |
| combination tools (scraper/burin) | 18 | 2.1 |
| burins | 161 | 18.5 |
| obliquely truncated blades | 6 | 0.7 |
| tools with notches | 35 | 4.0 |
| retouched blades, flakes, blocks | 104 | 11.9 |

5.2.2 Points (total no.: 50; figs. 6-8)

The fact that the term "points" is used here below does not mean that it is clear in all cases that these tools were used as projectiles. They could also have been used, for example, as cutting tools; for many of these pieces show use-"retouch" along the non-retouched edge.

The following types of points are present:

A. Gravettian points, total no.: 3.

These points are at least 50 mm long, slender, and with a straight or almost straight retouched back. The apex is situated on or close to the longitudinal axis of the point. Base-retouch may or may not be present.

B. Châtelperronian points, total no.: 3.

These points are at least 50 mm long, and relatively broad (at least 15 mm); the retouched edge is markedly curved. Base-retouch may or may not be present.

C. Tjonger points, total no.: 26.

These points have the same shape as the Châtelperronian points, but are narrower and usually smaller than 50 mm. Also in-

cluded in this group are those points that on account of their shape could be called Gravettian points, but that are smaller than 50 mm. Base-retouch may or may not be present. Günther (1973: 21) classifies Gravettian points and Tjonger points (*Federmesser*) jointly as *Rückenspitzen*.

D. Azilian points, total no.: 1.

Like Tjonger points, but semilunar in shape, and with two distinct pointed ends. Schwabedissen (1954: 9) calls them *Halbmondmesser*, Taute (1968: 15, fig. 2:7) *Halbrundmesser* (see also Schwabedissen, 1954: 24, fig. 12: f-i).

E. Creswellian points, total no.: 2.

Like Tjonger points, but then with one oblique truncation, with the nick closer to the apex than to the non-pointed end of the artefact. Schwabedissen and Taute call this type: *Dreieckmesser Typ Kent*. If the nick is in the middle then Schwabedissen speaks of *Dreieckmesser Typ Petersfels*. If the nick is below the middle (i.e. closer to the non-pointed end of the artefact) then one could call it a shouldered point (see F) (see Padayya, 1973: 204, fig. 15:12).

With the types described here above under A-E usually one edge is completely retouched, but sometimes part is left unretouched. From the overall external appearance of the artefact it can be seen in that case whether or not it is a long B-point (see G).

F. Shouldered points, total no.: 6 (of which only 1 is complete).

For a definition see Bohmers (1956), and here above (see E). The shouldered points from Een-Schipsloot are not very reminiscent of those of the Hamburgian tradition, although they somewhat resemble the points

of the Havelte type, that represent a kind of tanged points. From three fragments it is clear that one edge is retouched entirely; which shows their backed point character, that is typical of the *Federmesser* tradition. These artefacts are in a way shouldered Tjonger points (see Schwabedissen, 1954: 49 and fig. 65:4 and 6; Bohmers, unpublished drawings: Neer II; and Mace 1959: 246, fig. 4:19).

G. Long B-points, total no.: 2.

The term long B-points is used here for blades with an oblique truncation, if the truncation makes an angle of 45° or less with the longitudinal axis of the artefact. If the angle is greater than 45°, then we ascribe the tool to the category of obliquely truncated blades (see 5.2.10.). Perhaps it is preferable to use the term B-point only for microliths, as Bohmers originally did (Bohmers & Wouters, 1956: 29 and fig. 6:28-36). Taute (1968: 183) uses the name *Zonhovenspitze mit oder ohne Basisretusche* exclusively for microlithic types, and avoids the term B-point.

The artefacts referred to here as long B-points are of little value as far as dating is concerned, for they also occur within the Hamburgian and the Creswellian tradition. Moreover the borderline between long B-points and obliquely truncated blades is arbitrary.

H. A-points, total no.: 1.

A-points are microlithic points, of which one edge is retouched entirely (Bohmers & Wouters, 1956: 29 and fig. 6:19-27). It is remarkable that in the case of the one example from Een the basal two-thirds part is retouched dorsally, while the top-most third, that forms the point, is retouched ventrally. According to Dr. R.R. Newell (pers. comm.) this does not occur in the Mesolithic.

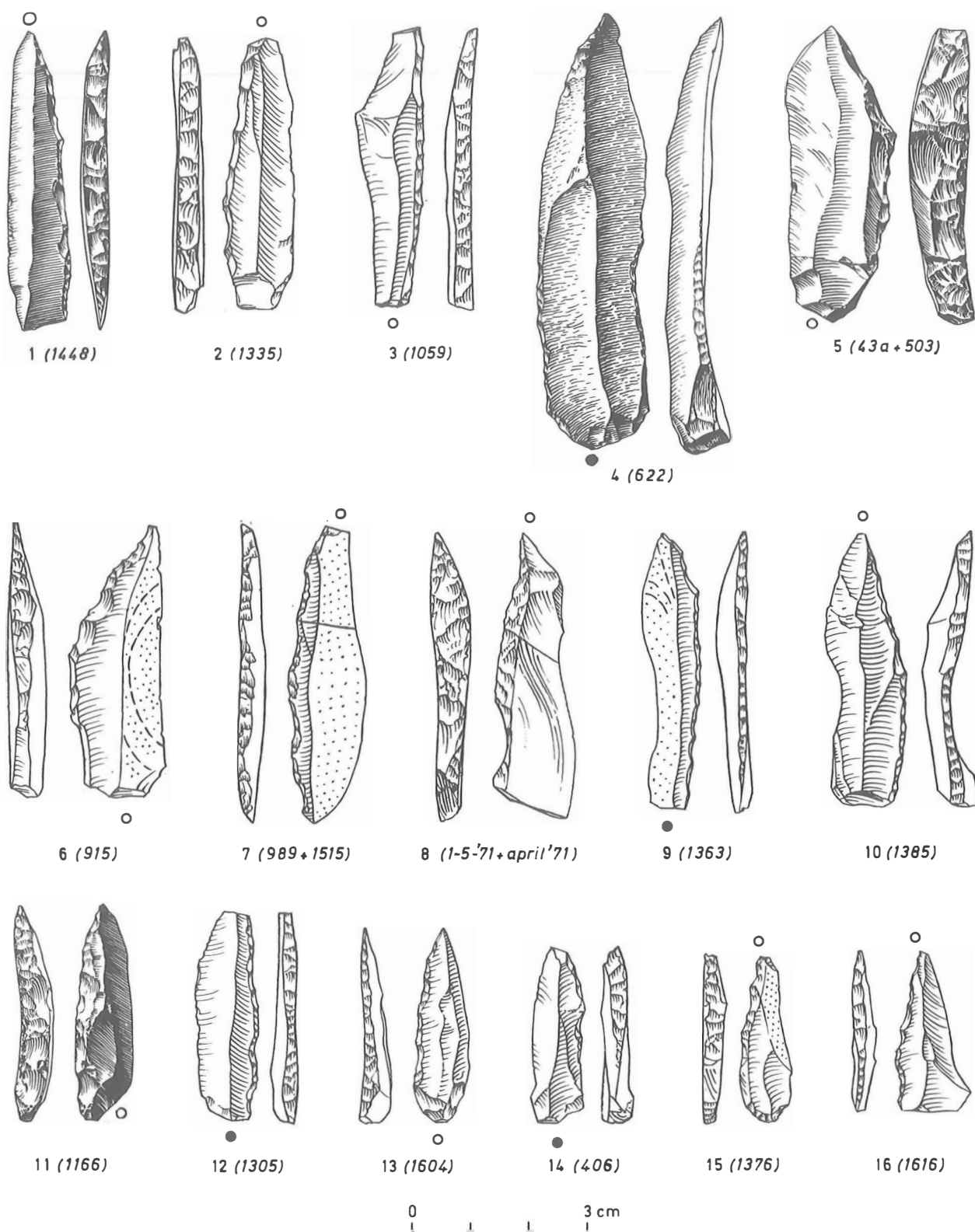


Fig. 6. Flint artefacts: 1-3 Gravettian points, 4-6 Châtelperronian points, 7-16 Tjonger points (the numbers between brackets indicate the inventory numbers).

- I. Point fragments (not attributable to any particular type), total no.: 6.

Here below the points of each type are described briefly (the numbers in italics between brackets indicate the inventory numbers). Retouch has been applied dorsally unless mentioned otherwise.

A. Gravettian points

1. Fig. 6:1 (*1448*). Complete, length 51 mm, breadth 11 mm, thickness 5 mm. Backing on the right. Along the left edge some fine retouch is present (utilized?). The top is retouched ventrally, and is situated proximally.
2. Fig. 6:2 (*1335*). Top broken off, length 45 mm, breadth 12 mm, thickness 6 mm. The backing is on the left. The artefact is burnt (*craquelé*). The entire length must originally have been c. 50 mm. Narrower at the base on account of counter notch. The top is situated proximally.
3. Fig. 6:3 (*1059*). Length 49 mm, breadth 12 mm, thickness 4 mm. The backing is on the right, the top is broken off. The entire length must have been c. 52 mm. Base-retouch (the percussion bulb has disappeared as a result of retouching). The ventral surface is slightly damaged (recently) 1 cm below the top.

