

VII Vuursteenbewerking - Flint technology

The Flint Technology of the - Hamburgian Culture - (Olbrachcice, S.W. Poland)

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The technology of treatment of flint and any other stone raw materials of the Hamburgian Culture has not been studied in literature. Only some hints have been given to the subject. (RUST 1958; TROMNAU 1975). The sites of the Hamburgian Culture, that have been studied up to the present give only artifacts of the stonewares in the form of the retouched artifacts, in other words so called tools. The characteristics of cores, blades, flakes and waste materials has been omitted (the KOBUSIEWICZ study is an exception). Also it has not been made the observations of traces of wear preserved on artifacts. If so it would have been possible to determine the real functions of the tools. Thus the present paper will focus primarily on the technology of flint of the Hamburgian Culture, examples of which will be flints of only one site in Olbrachcice. The above-mentioned site was excavated by the author in 1974 through 1976 (BURDUKIEWICZ 1979).

The site is located on the route of the Kopanica glacifluvial valley (a tributary of the Odra River, near Głogów). The Kopanica valley at the lower part of the river has been created as a result of the erosive activity of thawing waters of the Baltic Glacier after the Leszno (Brandenburg) Stage on the basal moraine of Warta Glaciation. In the valley recognized were the lower terrace, flood plain terrace (79.5-80 m of absolute height), higher terrace, sand terrace of 80-85 m high, on which there is the site and the border of the valley of 20 m high in comparison to the flood plain terrace. The sand terrace is composed of sand formations with occasional gravels, that at the top layer possess formations defined as solifluction layers. The top layer of sands of terrace bears traces of transformation (SZPONAR 1977).

The author's excavation embraced the area of 250 sq. m. Jointly 5645 flint artifacts, 312 scraps of stone plates and roundstones, 400 small fragments of animal bones¹ and 8 grams of charcoals² have been excavated. The materials were mainly located in kshemenitsa (remain of camp) of 3 m in diameter, in which great concentrations of artifacts could be observed (approximately 300 pieces from 1 sq. m.). Also a certain number of small, concentrations of artifacts as well as flint production sites could be observed too. Fragments of animal bones have been found in larger concentrations on the southwest side of kshemenitsa. Numerous flint artifacts and fragments of stone plates create compositions pointing out the homogeneity of the assemblage. From the side of plumb-line, the relics were scattered from surface in 1 m, but the main concentration embraced 40-60 cm in depth and is bound up with the level of rust-coloured soil BvCn (A), which colour is light brown (10YR 6/4 of Munsell Soil Charts) and layer-top of tundra soil k(A) (60-100 cm in depth), which colour is brown (10YR 7/4). The powerful translocation of relics observed from the side of plumb-line brought about cryoturbation processes and few of them had been brought to the surface owing to deep forest ploughing (KOWALKOWSKI 1979).

Stone raw materials of Hamburgian Culture have been subjected to petrography examination and from this it was possible to determine the correspondence amongst them and types of rocks that occur in the gully side of basal moraine that create the border of Kopanica valley (CZERWINSKA 1979). Flints constituted only about 6 per cent of all rocks (sample 310 pieces) and they are more numerous in trench and reach 50 per cent (only cores and nodules of flint were counted) owing to the sample of rocks collected from moraine. Also, comparatively great differences have been found, when compared with the percentage of other rocks found in moraine and in the site, that

