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# PROBLEMS CONCERNING HAMBURGIAN CULTURE IN CENTRAL EUROPE

## PROBLEM KULTURY HAMBURSKIEJ W EUROPIE ŚRODKOWEJ

Until recently Hamburgian Culture has been known only from finds made in north-western Germany and Holland. Lately a Hamburgian site has been investigated at Liny, Wolsztyn District, in western Poland. The material dealing with this assemblage, presented in this work, corresponds typologically and statistically with classical Hamburgian collections from Schleswig-Holstein. The site at Liny proves the extensive range of wanderings of Hamburgian hunters who came to western Poland from North Germany or Holland. The date of origin of the Hamburgian site at Liny should be determined on the basis of typology back to, probably, the Oldest Dryas (Meiendorf Interval) or the beginning of Bölling.

In the course of researches of a group of Late Palaeolithic and Mesolithic sites investigated by the author in recent years in the western sector of the Warsaw-Berlin ice marginal valley and its vicinity, a particularly interesting find—already signalled before World War II—was made at Liny, Wolsztyn District, in 1969. These investigations contributed much to the knowledge on Hamburgian Culture, i.e. the oldest known culture of central European Lowlands.

Relics of that culture were discovered at various sites in Schleswig-Holstein already at the end of the XIXc. but were distinguished for the first time in 1932, named originally the Wellingsbütteler Gruppe (after the site at Wellingsbüttel)[1], and changed the following year into *Hamburger Stufe* (Hamburgian) since the majority of defined sites of this Culture was located in the vicinity of Hamburg[2]. The first Hamburgian sites (at Elspeet in Holland) were then already known. Following the typological definition of the Hamburgian group the number of those sites increased rapidly. About a hundred sites are known at present.

The first and so far most complete studies dealing with traces of inhabitation of that Culture were carried out by A. Rust in the 1930's at the already classical Meiendorf and Stellmoor sites, Ahrensburg District, about 20 km north-east of Hamburg[3]. In post war years A. Rust made further most interesting discoveries on this subject while investigating the Borneck, Poggenwisch and Hasewisch sites near Meiendofr[4]. Meanwhile, several works devoted to Hamburgian problems dealing with its genesis, range, links with other Late Palaeolithic cultures, the life and husbandry of its people have been published in archaeological literature.

Until recently scientists knew of two finds in Poland, which were most probably of Hamburgian Culture—three shouldered points found among a mixed surface collection at Rogowo, Opole district[5], (Pl. X4-6) and at Liny, Wolsztyn district, known since 1928 from surface investigations conducted by O. Dobrindt, a local amateur archaeologist who carried out superficial probe investigations at this site together with F. Selger, in 1940. Dobrindt's collection was inspected in 1938 by A. Rust who described it for the first time as Hamburgian and published two shouldered points and a *Zinken*-perforator of that group[6]. Relics collected on numerous sites in that region and investigated by Dobrindt were lost during the Second World War. A greater part of his notes and sketches has been saved, alas, those concerning the site at Liny are missing. There are, however, notes including an enumeration and a brief description of finds and data on the localization of sites, at present preserved at the archives of the Poznań Archaeological Museum. Authorized by the Polish Academy of Scien-

[1] Schwantes 1932.
[2] Schwantes 1933.
[3] Rust 1937; 1943.
[4] Rust 1958.
[5] Rothert 1936.
[6] Rust 1943, p. 150. The site at Liny has, moreover, been mentioned several times in literature: Dobrindt 1936; 1944; Rothert 1941; Mey 1960.

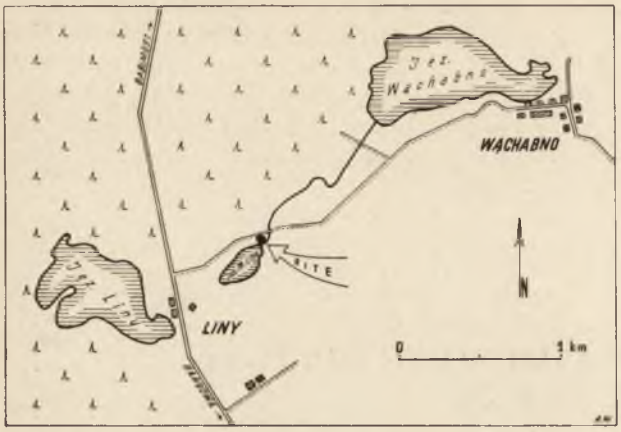


Fig. 1. Liny, Wolsztyn district. Situation of site 1.
Liny, pow. Wolsztyn. Położenie stanowiska 1

ces Institute of History of Material Culture the author of this work has, therefore, been able to find the aforementioned site in recent years[7], and exploit it during excavation seasons in 1969, 1970 and 1971.

There has been one more find in Poland which may be linked with Hamburgian Culture. It is the typological Hamburgian shouldered point from the "Nowy Młyn Industry" at Nowy Młyn, Skarżysko Kamienna district[8]. Yet, this was a single specimen derived from the deflation surface found together with numerous relics making up a mixture of various cultural implements.

It has so far been possible to accept Schleswig-Holstein, or the vicinity of Hamburg as the eastern boundary of Hamburgian Culture since the most easterly sites of that Culture were restricted to that area. The above mentioned implements were but problematic presuppositions, hardly sufficient to present evidence of the abode of Hamburgian hunters. The site at Liny—according to A. Rust: "probably the most easterly proved trace of Hamburgian inhabitation"—appeared to be the most undisputed. This utterance was based on an autopsy of O. Dobrindt's never published and still missing collection.

The recognition of—until recently few—typological Hamburgian elements discovered in Poland has being linked with the abidance of those people on Polish territories was even more difficult since extensive, hundreds of miles long distances—where Hamburgian Culture was unknown, if we disregard the very few horn implements which could probably also be linked with this Culture—separated these areas from those densely inhabited by Hamburgians (Schleswig-Holstein, Holland). These problems will be discussed later.

Results of researches at Liny shed new light on the problem concerning the range of Hamburgian Culture and proved the unquestionable presence of its people in Poland. An extensive part of this work is therefore devoted to the site at Liny, since finds made there provide most important evidence to support this statement.

Site Liny 1 is situated on the terrace of the Małe Liny Lake (Fig. 1), north of a morainic plateau, between the Nowy Tomyśl outwash plain in the east and the depression occupied by the River Obra in the west (Fig. 2). The edge of the Warsaw-Berlin ice marginal valley forms the southern border of the plateau. The site is situated at an armlet of the Nowy Tomyśl outwash plain which runs into the ice marginal valley in the vicinity of Smolno Wielkie.

This area is—just like the entire Nowy Tomyśl Plain—intersected by glacial channels which originated in the Leszno Phase of the Baltic inland ice period.


Fig. 2. A Geomorphological sketch of the vicinity of Liny, site 1, Wolsztyn district:

*1* — moraine; *2* — morainic plateau; *3* — outwash plain; *4* — lakes; *5* — valleys and channels.

Szkice geomorfologii okolic stanowiska Liny 1, pow. Wolsztyn:

*1* — morena, *2* — wysoczyzna, *3* — sandr, *4* — jeziora, *5* — doliny i rynny

[7] The author wishes to acknowledge the help of Docent Doctor S. K. Kozłowski in the arduous search of the Hamburgian site at Liny.

[8] Sawicki 1933-1934, Pl. 20:10.

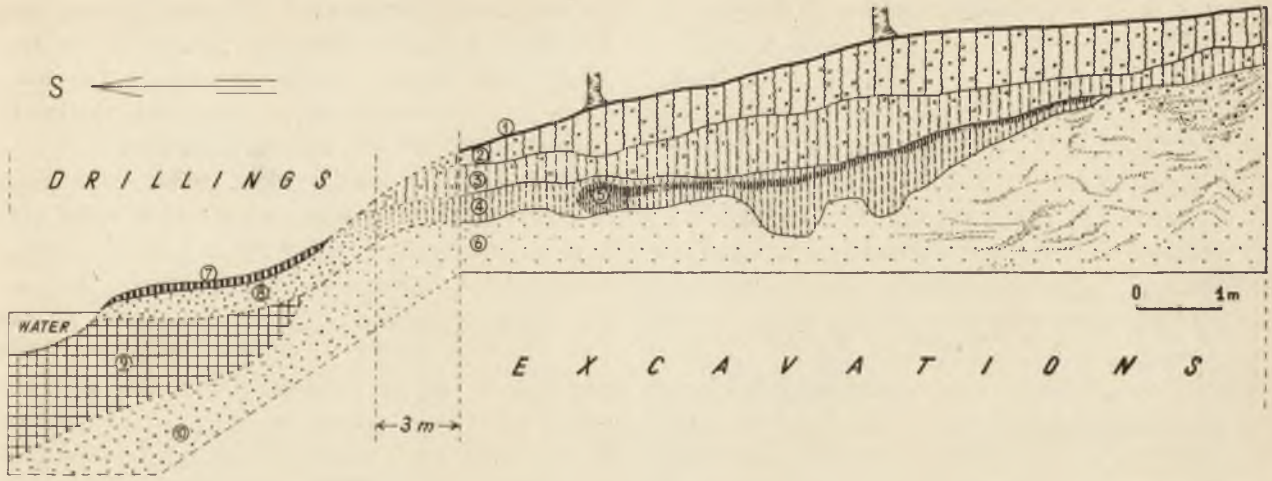


Fig. 3. Liny, Wolsztyn district, site I. Profile of the site along the N-S line:

*1* — present day humus; *2* — fine grey-brown sand with an admixture of rot and gravel; *3* — cf. layer 2, grey colour; *4* — sand of an intensively grey colour; *5* — dark-grey soil with streaks of yellow sand; *6* — fine grained, unstratified sand, gravelly pillow structure in the north part and marked deposits of iron compounds, yellow-brown colour, light yellow in the southern part without gravelly pillow structures and iron compounds; *7* — swamp humus; *8* — coarse grained sand with gravel; *9* — peat; *10* — sand with admixture of clay in the upper and coarse grained in the lower part.

Liny, pow. Wolsztyn. Profil stanowiska 1 po linii N-S:

*1* — humus współczesny; *2* — drobny piasek szarobrunatny z domieszką próchnicy i żwirów; *3* — jak warstwa 2, barwa szara; *4* — piasek intensywnie szary; *5* — ciemnoszara gleba z wkładkami żółtego piasku; *6* — drobnoziarniste piaski niewarstwowane, w części północnej wysady żwirowe i silne nacieki związków żelaza barwa żółtobrunatna, w części południowej jasnożółta, bez wysadów żwirowych i związków żelazistych; *7* — humus bagienny; *8* — gruboziarniste piaski ze żwirami; *9* — torf; *10* — piaski górą iłaste, dołem gruboziarniste

These channels could also have originated there after the Leszno Phase since blocks of dead or passive ice covered extensive areas. Water, circulating in subglacial tunnels, sculptured the bed of the inland ice and created glacial channels. With the passing of time the ceilings of these glacial passages collapsed and previously created negative forms were filled with ice blocks. When the inland ice receded moraine deposits covered these blocks and prevented their further melting. The Baltic inland ice stopped during its recession at the frontal moraine line of the Poznań Phase. Melting water carved outwash plains which were in turn re-modelled, during a successive oscilation, into present day valleys. Outwash plains in the Warsaw-Berlin ice marginal valley pass without any bends over to a mean terrace (II). This level is therefore more recent than the Poznań Phase. The burried ice blocks lasted out the entire period and preserved forms from previous epochs. They melted only in the Late Glacial. In accordance with observations in Poland these ice blocks began to melt in the Alleröd and even during the decline of the Older Dryas[9].

Studies of the pollen analysis of the glacial channel profile carried out recently at the Ośno Lake in the Warsaw-Berlin ice marginal valley, 14 km in a straight line from the site at Liny, show that ice blocks began to melt there in the Alleröd[10]. It must therefore be assumed that blocks of dead ice covering the area of the present day basin of the Małe Liny Lake began to melt at Liny also in the Alleröd. During warm oscilations in the Late Glacial the surface of this small reservoir was probably covered by shallow water.

Deposits composed of sand and gravel forming outwash plains where archaeological finds occur seldom exceed an inch or two; medium or coarse grained sand predominates. Drillings carried out during excavation works have shown that the bed of glacial channels in the vicinity of the site is filled with organogenic sediments reaching a depth of ca. 2.5 m.

The profile of the bed at the Liny site consists of (Fig. 3):

1. Present day humus.
2. A grey-brown layer of fine sand mixed with rot and some fine gravel 3-10 mm in diameter. The colour derives from iron compounds.
3. A layer similar to layer 2 in its consistence—grey without braun tint.
4. A soft intensively grey layer of sand.
5. A thin layer of dark grey soil with inserts of yellow sand clearly standing out against the predominant grey.