B. Châtelperronian points

1. Fig. 6:4 (*622*). Length 75 mm, breadth 18 mm, thickness 9 mm. The point is made out of a blade, of which the left edge already had a more or less curved shape, and the distal top of which has been further retouched into a point (both ventrally and dorsally). In addition part of the left edge has not been backed, while the retouch begins again 35 mm above the base. Of the right edge only the lowermost 33 mm is blunted. Use-“retouch” on the right edge, at the top, and the heavy percussion bulb

make it improbable that the artefact was used as a point. The broad striking platform remnant gives the impression that the blade came from a core with a prepared percussion surface, like Levallois cores that were used for making blades; occasionally blades of this type are encountered in the Upper Palaeolithic.

2. Fig. 6:5 (*43a + 503*). Length 51 mm, breadth 18 mm, thickness 10 mm. The backing is on the right, with the lowermost part dorsally retouched and the uppermost part ventrally and dorsally retouched (this was necessary on account of the 10-mm-thick back). The distal top is missing. The point originally must have measured ± 57 mm in length. Use-“retouch” is present on the left edge. The percussion bulb is missing. The artefact shows wind-gloss on the dorsal surface.
3. Fig. 6:6 (*915*). Length 46 mm, breadth 15 mm, thickness 7 mm. The backing is on the left. The base (with percussion bulb) is missing. The right edge is utilized. Because the base is broken off we classify this point as a Châtelperronian point; the original length would have been more than 50 mm.

C. Tjonger points (*Federmesser*)

1. Fig. 6:7 (*989 + 1515*). Length 50 mm, breadth 13 mm, thickness 5 mm. The backing is on the left. The top (proximal) is broken off. The original length is estimated at c. 55 mm. The back shows a slight nick on the upper part (cf. Creswellian points).
2. Fig. 6:8 (*1-5-'71 + april '71*). Length 49 mm, breadth 13 mm, thickness 7 mm. The backing is on the left, and retouch is present ventrally and dorsally. Of the base 2 mm is blunted. The top is proximal. The “ventral” surface shows white patina. This point is not made out of a blade, but out of a naturally frost-split fragment.
3. Fig. 6:9 (*1363*). Length 47 mm, breadth 10 mm, thickness 4 mm. The backing is on the right. The top is distal. The back shows a small nick towards the top. The flat percus-

- sion bulb is still present. The top lies on the longitudinal axis, as with the Gravettian points. The artefact has a slight patination.
4. Fig. 6:10 (1385). Length 46 mm, breadth 13 mm, thickness 6 mm. The backing is on the right. The top is proximal and lies, as with no. 3, on the longitudinal axis. Burnt (*craquelé*).
 5. Fig. 6:11 (1166). Length 37 mm, breadth 11 mm, thickness 5 mm. The backing is on the left. The percussion bulb has disappeared at the base as a result of retouching. The distal top lies on the longitudinal axis.
 6. Fig. 6:12 (1305). Length 35 mm, breadth 10 mm, thickness 4 mm. The backing is on the right. The top is missing; the original length must have been c. 39 mm. The percussion bulb is present at the base. Use-“retouch” is present on the left edge. The top must have lain on the longitudinal axis.
 7. Fig. 6:13 (1604). Length 33 mm, breadth 9 mm, thickness 5.5 mm. The backing is on the left. The top is distal, and lies on the longitudinal axis. At the round, thick base use-“retouch” is present, like that which is sometimes found on scraper edges; the basal end may therefore have been used as a scraper; in any case this part is too thick to permit shafting for use as an arrowhead.
 8. Fig. 6:14 (406). Length 30 mm, breadth 9 mm, thickness 6 mm. The top (distal) is broken off. The original length must have been about 32 mm. The backing is on the right. Retouch is absent over the basal 6 mm. The top lies on the longitudinal axis. The thick base would make shafting as an arrowhead impossible. Perhaps an unfinished item.
 9. Fig. 6:15 (1376). Length 27.5 mm, breadth 9 mm, thickness 4 mm. The backing is on the left. The top, of which c. 1 mm is missing, is proximal and lies on the longitudinal axis. The lowermost 7 mm of the back are not retouched. The base is retouched all round and shows traces of use; the artefact may have served as a small scraper. The top is also slightly blunted on the right edge, and may therefore have served as a small borer.
 10. Fig. 6:16 (1616). Length 27 mm, breadth 12 mm, thickness 4 mm. The backing is on the left. The top (proximal) lies on the longitudinal axis. The right edge is utilized.
 11. Fig. 7:17 (142). Length 31 mm, breadth 11 mm, thickness 4 mm. The backing is on right. The top lies on the longitudinal axis, and is probably proximal. Fine use-“retouch” is present on the left edge near to the base.
 12. Fig. 7:18 (1399). Length 44 mm, breadth 11 mm, thickness 4 mm. The backing is on the left. The top distal. Traces of use are present on the right edge. The base becomes slightly narrower on the right edge. The percussion bulb is present.
 13. Fig. 7:19 (912). Length 44 mm, breadth 10 mm, thickness 4 mm. The backing is on the left. The base is slightly narrower on the left edge. The top is distal. The percussion bulb is present. Because two-fifths of the back is unretouched, the artefact could also be classified as a long B-point (see also Schwabedissen, 1954: table 1: 6-8; Bohmers, 1956: fig. 2:17; Movius *et al.*, 1968: 46 and fig. 27:9 and 10).
 14. Fig. 7:20 (1590). Length 41 mm, breadth 9 mm, thickness 5 mm. The backing is on the right, except for the lowermost 4 mm, where retouch is absent. The uppermost 6 mm are retouched ventrally. The top is distal; the percussion bulb is present.
 15. Fig. 7:21 (120 + 121). Length 40 mm, breadth 10 mm, thickness 4 mm. The backing is on the right. The top is distal; the percussion bulb is present, but a small part of it has disappeared as a result of retouch.
 16. Fig. 7:22 (166). Length 39 mm, breadth 9 mm, thickness 4 mm. The backing is on the left. The distal top has broken off. The original total length must have been c. 44 mm. The percussion bulb is present. Towards the base the retouch bends round to the right, so the base is narrower.
 17. Fig. 7:23 (171). Length 37 mm, breadth 12 mm, thickness 3 mm. The backing is on the left, and the edge is almost straight. The right edge is strongly curved, and to-