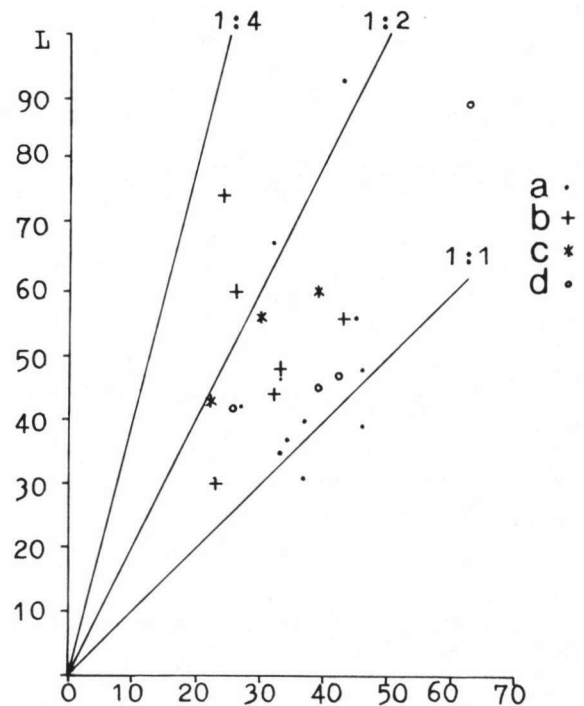
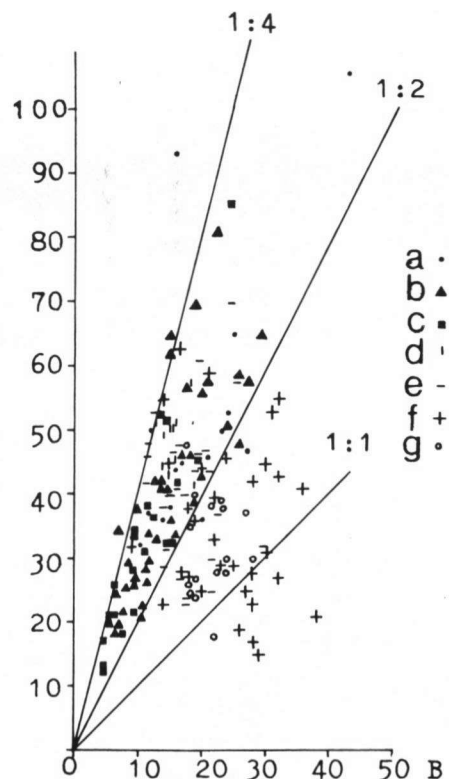


Fig. 1 Diagram length-breadth of cores and core tools:
a) single platform cores; b) opposite platform cores; c) cores with changed orientation; d) core tools (without cores in final stage of exploitation).

Fig. 2 Diagram length-breadth of blades and tools (main groups)
a) cortically blades; b) partially cortically blades; c) noncortical blades; d) shouldered points; e) 'Zinken'; f) burins; g) end-scrapers.



point to a selective choice of raw materials. Flint raw material occurred exclusively in the form of the Baltic Chalk Flint ranging in colour from completely black to whitish. This flint has been deposited by glacier. In moraine, the flint is often encountered in the shape of big nodules with numerous smoothnesses and surfaces which have undergone thermic cracks and sometimes preserve cortex. It is almost certain, that Hamburgian people collected stone raw material from the surface or raked up the gully side of moraine and carried them over to the site located several hundred meters from it. Some traces of penetration of the back of the valley in the form of not numerous blades and flakes have also been found. The location of the site on sand terrace, that is composed of sands and minute gravels gives way to the assumption, that all the larger stone objects have been deposited from the outside.

The whole process of flint production, except collecting of raw material was executed at the site. Preliminary treatment of flint nodules have been made giving the required shapes to the cores, producing debitage and tools to use them later. Nevertheless, comparison of the size of the cores and core tools and sizes of blades and blade tools indicate that a certain amount of blades had to be brought to the site from the outside. There are no adequate cores for the biggest blades (fig. 1 and 2). Singular flakes and blades in the gully side of moraine bear witness to the fact that the preliminary production of debitage could take place where the raw material had been mined.

To carry out the general analysis of the assemblage structure, acquired experiences how to use dynamic technology classification had been executed. The classification enables approximate reconstruction of the technological process of flint treatment and makes economy of the raw material more understandable (GINTER 1974; SCHILD, MARCZAK, KRÓLIK 1975). The following groups of objects have been singled out. Each group corresponds with subsequent phases of flint treatment, and enables presentation of assemblage structure, simultaneously, which can be of great importance for statistical comparison of assemblages.

I Group - Raw materials - 121 examples.

In this group the material that has been found was separated from that material which did not bear distinct traces of intentional working. The natural roundstones and flint debris have also been separated. They constitute reserves of raw material and for many reasons they proved to be useless for further working including numerous cracks or other unknown factors. Some of the nodules reach 9 cm in diameter. Beyond the Baltic Chalk Flint some pieces of hornstones are to be found amongst raw material.

II Group - Core Preparation and Early Phase of Exploitation of Core.