[9] Kozarski 1963; Tobolski 1966; Nowaczyk 1967.

[10] I wish to express my appreciation for this information to B. Nowaczyk M. A., who based his work on results of a pollen analysis prepared by K. Tobolski, hitherto unpublished.

6. A layer of fine grained unstratified sand.

Gravel pillow structures and intensive yellow-brown layers of iron compounds occur in higher situated parts on the north side of the profile away from the lake. In the southern part approaching the lake shore this layer is of a light yellow colour, there is no gravel and almost no iron interpolation.

Fine grained stratified yellowish sand of fluvioglacial outwash plains stretch below layer 6. Bore-holes drilled between the edge of the terrace and the present day extent of the water made it possible to reconstruct partly the composition structure located to the south of the excavation. It is marked in Fig. 3 by a broken line, its length shortened fourfold as the shore of the present day water reservoir stretches about a dozen yards to the South from the edge of the lake's terrace.

7. A layer of swamp humus covering the depression once filled with lake water.

8. Coarse grained sand with single gravel grains up to 4 cm in diameter of a rusty brown colour, in the northern sector near the excavation, and grey with dark ash coloured interpolations of slime in the lower part, in the southern sector.

9. Peat.

10. Sand with admixture of clay in the upper and coarse grained in the lower part.

Flint relics occured only in layers 1-5, never in layer 6 or below. They appeared very sporadically in the 1st layer, more often in the 2nd and most numerous in the 3rd, 4 th and 5th layers, the last present only in the western part of the excavation and often illegible. Layers 2 and 3 were once arable soil. It is known from archival sources that this had once been a cultivable area. The 4th layer might also be defined an arable strata which would in such case have a thickness up to 1.20 m. This thickness could be explained by a sliding of the arable soil down the slope. This took place particularly at the edge of the lake terrace with the water reservoir. Ploughing must have played a role there. Yet, the position of layer 4 in situ is supported by its inclusion of layer 5 in the western part of the excavation, which is probably a residue of the lake shore from the time when the water was at a higher level. The excellent state of preservation of flint artefacts lacking any trace of grinding or crushing at the edges—which usually takes place in such processes—is evidence against any intensive movement of these implements following their production.

The entire excavation area embraces 186 $m^2$ (Fig. 4). The 1 m wide probe dug years ago by O. Dobrindt (discovered during recent studies) runs through the middle of the present site. At present a young pine forest lines the north side of the excavation, the outwash plain terrace, steeply overhanging the lake, stretches at the south side. It seems that the entire assemblage of this site has been explored.

Our research works yielded 932 flint objects. It should be born in mind that ca. 1,100 flints, collected on the surface of this site and during probing studies already referred to, were lost during the war. It is also possible that a certain number of these objects was found in nearby areas since they were often gathered by school children. There was probably also a quantity of pseudo-artefacts in that number. In any case, the number of lost relics must have amounted up to 1,000. In accordance with planigraphy (Fig. 4) these relics have been distributed rather uniformly over an oblong area stretching along the edge of the lake terrace several yards away from its bend. There are nevertheless two distinctly intensive concentrations of finds. The first, bigger one, is in the very centre of the site, the second in its western part. Though it was impossible to find matching articulating pieces, parts of which have been found simultaneously in both collections, it was established that flints appearing in each of these two derived from one characteristic lump of rock. Four consecutive determinations provided irrefutable proof that both concentrations originated in the same period and represent but one chronologically and spatially compact formation.

It was possible, in five cases, to put together articulating pieces of blades composed of two parts—within the framework of the larger sector—and a large core out of four parts—in the eastern sector. But for the fact that 50% of relics were lost during the war—implements collected anyway without planigraphic records—such and more interesting articulating pieces could have been put together in greater numbers. 17 cores, 129 tools, including blades and partially retouched flakes, 786 samples of half-products and debitage have been distinguished among 932 flint objects. Their quantitative relation is shown in Diagram (Fig. 5).

## Cores

1. A single platform blade core, small, flat, unprepared edges (Pl. I 1).

2. Opposed double platform cores—4 pieces. Two are big, fairly chunky cores with unprepared edges (Pl. I 3, 4). One of those shows a bend and a slightly twisted stricking surface. One is small, partly covered with cortex; its stricking surface is only slightly marked with two blade negatives, there is no trace of its


Fig. 4. Liny, Wolsztyn district. Planigraphy of the site 1:

*1* — cores; *2* — end-scrapers; *3* — burins; *4* — truncated blades; *5* — truncated bladelets; *6* — shouldered points; *7* — *Zinken*-perforators; *8* — borers; *9* — retouched blades; *10* — groovers; *11* — noces; *12* — blades and flakes partially retouched; *13* — articulating pieces; *14* — stones; *15* — half products (blades and flakes) and debitage; *16* — sandstone bolster; *17* — hammer stone; *18* — heated flints.

Liny, pow. Wolsztyn, Planigrafia stanowiska 1:

*1* — rdzenie; *2* — drapacze; *3* — rylce; *4* — półtylczaki duże *5* — półtylczaki małe *6* — jednozadziorce; *7* — przekłuwacze typu *Zinken*; *8* — wiertniki; *9* — wiórowce; *10* — pazury; *11* — obłęczniki; *12* — wióry i odłupki łuskane; *13* — składanka; *14* — kamienie; *15* — półsurowiec i materiał odpadkowy; *16* — podkładka z piaskowca; *17* — tłuczek kamienny; *18* — krzemienie przegrzane w ogniu

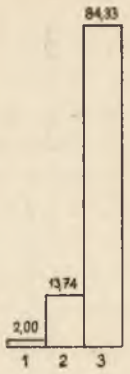


Fig. 5. Liny, Wolsztyn district, site 1. Diagram — The per cent of: *1* — cores; *2* — tools; *3* — half products (blades and flakes) and debitage.

Liny, pow. Wolsztyn, stan. 1. Diagram procentowego występowania: *1* — rdzenie; *2* — narzędzia; *3* — półsurowiec i odpadki produkcyjne

having been prepared for treatment (Pl. II 1). One implement is microlithic (Pl. I 2). The last two have been exploited to the largest possible extent.

3. Multiple platform cores for blades—6 pieces. The most interesting is a lenticular core with stricking surfaces on both flat sides covering completely every surface of the specimen. Fragments of older stricking surfaces served as stricking platforms (Pl. II3). Four small pieces, completely exploited, show no distinct trace of having been prepared for treatment. Two are partly covered with cortex (Pls. II2,4,5, and III2). The big core in the beginning stage of elaboration is composed of four parts (Pl. III7). One stricking platform has been well prepared, the other platform is lacking. The back of the specimen is covered with cortex.

4. Six core fragments difficult to define. Two have been heated.

## Tools

1. Dihedral angle burins—3 pieces. One is big, fairly slender, multinegative, two are small, short, one-negative implements (Pls. IV1,2 and III6). The burin edge is fairly delicate.

2. Lateral burins on truncations—5 pieces. Two are slender, two are chunky, one is very short. Two are one-negative (Pl. IV7-9), and two are double, multinegative tools (Pl. s IV6, V1). Burin negatives are delicate, most delicate in one case (Pl. IV8). It has been possible to match a burin spall with one of the burins (Pl. IV9).

3. Medial burins on truncations—6 pieces. One is slender, the rest chunky and short. Two implements are one-negative, single (Pl. s III3 and IV5). Two are multinegative (Pl. III4,5), double (Pl. IV3,4). The burin negatives are fairly delicate, but broad and blunt in one case.

4. Burins on broken blades—2 pieces. One is chunky but very delicate, made of a flat blade, double (Pl. III 1), the second is very short, single, one-negative (Pl. V2).

5. Simple end-scrapers on blades—5 pieces. Two have both side edges retouched, one—only a fraction of the left side. The sides of all other scrapers have not been retouched (Pl. V3-6,11).

6. Simple end-scrapers on flakes—4 pieces. All very short. One has a double working edge (Pl. V7-10).

7. Shouldered points—7 pieces. Three are complete, four damaged (Pl. V12-18). Two have been heated (Pl. V16,18). One of the tangs has been retouched towards the bulber surface (Pl. V17).

8. *Zinken*-perforators—9 pieces. Eight are complete, one has a broken point (Pl. VI1-9), all are slender. One has additionally the burin on a truncation (Pl. VI2), another has a truncated edge on the other end (Pl. VI6). Two implements have been produced from blades struck from core edges (Pl. VI1,3).

9. A groover, chunky, clearly detached, broken off (Pl. VI11).

10. Borers—3 pieces. Points retouched in reverse (Pls. VI10,12 and VII 1).

11. Truncated blades—7 pieces. Slender and fairly slender (Pl. VII2-8). Truncations steeply retouched, massive.

12. Truncated bladelets—7 pieces (Pl. VII9-15). Made from delicate, flat, generally not slender blades. Truncations are often almost diagonal, flaked by means of a very fine or microlithic retouch.

13. Retouched blades—2 pieces. Both broken off (Pl. VII16,17).

14. A noch. The noch is on the diagonal edge of the blade (Pl. VII18).

15. Partially retouched blades—36 pieces. Ten complete, generally slender or fairly slender. The longest measures 8,5 cm. Twenty four are broken. Two retouched blades are struck from the core edge. Parts of edges have been retouched in various ways (Pl. VII 19, VIII, X 10-13).

16. Flakes and debitage flakes retouched—31 pieces of various shapes and sizes. Parts of edges retouched in various manners (Pl. IX 1,3-5). The biggest, very massive, shows marks of polishing on the retouched edge (Pl. IX 1).

The common per cent relation of various types of tools from the site at Liny including partially retouched blades and retouched flakes is depicted in Diagram (Fig. 6).

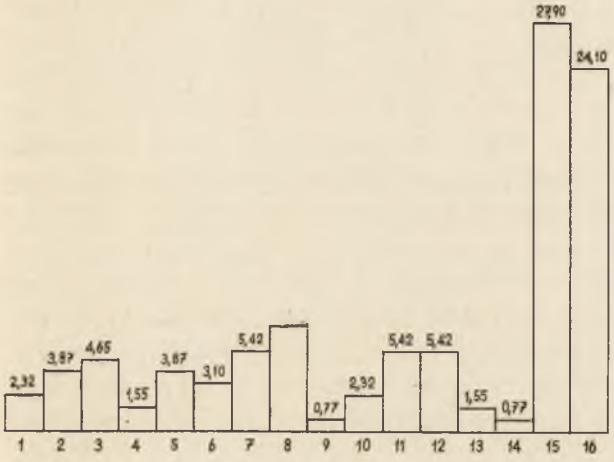


Fig. 6. Liny, Wolsztyn district, site 1. Diagram — Common quantitative relation of respective types of tools including partially retouched blades and partially retouched flakes (in per cent):

*1* — dihedral angle burins; *2* — lateral burins on truncation; *3* — medial burins on truncation; *4* — burins on broken blades; *5* — simple end-scrapers on blades; *6* — simple end-scrapers on flakes; *7* — shouldered points; *8* — *Zinken*-perforators; *9* — groovers; *10* — borers; *11* — truncated blades; *12* — truncated bladelets; *13* — retouched blades; *14* — noces; *15* — partially retouched blades; *16* — partially retouched flakes.

Liny, pow. Wolsztyn, stan. 1. Diagram wzajemnych stosunków ilościowych poszczególnych typów narzędzi z uwzględnieniem łuskanych wiórów i łuskanych odłupków (w procentach):

*1* — rylce klinowe boczne; *2* — rylce węgłowe boczne; *3* — rylce węgłowe środkowe; *4* — rylce łamańce; *5* — drapacze wiórowe; *6* — drapacze odłupkowe; *7* — jednozadziorce; *8* — przekłuwacze typu *Zinken*, *9* — pazury; *10* — wiertniki; *11* — półtylczaki duże; *12* — półtylczaki małe; *13* — wiórowce; *14* — obłęczniki; *15* — wióry łuskane; *16* — odłupki łuskane

## Half products

1. Blades—212 including 62 complete pieces. The term "blades" has been used to define specimens which are longer than or at least equal to 1.5 of the width. The longest measure 7 cm, generally 3-5 cm. Actually there are no choice blades. They represent often massive, not very regular, fairly broad specimens. The proportion of blades determined on 74 complete pieces (since 12 partially retouched blades have been added to the 62 complete pieces) are depicted in Diagram (Fig. 7).

112 broken blades, i.e., those with one end broken off. The longest is 5 cm. They are often broad, fairly massive. Four are articulating pieces composed of two parts.