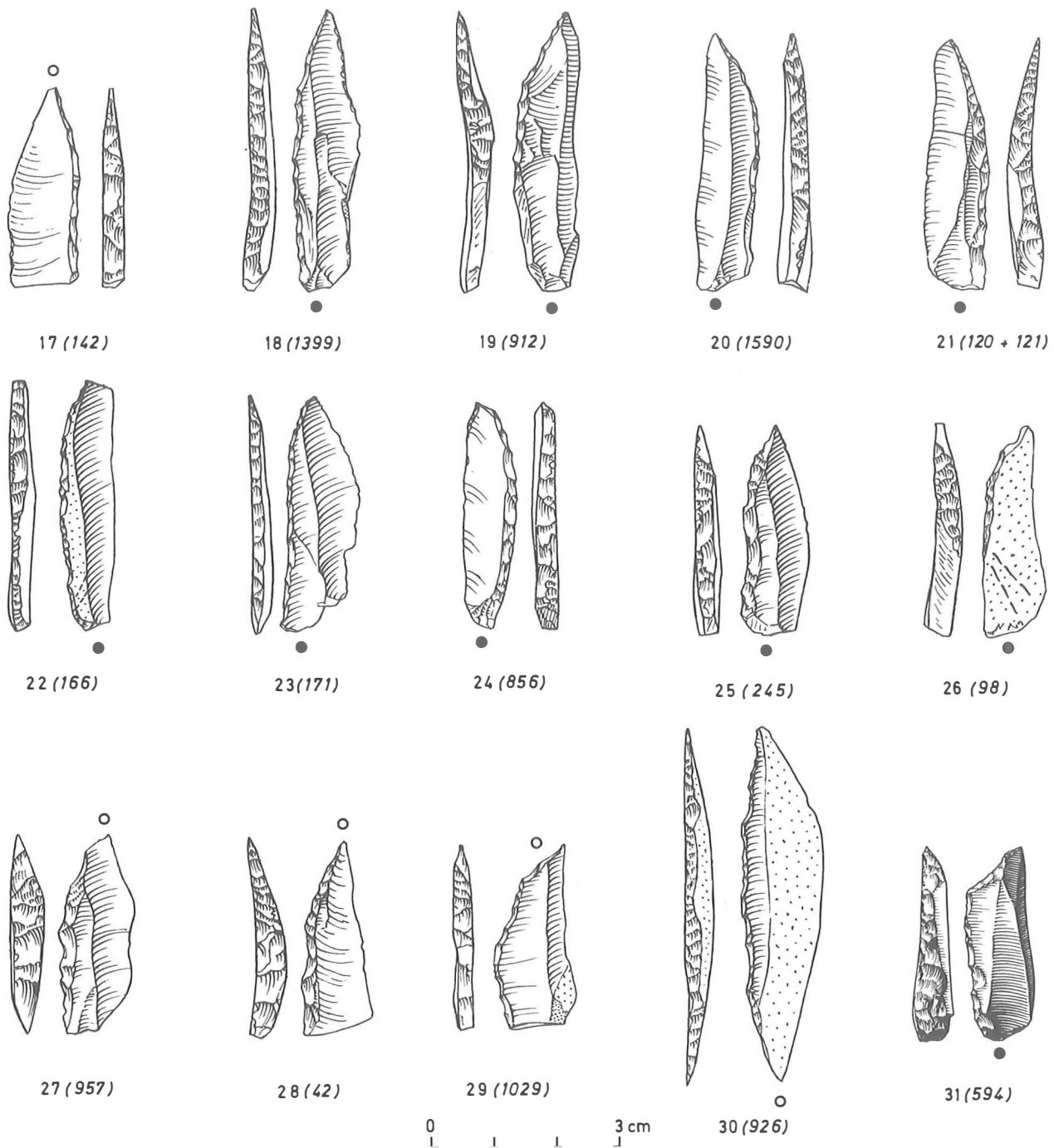


Fig. 7. Flint artefacts: 17-29 Tjonger points, 30 Azilian point, 31 Creswellian point (the numbers between brackets indicate the inventory numbers).

wards the base becoming gradually narrower (this has not been done intentionally, i.e. as a result of retouch). The top is distal; a flat percussion bulb is present.

18. Fig. 7:24 (856). Length 35 mm, breadth 8 mm, thickness 3,5 mm. The backing is on the right. The top is distal; the percussion bulb is present. The base becomes slightly

narrower on each edge. The top is concavely retouched on both edges, so the top slightly resembles a small borer. The left edge shows use-“retouch”; the dorsal face of the artefact shows white patina.

19. Fig. 7:25 (245). Length 33 mm, breadth 10 mm, thickness 4 mm. The backing is on the left edge; that is rather strongly curved, as well as the right edge. The top lies on the longitudinal axis, distally. Towards the base the retouch bends round to the right, so the base becomes slightly narrower. Base-retouch present. The right edge is utilized.
20. Fig. 7:26 (98). Length 32 mm, breadth 11 mm, thickness 5 mm. The backing is on the right. The top has broken off, and was situated distally. The artefact must originally have been c. 33 mm long. The back is retouched ventrally. Percussion bulb present. The artefact is made out of a flake. Only the top two-thirds of the back is retouched (here the same applies as to no. 13).
21. Fig. 7:27 (957). Length 31,5 mm, breadth 11 mm, thickness 6 mm. The backing is on the left edge, that is strongly curved; the proximal top is retouched ventrally and dorsally.
22. 939 (not illustrated). Length 29 mm, breadth 10 mm, thickness 7 mm. The backing is on the right. The distal top is retouched ventrally and dorsally, and has broken off. The original length would have been c. 31 mm. The left edge is marginally retouched almost from the base over a distance of 27 mm. Percussion bulb present. The base is formed by a triangular striking-platform remnant, of which the sides measure 9 mm and the base 7 mm in length; in view of this thickness shafting is unlikely. The artefact shows a white patina (stippled here and there).
23. Fig. 7:28 (42). Length 29 mm, breadth 11 mm, thickness 5 mm. The backing is on the left. Top proximal. Back strongly curved. The artefact is probably broken and the original length cannot be estimated.
24. Fig. 7:29 (1029). Length 28 mm, breadth 12 mm, thickness 3 mm. The backing is on

the left edge, that is strongly curved. Of the back the top 17 mm is dorsally retouched, the following 4 mm is ventrally retouched and the rest is again dorsally retouched. The top is proximal. The artefact is probably broken and the original length cannot be estimated.

25. 304 (not illustrated). Length 27 mm, breadth 10 mm, thickness 4 mm. The back runs straight, and is on the left edge; the right edge is strongly curved. Burnt (*craquele*). The percussion bulb is no longer recognizable. Top distal.
26. 1537 (not illustrated). Length 21 mm, breadth 9 mm, thickness 4 mm. The backing is on the left. Towards the base the retouch bends round to the right, so that the base becomes narrower. Top distal; percussion bulb present.

D. Azilian point

1. Fig. 7:30 (926). Length 55,5 mm, breadth 13 mm, thickness 5,5 mm. The backing is on the left. Very fine use-“retouch” is present on the lowermost 20 mm of the right edge.

E. Creswellian points

2. Fig. 7:31 (594). Length 31 mm, breadth 10 mm, thickness 6 mm. The backing is on the left. Top distal; percussion bulb present. Shafting unlikely, on account of the thickness of the percussion bulb. Base more or less retouched all round, on the left dorsally, on the right ventrally.
2. Fig. 8:32 (426). Length 24 mm, breadth 9 mm, thickness 5,5 mm. Backing on the right. Overall shape dumpy. Top distal; percussion bulb absent. Back retouched ventrally and dorsally at the base, and ventrally at the top.

F. Shouldered points

1. Fig. 8:33 (1671). Length 43 mm, breadth 25 mm, thickness 11 mm. This artefact is broken, and the distal top is missing. The en-

tire point must originally have measured c. 62 mm in length. On account of its massive size this artefact can hardly be ascribed to the shouldered points. Nor can we classify it as a Lyngby point; the Lyngby points belong to the tanged points. The retouch on the left edge of the base is insignificant here compared with the heavy retouch on the right edge, so we cannot speak of a tang. Taute (1968:11) comments on this matter: „*Als Stielspitzen sollten ferner nur solche Stücke bezeichnet werden, deren Schaftangeln einigermassen gleichwertige Retuschierung beider Kanten aufweisen, da andernfalls die Unterscheidung zwischen Stiel- und Kerbspitzen verwischt wird*”.

2. Fig. 8:34 (524). Length 32,5 mm, breadth 14 mm, thickness 6 mm. Backing on the left, retouched both ventrally and dorsally. Shoulder on the right. Base missing. The percussion bulb must have been at the base. Top distal.
3. Fig. 8:35 (41). Length 32 mm, breadth 10 mm, thickness 4 mm. Complete artefact. Backing on the left, over the entire length. Base-retouch present. Shoulder on the right. Percussion bulb at the base.
4. Fig. 8:36 (1611). Length 29 mm, breadth 10 mm, thickness 4 mm. Backing on the left, over the entire length, the topmost 18 mm dorsally, the lowermost 11 mm ventrally and dorsally. The distal top is formed on the right edge by a kind of burin facet and two flat flake-negatives on the ventral surface. Shoulder on the right. Basal part (with percussion bulb) is missing. Since the back is quite strongly curved on the left edge, and the shoulder-retouch on the right edge is rather straight and does not therefore constitute a notch, the artefact could perhaps better be classified as a tanged point.
5. Fig. 8:37 (691). Length 22 mm, breadth 9 mm, thickness 3 mm. The (distal) top part of the artefact is missing. The backing, on the left, is over its entire length (insofar as it is present). Flat percussion bulb at the base. The right edge of the blade has two ventral notches opposite the shoulder notch. The 2-

mm-long part between the two notches shows three very fine dorsal retouch strokes. This artefact is very reminiscent of some points of the Hamburgian tradition from Duurswoude-IV (see Bohmers & Houtsma, 1961: 139, fig. IV:1, and 145, fig. IX:3 and 7; in all three cases the shoulder has been made on the left and the so-called hafting notches have been made on the right, ventrally). In addition there are six artefacts from Duurswoude-IV (145, fig. IX:1, 2, 4, 8, 9, 11) where the shoulder has been made on the right and the hafting notches have been made on the left edge, dorsally.

6. 819 (not illustrated). Length 21 mm, breadth 13 mm, thickness 6 mm. Broken, only basal part present. Backing on the right. Shoulder on the left.

G. Long B-points

1. Fig. 8:38 (457). Length 51,5 mm, breadth 11 mm, thickness 4 mm. Backing on the left over a length of 20 mm. Top distal. Percussion bulb at the base. We classify this as a long B-point, because the back is only over a small part of the blade. In terms of shape, however, it is more like a well-proportioned Gravettian point (see also no. 13, fig. 7:19, Movius *et al.*, 1968: 46).
2. Fig. 8:39 (1593). Length 42 mm, breadth 10 mm, thickness 4 mm. Backing on the left at the top by means of fine retouch. The tool could also be regarded as a retouched blade, but the narrowed base and the removal of part of the percussion bulb could be indicative of shafting, so the term point seems to be preferable here.

H.A.-point

1. Fig. 8:40 (1037). Length 24 mm, breadth 7 mm, thickness 2 mm. Backing on the right, at the top end 8 mm ventrally, at the bottom 16 mm dorsally. Percussion bulb (at the base) has disappeared as a result of retouch.