Artifacts after preliminary preparation of cores (pre-cores) have been singled out. Typical for the Lowland, the younger cultures forms of that kind (GINTER 1974) can not be separated in the Hamburgian assemblage of Olbrachcice, if the initial single-platform core is not taken under consideration (fig. 3a). The preparation of top, striking platform and back of pre-core and unsuccessful beginning of exploitation of them can be observed. The following forms have been singled out:

1. Initially struck cores 3 exp.

Single-platform cores exclusively were taken into consideration and exploitation of which had been started (one or two exploitation negatives). Only one of the cores has prepared striking platform and the others did not bear the marks of preparation.

2. Cortical flakes 84 Exp. are covered in 50 per cent with cortex and natural surfaces on the dorsal face of the flake. They have been struck mainly during the preparation of the striking platforms, flaking surfaces, tops and backs of the cores. Some of them probably come from the first phase of exploitation of cores. The rest of the striking platforms of the flakes are dominantly natural. Cortical flakes are often bigger than others.

3. Cortical blades 18 exp.

Here remarks to cortical flakes are in force.

4. Blades removed from prepared pre-flaking surface showing traces of previous preparation 22 exp.

These are blades and flakes (rarely) bearing on the dorsal face traces of preparation of pre-flaking surface or sides of the cores (fig. 3d). They are slightly inflected.

III Group - The Phase of Exploitation of Cores.

The artifacts obtained during exploitation of core have been included here. The cores had been used till the core was wasted and than the rejuvenation of them had been given up. All the cores being in the phase of exploitation served as a material for obtaining blades or blades and flakes. Cores for flakes have not been found at all. The differentiation of sizes of cores presents fig. 1.

1. Single-platform cores - 11 exp.

Most of them have prepared pre-striking platform, the pre-flaking surface or core-sides were prepared rather rarely. Sometimes they do not have core-preparation. There are some examples of core rejuvenation by means of the narrowing of the flaking surface of core or changes of directions of striking blades and flakes can be observed.

2. Opposite platforms cores - 8 exp.

These kinds of cores having common flaking surface for two striking platforms most often underwent the phase of preparation of striking platforms and core-sides. The backs of the cores had been prepared rarely (fig. 3b).

3. Cores with changed orientation - 3 exp.

They bear marks of preparing of the striking platforms. The changing of directions of exploitation appeared when the other options in the assumed direction of exploitation had been exhausted, if the size of the core had been preserved.

4. Partially cortical flakes - 130 exp.

The dorsal face of the flake preserves less than 50 per cent of cortex or natural surface.

5. Flakes from cores with single platform - 276 exp.

There is agreement between the direction of striking of negatives on the dorsal face and direction of striking of flakes.

6. Flakes from cores with opposite platforms - 22 exp.

The direction of striking of negatives on the dorsal face are parallel but in opposed directions. The some applies to directions of the striking of flakes.

7. Flakes from cores with changed orientation - 73 exp.

The negatives on the dorsal face of flakes bear marks of striking in various directions.

8. Partially cortical blades - 42 exp.

9. Blades from cores with single platform - 89 exp.

10. Blades from cores with opposite platforms - 10 exp.

11. Blades from cores with changed orientation - 14 exp.

IV Group - Core Rejuvenation

That group encompasses artifacts which came into being when the striking platforms of cores and flaking surfaces of cores were being repaired. Chips which appeared when regularisation of striking platform edges had been made belonged to that group. In the German literature that phenomenon has groundlessly been identified with the retouch (RUST 1943), Taf. 21). Because of many difficulties with how to distinguish them from the other chips they have been jointly incorporated in the next group.

1. Core Tablets - 25 exp.

Flakes, that appeared during rejuvenation of striking platforms of cores.

2. Blades with traces of rejuvenation of flaking surface of core - 10 exp.

V Group - Cores in the Final Stage of Exploitation and Undetermined Fragments of Flakes, Blades and Chips.

That group encompasses cores in the final stage of exploitation, fragments of blades and flakes broken intentionally (fig. 3d) and unintentionally. Also minute wastes of exploitation of core, wastes and chips from retouch of tools and undetermined artifacts constitute that group.

1. Cores in the final stage of exploitation - 20 exp.

2. Undetermined fragments of cores - 31 exp.

3. Fragments of cortical flakes:

Proximal part - 96, medial part - 138, distal part - 80 exp.

4. Fragments of noncortical flakes:

Proximal part - 256, medial part - 237, distal part - 161 exp.