38 parts of blades (both sides broken off). These are also fragments of fairly broad, often massive specimens.

2. Flakes—51 pieces. These represent regular, round or oval specimens, their length being shorter or equal the width. It may sometimes reach up to 1.5 of the width. 37 complete pieces have been differentiated. The biggest is 4 cm in diameter. They are not very regular, often flat. There are moreover 14 flake fragments without bulbus, often flat.

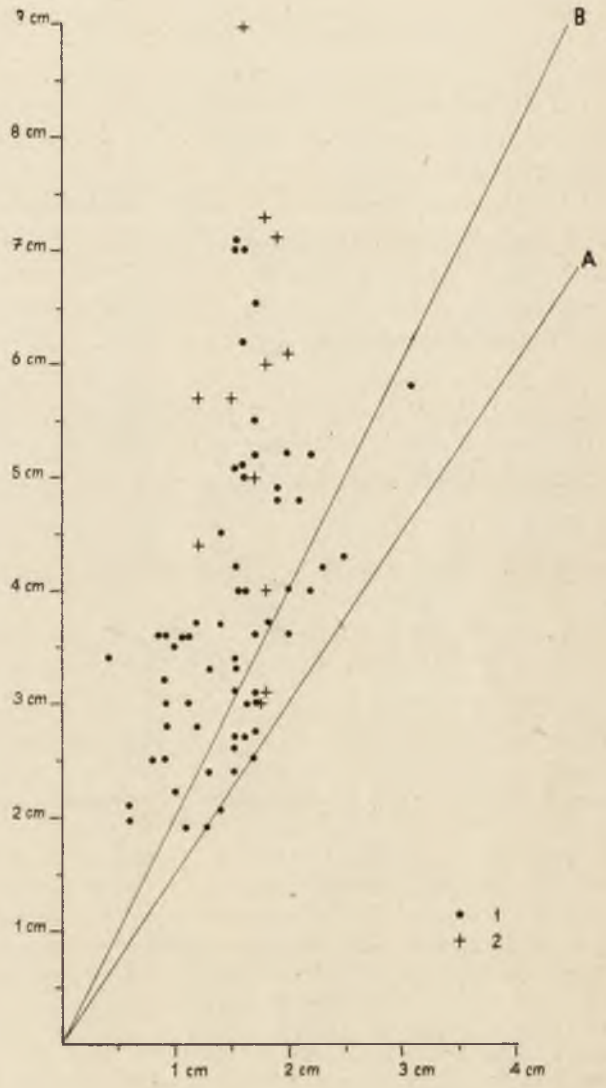


Fig. 7. Liny, Wolsztyn district, site 1. Diagram — Proportion of blades:

*1* — ordinary blades; *2* — partially retouched blades; *A* — proportion limits: length = one and half of width; *B* — proportion limits: length = two times the width.

Liny, pow. Wolsztyn, stan. 1. Diagram proporcji wiórów:

*1* — wióry zwykłe; *2* — wióry łuskane; *A* — granica proporcji: długość = 1,5 szerokości, *B* — granica proporcji: długość = 2× szerokość

3. Cortex flakes—85 pieces of very irregular shapes. The biggest measure up to 6.5 cm in diameter. One half or more of the surface is covered with cortex.

4. Debitage flakes—126 pieces, most irregular. The biggest is 5 cm in diameter.

5. Chips—243 pieces. Smaller than 2 cm in dia meter.

6. Thermical chunks and flints broken into pieces as a result of internal cracks—42 specimens. Often big. The biggest is 11 cm×6 cm.

Characteristic flint debitage

1. Burin spalls—12. The longest is up to 4 cm in length. It has been possible to match one implement with its burin.

2. Blades struck from the core edge—13 specimens. The longest is 8 cm. Ten pieces are chunky, massive, fairly big, three are small and delicate, 2-3 cm long. Two blades struck successively off the same block match each other (Pl. IX2).

Common per cent relation between respective types of produce from the site at Liny, including various types of half products and debitage, is depicted in Diagram (Fig. 8).

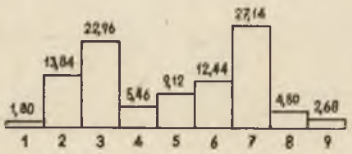


Fig. 8. Liny, Wolsztyn district, site 1. Diagram — Common quantitative relations between respective types of artefacts including various types of half-products and debitage (in per cent):

*1* — cores; *2* — tools; *3* — blades; *4* — flakes; *5* — cortex flakes; *6* — debitage flakes; *7* — chips; *8* — thermical chunks; *9* — core trimming flakes.

Liny, pow. Wolsztyn, stan. 1. Diagram wzajemnych stosunków ilościowych pomiędzy poszczególnymi typami wyrobów z uwzględnieniem różnych rodzajów półsurowca i odpadków produkcyjnych (w procentach):

*1* — rdzenie; *2* — narzędzia; *3* — wióry; *4* — odłupki; *5* — zaprawiaki z wstępnych faz obróbki; *6* — zaprawiaki z dalszych faz obróbki; *7* — okrzeski; *8* — łuski termiczne; *9* — charakterystyczne odpadki produkcji krzemieniarskiej

The entire flint assemblage represents a fairly progressive blade making technique. Blades were clearly the basic type of half product used for the production of tools. The maximum use of cores resulted in the occurrence of a significant percentage of chunky, usually irregularly shaped forms in the debitage. There are no perfect forms among the blades. They are often fairly slender, massive, straight, struck off opposed double platform cores. This limited slenderness and solidity can be seen in particular among tools made in principal from blades.

Eratic moraine flints—their tint ranging from almost black to milky-grey, of a varying degree of transparency, beginning with an almost limpid vitreous flint up to an entirely opaque mat as if of a fine grained consistence—were the only row material used at the site 1 at Liny. A most significant characteristic of the discussed assemblage is a grey-blue patina which covers a great number of implements with a thin but clearly visible layer.

Next to flint implements two stone objects have also been explored. The first represents a flat round rock (very hard sandstone) with traces of use (Pl. IX6). Its form resembles a circle. Traces of treatment to give the object its round form are clearly visible at the edges. There is an indentation in the centre of the upper surface, as if made by a hard, sharp tool. The other stone relic represents a small granite hammer-stone of an asymmetric oval shape. One of its ends shows distinct traces of pounding (Pl. IX7).

This is the inventory of relics discovered by means of regular exploitation in the last three years. In his work of 1944 O. Dobrindt published photographs of two tools discovered during his excavation works. Drawings of these relics—one burin and one *Zinken*-perforator (Pl. X7,8)—and a blade with a noch retouched on the bulber surface (Pl. X9) also discovered during those works—are at present at the archives of the Poznań Archaeological Museum. Two shouldered points and one *Zinken*-perforator, published by A. Rust and W. Mey[11], (Pl. X1-3) have been discovered during surface researches prior to 1938.

The typological characteristic of the assemblage here depicted includes the occurrence of artefacts such as shouldered points, *Zinken*-perforators, simple end-scrapers on blades with retouched edges, various burins, truncated bladelets made of delicate, small flakes with truncations with a fine or microlithic retouch, and big, massive truncated blades. The first two types—shouldered points and *Zinken*-perforators—are of particular interest. Various typological types of the first have been found in Europe's Upper Palaeolithic over extensive areas. But implements—typologically most similar—occur in Hamburgian Culture assemblages.

We shall discuss here only the best and most universally published sites of that Culture situated in the Ahrensburg area in Schleswig-Holstein. They

[11] Rust 1943; Mey 1960.

include: Meiendorf, Stellmoor, Borneck, Poggenwisch and Hasewisch. The material was gathered at regular archaeological researches. Owing to methodological studies this material supplied data on relative and absolute chronology.

The shouldered points from Liny (Pl. V 12-18) correspond completely with types illustrated by A. Rust[12]. It should be noted that this assemblage lacks very slender forms, as for example the majority of implements from Poggenwisch or the one of the three illustrated implements from Stellmoor.

The tool described as *Zinken*-perforator occured also in various cultures of the Earlier and Later Palaeolithic, principally in the Later Magdalenian Phase, though not so numerous as shouldered points. The *Zinken*-perforators from Liny (Pl. VI 1-9) do not differ at all from those found at Meiendorf, Borneck, Poggenwisch or Hasewisch[13]. There are indeed no double pieces—with edges on both ends—but this may be explained by the limited number found so far, i.e., 9. One of these implements has an edge of a burin on a truncation. This is, by the way, the only combined tool found at Liny. Examples of simple end-scrapers on blades with retouched edges (Pl. V 3-5) have also their very similar counterparts in the above quoted sites. The same applies to various types of burins, though, it seems, these at Liny are smaller than those from the Hamburg area, and give—in certain cases—the impression that they were broken and later repaired.

An interesting group includes truncated bladelets (Pl. VII 9-15). This type, described in A. Rust's publication as *Mikroformen* occured in large numbers at sites in the vicinity of Hamburg[14]. Truncated blades found at Liny have also their counterparts in hitherto known sites of Hamburgian Culture.

The entire assemblage of cores and tools from Liny shows in general a great resemblance to classical Hamburgian implements. This is seen in the type of the half products these tools were made of, in their solidity, proportions and the general character of blades. The Liny collection includes moreover a large, massive, retouched flake with clearly visible marks of grinding seen at the bottom as a polished part of the edge (Pl. IX 1). This implement has its counterpart at Meiendorf, Borneck and Poggenwisch[15]. Although they are not flakes but blades and their edges are polished more thoroughly—the Meiendorf implement in particular—they are nevertheless a successive, distinct proof of the convergence of sites here compared. The stone bolster with traces of use on the surface (Pl. IX 6) has its counterpart at Meiendorf and Stellmoor[16].

The Liny assemblage supports the previously mentioned thesis on the great typological uniformity and compactness of Hamburgian Culture assemblages[17]. Yet there is a remarkable difference between the Liny assemblage and the classical sites in the Hamburg area. This concerns the occurrence at Liny of very short, single end-scrapers on flakes (Pl. V 7-10). One has a double working edge. Such tools have not been found among Hamburgian Culture implements.

To compare assemblages—next to establishing facts dealing with the occurrence or lack of certain types of implements—it is equally important to depict per cent compilations of the quantity of certain types. These compilations are shown in Diagrams (Figs. 9 and 10). They present a graphic comparison of the quantitative relation of the occurrence of eleven types of flint artefacts from the sites at Liny and at Meiendorf, Borneck, Poggenwisch and Hasewish, expressed in per cent. These comparisons are based on quantitative data presented in A. Rust's work[18]. To facilitate comparison the percentage of types of implements found at Liny has been estimated pursuant to types used in A. Rust's comparative Table. There may be disagreement in comparisons as regards entry 11 since there is no certainty what forms A. Rust included in section "Variable", i.e., whether he included some ordinary, partially retouched blades which have been—with the exception of noched blades—excluded from the diagram of estimates at Liny. These last specimen distinguished out of a group—the most numerous at Liny—of partially retouched blades have been taken into account (cf. Fig. 6). Estimates for the Liny inventory for comparative diagrams have been prepared on the basis of an assemblage including 70 tools.

Diagram 5 is a statistical diagram making possible to depict the absolute per cent values of the occurrence of a respective type in each of the five compared assemblages. It also facilitates the observing of their concordance and divergences (Fig. 9).

Diagram 6 is an accumulation diagram. It shows the course of concordance in a more comprehensive manner (Fig. 10). Let us then compare the Liny

[12] Rust 1937, Pl. 17; 1943, Pl. 22; 1958, Pl. 5; 10-30, Pl. 44; 62:7-27.

[13] Rust 1937, Pl. 14; 1958, Pl. 3, 42, 56.

[14] Rust 1937, Pl. 19:1-12; 1958, Pl. 5:1-8, 45:1-10, 63:1-12.

[15] Rust 1937, p. 87, Fig. 2; 1958, p. 96, Fig. 38.

[16] Rust 1937, p. 109; 1943, p. 127.

[17] Schwabedissen 1951.

[18] Rust 1958.