5.2.3 Backed blades (total no.: 51; fig. 8)

The broken specimens could be fragments of

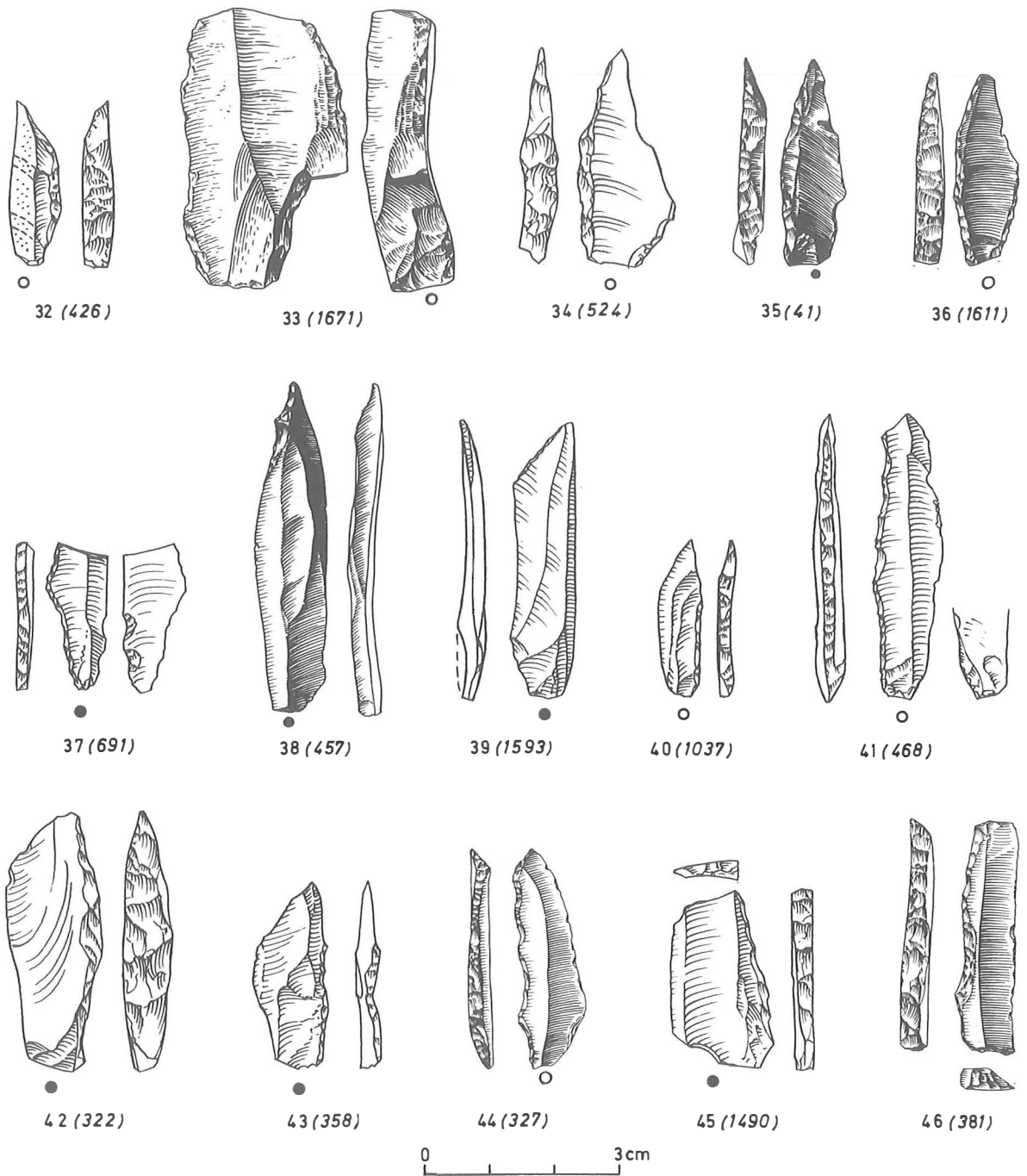


Fig. 8. Flint artefacts: 32 Creswellian point, 33-37 shouldered points, 38-39 long B-points, 40 A-point, 41-46 backed blades (the numbers between brackets indicate the inventory numbers).

points. A few specimens from Een-Schipsloot are not made out of blades, but out of flakes. We distinguish the following types:

A. Only one edge backed, no end-retouch

(called *Rückenmesser* by Schwabedissen and Taute), 45 specimens.

B. Both edges backed (called *paralleseitiges Messer* by Schwabedissen and Taute), 3 frag-

ments. (These could also be fragments of so-called Kremser or Font-Yves points; see Bohmers, 1947; Garrod, 1926).

- C. Right or left edge backed plus one of the ends (called *Messer mit returschierem Ende* by Schwabedissen and Taute), 2 specimens.
- D. Right or left edge backed plus both ends (called *Rechteckmesserchen* by Schwabedissen and Taute), 1 specimen. The broken specimens are not described in any further detail.

Backed blades, type A

- 1. Fig. 8:41 (468). Length 43 mm, breadth 10 mm, thickness 4 mm. Backing on the left. Percussion bulb present. Use-“retouch” present on right edge.
- 2. Fig. 8:42 (322). Length 40 mm, breadth 15 mm, thickness 8 mm. Backing on the right. RA-burin at the base. Along the left edge, that is strongly curved, use-traces are present.
- 3. Fig. 8:43 (358). Length 28 mm, breadth 11 mm, thickness 4 mm. Backing on the right, only the lowermost 18 mm retouched. Flat percussion bulb at the base. Left edge strongly curved; over a span of 3 mm fine retouch ventrally at 15 mm from the base.

Backed blades, type C

- 1. Fig. 8:44 (327). Length 34 mm, breadth 10,5 mm, thickness 3 mm. Backing on the left, more or less undulating, bending round to the right near the top and forming there an oblique truncation. Top distal. Right edge utilized.
- 2. Fig. 8:45 (1490). Length 27 mm, breadth 15 mm, thickness 3 mm. Backing on the right. Flat percussion bulb at the base. End-retouch is almost perpendicular to the back on the right. Left edge utilized.

Backed blades, type D

- 1. Fig. 8:46 (381). Length 36 mm, breadth 9 mm, thickness 4 mm. Backing on the left

and on both ends. Percussion bulb has disappeared as a result of retouch. Right edge utilized.

The six artefacts described here above, of the types A, C and D, are all complete; all the other specimens are broken.

5.2.4. *Triangles, rectangle* (total no.: 3; fig. 9)

Both of the triangles are made out of flakes. In the case of one specimen the 3 edges all show rather shallow retouch; one of the corners is unworked and still shows a fragment of cortex. The length of this specimen is 38 mm, the thickness 8 mm.

The other triangle (fig. 9:54) has one unretouched edge, that shows fine retouch near the corners. The two other edges are steeply retouched. One of the corners has broken off. The length is c. 45 mm, the thickness 8 mm.

The only rectangle has four more or less perpendicular edges, of which three are retouched semi-abruptly, the fourth edge is a fracture surface. The cross-section of this specimen, in contrast to that of the backed blades, is trapeziform. The breadth is 16 mm, the thickness 4 mm.

5.2.5. *Borers* (total no.: 37, fig. 9:51-52)

Among the tools 37 borers are present, of which 16 are broken, either at the apex or at the base.

From close inspection it appears that 4 specimens are made out of blades, 2 out of blocks and the rest out of core-preparation pieces or core-renewal pieces.

The apex of one borer is oriented almost at right angles to the longitudinal axis; all the other borers have an apex with almost the same orientation as the longitudinal axis. The apexes are generally fairly blunt, and triangular in cross-section; some show fine retouch applied from the extremity.

One specimen, that is made out of a block, has an apex that has been produced by making two deep notches. Slight traces of use are present on the otherwise unretouched apex.