5. Fragments of cortical blades:

Proximal part - 42, medial part - 45, distal part - 52 exp.

6. Fragments of noncortical blades:

Proximal part - 104, medial part - 159, distal part - 117 exp.

7. Undetermined fragments of flakes and blades - 405 exp.

8. Chips - 2328 exp. They are flakes reaching 1,5 cm in diameter.

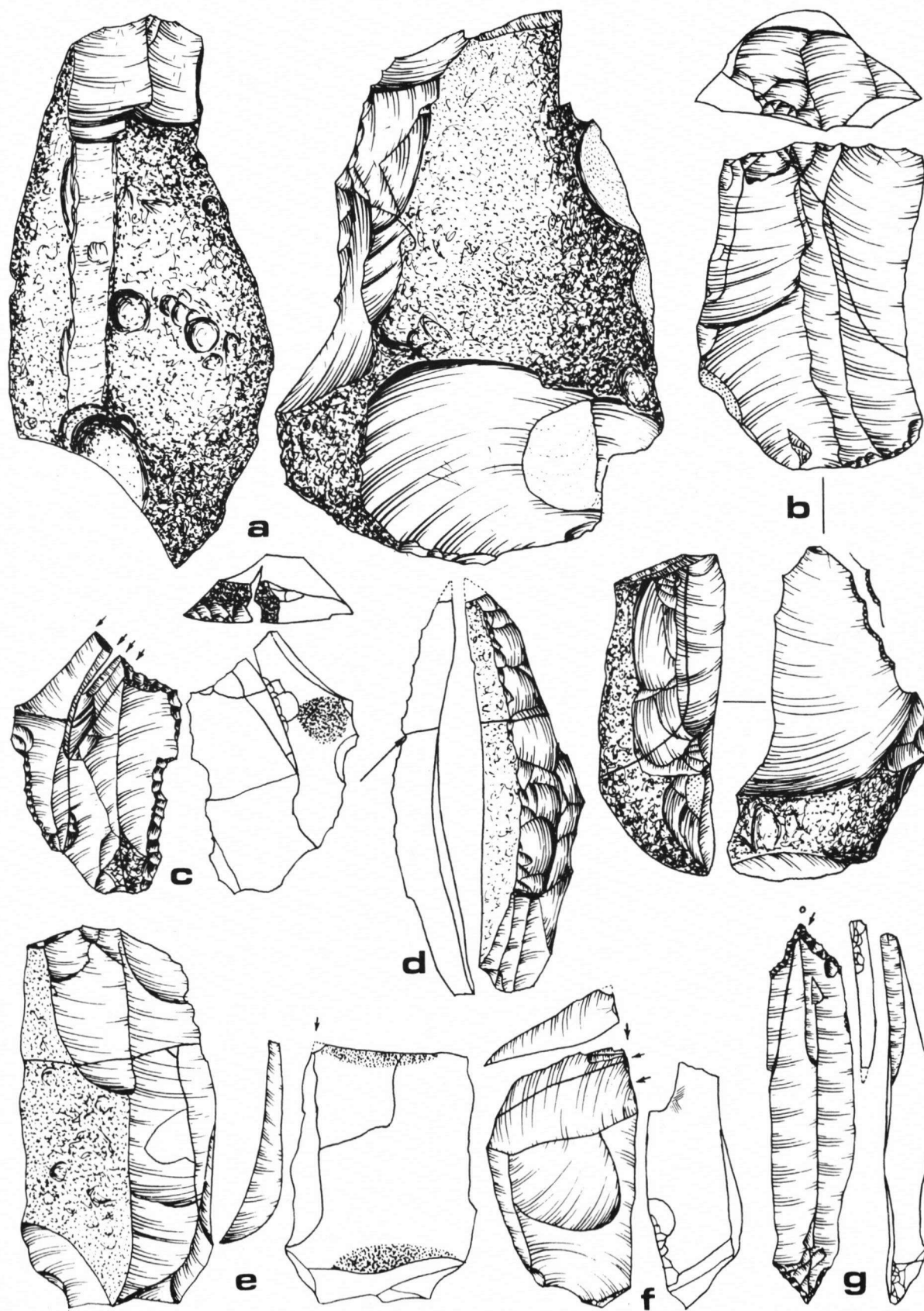


Figure 3 Flint artefacts of Hamburgian assemblage Olbrachcice 8.
a) single platform core with preparation traces;
b) core match to blade-saw;
c) burin spalls match to burin on retouched end (with traces of smoothing);

d) blade removed from prepared pre-flaking surface broken intentionally;
e) burin from intentionally broken blade (with traces of smoothing);
f) burin spall match to core burin (with scratches);
g) double borer changed into burin with borer.