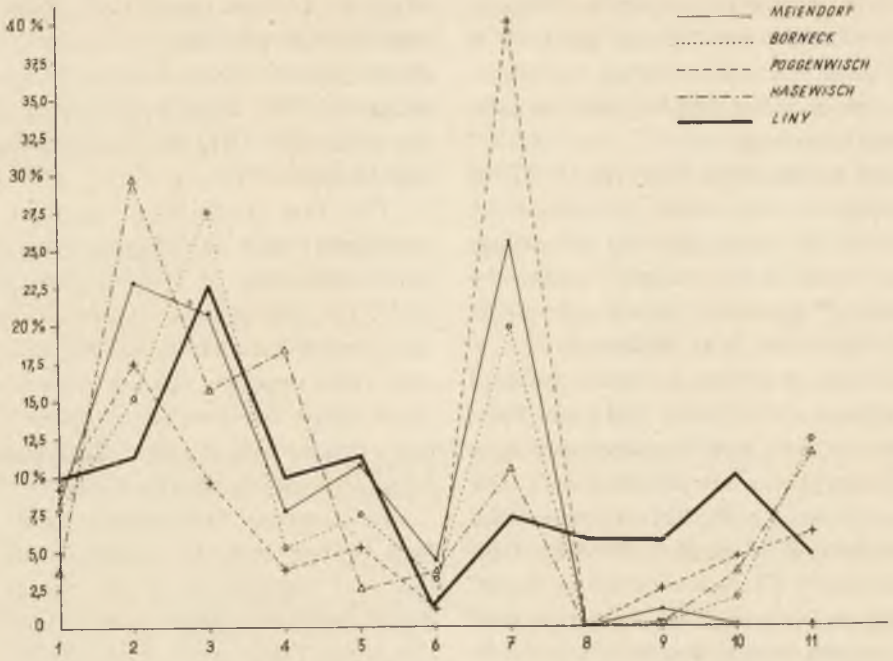


Fig. 9. A. Statistical diagram of the appearance of various types of flint implements in the best known Hamburgian assemblages:

*1* — shouldered points; *2* — *Zinken*-perforators; *3* — burins; *4* — truncated bladelets; *5* — noched blades; *6* — combined tools; *7* — simple end-scrapers on blades; *8* — simple endscrapers on flakes; *9* — borers and groovers; *10* — truncated blades; *11* — variable.

Diagram statystyczny występowania różnych typów wyrobów krzemiennych w najlepiej poznanych zespołach kultury hamburskiej:

*1* — jednozadziorce; *2* — przekłuwacze typu *Zinken*; *3* — rylce; *4* — małe półtylczaki; *5* — wióry z wnęką; *6* — narzędzia kombinowane; *7* — drapacze wiórowe; *8* — drapacze odłupkowe; *9* — wiertniki i pazury; *10* — duże półtylczaki; *11* — różne

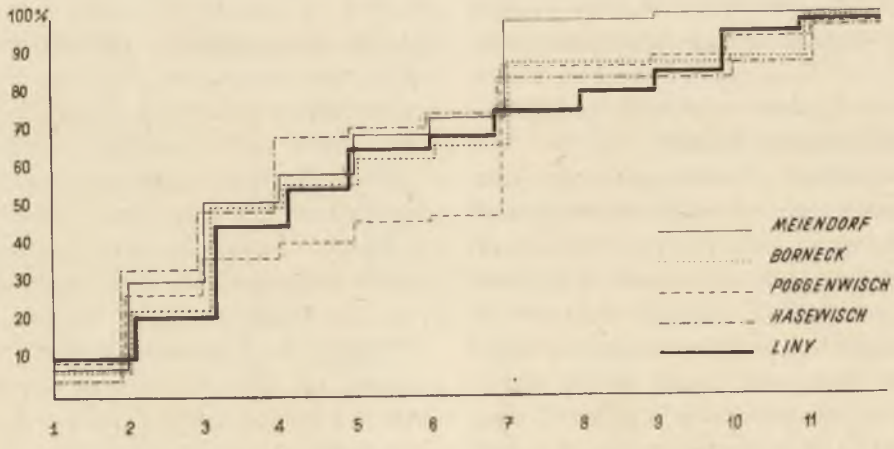


Fig. 10. Accumulation diagram of the appearance of various types of flint implements in the best known Hamburgian assemblages:

*1* — shouldered points; *2 Zinken*-perforators; *3* — burins; *4* — truncated bladelets; *5* — noched blades; *6* — combined tools; *7* — simple end-scrapers on blades; *8* — simple endscrapers on flakes; *9* — borers and groovers; *10* — truncated blades; *11* — variable.

Diagram akumulacyjny występowania różnych typów wyrobów krzemiennych w najlepiej poznanych zespołach kultury hamburskiej:

*1* — jednozadziorce; *2* — przekłuwacze typu *Zinken*; *3* — rylce; *4* — małe półtylczaki; *5* — wióry z wnęką; *6* — narzędzia kombinowane; *7* — drapacze wiórowe; *8* — drapacze odłupkowe; *9* — wiertniki i pazury; *10* — duże półtylczaki; *11* — różne

assemblage with others belonging to Hamburgian. An analysis of both diagrams shows that:

1. There is a particularly significant concordance in the occurrence of shouldered points (1) and combined tools (6).

2. There is a somewhat smaller but also very distinctive quantitative concordance to be seen in *Zinken*-perforators (2), burins (3), truncated bladelets (4), noched blades (5), truncated blades (10) and various forms (11).

3. There is a certain difference in the number of simple end-scrapers on blades found at Liny (7) in comparison with those from Meiendorf, Borneck and Poggenwisch, but the Hasewisch collection is very similar. The per cent of borers and groovers (9) is also bigger at Liny than at Hasewisch and Poggenwisch; none have been found at Meiendorf and Borneck.

4. The only significant difference concerns the occurrence of very short simple end-scrapers on flakes at Liny (8). These implements have not been found at all at other sites.

The following Table contains quantitative indices estimated for the same sites and similarities between the Liny and—in particular—the Borneck assemblages.

| The Quantitative Relation of | Meiendorf | Borneck | Poggenwisch | Hasewisch | Liny |
|---|---|---|---|---|---|
| tools to half products and debitage | 1:1.6 | 1:6.4 | 1:4.8 | 1:4.9 | 1:6.1 |
| cores to half products + debitage + tools | 1:50 | 1:74 | 1:234 | 1:187 | 1:54 |

To sum up—the typology which shows an almost absolute sameness of the type of implements, the comparison of the quantitative percentage of their occurrence, and the comparison of quantitative indices of the common relation of certain groups of implements within the framework of analysed groups provide proof of the great concordance of the site at Liny with classical Hamburgian assemblagess from Meiendorf, Borneck, Poggenwisch and Hasewisch. These comparisons make it possible to include the site at Liny with certainty to Hamburgian Culture.

Considering the lack of other data, the chronology of the Hamburgian assemblage at Liny has to be based on comparisons with other accurately marked sites of this Culture. It becomes again necessary to fall back on the most correctly dated sites at Meiendorf, Poggenwisch and Stellmoor. These sites supplied numerous data derived from various organic materials from that cultural layer, e.g., gyttja, horn and charcoal. We have at present seventeen radio-carbon data for Hamburgian deposits. They show a fairly extensive range. This problem has recently been discussed by R. Schild[19]. On the basis of various premises he reached the conclusion that the most accurate date of all would be the one determined on charcoal at the Poggenwisch site—11,030±370 (H 136-116) years B.C. He considers dates somewhat prior to 11,000 as the most correct for Hamburgian sites. These data were previously accepted by A. Rust for Hamburgian sites situated in the Hamburg area (Ahrensburg)[20]. In his opinion the age of the Meiendorf site should be shifted some centuries back and the Hasewisch site-advanced.

If the date older than 11,000 years B.C. were correct the existence of Hamburgian Cultures in Schleswig-Holstein should be placed within the Meiendorf Interval. This was a—recently ascertained—warm sway between the Lascaux and Bölling Interstadial which preceded the lowest temperatures of the Oldest Dryas (Grömitz Oscillation). The warm spell of the Meiendorf Interval was also confirmed at other Late Glacial sites in the Lowlands. In Poland vestiges of a warm oscillation—preceding the layers of sand and gravel of the Older Dryas—have been ascertained at Witów, Łęczyca district[21]. The existence of this oscillation is distinctly demonstrated at the Aschersleben See profile in the Harz Highlands. The well proved warm sway[22], which preceded the Oldest Dryas and corresponds chronologically to the Meiendorf Interval, has been defined there as the Müchelner Interval 2. According to R. Schild the Meiendorf Interval should be placed approximately between the years 11,600 and 11,100 B.C. Hamburgian Cultures prevailed therefore in Schleswig-Holstein approximately in the second half of the 12th millennium B.C. Palynological data from the Hamburgian Duurswoude IV site in Holland points to the possibility that this Culture prevailed in north-western Europe at least up to the beginning of the Bölling.

G. H. Brückner discovered in 1954 at Grömitz at the Lübeck Bay Hamburgian relics covered by a 4 m. layer of moraine[23]. From the typological point of view these relics can be compared most favourably with the Poggenwisch assemblage. According to A. Rust's interpretation the relatively late Grömitz site originated already in the Bölling and was later covered by a recuring shift of inland ice linked with an increasing chill in the Older Dryas[24]. This may

[19] Schild 1973.
[20] Rust 1958.
[21] Chmielewski 1970.
[22] Mania 1970.
[23] Brückner 1954.
[24] Rust 1958.

be so if we consider the existence of later sites in Holland. There are however doubts concerning the moraine overlaying the site from the Older Dryas. Pursuant to recent determinations the entire Skania was free of ice at the decline of the Oldest Dryas and the beginning of Bölling; the front of inland ice extended approximately from Göteborg, via Bornholm and the southern Baltic up to northern Latvia[25]. The site at Grömitz is 350 km off this line. The edge of the inland ice receded even farther to the north at the end of the Bölling. It seems improbable that the inland ice could have advanced so far south in the brief period of the Older Dryas when the glacier activity was not very intensive[26]. It is therefore possible that the Grömitz assemblage originated also in the Meiendorf Interval and the moraine layer should be linked with the maximum of the Older Dryas.

Attempts have been made to divide Hamburgian groups into chronologically different phases. Owing to the acquirement of absolute data a group of younger sites—represented by Poggenwisch and Hasewisch—has been distinguished. Sites at Meiendorf and Borneck are considered typical for the older group. Differences between these groups appear in the general typological character of the entire assemblage—most difficult to express in statistical terms[27]. It has not been possible so far to determine comprehensive and indisputable typological criteria permitting to fix the relative age of sites within a general framework of this Culture. These differences result from the extensive typological homogeneity of its groups.

As has already been shown, the Liny assemblage matches typologically well with known Hamburgian groups. Comparing the curves in Diagrams (Fig. 9 and 10), it may be seen that it approaches at some points assemblages of the Meiendorf-Borneck type and the Poggenwisch-Hasewisch type at others. This is not a very important problem considering the already mentioned difficulties in the typological-statistical differentiation of both groups. It seems most reasonable to link the chronology of the site at Liny with the Meiendorf Interval and to place it within the absolute limit of ca. 11,600-11,000 B.C.

There is, nevertheless, a typological phenomenon concerning this site, which should be elucidated since it may provide a premise to determine the chronology of this site, which differs typologically, as regards other groups, in one respect, i.e., the appearance of very short simple end-scrapers on flakes (Pl. V 7-10). No foreign admixture can be considered since no other archaeological site has been discovered in this area. There is no trace of foreign interpolation in the remaining material. These end-scrapers have therefore been considered a part of that assemblage.

This suggests a theory concerning the appearance of the "Tarnovian Trend"[28]. In accordance with this theory there was in the middle of the Alleröd a sudden curtailment of end-scrapers in flint assemblages of Late Palaeolithic cultures. The per cent of short scrapers increased at the expense of long scrapers. Cultures at the very end of the Pleistocene had therefore most of them. The quantitative index of short scrapers is therefore also an index of age. R. Schild considers the possibility that the "Tarnovian Trend" appeared a little earlier than in the mid-Alleröd. As regards our problem there are three possibilities:

1. The site at Liny existed in the Oldest Dryas and short scrapers appeared there only as an exception.

2. The site existed in the Oldest Dryas and short scrapers were the earliest manifestation of the "awakening" of the "Tarnovian Trend" already in that period.

3. The site originated later than other known sites of Hamburgian Culture, and shows therefore a significant increase in short end-scrapers, though, it would anyway be the earliest appearance of the "Tarnovian Trend".

It is impossible to decide at present which of these three possibilities took place. One of the difficulties concerns an interesting fact that so far no archaeological sites, which could be dated back to the second half of Bölling of the Oldest Dryas, have been discovered in Central European Lowlands. The problem could be solved by obtaining palynologic or radio-carbon data for the site at Liny. The possibility exists certainly in organogenic sediments known to be at the bottom of the lake in the vicinity of the site. Alas, the water level makes it impossible to study these sediments at present.