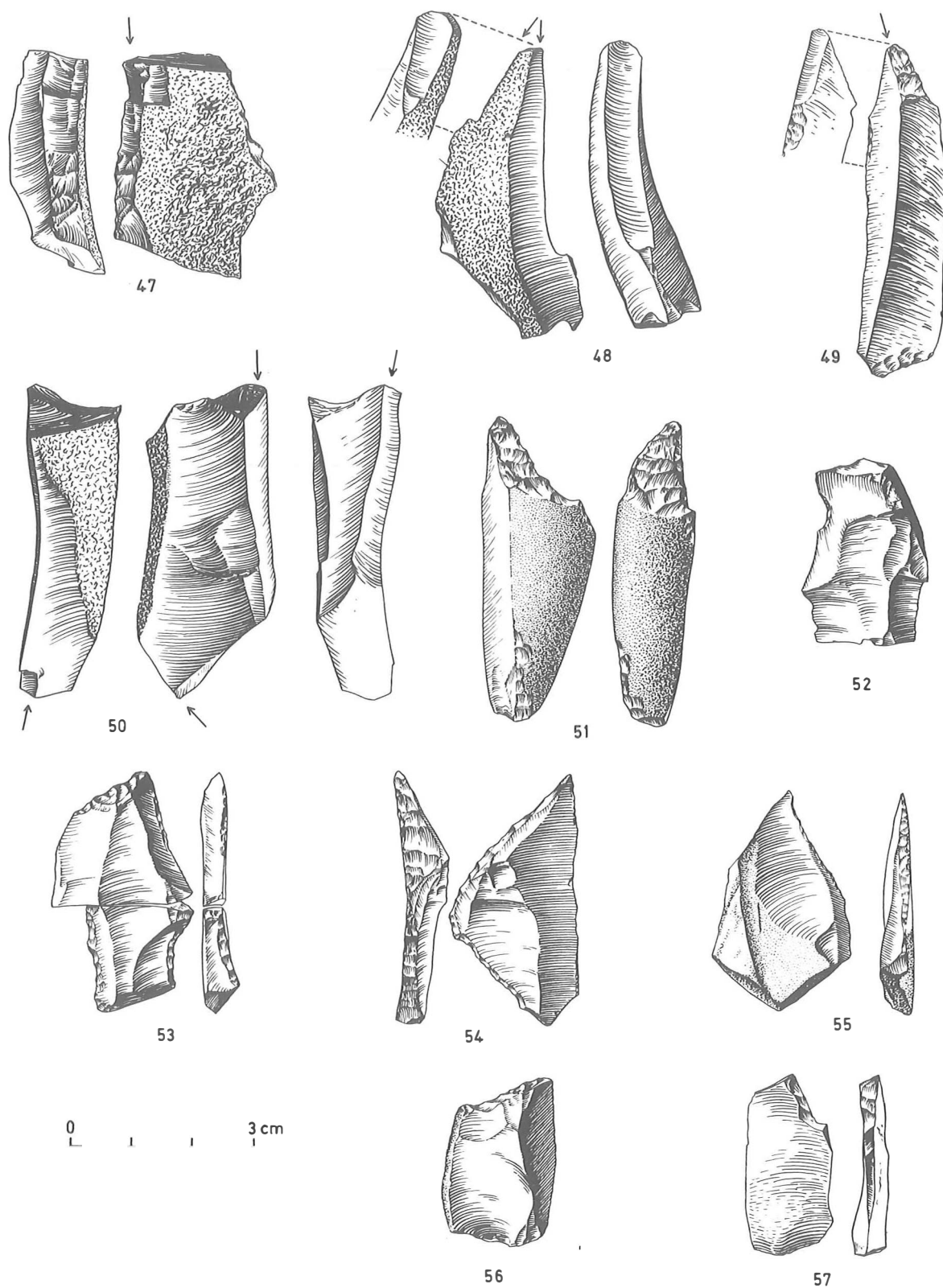


Fig. 9. Flint artefacts: 47 A-burin, 48 AA-burin, 49 RA-burin, 50 multiple burin, 51-52 borers, 53 disregarded, 54 triangle, 55 flake with retouch, 56 truncated blade, 57 notch remnant ("microburin").

Seventeen borer-apexes are retouched on one edge. Of these 12 show ventral retouch, and the rest dorsal retouch, with the exception of one specimen, that is worked both dorsally and ventrally. This is a large borer with a thick apex, that is triangular in cross-section, with some fine, longitudinally running retouch present on the lower edge.

Twenty borers show retouch on both edges of the apex, either dorsally (18 specimens), ventrally (2 specimens), or alternating, i.e. one edge ventrally and the other edge dorsally (6 specimens). Dimensions: length varying from 24-61 mm, breadth from 7-40 mm and thickness from 3-5 mm.

For the sake of completeness it should be mentioned that according to the terminology currently employed in Germany 5 of the borers described here above can be ascribed to the *Zinken*.

5.2.6. *Scrapers* (total no.: 406; fig. 10:58-69)

A scraper is an implement with a working edge that is not sharp and that is usually retouched dorsally. The angles, made by the retouch of this working edge and the ventral edge vary in the material concerned here from 30 to 75°.

This morphologically rather heterogeneous group of tools fall into distinct categories if one distinguishes the original basic material out of which they were made.

We distinguish primary and secondary basic material. We apply the term primary basic material (A) to flakes and blades that served primarily as blanks for the production of tools – in this case scrapers. We use the term secondary for material that was initially intended for some purposes other than the preparation of tools, such as cores and blocks (B), and by-products such as core-preparation pieces and core-renewal pieces (C), but that was evidently considered suitable for the production of scrapers.

A. Scrapers made out of primary basic material (total no.: 268)

The scrapers made out of flakes and blades can be further subdivided according to the

place where the working edge has been made: end scrapers, side scrapers and round scrapers.

- a. Round scrapers (8 specimens) – the working edge runs more or less uninterrupted all round; the shape is more or less circular. The diameter varies from 16-26 mm (average 20,13 mm), the thickness from 5-10 mm (average 7 mm), fig. 10:58.
- b. Side scrapers (1 specimen) of the type consisting of side scrapers made out of flakes/blades only one specimen has been found; length 33 mm, breadth 19 mm. The working edge, that is convex, runs parallel to the longitudinal axis, fig. 10:59.
- c. End scrapers (259 specimens) – the working edge is situated at the distal extremity, perpendicular to the longitudinal axis. This group consists of 2 subtypes:

Double scrapers (28 specimens) – working edges have been prepared at both the proximal and the distal extremity. Length 18-30 mm; breadth 11-28 mm, thickness 5-11 mm, average length 24 mm, average breadth 19 mm, average thickness 8 mm, fig. 10:61.

Single scrapers (231 specimens) – the working edge is situated at the distal extremity of the flake or blade. This category includes a large number of broken pieces (127 specimens). On the basis of the shape of the working edge the single scrapers can be divided into: symmetrically convex (69 specimens) fig. 10:62-63, asymmetrically convex (24 specimens) fig. 10:65-66, straight (5 specimens) fig. 10:67, and denticulated (6 specimens) fig. 10:64. This classification, that is simple compared to those of others (Movius *et al.*, 1968), can be applied at a glance and without any danger of mistakes being made.

B. Scrapers made out of blocks or cores (total no.: 31; fig. 10:68-69)

Scrapers made out of blocks/frost-split fragments (25 specimens) form, together with those made out of cores/core fragments (6

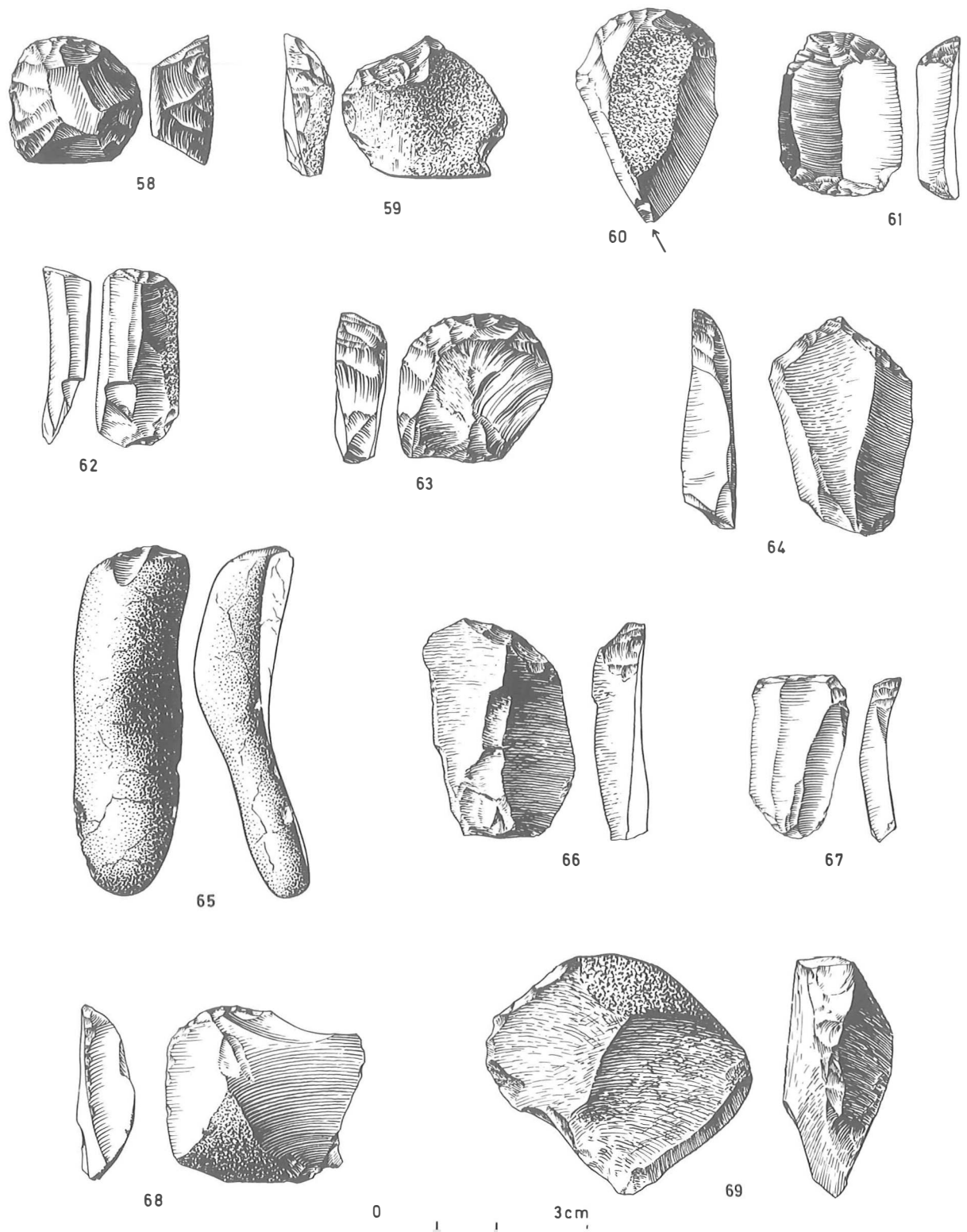


Fig. 10. Flint artefacts. Primary basic material: 58 round scraper, 59 side scraper, 60 combination burin/end scraper, 61 double end scraper, 62-63 end scrapers, symmetrically convex, 64 end scraper, denticulated, 65-66 end scrapers, asymmetrically convex, 67 end scraper, straight. Secondary basic material: 68 end scraper, 69 side scraper.