VI Group - Retouched Tools and Characteristic Tool Production Waste.

This group encompasses all retouched artifacts (taxonomy of tools will be presented separately), microburins and burin spalls. Together with burins, burin spalls often create articulations (fig. 3 c, e, f.). To that group should belong chips obtained during the process of the retouching of end scrapers and other tools. But they have already been mentioned earlier in the class of chips from the regularisation of cores.

1. Tools - 456 exp.

The size of tools in comparison with blades presents fig. 2. and selected tools fig. 3b, c, e-g.

2. Microburins - 20 exp.

3. Burin spalls - 49 exp.

The process of production of tools reveals repairing and reshaping (for example reshaping of borer into burin - fig. 3g or burin on unprepared end into burin on retouched end - fig. 3c).

VII Group - Tools for Flint Artifacts Production

Hammerstones with distinct traces of hammering, bolsters and not preserved bone and horn tools belong to this group.

1. Hammerstones - 2 exp.

2. Bolsters - 5 exp.

Seriously cracked fragments have been put together.

The above-mentioned dynamic technological classification of flint and stone artifacts of the Hamburgian assemblage from Olbrachcice indicates the comparatively simple techniques of the production of debitage and the non-complicated preliminary phase of preparation of cores which preceded it. The technique of hard hammerstone had been used in the course of preparation of core and exploitation of core. We can notice this observing the distinct traces of percussion points, great percussion scars on high percussion cones and thick rests of striking platforms. All retouched and unretouched artifacts with the macroscopic traces of using them have been subjected to microscopic analysis of traces of using (study by L. KOCON). Numerous traces of smoothing (fig. 3c, e) scratches (fig. 3f) and the rounding of the scraping edge indicates the intensive use of some flint tools and to application of a handle made from organic materials. Numerous rejuvenation of cores and repairing of tools indicate to economical using of raw material at the Olbrachcice assemblage.

Unfortunately, very well described technologically the Hamburgian site Liny, Zielona Góra Voivodship is not complete (the half of the assemblage from O. DOBRINT's excavation have been lost). In connection with that the Liny site can not be the basis for drawing broader conclusions. Owing to the KOBUSIEWICZ excavation 17 cores are to be found, mostly not prepared, 786 specimen of debitage and wastes, among them 85 cortical flakes, 13 blades removed from prepared pre-flaking surface showing traces of previous preparation. Moreover 129 tools and 12 burin spalls have been found (KOBUSIEWICZ 1973). Complete scientific description of the flint technology at the oldest settlements of the Central European Lowland when the last glacier withdrew, requires the renewed and more exhaustive elaboration over very rich Hamburgian assemblages from north-west Germany and Holland. Taxonomically Olbrachcice assem-

blage is particularly similar to Borneck, Meiendorf, Stellmoor, Deimern 41 and Heber 118 (RUST 1958, TROMNAU 1975). According to the latest discoveries, the Hamburgian Culture should be linked up to the Bölling interstadial (BOKELMANN 1979).

Technocomplex with shouldered points (Hamburgian) in comparison to younger technocomplexes i.e. Technocomplex with arched baldelets and Technocomplex with tanged points is expressed by means of comparatively simple techniques of blade and flake production without widely developed pre-core phase and without time and place distribution of production process. Several interesting questions, which are linked with technological problems, special question of the development of the social relations can not be solved without new elaboration of other assemblages. It is necessary to postulate introduction of the technological questions to the study of stone assemblages, which will widen many scientific problems without limitation now to build systems of archaeological cultures.

Notes

- ¹ According to the initial macroscopic examination of bone fragments carried out by doc. dr. T. Cryżewska from Wrocław University - Institute of Palaeozoology, these are mammal remains mainly cervoid - presumably reindeer.
- ² Charcoals from Olbrachcice have been given for C₁₄ analysis; - Lod 111. 12.658 ± 235 BP or 10.735 BC.

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