The site at Liny is situated—similar to sites in the Hamburg area—at the shore of a lake filling a former sub-glacial channel which was filled with dead ice at the time the settlement existed. Relics discovered at this site numbered up to 2,000—over 1,000 implements collected by O. Dobrindt are missing. In comparison with the thoroughly exploited sites at Borneck and Hasewisch this number makes up ca. 50% of their inventory, including 3,985 and 3,757 artefacts respectively. The Poggenwisch site, also completely exploited, yielded 2,830 implements, almost 50% more than found at Liny. The conclusion may be drawn that the group settled at Liny was not

[25] Galon 1968.
[26] Galon 1968.
[27] Rust 1958.
[28] Schild 1960.

so numerous or that the period of its inhabitance was shorter. The second possibility seems less probable. The significant typologic-statistical similarities of implements suggest the same way of living by members of the Liny group as by their kinsmen. Thus, the summer season at Liny had to correspond with the generally accepted period of summer hunting practiced in other areas.

The plot at Liny where the implements were discovered measured ca. 30×10 m. It is slightly larger than the sites at Borneck, Poggenwisch and Hasewisch—14×11 m, 11×11 m, 10×12 m, respectively. This apparent contradiction can easily be explained since those three areas were not tilled, but the site at Liny was prepared and used for crops. This could have resulted in a certain dispersal of implements. If so, it was not excessive since the state of preservation indicates that they have not been significantly moved about. The fact that no remains of sheds were found at Liny can probably also be ascribed to tillage; stones which would have marked their outlines had to be removed for ploughing. Eventual outlines of embankments supplementing a shed's construction—such as are known at Poggenwisch—met the same fate. Smaller stones found at the site are unevenly dispersed (cf. Planigraphic Sketch, Fig. 4) and are so small that they could not have been used for construction work.

The fire was kept in the eastern part of the camp. This is proved by a fair number of heated flints found there. It is possible that there were several fires since the area where heated flints were found is rather extensive (Fig. 4).

Judging by the entire material, flint was scarce at Liny. This may be seen in the extent cores were utilized (Pl. I 1,2, II 1,2,4,5). They include objects which are similar—considering their size and shape—to microlithic cores from the Mesolithic. Generally speaking, the entire inventory—including tools and half products—is smaller at Liny than that discovered at sites in north-western Europe. This proves anew the lack of raw material. Erratic stones, which had also been used, were found on the surface. But some of the boulder stones are covered with not much worn cortex. They may have been brought from the north, from areas where they had not yet been completely rounded.

It is interesting to compare the position of the site at Liny with other sites of Hamburgian Culture in relation to the edge of inland ice. Considering the span of several centuries in dating Hamburgian sites, it is impossible to define the exact position of this edge at the time the camp existed. Since we have acknowledged that most of them should be dated back to the Meiendorf Interval, it would be best to accept the moraine line which had been created in the maximum of the Oldest Dryas right after the warm spell, as the contemporary line at which the glacier front stopped. Present day science believes that this line was marked by the north Lithuanian moraine, i.e., the moraine of the Gardno Phase, traceable in the most northern part of Poland, the Uznam Island moraine, the north-eastern Rügen and the moraine H in Denmark[29]. Accepting this presupposition, the distance from the inland ice to the site at Grömitz situated farthest to the north would be 150 km, to sites grouped between Hamburg and Ahrensburg ca. 200 km, and 225 km to the site at Liny. This site can, therefore, also in this respect be well compared with other sites of Hamburgian Culture.

The sites in Holland were twice as far removed from the glacier, i.e., up to 500 km. The same applies to the presumably second Hamburgian site in Poland at Rogowo, Opole district (ca. 400 km).

Even if the site at Liny originated at a later date the distance would not have changed significantly since the glacier front ran, at the beginning of the Bölling, from south Latvian moraines via the south Baltic bed and Bornholm to northern Skania, not much farther north, therefore, than the moraine line of the maximum of the Oldest Dryas. The distance from this line to the site at Liny would then be ca. 280 km.

The site at Liny is so far the first confirmed Hamburgian Culture site situated in an area eastwards of similar groups near Hamburg. The distance between them is ca. 400 km.

The few finds made in the Brandenburg and Mecklenburg areas, which may be linked with the Hamburgian, include a *Zinken*-perforator from Dyrotz, a tool resembling a shouldered point from Buchow-Carpzow, Kr. Osthavelland, and some objects from reindeer horn prepared in the manner of Hamburgian implements (Grosswusterwitz, Kr. Jerichow II, Päwesin, Kr. Westhavelland)[30]. According to W. Mey some harpoons from the Brandenburg area may be included in Hamburgian Culture. But these assumptions are insufficiently supported by archaeological material. It is at present impossible to prove the existence of Hamburgian settlements in that area.

The discoveries at Liny made it possible to draw some conclusions concerning in particular the range of Hamburgian Culture. Certain present day theories on its genesis deal with observations published by G. Schwantes, who remarked on the significant simi-

[29] Roszko 1968; Galon 1968.
[30] Rust 1943; Mey 1960.

larity of Hamburgian and Aurignacian industries. He noticed, moreover, a perspicuous Magdalenian influence and, at the same time, certain analogies to sites at Mezin in the Ukraine and the Pekárna Cave in Moravia (*Zinken*-perforators)[31]. A. Rust, publishing the results of his well known discoveries in the Hamburg area, recognized south-eastern European areas as the source of Hamburgian Culture. He quotes sites at Mezin, Pekárna, Býci Skala, Předmostí and the Villendorf Venus layer[32], as more important analogies. Next to analogies based on finds of shouldered points and *Zinken*-perforators A. Rust supports his assertions by quoting similarities seen—in his opinion—between the ornamentation of Hamburgian horn implements and the ornamentation of Upper Palaeolithic sites of south-eastern Europe. This view was supported by Schwantes in 1958. He also believed that the sources of the Hamburgian were in the East. His views were based principally on schematic ornamentation occuring on those implements[33].

A. Bohmers decidedly opposed these theories. In his opinion Hamburgian Culture originated in the West European Magdalenian. He points out important typological differences between shouldered points from eastern Europe and those from the Hamburg area. According to Bohmers typical *Zinken*-perforators appear much more frequently in western than in south-eastern and eastern Europe where these implements have been found only sporadically. Ornaments on Hamburgian horn implements also differ from those found at Mezin, even more so than from certain forms of meander ornaments known from the south-west European Magdalenian Period. The Meiendorf harpoon is very similar to typical Magdalenian harpoons[34]. The same view has recently been shared by J. K. Kozłowski, who also believes that sources of Hamburgian Culture are not to be sought in the East where there were no similar industries. Hamburgian Culture developed on the Magdalenian basis[35].

Although the discovery of the site at Liny and its documentation by recent materials did not supply new data for a direct elucidation of the genesis of Hamburgian Culture, it is possible—owing to this discovery—to show the direction of influence of this Culture and to prove its extensive range towards the East (Fig. 11). The assumption that the settlement is a vestige of a trail of Hamburgian people moving from the East to the West seems not much probable. Pursuant to the views of those who favour the hypothesis on the south-western genesis of Hamburgians only primary ideas of forms of Hamburgian flint elaboration existed in these areas, the idea of the type of ornamentation preceded Hamburgian Culture itself and acquired its proper shape only in north-western Europe. The site at Liny corresponds typologically exactly with the wholly developed Hamburgian assemblages. The road cultural elements initiating Hamburgian Culture had to pass ran anyway further south. It seems that the Lowland areas were, prior to the Meiendorf Interval, still inaccessible to settlers. These remarks apply also to the site at Rogowo which probably belonged to Hamburgian Culture.

The opposite thesis, that the settlement at Liny was of a Hamburgian group which came to this area from the West or North-West, seems much more probable. Migrating reindeer hunters could easily have crossed the distance of 400 km separating Liny from Hamburgian centres. Pursuant to A. Rust's very convincing hypothesis, these groups made long seasonal trips in spring and autumn from periglacial areas, where they spent the summer, to areas of present day Holland and possibly to Dogger Bank, where the milder sea climate enabled them to spend the winter. Perhaps, they were compelled to make these wanderings by the movement of reindeer herds caused by the same factors. The distance from Hamburg to central Holland is almost 400 km. If we agreed with the above thesis on the seasonal trips by Hamburgians it would follow that it was possible to cover the distance from Hamburg to Liny in several or a dozen or so weeks, since it equals the ordinary seasonal spring or autumn wanderings (Fig. 11).

We do not intend to suggest that the settlement at Liny was established by a group of people who themselves came from e.g., Schleswig-Holstein or even Holland, but we would like to stress the large mobility of Hamburgian groups in general. Their expansion towards eastern lowlands could as well have lasted a long time and spread continually in this direction. As has been said, there is so far no proof for this assumption. Such proof could be provided by the discovery of several Hamburgian sites in Brandenburg or southern Mecklenburg.

Materials discovered at Liny do not prove directly that the camp existed in the summer season but there are significant analogies with sites near Hamburg, which are known to have existed in summer periods and, moreover, its distance from the inland ice front also corresponds to the distance of these sites

[31] Schwantes 1932; 1933.
[32] Rust 1937; 1943.
[33] Schwantes 1958.
[34] Bohmers 1960.
[35] Kozłowski 1971.


Fig. 11. The situation of the sites at Liny and Rogowo in relation to the so far known range of Hamburgian Culture in Europe:

*1* — range of Hamburgian Culture; *2* — highlands and mountains.

Położenie stanowisk w Linach i w Rogowie w stosunku do znanego dotychczas zasięgu kultury hamburskiej w Europie:

*1* — zasięg kultury hamburskiej; *2* — wysoczyzny i góry

from the glacier; it would therefore be correct to assume that it was established in the summer season.

Consequently, the question arises where the hunters of Liny's Hamburgian Culture sheltered during severe winters. The winter at Liny was certainly more severe than in the Hamburg area since the climate here was even more continental. Hence, if they were pressed to leave Schleswig-Holstein for the winter, the necessity to retreat was even greater in western Poland. Whether they moved farther west or wandered somewhere south (Rogowo?) remains an open question until traces of specific winter sites have been found or their non-existence substantiated.

If the dating of the site at Liny back to the Meiendorf Interval should prove correct, the discovery would be of an additional significance from the point of view of palaeogeography of Central European Lowlands. It would prove that such a warm oscillation really took place there and that the climate improved in western Poland in the second half of the XII millennium B.C. to make human settlement possible there for the first time in history.

If the site at Liny were to be dated to the Bölling it would nevertheless be the oldest so far discovered trace of human penetration into Polish Lowlands. The discovery and investigation of this site shifts the beginning of ancient history of this part of Central Europe about 1,500 years farther back.

*Translated by Jan Rudzki*

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## PROBLEM KULTURY HAMBURSKIEJ W EUROPIE ŚRODKOWEJ

### Streszczenie

W latach 1969-1971 przeprowadzono badania wykopaliskowe paleolitycznego stanowiska w Linach, pow. Wolsztyn. Wyniki tych badań stanowią interesujący przyczynek do znajomości późnoplejstoceńskiej kultury hamburskiej.

Kulturę tę wydzielono w północno-zachodnich Niemczech w początku lat trzydziestych. Początkowo nadano jej nazwę „Wellingsbütteler-Gruppe" od stanowiska Wellingsbüttel w Szlezwiku-Holsztynie, już po roku jednak zmienioną na „Hamburger Stufe"[1]*.

Najwszechstronniejsze dotychczas badania stanowisk kultury hamburskiej przeprowadził A. Rust w drugiej połowie lat trzydziestych na stanowiskach Meiendorf i Stellmoor oraz w latach powojennych na stanowiskach Borneck, Poggenwisch i Hasewisch[3,4]. Wszystkie one leżą kilkanaście kilometrów na północny wschód od Hamburga.

Z terenów Polski znane były do niedawna dwa znaleziska należące najprawdopodobniej do kultury hamburskiej. Były to: trzy jednozadziorce z Rogowa, pow. Opole[5] (tabl. X 4-6), pochodzące ze zmieszanej kolekcji powierzchniowej, oraz stanowisko w Linach, pow. Wolsztyn, wspomniane na wstępie,

* Patrz przypisy do tekstu angielskiego.

znane od 1928 r. z badań powierzchniowych O. Dobrindta. Zbiory tego ostatniego oglądał i po raz pierwszy zidentyfikował kulturowo A. Rust, który opublikował z nich trzy wyroby krzemienne[6]. Jest to jedyna publikacja zabytków z tego stanowiska, powtórzona przez W. Meya. Wszystkie zabytki z kolekcji O. Dobrindta zaginęły w czasie wojny. Brakło więc do niedawna niezbitych dowodów penetracji kultury hamburskiej na wschód od Szlezwiku-Holsztynu.

Dzięki notatkom archiwalnym i żmudnym poszukiwaniom udało się ostatnio stanowisko to odnaleźć i przebadać. Wykopaliska rzuciły nowe światło na kwestię zasięgu kultury hamburskiej. Udowodniły one z całą pewnością obecność grup ludności tej kultury w środkowej Europie.