specimens), a category of highly irregular tools. It is not possible to make a subdivision into specific types. There are no morphological similarities, neither in terms of shape, nor of situation of the working edge, nor of size.

The working edge, that has usually been prepared in a rudimentary fashion, is of varying form: it may be convex, concave, straight, or denticulated. The scraper angles also vary considerably.

Among the tools these scrapers can in fact be regarded as occasional tools, that were made to be used only once, out of pieces of flint that just happened to be available. The maximum length varies from 22-56 mm with an average value of 36,57 mm; the thickness varies from 6-13 mm.

C. Scrapers made out of core-preparation pieces or core-renewal pieces (total no.: 107)

This group can be divided into side scrapers and end scrapers, while the end scrapers can be further subdivided into combination, double and single scrapers. The single scrapers fall into 4 subgroups according to the shape of the scraper edge. Without dealing with all these various subtypes extensively, as we have done already with the scrapers made out of flakes and blades, we give some data here below.

- a. Side scrapers (5 specimens, 1 of which is broken). The side scraper, insofar as it has been prepared on core-renewal pieces, is usually situated on the rim of the striking platform remnant, that formed part of the striking platform of the core, before the scraper was removed. The scraper angles are therefore rather steep (between 75 and 90°). The length varies from 25-46 mm.
- b. End scrapers (102 specimens):
 - Combination side/end scrapers (2 specimens), length 30 and 35 mm.
 - Double end scrapers (6 specimens), length varying from 24-36 mm, average length 27,33 mm.
 - Single end scrapers (94 specimens): broken

(21 specimens), complete (73 specimens); length varying from 14-58 mm, average length 30,03 mm. According to the shape of the scraper edge the complete specimens can be further subdivided: symmetrically convex (58 specimens), asymmetrically convex (2 specimens), denticulated (8 specimens), straight (5 specimens).

The broken scrapers vary in length from 15-40 mm, average length 20,1 mm. The complete scrapers vary in length from 11-56 mm, average length 27,6 mm.

The original scraper angles (before the tool was used and/or additional retouch was applied) were measured in classes of 15° and then only for the single scrapers (total no.: 211). The measurements show a normal distribution, with the modus in the 45-60° class (50.7% of the material). The angles vary from 30-75°. If the scraper angles had been measured close to the working edge (i.e. mainly angles that arose after wear and the application of additional retouch) then higher values would have been obtained.

5.2.7. *Burins* (total no.: 161)

Among the tools, after the scrapers the burins form the largest type-group, with 161 specimens.

The subdivision of the burins is based on the classification of De Sonneville-Bordes and Perrot (1956) and the study of Movius (1968) that is expanded upon here below.

Bohmers (1956) straight away made use of this classification and conceived Dutch equivalents for the French terms:

- a. *burin dièdre* (Dutch: *tweevlaksteker*, *AA-steker*); dihedral burins.
- b. *burin sur troncature* (Dutch: *afgeknotte middensteker*, *RA-steker*); truncation burins.
- c. *burin sur cassure/sur plan naturel* (Dutch: *steker op gebroken einde of natuurlijk vlak*, *A-steker*); break burins.

The term *troncature* is in fact used in the literature rather loosely. Often there is not so much a truncation as rather simply the occur-

rence of marginal retouch, that does not influence the shape of the tool.

We share Bohmers' scepticism regarding a subdivision according to the location of the burin edge with respect to the longitudinal axis of the tool such as lateral and median burins (Movius *et al.*, 1968:34). This method, that is often applied to Late Palaeolithic material, is rather unreliable, in view of our experience with the collection from Een-Schipsloot, because the longitudinal axis cannot always be determined accurately.

A. Multiple burins (26 specimens, fig. 9:50)

There are 22 tools with burins at both ends, that can be divided as follows:

- 4 combinations of RA- and RA-burins;
- 6 combinations of RA- and AA-burins;
- 5 combinations of RA- and A-burins;
- 3 combinations of AA- and AA-burins;
- 2 combinations of AA- and A-burins;
- 2 combinations of A and A-burins.

Four tools have two burins at one end, namely:

- 3 specimens with 2 RA-burins;
- 1 specimen with 2 A-burins.

B. RA-burins (68 specimens, fig. 9:49)

42.88% were made out of flakes/blades, 10.72% out of blocks/core pieces and 34.48% out of core-preparation/renewal pieces.

The length values (in the case of blocks the length is measured parallel to the burin facet) vary from 17-61 mm, the average length is 35.5%; 56% lies between 25 and 40 mm. The burin angle was measured with the aid of a protractor with a level (Movius *et al.*, 1968:16). 74.1% have a burin angle between 60 and 80°. Also the width of the burin edge was noted. This varies considerably, from 1-11 mm. The reason for this wide variation undoubtedly lies in the different basic material that was used for making the

burins. The most frequently occurring values fall between 3 and 4 mm (60%).

C. A-burins (43 specimens, fig. 9:47)

The basic material consists for 19.26% out of flakes/blades, for 53.5% out of blocks/core pieces and for 19.26% out of core-preparation/renewal pieces. The length varies from 20-54 mm, the average length is 37.03 mm, 52.63% of the total has a length between 30 and 40 mm. Of the burin angles 51.8% fall between 70 and 80°. The width of the burin edge shows the highest frequency between 4 and 5 mm (44.3%).

D. AA-burins (24 specimens, fig. 9:48)

Flakes/blades 25.86%, blocks/core pieces 38.79%, core-preparation/renewal pieces 34.48%. Length varies from 23-68 mm, with the highest frequency between 25 and 45 mm (79.17%), the average length is 38.79 mm. Burin angles between 50 and 70° form 51.8% of the total. A striking feature however is the high percentage of burin angles of 90°, namely 33.3%! 58.3% of the burin edges have a width of 6-8 mm.

A remarkable feature is the great difference in basic material between RA-burins and A-burins. Only a small proportion of RA-burins (10.72%) are made out of blocks and core pieces. Yet these coarse irregular pieces determine the character of more than half (53.50%) of the A-burins. Taking into account the fact that this type was made without any previous preparation of the striking platform, and by means of only one burin blow, it can be said that the A-burin is the most rudimentary tool among the burins. The RA-burin, most usually made out of primary basic material and characterized by a carefully prepared striking platform, is a more sophisticated tool. Moreover the frequency distribution of the widths of the burin edges shows that 74% of the RA-burins have a burin

edge 3-5 mm wide. This relatively large number of narrow burin edges, compared with the other types, is possibly indicative of a specific function.

A frequency distribution of the burin angles shows a remarkable feature of the AA-burins. While the RA- and the A-burin angles have a normal distribution, with a modus at 70°, the distribution of AA-burin angles is bimodal and has a modus at 90°. The sharp decline after 90° can be explained by the technical impossibility of removing a burin spall that would form an angle of more than 90° with the striking platform.

5.2.8. *Burin spalls* (total no.: 170)

These are not included in the category of tools, but are discussed here. Of the total number of 170 burin spalls 44 show retouch on the back. This retouch was applied to the blade prior to effecting the burin blow, with the intention of influencing the splitting of the burin spall (Bosinski & Hahn, 1973: 135).

Eleven of these burin spalls with retouch show retouch at the distal end; this means in fact that this retouch determined the length of the spall. This retouch at the distal end is called termination retouch. The other 8 specimens show retouch in the middle of the back.

Ninety-eight burin spalls are primary: these are flakes with a triangular cross-section. The other 42 are secondary; these show the negative of a previous spall. As Bosinski and Hahn already ascertained, it is mainly the primary burin spalls that are retouched; there are only 3 secondary burin spalls with retouch as against 14 primary ones.