Stanowisko Liny 1 leży na odnodze sandru nowotomyskiego na terasie jeziora Małe Liny (ryc. 1), na północ od płata wysoczyznowego przylegającego do północnej krawędzi pradoliny Warszawsko-Berlińskiej (ryc. 2). Sandr nowotomyski poprzecinany jest rynnami glacjalnymi, powstałymi pod lądolodem zlodowacenia bałtyckiego fazy leszczyńskiej lub późniejszej. Poziom sandrowy, na którym leży stanowisko, przechodzi bez żadnego załomu w terasę średnią II w pradolinie Warszawsko-Berlińskiej, jest więc młodszy od fazy poznańskiej. Martwy lód zapełniający rynny glacjalne wytopił się najprawdopodobniej w Alleröddzie[9,10]. Wówczas to powstało dzisiejsze jezioro Małe Liny, którego zbiornik w czasie poprzednich cieplejszych oscylacji późnego glacjału był zapewne pokryty tylko płytką warstwą wody stojącą na powierzchni martwego lodu.

Profil podłoża, na którym znajduje się stanowisko, przedstawia rycina 3. Zabytki krzemienne wystąpiły tylko w warstwach 1-5. Nigdy w warstwie 6 lub poniżej. Najliczniej w warstwach 3, 4 oraz 5. Wiercenia wykonane pomiędzy krawędzią terasy a obecnym zasięgiem wody jeziora wykazały istnienie utworów organogenicznych (warstwa 9).

Ogólnie objęto wykopem 186 m$^2$ (ryc. 4), co pozwoliło uzyskać niemal 100% powierzchni stanowiska. Ewentualnie pewien znikomy procent zabytków pozostał być może w północno-zachodniej części, gdzie eksplorację uniemożliwiał las.

Z badań naszych uzyskaliśmy 932 zabytki krzemienne. Około 1000 zabytków z tego zespołu zebranych przez O. Dobrindta zaginęło. Planigrafia ukazuje ich rozrzut, w niewielkim tylko stopniu poprzesuwanych przez współczesną orkę. W omawianym zespole wyróżniono 17 rdzeni, 129 narzędzi, wliczając w tę sumę wióry i odłupki łuskane, oraz 786 okazów półsurowca i odpadków produkcyjnych (tabl. I-IX, X 10-13). Cały ilustrowany materiał zabytkowy pochodzi z badań w latach 1969-1971, a tylko trzy okazy (tabl. X 7-9), których rysunki udało się znaleźć — z sondażu wykonanego przez O. Dobrindta w 1941 r. Odpowiednie diagramy wykazują wzajemne stosunki ilościowe wyrażone w procentach pomiędzy różnymi grupami wyrobów krzemiennych pochodzących z eksploracji stanowiska w Linach (ryc. 5, 6, 8) oraz proporcje półsurowca wiórowego (ryc. 7). Cały zespół reprezentuje dość wysoko stojącą technikę wiórową. Jedynym surowcem używanym do wyrobu narzędzi krzemiennych był krzemień kredowy bałtycki.

Obok zabytków krzemiennych w skład zespołu wchodzą także podkładka z piaskowca i granitowy tłuczek, oba noszące ślady używania (tabl. IX 6, 7). Trzy okazy publikowane przez A. Rusta pochodzą z badań powierzchniowych sprzed 1938 r.

Podstawowe typy wyrobów ze stanowiska w Linach, takie jak jednozadziorce, pazury typu *Zinken*, drapacze wiórowe o łuskanych bokach, rylce różnych typów, małe i duże półtylczaki, odpowiadają dokładnie analogicznym typom znanym z klasycznych stanowisk kultury hamburskiej: Meiendorf, Stellmoor, Borneck, Poggenwisch i Hasewisch[12,16]. Podobieństwo to przejawia się także przy porównywaniu typologiczno-statystycznym zespołu z Lin z wymienionymi wyżej zespołami. W celu unaocznienia takiego porównania sklasyfikowano ponownie zespół z Lin wg listy typów zastosowanej przez A. Rusta przy zestawianiu inwentarzy z Meiendorf, Borneck, Poggenwisch i Hasewisch[18]. Diagramy: statystyczny (ryc. 9) i akumulacyjny (ryc. 10), ilustrują zbieżność linii obrazujących skład typologiczno-statystyczny porównywanych zespołów. Widać z nich, że inwentarz z Lin całkowicie odpowiada klasycznym inwentarzom hamburskim i w związku z tym wypada uznać, że należy on do tej kultury. Tylko w jednym wypadku występuje pewna różnica. Chodzi mianowicie o pojawienie się w zespole z Lin bardzo krótkich drapaczy odłupkowych (tabl. V 7-10), z których jeden ma podwójne drapisko.

Chronologię omawianego tu zespołu można obecnie wyznaczyć jedynie na podstawie analogii do innych dobrze datowanych inwentarzy. Stanowiska z okolic Hamburga dostarczyły dotychczas 17 różnych dat radiowęglowych, otrzymanych z różnych materiałów organicznych, pochodzących z warstw kulturowych. Ostatnio R. Schild przeprowadził analizę tych dat. Doszedł on do wniosku, że najbliższa prawdy jest data uzyskana z węgla ze stanowiska Poggenwisch (H 136-116) 11030±370 lat p.n.e. Uważa on, że najprawdopodobniejsze dla hamburgianu są daty nieco starsze niż 11000 lat p.n.e. Poprzednio A. Rust również uznał tą samą datę za najwłaściwszą dla stanowisk kultury hamburskiej znanych z okolic Hamburga[19,20].

Jeśli stwierdzenia te są słuszne, wówczas istnienie kultury hamburskiej w Szlezwiku-Holsztynie przypadałoby na tak zwany interwał Meiendorf. Interwał ten, stosunkowo niedawno odkryty, stanowił cieplejsze wahnięcie poprzedzające maksimum zimna najstarszego dryasu. Istnienie tego interwału znalazło najprawdopodobniej potwierdzenie także w Polsce (Witów, pow. Łęczyca). Znany jest on również ze stosunkowo niezbyt odległego stanowiska Aschersleben See z pogórza Harcu[21,22], gdzie nazwano go interwałem Müchelner 2.

Według R. Schilda interwał Meiendorf należy umieścić mniej więcej w okresie 11600-11100 p.n.e. Tak też należy datować większość stanowisk kultury hamburskiej. Daty palynologiczne niektórych stanowisk z Holandii (np. Duurswoude IV) wykazują, że hamburgian przetrwał do początków Böllingu. W ramach zespołów hamburskich usiłowano, kierując się typologią, dokonać podziału na zespoły starsze i młodsze. Wyniki jednak datowania bezwzględnego udowodniły, że w obecnej chwili nie ma kryteriów typologicznych, które pozwoliłyby dokonać takiego podziału zgodnego z rzeczywistością.

Zważywszy na podobieństwo zespołu z Lin do dobrze datowanych zespołów hamburskich ze Szlezwiku-Holsztynu, najsłuszniejsze wydaje się datowanie go także na interwał Meiendorf, a więc na drugą połowę 12 tysiąclecia p.n.e. Jednak z pewnym zastrzeżeniem. Wypływa ono mianowicie z faktu wystąpienia w Linach bardzo krótkich drapaczy, nie znanych zupełnie w innych stanowiskach kultury hamburskiej. Nasuwa się przypuszczenie, czy nie mamy tu do czynienia z najwcześniejszym objawem „budzenia się" prądu tarnowiańskiego. R. Schild dopuszcza możliwość, że element tarnowiański mógł pojawić się nieco wcześniej niż w połowie Allerödu[28]. Istnieją w związku z tym trzy możliwości:

1. Stanowisko istniało w najstarszym dryasie, a drapacze krótkie wystąpiły w nim zupełnie wyjątkowo.

2. Stanowisko istniało w najstarszym dryasie, a krótkie drapacze są najstarszym objawem pojawienia się prądu tarnowiańskiego.

3. Stanowisko w Linach jest późniejsze niż inne datowane stanowiska kultury hamburskiej, wobec czego ma już zaznaczoną kurtyzację drapaczy (choć byłby to zapewne i tak najstarszy przejaw występowania elementu tarnowiańskiego).

Sprawę wyjaśniłaby data palynologiczna lub radiowęglowa, którą można by uzyskać z poziomów organogenicznych z dna jeziora sąsiadującego ze stanowiskiem. Jednak poziom wody uniemożliwia obecnie zbadanie tych osadów.

Inwentarz zabytków w Linach jest mniej więcej o połowę lub blisko połowę mniejszy od inwentarzy stanowisk: Borneck, Poggenwisch i Hasewisch. Można więc przypuszczać, że grupa zamieszkująca to stanowisko była mniejsza. Nie wydaje się bowiem prawdopodobne, by sezon jej pobytu trwał krócej niż innych grup ludności kultury hamburskiej. Musiał on odpowiadać ogólnie przyjętemu rozkładowi czynności, zapewne bardzo ujednoliconemu w ramach hamburgianu.

Nie udało się odnaleźć w Linach żadnych śladów konstrukcji namiotów czy innego rodzaju schronień. Jeśli takie istniały, zostały zniszczone przez późniejszą orkę.

Porównanie położenia stanowiska w Linach i położenia innych stanowisk hamburskich w stosunku do krawędzi lądolodu w czasie, gdy obozowiska te istniały, również wykazuje analogie. Co najmniej większość tych stanowisk datujemy na interwał Meiendorf, za linię więc postoju czoła lodowca w okresie trwania osadnictwa hamburskiego najlepiej będzie przyjąć ciąg morenowy powstały w maksimum najstarszego dryasu. Linię tę, według ostatnich badań, wyznaczają kolejno: ciąg moren północnolitewskich, moreny fazy gardzieńskiej na polskim wybrzeżu, moreny na wyspie Uznam, moreny północno-wschodniej Rugii i morena H w Danii[29]. Przy tym założeniu odległość od czoła lodowca wynosi dla stanowisk hamburskich Szlezwiku-Holsztynu od 150 do 200 km, a stanowiska w Linach ok. 220 km. Oddalenie od lądolodu w wypadku stanowisk holenderskich dochodziło do 500 km, w czym przypomina je stanowisko, najprawdopodobniej hamburskie, z Rogowa, pow. Opole, oddalone od linii lodowca ok. 400 km. Gdyby data stanowiska w Linach okazała się młodsza, nie zmieniłoby to zbytnio tego, co powiedziano powyżej.

Liny są pierwszym dotychczas udowodnionym z pewnością punktem pobytu grupy ludności kultury hamburskiej w Polsce. Jest wielce prawdopodobne, że i znaleziska z Rogowa należą do tej kultury. Od pewnych stanowisk hamburskich na północnym zachodzie dzieli je odległość ok. 400 km. Z terenów między Szlezwikiem-Holsztynem a Linami nie znamy żadnych pewnych śladów pobytu grup ludności kultury hamburskiej (ryc. 11). Z Brandenburgii znane są bardzo nieliczne wyroby krzemienne i rogowe, które mogą być podejrzane o przynależność do niej, lecz są to tylko przypuszczenia słabo poparte materiałem archeologicznym[30].

Odkrycie w Linach pozwala na przeprowadzenie pewnych rozważań dotyczących głównie zasięgu kultury hamburskiej. Przypomnimy pokrótce teorie na temat jej genezy. Do niedawna powszechnie przyjmowano, że źródeł tej kultury należy szukać w Europie południowo-wschodniej. Miały tego dowodzić znaleziska jednozadzior ców i nielicznych pazurów typu *Zinken* oraz typ ornamentu geometrycznego, spotykane w zespołach górnopaleolitycznych tej części naszego kontynentu (Mezin, Pekárna, Předmostí, Willendorf)[31-33]. Ostatnio niektórzy badacze twierdzeniom tym przeciwstawiają tezę odwrotną, każącą wywodzić hamburgian z podłoża madleńskiego Europy zachodniej, widząc tam zarówno w inwentarzach krzemiennych, jak i w sztuce, więcej podobieństw niż w Europie południowo-wschodniej[34,35].

Jest mało prawdopodobne, by stanowisko w Linach można jakoś wiązać z wędrówką ze wschodu. Jest to stanowisko w pełni rozwinięte typologicznie. Zwolennicy tezy o południowo-wschodnim pochodzeniu kultury hamburskiej rozumieją ją zresztą w ten sposób, że z tych terenów przybyć miały formy przewodnie czy idee ornamentu, a nie rozwinięta już kultura. Prócz tego omawiane stanowisko leży zbyt daleko na północ, aby tędy mogła biec droga, którą by wędrowały elementy mające zainicjować hamburgian. Wydaje się bowiem, że tereny Niżu Środkowoeuropejskiego przed interwałem Meiendorf nie były jeszcze dostępne dla osadnictwa.