The ratio of burin spalls to burin edges is 170:205. Here it must be pointed out that for each burin edge one burin spall is reckoned, thus including those that have more negatives. Although the number thus obtained, 205, is on the low side, the ratio does not seem to be unsatisfactory.

All the more so if one considers the figures given by Hahn for the Magdalenian site of Andernach: 32 burin spalls against 78 burin

edges, i.e. more than twice as many burin edges.

5.2.9. *Combination tools (scraper/burin)* (total no.: 18; fig. 10:60)

Of these tools 9 are made out of blades/flakes. The length varies from 16-39 mm, with an average value of 30 mm. Five specimens (of which 2 are complete) are combinations of a side scraper/burin, made out of core-preparation/renewal pieces, while the same basic material was used for making another four specimens (of which 3 are broken) with a combination of end scraper/ burin.

5.2.10. *Obliquely truncated blades* (total no.: 6; fig. 9:56)

There are 4 complete specimens, and 2 fragmentary ones. Three oblique truncations are straight, 2 concavely retouched; in the case of the 6th specimen the truncation is almost perpendicular to the longitudinal axis of the artefact.

5.2.11. *Tools with notches* (total no.: 35)

This category includes 22 notched blades (including fragments). Distribution must be made between:

- shallow notches, resulting from a small amount of fine retouch and
- deep notches, resulting from a substantial application of retouch.

Notches of type a. occur on 2 complete and 9 broken blades (among the broken blades there is one particularly long specimen, 69 mm). On 6 of the blades traces of use can be seen on both sides of the notch. Of type b. 11 specimens are made out of blades. It is remarkable that for 4 examples the notch borders on to a transversal fracture. It is possible that these notches were made with the aim of breaking the blade on that spot. One specimen even has a notch on each side of a fracture. The presence of one typical notch remnant ("microburin",



Fig. 11. Photo of the profile wall of the Schipsloot with basin I. The culture level is indicated by the measuring-staff and is visible in the wall as a slightly paler band.



Fig. 12. Photo of basin I with the underlying sands.

fig. 9:57) in the material shows that this technique was already applied here (sporadically). On the remaining 7 specimens the notches do not border on to fractures.

There are 2 notched flakes. One example has a notch on a fracture surface, the other (very fragmentary) specimen has a notch next to the percussion bulb.

Seven core preparation pieces (of which 5 are broken) have a notch that has been crudely made, and finally 4 blocks have a notch too.

5.2.12. *Retouched blades, flakes, blocks* (total no.: 104; fig. 9:55)

These are all pieces with partial or marginal retouch (sometimes irregular), that is not restricted to any particular place.

6. CULTURAL RELATIONS

It is clear that we are not dealing with a site of the Ahrensburg tradition; typical tanged points



Fig. 13. Photo of the SW-NE profile of basin II. The white plastic squares indicate the location of the flint artefacts (see fig. 4 right).

are lacking, and the few B-points are of a different type (long) to that of the Ahrensburg tradition (short). Nor can we ascribe Een to the Hamburg tradition, despite the occurrence of a few atypical shouldered points and *Zinken*. Within the Hamburg tradition there are as a rule no backed blades or large quantities of Tjonger points.

The site must clearly be ascribed to the widely spread *Federmesser* tradition. As the name Tjonger tradition has been in general use for almost 40 years (Siebinga, 1944; Bohmers, 1947), in the Netherlands we mostly use this term (in France the term Azilian is used).

Various authors have subdivided the *Federmesser* tradition into groups on typological grounds, notably Schwabedissen (1954). Within his classification we can best ascribe Een to the so-called *Rissener Gruppe*, on account of: a. the limited size of the tools, b. the large group of short scrapers, and c. the fairly frequently occurring double scrapers. The *Rechteckmesser* that is present is however more a characteristic of his *Wehlener Gruppe* (cf. Schwabedissen, 1954: 17, fig. 5m) while Een also possesses characteristics of his *Tjonger Gruppe*, namely the presence of 3 Creswellian points, 3 Châtelperronian points and in addition a couple of tools that are reminiscent

of *Zinken*. The Creswellian points are small, however, and not very typical; and moreover few in number; the same applies equally to most of the *Federmesser* sites in Northern Germany (Bohnsack, 1956: 82 "*quantitativ wie qualitativ recht kümmerlich...*").

From the above it is clear that Een shows characteristics of all 3 groups mentioned by Schwabedissen. We therefore accede to the view of Paddyaya (1971) that there is little sense in making any distinction between the *Tjonger*, *Rissener* and *Wehlener Gruppen*.

Another question concerns the relationship with the English Late Upper Palaeolithic, that Garrod (1925) called Creswellian. To this tradition we ascribe the Dutch sites of Haule V, Wijster, Siegerswoude II, Zeijen and Neer II, the Belgian sites of Lommel and Presle near Charleroi (Henegouwen), and the German site of Hohenholz near Steinhude (Lower Saxony). At these sites one finds greater numbers of Creswellian points, long B-points, Cheddar points, shouldered points and *Zinken* than at the normal Tjonger sites. For this tradition we prefer to continue using the term Creswellian (Campbell, 1977). We agree with Paddyaya that the name Cheddarian (Bohmers, 1956) can better be dropped. Bohmers ascribed e.g. Siegerswoude II to the Cheddarian, although



Fig. 14. Photo of the NE-SW profile on basin III.

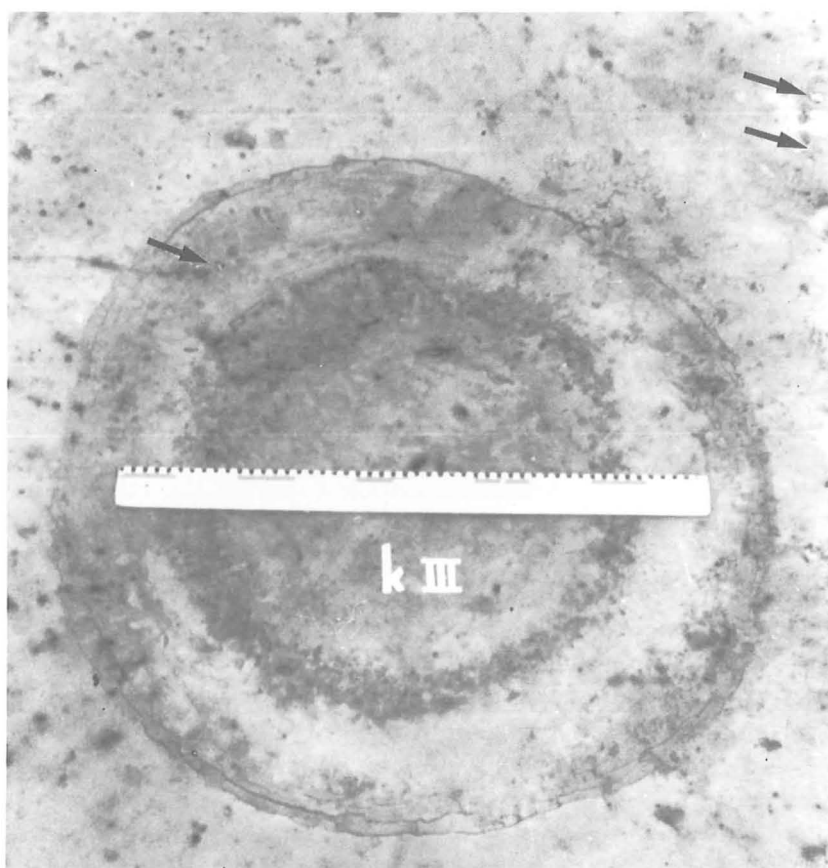


Fig. 15. Photo of basin III, as seen in a horizontal plane. The arrows indicate flint artefacts (see fig. 11 of Casparie and ter Wee).

not a single Cheddar point was found there. We find it hard to ascribe these sites to the *Federmesser* tradition, as Paddayya does. In Siegerswoude II and Zeijen, for example, there are no

typical Tjonger points present, and at Siegerswoude II, Neer II, Zeijen and Hohenholz the characteristic backed blades are almost completely lacking. It is noteworthy that these do