Przypuszczenie, że obozowisko w Linach było dziełem grupy ludzkiej przybyłej z zachodu, wydaje się o wiele bardziej prawdopodobne. Owe 400 km dzielące Liny od Szlezwiku-Holsztynu nie mogło stanowić wielkiej przeszkody. Zgodnie z przekonywającą hipotezą A. Rusta łowcy reniferów kultury hamburskiej odbywali co roku dalekie wędrówki z sezonowych obozowisk letnich w pobliżu lądolodu (Szlezwik-Holsztyn) na obozowiska zimowe, leżące na terenach o łagodniejszym klimacie morskim (Holandia, zapewne także dzisiejsza Dogger Bank), i z powrotem. Trasa taka w jedną stronę wynosi również ok. 400 km, tyle co spod Hamburga do zachodniej Polski. Nie sugerujemy bynajmniej, że twórcy obozowiska w Linach przywędrowali osobiście z Holandii czy Niemiec północnych. Chcemy tylko dowieść ich wielkiej ruchliwości. Wędrówka z zachodu na wschód trwała być może całe pokolenia. Nie mamy jednak dotychczas dowodów na to w postaci pewnych znalezisk archeologicznych z Brandenburgii czy południowej Meklemburgii.

Sądząc po odległości stanowiska w Linach od czoła lodowca oraz bliskiej analogii do innych stanowisk, było to obozowisko letnie. Zima w Linach była z pewnością ostrzejsza niż pod Hamburgiem. Nasuwa się pytanie, gdzie chronili się zimą łowcy reniferów z Lin. Jeśli byli zmuszeni wycofywać się ze Szlezwiku-Holsztynu, to tym bardziej musieli opuszczać tereny zachodniej Polski. Czy wycofywali się z powrotem daleko na zachód, czy gdzieś na południe (Rogowo?), pozostaje na razie kwestią otwartą.

Jeśli datowanie stanowiska w Linach na interwał Meiendorf jest słuszne, odkrycie to miałoby znaczenie z punktu widzenia paleogeografii Niżu Środkowoeuropejskiego. Dowodziłoby ono bowiem rzeczywistego istnienia tu takiej cieplejszej oscylacji, pozwalającej na osadnictwo ludzkie w drugiej połowie 12 tysiąclecia p.n.e.

Z archeologicznego punktu widzenia — nawet jeśli stanowisko nasze należałoby datować na Bölling — jest to obecnie najstarszy na naszych ziemiach ślad pojawienia się człowieka po ustąpieniu ostatniego zlodowacenia.

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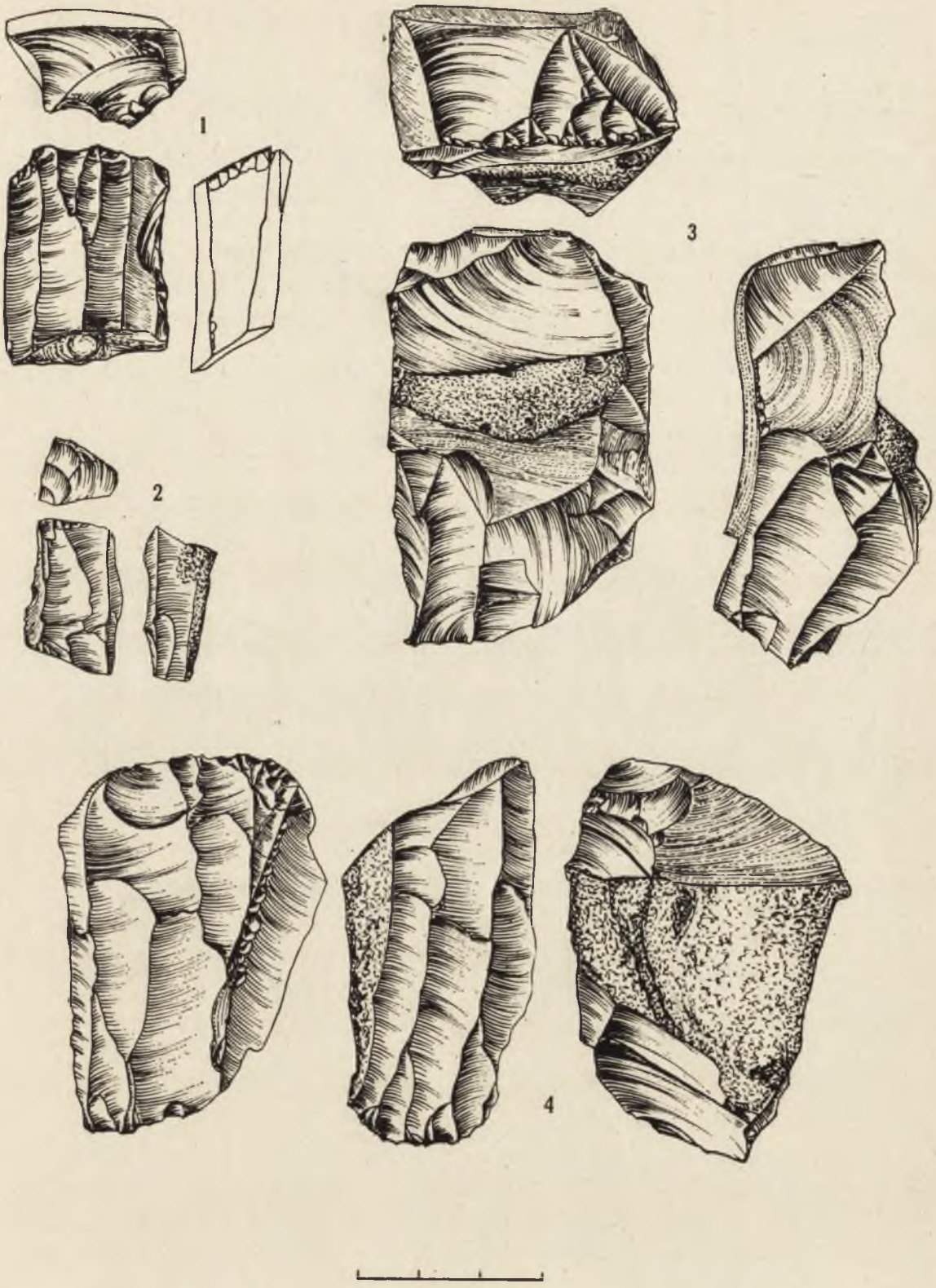
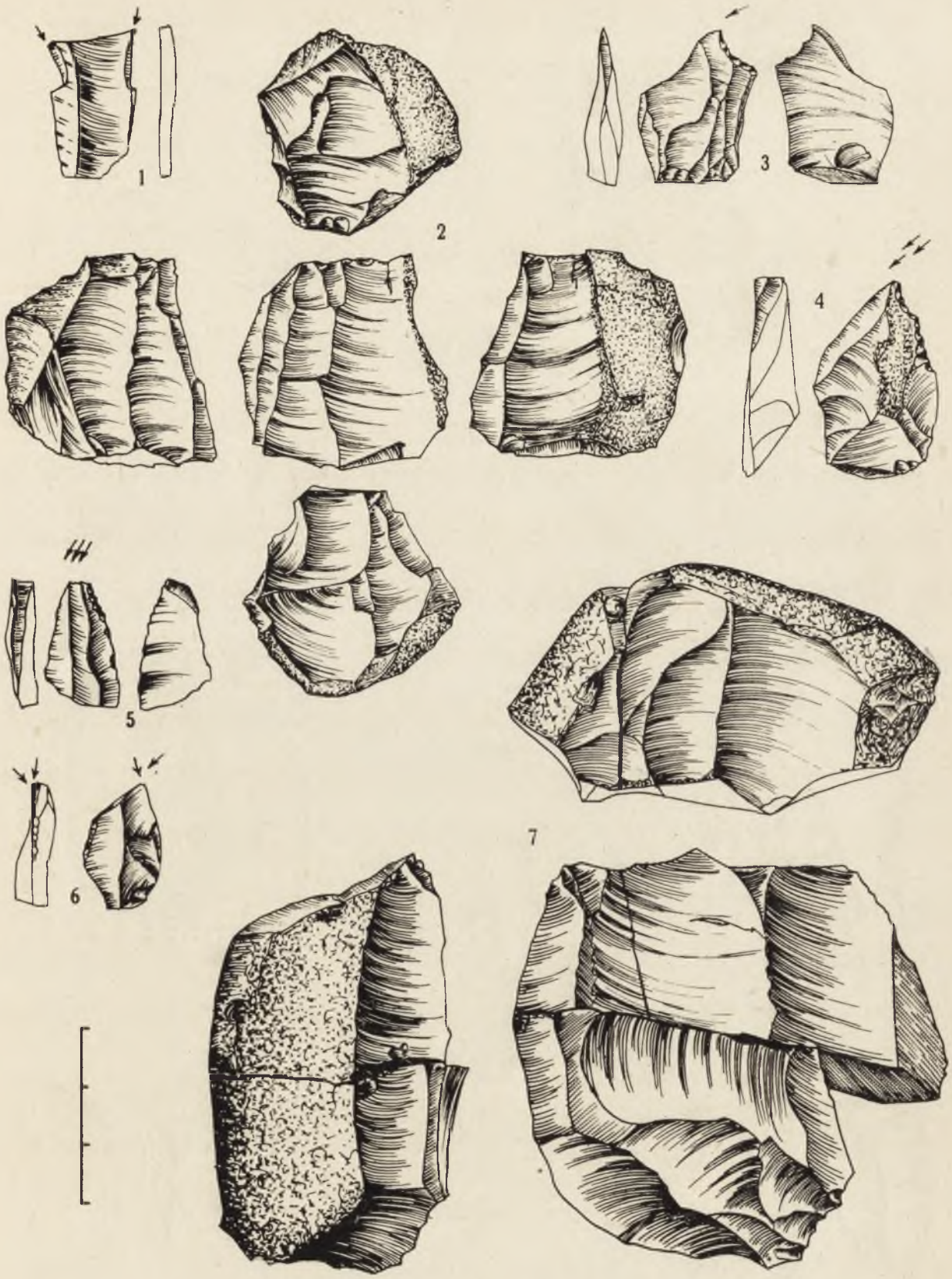



Pl. I. Liny, Wolsztyn district, site 1. Cores — Liny, pow. Wolsztyn, stan. 1. Rdzenie


Pl. II. Liny, Wolsztyn district, site 1. Cores — Liny, pow. Wolsztyn, stan. 1. Rdzenie

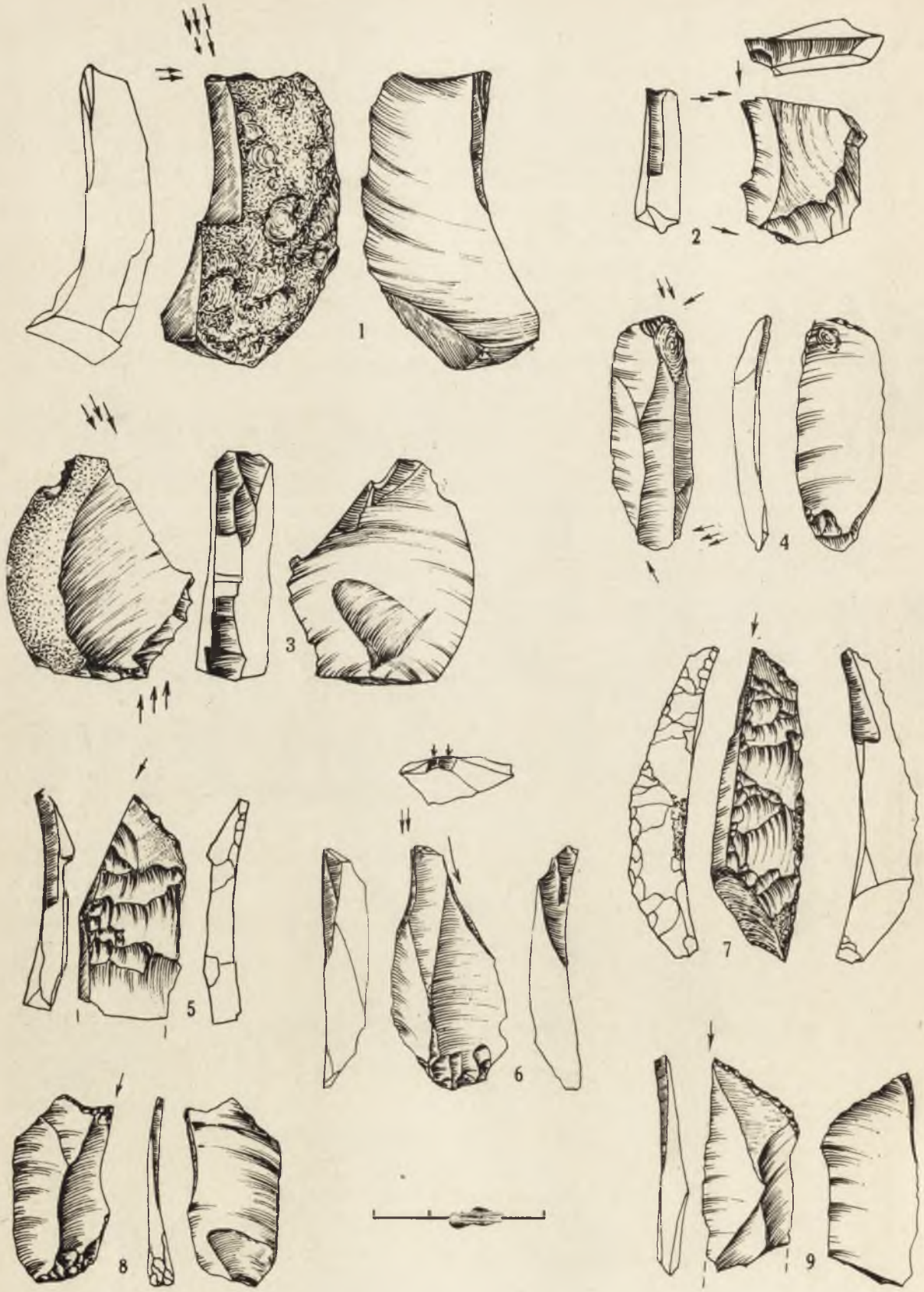



Pl. III. Liny, Wolsztyn district, site 1

*1, 3-6* — burins; *2, 7* — cores.

Liny, pow. Wolsztyn, stan. 1

*1, 3-6* — rylce; *2, 7* — rdzenie




Pl. IV. Liny, Wolsztyn district, site 1. Burins — Liny, pow. Wolsztyn, stan 1. Rylce


Pl. V. Liny, Wolsztyn district, site 1

*1,2* — burins; *3-6, 11* — simple end-scrapers on blades; *7-10* — simple end-s crapers on flakes; *12-18* — shouldered points.

Liny, pow. Wolsztyn, stan. 1

*1, 2* — rylce; *3-6, 11* — drapacze wiórowe; *7-10* — drapacze odłupkowe; *12-18* — jednozadziorce


Pl. VI. Liny, Wolsztyn district, site 1

*1-9* — *Zinken*-perforators; *10, 12* — borers; *11* — groover.

Liny, pow. Wolsztyn. stan, 1

*1-9* — przekłuwacze typu *Zinken*; *10, 12* — wiertniki; *11* — pazur

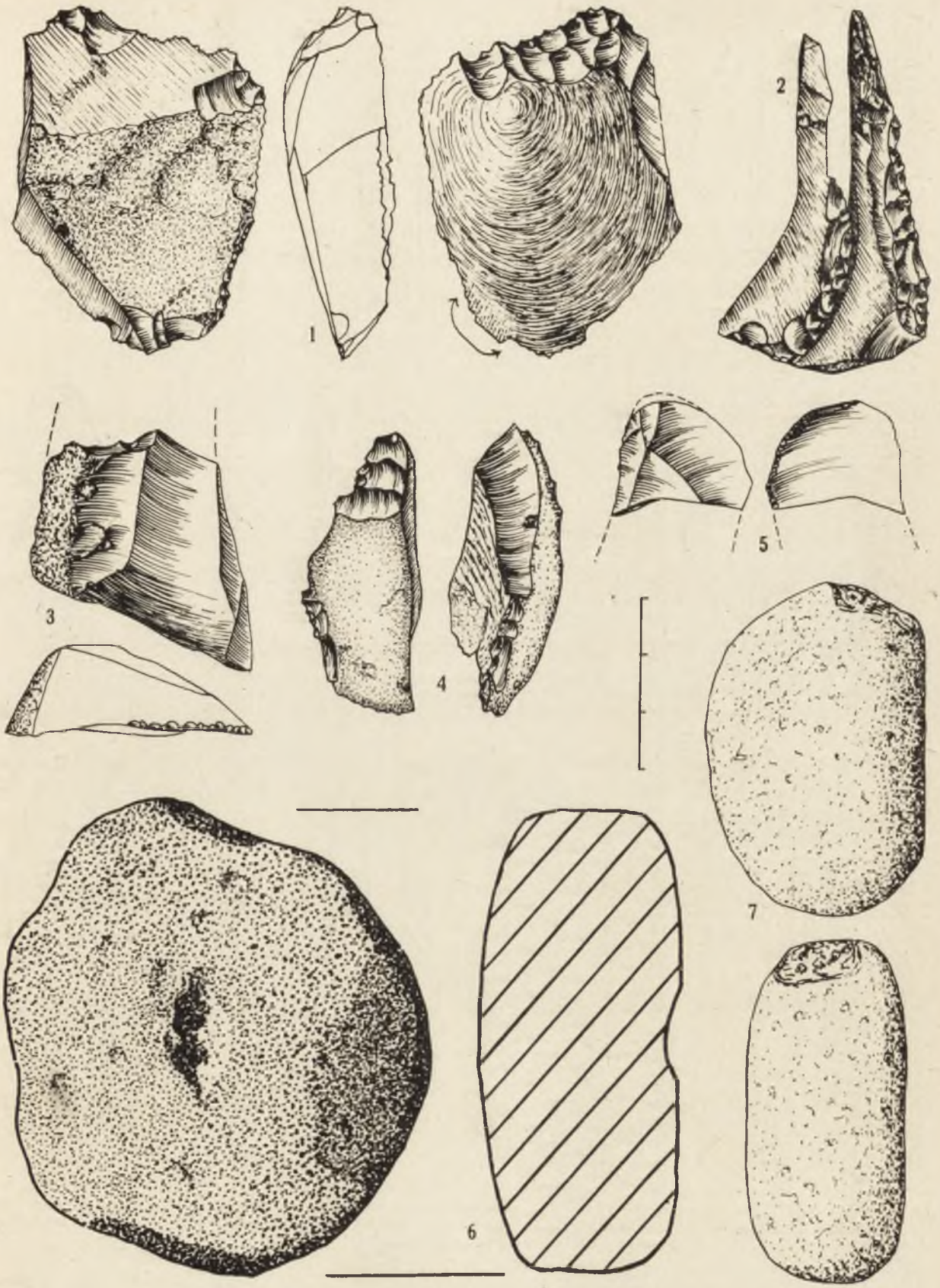

Pl. VII. Liny, Wolsztyn district, site 1

*1* — borer; *2-8* — truncated blades; *9-15* — truncated bladelets; *16, 17* — retouched blades; *18* — noch; *19* — partially retouched blade.

Liny, pow. Wolsztyn, stan. 1

*1* — wiertnik; *2-8* — półtylczaki; *9-15* — półtylczaki małe; *16, 17* — wiórowce; *18* — obłęczniki; *19* — wiór łuskany


Pl. VIII. Liny, Wolsztyn district, site 1. Partially retouched blades — Liny, pow. Wolsztyn, stan. 1. Wióry łuskane

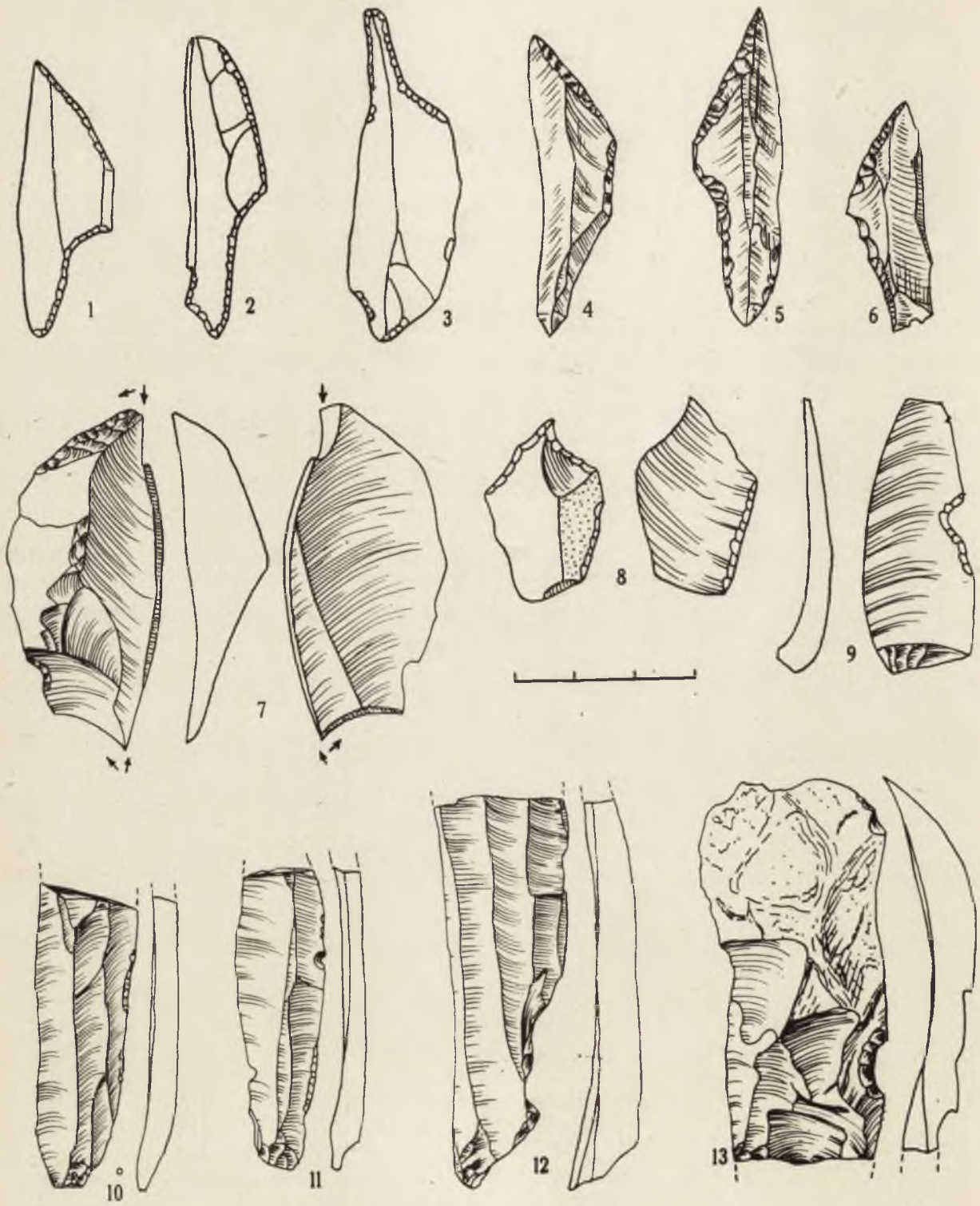



Pl. IX. Liny, Wolsztyn district, site 1

*1, 3-5* — flakes and debitage flakes retouched; 2 — two core edge blades match each other; *6* — sandstone bolster; *7* — hammer stone

Liny, pow. Wolsztyn, stan. 1

*1, 3-5* — odłupki i zaprawiaki łuskane; 2 — składanka z dwóch zatępców; *6* — podkładka z piaskowca; *7* — tłuczek kamienny




Pl. X. Liny, Wolsztyn district, site 1 (*1-3, 7-13*), and Rogowo, Opole district (*4-6*)

*1, 2* — shouldered points; *3* — *Zinken*-perforator (from O. Dobrindt's studies, according to A. Rust); *4-6* — shouldered points (according to L. Rothert); *7* — burin; *8* — *Zinken*-perforator; *9* — noched blade (according to drawings from the Archives of the Poznań Archaeological Museum); *10-13* — partially retouched blades (from excavations).

Liny, pow. Wolsztyn, stan 1 (*1-3, 7-13*) i Rogowo, pow. Opole (*4-6*)

*1, 2* — jednozadziorce; *3* — przekłuwacz typu *Zinken* (z badań O. Dobrinta wg A. Rusta); *4-6* — jednozadziorce (wg L. Rothert); *7* — rylec; *8* — *Zinken*; *9* — wiór z wnęką (wg rysunków z archiwum Muzeum Archeologicznego w Poznaniu); *10-13* — wióry łuskane (z wykopalisk)