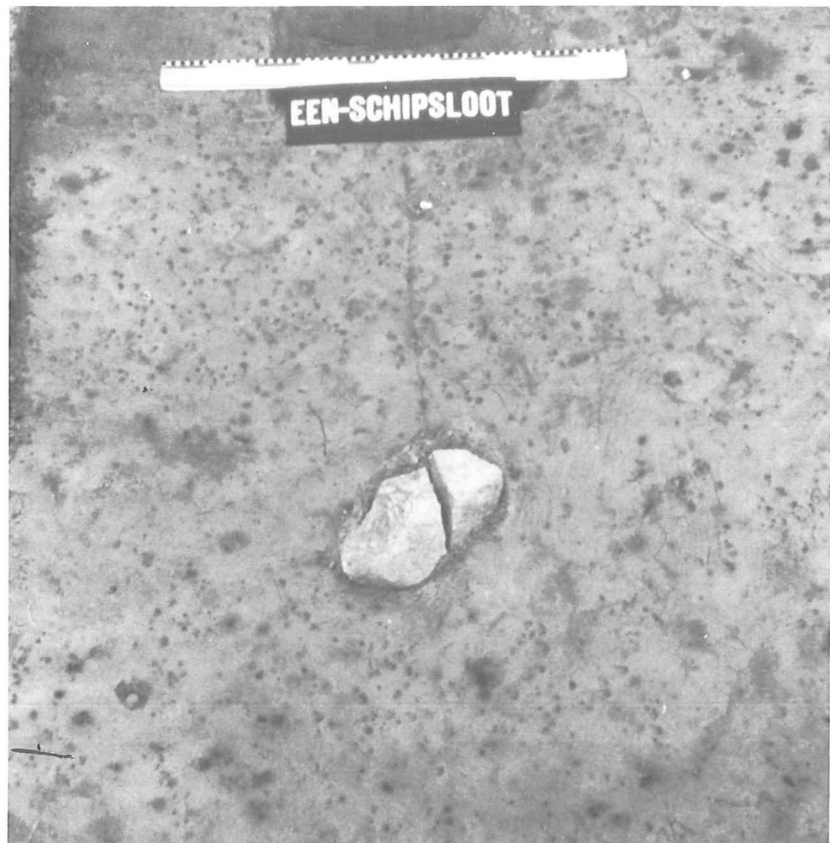


Fig. 16. Photo of a frost crack with a broken piece of granite.

occur in Lommel and Presle and at the English sites.

The first author does not agree with Paddayya's view that the presence of B-points, Azilian points and tanged points in a *Federmesser* context are indicative of a younger phase (Paddayya, 1971: 266). So far there is no evidence for this. Long B-points also occur in the Hamburg tradition, and in a certain sense the Havelte points of this tradition can also be called tanged points.

About the shouldered points from Een-Schipsloot, that are represented by six specimens, including one complete artefact (plus another 6 fragments, which are possibly also broken shouldered points), can be said that they do not resemble the Hamburgian type very much. They are usually smaller, and in most cases it can be assumed that the retouch continued over one entire edge, without inter-

ruption, as is also the general rule with Tjonger points. One could therefore also call them "Tjonger points with a shoulder". They are very similar to several types from Hengistbury Head (Mace, 1959: 246, fig. 4: 13-19).

The first author wonders whether the occurrence of points of this kind, that show affinity to the Hamburg type, is not perhaps indicative of rather a greater age.

As for the English Creswellian (within which shouldered points also occur), the precise age of this culture is still not known. From Aveline's Hole and Kent's Cavern we do know of biseriate harpoons and these are also found in the French Magdalenian VI (Bohmers points this out already in 1947: 198; see also Lanting & Mook, 1977: 21-23).

Paddayya (1971: 262) points out that the Tjonger artefacts of Budel II and Waskemeer were found at those sites under the "layer of

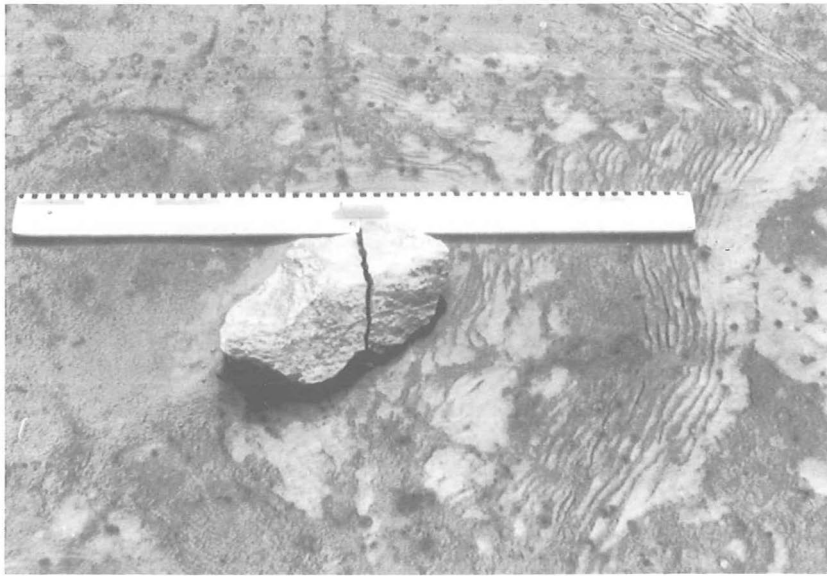


Fig. 17. Photo of the same stone as in fig. 16. Note the frost crack approximately perpendicularly above the middle of the staff. As a result of the wind blowing fine particles of sand across the excavated surface "fossil" wind ripples become visible once again in the culture level.

Usselo". The C 14-dating of Budel II is 9490 B.C. (GrN-1675). That of Waskemeer is 9200 B.C. (GrN-4871). Milheeze is dated to 8930 B.C. (GrN-2314), but the pollen analysis dates this site in the birch phase, i.e. the first part of the Allerød interstadial. In addition there is *Fundstelle C* of Westerkappeln, also a Tjonger site, with an age of 9850 B.C. (KI-271) (Günther, 1973; see for an overview of the C14-datings: Lanting & Mook, 1977).

The above-mentioned facts thus indicate that the Tjonger tradition is not restricted to the second part of the Allerød, but can also occur at an earlier stage (see also Paddayya, 1971: 262).

It is not impossible that the Hamburgian finds from Duurswoude II and IV actually date from the Bølling period (Bohmers & Houtsma, 1959). Between the end of the Bølling oscillation and the beginning of the Allerød there is a time difference of only a few hundred years. The similarity of the shouldered point, illustrated in fig. 8:37 (see 5.2.2), to those of the Havelte type from Duurswoude IV, is striking in this connection. These Havelte points also often have one or two small hafting notches opposite the shoulder. (These small notches also occur on shouldered points that are not of

the Havelte type (Bohmers, 1956: 7). This raises the question whether the Hamburgian tradition in its last phase could not have been contemporary with the Tjonger tradition in an early phase.

The occurrence of backed blades type D and type C show furthermore, in our opinion, affinity with the Late Magdalenian of Central and Southern Germany. To name a few examples (Schwabedissen, 1954): Petersfels near Engen, Hegau (Tafel 90: 20-22); Ölknitz, Kr. Stadtröda, Thuringia (fig. 89; 2,4); and further north: Westerbeck, Kr. Gifhorn, Lower Saxony (fig. 44: 30-31); Calbe-Kremkau, Kr. Salzwedel, D.D.R. (fig. 38: 5).

To summarize it can therefore be said that the very variable point complex of Een-Schipsloot shows some affinity with both the English Creswellian and the Late Magdalenian of South and Central Germany. It could therefore be argued that the site of Een should be dated in an early phase of the Allerød interstadial. With regard to the C14-dating of the peat at the bottom of basin I, it can be remarked that this only means that the artefacts cannot be younger, while furthermore it is clear that most of the basins must have originated after the Upper Palaeolithic occupation.

The geological data available also make it clear, however, that part of the material in any case must date from the first centuries of the Late Dryas period, i.e. from after the Allerød interstadial (see 3: basin II, where the culture level continues undisturbed over the basin, while it is clear that the basin must have originated at the beginning of the Late Dryas) (see also stratigraphical table in Casparie & ter Wee, this volume). This clearly shows, that any view arrived at merely on the basis of typological evidence should be proffered at the very least with some caution. In this connection it must be remembered that the shouldered points from Een are atypical. The possibility remains, of course, that in Een we are dealing with artefacts of an early and a late phase, that now occur together in one level.

7. SUMMARY

In this article an Upper Palaeolithic site at Een (province of Drenthe, the Netherlands) is described. In the course of an excavation the first and third authors collected a total number of 8785 flint artefacts and several larger stones (including pieces of granite), that must have been brought to the spot by Palaeolithic hunters. An overview of the flint material can be found under 5.1 and 5.2.1. From a cultural point of view the site clearly belongs to the so-called *Federmesser* tradition, or (according to the currently accepted nomenclature in the Netherlands) the Tjonger tradition. Characteristic elements include: considerable numbers of Tjonger points among the points, backed blades, and large quantities of (usually short) scrapers (46.6 % of the tools). Some conspicuous components of the material include two Creswellian points, and six points resembling shouldered points, that are reminiscent of the Hamburgian tradition.

Stratigraphically the finds occur at the boundary between 2 layers of coversand, that are to be regarded as Younger Cover sand I and Younger Cover sand II, respectively. The "layer of

Usselo", that one would expect to find at this level, was not visible.

During the excavation ten basin-shaped depressions were found, that must have originated in a periglacial environment during the first part of the Late Dryas (see Casparie & ter Wee, this volume), as well as a number of frost cracks. It is clear that most of these basins originated (relatively soon) after the occupation. In the case of one basin, however, artefacts occurred both at the bottom of the basin and in the undisturbed culture level above the basin. This means that either this basin originated during the occupation period (which must in that case be dated in the first part of the Late Dryas), or that there were (at least) 2 occupation phases, of which in any case the latter must have the dating mentioned.

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